CLINICAL GUIDELINES

Chiropractic Services

Version 1.0.2018

Effective June 4, 2018

Clinical guidelines for medical necessity review of chiropractic services.

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Dear Provider,

This document provides detailed descriptions of eviCore's basic criteria for musculoskeletal management services. They have been carefully researched and are continually updated in order to be consistent with the most current evidence-based guidelines and recommendations for the provision of musculoskeletal management services from national and international medical societies and evidence-based medicine research centers. In addition, the criteria are supplemented by information published in peer reviewed literature.

Our health plan clients review the development and application of these criteria. Every eviCore health plan client develops a unique list of CPT codes or diagnoses that are part of their musculoskeletal management program. Health Plan medical policy supersedes the eviCore criteria when there is conflict with the eviCore criteria and the health plan medical policy. If you are unsure of whether or not a specific health plan has made modifications to these basic criteria in their medical policy for musculoskeletal management services, please contact the plan or access the plan's website for additional information.

eviCore healthcare works hard to make your clinical review experience a pleasant one. For that reason, we have peer reviewers available to assist you should you have specific questions about a procedure.

For your convenience, eviCore's Customer Service support is available from 7 a.m. to 7 p.m. Our toll free number is (800) 918-8924.

Gregg P. Allen, M.D. FAAFP
EVP and Chief Medical Officer

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Covered Services and Exclusions

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Chiropractic Covered Services

Covered Chiropractic Services are those within the scope of chiropractic care that are supportive or necessary to help Members achieve the physical state enjoyed before an injury or illness, and that are determined by eviCore to be Medically Necessary, are authorized by eviCore healthcare, and are generally furnished for the diagnosis and/or treatment of a neuromusculoskeletal condition associated with an injury or illness, including the following:

- Examinations
- Manipulation
- Adjunctive Physiotherapy
- Emergency Services

Medically Necessary Chiropractic Services

- To be considered reasonable and necessary the following conditions must each be met:
  - Services are for the treatment of a covered injury, illness or disease.
  - There is strong evidence supporting the services as effective and appropriate treatment for the condition.
  - The clinical documentation must establish the individual's current condition and medical need for services.
  - Treatments are expected to result in significant, measurable, progressive improvement in a reasonable and generally predictable period of time. The improvement potential must be significant in relation to the extent and duration of the therapy required.
  - The complexity of the patient's condition must require the judgment and knowledge of a licensed qualified clinician. Services for conditions that do not require care under a qualified clinician are not skilled and are not considered reasonable or necessary services, even if they are performed by a qualified professional.
  - The amount, frequency, and duration of the services must be reasonable under accepted standards of practice. For these purposes, "generally acceptable standards of practice" means standards that are based on credible scientific evidence published in the peer-reviewed literature generally recognized by the relevant healthcare community, specialty society evidence-based guidelines or recommendation.

Chiropractic Coverage Exclusions

The following are not covered under the plan:

- Services provided by a non-participating chiropractor, except for emergencies, or as authorized by the health plan
- Services provided outside of the health plan's service area, except for emergencies
- Services that are not pre-authorized, except for initial visits or emergencies

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- Services incurred prior to the beginning or after the end of coverage
- Services that exceed the maximum covered visits for the benefit year
- Charges incurred for missed appointments
- Educational programs
- Pre-employment, school entrance, or athletic physical exams
- Services for conditions arising out of employment, including self-employment or covered under any workers' compensation act or law
- Services for any bodily injury arising from or sustained in an automobile accident that is covered under an automobile insurance policy
- Charges for which the member is not legally required to pay
- Services rendered by a person who ordinarily resides in the Member's home or who is related to the member by marriage or blood
- Services for preventive, maintenance, or wellness care
- Drugs, vitamins, nutritional supplements, or herbs
- Experimental or investigational services
- Services not medically necessary as determined by eviCore
- Vocational, stroke, or long-term rehabilitation
- Hypnotherapy, behavior training, sleep therapy, or biofeedback
- Rental or purchase of durable medical equipment (DME)
- Treatment primarily for purposes of weight control
- Lab services
- Thermography, hair analysis, heavy metal screening, or mineral studies
- Transportation costs, including ambulance charges
- Inpatient services
- Manipulation under anesthesia
- Services related to diagnosis and treatment of jaw joint or TMJ disorders
- Treatment of non-neuromusculoskeletal disorders
- Advanced diagnostic services, such as MRI, CT, EMG, SEMG, and NCV

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Cervical Conditions (Disc-Radicular)

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Brachial Neuritis or Radiculitis NOS

Synonyms
- Cervical Radiculitis
- Radicular syndrome of upper limbs

Definition
Neurogenic pain following the distribution of one, or less commonly, more cervical nerve root(s). Condition may be accompanied by upper extremity numbness, weakness, or hyporeflexia, and may be due to cervical disc herniation (typically in younger patients), or foraminal encroachment, or spinal stenosis (typically in older patients).

History
- Patient history may include:
- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications, other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)

Goals
- Rule out red flags (requires medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).
- Risk assessment (e.g. carotid auscultation) for cerebrovascular accident with cervical manipulation.

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinski's or Kernig's sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Myelopathy; spinal cord injury, tumor; Cerebrovascular Accident
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of a new headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Cancer	Cause of symptoms (metastatic or primary)
Alcoholism, drug abuse	Side effect or withdrawal phenomenon
Immune-compromised state	Infection

Presentation

Patient may report trauma or insidious onset. Presentation of patient will vary according to the anatomical cause of neuritis/radiculitis.

Subjective Findings

- Pain, numbness, tingling, paresthesias in the upper extremity following cervical nerve root distribution
- Complains of weakness in the upper extremity, such as with grip strength
- Lack of upper extremity coordination, and difficulty with fine manipulation tasks, including handwriting
- Improves with rest
- Placing hand on top of head may provide relief by decreasing tension on irritated cervical nerve
- Headaches and neck pain may accompany upper extremity pain

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

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Goal of Examination

Examine the neuromusculoskeletal system for possible causes or contributing factors to the neck condition.

Note: Diseases that may refer pain to the cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

Scope of Examination

- Inspection - spine, shoulder, elbow, wrist
- Palpation of bony and soft tissue - spine, shoulder, elbow, wrist
- Range of motion - spine, shoulder, elbow, wrist
- Motion palpation of spine
- Orthopedic testing - spine, shoulder, elbow, wrist
- Neurologic testing
- Vascular insufficiency testing (e.g. carotid auscultation)

Specific Aspects of Examination

- Determine whether there are signs of an upper motor neuron lesion (UMNL) or a lower motor neuron lesion (LMNL).
- Suspect a central nervous system disorder in patients exhibiting UMNL signs; refer to primary care provider immediately.
- If a single regional weakness is identified, attempt to localize the problem by associating any deficits in motor or sensory function with their corresponding spinal nerve level(s).
- If site of lesion cannot be clearly differentiated upon history and examination, referral to primary care provider is warranted for further evaluation.
- Weakness associated with a neuromotor or central nervous system disease should be referred for medical management.

Findings of Brachial Neuritis

- Cervical ROM restrictions may be present
- Muscle spasms in corresponding myotomes
- Nerve root tension signs (shoulder depression) are typically positive but may be absent in cases involving a free fragment of disc tissue
- Foraminal compression may cause radiating upper extremity pain
- Extension with rotation of cervical spine may cause shoulder or arm pain
- Dejerine's triad may be positive
- Dural tension signs
- Extremities symptoms and findings, if present, follow nerve root pattern
- Sensory abnormalities in dermatome
- Loss of reflex

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- Motor power weakness of upper extremity
- Decreased upper extremity girth may be present

Deep Tendon Reflex	C5 nerve root (C4/5 disc)	C6 nerve root (C5/6 disc)	C7 nerve root (C6/7 disc)
Sensation	Hypesthesia in deltoid region	Dorsolateral aspect of thumb and index finger	Index, middle fingers, and dorsum of hand
Motor	Deltoid, biceps	Biceps, wrist extensors	Triceps, wrist flexors
Deep Tendon Reflex	Biceps	Brachioradialis	Triceps

Differential Diagnoses

- Myocardial ischemia (refer for evaluation if suspected)
- Demyelinating conditions (symptoms, intensity and location vary)
- Myelopathy (trunk or leg dysfunction, gait disturbance, bowel or bladder dysfunction, signs of upper motor neuron involvement)
- Thoracic outlet syndrome (positive TOS orthopedic testing)
- Peripheral nerve entrapment (Phalen's test, Tinel's test at elbow and wrist)
- Adhesive capsulitis of shoulder with referred cervical pain (restricted active and passive shoulder motion)
- Rotator cuff disorder with referred cervical pain (significant pain with shoulder circumduction motions)
- Signs of upper motor neuron involvement (clonus, hyperreflexia, Babinski reflex) may suggest compression of the spinal cord, which should be evaluated medically.

Radiographs

Clinical decision involving cervical radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of intervertebral disc syndrome does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

An EMG study or an MRI/CT scan may be helpful in identifying a nerve root lesion. If an advanced diagnostic procedure is medically necessary, consult the health plan for coverage details.

Chiropractic Management

Minimization of the rotary component, and force applied with osseous cervical manipulation is recommended. Prior to osseous manipulation, patient should be questioned regarding reproduction of upper extremity complaints, or increase in pain when placed in pre-stress position. Mild mobilization of the cervical spine may be attempted before administering manipulation in patients with disc lesions. Reproduction

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of upper extremity complaints or increase in pain with either, indicates that caution should be taken. Use of non-osseous techniques, such as an activator, may be considered.

Chiropractic Manipulative Treatment may be used to increase spinal motion and correct biomechanical function. Depending on the pain level, modalities to address pain may be utilized, and if muscular spasms are present, soft tissue mobilization may be indicated. Postural exercises are utilized to improve the anatomical alignment of the spine, followed by cervical stabilization exercises. Cervical traction (manual or mechanical) may be utilized to decrease pain and peripheral symptoms. As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

With Soft Neurologic Signs (single nerve root distribution, paresthesias/sensory changes):

- Manage case conservatively for one week with treatment frequency commensurate with severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in degree of muscle spasm present continue treatment.
- If at least 50% improvement is reported subjectively, significant improvement in function is observed, and pain distribution is centralizing following the initial four weeks continue for an additional month at a decreasing frequency. A home exercise program should be introduced.
- At the end of week eight, improvement in pain should be assessed as at least 75% and additional measurable functional improvement should be achieved; pain should be centralized.
- By the end of week 12, treatment frequency should continue to diminish commensurate with patient's continued improvement. Patient should be prepared for released to a self-management program.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvementPain distribution is centralized to back ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

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With Firm Neurologic Signs (significant motor weakness and/or muscle atrophy):

- Manage conservatively for one week.
- If some improvement in pain is reported subjectively and there is some reduction in the degree of muscle spasm present continue conservative care.
- If at least 30% improvement is reported subjectively, significant improvement in function is observed, and the pain distribution is centralizing following the initial four weeks continue for an additional month at a decreasing frequency.
- At the end of week eight, pain should continue to centralize, pain should further decrease, function should continue to improve, and improvement in neurologic findings should be noted.
- By the end of week 12, improvement in pain should be assessed at least 75%, additional measurable functional improvement should be achieved and pain should be centralized.
- In the final four weeks, treatment frequency should continue to diminish commensurate with the patients continued improvement.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of 0muscle spasm
2-4	➢ 30% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of subjective findings ➢ Continued increase in function ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques ➢ Improvement in neurologic findings
9-12	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvementReinforce self-management techniques
13-16	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 16, whichever occurs first

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Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of upper extremity,
- Signs of demyelinating condition, tumor, or infection.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Cervical isometric exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Brief use of cervical collar, if necessary, in the acute stages to limit motion

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.

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17. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
18. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
19. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
20. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
21. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
22. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
23. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
26. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
27. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
28. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
29. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
30. Heckmann JG, Lang CJ, Zobelein I, et al: Herniated cervical intervertebral discs with radiculopathy: an outcome study of conservatively or surgically treated patients. J Spinal Disord 1999 Oct; 12(5): 396-401. Date last accessed 02/01/2018. https://journals.lww.com/jspinaldisorders/Abstract/1999/10000/Herniated_Cervical_Intervertebral_Discs_with.8.aspx.
31. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.

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32. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
33. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
34. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
35. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
36. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
37. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
38. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
39. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
40. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
41. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
42. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
43. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
44. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
45. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.

© 2018 eviCore healthcare. All rights reserved.

46. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
47. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
48. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
49. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
50. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
51. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
53. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
54. Rolak LA Neurology Secrets; Mosby; 1993.
55. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
56. Saal JS, Saal JA, Yurth EF: Nonoperative management of herniated cervical intervertebral disc with radiculopathy. Spine 1996 Aug 15; 21(16): 1877-83. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/8875719.
57. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
58. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
59. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
60. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
61. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.

© 2018 eviCore healthcare. All rights reserved.

62. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
64. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Verhagen AP, Scholten-Peeters GGM, de Bie RA, Bierma-Zeinstra SMA Conservative treatments for whiplash. Cochrane Database Syst Rev. 2004;(1):CD003338. Review. Date last accessed 02/01/2018. http://dx.doi.org/10.1002/14651858.CD003338.pub2.
68. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
69. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
70. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
71. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
72. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009).
73. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
74. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
75. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Brachial Plexus Lesions

Synonyms

- Cervical rib syndrome
- Scalenus anticus syndrome
- Costoclavicular syndrome
- Thoracic outlet syndrome

Definition

Condition characterized by pain in the neck and shoulder, numbness and/or tingling of the fingers, and weakening of the hand. This collection of symptoms is often described as Thoracic Outlet Syndrome (TOS). Condition is caused by compression of the neural and/or vascular structures of the brachial plexus.

History

Pain, numbness and/or tingling, and heaviness of the involved upper extremity are common complaints reported by a patient with TOS. Often, the symptoms are vague and generalized. The entire extremity may be involved; additionally, neck pain and headaches may be reported concomitantly.

Specific Aspects of History

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, ligament tear, tendon rupture
Fever, severe pain	Possible infection
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection
Cancer history	Cause of symptoms (metastatic or primary)
Discoloration of hand/fingers	Vascular occlusion, shunt emboli (dialysis patients)
Exertional symptoms, history of cardiac disease	Anginal equivalent

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Presentation

Symptoms may begin insidiously after repetitive or stressful activity, such as prolonged computer keyboard use, or mechanical and overhead work. Trauma, such as an automobile accident with occurrence of a whiplash injury also has been associated with onset of TOS with a frequency of up to 23%. Sports activities, especially throwing and swimming, have been implicated as well; symptoms may be similar to those of a clavicular fracture, with a delayed onset from hours to weeks.

Autonomic phenomena (e.g., cold hands, blanching, swelling) may also be reported. Proximity of the stellate ganglion to the first rib articulation, which is often dysfunctional or restricted in TOS, has been postulated as a cause.

Subjective Findings

- Pain in the neck and shoulder
- Numbness/tingling in the fingers
- Weakness in grip strength
- Cold hands
- Swelling in the hands
- Heaviness involving the upper extremity

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

Specific Aspects of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Orthopedic testing
- Neurologic testing

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Findings of Brachial Plexus Lesion

Careful neurological and musculoskeletal examination is essential to diagnose TOS adequately. Often, the most important aspect of the physical examination is to diagnose or rule out other problems of the neck and arm.

The mainstay of the physical examination diagnosis of TOS involves the so-called stress tests (or provocative maneuvers). Sensitivity and specificity of these tests have been low in the studies on TOS completed to date. Different techniques for performing and interpreting these tests are discussed in the literature and vary even more in the bedside clinical situation.

The most common tests are:

Adson maneuvers, where the head is placed in extension and side bending while the patient takes a deep breath and holds it, followed by rotation to stretch or tether the plexus and/or artery by the anterior and middle scalenes. The maneuver is held for 15-30 seconds while the clinician observes for onset of symptoms and obliteration of the pulse. Symptoms have been reported both to the side of bending, and more commonly, to the side away from the bending. If the symptoms are reported on the side of bending, then this finding overlaps with the Spurling sign, commonly used to assist in the diagnosis of cervical radiculopathy. Some examiners ask the patient to pull the head forward while maintaining the test position, causing the anterior scalene to contract against the plexus to enhance the stress effect.

Hyperabduction of the involved arm can also be used to stress the outlet; however, this maneuver often causes symptoms and loss of pulse even in normal individuals and may be misleading. The area of compression with this maneuver is considered more distal, and frequently located at the anterior humeral head and plexus, with tethering under the pectoralis minor muscle.

Costoclavicular bracing (military maneuver) closes the space between the clavicle and first rib and may reproduce symptoms.

Focal stress tests involve applying pressure directly to the anterior scalene, or upper segment of the pectoralis minor. These tests are considered positive if symptoms are reproduced within 15-30 seconds. In addition, some authors have noted a positive Tinel sign (percussing over the plexus) as diagnostic for TOS.

Elevated arm stress test (EAST) has been noted to be highly sensitive for TOS. The upper extremity is held in the "stick-em-up" position with the arms abducted and elbows flexed (both at 90°) for 3 minutes while the patient simultaneously and vigorously flexes and extends the fingers (grasp and release). This test is considered positive if the patient cannot complete the full 3 minutes. Unfortunately, this test is challenging even for individuals without neurovascular symptoms to complete; thus, it may have limited practical usefulness in most clinical situations. In one study, over 80% of patients with carpal tunnel syndrome (CTS) presenting to an electrodiagnostic medicine laboratory had a positive EAST.

Careful observation for asymmetry of the upper chest wall may reveal clavicular irregularity consistent with prior fracture. A non-tender hard mass over the middle third of the clavicle often is noted. Deformity from displaced fracture (with or without

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nonunion) or exuberant callus could be responsible for direct compression of the plexus. Pressure on the clavicle can reproduce or aggravate symptoms, especially when nonunion is present; motion can be detected between the fragments.

Differential Diagnoses

- Cervical myelopathy
- Cervical radiculopathy
- Double crush syndrome (thoracic outlet syndrome and compression at another distal or proximal site)
- Paget-von Schroetter syndrome, effort syndrome (spontaneous venous thrombosis, primary deep venous thrombosis of the upper extremity)
- Pancoast (apical lung) tumor
- Shoulder tendonitis, bursitis, impingement
- Shoulder (glenohumeral) instability
- Raynaud syndrome
- Ulnar neuropathy (cubital tunnel syndrome, Guyon canal syndrome)

Radiographs

Clinical decision involving cervical radiographs is based on eviCore's Radiographic Criteria. If orthopedic testing provides positive results with "stress tests", a minimum cervical radiographic series can be helpful in identifying a cervical rib, or an elevated first rib.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

The goal of chiropractic care is to reduce pain and inflammation, aid stretching and strengthening, and assist in a gradual return to activity. Modalities to reduce pain and inflammation are, therefore, appropriate.

- Modalities with deep heat (i.e., ultrasound), electric stimulation, superficial heat (i.e., Hydrocollator packs), stretching exercises, postural correction exercises, and strength and endurance exercises are all useful or necessary components of TOS treatment.
- Ultrasound is the preferred modality as it is capable of heating deep muscular and soft tissue structures, which is essential to increase elasticity, and facilitates effective stretching and/or manipulation, especially for the scalenes and pectoralis minor muscles. Ideally, ultrasound be performed immediately before the stretching or manual treatment, since the deep tissues cool (from 41-42°C back to 37°C) within 20-30 minutes.
- Caudal rib mobilization for the first and second ribs may be helpful in reducing symptoms.

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- Mobilization and manipulation procedures are indicated, and often necessary to release tight contracted/restricted vertebral segments and soft tissue (myofascial) regions, especially anterior/middle scalenes and pectoralis minor muscle entrapment sites.
- Frequency of care should be commensurate with the severity of the condition; frequency of chiropractic care should decrease with improvement of condition.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjectives ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in pain ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if condition does not progress as expected.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Rest, reduce strenuous activities
- Home ROM exercises, neurotension stretches
- Progression to therapeutic exercise—strengthening exercises
- Hot packs/cold packs, if needed, to relieve discomfort

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.

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13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.
17. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
18. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
19. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
20. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
21. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
22. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
23. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
26. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
27. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
28. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain.

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J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
29. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
30. Heckmann JG, Lang CJ, Zobelein I, et al: Herniated cervical intervertebral discs with radiculopathy: an outcome study of conservatively or surgically treated patients. J Spinal Disord 1999 Oct; 12(5): 396-401. Date last accessed 02/01/2018. https://journals.lww.com/jspinaldisorders/Abstract/1999/10000/Herniated_Cervical_Intervertebral_Discs_with.8.aspx.
31. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
32. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
33. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
34. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
35. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
36. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
37. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
38. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
39. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
40. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
41. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.

© 2018 eviCore healthcare. All rights reserved.

42. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
43. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
44. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
45. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
46. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
47. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
48. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
49. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
50. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
51. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
53. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
54. Rolak LA Neurology Secrets; Mosby; 1993.
55. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
56. Saal JS, Saal JA, Yurth EF: Nonoperative management of herniated cervical intervertebral disc with radiculopathy. Spine 1996 Aug 15; 21(16): 1877-83. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/8875719.
57. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
58. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal

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manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
59. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
60. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
61. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
62. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
64. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Verhagen AP, Scholten-Peeters GGM, de Bie RA, Bierma-Zeinstra SMA Conservative treatments for whiplash. Cochrane Database Syst Rev. 2004;(1):CD003338. Review. Date last accessed 02/01/2018. http://dx.doi.org/10.1002/14651858.CD003338.pub2.
68. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
69. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
70. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
71. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
72. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009).
73. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
74. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
75. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Cervicobrachial Syndrome

Synonyms
None

Definition
Condition related to pain in the arm of cervical origin.

History
Patient history may include:

- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications, other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic
- Response to prior treatment)

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinskis or Kernigs sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident, myelopathy, spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of A new headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Cancer	Cause of symptoms (metastatic or primary)
Alcoholism, drug abuse	Side effect or withdrawal phenomenon
Immune-compromised state	Infection

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Presentation
Varies, may result from traumatic onset or overuse syndrome.

Subjective Findings
- Pain, numbness and/or tingling, and heaviness of involved upper extremity.
- Symptoms are often vague and generalized—entire extremity may be involved; additionally, neck pain and headaches are reported concomitantly.
- Symptoms may begin insidiously after repetitive or stressful activity, such as prolonged computer keyboard use or mechanical and overhead work. Trauma, such as an automobile accident with occurrence of a whiplash injury, also has been associated with the onset.
- Autonomic phenomena (e.g., cold hands, blanching, swelling) also may be reported.

Functional Assessment
Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

Goal of Examination
Examine the neuromusculoskeletal system for possible causes or contributing factors to the neck pain.

Note: Diseases that may refer pain to the cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

Scope of Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing
- Vascular insufficiency testing (e.g. carotid auscultation)

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Specific Aspects of Examination

- Determine whether there are signs of an upper motor neuron lesion (UMNL) or a lower motor neuron lesion (LMNL).
- Suspect a central nervous system disorder in patients exhibiting UMNL signs, refer to primary care provider immediately.
- If a single regional weakness is identified, attempt to localize the problem by associating any deficits in motor or sensory function with their corresponding spinal nerve level(s).
- If site of lesion cannot be clearly differentiated upon history and examination, referral to primary care provider is warranted for further evaluation.
- Weakness associated with a neuromotor or central nervous system disease should be referred for medical management.

Findings of Cervicobrachial Syndrome

- Often antalgic so as to minimize symptoms ROM restrictions
- Extremities symptoms and findings, if present, follow nerve root pattern—sensory abnormalities in dermatomal pattern; loss of reflex may be present; motor power weakness of upper extremity in a myotomal distribution; decreased upper extremity girth may be present.

Deep Tendon Reflex	C5 nerve root (C4/5 disc)	C6 nerve root (C5/6 disc)	C7 nerve root (C6/7 disc)
Sensation	Hypesthesia in deltoid region	Dorsolateral aspect of thumb and index finger	Index, middle fingers, and dorsum of hand
Motor	Deltoid, biceps	Biceps, wrist extensors	Triceps, wrist flexors
Deep Tendon Reflex	Biceps	Brachioradialis	Triceps

Differential Diagnoses

- Myocardial ischemia (refer for evaluation if suspected)
- Thoracic outlet syndrome (positive TOS orthopedic test)
- Peripheral nerve entrapment (Phalens test, Tinels test at elbow and wrist)
- Adhesive capsulitis of shoulder with referred cervical pain (restricted active and passive shoulder motion)
- Rotator cuff disorder with referred cervical pain (significant pain with shoulder circumduction motions)
- Signs of upper motor neuron involvement (clonus, hyperreflexia, Babinski reflex) may suggest compression of spinal cord, which should be evaluated medically.

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Radiographs

Clinical decision involving cervical radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of intervertebral disc syndrome does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

An EMG study or an MRI/CT scan may be helpful in identifying a nerve root lesion. If an advanced diagnostic procedure is medically necessary, consult the health plan for coverage details.

Chiropractic Management

Minimization of the rotary component, and force applied with osseous cervical manipulation is recommended. Prior to osseous manipulation, patient should be questioned regarding reproduction of upper extremity complaints, or increase in pain when placed in pre-stress position. Mild mobilization of the cervical spine may be attempted before administering manipulation in patients with disc lesions. Reproduction of upper extremity complaints or increase in pain with either, indicates that caution should be taken. Use of non-osseous techniques, such as an activator, may be considered.

Chiropractic Manipulative Treatment may be used to increase spinal motion and correct biomechanical function. Depending on the pain level, modalities to address pain may be utilized, and if muscular spasms are present, soft tissue mobilization may be indicated. Postural exercises are utilized to improve the anatomical alignment of the spine, followed by cervical stabilization exercises. Cervical traction (manual or mechanical) may be utilized to decrease pain and peripheral symptoms. As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

With Soft Neurologic Signs (single nerve root distribution, paresthesias/sensory changes):

- Manage case conservatively for one week with treatment frequency commensurate with severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in degree of muscle spasm present—continue treatment.
- If at least 50% improvement is reported subjectively, significant improvement in function is observed, and pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency. A home exercise program should be introduced.
- At the end of week eight, improvement in pain should be assessed as at least 75% improved and significant improvement in functionshould be observed; pain should be centralized.

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- By the end of week 12, treatment frequency should continue to diminish commensurate with patient's continued improvement. Patient should be prepared for released to a self-management program.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

With Firm Neurologic Signs (significant motor weakness and/or muscle atrophy):

- Manage conservatively for one week.
- If some improvement in pain is reported subjectively and there is some reduction in the degree of muscle spasm present—continue conservative care.
- If at least 30% improvement is reported subjectively, significant improvement in function is observed, and the pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency.
- At the end of week eight, pain should continue to centralize, pain should further decrease, function should continue to increase, and improvement in neurologic findings should be noted.
- By the end of week 12, improvement in pain should be assessed at least 75%, additional measurable functional improvement should be achieved and pain should be centralized.
- In the final four weeks, treatment frequency should continue to diminish commensurate with the patients continued improvement.

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Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 30% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques ➢ Improvement in neurologic findings
9-12	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
13-16	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 16, whichever occurs first

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of upper extremity,
- Signs of demyelinating condition, tumor, or infection.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Postural advice/postural exercises
- Cervical isometric exercises, cervical stabilization exercises, stretching exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Use of cervical pillow while sleeping
- Brief use of cervical collar, if necessary, in the acute stages to limit motion
- Home cervical traction may be beneficial

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.

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11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.
17. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
18. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
19. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
20. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
21. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
22. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
23. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
26. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
27. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.

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28. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
29. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
30. Heckmann JG, Lang CJ, Zobelein I, et al: Herniated cervical intervertebral discs with radiculopathy: an outcome study of conservatively or surgically treated patients. J Spinal Disord 1999 Oct; 12(5): 396-401. Date last accessed 02/01/2018. https://journals.lww.com/jspinaldisorders/Abstract/1999/10000/Herniated_Cervical_Intervertebral_Discs_with.8.aspx.
31. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
32. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
33. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
34. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
35. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
36. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
37. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
38. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
39. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
40. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
41. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.

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42. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
43. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
44. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
45. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
46. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
47. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
48. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
49. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
50. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
51. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
53. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
54. Rolak LA Neurology Secrets; Mosby; 1993.
55. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
56. Saal JS, Saal JA, Yurth EF: Nonoperative management of herniated cervical intervertebral disc with radiculopathy. Spine 1996 Aug 15; 21(16): 1877-83. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/8875719.
57. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
58. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal

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manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
59. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
60. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
61. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
62. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
64. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Verhagen AP, Scholten-Peeters GGM, de Bie RA, Bierma-Zeinstra SMA Conservative treatments for whiplash. Cochrane Database Syst Rev. 2004;(1):CD003338. Review. Date last accessed 02/01/2018. http://dx.doi.org/10.1002/14651858.CD003338.pub2.
68. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
69. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
70. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
71. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
72. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009).
73. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
74. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
75. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Degeneration of Cervical Intervertebral Disc

Synonyms
Degeneration of cervicothoracic intervertebral disc.

Definition
Degeneration of Cervical Intervertebral Disc is commonly due to age-related changes. However, condition may also be affected by lifestyle, genetics, smoking, nutrition, and physical activity. Circumferential tears form in the posterolateral annulus after repetitive use. Several circumferential tears coalesce into radial tears, which progress into radial fissures. Disc then disrupts with tears passing throughout disc. Loss of disc height occurs with subsequent peripheral annular bulging. Proteoglycans and water escape through fissures formed from nuclear degradation, resulting in further thinning of the disc space. Vertebral sclerosis and osteophytic formation ultimately follow.

History
Patient history may include:

- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).
- Risk assessment (e.g. carotid auscultation) for cerebrovascular accident with cervical manipulation.

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinskis or Kernigs sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident; myelopathy; spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of a new headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Cancer	Cause of symptoms (metastatic or primary)
Alcoholism, drug abuse	Side effect or withdrawal phenomenon
Immune-compromised state	Infection

Presentation

Condition is usually associated with an insidious onset of pain. Patients may report prior history of several episodes of neck and/or arm pain, and/or history of neck or head trauma. Patients may report morning pain/stiffness that decreases with motion, but is aggravated by excessive motions or strenuous activity.

Subjective Findings

- Pain and stiffness in the neck
- Pain typically worse with motion
- Pain referred from disc to upper limb usually is nondermatomal
- Vibrational stress from driving also exacerbates discogenic pain

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

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Goal of Examination

Examine the neuromusculoskeletal system for possible causes or contributing factors to the neck pain.

Note: Diseases that may refer pain to the cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

Scope of Examination

- Inspection (including postural evaluation)
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing
- Vascular insufficiency testing (e.g. carotid auscultation)

Findings of Degeneration of Cervical Intervertebral Disc

- May relate tenderness to palpation in lateral portions of neck and along spinous processes.
- May demonstrate ROM restrictions in cervical spine; electrical shock-like sensations down arms and/or legs with cervical flexion may indicate myelopathy, or a disorder of the central nervous system, which requires medical evaluation.
- Nerve root tension signs (shoulder depression) may be positive.
- Foraminal compression may cause radiating upper extremity pain.
- Extension with rotation of cervical spine may cause shoulder or arm pain.
- Dejerine's triad may be positive.
- Signs of upper motor neuron involvement may suggest compression of spinal cord, which should be evaluated medically.

Differential Diagnoses

- Metastatic tumor (awakened by constant and severe night pain that is not relieved by changing position, especially when there is a known or suspected history of cancer)
- Spinal cord tumor
- Syringomyelia (superficial abdominal reflexes absent, insensitive to pain)
- Cervical vertebral instability (due to rheumatoid arthritis or following significant
- recent trauma)
- Gather information that leads to a prognosis and selection of appropriate interventions

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Radiographs

Clinical decision involving cervical radiographs is based on medical necessity, as per criteria for radiographic exam. Diagnosis of cervical degenerative disc condition does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results. Basic cervical radiographic series must include AP, APOM and lateral views. Oblique views may be appropriate if neurological deficits are present, and are typically considered after exposing and reviewing a basic 3-view cervical series.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Based on the findings of the initial evaluation, patient's symptoms may include: pain, postural dysfunction, loss of motion, neurologic signs, and subsequent loss of ADL's. Based on these findings, treatment may include modalities to decrease pain, postural exercises, ROM exercises, stretching exercises, manual techniques, such as joint mobilization, soft tissue mobilization and cervical manual traction, and strengthening exercises, such as cervical stabilization exercises. Mechanical traction may also be useful. Home program would reflect these treatments. Treatment frequency depends on the severity of the reported subjective findings and objective findings. Treatment frequency is expected to decrease as patient's condition improves. As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjectives ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of pain ➢ Continued increase in function ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques
9-12	➢ 75% improvement in pain ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques
13-16	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 16, whichever occurs first

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Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of upper extremity,
- Signs of myelopathy,
- Signs of a demyelinating condition, tumor or infection,
- Increasing neurological signs: increasing upper extremity numbness/tingling, increasing upper extremity weakness, decreasing upper extremity reflexes.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Cervical exercises such as isometrics, stabilization exercises, stretching
- Aerobic conditioning, such as walking or swimming
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Use of a cervical pillow while sleeping may be helpful
- Home traction, if helpful
- Use of tennis balls (or other appropriate device) for trigger point work such as suboccipitals, upper trapezius, rhomboids

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Acupuncture
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.

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17. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
18. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
19. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
20. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
21. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
22. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
23. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
26. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
27. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
28. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
29. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
30. Heckmann JG, Lang CJ, Zobelein I, et al: Herniated cervical intervertebral discs with radiculopathy: an outcome study of conservatively or surgically treated patients. J Spinal Disord 1999 Oct; 12(5): 396-401. Date last accessed 02/01/2018. https://journals.lww.com/jspinaldisorders/Abstract/1999/10000/Herniated_Cervical_Intervertebral_Discs_with.8.aspx.
31. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.

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32. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
33. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
34. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
35. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
36. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
37. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
38. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
39. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
40. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
41. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
42. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
43. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
44. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
45. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
46. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck

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pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
47. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
48. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
49. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
50. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
51. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002Column11
53. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
54. Rolak LA Neurology Secrets; Mosby; 1993.
55. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
56. Saal JS, Saal JA, Yurth EF: Nonoperative management of herniated cervical intervertebral disc with radiculopathy. Spine 1996 Aug 15; 21(16): 1877-83. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/8875719.
57. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
58. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
59. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
60. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
61. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons, 1997.
62. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.

© 2018 eviCore healthcare. All rights reserved.

63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
64. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Verhagen AP, Scholten-Peeters GGM, de Bie RA, Bierma-Zeinstra SMA Conservative treatments for whiplash. Cochrane Database Syst Rev. 2004;(1):CD003338. Review. Date last accessed 02/01/2018. http://dx.doi.org/10.1002/14651858.CD003338.pub2.
68. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
69. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
70. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
71. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
72. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009).
73. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
74. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
75. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Displacement of Cervical Intervertebral Disc Without Myelopathy

Synonyms

- Cervical disc herniation
- Herniated nucleus pulposus in cervical spine

Definition

Cervical nerve root irritation as a result of cervical disc pathology. Pain follows distribution of one, or less commonly, more than one cervical nerve root. Pain may be accompanied by numbness, weakness, or hyporeflexia in the effected upper extremity.

History

Patient history may include:

- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinskis or Kernigs sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident; myelopathy; spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
New onset of headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Cancer	Cause of symptoms (metastatic or primary)
Alcoholism, drug abuse	Side effect or withdrawal phenomenon
Immune-compromised state	Infection

Presentation

Typical patient is between 25-50 years of age. Chance of disc herniation after age 40 decreases as the nucleus pulposus dehydrates. Often, there is a history of trauma involving the extremes of extension, flexion, and/or rotation of neck; no aggravating event in 50% of patients.

Subjective Findings

- Pain and stiffness in the neck
- Depending on whether primarily motor or sensory involvement is present—radicular pain is deep, dull, and achy or sharp, burning, and electric
- Often associated with numbness or pain that may reach to the distal ends of the upper extremity
- May complain of weakness in upper extremity, such as with grip strength
- Upper extremity symptoms may predominate
- Patients may present with distal limb numbness and proximal weakness in addition to pain
- Midline disc protrusions may involve both extremities
- Better with rest
- Placing hand on top of head may provide relief by decreasing tension on irritated cervical nerve
- Headaches may accompany pain

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Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

Goal of Examination

Examine the neuromusculoskeletal system for possible causes or contributing factors to the neck pain.

Note: Diseases that may refer pain to the cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Specific Aspects of Examination

- Determine whether there are signs of an upper motor neuron lesion (UMNL) or a lower motor neuron lesion (LMNL).
- Suspect a central nervous system disorder in patients exhibiting UMNL signs, refer to primary care provider immediately.
- If a single regional weakness is identified, attempt to localize the problem by associating any deficits in motor or sensory function with their corresponding spinal nerve level(s).
- If site of lesion cannot be clearly differentiated upon history and examination, referral to primary care provider is warranted for further evaluation.
- Weakness associated with a neuromotor or central nervous system disease should be referred for medical management.

Findings of Cervical Intervertebral Disc Syndrome

- Often antalgic
- ROM restrictions
- Nerve root tension signs (shoulder depression) are typically positive but may be absent in cases involving a free fragment of disc tissue
- Foraminal compression may cause radiating upper extremity pain

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- Extension with rotation of cervical spine may cause shoulder or arm pain
- Dejerine's triad may be positive
- Dural tension signs
- Extremities symptoms and findings, if present, follow nerve root pattern—sensory abnormalities in dermatome; loss of reflex; motor power weakness of upper extremity; decreased upper extremity girth may be present; signs of upper motor neuron involvement (clonus, hyperreflexia, Babinski reflex) may suggest compression of spinal cord, which should be evaluated medically.

Deep Tendon Reflex	C5 nerve root (C4/5 disc)	C6 nerve root(C5/6 disc)	C7 nerve root(C6/7 disc)
Sensation	Hypesthesia in deltoid region	Dorsolateral aspect of thumb and index finger	Index, middle fingers, and dorsum of hand
Motor	Deltoid, biceps	Biceps, wrist extensors	Triceps, wrist flexors
Deep Tendon Reflex	Biceps	Brachioradialis	Triceps

Differential Diagnoses

- Myocardial ischemia (refer for evaluation if suspected)
- Thoracic outlet syndrome (positive TOS orthopedic test)
- Peripheral nerve entrapment (Phalens test, Tinels test at elbow and wrist)
- Adhesive capsulitis of shoulder with referred cervical pain (restricted active and passive shoulder motion)
- Rotator cuff disorder with referred cervical pain (significant pain with shoulder circumduction motions)
- Gather information that leads to a prognosis and selection of appropriate interventions

Radiographs

Clinical decision involving cervical radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of intervertebral disc syndrome does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

An EMG study or an MRI/CT scan may be helpful in identifying a nerve root lesion. If an advanced diagnostic procedure is medically necessary, consult the health plan for coverage details.

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Chiropractic Management

Minimization of the rotary component, and force applied with osseous cervical manipulation is recommended. Prior to osseous manipulation, patient should be questioned regarding reproduction of upper extremity complaints, or increase in pain when placed in pre-stress position. Mild mobilization of the cervical spine may be attempted before administering manipulation in patients with disc lesions. Reproduction of upper extremity complaints or increase in pain with either, indicates that caution should be taken. Use of non-osseous techniques, such as an activator, may be considered.

Chiropractic Manipulative Treatment may be used to increase spinal motion and correct biomechanical function. Depending on the pain level, modalities to address pain may be utilized, and if muscular spasms are present, soft tissue mobilization may be indicated. Postural exercises are utilized to improve the anatomical alignment of the spine, followed by cervical stabilization exercises. Cervical traction (manual or mechanical) may be utilized to decrease pain and peripheral symptoms. As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

With Soft Neurologic Signs (single nerve root distribution, paresthesias/sensory changes):

- Manage case conservatively for one week with treatment frequency commensurate with severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in degree of muscle spasm present—continue treatment.
- If at least 50% improvement is reported subjectively, significant improvement in function is observed, and pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency. A home exercise program should be introduced.
- At the end of week eight, improvement in pain should be assessed as at least 75% improved and additional measurable functional improvement should be achieved; pain should be centralized.
- By the end of week 12, treatment frequency should continue to diminish commensurate with patient's continued improvement. Patient should be prepared for released to a self-management program.

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Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

With Firm Neurologic Signs (significant motor weakness and/or muscle atrophy):

- Manage conservatively for one week.
- If some improvement in pain is reported subjectively and there is some reduction in the degree of muscle spasm present—continue conservative care.
- If at least 30% improvement is reported subjectively, significant improvement in functionis observed, and the pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency.
- At the end of week eight, pain should continue to centralize, pain should further decrease, function should continue to improve, and improvement in neurologic findings should be noted.
- By the end of week 12, improvement in pain should be assessed at least 75%, additional measurable functional improvement should be achieved and pain should be centralized.
- In the final four weeks, treatment frequency should continue to diminish commensurate with the patients continued improvement.

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Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 30% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of subjective findings ➢ Continued increase in function ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques ➢ Improvement in neurologic findings
9-12	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
13-16	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 16, whichever occurs first

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of upper extremity is apparent,
- Signs of demyelinating condition, tumor or infection are apparent,
- Progressive neurologic signs/symptoms are present: increasing upper extremity numbness/tingling, increasing upper extremity weakness, decreasing upper extremity reflexes.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Postural advice/postural exercises
- Cervical isometric exercises, cervical stabilization exercises, stretching exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Use of cervical pillow while sleeping
- Brief use of cervical collar, if necessary, in the acute stages to limit motion
- Home cervical traction

Alternative Management

- Acupuncture
- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.

© 2018 eviCore healthcare. All rights reserved.

11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.
17. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
18. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
19. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
20. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
21. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
22. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
23. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
26. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
27. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
28. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
29. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
30. Heckmann JG, Lang CJ, Zobelein I, et al: Herniated cervical intervertebral discs with radiculopathy: an outcome study of conservatively or surgically treated patients. J Spinal Disord 1999 Oct; 12(5): 396-401. Date last accessed 02/01/2018. https://journals.lww.com/jspinaldisorders/Abstract/1999/10000/Herniated_Cervical_Intervertebral_Discs_with.8.aspx.
31. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
32. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
33. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
34. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
35. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
36. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
37. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
38. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
39. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
40. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.

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41. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
42. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
43. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
44. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
45. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
46. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
47. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
48. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
49. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99.
50. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
51. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
53. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
54. Rolak LA Neurology Secrets; Mosby; 1993.
55. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
56. Saal JS, Saal JA, Yurth EF: Nonoperative management of herniated cervical intervertebral disc with radiculopathy. Spine 1996 Aug 15; 21(16): 1877-83. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/8875719.
57. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013

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Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
58. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
59. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
60. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
61. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
62. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
64. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Verhagen AP, Scholten-Peeters GGM, de Bie RA, Bierma-Zeinstra SMA Conservative treatments for whiplash. Cochrane Database Syst Rev. 2004;(1):CD003338. Review. Date last accessed 02/01/2018. http://dx.doi.org/10.1002/14651858.CD003338.pub2.
68. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
69. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
70. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
71. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
72. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009).
73. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
74. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
75. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Cervical Conditions (Non-specific)

Cervicalgia	**66**
Cervical Nonallopathic Lesion	**76**
Cervical Spondylosis Without Myelopathy	**86**
Cervical Sprain and Strain	**97**
Other Syndromes Affecting Cervical Region	**109**
Torticollis	**110**

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Cervicalgia

Synonyms

- Pain in neck
- Cervicodynia

Definition

Cervicalgia is a term used for pain in the cervical area. This condition is nonspecific in origin and/or nature, can be acute or chronic in nature, and is generally not used to describe episodes that involve radicular symptoms.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of chiropractic response to prior treatment)
- Episode Type
- A New Episode is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A Recurrent Episode is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- Continuation of Care is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

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- Risk assessment (e.g. carotid auscultation) for cerebrovascular accident with cervical manipulation.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinski's or Kernig's sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident; myelopathy; spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of new headache	Tumor; infection; vascular cause (older patients, also consider temporal ateritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Unexplained weight loss	Cancer
Alcoholism, drug abuse	Side effect or withdrawal phenomenon
Immune-compromised state	Infection
Open wound in the area of the primary region of complaint	Infection

Presentation

Usually insidious onset of pain. May report prior history of episodic neck pain. May begin between the 3rd and 6th decades of life and persist for years.

Subjective Findings

- Pain and stiffness in neck; pain typically worse with motion
- Headaches may accompany the neck pain
- Essentially constant awareness of some level of neck discomfort or limitations in motion

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

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Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Diseases that may refer pain to the cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Cervicalgia includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the cervical spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the cervical spine
    - Functional movement(s) involving the cervical spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (circumferential measurements of the upper extremities when indicated)
- Palpable areas of tenderness along the cervical spine region corresponding to hypertonicity of the cervical muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

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Differential Diagnoses

- Cervical disc herniation (typically, neurologic abnormality and radicular pain)
- Dislocation of the cervical spine (significant trauma, greater than 3 mm. loss of contact between contiguous segments)
- Fracture of cervical spine (history, abnormal radiograph)
- Inflammatory arthritides, such as rheumatoid arthritis (history, radiographic findings)
- Cervical spine tumor or infection (night pain, weight loss, history of cancer, fever)

Radiographs

Clinical decision involving cervical radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of cervicalgia does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities"

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(e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.

- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- If improvement following the initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider a different adjustive/manipulative technique.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed

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to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice, postural exercises
- Flexibility exercises
- Cervical stabilization exercises, isometrics
- Aerobic conditioning, such as walking or swimming
- Heat applications, cold packs, if needed, to relieve discomfort/stiffness
- Use of a cervical pillow while sleeping may be helpful

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.

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10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.

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27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
37. Kay TM, Gross A, Goldsmith C, Santaguida PL, Hoving J, Bronfort G, Cervical Overview Group. Exercises for mechanical neck disorders. Cochrane Database Syst Rev. 2005 Jul 20;(3):CD004250. Review. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/16034925.
38. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
39. Kroeling P, Gross A, Goldsmith CH, Cervical Overview Group. A Cochrane review of electrotherapy for mechanical neck disorders. Spine. 2005 Nov 1;30(21):E641-8. Date last accessed 02/01/2018. https://journals.lww.com/spinejournal/Abstract/2005/11010/A_Cochrane_Review_of_Electrotherapy_for_Mechanical.26.aspx.
40. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic

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review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
41. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
42. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
43. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009). Measurement properties of the Neck Disability Index: A systematic review. Journal of Orthopaedic and Sports Physical Therapy, 39(5), 400–417. Date last accessed 02/01/2018. https://secure.movementsciencemedia.org/doi/pdf/10.2519/jospt.2009.2930?code=jospt-site.
44. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
45. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
46. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
47. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
48. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
49. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
50. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
51. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
53. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
54. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
55. Rolak LA Neurology Secrets; Mosby; 1993.
56. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.

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57. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
58. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
59. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
60. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
61. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
62. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
64. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
68. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
69. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
70. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
71. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
72. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
73. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Cervical Nonallopathic Lesion

Synonyms

- Segmental dysfunction—cervical
- Somatic dysfunction—cervical
- Subluxation—cervical

Definition

Condition is associated with an abnormal or altered functional relationship between contiguous cervical vertebrae.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

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- Risk assessment (e.g. carotid auscultation) for cerebrovascular accident with cervical manipulation.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinskis or Kernigs sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident; myelopathy; spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of new headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Prolonged steroid use	Osteoporosis, Compression fracture
Intravenous drug abuse, alcoholism and/or diabetic	Infection
Immune-compromised state	Infection
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Unexplained weight loss	Malignancy
Prior or current history of cancer	Malignancy
Pain that is worse with recumbency or worse at night and or unrelated to movement	Malignancy
Fever or recent bacterial infection	Infection
Open wound in the area of the primary region of complaint	Infection

Presentation

Often arises from a "non-specific onset." Some form of acute or chronic postural abuse is often involved. There may be prior history of trauma to the involved region. Condition may be a sequela of, and secondary to, another primary diagnosis such as sprain, strain, or capsulitis.

Subjective Findings

Pain and/or stiffness in the region of the affected joints/segments.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a

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patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint. Assess risk of vertebrobasilar accident with cervical manipulation.

Note: Diseases that may refer pain to cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

The most serious cause of spinal pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that most commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing if
- Vascular insufficiency testing (e.g. carotid auscultation)

Objective Criteria

Cervical Nonallopathic Lesion includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the cervical spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the cervical spine
    - Functional movement(s) involving the cervical spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (circumferential measurements of the upper extremities when indicated)

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- Palpable areas of tenderness along the cervical spine region corresponding to hypertonicity of the cervical muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Radiographs

Clinical decision involving a radiographic series of the cervical spine is based on medical necessity, as per criteria for radiographic exam. Diagnosis of nonallopathic lesion does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.

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- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- If improvement following the initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider a different adjustive/manipulative technique.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Postural advice
- Cervical exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Acupuncture
- Massage
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck

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pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.

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29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
37. Kay TM, Gross A, Goldsmith C, Santaguida PL, Hoving J, Bronfort G, Cervical Overview Group. Exercises for mechanical neck disorders. Cochrane Database Syst Rev. 2005 Jul 20;(3):CD004250. Review. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/16034925.
38. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
39. Kroeling P, Gross A, Goldsmith CH, Cervical Overview Group. A Cochrane review of electrotherapy for mechanical neck disorders. Spine. 2005 Nov 1;30(21):E641-8. Date last accessed 02/01/2018. https://journals.lww.com/spinejournal/Abstract/2005/11010/A_Cochrane_Review_of_Electrotherapy_for_Mechanical.26.aspx.
40. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
41. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
42. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.

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43. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009). Measurement properties of the Neck Disability Index: A systematic review. Journal of Orthopaedic and Sports Physical Therapy, 39(5), 400–417. Date last accessed 02/01/2018. https://secure.movementsciencemedia.org/doi/pdf/10.2519/jospt.2009.2930?code=jospt-site.
44. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
45. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
46. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
47. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
48. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
49. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
50. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
51. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
53. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
54. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
55. Rolak LA Neurology Secrets; Mosby; 1993.
56. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
57. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
58. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.

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59. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
60. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
61. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
62. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
64. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
68. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
69. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
70. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
71. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
72. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
73. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Cervical Spondylosis Without Myelopathy

Synonyms

- Cervical or cervicodorsal arthritis
- Cervical or cervicodorsal osteoarthritis
- Cervical or cervicodorsal spondyloarthritis

Definition

Condition consisting of degenerative joint disease affecting the cervical vertebrae, intervertebral discs, and surrounding ligaments and connective tissue, sometimes with pain or paresthesia radiating down the arm.

History

The onset of symptoms is usually insidious. Occasionally, acute exacerbations may be brought on by excessive activity such as reading or painting a ceiling with the neck in extension. Trauma, e.g., a fall or rear-end collision, may also precipitate an acute exacerbation.

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

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Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinskis or Kernigs sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident; myelopathy; spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of a new headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Unexplained weight loss	Cancer
Alcoholism, drug abuse	Side effect or withdrawal phenomenon
Immune-compromised state	Infection
Open wound in the area of the primary region of complaint	Infection

Presentation

Usually patient reports an insidious onset of pain, or prior history of several episodes of neck, and/or arm pain, and/or history of neck or head trauma. There may be morning pain/stiffness that decreases with motion, but is aggravated by excessive motions or strenuous activity.

Subjective Findings

- Pain and stiffness in the neck
- Pain typically worse with motion
- May report crepitus with certain cervical motions, particularly circumduction
- Headaches may accompany pain

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- Non-dermatomal upper extremity pain (unilateral or bilateral) may occur with lateral recess stenosis and nerve root entrapment

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

Goal of Examination

Examine the neuromusculoskeletal system for possible causes or contributing factors to the neck pain.

Note: Diseases that may refer pain to the cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

The most serious cause of spinal pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that most commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid

Scope of Examination

- Inspection (including postural evaluation)
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Cervical Spondylosis without Myelopathy includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the cervical spine region upon any one (1) of the following:

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  - Active and/or passive range-of-motion of the cervical spine
  - Functional movement(s) involving the cervical spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (circumferential measurements of the upper extremities when indicated)
- Palpable areas of tenderness along the cervical spine region corresponding to hypertonicity of the cervical muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Differential Diagnoses

- Metastatic tumor (awakened by constant and severe night pain that is not relieved by changing position, especially when there is a known or suspected history of cancer)
- Spinal cord tumor
- Syringomyelia (superficial abdominal reflexes absent, insensitive to pain)
- Cervical vertebral instability (due to rheumatoid arthritis or following significant recent trauma)

Radiographs

Clinical decision involving lumbar radiographs is based on medical necessity, per eviCore's Radiographic Criteria. Diagnosis of cervical spondylosis does not warrant radiographic evaluation unless associated with a radiographic criterion.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

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Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- If improvement following the initial two weeks is not at least 25%, reassess case for other possible causes or complicating factors and consider a different adjustive/manipulative technique.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient’s condition.
- Patient's condition should resolve within 12 weeks. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

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Week	Progress
0-2	➢ 25% improvement in subjective findings ➢ Measureable functional improvement
3-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Introduce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of upper extremity,
- Signs of myelopathy,
- Signs of demyelinating condition, tumor or infection,
- Increasing neurological signs: increasing upper extremity numbness/tingling, increasing upper extremity weakness, or decreasing upper extremity reflexes.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Cervical exercises such as—isometrics, stabilization exercises, stretching
- Aerobic conditioning, such as walking or swimming
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Cervical pillow while sleeping

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- Home traction
- Use of tennis balls (or other appropriate device) for trigger point work, such as suboccipitals, upper trapezius, rhomboids

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck

© 2018 eviCore healthcare. All rights reserved.

pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.

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29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
37. Kay TM, Gross A, Goldsmith C, Santaguida PL, Hoving J, Bronfort G, Cervical Overview Group. Exercises for mechanical neck disorders. Cochrane Database Syst Rev. 2005 Jul 20;(3):CD004250. Review. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/16034925.
38. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
39. Kroeling P, Gross A, Goldsmith CH, Cervical Overview Group. A Cochrane review of electrotherapy for mechanical neck disorders. Spine. 2005 Nov 1;30(21):E641-8. Date last accessed 02/01/2018. https://journals.lww.com/spinejournal/Abstract/2005/11010/A_Cochrane_Review_of_Electrotherapy_for_Mechanical.26.aspx.
40. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
41. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
42. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.

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43. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009). Measurement properties of the Neck Disability Index: A systematic review. Journal of Orthopaedic and Sports Physical Therapy, 39(5), 400–417. Date last accessed 02/01/2018. https://secure.movementsciencemedia.org/doi/pdf/10.2519/jospt.2009.2930?code=jospt-site.
44. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
45. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
46. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
47. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
48. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
49. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
50. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
51. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
53. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
54. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
55. Rolak LA Neurology Secrets; Mosby; 1993.
56. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
57. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
58. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.

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59. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
60. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
61. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
62. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
64. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
68. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
69. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
70. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
71. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
72. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
73. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Cervical Sprain and Strain

Synonyms

- Whiplash
- Cervical acceleration/deceleration syndrome
- Cervical anterior longitudinal sprain/strain
- Atlanto-axial sprain
- Altanto-occipital sprain

Definition

Condition involving non-radicular neck pain that may extend into the trapezius region. Condition occurs either suddenly or following a trauma that may be either instantaneous or repetitive.

- Strain
  - Overstretching or tearing of a muscle or tendon.
- Sprain
  - Overstretching or tearing of ligamentous tissue.

Classification

Tendon and Ligament injuries are classified as...

- Grade I (mild)
  - Mild injury that causes only stretching or microscopic tears in a tissue. Although these tiny tears can stretch the tissue, they do not significantly affect the stability of the injured joint.
- Grade II (moderate)
  - Injured tissue is partially torn, and there is some mild to moderate joint instability.
- Grade III (severe)
  - Tissue is either torn completely or avulsed (pulled away from the place where it attaches to bone), and there is significant joint instability. Surgical referral may be necessary.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications

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- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movement.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).
- Risk assessment (e.g. carotid auscultation) for cerebrovascular accident with cervical manipulation.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinski's or Kernig's sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident; myelopathy; spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of a new headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Prior or current history of cancer	Cause of symptoms (metastatic or primary)

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Intravenous drug abuse, alcoholism and/or diabetic	Side effect or withdrawal phenomenon
Immunosupression, HIV, Immunosuppresive Drugs	Infection
Prolonged steroid use	Osteoporosis, Compression fracture
Open wound in the area of the primary region of complaint	Infection
Unexplained weight loss	Tumor; infection; metabolic or endocrine disorder

Presentation

- Strain
  - Overexertion in some static or dynamic activity; over stretching; or contusion. Pain is worse with initial activity; rest typically relieves the pain.
- Sprain
  - Chronic manifestations involve prolonged periods of postural abuse. Acute onset may involve a sudden motion or poor body mechanics while performing an activity.

Subjective Findings

- Strain
  - Pain and stiffness in a muscle/tendon group.
- Sprain
  - Pain and stiffness in the affected area.
    - Neck pain located anywhere from the occiput to cervicothoracic junction, and towards the shoulders along the distribution of the trapezii.
    - Motion of the head and neck is typically painful.
    - Headaches originating from the cervical region or occiput may accompany the neck pain.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

Goal of Examination

Examine the neuromusculoskeletal system for possible causes or contributing factors to the neck pain.

Note: Diseases that may refer pain to the cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

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The most serious cause of spinal pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that most commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic and neurologic testing if complaints radiate to back or upper extremities
- Assess risk of vertebrobasilar accident with cervical manipulation
- Vascular insufficiency testing (e.g. carotid auscultation)

Findings of Cervical Sprain/Strain

- Strain
  - Inspection negative for visible deformity
  - Tenderness, spasm, and possible swelling in the muscle or tendon upon palpation
  - Limited cervical motion is common and typically more painful on active motion
  - Pain on isometric contraction or active motion of the involved muscle
  - Neurological exam is usually normal
- Sprain
  - Inspection negative for visible deformity
  - Tenderness +2 or greater in the immediate area of the involved joint(s)
  - Localized spasm and/or swelling in the tissues directly adjacent to the region
  - Limited cervical motion is common and particularly more painful on end range
  - Pain intensified by passive motion of the involved joint(s)
  - Neurological exam is usually normal

Objective Criteria

Cervical Sprain/Strain includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND

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- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the cervical spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the cervical spine
    - Functional movement(s) involving the cervical spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (circumferential measurements of the upperextremities when indicated)
- Palpable areas of tenderness along the cervical spine region corresponding to hypertonicity of the cervical muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention

Differential Diagnoses

- Cervical disc herniation (typically neurologic abnormality and radicular pain)
- Dislocation of the cervical spine (significant trauma, greater than 3 mm. loss of contact between contiguous segments)
- Fracture of cervical spine (history, abnormal radiograph)
- Inflammatory arthritides, such as rheumatoid arthritis (history, radiographic findings)
- Cervical spine tumor or infection (night pain, weight loss, history of cancer, fever)

Radiographs

Clinical decision involving a radiographic series of the cervical region is based on medical necessity, as per criteria for radiographic exam. Diagnosis of cervical sprain/strain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:

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- Severity of clinical findings,
- Presence of complicating factors,
- Natural history of condition, and
- Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- If improvement following the initial two weeks is not at least 25%, reassess case for other possible causes or complicating factors and consider a different adjustive/manipulative technique.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient’s condition.
- Patient's condition should resolve within 12 weeks. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

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Week	Progress
0-2	➢ 25% improvement in subjective findings ➢ Measurable functional improvement
3-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Introduce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of upper extremity,
- Signs of demyelinating condition, tumor or infection.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Isometric cervical exercises
- Aerobic activity
- Cold/heat applications
- Use of cervical pillow
- Cervical support, as appropriate

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Alternatives to Chiropractic Management

- Acupuncture
- Massage
- Medication
- Physiatry
- Physical Therapy
- Osteopathic Manipulation
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients

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with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.

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30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
37. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
38. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
39. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
40. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
41. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
42. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
43. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.

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44. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
45. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
46. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
47. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
48. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
49. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
50. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
51. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
52. Rolak LA Neurology Secrets; Mosby; 1993.
53. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
54. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
55. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
56. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
57. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
58. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
59. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
60. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.

© 2018 eviCore healthcare. All rights reserved.

61. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
62. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
63. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
64. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
65. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
66. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
67. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
68. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
69. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
70. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Other Syndromes Affecting Cervical Region

Definition

ICD-10 codes M53.81, M53.82, and M53.83 represent non-specific conditions. These non-specific diagnosis codes do not address the cause of the patient's cervical condition. For a description of the Chiropractic Evaluation and Management of these conditions, refer to the appropriate ICD-10 codes in the Cervical Guideline that best describes the reported condition.

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Torticollis

Synonyms

- Idiopathic Spasmodic Torticollis
- Involuntary Contractions Of Neck Muscles
- Focal Dystonia
- Congenital Torticollis
- Acquired Torticollis
- Acute Wryneck
- Painful Neck Spasms
- Cervical Muscle Spasm
- Tonic Head Deviation
- Clonic Head Movements
- Head Torsion
- Spasmodic Torticollis
- Contracture Of Neck

Definition

Torticollis is a condition that causes the neck to involuntarily twist to one side, secondary to contraction of the neck muscles. The ear is tilted toward the contracted muscle, and the chin is facing the opposite direction.

Torticollis is derived from the Latin tortus, meaning twisted, and collum, meaning neck. Symptom is of diverse conditions; some of which include congenital problems, trauma, and infections.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.

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- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to the avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).
- Risk assessment (e.g. carotid auscultation) for cerebrovascular accident with cervical manipulation.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinskis or Kernigs sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident; myelopathy; spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of new headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Unexplained weight loss	Cancer
Alcoholism, drug abuse	Side effect or withdrawal phenomenon
Immune-compromised state	Infection
Open wound in the area of the primary region of complaint	Infection

Presentation

Acute onset, this condition may or may not be precipitated by acute trauma.

Subjective Findings

- Pain and/or stiffness in the neck
- Limited mobility

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Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index (NDI). The NDI has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for neck conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Diseases that may refer pain to the cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic and neurologic testing if complaints radiate to back or upper extremities
- Vascular insufficiency testing (e.g. carotid auscultation)

Objective Criteria

Torticollis includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the cervical spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the cervical spine
    - Functional movement(s) involving the cervical spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (circumferential measurements of the upper extremities when indicated)

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- Palpable areas of tenderness along the cervical spine region corresponding to hypertonicity of the cervical muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.
- Additional Findings
  - Antalgic head posture

Radiographs

Clinical decision involving cervical radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of torticollis does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

An EMG study or an MRI/CT scan may be helpful in identifying a nerve root lesion. If an advanced diagnostic procedure is medically necessary, consult the health plan for coverage details.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities"

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(e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.

- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- If improvement following the initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider a different adjustive/manipulative technique.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of upper extremity is apparent,
- Signs of demyelinating condition, tumor, or infection are apparent.

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Informed consent regarding risk for vertebrobasilar accident with cervical manipulation is recommended prior to commencement of treatment.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice—avoid prolonged awkward or rigid positions
- Isometric cervical exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Acupuncture
- Physical Therapy
- Physiatry
- Medication
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.

© 2018 eviCore healthcare. All rights reserved.

37. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
38. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
39. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
40. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
41. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
42. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
43. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
44. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
45. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
46. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
47. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
48. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
49. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
50. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
51. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
52. Rolak LA Neurology Secrets; Mosby; 1993.

© 2018 eviCore healthcare. All rights reserved.

53. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
54. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
55. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
56. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
57. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
58. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
59. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
60. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
61. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
62. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
63. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
64. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
65. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
66. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
67. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
68. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
69. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
70. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Headaches

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Cervicocranial Syndrome

Synonyms

- Barre-Lieou syndrome
- Posterior cervical sympathetic syndrome

Definition

Cervicocranial Syndrome is a dysfunction in the posterior cervical sympathetic nervous system; and, an extremely rare condition that is not well researched. Condition is not commonly recognized in medical or chiropractic literature. The National Institutes of Health provides additional information under its **Genetic and Rare Disease Information Center**.

Diagnosis is commonly misused by chiropractors to describe a cervicogenic headache. If this is the case, refer to Headache guideline for a description of the Chiropractic Evaluation and Management of this condition.

References

1. Pearce, J: Barre-Lieou “syndrome”. *Journal of Neurology Neurosurgery and Psychiatry* 2004;75:319
2. Office of Rare Diseases, National Institutes of Health. http://rarediseases.info.nih.gov

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Headache

Synonyms
Pain in head NOS

Definition
Condition involves pain in the head region. Pain is a constant, tight, pressing, or band-like sensation in the frontal, temporal, occipital, or parietal area (with frontal and temporal regions most common).

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).
- Risk assessment (e.g. carotid auscultation) for cerebrovascular accident with cervical manipulation.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Direct trauma to the head with loss of consciousness (LOC)	Subdural hematoma; epidural hematoma; fracture
Nuchal rigidity and/or positive Brudzinskis or Kernigs sign	Subarachnoid hemorrhage; meningitis
Bladder dysfunction associated with onset of neck pain	Myelopathy; spinal cord injury
Associated dysphasia	Cerebrovascular accident; myelopathy; spinal cord injury
Associated cranial nerve or central nervous system (CNS) signs/symptoms	Tumor; intracranial hematoma
Onset of new headache	Tumor; infection; vascular cause (older patients, also consider temporal arteritis; glaucoma)
Comorbidities of rheumatoid arthritis, seronegative arthritides, Down's syndrome	Atlantoaxial instability due to associated transverse ligament laxity
Cancer	Cause of symptoms (metastatic or primary)
Alcoholism, drug abuse	Side effect or withdrawal phenomenon
Immune-compromised state	Infection

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Presentation

Other considerations

- Giant cell arteritis
- Arteriosclerotic headache
- Hypertension
- Tumors
- Herpetic neuralgia
- Trigeminal neuralgia
- Glaucoma
- Subdural hematoma
- Sinus headaches

Subjective Findings

Symptoms consist of dull, generalized head pain. Pain tends to start at the posterior portion of the head and move anteriorly. Muscles of the cervical spine, scalp, jaw, and temporal regions are commonly involved.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint. Assess risk of vertebrobasilar accident with cervical manipulation.

Note: Diseases that may refer pain to and from the head and cervical spine include: brain lesions, CAD, dental disease, esophageal disease, upper airway disease, infection, and lymphadenopathy.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Evaluation of the following muscles
- Temporalis
- SCM
- Anterior scalenes
- Posterior scalenes
- Sub-occipitalis
- Upper trapezius
- Levator scapula
- Cervical erectors
- Orthopedic and neurologic testing of the cervical spine, spinal nerves, cranial nerves
- Vascular insufficiency testing (e.g. carotid auscultation

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Findings of Headache

- Typically, tenderness at the cervical muscles and suboccipital region
- Associated soft tissue may be shortened with degrees of muscle hypertonicity
- Range of motion typically limited asymmetrically
- Joint fixation upon motion palpation
- Orthopedic and neurological testing is typically unremarkable

Differential Diagnoses

- Onset of symptoms may be acute or gradual
- Symptoms are generally recurrent
- As many as 40% of teenagers and adults are effected by headaches

Radiographs

Clinical decision involving a radiographic series of the cervical spine is based on medical necessity, as per criteria for radiographic exam. Diagnosis of headache does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Manage conservatively for two weeks with treatment frequency commensurate with severity of the condition.
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks at a decreasing treatment frequency.
- Total treatment duration should not exceed eight weeks.
- If improvement following the initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider different adjustive/manipulative technique.
- If patient is not asymptomatic or near asymptomatic at the end of the second two week trial or has reached a plateau, refer patient to their primary care provider to explore other treatment alternatives.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Informed consent regarding risk for vertebrobasilar accident with cervical manipulation is recommended prior to commencement of treatment.

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Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 50% increase in range of motion
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques
5-8	➢ One follow-up, then discharge

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Isometric cervical exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Mobilization (physical therapist)
- Acupuncture
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018.

© 2018 eviCore healthcare. All rights reserved.

https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.

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37. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
38. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
39. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
40. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
41. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
42. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
43. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
44. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
45. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
46. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
47. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
48. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
49. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
50. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
51. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
52. Rolak LA Neurology Secrets; Mosby; 1993.

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53. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
54. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
55. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
56. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
57. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
58. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
59. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
60. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
61. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
62. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
63. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
64. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
65. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
66. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
67. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
68. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
69. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
70. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Migraine Without Aura

Synonyms
Common Migraine

Definition
Common Migraine Headache is a dominantly inherited disorder characterized by varying degrees of recurrent vascular-quality headache, photophobia, sleep disruption, and depression, which may or may not be preceded by an aura.

History
- Attacks usually occur while awake.
- Nausea and vomiting usually occur later in attack.
- Photophobia and/or phonophobia are also commonly associated with the headache.
- About 60% of people who experience Migraine Headaches report a prodrome.
- The following symptoms are typical of the prodrome:
  - Food cravings
  - Constipation or diarrhea
  - Mood changes—depression, irritability
  - Muscle stiffness, especially in the neck
  - Fatigue
  - Increased frequency of urination

Common migraine headaches are not associated with auras. About 75% of migraine headaches are of the 'common' type.

Red Flags
The following symptoms reported by patients require physician referral or co-management:

- Sudden onset of severe headache with no prior history—subarachnoid hemorrhage; meningitis
- Vomiting without nausea—increased intracranial pressure
- Suspicion of drug or alcohol dependence—side effect or withdrawal phenomenon
- Persistent or severe headache in a child—tumor; encephalitis; meningitis
- Headaches associated with other neurological signs or symptoms (e.g., diplopia, loss of sensation, weakness, ataxia), or those of unusually abrupt onset.
- Headaches that are persistent (especially beyond 72 hours), that first occur after the age of 55, or that develop after a head injury or major trauma.
- Headaches that are associated with a stiff neck or fever.

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Subjective Findings

A typical migraine headache is throbbing or pulsatile in nature. Initially, it is unilateral and localized in the frontotemporal and ocular area, and then builds up over a period of one to two hours, progressing posteriorly and becoming diffuse. It can last from several hours to an entire day. Pain intensity is moderate to severe and tends to intensify even with routine physical activity.

Objective Findings

- Measure blood pressure, pulse rate, temperature
- Inspection of posture (forward head carriage, rounded shoulders)
- Palpate temporal arteries
- Palpate cervical spine for muscle spasm, trigger points, segmental dysfunction
- Perform cervical ROM
- Auscultate carotid arteries
- Percussion of sinuses
- Neurological examination for focal signs or asymmetric reflexes; test cranial nerves

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the headache.

Note: Diseases that may refer pain to the head include: brain lesions, cervical spine conditions, dental disease, and vascular conditions.

Specific Aspects of Examination

- Cognitive changes, such as confusion, drowsiness or giddiness may be an indication of meningitis, encephalitis, subarachnoid hemorrhage, or other space occupying lesion
- Nuchal rigidity may be an indication of meningitis or subarachnoid hemorrhage
- Headache associated with diastolic blood pressure greater than 110 mm.Hg.—uncontrolled hypertension
- Persistent or severe headache in a child—tumor
- Articular derangements such as rheumatoid arthritis or similar autoimmune disease, joint instability or hypermobility particularly of the atlanto-axial joint
- History of infection as indicated by a fever greater than 100, constant low-grade fever, joint infection
- Signs or symptoms of cerebrovascular insufficiency
- Recent loss of consciousness or blow to the head; positive cranial nerve exam

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Radiographs

Medical necessity of radiographs is determined, per eviCore's criteria for cervical radiographic exam. Diagnosis of a classical migraine does not warrant radiographic evaluation unless associated with other radiographic criteria.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Initiate a two to four week trial of treatment.
- Treatment frequency utilized should be commensurate with the severity of condition.
- If severity or frequency of headaches decreases following the initial trial—continue treatment at a reduced frequency for a one month period before releasing patient to PRN care.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If patient does not improve with trial of chiropractic treatment or has reached a plateau, refer patient back to referring physician to explore other alternatives.

Week	Progress
0-2	➢ 50% improvement in pain ➢ 50% increase in range of motion
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques
5-8	➢ One follow-up, then discharge

Natural History without Treatment

Most migraine sufferers manage their headaches without conventional medical advice and generally treat their attacks with over-the-counter medication.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

Instruct patient to avoid dietary triggers, such as chocolate, aged cheeses and meats, wine and beer (e.g., sulfites), caffeine, onions, nuts and peanut butter, dairy products, baked goods, and citrus fruits. Be aware of other potential triggers, such as allergic reactions, bright lights, loud noises, physical or mental stress, changes in sleep patterns, smoking or exposure to tobacco smoke, missed meals, and hormonal fluctuations.

Alternatives to Chiropractic

- Acupuncture
- Biofeedback
- Stress Management
- Yoga
- Meditation
- Exercise
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-

© 2018 eviCore healthcare. All rights reserved.

Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006Column11
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and

© 2018 eviCore healthcare. All rights reserved.

pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.
33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
37. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
38. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
39. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
40. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
41. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
42. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical

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range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
43. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
44. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
45. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
46. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
47. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
48. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
49. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
50. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
51. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
52. Rolak LA Neurology Secrets; Mosby; 1993.
53. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
54. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
55. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
56. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
57. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion

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1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
58. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
59. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
60. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
61. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
62. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
63. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
64. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
65. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
66. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
67. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
68. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
69. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
70. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Migraine With Aura

Synonyms
Classical Migraine

Definition
Classical Migraine Headache is a dominantly inherited disorder characterized by varying degrees of recurrent vascular-quality headache, photophobia, sleep disruption, and depression, which is usually preceded by an aura.

History
- Attacks usually occur while awake.
- Nausea and vomiting usually occur later in attack.
- Photophobia and/or phonophobia are also commonly associated with the headache.
- About 60% of people who experience Migraine Headaches report a prodrome.
- The following symptoms are typical of the prodrome:
  - Food cravings
  - Constipation or diarrhea
  - Mood changes—depression, irritability
  - Muscle stiffness, especially in the neck
  - Fatigue
  - Increased frequency of urination

Classical migraine headaches exhibit an aura. A migraine aura is a complex of neurological symptoms that may precede or accompany the headache phase, or may occur in isolation. Auras have a wide range of symptoms, which include:

- Visual—flashing lights, wavy lines, spots, partial loss of sight, blurry vision
- Olfactory hallucinations—smelling odors that are not there
- Tingling or numbness of the face or extremities on the side where the headache develops
- Difficulty finding words and/or speaking
- Confusion
- Vertigo
- Partial paralysis
- Auditory hallucinations
- Decrease in, or loss of hearing
- Reduced sensation
- Hypersensitivity to feel and touch

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Red Flags

The following symptoms reported by patients require physician referral or co-management:

- Sudden onset of severe headache with no prior history—subarachnoid hemorrhage; meningitis
- Vomiting without nausea—increased intracranial pressure
- Suspicion of drug or alcohol dependence—side effect or withdrawal phenomenon
- Persistent or severe headache in a child—tumor; encephalitis; meningitis
- Headaches associated with other neurological signs or symptoms (e.g., diplopia, loss of sensation, weakness, ataxia), or those of unusually abrupt onset.
- Headaches that are persistent (especially beyond 72 hours), that first occur after the age of 55, or that develop after a head injury or major trauma.
- Headaches that are associated with a stiff neck or fever.

Subjective Findings

A typical migraine headache is throbbing or pulsatile in nature. Initially, it is unilateral and localized in the frontotemporal and ocular area, and then builds up over a period of one to two hours, progressing posteriorly and becoming diffuse. It can last from several hours to an entire day. Pain intensity is moderate to severe and tends to intensify even with routine physical activity.

Objective Findings

- Measure blood pressure, pulse rate, temperature
- Inspection of posture (forward head carriage, rounded shoulders)
- Palpate temporal arteries
- Palpate cervical spine for muscle spasm, trigger points, segmental dysfunction
- Perform cervical ROM
- Auscultate carotid arteries
- Percussion of sinuses
- Neurological examination for focal signs or asymmetric reflexes; test cranial nerves

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the headache.

Note: Diseases that may refer pain to the head include: brain lesions, cervical spine conditions, dental disease, and vascular conditions.

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Specific Aspects of Examination

- Cognitive changes, such as confusion, drowsiness or giddiness may be an indication of meningitis, encephalitis, subarachnoid hemorrhage, or other space occupying lesion
- Nuchal rigidity may be an indication of meningitis or subarachnoid hemorrhage
- Headache associated with diastolic blood pressure greater than 110 mm.Hg.—uncontrolled hypertension
- Persistent or severe headache in a child—tumor
- Articular derangements such as rheumatoid arthritis or similar autoimmune disease, joint instability or hypermobility particularly of the atlanto-axial joint
- History of infection as indicated by a fever greater than 100, constant low-grade fever, joint infection
- Signs or symptoms of cerebrovascular insufficiency
- Recent loss of consciousness or blow to the head; positive cranial nerve exam

Radiographs

Medical necessity of radiographs is determined, per eviCore's criteria for cervical radiographic exam. Diagnosis of a classical migraine does not warrant radiographic evaluation unless associated with other radiographic criteria.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Initiate a two to four week trial of treatment.
- Treatment frequency utilized should be commensurate with severity of condition.
- If severity or frequency of headaches decreases following the initial trial—continue treatment at a reduced frequency for a one month period before releasing patient to PRN care.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If patient does not improve with the trial of chiropractic treatment or has reached a plateau, refer patient back to referring physician to explore other alternatives.

Week	Progress
0-2	➢ 50% improvement in pain ➢ 50% increase in range of motion
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques
5-8	➢ One follow-up, then discharge

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Natural History Without Treatment

Most migraine sufferers manage their headaches without conventional medical advice, and generally treat their attacks with over-the-counter medication.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

Instruct patient to avoid dietary triggers, such as chocolate, aged cheeses and meats, wine and beer (e.g., sulfites), caffeine, onions, nuts and peanut butter, dairy products, baked goods, and citrus fruits. Be aware of other potential triggers, such as allergic reactions, bright lights, loud noises, physical or mental stress, changes in sleep patterns, smoking or exposure to tobacco smoke, missed meals, and hormonal fluctuations.

Alternatives to Chiropractic

- Acupuncture
- Biofeedback
- Stress Management
- Yoga
- Meditation
- Exercise
- Medication
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.

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18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.

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33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
37. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
38. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
39. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
40. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
41. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
42. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
43. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
44. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
45. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
46. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.

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47. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
48. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
49. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
50. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
51. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
52. Rolak LA Neurology Secrets; Mosby; 1993.
53. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
54. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
55. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
56. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
57. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
58. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
59. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
60. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
61. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
62. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
63. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
64. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
65. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018.

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https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
66. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
67. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
68. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
69. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
70. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Unspecified Migraine Headache

Synonyms
Migraine

Definition
Unspecified Migraine Headache is a dominantly inherited disorder characterized by varying degrees of recurrent vascular-quality headache, photophobia, sleep disruption, and depression, which may or may not be preceded by an aura.

History
- Attacks usually occur while awake.
- Nausea and vomiting usually occur later in attack.
- Photophobia and/or phonophobia are also commonly associated with the headache.
- About 60% of people who experience Migraine Headaches report a prodrome.
- The following symptoms are typical of the prodrome:
  - Food cravings
  - Constipation or diarrhea
  - Mood changes, e.g., depression, irritability
  - Muscle stiffness, especially in the neck
  - Fatigue
  - Increased frequency of urination

Some migraine headaches exhibit an aura. A migraine aura is a complex of neurological symptoms that may precede, or accompany the headache phase, or may occur in isolation. Auras have a wide range of symptoms, which include:

- Visual—flashing lights, wavy lines, spots, partial loss of sight, blurry vision
- Olfactory hallucinations—smelling odors that are not there
- Tingling or numbness of the face or extremities on the side where the headache develops
- Difficult finding words and/or speaking
- Confusion
- Vertigo
- Partial paralysis
- Auditory hallucinations
- Decrease in or loss of hearing
- Reduced sensation
- Hypersensitivity to feel and touch

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Red Flags

The following symptoms reported by patients require physician referral or co-management:

- Sudden onset of severe headache with no prior history—subarachnoid hemorrhage; meningitis
- Vomiting without nausea—increased intracranial pressure
- Suspicion of drug or alcohol dependence—side effect or withdrawal phenomenon
- Persistent or severe headache in a child—tumor; encephalitis; meningitis
- Headaches associated with other neurological signs or symptoms (e.g., diplopia, loss of sensation, weakness, ataxia), or those of unusually abrupt onset.
- Headaches that are persistent (especially beyond 72 hours), that first occur after the age of 55, or that develop after a head injury or major trauma.
- Headaches that are associated with a stiff neck or fever.

Subjective Findings

A typical migraine headache is throbbing or pulsatile in nature. Initially, it is unilateral and localized in the frontotemporal and ocular area, and then builds up over a period of one to two hours, progressing posteriorly, and becoming diffuse. It can last from several hours to an entire day. Pain intensity is moderate to severe and tends to intensify even with routine physical activity.

Objective Findings

- Measure blood pressure, pulse rate, temperature
- Inspection of posture (forward head carriage, rounded shoulders)
- Palpate temporal arteries
- Palpate cervical spine for muscle spasm, trigger points, segmental dysfunction
- Perform cervical ROM
- Auscultate carotid arteries
- Percussion of sinuses
- Neurological examination for focal signs or asymmetric reflexes; test cranial nerves

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the headache.

Note: Diseases that may refer pain to the head include: brain lesions, cervical spine conditions, dental disease, and vascular conditions.

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Specific Aspects of Examination

- Cognitive changes, such as confusion, drowsiness or giddiness may be an indication of meningitis, encephalitis, subarachnoid hemorrhage, or other space occupying lesion
- Nuchal rigidity may be an indication of meningitis or subarachnoid hemorrhage
- Headache associated with diastolic blood pressure greater than 110 mm.Hg.—uncontrolled hypertension
- Persistent or severe headache in a child—tumor
- Articular derangements such as rheumatoid arthritis or similar autoimmune disease, joint instability or hypermobility particularly of the atlanto-axial joint
- History of infection as indicated by a fever greater than 100, constant low-grade fever, joint infection
- Signs or symptoms of cerebrovascular insufficiency
- Recent loss of consciousness or blow to the head; positive cranial nerve exam

Radiographs

Medical necessity of radiographs is determined, per eviCore's criteria for cervical radiographic exam. Diagnosis of a classical migraine does not warrant radiographic evaluation unless associated with other radiographic criteria.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Initiate a two to four week trial of treatment.
- Treatment frequency utilized should be commensurate with severity of condition.
- If severity or frequency of headaches decreases following the initial trial—continue treatment at a reduced frequency for a one month period before releasing patient to PRN care.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If patient does not improve with the trial of chiropractic treatment or has reached a plateau, refer patient back to referring physician to explore other alternatives.

Week	Progress
0-2	➢ 50% improvement in pain ➢ 50% increase in range of motion
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques
5-8	➢ One follow-up, then discharge

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Natural History Without Treatment

Most migraine sufferers manage their headaches without conventional medical advice, and generally treat their attacks with over-the-counter medication.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

Avoid dietary triggers, such as chocolate, aged cheeses and meats, wine and beer (e.g., sulfites), caffeine, onions, nuts, peanut butter, dairy products, baked goods, and citrus fruits. Be aware of other potential triggers, such as allergic reactions, bright lights, loud noises, physical or mental stress, changes in sleep patterns, smoking or exposure to tobacco smoke, missed meals, and hormonal fluctuations.

Alternatives to Chiropractic

- Biofeedback
- Stress Management
- Yoga
- Meditation
- Exercise
- Acupuncture
- Medication
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Aprill C, Bogduk N: The prevalence of cervical zygapophyseal joint pain. A first approximation. Spine 1992 Jul; 17(7): 744-7. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/1502636.
3. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
4. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
5. Bland JH: In: Disorders of the Cervical Spine. 2nd ed, Philadelphia, Pa: WB Saunders Co, 1994.
6. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
7. Bolton JE, Humphreys BK, van Hedel HJ. Validity of weekly recall ratings of average pain intensity in neck patients. J Manipulative Physiol Ther. 2010 Oct;33(8):612-617. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475410002071 https://www.ncbi.nlm.nih.gov/pubmed/21036283.
8. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
9. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
10. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
11. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
12. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
13. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
14. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
15. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
16. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
17. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.

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18. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
19. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
20. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
21. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
22. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
25. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
26. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
27. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
28. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
29. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
30. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
31. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
32. Hurwitz EL, et. al. Treatment of neck pain: non-invasive intervention. Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Eur Spine J (2008) 17 (Suppl 1): S123-S152, DOI 10.1007/s00586-008-0631-zEric. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271098/.

© 2018 eviCore healthcare. All rights reserved.

33. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
34. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
35. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
37. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
38. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
39. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
40. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
41. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
42. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
43. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
44. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
45. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
46. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.

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47. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
48. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
49. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
50. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
51. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
52. Rolak LA Neurology Secrets; Mosby; 1993.
53. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
54. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
55. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
56. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
57. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
58. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
59. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
60. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
61. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
62. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
63. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
64. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
65. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018.

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https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
66. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
67. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
68. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
69. Young WF: Cervical spondylotic myelopathy: a common cause of spinal cord dysfunction in older persons. Am Fam Physician 2000 Sep 1; 62(5): 1064-70, 1073. Date last accessed 02/01/2018. https://www.aafp.org/afp/2000/0901/p1064.html.
70. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lower Extremity Conditions

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Achilles Tendinitis

Definition

Achilles tendinitis is usually related to overuse, lack of adequate heel height, or unaccustomed use; results in microscopic tears in Achilles tendon leading to an inflammatory response. In some cases there will be a peritendinous inflammation that does not generally progress to degenerative tendinosis (nor rupture). In other situations, there will be clinical inflammation, but objective pathologic evidence for cellular inflammation is lacking—in these conditions the term tendinosis is more appropriate. Non-insertional tendinitis occurs proximal to retrocalcaneal bursa. Insertional tendinitis is localized to the calcaneal tendon insertion. With this condition, pain is related to contact between the posterior calcaneus and Achilles tendon. Haglund's deformity may be related to condition. Localized calcification within the Achilles tendon can be a cause of insertional tendonitis.

History

Specific Aspects of History

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, compartment syndrome
Fever, severe pain	Possible infection
Cancer history	Cause of symptoms (metastatic or primary)
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection
Multiple joint involvement	Rheumatologic diseases
Diabetes	Neuropathy

Presentation

Condition involves a complaint of acute or chronic heel pain; often worse with activity.

Subjective Findings

- Tenderness and pain at Achilles tendon
- Stiffness that gradually eases as tendon is warmed up
- Pain after activity that gradually worsens
- Radiating or localized pain along tendon during, and/or after running

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Orthopedic and neurologic testing if neurologic signs are present

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Specific Aspects of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Findings of Achilles Tendinitis

- Pain and swelling over the Achilles tendon
- Localized tenderness on squeezing tendon
- Deep palpation will elicit tenderness
- Palpable nodularity in tender aspect of the tendon
- Pain is produced or increased with forced passive dorsiflexion, resistance to active plantar flexion, or both
- Weakness is evidenced by inability to raise up on toes (decreased MMT of plantarflexion)
- Crepitus may be present

Differential Diagnoses

- Partial tear of Achilles tendon
- Gout
- Spondyloarthropathies

Radiographs

Clinical decision involving a radiographic series of the heel is based on medical necessity, as per criteria for radiographic exam. Diagnosis of Achilles tendinitis does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of chiropractic is to reduce pain and inflammation, aid stretching and strengthening, and assist in gradual return to activity. Manipulation and modalities to reduce pain and inflammation are, therefore, appropriate. Cross friction massage at site of injury can help stimulate healing.

- Treatment frequency should be commensurate with severity of condition.
- Functional status & activity level should be assessed at the onset of care
- Patient education in rest/reduction of strenuous activities, as well as identification of causative factor and correction of faulty technique should be emphasized:
- Instruction in proper warm-up and cool-down
- Instruction in appropriate footwear

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- Instruction in the use of temporary heel lift
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If patient does not improve with trial of chiropractic treatment or has reached a plateau, refer patient back to referring physician to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 25% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective findings ➢ 75% increase in range of motion ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ One to two additional visits, then discharge ➢ Reinforce self-management techniques

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Rest, reduce strenuous activities
- Home ROM exercises, stretching calf musculature
- Progression to therapeutic exercise—strengthening exercises
- Hot packs/cold packs, if needed, to relieve discomfort

Alternatives/Adjuncts to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Medication
- Surgery (as last resort)
- Cortisone injection

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Brantingham JW, Globe G, Pollard H, Hicks M, Korporaal C, Hoskins W: Manipulative therapy for lower extremity conditions: expansion of literature review. J Manipulative Physiol Ther 2009, 32:53-71. Date last accessed 02/01/2018. http://www.jmptonline.org/article/S0161-4754(08)00291-1/fulltext.
7. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
8. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
9. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
10. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
11. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
12. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
13. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Clement DB, Taunton JE, Smart GW: Achilles tendinitis and peritendinitis: etiology and treatment. Am J Sports Med 1984 May-Jun; 12(3): 179-84. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/6742297.
16. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
17. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007

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May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
18. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
19. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
20. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
21. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
25. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
26. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
27. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
28. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
29. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
30. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
31. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
32. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed

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02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
33. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
34. Jackson BA, Schwane JA, Starcher BC: Effect of ultrasound therapy on the repair of Achilles tendon injuries in rats. Med Sci Sports Exerc 1991 Feb; 23(2): 171-6 . Date last accessed 02/01/2018. http://europepmc.org/abstract/med/2017013.
35. James SL, Bates BT, Osternig LR: Injuries to runners. Am J Sports Med 1978 Mar-Apr; 6(2): 40-50. Date last accessed 02/01/2018. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.947.482&rep=rep1&type=pdf.
36. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
37. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
38. Köhne E, Jones A, Korporaal C, Price JL, Brantingham JW, Globe G. A prospective, single-blinded, randomized, controlled clinical trial of the effects of manipulation on proprioception and ankle dorsiflexion in chronic recurrent ankle sprain. J Amer Chiropr Assoc. 2007;44:7–178. Date last accessed 02/01/2018. http://web.b.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=10817166&AN=25752334&h=EmyX4S5xFXJfmTUIlHN8%2bVR1PSogn3B2vsK2Bq0AVE9WaA4ruI4k7kdXenO74%2bFn5AUgV%2fLRchJQrhAKRhj2pA%3d%3d&crl=c&resultNs=AdminWebAuth&resultLocal=ErrCrlNotAuth&crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jrnl%3d10817166%26AN%3d25752334.
39. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
40. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
41. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
42. Lopez-Rodriguez S, Fernandez de-Las-Penas C, Alburquerque-Sendin F, Rodriguez-Blanco C, Palomeque-del-Cerro L. Immediate effects of manipulation of the talocrural joint on stabilometry and baropodometry in patients with ankle sprain. J Manipulative Physiol Ther. 2007;30:186–192. Date last accessed 02/01/2018. http://www.jmptonline.org/article/S0161-4754(07)00056-5/pdf.
43. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
44. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
45. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
46. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck

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pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
47. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
48. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
49. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
50. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
51. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
52. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology; Year Book Medical Publishers, Inc.; 2002.
53. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
54. Rolak LA Neurology Secrets; Mosby; 1993.
55. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
56. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
57. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
58. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
59. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
60. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
61. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
62. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
63. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.

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64. Travell J, Simons DG: Myofascial Pain and Dysfunction: The Trigger Point Manual: The Lower Extremities. Lippincott Williams & Wilkins; 1992:289-314.
65. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
66. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
67. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
68. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
69. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
70. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
71. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
72. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sprain and Strain of Knee and Leg

Synonyms

- Trick knee
- Bum knee

Definition

Knee injuries can take the form of a sprain or a strain.

- Sprain
  - Results from suddenly stretching or tearing ligaments that hold knee together.
- Strain
  - Injury to muscles or tendons that connect muscles to bones.

History

Key features of the patient history for this condition include:

- Prior trauma
- Bilateral pain
- Night pain
- Excessive running or bicycling
- Overuse
- Absence of trauma
- Instability
- Give-way weakness

Location of Pain	Loss of Motion	Swelling
Medial Lateral Subpatellar Posterior	Flexion Extension	Redness and heat

Specific Aspects of History

- Rule out red flags (require medical management) i.e. infection, arthridities, gout other autoimmune disorders, juvenile arthritis, rheumatoid arthritis.
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, Torn meniscus, cruciate ligament tears (anterior and posterior)
Infection	Cellulitis, Osteomyelitis

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Presentation

- Sprain
  - is usually caused by an accident, such as tripping, falling, or twisting the knee.
- Strain
  - is usually a result from overuse, sudden stops or starts, or an athletic injury.

Subjective Findings

Typically, there will be pain, tenderness, swelling, or bruising of the injured area. If injury is serious, it may be difficult moving the knee.

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue and distal pulses
- Range of motion, active and passive
- Strength testing
- Orthopedic testing
- Neurologic testing if neurologic signs are present

Goal of Examination

Determine which anatomical structure is involved:

- Anterior drawer testing also evaluates soundness of the ACL.
- Employ tibial sag test to distinguish disorders of ACL from those of PCL.
- McMurray testing substantiates meniscal disorders.
- Assess knee joint stability by applying various stresses to joint.
- Excessive joint motion (laxity) indicates an injury.
- Appearance of soft or mushy end point versus a healthy hard (e.g., abrupt increase in joint stiffness) end point implies possible ligament damage.
- Functional status & activity level should be assessed at the onset of care.

Differential Diagnoses

- Baker cyst
- Bursitis
- Knee dislocation
- Meniscal tear
- Osteochondral fracture (osteochondritis dissecans and osteonecrosis)
- Patellar dislocation
- Patellar fracture
- Patellar tendon rupture

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Radiographs

Clinical decision involving a radiographic series of the knee and leg are based on medical necessity, as per criteria for radiographic exam. Diagnosis of a strain/sprain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of chiropractic care includes: pain relief, restoration of motion, restoration of strength and function.

- Physiotherapeutic modalities to decrease pain and inflammation are appropriate in the acute phase.
- Next phase of treatment will utilize chiropractic manipulation and exercise to restore motion and normalize strength.
- As functional improvement continues, patient should be transitioned to a home program.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Treatment frequency should be commensurate with severity of condition.
- As condition improves, treatment frequency should continue to decrease, and patient should be transitioned to a self-management program.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in pain ➢ 30-50% increase in range of motion ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques (see below)
5-8	➢ Continued reduction of pain ➢ Significant measurable functional improvement ➢ Continued increase in range of motion ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

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Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- Improvement does not meet the above guidelines or improvement has reached a plateau, or
- Atrophy of lower extremity becomes evident.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Instruction in home exercise program for ROM and strengthening
- Cold packs, if needed, to relieve discomfort

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Surgery
- Medication
- Physiatry
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Brantingham JW, Globe G, Pollard H, Hicks M, Korporaal C, Hoskins W: Manipulative therapy for lower extremity conditions: expansion of literature review. J Manipulative Physiol Ther 2009, 32:53-71. Date last accessed 02/01/2018. http://www.jmptonline.org/article/S0161-4754(08)00291-1/fulltext.
7. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
8. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
9. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
10. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
11. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
12. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
13. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
16. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
17. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
18. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
19. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.

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22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord.

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2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.

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51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Thomson LC, Handoll HHG, Cunningham A, Shaw PC. Physiotherapist-led programmes and interventions for rehabilitation of anterior cruciate ligament, medial collateral ligament and meniscal injuries of the knee in adults. Cochrane Database Syst Rev. 2002;(2):CD001354. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001354/full.
57. Travell J, Simons DG: Myofascial Pain and Dysfunction: The Trigger Point Manual: The Lower Extremities. Lippincott Williams & Wilkins; 1992:289-314
58. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
59. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
60. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
61. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
62. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
63. Woo SL, Chan SS, Yamaji T: Biomechanics of knee ligament healing, repair and reconstruction. J Biomech 1997 May; 30(5): 431-9. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/9109554.
64. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
65. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
66. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sprain and Strain of the Hip and Thigh

Synonyms
Groin Strain

Definition
Condition is used to describe hip adductor injuries. Hip adductor injuries occur most commonly, when there is a forced push-off (side-to-side motion). High forces occur in adductor tendons when an athlete must shift direction suddenly in the opposite direction. As a result, the adductor muscles contract to generate opposing forces.

Improper management of acute adductor strains or returning to play before pain-free sport-specific activities can be performed may lead to chronic injury.

History
Groin pain represents a number of different diagnoses; all differential diagnoses should be kept in mind when assessing a patient. Obtain information about the mechanism of injury and loss of function, as well as the location, quality, duration, and severity of pain. Aggravating and alleviating factors should also be noted.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.

Red Flag	Possible Consequence or Cause
Severe trauma	Ligament tear, pelvic fracture; avascular necrosis
Fever, severe pain	Infection
Loss of distal pulse, severe pain beginning 12-24 hours after trauma	Compartment syndrome
Diabetes	Neuropathy
Multiple joint involvement	Rheumatologic diseases
Unilateral edema	Deep vein thrombosis
Skin rash in dermatomal pattern	Shingles
Constipation, bloody stools, unexplained weight loss	Colon or pelvic organ cancer
Groin pain	Inguinal hernia, pelvic pathology
Pain with urination, hematuria	UTI; renal stone
Cancer	Cause of symptoms (metastatic or primary)
Discoloration of leg or foot, pain with ambulation	Arterial occlusion
History of Steroid Use	Avascular Necrosis
Immune-compromised state	Infection

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Specific Aspects of History

Location
Usually, pain is described at the site of adductor longus tendon proximally, especially with rapid adduction of the thigh. As an injury becomes more chronic, pain may radiate distally along the medial aspect of the thigh and/or proximally toward the rectus abdominis.

- Exercise-induced medial thigh pain over the area of adductors, especially after kicking and twisting, may indicate obturator neuropathy.
- Pain at the symphysis pubis or scrotum may be more consistent with osteitis pubis.
- Conjoined tendon lesions present as pain that radiates upward into the rectus abdominis or laterally along the inguinal ligament. Exquisite tenderness is present at site of the injury.

Quality
Acute injuries are described as a sudden ripping or stabbing pain in the groin. Chronic injuries are described as a diffuse dull ache.

Duration
Initial intense pain lasts less than a second; initial pain is soon replaced with an intense dull ache.

Severity of pain
Pain severity varies among patients.

Loss of function
True loss of function is not observed unless a Grade 3 tear is present. In the case of a severe tear, loss of hip adduction occurs. Loss of function should also alert physician/therapist to possible nerve involvement (obturator nerve entrapment).

Mechanism of injury
Rapid adduction of hip against an abduction force (e.g., changing direction suddenly in tennis), acute forced abduction that puts an unusual stretch on tendon (e.g., a rugby tackle), and a sudden acceleration in sprinting are the most common mechanisms of injury.

Presentation
A common cause of condition has been attributed to forceful abduction of the thigh during an intentional adduction. This type of motion may occur when an athlete attempts to kick a ball and meets resistance from an opposing player who is trying to kick the ball in the opposite direction. To a lesser extent, jumping also can cause injury to the adductor muscles, but more commonly, involves the hip flexors. Overstretching of adductor muscles is a less common etiology.

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Subjective Findings

Generally, symptoms are diffuse with typical complaints of pain and stiffness in the groin region, especially with activity.

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue and distal pulses
- Range of motion, active and passive
- Orthopedic and neurologic testing if neurologic signs are present
- MMT

Specific Aspects of Examination

Physical findings can help distinguish adductor strains from other causes of groin pain such as the following:

- Iliopsoas strain
  - Hip flexion against resistance is painful. Tenderness is difficult to localize because insertion of the iliopsoas is deep.
- Osteitis pubis
  - Tenderness of the symphysis pubis and possible loss of full rotation of one or both hip joints are noted.
- Conjoined tendon lesions (i.e., sportsman's hernia)
  - Exquisite tenderness upon palpation at the inguinal canal. Having patient cough reproduces pain.
- Obturator neuropathy
  - Adductor muscle weakness, muscle spasm, and paresthesia over the medial aspect of the distal thigh may be present. Loss of adductor tendon reflex with preservation of other muscle stretch reflexes often is observed. A positive Howship-Romberg sign (medial knee pain induced by forced hip abduction, extension, and internal rotation) sometimes is observed.

Findings of Adductor Strain

Acute adductor strain commonly occurs at the musculotendinous junction.

- Tenderness, swelling, and ecchymosis can be observed at the superior medial thigh.
- Sometimes, a defect in muscle can be palpated.
- Pain is noted with resisted adduction and full passive abduction of hip.
- Pure hip adductor strain can be distinguished from combination injuries involving hip flexors (i.e., iliopsoas, rectus femoris) by having the patient lie in a supine position.
- If more discomfort is reproduced with resistive adduction when the knee and hip are extended, than if the hip and knee are flexed, a pure hip adductor strain can be assumed.

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Differential Diagnoses

- Bursitis and tendinitis injuries
- Somatic conditions (urological disorders, gastrointestinal disorders, STD's, and gynelogical complaints)
- Joint conditions (sacroiliac dysfunction and acetabular labral tear and degenerative joint disease
- Bone conditions (Avulsion fracture, stress fracture of femoral neck, and Legg-Calve-Perthes disease, slipped capital femoral epiphysis, osteitis pubis)
- Neuralgia and nerve entrapment
- Sportsman's or inguinal hernia
- Rectus femoris tendinitis

Chiropractic Management

Goal of chiropractic care is to restore normal joint relationships, reduce pain and inflammation, aid stretching and strengthening, and assist in gradual return to activity. Therefore, physical therapy modalities to reduce pain and inflammation are appropriate in the acute phase.

- Initial management of an adductor injury should include protection, rest, ice, compression, and elevation (PRICE).
- Painful activities should be avoided.
- Use of crutches during the first few days may be indicated to relieve pain.
- Patient education consists of rest/reduction of strenuous activities, as well as identification of causative factor and correction of faulty technique is also important.
- Next phase of treatment should utilize chiropractic manipulation and exercise to restore motion and normalize strength.
- As functional improvement continues, patient should transition to a home program.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Treatment frequency should be commensurate with severity of condition.
- As condition improves, treatment frequency should continue to decrease and patient should transition to a self-management program.

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Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in pain ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques (see below) ➢ Significant measurable functional improvement
5-8	➢ Continued reduction of pain ➢ Continued increase in range of motion ➢ Significant measurable functional improvement ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- Improvement does not meet the above guidelines or improvement has reached a plateau, or
- Atrophy of lower extremity becomes evident.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Trunk stabilization exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness

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Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Acupuncture
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Brantingham JW, Globe G, Pollard H, Hicks M, Korporaal C, Hoskins W: Manipulative therapy for lower extremity conditions: expansion of literature review. J Manipulative Physiol Ther 2009, 32:53-71. Date last accessed 02/01/2018. http://www.jmptonline.org/article/S0161-4754(08)00291-1/fulltext.
7. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
8. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
9. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
10. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
11. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
12. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
13. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.

© 2018 eviCore healthcare. All rights reserved.

14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
16. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
17. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
18. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
19. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
25. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
26. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
27. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
28. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
29. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its

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Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
30. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
31. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
32. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
33. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
34. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
35. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
36. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
37. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J

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Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Travell J, Simons DG: Myofascial Pain and Dysfunction: The Trigger Point Manual: The Lower Extremities. Lippincott Williams & Wilkins; 1992:289-314.
58. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
59. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
60. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
61. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018.

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https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
62. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
63. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
64. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
65. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sprain-Strain of Ankle

Synonyms

- Twisted Ankle
- Rolled Ankle

Definition

Injury to the lateral ankle ligaments is the most common ankle sprain. Lateral ankle ligaments are responsible for resistance against inversion and internal rotation stress. The anterior talofibular ligament (ATFL) is the most commonly injured, followed by the calcaneofibular ligament (CFL). The posterior talofibular ligament (PTFL) is rarely injured. Medial supporting ligaments are the superficial and deep deltoid ligaments, responsible for resistance to eversion and external rotation stress, and are less commonly injured.

If left untreated, ankle sprains can lead to chronic instability and impairment. Prognosis for ankle sprains is inversely proportional to severity and grade of injury, age of patient, and recurrence rate. Younger patients and those with previous sprains have a worse prognosis. See West Point Ankle Sprain Grading System below.

- Sprain
  - Results from suddenly stretching or tearing ligaments that hold ankle together.
- Strain
  - Injury to muscles or tendons that connect muscles to bones.

History

Typically, plantarflexion and inversion of the foot occur, perhaps as the result of uneven terrain or landing on the foot of another athlete. Overloading the peroneal muscles also may play a role. Invariably, ankle sprains involve trauma.

- Forced external rotation of the ankle results in a syndesmotic, or high, ankle sprain. These injuries occur less frequently than inversion injuries, but they are more disabling and require prolonged recovery periods.
- Recurrent ankle sprains or chronic lateral instability are consequences of Grade III ankle sprains.

Specific Aspects of History

- Rule out red flags (require medical management) i.e. infection, arthridities, gout other autoimmune disorders, juvenile arthritis, rheumatoid arthritis.
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, ligament tears
Infection	Cellulitis, Osteomyelitis

Presentation

The condition typically presents with swelling, ecchymosis, severe pain, and inability to bear weight or ambulate on the ankle.

Subjective Findings

Typically, there will be pain, tenderness, swelling, or bruising of the injured area. If injury is serious, it may be difficult moving the ankle.

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue and distal pulses
- Range of motion, active and passive
- Strength testing
- Orthopedic testing
- Neurologic testing if neurologic signs are present

Goal of Examination

- Inspection
- Localized swelling
- Diffused ecchymosis
- Gait Analysis
- Assistive device
- Palpation of bony and soft tissue
- Tenderness at site of lesion
- Joint effusion
- Skin temperature
- Range of motion, active and passive
- Ankle (dorsiflexion, plantarflexion, inversion, eversion)
- Knee (flexion, extension)
- Orthopedic
- Test for ankle stability:
- Anterior Drawer Test
- Talar Tilt Test
- Fibular compression test (Squeeze Test)
- Neurologic testing
- Non contributory
- Do not test heel walking or toe walking during acute phase

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West Point Ankle Sprain Grading System

Criterion	Grade 1	Grade 2	Grade 3
Location of tenderness	ATFL	ATFL, CFL	ATFL, CFL, PTFL
Edema, ecchymosis	Slight local	Moderate local	Significant diffuse
Weight-bearing ability	Full or partial	Difficult without crutches	Impossible without significant pain
Ligament damage	Stretched	Partial tear	Complete tear
Instability	None	None or slight	Definite

Differential Diagnoses

- Fractures
- Tendon injuries
- Radicular pathology
- Crystalline deposition diseases: gout and pseudogout (Chondrocalcinosis)

Radiographs

Clinical decision involving a radiographic series of the ankle is based on medical necessity, as per criteria for radiographic exam. Diagnosis of a strain/sprain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of chiropractic care includes: pain relief, restoration of motion, restoration of strength and function.

- Physiotherapeutic modalities to decrease pain and inflammation are appropriate in the acute phase.
- Next phase of treatment will utilize chiropractic manipulation and exercise to restore motion and normalize strength.
- Functional status & activity level should be assessed at the onset of care
- As functional improvement continues, patient should be transitioned to a home program.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Treatment frequency should be commensurate with severity of condition.
- As condition improves, treatment frequency should continue to decrease, and patient should be transitioned to a self-management program.

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Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in pain ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques (see below) ➢ Significant measurable functional improvement
5-8	➢ Continued reduction of pain ➢ Continued increase in range of motion ➢ Significant measurable functional improvement ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- Improvement does not meet the above guidelines or improvement has reached a plateau, or
- Atrophy of lower extremity becomes evident.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Instruction in home exercise program for ROM and strengthening
- Cold packs, if needed, to relieve discomfort

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Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Surgery
- Medication
- Physiatry
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Brantingham JW, Globe G, Pollard H, Hicks M, Korporaal C, Hoskins W: Manipulative therapy for lower extremity conditions: expansion of literature review. J Manipulative Physiol Ther 2009, 32:53-71. Date last accessed 02/01/2018. http://www.jmptonline.org/article/S0161-4754(08)00291-1/fulltext.
7. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
8. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
9. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
10. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
11. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
12. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
13. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.

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14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Clement DB, Taunton JE, Smart GW: Achilles tendinitis and peritendinitis: etiology and treatment. Am J Sports Med 1984 May-Jun; 12(3): 179-84. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/6742297.
16. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
17. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
18. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
19. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
20. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
21. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
24. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
25. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
26. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
27. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
28. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
29. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
30. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive

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interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
31. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
32. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
33. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
34. Jackson BA, Schwane JA, Starcher BC: Effect of ultrasound therapy on the repair of Achilles tendon injuries in rats. Med Sci Sports Exerc 1991 Feb; 23(2): 171-6 . Date last accessed 02/01/2018. http://europepmc.org/abstract/med/2017013.
35. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
36. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
37. Köhne E, Jones A, Korporaal C, Price JL, Brantingham JW, Globe G. A prospective, single-blinded, randomized, controlled clinical trial of the effects of manipulation on proprioception and ankle dorsiflexion in chronic recurrent ankle sprain. J Amer Chiropr Assoc. 2007;44:7–178. Date last accessed 02/01/2018. http://web.b.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=10817166&AN=25752334&h=EmyX4S5xFXJfmTUIlHN8%2bVR1PSogn3B2vsK2Bq0AVE9WaA4rul4k7kdXenO74%2bFn5AUgV%2fLRchJQrhAKRhj2pA%3d%3d&crl=c&resultNs=AdminWebAuth&resultLocal=ErrCrlNotAuth&crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jrnl%3d10817166%26AN%3d25752334.
38. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
39. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
40. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
41. Lopez-Rodriguez S, Fernandez de-Las-Penas C, Alburquerque-Sendin F, Rodriguez-Blanco C, Palomeque-del-Cerro L. Immediate effects of manipulation of the talocrural joint on stabilometry and baropodometry in patients with ankle sprain. J Manipulative Physiol Ther. 2007;30:186–192. Date last accessed 02/01/2018. http://www.jmptonline.org/article/S0161-4754(07)00056-5/pdf.
42. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
43. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.

© 2018 eviCore healthcare. All rights reserved.

44. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
45. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
46. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
47. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
48. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
49. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
50. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
51. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
52. Rolak LA Neurology Secrets; Mosby; 1993.
53. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
54. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
55. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
56. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
57. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
58. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.

© 2018 eviCore healthcare. All rights reserved.

59. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
60. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
61. Travell J, Simons DG: Myofascial Pain and Dysfunction: The Trigger Point Manual: The Lower Extremities. Lippincott Williams & Wilkins; 1992:289-314.
62. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
63. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
64. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
65. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
66. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
67. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
68. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
69. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Tibialis Tendonitis

Synonyms
Tibialis (anterior/posterior) tendinitis

Definition
Condition involves tendons that are subjected to chronic stress. Condition may eventually become inflamed and painful; and occasionally develop from a single precipitating event such as an ankle sprain. More frequently there is an underlying biomechanical problem that predisposes patient for injury upon activity.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, ligament tears
Fever, severe pain	Infection
Sensory changes	Tarsal tunnel syndrome
Diabetes; paresthesias in stocking glove distribution	Neuropathy; B12 deficiency, hypothyroidism, lead poisoning
Multiple joint involvement	Rheumatologic diseases, gout
History of high impact activities	Stress fractures
Severe pain, numbness within 12-24 hours following trauma	Compartment syndrome
Cancer	Cause of symptoms (metastatic or primary)
Discoloration of leg or foot; exertional foot or calf pain	Arterial occlusion; vascular insufficiency
Immune-compromised state	Infection

Presentation
Presentation will vary somewhat, depending on the specific tendon involved. Anterior tibialis tendonitis is the least common, and has been associated with a history of downhill running. Posterior tibialis tendonitis frequently results when biomechanical forces of pes planus and excessive pronation are present. Peroneal tendonitis tends to develop when pes cavus and excessive supination are present. The latter two have also been associated with leg length differences. Complete rupture of the posterior tibialis will result in a fallen longitudinal arch.

Subjective Findings
- Complaints of loss of function due to pain
- Localized tenderness over the affected tendon
- May complain of ankle feeling “unstable”

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Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Scope of Examination

- History
- Inspection
- Palpation of bony and soft tissue and distal pulses
- Range of motion, active and passive
- MMT
- Orthopedic and neurologic testing if neurologic signs are present

Findings of Tibialis Tendonitis

- Diffuse swelling and warmth may be present over affected tendon
- Restricted motion is common, with pain on AROM and resistance
- Localized tenderness on palpation
- Weakness in toe raises due to difficulty stabilizing midfoot

Differential Diagnoses

- Ligament sprain
- Ankle capsulitis/synovitis
- Avascular necrosis
- Subtalar tarsal coalition
- Retrocalcaneal bursitis

Radiographs

Clinical decision involving a radiographic series of the lower leg is based on medical necessity, as per criteria for radiographic exam. Diagnosis of tibialis tendinitis does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of chiropractic is to reduce pain and inflammation, aid stretching and strengthening, and assist in gradual return to activity.

- Initial phase is aimed towards reduction of inflammation, thus manipulation and modalities to reduce pain and inflammation are appropriate.
- Functional status & activity level should be assessed at the onset of care
- Treatment frequency should be commensurate with severity of condition.

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- Perform assessment for stretching and strengthening of lower extremity.
- Patient education in rest/reduction of strenuous activities, as well as identification of causative factor and correction of faulty technique (e.g., instruction in proper warm-up and cool-down, instruction in appropriate footwear) is included in rehabilitation program.
- Biomechanical factors may be addressed by orthotics or footwear, and aggravating factors must be assessed.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in subjective findings ➢ 30-50% increase in range of motion ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques (see below)
5-8	➢ Continued reduction of pain ➢ Continued increase in range of motion ➢ Significant measurable functional improvement ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- There is suspicion of tendon rupture
- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Signs or symptoms of circulatory disturbance,
- Development of atrophy or other neurological symptoms in lower extremity.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed

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to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- PRICE (protection, rest, ice, compression, and elevation)
- Home ROM exercises
- Progression to therapeutic exercise: strengthening exercises
- Cold packs, if needed, to relieve discomfort

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Medication
- Surgery
- Immobilization if necessary
- Steroid injection
- Acupuncture

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Brantingham JW, Globe G, Pollard H, Hicks M, Korporaal C, Hoskins W: Manipulative therapy for lower extremity conditions: expansion of literature review. J Manipulative Physiol Ther 2009, 32:53-71. Date last accessed 02/01/2018. http://www.jmptonline.org/article/S0161-4754(08)00291-1/fulltext.
7. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
8. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
9. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.

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10. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
11. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
12. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
13. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
16. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
17. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
18. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
19. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
25. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
26. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last

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accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
27. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
28. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
29. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
30. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
31. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
32. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
33. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
34. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
35. Köhne E, Jones A, Korporaal C, Price JL, Brantingham JW, Globe G. A prospective, single-blinded, randomized, controlled clinical trial of the effects of manipulation on proprioception and ankle dorsiflexion in chronic recurrent ankle sprain. J Amer Chiropr Assoc. 2007;44:7–178. Date last accessed 02/01/2018. http://web.b.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=10817166&AN=25752334&h=EmyX4S5xFXJfmTUIlHN8%2bVR1PSogn3B2vsK2Bq0AVE9WaA4ruI4k7kdXenO74%2bFn5AUgV%2fLRchJQrhAKRhj2pA%3d%3d&crl=c&resultNs=AdminWebAuth&resultLocal=ErrCrlNotAuth&crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jrnl%3d10817166%26AN%3d25752334.
36. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
37. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
38. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
39. Lopez-Rodriguez S, Fernandez de-Las-Penas C, Alburquerque-Sendin F, Rodriguez-Blanco C, Palomeque-del-Cerro L. Immediate effects of manipulation of the talocrural joint on stabilometry

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and baropodometry in patients with ankle sprain. J Manipulative Physiol Ther. 2007;30:186–192. Date last accessed 02/01/2018. http://www.jmptonline.org/article/S0161-4754(07)00056-5/pdf.
40. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
41. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
42. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
43. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
44. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
45. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
46. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
47. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
48. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
49. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
50. Rolak LA Neurology Secrets; Mosby; 1993.
51. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
52. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
53. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
54. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.

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55. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
56. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
57. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
58. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
59. Travell J, Simons DG: Myofascial Pain and Dysfunction: The Trigger Point Manual: The Lower Extremities. Lippincott Williams & Wilkins; 1992:289-314
60. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
61. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
62. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
63. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
64. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
65. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
66. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
67. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lumbosacral Conditions (Disc-Radicular)

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Degeneration of Lumbar or Lumbosacral Intervertebral Disc

Synonyms
None

Definition
Condition associated with recurrent, episodic, chronic low back pain and stiffness, occasionally accompanied by sciatica, which has been present for greater than three months. Disc degeneration is a function of the aging process, but can be accelerated by factors, such as trauma, heredity, infection, and use of tobacco. It is believed that loss of disc height loosens formerly tight ligaments, allowing tears to occur in the annulus with sliding and twisting motions that occur due to loosened ligaments. These tears then contribute to chronic, recurrent low back pain.

History

Patient history should include:
- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
  - A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
  - A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
  - **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.

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- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct Blow to the back in young Adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Onset of pain is usually insidious. Patient may report a prior history of episodic low back pain, occasionally accompanied by sciatica, and may begin between the third and sixth decades of life, and persist for years.

Subjective Findings

- Pain and stiffness in lower back lasting over a period of time greater than three months
- Pain typically worse with motion
- Stiffness upon arising from a seated position
- May report history of occasional sciatica, but lower back symptoms predominate
- Essentially, constant awareness of some level of back discomfort or limitations in motion

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

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The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Objective Criteria

Degeneration of Lumbar or Lumbosacral Intervertebral Disc includes the following clinical findings:

- Neurological examination may demonstrate:
  - Abnormal sensation
  - Neural tension signs
  - Diminished motor strength
  - Abnormal deep tendon reflexes (DTR)
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Muscle atrophy may be present (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Differential Diagnoses

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- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Osteoporosis and compression fractures (major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection in disc or bone (fever, history of IV drug use, history of severe pain)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)
- Metastatic disease, myeloma, lymphoma (pathologic fracture, severe night pain)
- Spinal tuberculosis (lower socioeconomic groups, AIDS)
- Depression

Radiographs

Clinical decision involving lumbar radiographs is based on medical necessity, as per criteria for radiographic exam. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Degenerative joint disease may be observed with this procedure. Possible findings include: osteophyte formation, sclerosing of articular surfaces, and facetal arthrosis. Generally, there is poor correlation between the extent of radiological changes and clinical signs and symptoms.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.

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- Manage condition for two weeks with frequency of treatment commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks at a deceased frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Attempt a return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment will be efficacious.
- Treatment in weeks five through eight should continue to produce improvement in subjective findings and function, with a decrease in treatment frequency commensurate with improvement in patient's condition.
- If treatment during weeks nine through twelve is necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in pain ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Introduce self-management techniques (active care)
5-8	➢ 75% improvement in pain ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques (active care)
9-12	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

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Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Fever, chills, unexplained weight loss, significant night time pain are apparent,
- Presence of pathological fracture or obvious deformity are apparent,
- Saddle anesthesia, loss of major motor function, or bowel or bladder dysfunction are apparent,
- Abdominal pulsations are apparent.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbar stabilization exercises
- Aerobic conditioning, such as walking or swimming
- Heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Acupuncture
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.
14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
16. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.

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17. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
18. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
19. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
25. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
26. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
27. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
28. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
29. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
30. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
31. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
32. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
33. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
34. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
35. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
36. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
37. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.

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46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Displacement of Lumbar Intervertebral Disc Without Myelopathy

Synonyms

- Lumbago or Sciatica due to displacement of lumbar intervertebral disc
- Neuritis or Radiculitis due to displacement or rupture of lumbar intervertebral disc

Definition

Condition involving displacement of lumbar intervertebral disc causing impingement of the contents of nucleus pulposus on surrounding neuronal structures. Displacement may cause pain in localized lumbar structures, and may cause development of neurologic symptoms in areas supplied by affected nerve root(s).

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
  - A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
  - A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
  - **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements. Determine if trauma-related; determine nature and extent of traumatic event.

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- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct Blow to the back in young Adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosupression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Typical patient is between 25-60 years of age. Activity precipitating pain typically involves bending, twisting, and/or lifting. No aggravating event in 50% of patients. Usually reports history of several or more resolved low back pain episodes previous to this onset.

Subjective Findings

- Pain and stiffness in lower back
- Often associated with numbness, pain, and/or weakness that may reach to distal ends of lower extremities
- Extremity symptoms may predominate
- Midline disc protrusions may involve both extremities
- Type and radiation of pain vary
- Worse with prolonged sitting, standing, bending, stooping, lifting
- Better with rest

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Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the low back pain.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Note: 98% of all disc lesions are located at L4/5 or L5/S1.

Specific Aspects of Examination

- Determine whether there are signs of an upper motor neuron lesion (UMNL) or a lower motor neuron lesion (LMNL).
- Suspect a central nervous system disorder in patients exhibiting UMNL signs; if so, then refer to primary care provider immediately.
- If a single regional weakness is identified, attempt to localize the problem by associating any deficits in motor or sensory function with their corresponding spinal nerve level(s).
- If site of lesion cannot be clearly differentiated upon history and examination, referral to primary care provider is warranted for further evaluation.
- Weakness associated with a neuromotor or central nervous system disease should be referred for medical management.

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Objective Criteria

Displacement of Lumbar Intervertebral Disc without Myelopathy includes the following clinical findings:

- Neurological examination may demonstrate:
  - Abnormal sensation
  - Neural tension signs
  - Diminished motor strength
  - Abnormal deep tendon reflexes (DTR)
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Muscle atrophy may be present (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Neurologic Testing	L4 nerve root (L3/4 disc)	L5 nerve root (L4/5 disc)	S1 nerve root (L5/S1 disc)
Sensation	Hypesthesia medial foot	Hypesthesia lateral lower leg and dorsum of foot	Hypesthesia posterior calf or lateral foot
Motor	Anterior tibialis (dorsiflexion); heel walking	Extensor hallicus longus (dorsiflexion of great toe); heel walking	Peroneus Longus and Brevis (Eversion of foot); toe walking
Deep Tendon Reflex	Patella		Achilles

Differential Diagnoses

- Metastatic tumor (awakened by constant and severe night pain, not relieved by changing position, especially when there is a known or suspected history of cancer)
- Spinal cord tumor
- Gather information that leads to a prognosis and the selection of appropriate interventions

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Radiographs

Clinical decision involving lumbar radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of intervertebral disc syndrome does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

An EMG study or an MRI/CT scan may be helpful in identifying a nerve root lesion. If an advanced diagnostic procedure is medically necessary, consult the health plan for coverage details.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with frequency of treatment commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks at a deceased frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.

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- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Attempt a return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment will be efficacious.
- Treatment in weeks five through eight should continue to produce improvement in subjective findings and function, with a decrease in treatment frequency commensurate with improvement in patient's condition.
- If treatment during weeks nine through twelve is necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

With Soft Neurologic Signs (single nerve root distribution, paresthesias/sensory changes):

- Manage case conservatively for one week with treatment frequency commensurate with severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in degree of muscle spasm present—continue treatment.
- If at least 50% improvement is reported subjectively, 50% increase in range of motion is observed, and pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency. A home exercise program should be introduced.
- At the end of week 8, improvement in pain and range of motion should be assessed as at least 75% improved; pain should be centralized.
- By the end of week 12, treatment frequency should continue to diminish commensurate with patient's continued improvement. Patient should be prepared for released to a self-management program.

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Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques
9-12	➢ The patient should be approaching maximum improvement. The treatment *frequency should continue to decrease with improvement.*

With Firm Neurologic Signs (significant motor weakness and/or muscle atrophy):

- Manage conservatively for one week.
- If some improvement in pain is reported subjectively and there is some reduction in the degree of muscle spasm present—continue conservative care.
- If at least 30% improvement is reported subjectively, 50% increase in range of motion is observed, and the pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency.
- At the end of week 8, pain should continue to centralize, pain should further decrease, and range of motion should continue to increase, and improvement in neurologic findings should be noted.
- By the end of week 12, improvement in pain and range of motion should be assessed at least 75% and pain should be centralized.
- In the final four weeks, treatment frequency should continue to diminish commensurate with the patients continued improvement.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 30% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques ➢ Improvement in neurologic findings
9-12	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
13-16	➢ The patient should be approaching maximum improvement. The treatment *frequency should continue to decrease with improvement.*

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Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if...

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Increasing neurologic signs/symptoms: increasing lower extremity numbness/tingling, increasing lower extremity weakness, increasing lower extremity pain, and/or decreasing lower extremity deep tendon reflexes are all indications for a referral to the primary care provider.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbar stabilization exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.
14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
16. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.

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17. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
18. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
19. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
25. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
26. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
27. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
28. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
29. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
30. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
31. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
32. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
33. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
34. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
35. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
36. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
37. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.

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46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lumbosacral Radiculitis

Synonyms

- Lumbosacral neuritis
- Radicular syndrome of lower limbs

Definition

Condition associated with neurogenic pain following distribution of one, or less commonly, more lumbar nerve root(s) due to mechanical pressure and inflammation of lower lumbar nerve roots. Condition may be accompanied by lower extremity numbness, weakness, or hyporeflexia, and additionally, may be due to lumbar disc herniation (typically younger patients) or bony mechanical pressure of lower lumbar nerve root(s) (typically in older patients).

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
  - A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
  - A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
  - **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

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Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct Blow to the back in young Adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Patient may report trauma or an insidious onset; onset of lower back symptoms is often sudden. Sitting, coughing, or sneezing will often exacerbate patient's symptoms. Pain referral to anterior thigh, or posterior thigh may be reported (depending on affected nerve root).

Subjective Findings

- Pain, numbness, tingling, paresthesia in lower extremity following lumbar nerve root distribution
- Complaints of weakness in lower extremity
- Midline disc protrusions may involve both extremities
- Better with rest
- Flexing knee may provide relief by decreasing tension on irritated lumbar nerve

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Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Specific Aspects of Examination

- Determine whether there are signs of an upper motor neuron lesion (UMNL) or a lower motor neuron lesion (LMNL).
- Suspect a central nervous system disorder in patients exhibiting UMNL signs; if so, then refer to primary care provider immediately.
- If a single regional weakness is identified, attempt to localize the problem by associating any deficits in motor or sensory function with their corresponding spinal nerve level(s).
- If site of lesion cannot be clearly differentiated upon history and examination, referral to primary care provider is warranted for further evaluation.
- Weakness associated with a neuromotor or central nervous system disease should be referred for medical management.

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Objective Criteria

Lumbosacral Radiculitis includes the following clinical findings:

- Neurological examination may demonstrate:
  - Abnormal sensation
  - Neural tension signs
  - Diminished motor strength
  - Abnormal deep tendon reflexes (DTR)
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Muscle atrophy may be present (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Note: Approximately 5% of lumbar radiculopathies involve L4 nerve root; 67%, L5 nerve root; and 28%, S1 nerve root.

Neurologic Testing	L4 nerve root (L3/4 disc)	L5 nerve root (L4/5 disc)	S1 nerve root (L5/S1 disc)
Sensation	Hypesthesia medial foot	Hypesthesia lateral lower leg and dorsum of foot	Hypesthesia posterior calf or lateral foot
Motor	Anterior tibialis (dorsiflexion); heel walking	Extensor hallicus longus (dorsiflexion of great toe); heel walking	Peroneus Longus and Brevis (Eversion of foot); toe walking
Deep Tendon Reflex	Patella	-	Achilles

Signs of upper motor neuron involvement (clonus, hyperreflexia, Babinski reflex) may suggest compression of the spinal cord, which should be evaluated medically.

Differential Diagnoses

- Extraspinal nerve entrapment (due to abdominal or pelvic mass)
- Cauda equina syndrome (saddle anesthesia, bladder or bowel dysfunction, bilateral involvement)
- Myelopathy due to thoracic disc herniation
- Demyelinating disease
- Lateral femoral cutaneous nerve entrapment (lateral thigh, sensory only, reverse SLR or femoral nerve stretch test)

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- Trochanteric bursitis (no nerve root tension signs, pain on lateral thigh/leg, exquisite tenderness to palpation over trochanter)

Radiographs

Medical necessity of radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Determination of necessity of x-rays requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results. If condition is caused by a soft tissue structure, x-rays may be normal. Basic lumbar radiographic series must include AP and lateral views.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with frequency of treatment commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks at a deceased frequency.

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- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Attempt a return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment will be efficacious.
- Treatment in weeks five through eight should continue to produce improvement in subjective findings and function, with a decrease in treatment frequency commensurate with improvement in patient's condition.
- If treatment during weeks nine through twelve is necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

With Soft Neurologic Signs (single nerve root distribution, paresthesias/sensory changes):

- Manage case conservatively for one week with treatment frequency commensurate with severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in degree of muscle spasm present—continue treatment.
- If at least 50% improvement is reported subjectively, 50% increase in range of motion is observed, and pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency. A home exercise program should be introduced.
- At the end of week 8, improvement in pain and range of motion should be assessed as at least 75% improved; pain should be centralized.
- By the end of week 12, treatment frequency should continue to diminish commensurate with patient's continued improvement. Patient should be prepared for released to a self-management program.

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Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement. ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ The patient should be approaching maximum improvement. The treatment *frequency should continue to decrease with improvement.*

With Firm Neurologic Signs (significant motor weakness and/or muscle atrophy):

- Manage conservatively for one week.
- If some improvement in pain is reported subjectively and there is some reduction in the degree of muscle spasm present—continue conservative care.
- If at least 30% improvement is reported subjectively, 50% increase in range of motion is observed, and the pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency.
- At the end of week eight, pain should continue to centralize, pain should further decrease, and range of motion should continue to increase, and improvement in neurologic findings should be noted.
- By the end of week 12, improvement in pain and range of motion should be assessed at least 75% and pain should be centralized.
- In the final four weeks, treatment frequency should continue to diminish commensurate with the patients continued improvement.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 30% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques ➢ Improvement in neurologic findings
9-12	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
13-16	➢ The patient should be approaching maximum improvement. The treatment *frequency should continue to decrease with improvement.*

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Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Increasing neurologic signs/symptoms: increasing lower extremity numbness/tingling, increasing lower extremity weakness, increasing lower extremity pain, and/or decreasing lower extremity deep tendon reflexes are all indications for a referral to the primary care provider.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbar stabilization exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Brief use of lumbar support, if necessary, in the acute stages to limit motion

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Acupuncture
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.
14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
16. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.

© 2018 eviCore healthcare. All rights reserved.

17. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
18. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
19. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
25. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
26. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
27. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
28. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
29. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
30. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
31. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
32. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
33. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
34. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
35. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
36. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
37. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.

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46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Post-Laminectomy Syndrome, Lumbar Region

Synonyms
None

Definition
Condition that results following a laminectomy procedure in the lumbar spine region; typically, a laminectomy is performed in an effort to correct lumbar spinal stenosis.

History

Patient history should include:
- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
  - A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
  - A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
  - **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosupression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Patient reports a history of a lumbar laminectomy.

Note: Criteria for performing a lumbar laminectomy has been a source of controversy. Retrospective reviews of the appropriateness of this procedure have reported that anywhere from 23-38% were inappropriate.

Subjective Findings

- Continued pain and stiffness in the lower back
- Often associated with numbness, pain, and/or weakness that may reach to the distal ends of the lower extremities
- Extremity symptoms may predominate
- Type and radiation of pain vary
- Worse with prolonged sitting, standing, bending, stooping, lifting

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to lower back pain.

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Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Specific Aspects of Examination

- Determine whether there are signs of an upper motor neuron lesion (UMNL) or a lower motor neuron lesion (LMNL).
- Suspect a central nervous system disorder in patients exhibiting UMNL signs; if so, then refer to primary care provider immediately.
- If a single regional weakness is identified, attempt to localize the problem by associating any deficits in motor or sensory function with their corresponding spinal nerve level(s).
- If site of lesion cannot be clearly differentiated upon history and examination, referral to primary care provider is warranted for further evaluation.
- Weakness associated with a neuromotor or central nervous system disease should be referred for medical management.

Objective Criteria

Post Laminectomy Syndrome includes the following clinical findings:

- Neurological examination may demonstrate:
  - Abnormal sensation
  - Neural tension signs
  - Diminished motor strength
  - Abnormal deep tendon reflexes (DTR)
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine

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  - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Muscle atrophy may be present (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Neurologic Testing	L5 nerve root (L4/5 disc)	S1 nerve root (L5/S1 disc)
Sensation	Hypesthesia lateral lower leg	Hypesthesia posterior calf or lateral foot
Motor	Dorsiflexion of great toe (extensor hallicus longus); heel walking	Plantar flexion of great toe or foot; toe walking
Deep Tendon Reflex		Absent or diminished Achilles reflex

Differential Diagnoses

- Metastatic tumor (awakened by constant and severe night pain that is not relieved by changing position, especially when there is a known or suspected history of cancer).
- Spinal cord tumor.
- Gather information that leads to a prognosis, and the selection of appropriate interventions.

Radiographs

Diagnosis of lumbar post-laminectomy syndrome indicates a need for radiographs that meets eviCore's Radiographic Criteria due to prior history of surgery to the involved area.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:

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- Severity of clinical findings,
- Presence of complicating factors,
- Natural history of condition, and
- Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with frequency of treatment commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks at a deceased frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Attempt a return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment will be efficacious.
- Treatment in weeks five through eight should continue to produce improvement in subjective findings and function, with a decrease in treatment frequency commensurate with improvement in patient’s condition.
- If treatment during weeks nine through twelve is necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

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With Soft Neurologic Signs (single nerve root distribution, paresthesias/sensory changes):

- Manage case conservatively for one week with treatment frequency commensurate with severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in degree of muscle spasm present—continue treatment.
- If at least 50% improvement is reported subjectively, 50% increase in range of motion is observed, and pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency. A home exercise program should be introduced.
- At the end of week eight, improvement in pain and range of motion should be assessed as at least 75% improved; pain should be centralized.
- By the end of week 12, treatment frequency should continue to diminish commensurate with patient's continued improvement. Patient should be prepared for released to a self-management program.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques
9-12	➢ The patient should be approaching maximum improvement. The treatment *frequency should continue to decrease with improvement.*

With Firm Neurologic Signs (significant motor weakness and/or muscle atrophy):

- Manage conservatively for one week.
- If some improvement in pain is reported subjectively and there is some reduction in the degree of muscle spasm present—continue conservative care.
- If at least 30% improvement is reported subjectively, 50% increase in range of motion is observed, and the pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency.
- At the end of week eight, pain should continue to centralize, pain should further decrease, and range of motion should continue to increase, and improvement in neurologic findings should be noted.
- By the end of week 12, improvement in pain and range of motion should be assessed at least 75% and pain should be centralized.

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- In the final four weeks, treatment frequency should continue to diminish commensurate with the patients continued improvement.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 30% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques ➢ Improvement in neurologic findings
9-12	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
13-16	➢ The patient should be approaching maximum improvement. The treatment *frequency should continue to decrease with improvement.*

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of lower extremity,
- Signs of demyelinating condition, tumor or infection,
- Increasing neurologic signs/symptoms: increasing lower extremity numbness/tingling, increasing lower extremity weakness, increasing lower extremity pain, and/or decreasing lower extremity deep tendon reflexes.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Postural advice
- Lumbar stabilization exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.

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12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.
14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
16. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
17. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
18. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
19. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
25. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
26. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.

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27. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
28. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
29. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
30. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
31. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
32. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
33. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
34. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
35. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
36. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
37. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck

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pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.

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59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sciatica

Synonyms
Neuralgia or neuritis of sciatic nerve

Definition
Condition associated with neurogenic pain following the distribution of the sciatic nerve due to mechanical pressure and inflammation of the nerve. Condition may be accompanied by lower extremity numbness, weakness, or hyporeflexia.

History

Patient history should include:
- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
  - A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
  - A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
  - **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct Blow to the back in young Adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Patient may report trauma, or an insidious onset; onset of lower back symptoms is often sudden. Sitting, coughing, and/or sneezing will often exacerbate patient's symptoms. Pain referral to the posterior thigh is common.

Subjective Findings

- Pain, numbness, tingling, paresthesias in the lower extremity following sciatic nerve distribution
- Complaints of weakness in the lower extremity
- Midline disc protrusions may involve both extremities
- Better with rest
- Flexing knee may provide relief by decreasing tension on irritated nerve

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

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Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Specific Aspects of Examination

- Determine whether there are signs of an upper motor neuron lesion (UMNL) or a lower motor neuron lesion (LMNL).
- Suspect a central nervous system disorder in patients exhibiting UMNL signs; if so, then refer to primary care provider immediately.
- If a single regional weakness is identified, attempt to localize the problem by associating any deficits in motor or sensory function with their corresponding spinal nerve level(s).
- If site of lesion cannot be clearly differentiated upon history and examination, referral to primary care provider is warranted for further evaluation.
- Weakness associated with a neuromotor or central nervous system disease should be referred for medical management.

Objective Criteria

Sciatica includes the following clinical findings:

- Neurological examination may demonstrate:
  - Abnormal sensation
  - Neural tension signs
  - Diminished motor strength
  - Abnormal deep tendon reflexes (DTR)
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine

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  - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Muscle atrophy may be present (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Note: Approximately 5% of lumbar radiculopathies involve L4 nerve root; 67%, L5 nerve root; and 28%, S1 nerve root.

Differential Diagnoses

- Extraspinal nerve entrapment (due to abdominal or pelvic mass)
- Cauda equina syndrome (saddle anesthesia, bladder or bowel dysfunction, bilateral involvement)
- Myelopathy due to thoracic disc herniation
- Demyelinating disease
- Lateral femoral cutaneous nerve entrapment (lateral thigh, sensory only, reverse SLR or femoral nerve stretch test)
- Trochanteric bursitis (no nerve root tension signs, pain on lateral thigh/leg, exquisite tenderness to palpation over trochanter)

Neurologic Testing	L4 nerve root (L3/4 disc)	L5 nerve root (L4/5 disc)	S1 nerve root (L5/S1 disc)
Sensation	Hypesthesia medial foot	Hypesthesia lateral lower leg and dorsum of foot	Hypesthesia posterior calf or lateral foot
Motor	Anterior tibialis (dorsiflexion); heel walking	Extensor hallicus longus (dorsiflexion of great toe); heel walking	Peroneus Longus and Brevis (Eversion of foot); toe walking
Deep Tendon Reflex	Patella		Achilles

Signs of upper motor neuron involvement (clonus, hyperreflexia, Babinski reflex) may suggest compression of the spinal cord, which should be evaluated medically.

Radiographs

Necessity for radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Determination of the necessity of x-rays requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results. If condition is caused by a soft tissue structure, x-rays may be normal. Basic lumbar radiographic series must include AP and lateral views.

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Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with frequency of treatment commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks at a deceased frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Attempt a return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.

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- Following the initial four weeks, at least 50% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment will be efficacious.
- Treatment in weeks five through eight should continue to produce improvement in subjective findings and function, with a decrease in treatment frequency commensurate with improvement in patient's condition.
- If treatment during weeks nine through twelve is necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

With Soft Neurologic Signs (single nerve root distribution, paresthesias/sensory changes):

- Manage case conservatively for one week with treatment frequency commensurate with severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in degree of muscle spasm present—continue treatment.
- If at least 50% improvement is reported subjectively, 50% increase in range of motion is observed, and pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency. A home exercise program should be introduced.
- At the end of week eight, improvement in pain and range of motion should be assessed as at least 75% improved; pain should be centralized.
- By the end of week 12, treatment frequency should continue to diminish commensurate with patient's continued improvement. Patient should be prepared for released to a self-management program.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

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With Firm Neurologic Signs (significant motor weakness and/or muscle atrophy):

- Manage conservatively for one week.
- If some improvement in pain is reported subjectively and there is some reduction in the degree of muscle spasm present—continue conservative care.
- If at least 30% improvement is reported subjectively, 50% increase in range of motion is observed, and the pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency.
- At the end of week eight, pain should continue to centralize, pain should further decrease, and range of motion should continue to increase, and improvement in neurologic findings should be noted.
- By the end of week 12, improvement in pain and range of motion should be assessed at least 75% and pain should be centralized.
- In the final four weeks, treatment frequency should continue to diminish commensurate with the patient's continued improvement.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 30% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques ➢ Improvement in neurologic findings
9-12	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
13-16	➢ The patient should be approaching maximum improvement. The treatment *frequency should continue to decrease with improvement.*

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Increasing neurologic signs/symptoms: increasing lower extremity numbness/tingling, increasing lower extremity weakness, increasing lower extremity pain, and/or decreasing lower extremity deep tendon reflexes are all indications for a referral to the primary care provider.

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Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbar stabilization exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Brief use of lumbar support, if necessary, in the acute stages to limit motion

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.

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6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Christensen KD, Buswell K. Chiropractic Physicians, Peace Health Medical Group, Longview, WA. Chiropractic outcomes managing radiculopathy in hospital setting; a retrospective review of 162 patients. J Chiropr Med. 2008 September; 7(3): 115–125. Published online 2008 September 2. doi: 10.1016/j.jcm.2008.05.001. Date last accessed 02/01/2018. www.ncbi.nlm.nih.gov/pmc/articles/PMC2682943/.
14. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
15. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
16. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
17. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
18. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
19. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.

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23. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
25. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
26. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
27. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
28. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
29. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
30. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
31. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
32. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
33. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
34. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
35. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
36. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord.

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2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
37. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.

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52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Spinal Stenosis, Lumbar

Synonyms
None

Definition
Condition caused by a narrowing of the spinal canal, usually present with pain or weakness in extremities on walking, and may be mistaken for intermittent claudication due to vascular disease. Size of canal may be small since birth, due to some congenital or developmental factors in certain individuals. Later in life when degenerative changes occur, canal is further narrowed by osteophytes from facet joints and the vertebral body, thickening of the posterior longitudinal ligament or ligamentum flavum, or retrolisthesis of the vertebral body secondary to narrowing of disc space.

History

Patient history should include:
- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
  - A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
  - A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
  - **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

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Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct Blow to the back in young Adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Osteoporosis
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Symptoms start gradually and usually occur in males over age 45-50.

- History may be vague
- Patient may complain of weakness, pain, tingling, or numbness of one or both legs after walking
- Legs feel heavy or rubbery
- May be some pain in the gluteal region or legs, and sitting or standing with the spine flexed relieves symptoms
- May take much longer to resume walking for someone with spinal stenosis than with vascular disease
- Some patients may complain of pain radiating down the sciatic nerve distribution

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Subjective Findings

- Pain, numbness, tingling, paresthesias in the lower extremity following lumbar nerve root distribution
- May complain of weakness in the lower extremity
- Better with rest
- Flexing spine may provide relief by decreasing pressure on lumbar nerve root

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Lumbar Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Specific Aspects of Examination

- Determine whether there are signs of an upper motor neuron lesion (UMNL) or a lower motor neuron lesion (LMNL).
- Suspect a central nervous system disorder in patients exhibiting UMNL signs; if so then refer to primary care provider immediately.
- If a single regional weakness is identified, attempt to localize the problem by associating any deficits in motor or sensory function with their corresponding spinal nerve level(s).
- If site of lesion cannot be clearly differentiated upon history and examination, referral to primary care provider is warranted for further evaluation.

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- Weakness associated with a neuromotor or central nervous system disease should be referred for medical management.

Objective Criteria

Spinal Stenosis includes the following clinical findings:

- Neurological examination may demonstrate:
  - Abnormal sensation
  - Neural tension signs
  - Diminished motor strength
  - Abnormal deep tendon reflexes (DTR)
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Muscle atrophy may be present (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Neurologic Testing	L4 nerve root (L3/4 disc)	L5 nerve root (L4/5 disc)	S1 nerve root (L5/S1 disc)
Sensation	Hypesthesia medial foot	Hypesthesia lateral lower leg and dorsum of foot	Hypesthesia posterior calf or lateral foot
Motor	Anterior tibialis (dorsiflexion); heel walking	Extensor hallicus longus (dorsiflexion of great toe); heel walking	Peroneus Longus and Brevis(Eversion of foot); toe walking
Deep Tendon Reflex	Patella		Achilles

Note: Signs of upper motor neuron involvement (clonus, hyperreflexia, Babinski reflex) may suggest compression of the spinal cord, which should be evaluated medically.

Differential Diagnoses

- Extraspinal nerve entrapment (due to abdominal or pelvic mass)
- Cauda equina syndrome (saddle anesthesia, bladder or bowel dysfunction, bilateral involvement)
- Myelopathy due to thoracic disc herniation
- Demyelinating disease
- Lateral femoral cutaneous nerve entrapment (lateral thigh, sensory only, reverse SLR or femoral nerve stretch test)

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- Trochanteric bursitis (no nerve root tension signs, pain on lateral thigh/leg, exquisite tenderness to palpation over trochanter)
- Gathering of information that leads to a prognosis, and the selection of appropriate interventions
- Disc protrusion
- Herniated nucleus pulposis
- Peripheral vascular disease
- Spondylolisthesis

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with frequency of treatment commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks at a deceased frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

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- Attempt a return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment will be efficacious.
- Treatment in weeks five through eight should continue to produce improvement in subjective findings and function, with a decrease in treatment frequency commensurate with improvement in patient's condition.
- If treatment during weeks nine through twelve is necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

With Soft Neurologic Signs (single nerve root distribution, paresthesias/sensory changes):

- Manage case conservatively for one week with treatment frequency commensurate with severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in degree of muscle spasm present—continue treatment.
- If at least 50% improvement is reported subjectively, 50% increase in range of motion is observed, and pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency. A home exercise program should be introduced.
- At the end of week eight, improvement in pain and range of motion should be assessed as at least 75% improved; pain should be centralized.
- By the end of week 12, treatment frequency should continue to diminish commensurate with patient's continued improvement. Patient should be prepared for released to a self-management program.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 50% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques
9-12	➢ Gradual improvement leading toward resolution ➢ Reinforce self-management techniques ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

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With Firm Neurologic Signs (significant motor weakness and/or muscle atrophy):

- Manage conservatively for one week.
- If some improvement in pain is reported subjectively and there is some reduction in the degree of muscle spasm present—continue conservative care.
- If at least 30% improvement is reported subjectively, 50% increase in range of motion is observed, and the pain distribution is centralizing following the initial four weeks—continue for an additional month at a decreasing frequency.
- At the end of week eight, pain should continue to centralize, pain should further decrease, and range of motion should continue to increase, and improvement in neurologic findings should be noted.
- By the end of week 12, improvement in pain and range of motion should be assessed at least 75% and pain should be centralized.
- In the final four weeks, treatment frequency should continue to diminish commensurate with the patients continued improvement.

Week	Progress
0-1	➢ Some reduction of subjective findings ➢ Some reduction of muscle spasm
2-4	➢ 30% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution is centralizing ➢ Reinforce self-management techniques
5-8	➢ Continued reduction of subjective findings ➢ Significant measurable functional improvement ➢ Pain distribution continues to centralize ➢ Reinforce self-management techniques ➢ Improvement in neurologic findings
9-12	➢ 75% improvement in subjective findings ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
13-16	➢ The patient should be approaching maximum improvement. The treatment *frequency should continue to decrease with improvement.*

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of lower extremity,
- Signs of demyelinating condition, tumor or infection,
- Increasing neurologic signs/symptoms: increasing lower extremity numbness/tingling, increasing lower extremity weakness, increasing lower extremity pain, and/or decreasing lower extremity deep tendon reflexes.

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Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice, instruction in proper body mechanics
- Lumbar stabilization exercises, flexibility exercises, as indicated
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Brief use of lumbar support, if necessary, in the acute stages to limit motion

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physiatry
- Medication
- Physical Therapy
- Surgery
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.

© 2018 eviCore healthcare. All rights reserved.

5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software.

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Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.

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36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev.

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2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lumbosacral Conditions (Non-Specific)

Disorder of Sacrum	**272**
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Disorder of Sacrum

Definition

Condition is an abnormal or altered functional relationship between contiguous joints involving the sacrum.

History

- Patient history should include:
- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements. Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Often arises from a "non-specific onset." Some form of acute or chronic postural abnormality is often involved. Prior history of trauma to involved region is possible. Condition may be a sequela of, and secondary to, another primary diagnosis such as sprain, strain or capsulitis.

Subjective Findings

Pain and/or stiffness in the sacral region.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

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Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing
- Schober test, and measuring chest expansion should be used to r/o ankylosing spondylitis

Objective Criteria

Disorder of Sacrum includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Radiographs

Clinical decision involving sacral radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of this sacral condition does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

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Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- If improvement following the initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider a different adjustive/manipulative technique.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Return to normal activity within four weeks should be attempted.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.

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- Following the initial four weeks, at least 75% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment may be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should plateau or completely resolve at this time.
- If patient is not asymptomatic, or near asymptomatic at the end of the second two week trial or has reached a plateau, refer patient to their primary care provider for other treatment options.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in the subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbar stabilization exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Massage
- Acupuncture
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

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18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.

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32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.

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48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lumbago

Synonyms

- Low back pain
- Lumbalgia
- Low back syndrome

Definition

Lumbago is a low back pain, nonspecific in origin and/or nature; and, can be acute or chronic in nature.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression medication	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Usually insidious onset of pain, may report prior history of episodic low back pain.

Subjective Findings

- Pain typically worse with motion
- Stiffness upon arising from a seated position
- Constant awareness of some level of back discomfort or limitations in motion may be reported
- Pain and stiffness in the low back

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

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The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Lumbago includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention

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Differential Diagnoses

- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Osteoporosis and compression fractures (major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection in disc or bone (fever, history of IV drug use, history of severe pain)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)
- Metastatic disease, myeloma, lymphoma (pathologic fracture, severe night pain)
- Spinal tuberculosis (lower socioeconomic groups, AIDS)
- Depression

Radiographs

Decision to expose radiographs is based on medical necessity, per eviCore's Radiographic Criteria. Diagnosis of Lumbago does not warrant radiographic evaluation unless associated with other radiographic criteria.

Advanced Diagnostic Testing

Advanced diagnostic testing typically is not a consideration, unless patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities"

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(e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.

- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Fever, chills, unexplained weight loss, significant night time pain,
- Presence of pathological fracture,
- Obvious deformity,
- Saddle anesthesia,
- Loss of major motor function,
- Bowel or bladder dysfunction,
- Abdominal pain,
- Visceral dysfunction,

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- Increasing neurologic signs/symptoms: increasing LE weakness, increasing LE pain, increasing LE numbness/tingling, and decreasing LE reflexes.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice, instruction in proper body mechanics
- Flexibility exercises
- Lumbar stabilization exercises
- Aerobic conditioning, such as walking or swimming
- Heat applications, cold packs, if needed, to relieve discomfort/stiffness

Alternative Management

- Osteopathic Manipulation
- Acupuncture
- Physical Therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.

© 2018 eviCore healthcare. All rights reserved.

4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.

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22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord.

© 2018 eviCore healthcare. All rights reserved.

2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.

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51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lumbar Nonallopathic Lesion

Synonyms

- Nonallopathic Lesion—lumbosacral region
- Segmental dysfunction—lumbar
- Somatic dysfunction—lumbar
- Subluxation—lumbar

Definition

Condition is associated with an abnormal or altered functional relationship between contiguous lumbar vertebrae.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic response to prior treatment)
- Episode Type
  - A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
  - A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
  - **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.

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- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the spine	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night and/or unrelated to movement	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse, alcoholism and/or diabetes	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Condition often arises from a "non-specific onset." Some form of acute or chronic postural abuse is often involved. There may be prior history of trauma to involved region. Condition may be a sequela of, and secondary to, another primary diagnosis such as sprain, strain, or capsulitis.

Subjective Findings

Condition is associated with pain and/or stiffness in the region of affected joints/segments.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

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Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Lumbar Nonallopathic Lesion includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

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Radiographs

Clinical decision involving a radiographic series of the lumbar spine is based on medical necessity, as per criteria for radiographic exam. Diagnosis of nonallopathic lesion does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 50% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

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- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbar stabilization exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

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Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Massage
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.

© 2018 eviCore healthcare. All rights reserved.

14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the

© 2018 eviCore healthcare. All rights reserved.

UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.

© 2018 eviCore healthcare. All rights reserved.

44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.

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63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lumbar Spondylosis

Synonyms

- Lumbar degenerative joint disease
- Lumbar arthritis

Definition

Condition that can present with low back pain and stiffness due to degenerative changes of the osseous structures of the lumbar spine that may result in narrowing or stenosis of the spinal canal or intervertebral foramen in the lumbar region. Occasionally, condition may also present with radicular pain into lower extremity; narrowing may be caused by osteophytes and /or buckling or protrusion of the interlaminar ligaments.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior physical therapy response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.

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- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Condition usually starts with an insidious onset of pain. Patient may report prior history of low back, and/or leg pain, and/or history of low back trauma. Patient may also report morning pain/stiffness that decreases with motion, but is aggravated by excessive motions or strenuous activity.

Subjective Findings

- Pain and stiffness in the low back
- Pain typically worse with motion
- May report crepitus with certain low back motions
- Non-dermatomal lower extremity pain (unilateral or bilateral) may occur with lateral recess stenosis and nerve root entrapment

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

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Goal of Examination

Examine the neuromusculoskeletal system for possible causes or contributing factors of the low back pain.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection (including postural evaluation)
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Lumbar Spondylosis includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

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Differential Diagnoses

- Metastatic tumor; awakened by constant and severe night pain that is not relieved by changing position, especially when there is a known or suspected history of cancer
- Spinal cord tumor
- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Osteoporosis and compression fractures (major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection in disc or bone (fever, history of IV drug use, history of severe pain)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)

Radiographs

Clinical decision involving lumbar radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of lumbar spondylosis does not in and of itself compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.

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- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Atrophy of lower extremity is apparent,
- Signs of myelopathy are apparent,
- Signs of demyelinating condition, tumor or infection are apparent,
- Increasing neurological signs are apparent: increasing LE numbness/tingling, increasing LE weakness, decreasing LE reflexes.

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Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbar exercises, such as isometrics, stabilization exercises, stretching
- Aerobic conditioning, such as walking or swimming
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Home traction, if helpful

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.

© 2018 eviCore healthcare. All rights reserved.

6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.

© 2018 eviCore healthcare. All rights reserved.

23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.

© 2018 eviCore healthcare. All rights reserved.

37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis,

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recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms; Aspen Publishers; 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lumbar Sprain/Strain

Synonyms
None

Definition
Patients often complain of non-radicular low back pain that may extend into the buttocks. Onset of symptoms occurs either suddenly, or following a trauma; may be either instantaneous or repetitive. Pain and spasm is typically localized in the lumbar musculature. Spinal motion, particularly flexion, usually is painful and decreased.

- Strain
  - Overstretching or tearing of a muscle or tendon.
- Sprain
  - Overstretching or tearing of ligamentous tissue.

Classification
Tendon and Ligament injuries are classified as...

- Grade I (mild)
  - Mild injury that causes only stretching or microscopic tears in a tissue. Although these tiny tears can stretch the tissue, they do not significantly affect the stability of the injured joint.
- Grade II (moderate)
  - Injured tissue is partially torn, and there is some mild to moderate joint instability.
- Grade III (severe)
  - Tissue is either torn completely or avulsed (pulled away from the place where it attaches to bone), and there is significant joint instability. Surgical referral may be necessary.

History
Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic response to prior treatment)
- Episode Type

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- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

- Sprain
  - Overexertion of the back in some static or dynamic activity; overstretching; or contusion. Back pain is worse with initial activity and rest typically relieves the pain. Trauma may precipitate the condition.

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- Strain
  - Chronic manifestations typically involves prolonged periods of postural abuse. Acute onset typically involves a sudden motion or poor body mechanics while performing an activity. Trauma may precipitate the condition.

Subjective Findings

- Sprain
  - Pain and stiffness in the lumbar area.
- Strain
  - Pain and stiffness in a muscle/tendon group of the lumbar region.

Low back pain may radiate into the buttocks. The need to frequently shift position is often present. Patient may have difficulty standing upright.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Lumbar Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

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Objective Criteria

Lumbar Sprain/Strain includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Differential Diagnoses

- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Lumbar vertebral body fracture (major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection (fever)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)
- Myeloma (night sweats)

Radiographs

Clinical decision involving a radiographic series of the lumbar spine is based on medical necessity, as per criteria for radiographic exam. Diagnosis of lumbar sprain/strain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

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Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with frequency of treatment commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks at a deceased frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Attempt a return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment will be efficacious.
- Treatment in weeks five through eight should continue to produce improvement in subjective findings and function, with a decrease in treatment frequency commensurate with improvement in patient's condition.

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- If treatment during weeks nine through twelve is necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 25% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Introduce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Continued significant measurable functional improvement ➢ Reinforce self-management techniques
9-12	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Fever, chills, unexplained weight loss, significant night time pain,
- Presence of pathological fracture,
- Obvious deformity,
- Saddle anesthesia,
- Loss of major motor function,
- Bowel or bladder dysfunction,
- Abdominal pain,
- Visceral dysfunction.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Postural advice, postural exercises
- Lumbar exercises such as: lumbar stabilization exercises, flexibility exercises
- Aerobic conditioning, such as walking or swimming
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Home lumbar traction, if helpful

Alternatives to Chiropractic Management

- Acupuncture
- Medication
- Osteopathic Manipulation
- Physiatrist
- Physical Therapy
- Massage
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients

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with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.

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27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.

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41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol

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Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lumbosacral (joint/ligament), Sprain and Strain

Synonyms
None

Definition
Condition involving non-radicular, lower posterolateral back pain that may extend into the buttocks or groin. Condition occurs either suddenly or following a trauma, which may be either instantaneous or repetitive.

- Strain
  - Overstretching or tearing of a muscle or tendon.
- Sprain
  - Overstretching or tearing of ligamentous tissue.

Classification
Tendon and Ligament injuries are classified as...

- Grade I (mild)
  - Mild injury that causes only stretching or microscopic tears in a tissue. Although these tiny tears can stretch the tissue, they do not significantly affect the stability of the injured joint.
- Grade II (moderate)
  - Injured tissue is partially torn, and there is some mild to moderate joint instability.
- Grade III (severe)
  - Tissue is either torn completely or avulsed (pulled away from the place where it attaches to bone), and there is significant joint instability. Surgical referral may be necessary.

History
Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic response to prior treatment)
- Episode Type

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- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back or pelvis in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

- Strain
  - Overexertion of the pelvic girdle in some static or dynamic activity; overstretching; or contusion. Pain is worse with initial activity and rest typically relieves the pain. Trauma may precipitate condition.

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- Sprain
  - Chronic manifestations typically involve prolonged periods of postural abuse. Acute onset typically involves a sudden motion, or poor body mechanics while performing an activity. Trauma may precipitate condition.

Subjective Findings

Low back pain that may diffusely radiate into the buttocks or groin on the affected side. Patient may have a need to frequently shift position, and have difficulty standing upright

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Lumbosacral Sprain/Strain includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength

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- Normal deep tendon reflexes (DTR)
- Absence of pathological reflexes (clonus, hyperreflexia) AND

- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Differential Diagnoses

- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Lumbar vertebral body and pelvic fracture (major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection (fever)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)
- Myeloma (night sweats)

Radiographs

Clinical decision involving a radiographic series of the lumbosacral region is based on medical necessity, as per criteria for radiographic exam. Diagnosis of lumbosacral sprain/strain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:

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- Severity of clinical findings,
- Presence of complicating factors,
- Natural history of condition, and
- Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with frequency of treatment commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 25% improvement is reported subjectively, and significant improvement in function is observed following the first two weeks—continue for up to two additional weeks at a deceased frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Attempt a return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 50% improvement in subjective findings, and additional measurable functional improvement should be appreciated in order to determine whether further treatment will be efficacious.
- Treatment in weeks five through eight should continue to produce improvement in subjective findings and function, with a decrease in treatment frequency commensurate with improvement in patient’s condition.
- If treatment during weeks nine through twelve is necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

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Week	Progress
0-2	➢ 25% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Introduce self-management techniques
5-8	➢ 75% improvement in subjective findings ➢ Continued significant measurable functional improvement ➢ Reinforce self-management techniques
9-12	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Fever, chills, unexplained weight loss, significant night time pain,
- Presence of pathological fracture,
- Obvious deformity,
- Saddle anesthesia,
- Loss of major motor function,
- Bowel or bladder dysfunction,
- Abdominal pain,
- Visceral dysfunction.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Rest and ice in the acute phase followed by a program of progressive strengthening exercises beginning within one to two weeks of first treatment
- Heat applications, if needed, to relieve discomfort/stiffness after the acute phase
- Postural advice
- Lumbar and Sacroiliac stabilization exercises
- Aerobic conditioning

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients

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with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.

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27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.

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41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol

© 2018 eviCore healthcare. All rights reserved.

Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Pelvic Nonallopathic Lesion

Synonyms

- Nonallopathic lesion—hip or pubic region
- Segmental dysfunction—hip or pubic region
- Somatic dysfunction—hip or pubic region
- Subluxation—hip or pubic region

Definition

Condition consisting of an abnormal or altered functional relationship involving the pelvis.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.

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- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the spine in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior or current history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Condition often arises from a "non-specific onset." Some form of acute or chronic postural abuse is often involved. There may be prior history of trauma to the involved region. Condition may be a sequela of, and secondary to, another primary diagnosis, such as sprain, strain, or capsulitis.

Subjective Findings

Condition involves pain and/or stiffness in the region of the affected joints/segments.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

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The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Pelvic Nonallopathic Lesion includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Radiographs

Clinical decision involving a radiographic series of the pelvis is based on medical necessity, as per criteria for radiographic exam. Diagnosis of nonallopathic lesion does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

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Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.

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- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbopelvic stabilization exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Acupuncture
- Massage
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

© 2018 eviCore healthcare. All rights reserved.

18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.

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31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.

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46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sacral Nonallopathic Lesion

Synonyms

- Nonallopathic lesion—sacralcoccygeal, or sacroiliac region
- Segmental dysfunction—sacralcoccygeal, or sacroiliac region
- Somatic dysfunction—sacralcoccygeal, or sacroiliac region
- Subluxation—sacralcoccygeal, or sacroiliac region

Definition

Condition involving an abnormal or altered functional relationship involving the sacrum.

History

Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back or pelvis in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior or current history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

Often arises from a "non-specific onset." Some form of acute or chronic postural abuse is often involved. There may be a prior history of trauma to the involved region. Condition may be a sequela of, and secondary to, another primary diagnosis such as sprain, strain, or capsulitis.

Subjective Findings

Complaints of pain and/or stiffness in the region of affected joints/segments are common.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

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The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Sacral Nonallopathic Lesion includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Radiographs

Clinical decision involving a radiographic series of the sacrum is based on medical necessity, as per criteria for radiographic exam. Diagnosis of nonallopathic lesion does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

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Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.

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- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbosacral stabilization exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Massage
- Acupuncture
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

© 2018 eviCore healthcare. All rights reserved.

18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.

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31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.

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46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sacroiliac Ligament Sprain

Synonyms
None

Definition
Condition involving non-radicular lower posterolateral back pain that may extend into the buttocks or groin and occurs either suddenly or following a trauma, which may be either instantaneous or repetitive.

Sprain
Overstretching or tearing of ligamentous tissue.

Classification
Ligament injuries are classified as:

- Grade I (mild)
  - Mild injury that causes only stretching or microscopic tears in a tissue. Although these tiny tears can stretch the tissue, they do not significantly affect the stability of the injured joint.
- Grade II (moderate)
  - Injured tissue is partially torn, and there is some mild to moderate joint instability.
- Grade III (severe)
  - Tissue is either torn completely or avulsed (pulled away from the place where it attaches to bone), and there is significant joint instability. Surgical referral may be necessary.

History
Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.

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- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back or pelvis in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

- Sprain
  - Chronic manifestations typically involve prolonged periods of postural abuse. Acute onset typically involves sudden motion or poor body mechanics while performing an activity. Trauma may precipitate condition.

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Subjective Findings

- Sprain
  - Pain and stiffness in the sacroiliac area. Condition involves pain that may diffusely radiate into the buttocks or groin on the affected side. Often patient has a need to frequently shift position, and has difficulty standing upright.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Sacroiliac Ligament Sprain includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility

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- Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
  - Active and/or passive range-of-motion of the lumbar spine
  - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

Differential Diagnoses

- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Lumbar vertebral body and pelvic fracture (major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection (fever)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)
- Myeloma (night sweats)

Radiographs

Clinical decision involving a radiographic series of this region is based on medical necessity, as per criteria for radiographic exam. Diagnosis of sacroiliac sprain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and

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- Expectation for functional improvement.

Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

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Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Fever, chills, unexplained weight loss, significant night time pain,
- Presence of pathological fracture,
- Obvious deformity,
- Saddle anesthesia,
- Loss of major motor function,
- Bowel or bladder dysfunction,
- Abdominal pain,
- Visceral dysfunction.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Rest and ice in the acute phase followed by a program of progressive strengthening exercises beginning within 1-2 weeks of first treatment
- Heat applications, if needed, to relieve discomfort/stiffness after the acute phase
- Postural advice
- Lumbar and Sacroiliac stabilization exercises
- Aerobic conditioning

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

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18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005

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May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.

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46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sacroiliitis

Synonyms
Inflammation of sacroiliac joint NOS

Definition
Sacroiliitis is an inflammation of the sacroiliac joint. All patients with sacroiliitis will have sacroiliac joint pain— this symptom can be overlooked because of the patient's refusal to move due to the pain.

Diagnosis is commonly misused by some chiropractors to describe a sacroiliac sprain/strain. If this is the case, refer to Sacroiliac Ligament Sprain for a description of the Chiropractic Evaluation and Management of this condition.

History
Patient history should include:

- Documentation of pain level using a validated pain scale (VAS/NRS) and its frequency
- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic response to prior treatment)
- Episode Type
- A **New Episode** is defined by the absence of clinical care within the past 12 weeks upon initiation of care.
- A **Recurrent Episode** is defined by an exacerbation since cessation of care of a condition that was previously diagnosed and treated by a given provider within any 12-month period.
- **Continuation of Care** is defined by the need for ongoing, skilled clinical management of a condition where care has been initiated within the past 12 weeks.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Identify fear avoidance beliefs and behaviors that may lead to avoidance of activities and/or movements.
- Determine if trauma-related; determine nature and extent of traumatic event.

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- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back or pelvis in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Open wound in the area of the primary region of complaint	Infection
Abdominal Pulsations – May be associated with back pain	Abdominal Aortic Aneurysm

Presentation

In most cases of sacroiliitis, there is a diffuse pattern of back and pelvic pain that mimic each other. Patients with SI inflammation will generally complain of low back, buttock, and thigh pain. Typically, pain becomes worse when sitting for prolonged period of time.

Conditions that can predispose patients to sacroiliitis include trauma, pregnancy, infections of the skin, osteomyelitis, urinary tract infection, endocarditis and drug addiction. This type of infection is seen with some frequency in intravenous drug users.

Subjective Findings

Patients exhibit low back pain that may diffusely radiate into the buttocks or groin on the affected side. Often there is a need to frequently shift position; and may have difficulty standing upright.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Oswestry Disability Index. The Oswestry survey has been studied in peer-reviewed scientific literature, and it has been proven to be a valid, reliable, and responsive measure for low back conditions.

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Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Objective Criteria

Sacroiliitis includes the following clinical findings:

- Negative neurological examination, which may be evidenced by:
  - Normal sensation
  - Absence of neural tension signs
  - Normal motor strength
  - Normal deep tendon reflexes (DTR)
  - Absence of pathological reflexes (clonus, hyperreflexia) AND
- Impaired Range-of-motion (ROM)/Flexibility
  - Reproduction of pain correlated with the lumbar spine region upon any one (1) of the following:
    - Active and/or passive range-of-motion of the lumbar spine
    - Functional movement(s) involving the lumbar spine related to activities of daily living (ADLs) AND
- Absence of muscle atrophy (calf measurement when indicated)
- Palpable areas of tenderness along the lumbar spine region corresponding to hypertonicity of the lumbar muscles AND
- Evidence of significant pain and/or functional limitation necessitating skilled intervention.

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Differential Diagnoses

- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Lumbar vertebral body and pelvic fracture (major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection (fever)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)
- Myeloma (night sweats)

Radiographs

Clinical decision involving lumbosacral radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of sacroiliitis does not, in and of itself, compel radiographic evaluation unless resultant instability is suspected. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Note: Sclerosis or obliteration of the SIJ can be seen in older patients. X-rays usually are normal in young patients with ankylosing spondylitis (AS), while the joint can appear fused in older patients.

Joint widening with erosive and sclerotic changes at the bony margins is suggestive of sacroiliitis.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Requirements for Chiropractic Visits

- The following findings must be present to establish the medical necessity of chiropractic treatment:
  - Significant Functional Limitation (i.e. Activities of daily living, vocational activities) - Practitioners are strongly encouraged to utilize validated, standardized assessment tools to quantify functional limitations (e.g. Neck Disability Index, Oswestry Disability Index).
  - Pain: limiting function and at least 3/10.
- Treatment frequency and duration must be based on:
  - Severity of clinical findings,
  - Presence of complicating factors,
  - Natural history of condition, and
  - Expectation for functional improvement.

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Chiropractic Management

- Chiropractic management should include appropriate patient education and reassurance, reactivation advice, and the promotion of self-efficacy.
- Home programs should be initiated with the first therapy session and must include ongoing assessments of compliance as well as upgrades to the program.
- Manage condition for two weeks with a treatment frequency commensurate with severity of condition.
- Passive care may be clinically indicated in the acute/subacute phase of treatment, or during an acute exacerbation, however, the exclusive use of "passive modalities" (e.g., palliative care) has not demonstrated clinical efficacy in achieving functional restoration.
- If at least 50% improvement is reported subjectively, and a significant improvement in function is observed following the first two weeks—continue for up to two additional weeks.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Aerobic conditioning and spinal stabilization exercises should be introduced as soon as acute pain has subsided.
- Attempt to return to normal activity within four weeks.
- Use of self-directed home therapy will facilitate the fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings and additional measurable functional improvement should be appreciated in order to determine if further treatment will be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency commensurate with improvement in patient's condition.
- If weeks nine through twelve are necessary, patient should be prepared for discharge with self-management techniques.
- Condition should have reached a plateau, or completely resolved at this time; if not, consider the referral guidelines outlined below.

Week	Progress
0-2	➢ 50% improvement in subjective complaints ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective complaints ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques
5-8	➢ Pain distribution is centralized to back ➢ Continued significant measurable functional improvement ➢ Reinforce self-management techniques
9-12	➢ The patient should be approaching maximum improvement. The treatment frequency should continue to decrease with improvement.

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Referral Guidelines

Refer patient to the primary care provider for evaluation of alternative treatment options if:

- Improvement does not meet the above guidelines or improvement has reached a plateau,
- Fever, chills, unexplained weight loss, significant night time pain,
- Presence of pathological fracture,
- Obvious deformity,
- Saddle anesthesia,
- Loss of major motor function,
- Bowel or bladder dysfunction,
- Abdominal pain,
- Visceral dysfunction,
- Suspicion of the presence of inflammatory arthritis.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Rest and ice in the acute phase followed by a program of progressive strengthening exercises beginning within one to two weeks of first treatment
- Heat applications, if needed, to relieve discomfort/stiffness after the acute phase
- Postural advice
- Lumbar and Sacroiliac stabilization exercises
- Aerobic conditioning

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry

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- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.

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16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.

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45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Neuromusculoskeletal Conditions (Non-specific)

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Congenital Spondylolisthesis

Synonyms
None

Definition
Condition resulting from congenital anomalies of the spine, allowing a spinal vertebra to slip forward on the vertebral segment below. Congenital spondylolisthesis is characterized by presence of dysplastic facet joints allowing forward translation of one vertebra relative to another. Orientation of facets in an axial or sagittal plane may allow for forward translation, producing undue stress on the pars, resulting in a fracture.

History
Patient history may include:

- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic response to prior treatment)

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection

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Red Flag	Possible Consequence or Cause
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection

Presentation

Congenital spondylolisthesis (dysplastic type) occurs with a 2:1 female-to-male ratio with symptoms beginning around the adolescent growth spurt. These comprise about 14-21% of all cases of spondylolisthesis; these cases usually have no defect in the pars interarticularis.

Typical patient is between 10-18 years of age. Pain is felt in the lower back, buttocks and thighs and sometimes in the legs, feet, and toes.

There are two distinct types of pain:

- Dull
  - Ache in the lower back, buttocks, and thighs that is made worse by standing, bending, and various postural stresses.
- Severe
  - Pain radiating to the legs and feet that is burning or lancinating in type, made worse by coughing and sneezing, and associated in some cases with signs of involvement of the roots or cauda equina. Stiffness is also present, especially with forward bending. Spine often shows scoliosis and the patient has a “pelvic waddle” gait.
    - Symptoms often occur around the time of an adolescent growth spurt.
    - Some report acute onset of focal lower back pain during activity, while others have more insidious onset.
    - Radiating pain may extend to the buttocks or thigh.
    - Pain may be more significant and have mechanical characteristics with higher grades of spondylolisthesis.
    - In most cases, patients do not complain of symptoms suggesting neurologic deficit with lower grades of spondylolisthesis.
    - Radicular pain becomes more common with larger slips.
    - Complaints of radiating pain below the level of the knee associated with numbness and tingling in a dermatomal distribution would suggest the presence a radiculopathy resulting from either the foraminal stenosis that occurs with spondylolisthesis or a concomitant herniated disc.
    - Nerve root impingement from the fibrocartilaginous bar that forms at the sight of the lysis may occur.
    - High grades of spondylolisthesis may present with neurogenic claudication or symptoms suggesting cauda equina impingement.
    - Patient's pain usually is provoked by activity, particularly back extension activities.
    - Patients with acute spondylolysis tend to demonstrate poor tolerance of activities requiring excessive spine loading, including running and jumping.

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- Sitting usually is better tolerated.
- A large percentage of patients with spondylolysis are asymptomatic.
- Progression of a spondylolisthesis also may occur without symptoms.

Subjective Findings

- Low back pain, especially with hyperextension
- Stiffness in the low back with forward bending
- Poor posture
- Worse with prolonged standing, bending, stooping, lifting
- Better with sitting and lying down

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Hamstring tightness is observed almost universally, even in low-grade spondylolisthesis
- Palpation of bony and soft tissue
- Lumbar spasm may be present
- A palpable step-off is noted with slips equal to or greater than grade 2
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing
- Dermatomal weakness may be present if a radiculopathy or an element of stenosis is present

Findings of Congenital Spondylolisthesis

- ROM restrictions especially with flexion and extension
- Paraspinal muscle spasm
- Hamstring spasm and tightness
- Scoliosis may be present
- L5 spinous process may be palpably prominent

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- Step- like defect may be present
- Lumbar lordosis may be exaggerated
- “Pelvic waddle” gait
- Objective neurologic findings are often subtle, and correspond to involvement of the first sacral nerve root or cauda equina involvement

Complications

The most common complication of spondylolisthesis of any type is nerve root impingement/radiculopathy at the level of spondylolisthesis. Spinal stenosis and cauda equina syndrome may occur when a significant slip has occurred. Disc degeneration occurs at the level of the spondylolisthesis faster than at other levels of the spine, increasing the risk of discogenic lower back pain.

Differential Diagnoses

- Metastatic tumor (awakened by constant and severe night pain that is not relieved by changing position, especially when there is a known or suspected history of cancer)
- Spinal cord tumor
- Syringomyelia (superficial abdominal reflexes absent, insensitive to pain)
- Gather information which leads to a prognosis and the selection of appropriate interventions

Radiographs

Clinical decision involving a radiographic series of the spine is based on medical necessity, as per criteria for radiographic exam. Diagnosis of spondylolisthesis does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient’s history, subjective findings, objective findings, and review of other available diagnostic testing results.

The most commonly used grading system for spondylolisthesis is the one proposed by Meyerding in 1947. The degree of slippage is measured as the percentage of distance the anteriorly translated vertebral body has moved forward relative to the superior end plate of the vertebra below. Classifications use the following grading system:

- **Grade 1**: 1- 25% slippage
- **Grade 2**: 26-50% slippage
- **Grade 3**: 51-75% slippage
- **Grade 4**: 76-100% slippage
- **Grade 5**: Greater than 100% slippage

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Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Once a diagnosis is determined, provide the patient with appropriate reassurance. A majority of patients respond favorably to manipulation of the sacroiliac joint or the facet joints of the lumbar segments above the site of spondylolisthesis. Special care should be taken with grade 3, 4, and 5 displacements with significant disc degeneration, as the stability of these conditions may be questionable.

- Manage the condition conservatively for two weeks with a treatment frequency commensurate with severity of complaint.
- Functional status & activity level should be assessed at the onset of care
- If at least 50% improvement is reported subjectively, significant measurable functional improvement, and 25% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks.
- Aerobic conditioning and strengthening should be introduced as soon as acute pain has subsided.
- Return to normal activity within four weeks should be attempted.
- Following initial four weeks, at least 75% improvement in subjective findings, and 75% improvement in range of motion should be appreciated in order to determine whether further treatment may be efficacious.
- Treatment in weeks five through eight should continue with a decrease in treatment frequency commensurate with improvement in the patient's condition.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If weeks nine through twelve are necessary, patient should be prepared for discharge with self-management techniques.
- Patient's condition should have reached a plateau or completely resolved at this time; if not, consider a referral to primary care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjectives ➢ 25% increase in range of motion
3-4	➢ 75% improvement in subjectives ➢ 75% increase in range of motion ➢ Significant measurable functional improvement
5-8	➢ Pain distribution is centralized to back ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
9-12	➢ Gradual improvement leading toward resolution ➢ Significant measurable functional improvement ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

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Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Lumbar stabilization exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.

© 2018 eviCore healthcare. All rights reserved.

6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev.

© 2018 eviCore healthcare. All rights reserved.

2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range

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of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018.

© 2018 eviCore healthcare. All rights reserved.

https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Late Effect of Sprain/Strain Injury

Synonyms
None

Definition
This condition involves non-radicular pain following a specified sprain-strain injury.

History
Patient history may include:

- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic response to prior treatment)

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection

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Presentation
Condition involves non-radicular pain that may begin following a specified sprain-strain injury.

Subjective Findings
Typically, pain and spasm reported with condition is localized. Movement of the involved area may be painful and decreased.

Goal of Lumbar Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Scope of Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing if complaints radiate to upper or lower extremities
- Muscle testing

Findings of Late Effect of Sprain/Strain
- Posture may be antalgic
- Tenderness and possible swelling in the muscle or tendon
- Pain on isometric contraction or active motion of the involved lumbar musculature
- Mild, localized discomfort with nerve tension tests may be noted
- Tenderness +2 or greater in the immediate area of the involved joint(s)
- Localized spasm and/or swelling in the tissues of the region
- Pain may be intensified by passive motion

Differential Diagnoses
- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection (fever)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)
- Myeloma (night sweats)

Radiographs
Clinical decision involving a radiographic series of the involved region is based on medical necessity, as per criteria for radiographic exam. Diagnosis of late effects of a sprain/strain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

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Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Once diagnosis is determined, provide the appropriate reassurance. Chiropractic treatment should involve rehabilitative type care to resolve adhesions, fibrous tissue, reduced ranges of motion, and infiltration of pain sensitive neurofibrils.

- Manage the condition conservatively for two weeks with the frequency of treatment commensurate with the severity of the condition.
- Aerobic conditioning and strengthening should be introduced as soon as possible.
- Return to normal activity should be attempted as soon as possible.
- Following initial four weeks, at least 75% improvement in subjective findings, and 75% improvement in range of motion should be appreciated in order to determine whether further treatment may be efficacious.
- Treatment frequency should continue to decrease commensurate with improvement in the patient's condition.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Patient's condition should reach a plateau or be completely resolved after eight weeks of treatment; if not, a referral to the primary care provider for alternative treatment measures should be made.

Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 25% increase in range of motion
3-4	➢ 75% improvement in subjective findings ➢ 75% increase in range of motion ➢ Reinforce self-management techniques
5-8	➢ One to two additional visits, then discharge ➢ Reinforce self-management techniques

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Postural advice, postural exercises
- Exercises, such as lumbar stabilization exercises, flexibility exercises
- Aerobic conditioning, such as walking or swimming
- Cold/heat applications, if needed, to relieve discomfort/stiffness
- Home traction, if helpful

Alternatives to Chiropractic Management

- Acupuncture
- Medication
- Osteopathic Manipulation
- Physiatrist
- Physical Therapy
- Massage
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients

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with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.

© 2018 eviCore healthcare. All rights reserved.

27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.

© 2018 eviCore healthcare. All rights reserved.

41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol

© 2018 eviCore healthcare. All rights reserved.

Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Myalgia

Synonyms
Fibromyositis NOS

Definition
Inflammation/irritation of muscle tissue, associated with focal points of tender nodules, which may refer pain to other areas of the body when palpated.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Statin use	Rhabdomyolysis

Presentation
Often occurs in areas of muscles that previously experienced cumulative or sudden onset trauma. Subsequent acute manifestations typically are precipitated by exposure to cold, or by overstretching/overloading the same region of muscle. Condition is frequently seen in people with poor posture.

Subjective Findings
- Dull aching pains in the muscle rather than the joints
- Patient may complain of a diffuse area of pain/stiffness covering an area adjacent to main area of complaint
- May report "knots" or "bumps" in the involved muscles

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Goals

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic and neurologic testing

Findings of Myalgia

- Involved muscle is generally resistant to stretching, limited by pain
- Tender nodules or areas of ropiness are noted in involved muscle group
- Nodular areas are tender to palpation and may elicit a "jump sign" or a "quickening reaction"
- Sensitized areas are generally called trigger points, and if active, palpation may lead to referral of pain

Radiographs

Clinical decision involving a radiographic series is based on medical necessity, as per criteria for radiographic exam. Diagnosis of myalgia does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Condition should be managed conservatively for two weeks.
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks at a decreasing frequency.
- Total treatment duration should not exceed eight weeks.
- Frequency of care should be dependent on the severity of condition.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If patient is not asymptomatic, or near asymptomatic at the end of the second two week trial, or has reached a plateau, refer to primary care provider to explore other alternatives.

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Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 50% increase in range of motion
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques
5-8	➢ Follow-up, then discharge

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Stretching exercises
- Aerobic conditioning exercises
- Heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical therapy with aggressive deep myofascial therapy
- Physiatry
- Medication
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.

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35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal

© 2018 eviCore healthcare. All rights reserved.

manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Other Symptoms Referable to the Back

Synonyms

- Ossification of posterior longitudinal ligament
- Panniculitis specified as sacral of affecting back

Definition

Condition associated with pain or limited mobility in the lower back due to a variety of causes, excluding those otherwise specified.

History

Patient history may include:

- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including response to prior treatment)

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection
Pain that does not change with change in position	Kidney disease

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Presentation
Condition is commonly associated with an acute or traumatic onset, and is often a sequela to over-exertion or stress.

Subjective Findings
Diffuse pain in the lower or mid back.

Goal of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the back include: aortic aneurysm, colon cancer, endometriosis, hip disease, kidney disease, kidney stones, ovarian disease, pancreatitis, pelvic infections, tumors or cysts of the reproductive tract, uterine cancer.

The most serious cause of low back pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing if complaints radiate to lower extremities or signs/symptoms of cauda equina syndrome are present

Findings of Other Symptoms Referable to the Back
- Typically, tenderness only at the affected spinal joints/segments
- Associated soft tissue may be shortened with degrees of muscle hypertonicity
- Range of motion typically limited asymmetrically
- Joint fixation upon motion palpation
- Orthopedic and neurological testing is typically unremarkable

Differential Diagnoses
- Extraspinal causes (ovarian cyst, kidney stone, pancreatitis, ulcer)
- Osteoporosis and compression fractures (major trauma, or minor trauma in elderly/osteoporotic patient)
- Infection in disc or bone (fever, history of IV drug use, history of severe pain)
- Inflammatory arthritides (family history, patient age/sex, morning stiffness)
- Metastatic disease, myeloma, lymphoma (pathologic fracture, severe night pain)
- Spinal tuberculosis (lower socioeconomic groups, AIDS)

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- Depression
- Gather information that leads to a prognosis and the selection of appropriate interventions

Radiographs

Clinical decision involving radiographs is based on medical necessity, as per eviCore's Radiographic Criteria. Diagnosis of this condition does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Manage conservatively for two weeks with no greater than two visits per week.
- If at least 50% improvement is reported subjectively, functional status & activity level should be assessed at the onset of care, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks at a decreased treatment frequency.
- If improvement following the initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider different adjustive/manipulative technique.
- If patient is not asymptomatic, or at least 90% improved at the end of the second two week trial or has reached a plateau, refer HMO patients to primary care provider to explore other alternatives; PPO patients may be referred to family physician or appropriate specialist.
- Home care in the form of stretching and exercise is required to obtain the desired outcome.
- Education in home care techniques should begin as of the first visit and be continually reinforced at each subsequent visit.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 50% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ 90% improvement in pain ➢ 90% increase in range of motion ➢ Significant measurable functional improvement
5-8	➢ Pain distribution is centralized to back ➢ Significant measurable functional improvement ➢ Reinforce self-management techniques ➢ Release to self-management program

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Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options, if:

- Improvement does not meet the above guidelines, or improvement has reached a plateau,
- Fever, chills, unexplained weight loss, significant night time pain,
- Presence of pathological fracture,
- Obvious deformity,
- Saddle anesthesia,
- Loss of major motor function,
- Bowel or bladder dysfunction,
- Abdominal pain,
- Visceral dysfunction,
- Increasing neurologic signs/symptoms: increasing lower extremity weakness, increasing lower extremity pain, increasing lower extremity numbness/tingling, and decreasing lower extremity reflexes.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice, instruction in proper body mechanics
- Flexibility exercises
- Lumbar stabilization exercises
- Aerobic conditioning, such as walking or swimming
- Heat applications, cold packs, if needed, to relieve discomfort/stiffness

Alternative Management

- Osteopathic Manipulation
- Physical Therapy
- Physiatry

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- Medication
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007

© 2018 eviCore healthcare. All rights reserved.

May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed

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02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.

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45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Pain in Limb

Synonyms
None

Definition
Diagnosis is reserved for limb pain involving “soft tissue” structures.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, ligament tears
Fever, severe pain	Infection
Sensory changes	Neurological condition
Diabetes; paresthesias in stocking glove distribution	Neuropathy; B12 deficieincy, hypothyroidism, lead poisoning
Multiple joint involvement	Rheumatologic diseases, gout
History of high impact activities	Stress fractures
Severe pain, numbness within 12-24 hours following trauma	Compartment syndrome
Cancer	Cause of symptoms (metastatic or primary)
Discoloration of limb; exertional foot or calf pain	Arterial occlusion; vascular insufficiency
Immune-compromised state	Infection

Presentation
Condition occurs in areas of muscles, ligaments, fascia, or tendons in an extremity; these areas may have previously experienced cumulative or sudden onset trauma.

Subjective Findings
- Dull aching pains in soft tissue structures rather than the joints.
- Patient may complain of a diffuse area of pain/stiffness covering an area adjacent to main area of complaint.

Goal of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

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Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing
- Muscle testing

Findings of Pain in Limb

- Involved areas are generally resistant to stretching, limited by pain.
- Tender nodules or areas of ropiness may be noted in involved area.
- Range of motion of the involved area may be limited.
- Orthopedic and neurologic testing typically is unremarkable.

Radiographs

Clinical decision involving a radiographic series is based on medical necessity, as per criteria for radiographic exam. Diagnosis of pain in limb does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Manage this condition conservatively for two weeks with a treatment frequency commensurate with the severity of the condition.
- Functional status & activity level should be assessed at the onset of care
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks at a decreasing frequency.
- If improvement following the initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider different adjustive/manipulative technique.
- If patient is not asymptomatic, or near asymptomatic at the end of the second two week trial, or has reached a plateau, refer patient to the primary care provider to explore other alternatives.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

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Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 50% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ One follow-up, then discharge

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Stretching exercises
- Aerobic conditioning exercises
- Heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Acupuncture
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

© 2018 eviCore healthcare. All rights reserved.

18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.

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31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.

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46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Scoliosis

Definition
Scoliosis is defined as a spinal curvature greater than 10 degrees in the coronal plane.

History
Most individuals present with a non-painful deformity. Scoliosis is often classified according to the age of the individual at onset (such as infantile, juvenile, or adolescent). Condition is more common in girls, and it typically progresses during periods of rapid growth between ages 11-14.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Fever, severe pain	Possible infection
Immune-compromised state	Infection
Cancer history	Cause of symptoms (metastatic or primary)
Discoloration of foot/toes	Vascular occlusion
Exertional symptoms, history of cardiac disease	Anginal equivalent

Presentation
Deformity or postural changes are often noted by the family or school nurse.

Subjective Findings
Initially, patients have a non-painful deformity. Pain syndromes may develop as posture worsens. Breathing complaints associated with decreases in cardiopulmonary efficiency occur in severe cases.

Functional Assessment
Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index or the Oswestry Disability Index. These surveys have been studied in peer-reviewed scientific literature, and they have been proven to be a valid, reliable, and responsive measure for back conditions.

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Goals of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

- Rule out concurrent spinal pathologies
- Look for presence of neuromuscular disease
- Assess possibility of referred organ pain

Scope of Musculoskeletal Examination

- History including general demographics, growth and development
- Review of systems, including cardiopulmonary
- Inspection - gross symmetry, coordinated movement, posture and body mechanics
- Palpation of bony and soft tissue
- Strength
- Range of motion, active and passive
- Orthopedic testing
- Neurologic testing if neurologic signs are present

Findings of Scoliosis

- In the case of a structural scoliosis, patient will show a curve that is not corrected by side bending. There is frequently a rotation of the involved vertebrae, resulting in a rib “hump” on the convex side of the curve (most easily viewed from behind in forward flexion).
- Rib “hump”
- Complains of muscular pain

Radiographs

Clinical decision involving a radiographic series of the spine is based on medical necessity, as per criteria for radiographic exam. Diagnosis of scoliosis does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient’s history, subjective findings, objective findings, and review of other available diagnostic testing results. If evidence of a structural scoliosis is present and the patient has not yet reached skeletal maturity, the exposure of x-rays may be considered medically necessary. Please note that the spinal region to be exposed has to be symptomatic and the curvature in question must involve the symptomatic area.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

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Chiropractic Management

- Treatment of pain associated with scoliosis may include spinal manipulation and physiotherapeutic modalities.
- Instruction in a home exercise program is extremely important, as a home program will increase function and reduce the patient's dependence of passive treatments.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Treatment of asymptomatic individuals is not considered medically necessary.
- Treatment of asymptomatic individuals is typically focused on "straightening" the scoliotic curve.
- Chiropractic manipulation utilized to correct a structural scoliotic curve is considered experimental and investigational.

Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 25% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective findings ➢ 75% increase in range of motion ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ One to two additional visits, then discharge ➢ Reinforce self-management techniques

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options as follows:

- Having greater than a 25 degree curve and immature skeleton should be referred for orthotic bracing.
- With greater than 40 degree curve and immature skeleton or greater than 50 degree curve and mature skeleton should be referred for surgical consult.
- Developing thoracic lordosis should be referred for surgical consult.
- With onset of motor weakness, sensory abnormalities, loss of reflex, or signs of upper motor neuron involvement should be referred for medical evaluation.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.

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- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Rest, reduce strenuous activities
- Home ROM exercises, stretching
- Progression to therapeutic exercise—strengthening exercises, postural exercises
- Hot packs/cold packs, if needed, to relieve discomfort
- Bracing

Alternatives/Adjuncts to Chiropractic Management

- Acupuncture
- Osteopathic manipulation
- Physical Therapy
- Medication
- Orthotist
- Pain management/Injection therapy
- Surgery

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.

© 2018 eviCore healthcare. All rights reserved.

9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.

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40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.

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57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Muscle Spasm

Synonyms
None

Definition
Spasm of the muscle tissue, associated with focal or diffuse points of tenderness that may produce local pain or may refer pain to other areas of the body when palpated.

History
Patient's history will vary according to the location of the chief complaint.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Saddle anesthesia	Cauda equina syndrome
Severe or progressive neurologic complaints	Cauda equina syndrome
Global or progressive motor weakness in the lower extremities	Cauda equina syndrome
Recent onset of bowel dysfunction or acute onset of bladder dysfunction in association with low back pain	Cauda equina syndrome
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression medication	Infection
Prolonged steroid use	Infection
Pain that does not change with change in position	Kidney disease

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Presentation
Often occurs in areas of muscles that previously experienced cumulative or sudden onset trauma. Subsequent acute manifestations, typically, are precipitated by exposure to cold, or by overstretching/overloading the same region of muscle frequently seen in people with poor posture.

Subjective Findings
- Dull aching pains in the muscle rather than the joints.
- May complain of a diffuse area of pain/stiffness covering an area adjacent to main area of complaint.
- May report "knots" or "bumps" in the involved muscles.

Goals of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Scope of Musculoskeletal Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing
- Muscle testing

Findings of Muscle Spasm is Present
- Involved muscle is generally resistant to stretching; limited by pain.
- Tender nodules or areas of ropiness are noted in involved muscle group.
- Nodular areas are tender to palpation and may elicit a "jump sign" or a “quickening reaction."
- Sensitized areas are generally called trigger points, and if active, palpation may lead to referral of pain.

Radiographs
Clinical decision involving a radiographic series is based on medical necessity, as per criteria for radiographic exam. Diagnosis of muscle spasm does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient’s history, subjective findings, objective findings, and review of other available diagnostic testing results.

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Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Condition should be managed conservatively for two weeks.
- Treatment frequency should be commensurate with the severity of the condition.
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks at a decreasing frequency.
- Total treatment duration should not exceed eight weeks.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If improvement following initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider different adjustive/manipulative technique.
- If patient is not asymptomatic, or near asymptomatic, at the end of the second two week trial or has reached a plateau, refer patient to their primary care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 50% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ One follow-up, then discharge

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Postural advice
- Stretching exercises
- Aerobic conditioning exercises
- Heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.

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12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.

© 2018 eviCore healthcare. All rights reserved.

28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.

© 2018 eviCore healthcare. All rights reserved.

42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018.

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https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Fasciitis

Synonyms
None

Definition
Condition associated with inflammation/irritation of fascia.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection

Presentation
Often occurs in areas of connective tissue that previously experienced cumulative or sudden onset trauma.

Subjective Findings
- Dull aching pains in the deep connective tissue rather than the joints.
- Patient may complain of a diffuse area of pain/stiffness covering an area adjacent to main area of complaint.

Goal of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

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Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Findings of Fasciitis

- Involved tissue is generally resistant to stretching, limited by pain.
- Tender nodules are noted in involved tissues.

Radiographs

Clinical decision involving a radiographic series is based on medical necessity, as per criteria for radiographic exam. Diagnosis of fasciitis does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Condition should be managed conservatively for two weeks.
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks— continue for up to two additional weeks at a decreasing frequency.
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- Frequency of care should be dependent on the severity of the condition.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
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Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 50% increase in range of motion ➢ Significant measurable functional improvement
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Discharge Criteria

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Self-Management Techniques

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- Stretching exercises
- Aerobic conditioning exercises
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Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Physiatry
- Medication
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila

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Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical

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range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Neuralgia

Definition

Condition is an unspecified condition that exhibits pain extending along the course of one or more nerves. Refer to the corresponding area of involvement for details on the Chiropractic Evaluation and Management of the following neurological conditions:

- Brachial Neuritis or Radiculitis
- Cervicobrachial Syndrome
- Brachial Plexus Lesion
- Lumbosacral Radiculitis
- Sciatica
- Carpal Tunnel Syndrome

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Thoracic Conditions (Disc Radicular)

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Displacement of Thoracic Intervertebral Disc Without Myelopathy

Synonyms

- Thoracic herniated nucleus pulposus
- Disc protrusion or propulsion
- Slipped disc

Definition

Nerve root irritation as a result of thoracic disc pathology.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Direct blow to the back in young adult	Fracture
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse or immunosuppression	Infection
Prolonged steroid use	Infection

Presentation

Axial pain may be the predominant complaint. Axial pain is usually localized to the middle-to-lower thoracic region, but may radiate to the middle lumbar region as well. Patient usually describes this pain as being of mild to moderate intensity.

Subjective Findings

- Pain and stiffness in the mid back.
- Patient may complain of radicular pain, often band-like, and often spans across the anterior chest wall.
- T10 dermatomal region most often is described as the focus of pain, irrespective of the level involved.
- Upper thoracic and lateral disc herniations most often precipitate radicular pain, and they may even cause concomitant axial pain.

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- Patients with radicular symptoms often complain of sensory changes, including dysesthesias and paresthesias, and usually occur in a dermatomal or radicular distribution.
- Patients with central protrusions may present with myelopathic symptoms, such as increased muscle tone, hyperreflexia, abnormal gait, and urinary incontinence.
- Patients with lateral herniation may have symptoms of radiculopathy.

Other presentations must be considered in ruling out displacement of thoracic intervertebral disc:

- Patients with a large acute midline or paramedian disc herniation may cause classic spinal cord syndromes such as Brown-Sequard syndrome.
- Presentation may also mimic that of degenerative hip disease or renal disease; chest and abdominal pain suggests a mid thoracic herniation.
- Patient with an upper thoracic lesion could present with neck pain, upper extremity pain, or symptoms of Horner syndrome.
- Patient with thoracic intervertebral disc conditions pain may present with symptoms that could be confused with those of cervical degenerative disease, particularly if a T1 or T2 disc herniation is present.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index or the Oswestry Disability Index. These surveys have been studied in peer-reviewed scientific literature, and they have been proven to be a valid, reliable, and responsive measure for back conditions.

Goal of Examination

Rule out other possible causes.

Note: Extraspinal diseases that may refer pain to the thoracic spine include: aortic aneurysm, CAD, CHF, gall bladder disease, herpes zoster, hiatal hernia, kidney disease, pancreatic disease, peptic ulcer disease, rib lesions, spinal cord tumor.

The most serious cause of spinal pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that most commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid

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Scope of Thoracic Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing

Results if Thoracic Intervertebral Disc Syndrome

- Patient with radicular symptoms may demonstrate decreased or altered sensation to light touch or pinprick in the dermatomes distal to the lesion. Clinician must establish a sensory level by testing sensory dermatomes and by correlating the results with the patient's complaints of dysesthesias and paresthesias.
- Spinal cord compression caused by the herniated disc may elicit upper motor neuron signs such as spasticity, hyperreflexia, positive Babinski sign (e.g., extension of the big toe at the metatarsophalangeal joint elicited by stroking lateral aspect of foot), and gait disturbances.
- Patient may also have weakness caused by compression of the spinal cord. Presence of a Hoffmann sign is demonstrated with the flicking of the terminal phalanx of middle finger, which results in reflex flexion of the distal phalanx of thumb, index, ring, and little fingers. This sign is not expected unless concomitant cervical pathology is present.
- Palpation or percussion of the spine may reproduce radicular symptoms. Although one cannot examine the function of muscles innervated by thoracic nerve roots because of their low specificity, having the patient sit upright and observing for any asymmetric contractions of the rectus abdominis may be helpful.
- One may test superficial abdominal reflexes to isolate an upper motor neuron lesion from this region. Superficial cremasteric reflex could be used to test the efferent T12 level and the afferent L1-L2 levels.
- If ankle clonus is present, or if the plantar reflex is found to be positive, one must be wary of an upper motor lesion; the thoracic and thoracolumbar regions should be examined.
- In high thoracic herniations (T2 through T5), discerning thoracic disease from cervical disease may be difficult. A positive result with the Spurling compression test suggests a cervical pathology. Spurling test is a maneuver designed to exacerbate encroachment on a cervical nerve root by extending and rotating the patient's head toward the symptomatic side, followed by axial compression.

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Radiographs

Radiographs of the thoracic spine region are based on medical necessity, as per eviCore's Criteria for Radiographic Exam. Diagnosis of intervertebral disc syndrome does not, in and of itself, compel radiographic evaluation. Determination requires assessment of history, subjective findings, objective findings, and other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Prior to manipulation, patient should be questioned regarding reproduction of radicular complaints, or increase in pain when placed in pre-stress position.

- Mild mobilization of the thoracic spine may be attempted before administering manipulation in patients with disc lesions.
- Reproduction of radicular complaints, or increase in pain with either, indicates caution should be taken.
- In such cases, use of a low force technique, or an activator may be considered until such time as a high velocity technique can be tolerated.
- Manage conservatively for one week with a treatment frequency commensurate with the severity of the condition.
- If some improvement in pain is reported subjectively, and there is some reduction in the degree of muscle spasm present—continue treatment.
- If at least 50% improvement is reported subjectively, 50% increase in range of motion is observed, and the pain distribution is centralizing following initial four weeks—continue for additional month at a decreasing treatment frequency.
- Patient should be introduced to an active care program.
- At the end of week eight, pain should continue to centralize, pain should further decrease, and range of motion should continue to increase.
- By the end of week eighth week, improvement in pain and range of motion should reach at least 75%, and pain should be centralized to the spine.
- In the final four weeks, treatment frequency should continue to diminish commensurate with the patient's continued improvement.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Patient should then be released to a self-management program.
- If improvement does not meet the above guidelines, or improvement has reached a plateau, refer patient to their primary care provider for alternative treatment options.

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Week	Progress
0-2	➢ 25% improvement in subjective findings ➢ 25% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ 50% improvement in subjective findings ➢ 50% increase in range of motion ➢ Introduce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ 75% improvement in subjective findings ➢ 75% improvement in range of motion ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
9-12	➢ Gradual improvement leading toward resolution ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 12, whichever occurs first

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Trunk stabilization exercises
- Aerobic conditioning
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Acupuncture
- Physical therapy
- Physiatry
- Medication
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

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18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Garfin SR, Vaccaro AR: Thoracic Disc Herniations. Orthopedic Knowledge Update 5; 1996.
20. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
23. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
25. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
26. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
27. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
28. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
29. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
30. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
31. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.

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32. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
33. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
34. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
35. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
36. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
37. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
38. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009). Measurement properties of the Neck Disability Index: A systematic review. Journal of Orthopaedic and Sports Physical Therapy, 39(5), 400–417. Date last accessed 02/01/2018. https://secure.movementsciencemedia.org/doi/pdf/10.2519/jospt.2009.2930?code=jospt-site.
39. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
40. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
41. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
42. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
43. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
44. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
45. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
46. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
47. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
48. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
49. Rolak LA Neurology Secrets; Mosby; 1993.
50. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
51. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
52. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
53. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
54. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
55. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
56. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
57. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
58. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
59. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
60. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
61. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
62. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
63. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
64. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
65. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Thoracic Rib Cage Conditions (Non-specific)

Pain in Thoracic Spine	**447**
Rib Cage Nonallopathic Lesion	**455**
Sprain and Strain of Ribs	**463**
Thoracic Nonallopathic Lesion	**470**
Thoracic Sprain/Strain	**478**

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Pain in Thoracic Spine

Synonyms

- Thoracalgia
- Mid back pain

Definition

Condition is a subjective finding often reported by individuals. There may be minimal or no objective findings on physical examination or diagnostic studies.

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse, immunosupression and/or diabetic	Infection
Prolonged steroid use	Osteoporosis, compression fracture

Presentation

Condition often arises from a "non-specific onset." Some form of acute or chronic postural abuse is often involved. Prior history of trauma to the involved region may be reported. Condition may be a sequela of, and secondary to, another primary diagnosis such as sprain, strain, or capsulitis.

Subjective Findings

Complaints consist of pain and/or stiffness in the thoracic spine region.

Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index or the Oswestry

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Disability Index. These surveys have been studied in peer-reviewed scientific literature, and they have been proven to be a valid, reliable, and responsive measure for back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the thoracic spine include: aortic aneurysm, CAD, CHF, gall bladder disease, herpes zoster, hiatal hernia, kidney disease, pancreatic disease, peptic ulcer disease, rib lesions, spinal cord tumor.

Scope of Thoracic Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic and
- Neurologic testing if complaints radiate in a dermatomal pattern.

Findings of Pain in Thoracic Spine

- Typically, tenderness at only the affected spinal joints/segments.
- No complicating factors are identified.
- No suspicious and unexplainable exam findings are noted.
- Associated soft tissues may be shortened with degrees of muscle hypertonicity.
- Range of motion may be limited.
- Joint fixation detected with motion palpation.
- Orthopedic and neurological testing is typically unremarkable.

Radiographs

Clinical decision involving thoracic radiographs is based on medical necessity, as per eviCore's criteria for radiographic exam. Diagnosis of thoracic pain does not warrant radiographic evaluation unless associated with other radiographic criteria.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Manage conservatively for two weeks with no greater than two visits per week.
- If at least 75% improvement is reported subjectively, and 75% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks.
- Total time for an uncomplicated case should not exceed eight weeks.

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- If improvement following the initial two weeks is not at least 75%, reassess case for other possible causes, or complicating factors, and consider a different adjustive/manipulative technique.
- Home care in the form of stretching and exercise is required to obtain the desired outcome.
- Education in home care techniques should begin as of the first visit, and continually be reinforced at each subsequent visit.
- Treatment frequency used should decrease as condition improves.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.

Week	Progress
0-2	➢ 75% improvement in subjective findings ➢ 75% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ One follow-up, then discharge

Referral Guidelines

Refer patient to their primary care provider for evaluation of alternative treatment options if...

- Improvement does not meet the above guidelines or improvement has reached a plateau
- Fever, chills, unexplained weight loss, significant night time pain
- Presence of pathological fracture
- Obvious deformity

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Postural advice
- Back stabilization exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Mobilization (physical therapist)
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018.

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http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its

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Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009). Measurement properties of the Neck Disability Index: A systematic review. Journal of Orthopaedic and Sports Physical Therapy, 39(5), 400–417. Date last accessed 02/01/2018. https://secure.movementsciencemedia.org/doi/pdf/10.2519/jospt.2009.2930?code=jospt-site.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials.

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Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.

© 2018 eviCore healthcare. All rights reserved.

60. Vianin, Michael; Psychometric properties and clinical usefulness of the Oswestry Disability Index Journal of Chiropractic Medicine , December 2008 Volume 7 , Issue 4 , 161 - 163. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S1556370708000941.
61. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
62. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
63. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
64. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
65. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Rib Cage Nonallopathic Lesion

Synonyms

- Segmental dysfunction (costochondral, costovertebral, or sternochondral)
- Somatic dysfunction (costochondral, costovertebral, or sternochondral)
- Subluxation (costochondral, costovertebral, or sternochondral)

Definition

Condition consisting of an abnormal or altered functional relationship at the costochondral, the costovertebral, or the sternochondral joint.

History

Patient history may include:

- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse, immunosupression and/or diabetic	Infection
Prolonged steroid use	Osteoporosis, compression fracture

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Presentation
Condition often arises from a "non-specific onset." Some form of acute or chronic postural abuse is often involved. Condition may involve a prior history of trauma to the region, and may be a sequela of, and secondary to, another primary diagnosis such as sprain, strain, or capsulitis.

Subjective Findings
Condition involves pain and/or stiffness in the region of the affected joints/segments.

Functional Assessment
Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index or the Oswestry Disability Index. These surveys have been studied in peer-reviewed scientific literature, and they have been proven to be a valid, reliable, and responsive measure for back conditions.

Goal of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the thoracic spine include: aortic aneurysm, CAD, CHF, gall bladder disease, herpes zoster, hiatal hernia, kidney disease, pancreatic disease, peptic ulcer disease, rib lesions, spinal cord tumor.

Scope of Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing if complaints radiate in a dermatomal pattern

Findings of Rib Cage Nonallopathic Lesion
- Typically, tenderness at only the affected spinal joints/segments
- Associated soft tissue may be shortened with degrees of muscle hypertonicity
- Range of motion typically limited asymmetrically
- Joint fixation upon motion palpation
- Orthopedic and neurological testing is typically unremarkable

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Radiographs

Clinical decision involving a radiographic series of the ribs is based on medical necessity, as per criteria for radiographic exam. Diagnosis of nonallopathic lesion does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

- Manage conservatively for two weeks.
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks at a decreasing frequency.
- If improvement following initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider different adjustive/manipulative technique.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If patient is not asymptomatic or near asymptomatic at the end of the second two week trial or has reached a plateau, refer patient to primary care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjectives ➢ 50% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ One follow-up, then discharge

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed

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to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Back stabilization exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Mobilization (physical therapist)
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.

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12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.

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28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009). Measurement properties of the Neck Disability Index: A systematic review. Journal of Orthopaedic and Sports Physical Therapy, 39(5), 400–417. Date last accessed 02/01/2018. https://secure.movementsciencemedia.org/doi/pdf/10.2519/jospt.2009.2930?code=jospt-site.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.

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42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol

© 2018 eviCore healthcare. All rights reserved.

Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sprain and Strain of Ribs

Synonyms
Chondrocostal sprain/strain

Definition
Condition involving the soft tissue structures involving the chondrocostal joint, the costovertebral joint, or the sternochondral joint.

History
Patient history may include:

- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse, immunosupression and/or diabetic	Infection
Prolonged steroid use	Osteoporosis, compression fracture

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Presentation
Condition often arises from a "non-specific onset." Some form of acute or chronic postural abuse is often involved; there may be prior history of trauma to the involved region.

Subjective Findings
Pain and/or stiffness in the region of the affected joints/segments.

Goal of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the thoracic spine include: aortic aneurysm, CAD, CHF, gall bladder disease, herpes zoster, hiatal hernia, kidney disease, pancreatic disease, peptic ulcer disease, rib lesions, spinal cord tumor.

Scope of Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic and neurologic testing if complaints radiate to upper or lower extremities

Findings of Rib Cage Sprain/Strain
- Typically, tenderness only at the affected spinal joints/segments.
- Associated soft tissue may be shortened with degrees of muscle hypertonicity.
- Range of motion typically limited asymmetrically.
- Joint fixation upon motion palpation.
- Orthopedic and neurological testing is typically unremarkable.

Radiographs
Clinical decision involving a radiographic series of the rib cage is based on medical necessity, as per criteria for radiographic exam. Diagnosis of rib sprain/strain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient’s history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing
Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

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Chiropractic Management

- Manage this condition conservatively for two weeks with a treatment frequency commensurate with the severity of the condition.
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks at a decreasing frequency.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If improvement following the initial two weeks is not at least 50%, reassess case for other possible causes or complicating factors and consider different adjustive/manipulative techniques.
- If the patient is not asymptomatic, or near asymptomatic at the end of the second two week trial, or has reached a plateau, refer to the primary care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjectives ➢ 50% increase in range of motion
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques
5-8	➢ One follow-up, then discharge

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Back stabilization exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Mobilization (physical therapist)
- Acupuncture
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

© 2018 eviCore healthcare. All rights reserved.

18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.

© 2018 eviCore healthcare. All rights reserved.

32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256
37. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009). Measurement properties of the Neck Disability Index: A systematic review. Journal of Orthopaedic and Sports Physical Therapy, 39(5), 400–417. Date last accessed 02/01/2018. https://secure.movementsciencemedia.org/doi/pdf/10.2519/jospt.2009.2930?code=jospt-site.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.

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47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Thoracic Nonallopathic Lesion

Synonyms

- Segmental dysfunction—thoracic
- Somatic dysfunction—thoracic
- Subluxation—thoracic

Definition

Condition is associated with an abnormal or altered functional relationship between contiguous thoracic vertebrae.

History

Patient history may include:

- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night and/or unrelated to movement	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse, alcoholism, and/or diabetic	Infection
Prolonged steroid use	Osteoporosis, compression fracture

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Presentation
Condition often arises from a "non-specific onset." Some form of acute or chronic postural abuse is often involved; there may be prior history of trauma to the involved region. Condition may be a sequela of, and secondary to, another primary diagnosis such as sprain, strain, or capsulitis.

Subjective Findings
Pain and/or stiffness in the region of the affected joints/segments is commonly reported.

Functional Assessment
Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index or the Oswestry Disability Index. These surveys have been studied in peer-reviewed scientific literature, and they have been proven to be a valid, reliable, and responsive measure for back conditions.

Goal of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the thoracic spine include: aortic aneurysm, CAD, CHF, gall bladder disease, herpes zoster, hiatal hernia, kidney disease, pancreatic disease, peptic ulcer disease, rib lesions, spinal cord tumor.

The most serious cause of spinal pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that most commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion
- Motion palpation of spine
- Orthopedic
- Neurologic testing if complaints radiate to lower extremities

Findings of Thoracic Nonallopathic Lesion
- Typically, tenderness only at the affected spinal joints/segments
- Associated soft tissue may be shortened with degrees of muscle hypertonicity
- Range of motion typically limited asymmetrically
- Joint fixation upon motion palpation
- Orthopedic and neurological testing is typically unremarkable

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Radiographs

Clinical decision involving a radiographic series of the thoracic spine is based on medical necessity, as per criteria for radiographic exam. Diagnosis of nonallopathic lesion does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Once a diagnosis is determined, provide the patient with appropriate reassurance.

- Manage the condition conservatively for two weeks with a treatment frequency commensurate with severity of the condition.
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks.
- Aerobic conditioning and strengthening should be introduced as soon as acute pain has subsided.
- Return to normal activity within four weeks should be attempted.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings, and 75% improvement in range of motion should be appreciated in order to determine whether further treatment may be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency, commensurate with improvement in the patient's condition.
- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 50% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ Near asymptomatic ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ Follow-up, then discharge

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Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Back stabilization exercises
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Massage
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.

© 2018 eviCore healthcare. All rights reserved.

400 Buckwalter Place Boulevard, Bluffton, SC 29910 • (800) 918-8924

7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.

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24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. MacDermid, J. C., Walton, D. M., Avery, S., Blanchard, A., Etruw, E., McAlpine, C., et al. (2009). Measurement properties of the Neck Disability Index: A systematic review. Journal of Orthopaedic and Sports Physical Therapy, 39(5), 400–417. Date last accessed 02/01/2018. https://secure.movementsciencemedia.org/doi/pdf/10.2519/jospt.2009.2930?code=jospt-site.
38. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.

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39. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
40. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
41. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
42. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
43. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion

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1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Thoracic Sprain/Strain

Synonyms
None

Definition
Injury (repetitive or instantaneous) to the mid-back soft tissues with associated pain in the thoracic region.

- Strain
  - Overstretching or tearing of a muscle or tendon.
- Sprain
  - Overstretching or tearing of ligamentous tissue.

Classification
Tendon and ligament injuries are classified as...

- Grade I (mild)
  - Mild injury that causes only stretching or microscopic tears in a tissue. Although these tiny tears can stretch the tissue, they do not significantly affect the stability of the injured joint.
- Grade II (moderate)
  - Injured tissue is partially torn, and there is some mild to moderate joint instability.
- Grade III (severe)
  - Tissue is either torn completely or avulsed (pulled away from the place where it attaches to bone), and there is significant joint instability. Surgical referral may be necessary.

History
Patient history may include:

- General demographics
- Occupation/employment
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including history of prior chiropractic and response to prior treatment)

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Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Onset following minor fall or heavy lifting in elderly or osteoporotic patient	Fracture
Unexplained weight loss	Malignancy
Prior history of cancer	Malignancy
Pain that is worse with recumbency or worse at night	Malignancy
Fever or recent bacterial infection	Infection
Intravenous drug abuse, alcoholism and/or diabetic	Infection
Prolonged steroid use	Osteoporosis, Compression fracture
Immunosuppression, HIV, immunosuppressive drugs	

Presentation

- Strain
  - Over exertion of the back in some static or dynamic activity; overstretching; or contusion. Back pain is worse with initial activity, and typically, rest relieves the pain. Trauma may precipitate the condition.
- Sprain
  - Typically, chronic manifestations involve prolonged periods of postural abuse, and acute onset involves a sudden motion or poor body mechanics while performing an activity. Trauma may precipitate the condition.

Subjective Findings

- Strain
  - Pain and stiffness in a muscle/tendon group of the thoracic region.
- Sprain
  - Pain and stiffness in the thoracic area.
    - Persistent pain
    - Strain injuries are aggravated by motion or weight bearing
    - Sprain injuries are aggravated by the end-ranges of motion

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Functional Assessment

Documentation of a patient's level of function is an important aspect of patient care. This documentation is required in order to establish the medical necessity of ongoing chiropractic treatment. The best way to document the patient's level of function is a patient reported outcome assessment like the Neck Disability Index or the Oswestry Disability Index. These surveys have been studied in peer-reviewed scientific literature, and they have been proven to be a valid, reliable, and responsive measure for back conditions.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Extraspinal diseases that may refer pain to the thoracic spine include: aortic aneurysm, CAD, CHF, gall bladder disease, herpes zoster, hiatal hernia, kidney disease, pancreatic disease, peptic ulcer disease, rib lesions, spinal cord tumor

The most serious cause of spinal pain is malignant tumor. Most malignant tumors are metastatic and some may cause bony collapse and paralysis. Cancers that most commonly metastasize to bone consist of adrenal, breast, kidney, lung, prostate, and thyroid.

Scope of Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion (Active and Passive)
- Motion palpation of spine
- Orthopedic testing
- Neurologic testing if complaints radiate in a dermatomal pattern

Findings of Thoracic Sprain/Strain

- Strain
  - Pain on isometric contraction or active motion of the involved thoracic musculature.
  - Tenderness and possible swelling in the muscle or tendon.
  - Neurological examination is normal if condition is sprain/strain (dermatomal hypesthesia may be found if unilateral thoracic disc rupture).
- Sprain
  - Tenderness +2 or greater in the immediate area of the involved joint(s).
  - Localized spasm and/or swelling in the tissues of the thoracic region.
  - Pain is intensified by passive motion of the thoracic spine.
  - Isometric contraction is not usually painful.

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- Neurological examination is normal if condition is sprain/strain (dermatomal hypesthesia may be found if unilateral thoracic disc rupture).

Differential Diagnoses

- Thoracic vertebral body fracture (major trauma, minor trauma in elderly or osteoporotic patient, pathological fracture)
- Herpetic neuralgia (vesicles present following nerve root path)
- Thoracic disc rupture (long tract signs, such as clonus, spasticity, gait disturbance, or numbness of both legs)
- Tumor (intense constant pain, severe night time pain)
- Extraspinal causes, such as from disease/disorder of the pancreas, heart or kidney

Radiographs

Clinical decision involving a radiographic series of the thoracic region is based on medical necessity, as per criteria for radiographic exam. Diagnosis of thoracic sprain/strain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Once a diagnosis is determined, provide the patient with appropriate reassurance.

- Manage conservatively for two weeks commensurate with severity of complaint.
- If at least 50% improvement is reported subjectively, and 50% increase in range of motion is observed following the first two weeks—continue for up to two additional weeks.
- Aerobic conditioning and strengthening should be introduced as soon as acute pain has subsided.
- Return to normal activity within four weeks should be attempted.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Following the initial four weeks, at least 75% improvement in subjective findings, and 75% improvement in range of motion should be appreciated in order to determine whether further treatment may be efficacious.
- Treatment in weeks five through eight should continue to decrease in frequency, commensurate with improvement in the patient's condition.
- Additionally, patient should be prepared for discharge with self-management techniques.

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- Patient's condition should resolve at this point. If the condition has not progressed towards resolution, refer the patient to an appropriate health care provider to explore other treatment alternatives.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some reduction of muscle spasm ➢ Significant measurable functional improvement
2-4	➢ 75% improvement in subjective complaints ➢ 75% increase in range of motion ➢ Introduce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ Continued improvement in pain ➢ Continued improvement in range of motion ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

Referral Guidelines

Refer patient to the primary care provider for evaluation of alternative treatment options if:

- Improvement following the initial two weeks is not at least 25-50%, reassess case for other possible causes, or complicating factors and consider different adjustive/manipulative technique
- Patient is not asymptomatic, or nearly so at the end of the second two week trial or has reached a plateau
- Fever, chills, unexplained weight loss, significant night time pain
- Presence of pathological fracture
- Obvious deformity
- Loss of major motor function
- Abdominal pulsations
- Visceral dysfunction

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed

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to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Thoracic extension exercises
- Aerobic conditioning, such as walking or bicycling
- Cold/heat applications, if needed, to relieve discomfort/stiffness

Alternatives to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical therapy
- Physiatry
- Medication
- Massage
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck

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pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.

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26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck

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pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
44. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
45. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
46. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
47. Rolak LA Neurology Secrets; Mosby; 1993.
48. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
49. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
50. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
51. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
52. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
53. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
54. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
55. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
56. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
57. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.

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58. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
59. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
60. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
61. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
62. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
63. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Upper Extremity Conditions

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Acromioclavicular Sprain

Synonyms
None

Definition
Condition involves an injury to the ligaments of the acromioclavicular (AC) joint; this is a common injury to the shoulder (represents 40-50% of shoulder injuries). Injury often occurs with a blow to the tip of the shoulder; this type of injury may range from a minor ligamentous sprain to a major ligamentous disruption.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Determine OPQRST (Onset, Provocative/Palliative factors, Quality, Radiation/Referral pattern, Site [location], Timing of complaint).
- Functional status & activity level should be assessed at the onset of care

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, neurovascular compromise
Exertional, history of cardiac disease	Cardiac pain can radiate to the shoulder
Constant, relieved/worse with meals, positional, associated with fatty meals	Gastrointestinal diseases including cholelithiasis and perforated ulcer
Pleuritic pain, shortness of breath, associated with cough	Pulmonary diseases
Multiple joint involvement	Rheumatology diseases
Fever, severe pain	Possible infection
Cancer history	Cause of symptoms (metastatic or primary)
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection

Presentation
Initially, patient may experience acute generalized shoulder or trapezius pain, tenderness, and swelling. As these diffuse symptoms resolve, specific point tenderness over the AC joint is usually noted.

Subjective Findings
Shoulder pain is usually noted with specific movements (crossing the upper arm in front of the chest) or specific exercises (bench press and bar dips).

Goal of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

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Note: In the acute situation, it may be difficult to rule out a concomitant rotator cuff tear as active and passive shoulder abduction maneuvers are difficult to perform.

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Strength testing
- Orthopedic testing
- Neurologic testing if neurologic signs are present

Results of Tests for Acromioclavicular Sprain

- Positive cross over test
- Passive shoulder abduction maneuvers may be difficult to perform
- Pain and tenderness are noted over the AC joint; if injury is severe, a step deformity may be present or pain may extend over the distal third of the clavicle.
- Negative testing for rotator cuff tear

Acromioclavicular sprains can be classified into three grades of injury according to the extent of involvement of the acromioclavicular and coracoclavicular ligaments:

- Type I (Mild Sprain)
  - Swelling and tenderness is localized at the AC joint. Pain is present on horizontal flexion. Acromioclavicular ligament and capsule are stretched but not torn and the coracoclavicular ligament is intact.
- Type II (Moderate Sprain)
  - Injury caused by a moderate force. Pain and tenderness are localized over the AC joint and laxity is present (a step deformity may be present). Acromioclavicular ligament and capsule are torn and the coracoclavicular ligament is stretched, but intact.
- Type III (Severe Sprain)
  - Injury caused by a severe force. Pain and tenderness are present over the AC joint and over the distal clavicle and coracoid process. Distal end of the clavicle is easily palpable and ballotable. There is complete dislocation of the attachments of the deltoid and trapezius muscles at the site of injury. Acromioclavicular ligament and capsule are ruptured rather than the coracoclavicular ligament.

Differential Diagnoses

- Adhesive Capsulitis
- Biceps Rupture
- Bicipital Tendonitis
- Cervical Disc Disease

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- Cervical Spondylosis
- Cervical Sprain and Strain
- Complex Regional Pain Syndromes
- Myofascial Pain
- Osteoarthritis
- Rheumatoid Arthritis
- Rotator Cuff Disease
- Thoracic Outlet Syndrome

Radiographs

Clinical decision involving a radiographic series of the AC joint is based on medical necessity, as per criteria for radiographic exam. Diagnosis of an AC sprain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of chiropractic varies according to the severity of injury. Severe injuries should be referred out for orthopedic consultation. Mild and moderate injuries should address pain relief, restoration of motion, restoration of strength and function. Therefore, the use of physiotherapy modalities to decrease pain and inflammation are appropriate. Immobilization with a sling is optional for mild injuries based on the need for pain relief. Immobilization is recommended for moderate and severe injuries. An early introduction to active care techniques is vital. Treatment frequency should be commensurate with the severity of the condition. As the patient's subjective findings and objective findings improve, the patient should be treated less frequently and transitioned to a self-management program.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in subjective findings ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques (see below) ➢ Significant measurable functional improvement
5-8	➢ Continued reduction of pain ➢ Continued increase in range of motion ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

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If improvement does not meet the above guidelines or improvement has reached a plateau refer the patient to primary care provider to explore other treatment alternatives.

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Instruction in home exercise program for ROM and strengthening
- Cold packs, if needed, to relieve discomfort
- Nocturnal shoulder immobilization may be appropriate

Alternatives/Adjuncts to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Surgery
- Medication
- Physiatry
- Acupuncture
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.

© 2018 eviCore healthcare. All rights reserved.

5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.

© 2018 eviCore healthcare. All rights reserved.

23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.

© 2018 eviCore healthcare. All rights reserved.

37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nathan PA, Keniston RC: Carpal tunnel syndrome. In: Kasdan ML, ed. Occupational Hand & Upper Extremity Injuries & Diseases. Mosby-Year Book; 1991:129-139.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.

© 2018 eviCore healthcare. All rights reserved.

53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Adhesive Capsulitis of the Shoulder

Synonyms
Frozen Shoulder Syndrome

Definition
Adhesive capsulitis (also commonly known as 'Frozen Shoulder Syndrome ‘) occurs when the capsule surrounding the humeral head becomes contracted; thereby limiting or preventing motion. Adhesive capsulitis has typically been classified into two forms—primary and secondary. In the primary or idiopathic form, no known precipitating event can be identified. The secondary form is associated with or attributable to other illnesses or events. Cause of adhesive capsulitis remains unknown, and the end result appears to be fibrotic thickening of the anterior capsule at the rotator interval. Onset of adhesive capsulitis is usually gradual. Three clinical stages of the disease are described as follows:

- Freezing stage
  - Characterized by the most severe pain, and a gradual diminution of articular volume.
- Frozen stage
  - Pain decreases gradually but without appreciable improvement in motion.
- Thawing stage
  - Marked by gradual return of motion. Motions that are most frequently limited are abduction and external rotation.

History
Key features of the patient history include:

- Sub-acute onset of unilateral shoulder pain with little to no trauma or overuse, a distinct component of night pain
- Marked limitation in shoulder movement

Specific Aspects of History
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, rotator cuff tear
Exertional, history of cardiac diagnosis	Cardiac pain can radiate to the shoulder
Constant, relieved/worse with meals, positional, associated with fatty meals	Gastrointestinal diseases including cholelithiasis
Pleuritic, shortness of breath, associated with cough	Pulmonary diseases
Multiple joint involvement	Rheumatology diseases
Fever, severe pain	Possible infection
Cancer history	Cause of symptoms (metastatic or primary)
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection

Presentation

Disorder tends to affect women more than men; occurs in the fifth, sixth, and seventh decades of life; does not show a particular preference for handedness; and can on occasion become bilateral (up to 10%). There is a marked limitation in active and passive range of shoulder motion. All planes of motion seem to be affected, with external rotation and abduction being the most limited. In testing passive motion, the end point is firm but not quite as firm as with that of a bony block. Manual muscle testing of the rotator cuff muscles should reveal well-preserved muscle strength with little to no pain.

Subjective Findings

- Shoulder pain, which may radiate distally or proximally
- Pain with ROM
- Loss of ROM

Goal of Examination for Adhesive Capsulitis

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Orthopedic and neurologic testing if neurologic signs are present

Findings of Adhesive Capsulitis

- Limited AROM and PROM of the affected shoulder
- MMT of the affected shoulder is strong and pain-free
- Patient presents with “capsular pattern”; most limited in external rotation, followed by abduction, followed by flexion, followed by internal rotation
- “Firm” end point

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Differential Diagnoses

- Referred pain from cardiac, pulmonary, or gastrointestinal pathology
- Inflammatory diseases
- Infection
- Fracture
- Rotator cuff pathology
- Glenohumeral arthritis

Radiographs

Clinical decision involving a radiographic series of the shoulder is based on medical necessity, as per criteria for radiographic exam. Diagnosis of adhesive capsulitis does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Chiropractic care for this condition utilizes modalities to ease pain and increase joint motion. Joint mobilization, manipulation, ROM/stretching exercises, strengthening exercises, and instruction in a home exercise program, all play a role in the suggested treatment protocol. Effectiveness of passive physiotherapy modalities is currently in question accordingly, the focus of treatment should be active care with the aim of transitioning the patient to a home care program. Treatment frequency should be commensurate with the severity of the condition. As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency. Functional status & activity level should be assessed at the onset of care

Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in subjective findings ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques (see below) ➢ Significant measurable functional improvement
5-8	➢ Continued reduction of pain ➢ Continued increase in range of motion ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

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Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice
- Home ROM exercises, home self joint mobilization techniques
- Progression to therapeutic exercise—strengthening exercises
- Hot packs/cold packs, if needed, to relieve discomfort

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Acupuncture
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.

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7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.

© 2018 eviCore healthcare. All rights reserved.

24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-

© 2018 eviCore healthcare. All rights reserved.

14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nathan PA, Keniston RC: Carpal tunnel syndrome. In: Kasdan ML, ed. Occupational Hand & Upper Extremity Injuries & Diseases. Mosby-Year Book; 1991:129-139.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018.

© 2018 eviCore healthcare. All rights reserved.

https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Carpal Tunnel Syndrome

Synonyms
None

Definition
Carpal tunnel syndrome (CTS) is a compression neuropathy affecting the median nerve in the carpal tunnel leading to symptoms in the radial 3 1/2 digits, and possibly thenar muscle atrophy or fasciculation.

Specific Aspects of History
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Fever, severe pain	Possible infection
Cancer history	Cause of symptoms (metastatic, primary or paraneoplastic), potential complications of chemotherapy
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection
Cold intolerance, fatigue, constipation	Hypothyroidism
Multiple joint involvement, unusual skin rashes, other vascular involvement	Rheumatologic diseases (e.g., Rheumatoid arthritis, Sjogren's Syndrome, Systemic Lupus Erythematosis, Polyarteritis nodosa)
Stocking-glove neurological involvement	Diabetes, alcoholism, B12 deficiency
Auto repair occupation, battery exposure	Lead poisoning
Hand/skull disproportionately large	Acromegaly

Presentation
Typically, patient's present with a history of repetitive stress or overuse. Some anatomical wrist shapes may be predisposing features. The "square-shaped wrist" and wrists with a high ratio of thickness to width are commonly seen. Prior medical conditions, such as previous history of wrist fracture, diabetes, Rheumatoid arthritis, and acromegaly are associated with this condition. Condition is more commonly seen with females, pregnant women, older individuals, and those with an increased Body Mass Index.

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Subjective Findings

- Wrist pain, frequently with proximal radiation
- Numbness and tingling in the hand
- Pain consisting of a “pins and needles” feeling at night, which frequently awakens the patient
- Weakness in grip or pinch
- Feeling of incoordination, clumsiness

Scope of Musculoskeletal Examination

- Inspection (including thenar eminence size and structure)
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Tingling in the median nerve distribution is induced by full flexion (or full extension for reverse Phalen) of the wrists for up to 60 seconds
- Apply firm pressure directly over the carpal tunnel, usually with the thumbs, for up to 30 seconds to reproduce symptoms
- Gentle tapping over the median nerve in the carpal tunnel region elicits tingling in the nerve's distribution
- Motor examination: Wasting and weakness of the median-innervated hand muscles (LOAF muscles) may be detectable

Specific Aspects of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Findings of Carpal Tunnel

May have:

- Decreased sensory testing (light touch) in the radial 3.5 digits, depending on severity;
- Decreased grip and pinch, depending on severity; and
- Reproduction of the chief complaint with the aforementioned maneuvers.

Differential Diagnoses

- Cervical radiculopathy
- Proximal nerve impingement
- Pregnancy

Radiographs

Clinical decision involving a radiographic series of the wrist is based on medical necessity, as per criteria for radiographic exam. Diagnosis of carpal tunnel syndrome does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient’s history,

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subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

The goal of chiropractic care is to reduce pain and inflammation, aid in stretching and strengthening of the involved structures, and assist in the gradual return to activity.

- Treatments such as ice massage, ultrasound, yoga, and joint mobilization have proven to be beneficial.
- Functional status & activity level should be assessed at the onset of care
- Patient should be educated in proper protection techniques to be used during all activities.
- Patient should be started on a home program.
- Wrist splints for use at night should be used to assist in eliminating extreme or awkward wrist motions, thereby, reducing stress on the structure within the carpal tunnel.
- Strengthening and stretching exercises should be started only when pain and paresthesias resolve.
- Retraining of proper positioning to avoid re-injury, and other factors in occupationally related overuse syndromes, is an important component of the overall treatment of the patient.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- Initially, a two to four week trial of treatment should be instituted. Frequency of treatment should be consistent with the severity of condition. If severity or frequency of symptoms decreases following the initial trial—continue treatment at a reduced frequency for a one month period before releasing patient to PRN care. If patient does not improve with the trial of chiropractic treatment, or has reached a plateau, refer patient back to referring physician to explore other treatment alternatives.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in subjective findings ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques (see below) ➢ Significant measurable functional improvement
5-8	➢ Continued reduction of pain ➢ Continued increase in range of motion ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

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Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Rest, reduce strenuous activities
- Home ROM exercises
- Progression to therapeutic exercise—strengthening exercises
- Use of wrist splint
- Yoga

Alternatives/Adjuncts to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Medication
- Surgery
- Cortisone injection

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila

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Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical

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range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nathan PA, Keniston RC: Carpal tunnel syndrome. In: Kasdan ML, ed. Occupational Hand & Upper Extremity Injuries & Diseases. Mosby-Year Book; 1991:129-139.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion

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1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Disorders of Bursae and Tendons in Shoulder Region

Synonyms
None

Definition
Shoulder girdle bursitis is generally a secondary condition brought on by calcific tendonitis, or pathology of the rotator cuff. It can be primary in patients who have rheumatic illnesses or bacterial infections.

History
Key features of patient history include sub-acute onset of unilateral shoulder pain with little to no trauma or overuse, a distinct component of night pain, and marked limitation in shoulder movement.

Specific Aspects of History
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, rotator cuff tear
Exertional, history of cardiac diagnosis	Cardiac pain can radiate to the shoulder
Constant, relieved/worse with meals, positional, associated with fatty meals	Gastrointestinal diseases including cholelithiasis
Pleuritic, shortness of breath, associated with cough	Pulmonary diseases
Multiple joint involvement	Rheumatology diseases (Gout)
Fever, severe pain	Possible infection
Cancer history	Cause of symptoms (metastatic or primary)
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection

Presentation
Usually there is no history of trauma, but may follow an injury or overuse (traumatic bursitis, hemorrhagic bursitis). Onset of pain develops over several hours, or the course of a day. Pain at rest, particularly at night, is characteristic. Active range of motion is limited, as is passive range of motion. Passive limitations are not in a capsular pattern.

Scope of Musculoskeletal Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Orthopedic testing
- Neurologic testing if neurologic signs are present

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Specific Aspects of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Referred pain to the shoulder can occur from cardiac, pulmonary, gastrointestinal pathology, or infection.

Findings of Bursitis of the Shoulder

- Limited AROM, especially in abduction, flexion, and external rotation, when compared with PROM
- Palpation is severely painful on the bursa
- Feeling of spongy swelling at the subacromial space, not present on the uninvolved shoulder
- Pain of bursitis is usually reproduced with passive abduction at 180 degrees, passive internal rotation and passive horizontal adduction

Differential Diagnoses

- Rheumatoid arthritis
- Osteoarthritis
- Fracture
- Ligamentous injury
- Tendonitis

Radiographs

Clinical decision involving a radiographic series of the shoulder is based upon medical necessity, as per criteria for radiographic exam. Diagnosis of bursitis does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of chiropractic care includes: pain relief, restoration of motion, restoration of strength and function.

- Physiotherapeutic modalities to decrease pain and inflammation are appropriate in the acute phase.
- Functional status & activity level should be assessed at the onset of care
- Next phase of treatment will utilize chiropractic manipulation and exercise to restore motion and normalize strength.

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- As functional improvement continues, patient should be transitioned to a home program.
- Treatment frequency should be commensurate with severity of condition.
- As condition improves, treatment frequency should continue to decrease, and patient should be transitioned to a self-management program.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in pain ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques (see below) ➢ Significant measurable functional improvement
5-8	➢ 50% improvement in pain ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques (see below)

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Postural advice to remove compression in the subacromial area
- Home ROM exercises, home self joint mobilization techniques
- Progression to therapeutic exercise—strengthening exercises
- Cold packs, if needed, to relieve discomfort

Alternatives to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Acupuncture
- Medication
- Surgery
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

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18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.

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32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nathan PA, Keniston RC: Carpal tunnel syndrome. In: Kasdan ML, ed. Occupational Hand & Upper Extremity Injuries & Diseases. Mosby-Year Book; 1991:129-139.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.

© 2018 eviCore healthcare. All rights reserved.

48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Lateral Epicondylitis

Synonyms

- Tennis Elbow
- Epitrochlear bursitis
- Epicondylitis

Definition

Condition involving inflammation of the muscles of the forearm, or their tendons near their origin on the humerus. Most often the origin of the Extensor Carpi Radialis Brevis (ECRB) displays an abnormal vascular proliferation and focal hyaline degeneration. Extensor Digitorum Communis (EDC) may also be involved in some cases. It is most common in the 4thdecade. Typically, injury is caused by repetitive twisting the wrist or forearm. There may be a partial tear of the tendon fibers at or near their point of insertion on the humerus. Risk factors are forceful repetitive wrist or forearm movement.

History

Patient history may include:

- General demographics
- Occupation/employment
- Hand dominance
- Living environment
- History of current condition
- Functional status & activity level
- Medications
- Other tests and measurements (laboratory and diagnostic tests)
- Past history (including response to prior treatment)
- Functional status & activity level should be assessed at the onset of care

Goals

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Fever, severe pain	Possible infection
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection
Cancer history	Cause of symptoms (metastatic or primary)
Discoloration of hand/fingers	Vascular occlusion, shunt emboli (dialysis patients)
Exertional symptoms, history of cardiac disease	Anginal equivalent

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Presentation
Condition involves a complaint of acute or chronic elbow pain; often complaint is worse with activity.

Subjective Findings
- Tenderness and pain at lateral epicondyle
- Pain is made worse by activities that require extending the wrist or holding an object in the hand with the wrist stiff
- Weak grasp
- Dropping items

Goals of Examination
Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Scope of Examination
- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Orthopedic and neurologic testing if neurologic signs are present

Findings of Lateral Epicondylitis
- Tender to palpation over lateral epicondyle. Greatest tension is elicited with the elbow in extension, forearm in pronation, and wrist in flexion
- MMT of effected wrist extensors is weak and painful – especially ECRL/ECRB, EDC
- Weak grip and pinch test

Differential Diagnoses
- C6 or C7 cervical nerve root compression
- PIN syndrome entrapment at arcade of Frohse is recognized in approximately 5% of patients
- Radial nerve entrapment syndrome
- Radial head arthritis
- Posterolateral plica
- Remnant plicae may become inflamed because of repeated trauma and inflammation
- Resultant plicae may become entrapped in the radiocapitellar joint
- Posterolateral instability
- Olecranon bursitis
- Crystalline deposition such as gout and pseudogout (Chonrocalcinosis)

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Radiographs

Clinical decision involving a radiographic series of the elbow is based upon medical necessity, as per criteria for radiographic exam. Diagnosis of lateral epicondylitis does not in and of itself require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of treatment is to reduce pain and inflammation, aid stretching and strengthening, and assist in gradual return to activity.

- Manipulation and modalities to reduce pain and inflammation are, therefore, appropriate.
- Treatment frequency should be commensurate with severity of the condition.
- Patient education in rest/reduction of strenuous activities, early transition to an active care program, identification of causative factors, and correction of faulty technique are important areas of emphasis.
- Strengthening and stretching exercises will be started when pain becomes manageable.
- Retraining for proper positioning to avoid re-injury and other factors in occupationally related overuse syndromes is an important component of the overall therapy consult.
- Initiate two to four week trial of treatment.
- Frequency of treatment should be consistent with the severity of the condition.
- If severity or frequency of symptoms decreases following the initial trial—continue treatment at a reduced frequency for a one month period before releasing patient to PRN care.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If patient does not improve with the trial of chiropractic treatment or has reached a plateau, refer patient back to referring physician to explore other treatment alternatives.

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Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 25% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective findings ➢ 75% increase in range of motion ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ One to two additional visits, then discharge ➢ Reinforce self-management techniques

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Rest, reduce strenuous activities
- Home ROM exercises, stretching wrist extensor musculature
- Progression to therapeutic exercise: strengthening exercises
- Hot packs/cold packs, if needed, to relieve discomfort
- Use of strap to disperse forces transmitted to the extensor tendons
- Brace to disperse forces applied to the extensor tendons

Alternatives/Adjuncts to Chiropractic Management

- Acupuncture
- Osteopathic Manipulation
- Physical Therapy
- Medication
- Surgery (as last resort)
- Cortisone or local anesthetic injection

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.

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18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.

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32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nathan PA, Keniston RC: Carpal tunnel syndrome. In: Kasdan ML, ed. Occupational Hand & Upper Extremity Injuries & Diseases. Mosby-Year Book; 1991:129-139.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.

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48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Medial Epicondylitis

Synonyms

- Golfers Elbow
- Peritendonitis
- Epicondylitis

Definition

Condition involving inflammation of the muscles of the forearm, or their tendons, near their origin on the humerus; possibly due to overuse or degeneration. There may be a partial tear of the tendon fibers at or near their point of insertion on the humerus. Risk factors are forceful repetitive wrist or forearm movement.

Specific Aspects of History

- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.
- Functional status & activity level should be assessed at the onset of care.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture
Fever, severe pain	Possible infection
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection
Cancer history	Cause of symptoms (metastatic or primary)
Discoloration of hand/fingers	Vascular occlusion, shunt emboli (dialysis patients)
Exertional symptoms, history of cardiac disease	Anginal equivalent
Multiple joint involvement, tophi	Rheumatological conditions, gout

Presentation

Condition involves a complaint of acute or chronic elbow pain; often complaint is worse with activity.

Subjective Findings

- Pain at medial epicondyle
- Pain is made worse by gripping, and resisted wrist flexion
- Weak grasp in severe cases
- Possible medial collateral ligament laxity

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Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Orthopedic and neurologic testing if neurologic signs are present
- MMT

Specific Aspects of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Findings of Medial Epicondylitis

- Tender to palpation over medial epicondyle
- MMT of effected wrist flexors and elbow-wrist mechanism is weak
- Resisted wrist flexion and forearm pronation is painful

Differential Diagnoses

- Cervical nerve root compression
- Ulnar nerve entrapment syndrome
- May accompany lateral epicondylitis
- Crystalline deposition such as gout and pseudogout (Chonrocalcinosis)
- Acute or chronic infection
- Olecranon bursitis

Radiographs

Clinical decision involving a radiographic series of the elbow is based on medical necessity, as per criteria for radiographic exam. Diagnosis of medial epicondylitis does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of treatment is to reduce pain and inflammation, aid stretching and strengthening, and assist in gradual return to activity.

- Manipulation and modalities to reduce pain and inflammation are, therefore, appropriate.
- Treatment frequency should be commensurate with the severity of the condition.

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- Patient education in rest/reduction of strenuous activities, early transition to an active care program, identification of causative factors, and correction of faulty technique are important areas of emphasis.
- Strengthening and stretching exercises will be started when pain becomes manageable.
- Retraining for proper positioning to avoid re-injury and other factors in occupationally related overuse syndromes is an important component of the overall therapy consult.
- Initiate two to four week trial of treatment.
- Frequency of treatment should be consistent with the severity of the condition.
- If severity or frequency of symptoms decreases following the initial trial—continue treatment at a reduced frequency for a one month period before releasing patient to PRN care.
- As treatment progresses, one should see an increase in the active regimen of care, a decrease in the passive regimen of care, and a fading of treatment frequency.
- If patient does not improve with the trial of chiropractic treatment or has reached a plateau, refer patient back to referring physician to explore other treatment alternatives.

Week	Progress
0-2	➢ 50% improvement in subjective findings ➢ 25% increase in range of motion ➢ Significant measurable functional improvement
3-4	➢ 75% improvement in subjective findings ➢ 75% increase in range of motion ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ One to two additional visits, then discharge ➢ Reinforce self-management techniques

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

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Self-Management Techniques

- Rest, reduce strenuous activities
- Home ROM exercises, stretching wrist musculature
- Progression to therapeutic exercise—strengthening exercises
- Hot packs/cold packs, if needed, to relieve discomfort
- Use of strap to disperse forces transmitted to the flexor tendons

Alternatives/Adjuncts to Chiropractic Management

- Osteopathic Manipulation
- Acupuncture
- Physical Therapy
- Medication
- Pain management/Injection therapy
- Surgery (as last resort)

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Boden SD, Wiesel SW, Laws ER, Rothman RH. The Aging Spine: Essentials of Pathophysiology, Diagnosis and Treatment. W.B. Saunders Company. 1991.
5. Braddom RL: Management of common cervical pain syndromes. In: Delisa JA, ed. Rehabilitation Medicine: Principles and Practice. Philadelphia, Pa: Lippincott Williams & Wilkins; 1993: 1036-46.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Northwestern Health Sciences University, Bloomington, MN, USA. Effectiveness of Manual Therapies: The UK Evidence Report. Spine (Phila Pa 1976). 2011 Feb 1;36(3):230-42; Chiropr Osteopat. 2010;18(1):4. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pubmed/20184717.
7. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
8. Brotzman, SB, ed., Wilks, KE, ed,; Handbook of Orthopaedic Rehabilitation, Second Edition; Elsevier Inc; 2006.
9. Brotzmen, S.B., ed., Handbook of Orthopaedic Rehabilitation, Mosby, 2006.
10. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
11. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients

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with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
12. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
13. Clark CR: Degenerative conditions of the spine: differential diagnosis and non-surgical treatment. In: Frymoyer JW, ed. The Adult Spine: Principles and Practice. New York, NY: Raven Press; 1991: 1154-64.
14. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
15. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
16. Dvorak J, Dvorak V, Gilliar W, Schneider W, Spring H and Tritschler T. Musculoskeletal Manual Medicine Diagnosis and Treatment (5 ed.). Stuttgart, New York: Thieme, 2008.
17. Dvorak; Dvorak. Manual Medicine Diagnostics; Springer-Verlag, 1988.
18. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
19. Gatterman; Foundations of Chiropractic Subluxation; St. Louis: Mosby, 1995.
20. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
21. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
22. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
23. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
24. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
25. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
26. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.

© 2018 eviCore healthcare. All rights reserved.

27. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
28. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
29. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
30. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
31. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
32. Jaskoviak, P., Shafer, R. Applied Physiotherapy, 2nd Edition. The American Chiropractic Association, 1993.
33. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
34. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
35. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
36. Lonstein JE: Idiopathic scoliosis. In: Lonstein JE, Bradfordn DS, Winter RB, Ogilvie J, eds. Moe's Textbook of Scoliosis and Other Spinal Deformities. 3rd ed. Philadelphia, Pa: WB Saunders Co; 1995:219-256.
37. Magee, David J., Orthopedic Physical Assessment, Fifth Edition, W.B. Saunders Company, 2008.
38. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
39. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
40. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
41. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials.

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Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
42. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
43. Nathan PA, Keniston RC: Carpal tunnel syndrome. In: Kasdan ML, ed. Occupational Hand & Upper Extremity Injuries & Diseases. Mosby-Year Book; 1991:129-139.
44. Nelson CF. Headache Diagnosis. In: Lawrence DJ, Cassidy JD, McGregor M, et. Al., eds. Advances in Chiropractic. Mosby-Year Book; 1994; 1:77-99. Date last accessed 02/01/2018.
45. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
46. Olson SH, Brumback RA, Gascon G, Iyer V; Handbook of Symptom Oriented Neurology, Third Edition, Year Book Medical Publishers, Inc.; 2002.
47. Richardson, Jan K., Iglarsh, Z. Annette, Clinical Orthopaedic Physical Therapy, W. B. Saunders Company, 1994.
48. Rolak LA Neurology Secrets; Mosby; 1993.
49. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
50. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
51. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
52. Schonstein E, Kenny DT, Keating J, Koes BW. Work conditioning, work hardening, and functional restoration for workers with back and neck pain. Cochrane Database Syst Rev. 2003;(1):CD001822. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001822/full.
53. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
54. Snider RK. (Editor). Essentials of Musculoskeletal Care. American Academy of Orthopaedic Surgeons. 1997.
55. Southmayd, W., Hoffman, M., Sports Health, The Complete Book of Athletic Injuries, Quick Fox, 1981.
56. Souza, TA; Differential Diagnosis for the Chiropractor: Protocols and Algorithms, Fourth Edition; Aspen Publishers, 2009.
57. Turek, S.L., Orthopaedics Principles and Their Applications, Sixth Edition, J.B. Lippincott Co. 2005.
58. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
59. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol

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Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
60. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.
61. White AA, Panjabi MM: In: Biomechanics of the Spine. 2nd Ed. Philadephia, PA: JB Lippincott, 1990.
62. Wyatt LH; Handbook of Clinical Chiropractic, Second Edition, Aspen Publishers; 2005.
63. Yochum and Rowe; Essentials of Skeletal Radiology, Third Edition, Williams and Wilkens, 2005.
64. Zohn, D. Musculoskeletal Pain: Diagnosis and Physical Treatment, 2nd ed. Little Brown and Company, 1987.

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Sprain and Strain of the Shoulder and Upper Arm

Synonyms
None

Definition
Condition involving localized pain in the shoulder and upper arm. Condition occurs either suddenly or following a trauma, which may be either instantaneous or repetitive.

- Strain
  - Overstretching or tearing of a muscle or tendon.
- Sprain
  - Overstretching or tearing of ligamentous tissue.

Classification
Tendon and ligament injuries are classified as...

- Grade I (mild)
  - Mild injury that causes only stretching or microscopic tears in a tissue. Although these tiny tears can stretch the tissue, they do not significantly affect the stability of the injured joint.
- Grade II (moderate)
  - Injured tissue is partially torn, and there is some mild to moderate joint instability.
- Grade III (severe)
  - Tissue is either torn completely or avulsed (pulled away from the place where it attaches to bone), and there is significant joint instability. Surgical referral may be necessary.

History
Acute trauma is commonly the cause of shoulder/arm sprain/strains, however, repetitive motion may also be a factor.

Specific Aspects of History
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

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Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, rotator cuff tear
Exertional, history of cardiac disease	Cardiac pain can radiate to the shoulder
Constant, relieved/worse with meals, positional, associated with fatty meals	Gastrointestinal diseases including cholelithiasis and perforated ulcer
Pleuritic pain, shortness of breath, associated with cough	Pulmonary diseases
Multiple joint involvement	Rheumatology diseases
Fever, severe pain	Possible infection
Cancer history	Cause of symptoms (metastatic or primary)
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state	Infection

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Muscle testing
- Orthopedic testing
- Neurologic testing if neurologic signs are present

Specific Aspects of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Note: Referred pain to the shoulder can occur from cardiac, pulmonary, gastrointestinal pathology, or infection.

Findings of Sprain and Strain of an Unspecified Site of the Shoulder and Upper Arm

- Range of motion may be limited due to pain or soft tissue restrictions in chronic cases
- Abnormal glenohumeral rhythm
- Pain with passive motion (sprain)
- Pain on resistance (strain)

Differential Diagnoses

- Adhesive Capsulitis
- Biceps Rupture
- Bicipital Tendinitis
- Cervical Disc Disease
- Cervical Myofascial Pain
- Cervical Spondylosis
- Cervical Sprain and Strain

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- Complex Regional Pain Syndromes
- Fibromyalgia
- Myofascial Pain
- Osteoarthritis
- Rheumatoid Arthritis
- Thoracic Outlet Syndrome

Radiographs

Clinical decision involving a radiographic series of the shoulder is based upon medical necessity, as per criteria for radiographic exam. Diagnosis of a sprain/strain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

Advanced Diagnostic Testing

Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

Chiropractic Management

Goal of chiropractic care includes: pain relief, restoration of motion, restoration of strength and function.

- Functional status & activity level should be assessed at the onset of care
- Physiotherapeutic modalities to decrease pain and inflammation are appropriate in the acute phase.
- Next phase of treatment will utilize chiropractic manipulation and exercise to restore motion and normalize strength.
- As functional improvement continues, patient should be transitioned to a home program.
- Treatment frequency should be commensurate with severity of condition.
- As condition improves, treatment frequency should continue to decrease, and patient should be transitioned to a self-management program.

Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in pain ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques (see below) ➢ Significant measurable functional improvement
5-8	➢ Continued reduction of pain ➢ Continued increase in range of motion ➢ Discharge patient to elective care, or to their primary care provider for alternative treatment options when a plateau is reached, or by week 8, whichever occurs first

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Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Home ROM exercises, home self joint mobilization techniques
- Progression to therapeutic exercise: strengthening exercises
- Cold packs, if needed, to relieve discomfort

Alternatives/Adjuncts to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Surgery
- Medication
- Pain management/Injection therapy

References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
5. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.

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6. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
7. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
8. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
9. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
10. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
11. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
12. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
13. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
14. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
15. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
16. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
17. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
18. Hubbard TJ, Denegar CR: Does cryotherapy improve outcomes with soft tissue injuries? Journal of Athletic Training 2004; 39 (3): 278-279. Date last accessed 02/01/2018. http://www.mccc.edu/~behrensb/documents/cryoarticle_000.pdf.
19. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its

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Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
20. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
21. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
22. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
23. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
24. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
25. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.
26. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
27. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
28. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
29. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
30. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
31. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018.

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https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
32. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
33. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
34. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.
35. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
36. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
37. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
38. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.

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Strain Rotator Cuff

Synonyms
None

Definition
Rotator cuff is made up of four (4) interrelated muscles arising from the scapula, and attaching to the tuberosities of the humerus. These four muscles are the supraspinatus muscle, the infraspinatus muscle, the teres minor muscle and the subscapularis muscle. Their tendons form a continuous cuff around the humerus head that allows the cuff muscles to provide an infinite variety of moments to rotate, and adjust the humeral head within the glenoid fossa. This condition involves an injury to this group of muscles.

Goals
- Rule out red flags (require medical management).
- Identify comorbidities requiring medical management, and those that affect chiropractic management.
- Determine if trauma-related; determine nature and extent of traumatic event.

Red Flag	Possible Consequence or Cause
Severe trauma	Fracture, rotator cuff tear
Exertional chest or arm pain, history of cardiac disease	Cardiac pain can radiate to the shoulder
Constant, relieved/worse with meals, positional, associated with fatty meals	Gastrointestinal diseases including cholelithiasis and perforated ulcer
Pleuritic pain, shortness of breath, associated with cough	Pulmonary diseases
Multiple joint involvement	Rheumatology diseases
Cancer history	Cause of symptoms (metastatic or primary)
Unilateral edema	Upper extremity deep vein thrombosis
Immune-compromised state, fever	Infection

Presentation
Presentation of the condition depends on a number of factors:

- Patient's age
- Shoulder pain in young overhead athletes suggests underlying shoulder instability
- In older patients, degenerative rotator cuff disease or frozen shoulder is suggested by shoulder pain
- What is the patient's occupation or sport? Repetitive overhead activities and sports predispose to rotator cuff tendinitis.
- Mechanism of injury
- Fall on an outstretched arm could indicate a dislocation of the glenohumeral joint or a fracture of the humeral neck

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- Repetitive overhead motions can cause tendinitis and, in the long run, chronic degenerative changes
- Fall or a trauma on the tip of the shoulder can result in an acromioclavicular sprain

Subjective Findings

- Onset
  - Insidious slow onset may suggest tendinitis or osteoarthritis.
  - Sudden onset usually is due to a trauma causing a fracture, dislocation, or a rotator cuff tear.
- Location of pain
  - Pain located on the superior or lateral aspect of the shoulder suggests rotator cuff involvement.
  - Pain on the anterior aspect of the shoulder may result from bicipital tendinitis, an acromioclavicular sprain, or anterior instability.
  - Neck pain and radicular pain or paresthesias suggest a cervical spine disorder.
- Severity of pain
  - Acute burning pain could indicate an acute bursitis.
  - Intermittent dull pain may be due to a degenerative rotator cuff condition.
- Type of pain
  - Sharp burning pain suggests a neurologic origin.
  - Bone and tendon pain is deep, boring, and localized.
  - Muscle pain is dull and aching, not localized, and may be referred to other areas.
  - Vascular pain is aching, cramplike, poorly localized, and may be referred to other areas.
- Duration of Symptoms
  - Frozen shoulder goes through 3 stages that can last up to 3-4 years.
  - Acute bursitis has a short-term evolution and responds well to nonsteroidal anti-inflammatory drugs (NSAIDs).
  - Rotator cuff condition will often involve a distinct mechanism of onset.
- Timing of pain
  - Predominantly night pain suggests frozen shoulder.
  - Morning pain and stiffness improved by activity may be caused by a synovitis.
  - Pain that increases with activity is usually the result of muscular involvement.
- Activities/positions that increase the pain
  - Pain increased by overhead activities or arm-length activities suggests rotator cuff involvement.
  - Pain increased when throwing is likely to be due to anterior instability.
  - Pain increased by lying on the affected shoulder may be caused by an acromioclavicular sprain.

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- Constant vs intermittent symptoms
  - Intermittent symptoms usually result from soft tissues or joint disorders.
  - Constant symptoms suggest a neurologic lesion.

Goal of Examination

Examine the musculoskeletal system for possible causes or contributing factors to the complaint.

Scope of Musculoskeletal Examination

- Inspection
- Palpation of bony and soft tissue
- Range of motion, active and passive
- Strength testing
- Orthopedic testing
- Neurologic testing if neurologic signs are present

Findings of Rotator Cuff Sprain

- ROM may be limited by pain, but will otherwise be unlimited.
- Pain and weakness with shoulder external rotation, internal rotation and abduction.
- Following tests are positive for impingement:
- Neer
- Hawkins-Kennedy
- Yocum
- Posterior impingement test
- Following tests that use resisted isometric contraction can positively identify involvement of the supraspinatus tendon:
- Jobe test
- Full can test
- Following tests that use resisted isometric contraction can positively identify involvement of the infraspinatus tendon:
- Infraspinatus isolation test
- Patte test
- No specific resisted isometric contraction tests are available for the teres minor tendon.
- Following tests that use resisted isometric contraction can positively identify involvement of the subscapular tendon:
- Gerber lift-off test
- Gerber push with force test
- Following tests that use resisted isometric contraction can positively identify involvement of the long head of the biceps tendon:
- Speed palm up test
- Yergason test

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Differential Diagnoses

- Adhesive Capsulitis
- Biceps Rupture
- Bicipital Tendinitis
- Cervical Disc Disease
- Cervical Myofascial Pain
- Cervical Spondylosis
- Cervical Sprain and Strain
- Complex Regional Pain Syndromes
- Fibromyalgia
- Myofascial Pain
- Osteoarthritis
- Rheumatoid Arthritis
- Thoracic Outlet Syndrome

Radiographs

Clinical decision involving a radiographic series of the shoulder is based upon medical necessity, as per criteria for radiographic exam. Diagnosis of a rotator cuff strain does not, in and of itself, require radiographic evaluation. Determination of the need for ordering or exposing radiographs requires prior assessment of the patient's history, subjective findings, objective findings, and review of other available diagnostic testing results.

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Advanced diagnostic testing may be a consideration if the patient does not respond to an initial trial of chiropractic care.

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Goal of chiropractic care includes pain relief, restoration of motion, restoration of strength and function.

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- As functional improvement continues, patient should be transitioned to a home program.
- Treatment frequency should be commensurate with the severity of the condition.
- As condition improves, treatment frequency should continue to decrease and patient should be transitioned to a self-management program.

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Week	Progress
0-1	➢ Some reduction of pain ➢ Some improvement in range of motion ➢ Significant measurable functional improvement
2-4	➢ 50% improvement in subjective complaints ➢ 30-50% increase in range of motion ➢ Reinforce self-management techniques ➢ Significant measurable functional improvement
5-8	➢ 75% reduction of pain ➢ 50-75% increase in range of motion
9-12	➢ Reinforce self-management techniques ➢ Transition to a self-management program

Discharge Criteria

- Discharge occurs when reasonable functional goals and expected outcomes have been achieved.
- The patient is discharged when the patient/care-giver can continue management of symptoms with an independent home program.
- Treatment is discontinued when the patient is unable to progress towards outcomes because of medical complications, psychosocial factors or other personal circumstances.
- If the member has been non-compliant with treatment as is evidenced by the clinical documentation, and/or the lack of demonstrated progress, treatment will be deemed to be not medically necessary and the member should be discharged from treatment.

Self-Management Techniques

- Instruction in home exercise program for ROM and strengthening
- Cold packs, if needed, to relieve discomfort
- Nocturnal shoulder immobilization may be appropriate

Alternatives/Adjuncts to Chiropractic Management

- Osteopathic Manipulation
- Physical Therapy
- Surgery
- Medication
- Pain management/Injection therapy

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References

1. Aker PD, Gross AR, Goldsmith CH, Peloso P. Conservative management of mechanical neck pain: systematic overview and meta-analysis. BMJ 1996 Nov 23;313(7068):1291-6. Date last accessed 02/06/2018. http://www.bmj.com/content/313/7068/1291.
2. Assendelft WJ, Morton SC, Yu EI, Suttorp MJ, Shekelle PG, Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies, Ann Intern Med. 2003 Jun 3;138(11):871-81. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716460/spinal-manipulative-therapy-low-back-pain-meta-analysis-effectiveness-relative.
3. Aure OF, Nilsen JH, Vasseljen O, Manual therapy and exercise therapy in patients with chronic low back pain: a randomized, controlled trial with 1-year follow-up, Spine. 2003 Mar 15;28(6):525-31; discussion 531-2. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/03150/Manual_Therapy_and_Exercise_Therapy_in_Patients.2.aspx.
4. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(03)00177-3/abstract.
5. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg RP, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63. doi: 10.1016/j.jmpt.2013.08.010. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(13)00237-6/abstract.
6. Cherkin DC, Deyo RA, Battie M, Street J, Barlow W. A Comparison of Physical Therapy, Chiropractic Manipulation, and Provision of an Educational Booklet for the Treatment of Patients with Low Back Pain. NEJM 1998;339:1021-9. Date last accessed 02/06/2018. http://www.nejm.org/doi/full/10.1056/NEJM199810083391502.
7. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG, A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain, Ann Intern Med. 2003 Jun 3;138(11):898-906. Date last accessed 02/06/2018. http://annals.org/aim/article-abstract/716463/review-evidence-effectiveness-safety-cost-acupuncture-massage-therapy-spinal-manipulation.
8. Conlin A, Bhogal S, Sequeira K, Teasell R. Treatment of whiplash-associated disorders--part I: Non-invasive interventions. Pain Res Manag. 2005 Spring;10(1):21-32. Date last accessed 02/06/2018. https://www.hindawi.com/journals/prm/2005/503704/abs/.
9. Côté P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Early aggressive care and delayed recovery from whiplash: Isolated finding or reproducible result? Arthritis Rheum. 2007 May 25;57(5):861-868. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/jmt.2008.16.2.42E.
10. Ernst E, Canter PH. A systematic review of systematic reviews of spinal manipulation. J R Soc Med. 2006 Apr;99(4):192-6. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/16574972.
11. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
12. Giles LG, Muller R. Chronic spinal pain: a randomized clinical trial comparing medication, acupuncture, and spinal manipulation. Spine. 2003 Jul 15;28(14):1490-502; discussion 1502-3. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/07150/Chronic_Spinal_Pain__A_Randomized_Clinical_Trial.3.aspx.
13. Green S, Buchbinder R, Glazier R, Forbes A: Systematic review of randomised controlled trials of interventions for painful shoulder: selection criteria, outcome assessment, and efficacy. BMJ 1998 Jan 31; 316(7128): 354-60. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2665551/.

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14. Green S, Buchbinder R, Hetrick S. Physiotherapy interventions for shoulder pain. Cochrane Database Syst Rev. 2003;(2):CD004258. Review. Date last accessed 02/01/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001156.pub2/full.
15. Gross AR, Aker PD, Goldsmith CH, Peloso P. Physical medicine modalities for mechanical neck disorders (Cochrane Review). In: The Cochrane Library, Issue 3, 2002. Oxford: Update Software. Date last accessed 02/06/2018. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000961/full.
16. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G, Cervical overview group, Manipulation and Mobilisation for Mechanical Neck Disorders, Cochrane Database Syst Rev. 2004;1:CD004249. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2004/07150/A_Cochrane_Review_of_Manipulation_and_Mobilization.9.aspx.
17. Grunnesjo MI, Bogefeldt JP, Svardsudd KF, Blomberg SI. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. J Manipulative Physiol Ther. 2004 Sep;27(7):431-41. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00126-5/abstract.
18. Haas M, Groupp E, Panzer D, Partna L, Lumsden S, Aickin M, Efficacy of cervical endplay assessment as an indicator for spinal manipulation, Spine. 2003 Jun 1;28(11):1091-6. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2003/06010/Efficacy_of_Cervical_Endplay_Assessment_as_an.2.aspx.
19. Hoiriis KT, Pfleger B, McDuffie FC, Cotsonis G, Elsangak O, Hinson R, Verzosa GT. A randomized clinical trial comparing chiropractic adjustments to muscle relaxants for subacute low back pain. J Manipulative Physiol Ther. 2004 Jul-Aug;27(6):388-98. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00098-3/fulltext.
20. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, Peloso PM, Holm LW, Côté P, Hogg-Johnson S, Cassidy JD, Haldeman S. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(08)00344-8/abstract.
21. Hurwitz EL, Morgenstern H, Harber P, Kominski GF, Yu F, Adams AH. A randomized trial of chiropractic manipulation and mobilization for patients with neck pain: clinical outcomes from the UCLA neck-pain study. Am J Public Health 2002 Oct;92(10):1634-41. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447299/.
22. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2006/03150/A_Randomized_Trial_of_Chiropractic_and_Medical.2.aspx.
23. Ianuzzi A, Khalsa PS. Comparison of human lumbar facet joint capsule strains during simulated high-velocity, low-amplitude spinal manipulation versus physiological motions. Spine J. 2005 May-Jun;5(3):277-90. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15863084.
24. Kjellman GV, Skargren EI, Oberg BE. A critical analysis of randomised clinical trials on neck pain and treatment efficacy: a review of the literature. Scandinavian Journal of Rehabilitation Medicine 1999, 31(3), 139-152. Date last accessed 02/06/2018. http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A248386&dswid=6970.
25. Kuczynski JJ, Schwieterman B, Columber K, Knupp D, Shaub L, & Cook CE. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. Int. J. Sports Phys. Ther. Dec 2012;7(6):647–62. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537457/.
26. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord. 2005 Aug 4;6(1):43. Date last accessed 02/06/2018. https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-6-43.

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27. Martínez-Segura R, De-la-Llave-Rincón AI, Ortega-Santiago R, Cleland JA, Fernández-de-Las-Peñas C. Immediate changes in widespread pressure pain sensitivity, neck pain, and cervical range of motion after cervical or thoracic thrust manipulation in patients with bilateral chronic mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2012 Sep;42(9):806-14. doi: 10.2519/jospt.2012.4151. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2012.4151.
28. Martinez-Segura R, Fernandez-de-las-Penas C, Ruiz-Saez M, Lopez-Jimenez C, Rodriguez-Blanco C. Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther. 2006 Sep;29(7):511-7. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(06)00175-8/fulltext.
29. Masaracchio M, Cleland JA, Hellman M, Hagins M. Short-term combined effects of thoracic spine thrust manipulation and cervical spine nonthrust manipulation in individuals with mechanical neck pain: a randomized clinical trial. J Orthop Sports Phys Ther. 2013 Mar;43(3):118-27. doi: 10.2519/jospt.2013.4221. Date last accessed 02/06/2018. https://www.jospt.org/doi/abs/10.2519/jospt.2013.4221.
30. McHardy A, Hoskins W, Pollard H, Onley R, Windsham R: Chiropractic treatment of upper extremity conditions: a systematic review. J Manipulative Physiol Ther 2008, 31:146-159. Date last accessed 02/01/2018. https://www.sciencedirect.com/science/article/pii/S0161475407003375.
31. Mohseni-Bandpei MA, Stephenson R, Richardson B, Spinal manipulation in the treatment of low back pain: a review of the literature with particular emphasis on randomized controlled clinical trials. Physical Therapy Reviews 1998, 3(4), 185-194. Date last accessed 02/06/2018. http://www.tandfonline.com/doi/abs/10.1179/ptr.1998.3.4.185.
32. Muller R, Giles LG. Long-term follow-up of a randomized clinical trial assessing the efficacy of medication, acupuncture, and spinal manipulation for chronic mechanical spinal pain syndromes. J Manipulative Physiol Ther. 2005 Jan;28(1):3-11. Date last accessed 02/06/2018. http://www.jmptonline.org/article/S0161-4754(04)00258-1/abstract.
33. Munday S, Jones A, Brantingham J, Globe G, Jensen M, Price J. A randomized, single-blinded, placebo-controlled trial to evaluate the efficacy of chiropractic shoulder girdle adjustment in the treatment of shoulder impingement syndrome. J Am Chiro Assoc. 2007;44(8):6-15. Date last accessed 02/01/2018. http://web.b.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=10817166&AN=26130867&h=lTMsKqvHWm3UzoehGh2VXqBFyyUadRvIeyZg%2fYjFxQM1W4tZKYbfQWQKqAOiBNs%2bCd1dqr0dmhH3z5zfgROdEg%3d%3d&crl=c&resultNs=AdminWebAuth&resultLocal=ErrCrlNotAuth&crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jrnl%3d10817166%26AN%3d26130867.
34. Niemisto L, Rissanen P, Sarna S, Lahtinen-Suopanki T, Lindgren KA, Hurri H. Cost-effectiveness of combined manipulation, stabilizing exercises, and physician consultation compared to physician consultation alone for chronic low back pain: a prospective randomized trial with 2-year follow-up. Spine. 2005 May 15;30(10):1109-15. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/2005/05150/Cost_effectiveness_of_Combined_Manipulation,.2.aspx.
35. Rothwell DM, Bondy SJ, Williams JI. Chiropractic manipulation and stroke: a population-based case-control study. Stroke 2001 May;32(5):1054-60. Date last accessed 02/06/2018. http://stroke.ahajournals.org/content/32/5/1054.short.
36. Saavedra-Hernández M, Arroyo-Morales M, Cantarero-Villanueva I, Fernández-Lao C, Castro-Sánchez AM, Puentedura EJ, Fernández-de-las-Peñas C. Short-term effects of spinal thrust joint manipulation in patients with chronic neck pain: a randomized clinical trial. Clin Rehabil. 2013 Jun;27(6):504-12. doi: 10.1177/0269215512464501. Date last accessed 02/06/2018. http://journals.sagepub.com/doi/abs/10.1177/0269215512464501.
37. Santilli V, Beghi E, Finucci S. Chiropractic manipulation in the treatment of acute back pain and sciatica with disc protrusion: a randomized double-blind clinical trial of active and simulated spinal manipulations. Spine J. 2006 Mar-Apr;6(2):131-7. Date last accessed 02/06/2018. http://www.thespinejournalonline.com/article/S1529-9430(05)00833-8/abstract.

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38. Shaffer BS: Painful conditions of the acromioclavicular joint. J Am Acad Orthop Surg 1999 May-Jun; 7(3): 176-88. Date last accessed 02/01/2018. https://insights.ovid.com/pubmed?pmid=10346826.
39. Skargren EI, Carlsson PG, Oberg BE. One-year follow-up comparison of the cost and effectiveness of chiropractic and physiotherapy as primary management for back pain. Subgroup analysis, recurrence, and additional health care utilization. Spine. 1998 Sep 1;23(17):1875-83; discussion 1884. Date last accessed 02/06/2018. https://journals.lww.com/spinejournal/Abstract/1998/09010/One_Year_Follow_up_Comparison_of_the_Cost_and.16.aspx.
40. Speed C and Hazleman B. Shoulder Pain. BMJ Clin Evid Concise 2005; 13: 355-357. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2907630/pdf/2006-1107.pdf.
41. Speed C and Hazleman B. Shoulder Pain. BMJ Clin Evid Concise 2005;13:355-35. Date last accessed 02/01/2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1283277/.
42. United Kingdom back pain exercise and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ. 2004 Dec 11;329(7479):1377. Epub 2004 Nov 19. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/15556955.
43. Vernon H, Humphreys K, Hagino C. Chronic mechanical neck pain in adults treated by manual therapy: a systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther. 2007 Mar-Apr;30(3):215-27. Date last accessed 02/06/2018. https://www.ncbi.nlm.nih.gov/pubmed/17416276.
44. Wasiak R, Kim J, Pransky GS. The Association Between Timing and Duration of Chiropractic Care in Work-Related Low Back Pain and Work-Disability Outcomes. J Occup Environ Med. 2007. Date last accessed 02/06/2018. https://journals.lww.com/joem/Abstract/2007/10000/The_Association_Between_Timing_and_Duration_of.13.aspx.

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Chiropractic Care Guidelines for Children Aged 0-14

This document serves as a guideline only; special circumstances may result in outcomes that are not reflected in the guidelines below.

- Children under the age of 15 are not eligible for eviCore's Waiver program.
- All services must be medically necessary per eviCore's guidelines.
- Child's diagnosis must be for a covered neuromusculoskeletal (NMS) condition.
- All x-rays must be pre-authorized.

Age	Visits
0-6	Up to 6 medically necessary visits may be approved per calendar year; visits beyond the guideline maximum will be reviewed on a case by case basis.
7-14	Up to 8 medically necessary visits may be approved per calendar year; visits beyond the guideline maximum will be reviewed on a case by case basis.

Authorization is required as stated in the member's benefit comment. eviCore will only authorize care for approved NMS conditions. Systemic or organic conditions will not be authorized for reimbursement.

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Diagnosis Codes

Cervical Conditions (Disc Radicular)	ICD-10 Codes
Brachial Neuritis or Radiculitis NOS	M54.11, M54.12, M54.13
Brachial Plexus Lesions	G54.0
Cervicobrachial Syndrome	M53.1
Degeneration of Cervical Intervertebral Disc	M50.31, M50.32, M50.33
Displacement of Cervical Intervertebral Disc Without Myelopathy	M50.21, M50.22, M50.23, M50.91, M50.92, M50.93, M50.11, M50.12, M50.13
Cervical Conditions (Non-Specific)	**ICD-10 Codes**
Cervical Nonallopathic Lesion	M99.01
Cervical Spondylosis Without Myelopathy	M47.811, M47.812, M47.813
Cervical Sprain and Strain	S13.4XXA, S13.4XXD, S13.4XXS, S13.8XXA, S13.8XXD, S13.8XXS, S16.1XXA, S16.1XXD, S16.1XXS
Cervicalgia	M54.2
Other Syndromes Affecting Cervical Region	M53.81, M53.82, M53.83
Torticollis	G24.3, M43.6
Headaches	**ICD-10 Codes**
Cervicocranial Syndrome	M43.10
Migraine With Aura	G43.101, G43.109, G43.111, G43.119, G43.501, G43.509, G43.511, G43.519
Headache	R51, G44.209, G44.201
Migraine Without Aura	G43.001, G43.009, G43.011, G43.019, G43.701, G43.709, G43.711, G43.719
Unspecified Migraine Headache	G43.901, G43.909, G43.911, G43.919, G43.801, G43.809, G43.811, G43.819
Lower Extremity Conditions	**ICD-10 Codes**
Achilles Tendinitis	M76.61, M76.62
Sprain and Strain of Knee and Leg	S83.8X1A, S83.8X1D, S83.8X2A, S83.8X2D,S83.402A, S83.402D, S83.401A, S83.401D, S83.502A, S83.502D, S83.501A, S83.501D
Sprain-Strain of Ankle	S93.412A, S93.412D, S93.411A, S93.411D, S93.422A, S93.422D, S93.421A, S93.421D, S93.492A, S93.492D, S93.491A, S93.491D, S93.432A, S93.432D, S93.431A, S93.431D, S96.812A, S96.812D, S96.811A, S96.811D
Sprain and Strain of Hip and Thigh	S76.092A, S76.092D, S76.091A, S76.091D, S73.192A, S73.192D, S73.191A, S73.191D, S76.012A, S76.012D, S76.011A, S76.011D
Tibialis Tendonitis	M76.811, M76.812, M76.821, M76.822

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Lumbosacral Conditions (Disc Radicular)	ICD-10 Codes
Degeneration of Lumbar or Lumbosacral Intervertebral Disc	M51.36, M51.37
Displacement of Lumbar Intervertebral Disc Without Myelopathy	M51.26, M51.27, M51.86, M51.87, M51.15, M51.16, M51.17, M51.35
Lumbosacral Radiculitis	M54.15, M54.16, M54.17, M54.18
Post-Laminectomy Syndrome, Lumbar Region	M96.1
Sciatica	G57.00, G57.01, G57.02, M54.30, M54.31, M54.32, M54.40, M54.41, M54.42
Spinal Stenosis, Lumbar	M48.06, M48.07, M48.08, M99.53
Lumbosacral Conditions (Non-Specific)	**ICD-10 Codes**
Disorder of Sacrum	M53.3, M53.88, M53.2X8
Lumbago	M54.5
Lumbar Nonallopathic Lesion	M99.03
Lumbar Spondylosis	M47.816, M47.817, M47.896, M47.897
Lumbar Sprain/Strain	S33.5XXA, S33.5XXD, S33.5XXS, S39.012A,S39.012D, S39.012S, S39.092A, S39.092D, S39.092S
Lumbosacral (joint/ligament), Sprain and Strain	S33.8XXA, S33.8XXD, S33.8XXS, S33.9XXA,S33.9XXD, S33.9XXS
Pelvic Nonallopathic Lesion	M99.05
Sacral Nonallopathic Lesion	M99.04
Sacroiliac Ligament Sprain/Strain	S33.6XXA, S33.6XXD, S33.6XXS
Sacroilitis	M46.1
Neuromusculoskeletal Conditions (Non-Specific)	**ICD-10 Codes**
Congenital Spondylolisthesis	M43.10, M43.11, M43.12, M43.13, M43.14, M43.15, M43.16, M43.17, M43.18, M43.19, Q76.2
Late Effect of Sprain/Strain Injury	Late Effect of Sprain/Strain
Myalgia	M79.1
Other Symptoms Referable to the Back	M53.84, M53.85, M53.86, M53.9, M54.89, M54.9
Pain in Limb	M2250, M79609
Scoliosis	M41.112, M41.113, M41.114, M41.115, M41.116, M41.117, M41.119, M41.122, M41.123, M41.124, M41.125, M41.126, M41.127, M41.129, M41.20, M41.22, M41.23, M41.24, M41.25, M41.26, M41.27, M41.30, M41.34, M41.35, M41.40, M41.41, M41.42, M41.43, M41.44, M41.45, M41.46, M41.47, Q76.3
Muscle Spasm	M62.830, M62.838
Fasciitis	M79.7
Neuralgia	M79.2

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Thoracic Conditions (Disc Radicular)	ICD-10 Codes
Displacement of Thoracic Intervertebral Disc Without Myelopathy	M51.24, M51.84, M51.14, M54.14, R51
Diagnosis	**ICD-10 Codes**
Pain in Thoracic Spine	M54.6
Rib Cage Nonallopathic Lesion	M99.08
Sprain and Strain of Ribs	S23.41XA, S23.41XD, S23.41XS, S23.421A, S23.421D, S23421S
Thoracic Nonallopathic Lesion	M99.02
Thoracic Sprain/Strain	S23.3XXA, S23.3XXD, S23.3XXS, S23.8XXA, S23.8XXD
Upper Extremity Conditions	**ICD-10 Codes**
Acromioclavicular Sprain	S43.51XA, S43.51XD, S43.52XA, S43.52XD
Adhesive Capsulitis of the Shoulder	M75.01, M75.02
Carpal Tunnel Syndrome	G56.01, G56.02
Disorders of Bursae and Tendons in Shoulder Region	S46.902A, S46.901D, S46.902D, S46.901A, S46.802A, S46.801D, S46.802D, S46.801A, S46.991A, S46.892A, S46.891D, S46.892D, S46.891A, M75.51, M75.52
Lateral Epicondylitis	M77.10, M77.11, M77.12
Medial Epicondylitis	M77.00, M77.01, M77.02
Sprain and Strain of the Shoulder and Upper Arm	S43.412A, S43.412D, S43.82XA, S43.81XD, S43.82XD, S43.81XA, S43.411A, S43.411D, S46.811A, S46.811D, S46.812A,S46.812D
Strain Rotator Cuff	S43.421A, S43.421D, S43.422A, S43.422D, S46.011A, S46.011D, S46.012A, S46.012D

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