



CLINICAL GUIDELINES

Spine Imaging Policy

Version 1.0

Effective February 14, 2020



eviCore healthcare Clinical Decision Support Tool Diagnostic Strategies: This tool addresses common symptoms and symptom complexes. Imaging requests for individuals with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist and/or individual's Primary Care Physician (PCP) may provide additional insight.

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Procedure Codes Associated with Spine Imaging	
MRI/MRA	CPT®
Cervical MRI without contrast	72141
Cervical MRI with contrast	72142
Cervical MRI without and with contrast	72156
Thoracic MRI without contrast	72146
Thoracic MRI with contrast	72147
Thoracic MRI without and with contrast	72157
Lumbar MRI without contrast	72148
Lumbar MRI with contrast	72149
Lumbar MRI without and with contrast	72158
Spinal Canal MRA	72159
MRI Pelvis without contrast	72195
MRI Pelvis with contrast	72196
MRI Pelvis without and with contrast	72197
CT	CPT®
Cervical CT without contrast	72125
Cervical CT with contrast (Post-Myelography CT)	72126
Cervical CT without and with contrast	72127
Thoracic CT without contrast	72128
Thoracic CT with contrast (Post-Myelography CT)	72129
Thoracic CT without and with contrast	72130
Lumbar CT without contrast (Post-Discography CT)	72131
Lumbar CT with contrast (Post-Myelography CT)	72132
Lumbar CT without and with contrast	72133
CT Pelvis without contrast	72192
CT Pelvis with contrast	72193
CT Pelvis without and with contrast	72194
Ultrasound	CPT®
Spinal canal ultrasound	76800
Nuclear Medicine	CPT®
Bone Marrow Imaging, Limited	78102
Bone Marrow Imaging, Multiple	78103
Bone Marrow Imaging, Whole Body	78104
Bone or Joint Imaging, Limited	78300
Bone or Joint Imaging, Multiple	78305
Bone Scan, Whole Body	78306
Bone Scan, 3 Phase Study	78315
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, single area (eg, head, neck, chest, pelvis), single day imaging	78800
Radiopharmaceutical localization of tumor, inflammatory process or	78801

distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, 2 or more areas (eg, abdomen and pelvis, head and chest), 1 or more days imaging or single area imaging over 2 or more days	
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); planar, whole body, single day imaging	78802
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT), single area (eg, head, neck, chest, pelvis), single day imaging	78803
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT) with concurrently acquired computed tomography (CT) transmission scan for anatomical review, localization and determination/detection of pathology, single area (eg, head, neck, chest, pelvis), single day imaging	78830
Radiopharmaceutical localization of tumor, inflammatory process or distribution of radiopharmaceutical agent(s) (includes vascular flow and blood pool imaging, when performed); tomographic (SPECT), minimum 2 areas (eg, pelvis and knees, abdomen and pelvis), single day imaging, or single area imaging over 2 or more days	78831

SP-1: General Guidelines

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SP-1.1: General Considerations

- Before advanced diagnostic imaging can be considered, there must be an initial face-to-face clinical evaluation as well as a clinical re-evaluation after a trial of failed conservative therapy; the clinical re-evaluation may consist of a face-to-face evaluation or other meaningful contact with the provider's office such as email, web or telephone communications.
- A face-to-face clinical evaluation is required to have been performed within the last 60 days before advanced imaging is considered. This may have been either the initial clinical evaluation or a clinical re-evaluation.
- The initial clinical evaluation should include a relevant history and physical examination (including a detailed neurological examination), appropriate laboratory studies, non-advanced imaging modalities, results of manual motor testing, the specific dermatomal distribution of altered sensation, reflex examination, and nerve root tension signs (e.g., straight leg raise test, slump test, femoral nerve tension test). *The initial clinical evaluation must be face-to-face; other forms of meaningful contact (telephone call, electronic mail or messaging) are not acceptable as an initial evaluation.*
 - ◆ For those spinal conditions/disorders for which the Spine Imaging Guidelines require a plain x-ray of the spine prior to consideration of an advanced imaging study, the plain x-ray must be performed after the current episode of symptoms started or changed (see **SP-2.1: Anatomic Guidelines**).
- Clinical re-evaluation is required prior to consideration of advanced diagnostic imaging to document failure of significant clinical improvement following a recent (within 3 months) six week trial of provider-directed treatment. Clinical re-evaluation can include documentation of a face-to-face encounter or documentation of other meaningful contact with the requesting provider's office by the patient (e.g., telephone call, electronic mail or messaging).
 - ◆ Provider-directed treatment may include education, activity modification, NSAIDs (non-steroidal anti-inflammatory drugs), narcotic and non-narcotic analgesic medications, oral or injectable corticosteroids, a provider-directed home exercise/stretching program, cross-training, avoidance of aggravating activities, physical/occupational therapy, spinal manipulation, interventional pain procedures and other pain management techniques.
- Any bowel/bladder abnormalities or emergent or urgent indications should be documented at the time of the initial clinical evaluation and clinical re-evaluation.
- Altered sensation to pressure, pain, and temperature should be documented by the specific anatomic distribution (e.g., dermatomal, stocking/glove or mixed distribution).
- Motor deficits (weakness) should be defined by the specific myotomal distribution (e.g., weakness of toe flexion/extension, knee flexion/extension, ankle dorsi/plantar flexion, wrist dorsi/palmar flexion) and gradation of muscle testing should be documented as follows:

Grading of Manual Muscle Testing

0	No evidence of muscle function
1	Muscle contraction but no or very limited joint motion
2	Movement possible with gravity eliminated
3	Movement possible against gravity
4	Movement possible against gravity with some resistance
5	Movement possible against gravity with full or normal resistance

- Pathological reflexes (e.g. Hoffmann's, Babinski, and Chaddock sign) should be reported as positive or negative.
- Asymmetric reflexes and reflex examination should be documented as follows:

Grading of Reflex Testing

0	No response
1+	A slight but definitely present response
2+	A brisk response
3+	A very brisk response without clonus
4+	A tap elicits a repeating reflex (clonus)

- Advanced diagnostic imaging is often urgently indicated and may be necessary if serious underlying spinal and/or non-spinal disease is suggested by the presence of certain patient factors referred to as "red flags." See **SP-1.2: Red Flag Indications**.
- Spinal specialist evaluation can be helpful in determining the need for advanced diagnostic imaging, especially for patients following spinal surgery.
- The need for repeat advanced diagnostic imaging should be carefully considered and may not be indicated if prior advanced diagnostic imaging has been performed. Requests for simultaneous, similar studies such as spinal MRI and CT need to be documented as required for preoperative surgical planning. These studies may be helpful in the evaluation of complex failed spinal fusion cases or needed for preoperative surgical planning when the determination of both soft tissue and bony anatomy is required.
- Serial advanced imaging, whether CT or MRI, for surveillance of healing or recovery from spinal disease is not supported by the currently available scientific evidence-based medicine for the majority of spinal disorders.
- Advanced imaging is generally unnecessary for resolved or improving spinal pain and/or radiculopathy.
- For patients experiencing chronic spine pain, advanced diagnostic imaging has not been shown to be of value in patients with stable, longstanding spinal pain without neurological features or without clinically significant or relevant changes in symptoms or physical examination findings.

Practice Notes

Straight leg raise test (also known as the Lasegue's test) – With the patient in the supine position, the hip medially rotated and adducted, and the knee extended, the examiner flexes the hip until the patient complains of pain or tightness in the back or back of the leg. If the pain is primarily back pain, it is more likely a disc herniation or the pathology causing the pain is more central. If pain is primarily in the leg, it is more likely that the pathology causing the pressure on neurological tissues is more lateral. Disc herniation or pathology causing pressure between the two extremes are more likely to cause pain in both areas. The examiner then slowly and carefully drops the leg back (extends it) slightly until the patient feels no pain or tightness. The patient is then asked to flex the neck so the chin is on the chest, or the examiner may dorsiflex the patient's foot, or both actions may be done simultaneously. Both of these maneuvers are considered to be provocative tests for neurological tissue.

Slump test – The patient is seated on the edge of the examination table with the legs supported, the hips in neutral position, and the hands behind the back. The examination is performed in sequential steps. First, the patient is asked to “slump” the back into thoracic and lumbar flexion. The examiner maintains the patient's chin in neutral position to prevent neck and head flexion. The examiner then uses one arm to apply overpressure across the shoulders to maintain flexion of the thoracic and lumbar spines. While this position is held, the patient is asked to actively flex the cervical spine and head as far as possible (i.e., chin to chest). The examiner then applies overpressure to maintain flexion of all three parts of the spine (cervical, thoracic, and lumbar) using the hand of the same arm to maintain overpressure in the cervical spine. With the other hand, the examiner then holds the patient's foot in maximum dorsiflexion. While the examiner holds these positions, the patient is asked to actively straighten the knee as much as possible. The test is repeated with the other leg and then with both legs at the same time. If the patient is unable to fully extend the knee because of pain, the examiner releases the overpressure to the cervical spine and the patient actively extends the neck. If the knee extends further, the symptoms decrease with neck extension, or the positioning of the patient increases the patient's symptoms, then the test is considered positive.

Femoral nerve tension test (also known as the prone knee bending test) – The patient lies prone while the examiner passively flexes the knee as far as possible so that the patient's heel rests against the buttock. At the same time, the examiner should ensure that the patient's hip is not rotated. If the examiner is unable to flex the patient's knee past 90 degrees because of a pathological condition in the hip, the test may be performed by passive extension of the hip while the knee is flexed as much as possible. The flexed knee position should be maintained for 45 to 60 seconds. Unilateral neurological pain in the lumbar area, buttock, and/or posterior thigh may indicate an L2 or L3 nerve root lesion. Pain in the anterior thigh indicates tight quadriceps muscles or stretching of the femoral nerve.

Hoffmann's sign – The examiner holds the patient's middle finger and briskly flicks the distal phalanx. A positive test is noted if the interphalangeal joint of the thumb of the same hand flexes.

Babinski’s sign – The examiner runs a sharp instrument along the plantar surface of the foot from the calcaneus along the lateral border to the forefoot. A positive test occurs with extension of the great toe with flexion and splaying of the other toes. A negative test occurs with no movement of the toes at all or uniform bunching up of the toes.

Chaddock sign – The examiner strokes the lateral malleolus. A positive test occurs with extension of the great toe.

SP-1.2: Red Flag Indications

Red Flag Indications are intended to represent the potential for life or limb threatening conditions. Red Flag Indications are clinical situations in which localized spine pain and associated neurological features are likely to reflect serious underlying spinal and/or non-spinal disease and warrant exception to the requirement for documented failure of six weeks of provider-directed treatment. Advanced diagnostic imaging of the symptomatic level is appropriate and/or work-up for a non-spinal source of spine pain for Red Flag Indications.

- Red Flag Indications include:
 - ◆ Motor Weakness
 - ◆ Aortic Aneurysm or Dissection
 - ◆ Cancer
 - ◆ Cauda Equina Syndrome
 - ◆ Fracture
 - ◆ Infection
 - ◆ Severe Radicular Pain

Motor Weakness (See: Grading of Manual Muscle Testing and Reflex Testing in SP-1.1: General Considerations)

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
Clinical presentation including one or more of the following: <ul style="list-style-type: none"> ◆ Motor weakness of grade 3/5 or less of specified muscle(s); ◆ New onset foot drop; ◆ Acute bilateral lower extremity weakness; ◆ Progressive objective motor /sensory/deep tendon reflex deficits on clinical re-evaluation. 	MRI of the relevant spinal level without contrast or MRI of the relevant spinal level without and with contrast

Aortic Aneurysm or Dissection

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<ul style="list-style-type: none"> ◆ New onset of back and/or abdominal pain in an individual with a known AAA; or ◆ Acute dissection is suspected. 	See: <u>PVD-6: Aortic Disorders, Renal Vascular Disorders and Visceral Artery Aneurysms</u> and/or <u>CH-29: Thoracic Aorta</u>

Spine Imaging

Cancer

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<p>Clinical presentation including either of the following:</p> <ul style="list-style-type: none"> ◆ There is clinical suspicion of spinal malignancy AND one or more of the following: <ul style="list-style-type: none"> ■ Night pain ■ Uncontrolled or unintended weight loss ■ Pain unrelieved by change in position ■ Age greater than 70 years ■ Severe and worsening spinal pain despite a reasonable (generally after 1 week) trial of provider-directed treatment with re-evaluation; or ◆ Known metastatic malignancies; or acute spinal cord compression from primary or metastatic spinal neoplastic disease is suspected by history and physical examination. 	<p>MRI of the relevant spinal level without contrast or MRI of the relevant spinal level without and with contrast; CT without contrast of the relevant spinal level if MRI contraindicated. See also: <u>ONC-31.5: Bone (including Vertebral) Metastases</u> and <u>ONC-31.6: Spinal Cord Compression</u> in the Oncology Imaging Guidelines.</p>

Cauda Equina Syndrome

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<p>Clinical presentation including one or more of the following:</p> <ul style="list-style-type: none"> ◆ Acute onset of bilateral sciatica; ◆ Perineal sensory loss (“saddle anesthesia”); ◆ Decreased anal sphincter tone; ◆ Bowel/bladder incontinence; ◆ Acute urinary retention. 	<p>MRI Lumbar Spine without contrast (CPT® 72148) or MRI Lumbar Spine without and with contrast (CPT® 72158)</p>

Fracture

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<p>There is clinical suspicion of spinal fracture related to one or more of the following:</p> <ul style="list-style-type: none"> ◆ Long term use of systemic glucocorticoids; ◆ History of prior low energy fractures; ◆ History of low bone mineral density; ◆ Age ≥ 65 years; ◆ Recent significant trauma at any age; ◆ High speed vehicular accident; ◆ Ejection from a motor vehicle; ◆ Fall from elevation ≥ 3 feet/5 stairs; ◆ Head trauma and/or maxillofacial trauma ◆ Patients with ankylosing spondylitis are at high risk of cervical spine fractures even with minor direct/indirect trauma to the cervical spine which can result in quadriparesis/quadriplegia. 	<p>MRI of the relevant spinal level without contrast or CT of the relevant spinal level without contrast</p>

Infection

History, Symptoms or Physical Exam Findings (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<p>There is a clinical suspicion of spinal infection (e.g., disc space infection, epidural abscess or spinal osteomyelitis) and one or more of the following:</p> <ul style="list-style-type: none"> ◆ Fever; ◆ History of IV drug use; ◆ Recent bacterial infection (UTIs, pyelonephritis, pneumonia); ◆ Immunocompromised states; ◆ Long term use of systemic glucocorticoids; ◆ Organ transplant recipient taking anti-rejection medication; ◆ Diabetes mellitus; ◆ HIV/AIDS; ◆ Chronic dialysis; ◆ Immunosuppressant therapy. 	<p>MRI of the relevant spinal level without and with contrast or MRI without contrast</p>

Severe Radicular Pain

All of the following must be present (Initial clinical evaluation required within the last 60 days)	Advanced Diagnostic Imaging
<ul style="list-style-type: none"> ◆ Severe radicular pain in a specified spinal nerve root distribution (minimum 9/10 on the VAS); and ◆ Documented significant functional loss at work or at home; and ◆ Severity of pain unresponsive to a minimum of seven (7) days of provider-directed treatment; and ◆ Treatment plan includes one of the following: <ul style="list-style-type: none"> ■ Transforaminal epidural steroid injection (TFESI) at any level(s); or ■ Interlaminar epidural steroid injection (ILES) at the cervical or thoracic levels; or ■ A plan for urgent/emergent spinal surgery. 	<p>MRI of the relevant spinal level without contrast or MRI without and with contrast</p>

SP-1.3: Definitions

- **Radiculopathy**, for the purpose of this policy, is defined as the presence of pain resulting in significant functional limitations (i.e., diminished quality of life and impaired, age-appropriate activities of daily living), dysaesthesia(s) or paraesthesia(s) reported by the individual in a specified dermatomal distribution of an involved named spinal root(s) and **ONE or MORE** of the following:
 - ◆ Loss of strength of specific named muscle(s) or myotomal distribution(s) or demonstrated on detailed neurologic examination (within the prior 3 months), concordant with nerve root compression of the involved named spinal nerve root(s).
 - ◆ Altered sensation to light touch, pressure, pin prick or temperature demonstrated on a detailed neurologic examination (within the prior 3 months) in the sensory distribution concordant with nerve root compression of the involved named spinal nerve root(s).
 - ◆ Diminished, absent or asymmetric reflex(es) within the prior 3 months concordant with nerve root compression of the involved named spinal nerve root(s).
 - ◆ Either of the following:
 - A concordant radiologist's interpretation of an advanced diagnostic imaging study (MRI or CT) of the spine demonstrating compression of the involved named spinal nerve root(s) or foraminal stenosis at the concordant level(s) (Performed within the prior 12 months).
 - Electrodiagnostic studies (EMG/NCV's) diagnostic of nerve root compression of the involved named spinal nerve root(s). (Performed within the prior 12 months).
- **Radicular pain** is pain which radiates to the upper or lower extremity along the course of a spinal nerve root, typically resulting from compression, inflammation and/or injury to the nerve root.
- **Radiculitis** is defined, for the purpose of this policy, as radicular pain without objective neurological findings.

References

1. el Barzouhi A, Vleggeert-Lankamp C, Lycklama à Nijeholt GJ, et al. Magnetic resonance imaging in follow-up assessment of sciatica. *N Engl J Med*. 2013;368(11):999-1007. doi:10.1056/NEJMoa1209250.
2. Deyo RA, Dieh AK, Rosenthal M. Reducing roentgenography use. *Arch Intern Med*. 1987;147(1):141-145. doi:10.1001/archinte.1987.00370010139029.
3. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA*. 1992; 268(6):760-765. doi:10.1001/jama.1992.03490060092030.
4. Panagopoulos J, Hush J, Steffens D, Hancock, MJ. Do MRI findings change over a period of up to 1 year in patients with low back pain and/or sciatica? *Spine*. 2017;42(7):504-512. doi:10.1097/BRS.0000000000001790.
5. Fabiano V, Franchino G, Napolitano M, et. al. Utility of magnetic resonance imaging in the follow-up of children affected by acute osteomyelitis. *Curr Pediatr Res*. 2017;21(2):354-358.
6. Gilbert FJ, Grant AM, Gillan MG, et al. Low back pain: influence of early MR imaging or CT on treatment and outcome - multicenter randomized trial. *Radiology*. 2004;231:343-351. doi:10.1148/radiol.2312030886.
7. Hoppenfeld S. *Physical Examination of the Spine and Extremities*. Upper Saddle River: Prentice Hall; 1976.
8. Magee DJ. *Orthopedic Physical Assessment*. 4th ed. Philadelphia, PA:Saunders; 2002.
9. Patel ND, Broderick DF, Burns J, et. al. Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria®: Low Back Pain. American College of Radiology (ACR); Date of Origin: 1996. Last Review: 2015. <https://acsearch.acr.org/docs/69483/Narrative/>
10. Patrick N, Emanski E, Knaub MA. Acute and chronic low back pain. *Med Clin North Am*. 2016;100(1):169-81.
11. Reinus WR. *Clinician's Guide to Diagnostic Imaging*. New York, NY: Springer; 2014. doi:10.1007/978-1-4614-8769-2.
12. Sharma H, Lee SWJ, Cole AA. The management of weakness caused by lumbar and lumbosacral nerve root compression. *J Bone Joint Surg Br*. 2012;94-B(11):1442-1447. doi:10.1302/0301-620X.94B11.29148.
13. Stiell IG, Clement CM, McKnight RD, et al. The Canadian c-spine rule versus the NEXUS low-risk criteria in patients with trauma. *N Engl J Med*. 2003;349:2510-2518. doi:10.1056/NEJMoa031375.
14. Underwood M, Buchbinder R. Red flags for back pain. *BMJ*. 2013;347:f7432. doi:10.1136/bmj.f7432.
15. Verhagen A, Downie A, Popal N, et al. Red flags presented in current low back pain guidelines: a review. *Eur Spine J*. 2016; 25:2788-2802. doi:10.1007/s00586-016-4684-0.
16. Visconti AJ, Biddle J, Solomon M. Follow-up imaging for vertebral osteomyelitis a teachable moment. *JAMA*. 2014;174(2):184. doi:10.1001/jamainternmed.2013.12742.
17. Tsiang JT, Kinzy TG, Thompson N, et al. Sensitivity and specificity of patient-entered red flags for lower back pain. *The Spine Journal*. 2019;19(2):293-300. doi:10.1016/j.spinee.2018.06.342.

SP-2: Imaging Techniques

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SP-2.1: Anatomic Guidelines

- Anatomic regions of the spine/pelvis that are included in the following MRI and CT advanced diagnostic imaging studies:
 - ◆ Cervical spine: from the skull base/foramen magnum through T1
 - ◆ Thoracic spine: from C7 through L1
 - ◆ Lumbar spine: from T12 through mid-sacrum
 - ◆ Pelvis: includes hips, sacroiliac joints, sacrum, coccyx
- CT or MRI of the cervical and thoracic spine will image the entire spinal cord since the end of the spinal cord or conus medullaris usually ends at L1 in adults. Therefore, lumbar spine imaging is not needed when the goal is to image only the spinal cord unless there is known or suspected low lying conus medullaris (e.g. tethered cord).
- Plain x-ray should be the initial evaluation for certain suspected spine conditions, including:
 - ◆ See **SP-11: Pathological Spinal Compression Fractures**
 - ◆ See **SP-8: Lumbar Spine Spondylolysis/Spondylolisthesis**
 - ◆ See **SP-10.2: Inflammatory Spondylitis**
 - ◆ See **SP-3.2: Neck (Cervical Spine) Trauma, SP-4.2: Upper Back (Thoracic Spine) Trauma, and SP-6.2: Low Back (Lumbar Spine) Trauma**
 - ◆ See **SP-5.2: Coccydynia without Neurological Features**
 - ◆ See **SP-14: Spinal Deformities (e.g. Scoliosis/Kyphosis)** and **PEDSP-4: Spinal Dysraphism**
 - ◆ See **SP-10: Sacro-Iliac (SI) Joint Pain, Inflammatory Spondylitis/Sacroiliitis and Fibromyalgia**
 - ◆ See **SP-15: Post-Operative Spinal Disorders**

SP-2.2: MRI of the Spine

- See Procedure Codes Associated with Spine Imaging
- Spine MRI is performed either without contrast, with contrast or without and with contrast. A “with contrast” study alone is appropriate only to complete a study begun without contrast. Contrast is generally not indicated for most disc and nerve root disorders, fractures and degenerative disease.
- Spine MRI indications include:
 - ◆ Evaluation of disc disease, spinal cord and nerve root disorders and most other spinal conditions including evaluation of congenital anomalies of the spine and spinal cord
 - ◆ Suspicion for or surveillance of known spine/spinal canal/spinal cord neoplastic disease.
 - ◆ Suspicion, diagnosis of or surveillance of spinal infections, multiple sclerosis or other causes of myelitis, syringomyelia, cauda equina syndrome or other “red flag” indications. See **SP-1.2: Red Flag Indications**.
 - ◆ Preoperative evaluation to define abnormal or variant spinal anatomy that could influence the outcome of a potential surgical procedure. See **SP-16.1: Prior to Spine Surgery**.

- ◆ Spinal imaging for patients having undergone recent spinal surgery e.g., laminectomy, discectomy, spinal decompression, when history and physical examination is suspicious for hematoma, post-surgical infection, or cerebrospinal fluid (CSF) leak.

Positional MRI:

- Positional MRI is also referred to as dynamic, weight-bearing or kinetic MRI. Currently, there is inadequate scientific evidence to support the medical necessity of this study. As such, it should be considered experimental or investigational.

SP-2.3: CT of the Spine

- See Procedure Codes Associated with Spine Imaging
- Spine CT indications include:
 - ◆ Individuals who cannot have MRI (with implanted ferromagnetic materials or electronically, magnetically or mechanically activated implanted devices that are not determined by the manufacturer as MRI compatible).
 - ◆ Any spinal trauma/fractures, especially spinal trauma/fractures that could result in spinal instability and spinal cord/spinal nerve compression.
 - ◆ Spinal neoplastic disease – primary or metastatic.
 - ◆ In conjunction with myelography or discography (see **SP-2.4: CT/Myelography** and **SP-2.5: Lumbar Provocative Discography CT**).
 - ◆ Preoperative evaluation to define abnormal or variant bony spinal anatomy that could influence the outcome of a potential surgical procedure (see **SP-16.1: Prior to Spine Surgery**).
 - ◆ To assess spinal fusions when pseudoarthrosis is suspected (not to be used for routine post-operative assessment where x-rays are sufficient and/or there are no concordant clinical signs or symptoms).
 - ◆ Congenital, developmental or acquired spinal deformity (see **SP-14: Spinal Deformities [e.g. Scoliosis/Kyphosis]**). Spondylolysis when routine x-rays are negative and/or MRI is equivocal, indeterminate or non-diagnostic (see **SP-8: Lumbar Spine Spondylolysis/Spondylolisthesis**).
 - ◆ To evaluate calcified lesions, (e.g., osteophytes, ossification of the posterior longitudinal ligament [OPLL]).

SP-2.4: CT/Myelography

- See Procedure Codes Associated with Spine Imaging
- CT/Myelography is generally unnecessary as an initial study when a diagnostic quality MRI has been obtained.
- CT/Myelography indications include:
 - ◆ To clarify equivocal, indeterminate or non-diagnostic MRI findings or to further evaluate the significance of multiple spinal abnormalities.
 - ◆ When an MRI is contraindicated (see **SP-2.2: MRI of the Spine**).

- ◆ Preoperative planning for spine surgery, (e.g., multilevel spinal stenosis or when a previous MRI is insufficient, equivocal, indeterminate or non-diagnostic). See **SP-16.1: Prior to Spine Surgery**
- ◆ Evaluation after previous spinal surgery when an MRI without and with contrast is contraindicated or MRI results are equivocal, indeterminate or non-diagnostic.
- ◆ eviCore authorizes only the post-myelogram CT (i.e., CPT® 72126, CPT® 72129, and CPT® 72132) and not any other myelogram-related procedure codes (i.e., CPT® 72265 or CPT® 62284).
 - Providers may be required to obtain prior authorization for myelogram-related procedure codes and requirements may vary by health plan payer.
 - Providers are urged to obtain written instructions and prior authorization requirements directly from each health plan payer for myelogram-related procedure codes.

SP-2.5: Lumbar Provocative Discography CT

- eviCore authorizes only the post-lumbar discography CT procedure codes and not any other discography-related procedure codes. A post-lumbar discography CT is considered medically necessary following an approved discography and ALL of the following apply:
 - ◆ A post-discography CT is coded as without contrast.
 - ◆ A CT lumbar spine without contrast (CPT® 72131) is appropriate if verified to be performed as a post-discography CT.
 - ◆ When a post-discography CT is requested and the discography has already been approved eviCore will issue authorization for the post-discography CT procedure codes.

Practice Notes

- Provocative Discography/CT is a controversial procedure purported to diagnose (or rule-out) a discogenic “pain generator” i.e., the source of non-specific axial spinal pain. This diagnostic study, when reported as positive, is often used as an indication for spinal fusion in patients with non-specific axial back pain.
- The following uses of discography are considered controversial:
 - ◆ To identify a symptomatic pseudoarthrosis in a failed spinal fusion.
 - ◆ To identify which of two herniated discs seen on MRI is symptomatic when not determined clinically or otherwise.
 - ◆ To confirm the discogenic nature of pain in a patient with an abnormal disc seen on MRI and to rule out pain from an adjacent disc level.
 - ◆ To confirm the presumptive diagnosis of “internal disc disruption”.
 - ◆ Discography of the cervical and/or thoracic spine.

SP-2.6: Ultrasound of the Spinal Canal

- Spinal canal ultrasound (CPT® 76800) describes the evaluation of the spinal cord (canal and contents) most often performed in newborns, infants, young children and intraoperatively.
- CPT® 76800 describes evaluation of the entire spine and should not be reported multiple times for imaging of different areas of the spinal canal.
- CPT® 76998, rather than CPT® 76800, should be used to report intraoperative spinal canal ultrasound (ultrasonic guidance). Intraoperative use of spinal ultrasound (CPT® 76998) would not require prior authorization by eviCore.

Indications for spinal canal ultrasound (CPT® 76800):

- This study is generally limited to infants, newborns and young children because of incomplete ossification of the vertebral segments surrounding the spinal cord, including the assessment of CSF in the spinal canal and for image-guided lumbar puncture.
- When ossification of the vertebral segments is incomplete for evaluation of suspected or known tethered cord (see **PEDSP-5: Tethered Cord**).
- Evaluation of suspected occult and non-occult spinal dysraphism (see **PEDSP-4: Spinal Dysraphism**).
- Evaluation of spinal cord tumors, vascular malformations and cases of birth-related trauma.
- Contraindicated for use in the adult spine for the assessment of spinal pain, radiculopathy, facet inflammation, nerve root inflammation, disc herniation, and soft tissue conditions surrounding the adult spine other than for superficial masses.

SP-2.7: Limitations of Spinal Imaging in Degenerative Disorders

- Non-specific axial spinal pain is ubiquitous. Advanced diagnostic imaging infrequently identifies the source of the spinal pain (pain generator).
- Incidental findings on MRI and CT, including bulging, protruding, extruding or herniated discs, are often non-concordant, asymptomatic and increase in incidence as the spine ages.
- In individuals with poorly defined clinical presentations, “abnormal” spinal advanced diagnostic imaging results are infrequently clinically concordant, significant, material or substantive and may even lead to inappropriate treatment.
- Performing advanced spinal imaging based only on the presence of spinal degenerative findings identified on x-rays is not generally indicated in patients who are either asymptomatic or present with non-specific axial spinal pain.

SP-2.8: Miscellaneous Spinal Lesions

Vertebral body hemangiomas:

- Vertebral body hemangiomas are common and are generally benign and incidental findings on plain x-rays and advanced diagnostic imaging studies.
- If the appearance of a vertebral body hemangioma is typical on plain x-ray, further spinal advanced diagnostic imaging is not usually required, unless there are associated neurologic symptoms or signs on physical examination.
- If the appearance of a vertebral body hemangioma is atypical on plain x-ray, (with or without neurological signs or symptoms on physical exam, MRI without contrast or MRI without and with contrast is indicated.
- Occasionally, MRI may be equivocal, indeterminate or non-diagnostic and CT without contrast of the spinal area is indicated to help clarify the diagnosis.
- No follow-up imaging is necessary once the diagnosis of a vertebral body hemangioma is established without neurological features.

Tarlov cysts:

- Tarlov cysts are most often cystic dilatations of nerve root sleeves in the lumbar spine and sacrum.
- Controversy exists as to whether Tarlov cysts can result in neurologic signs and symptoms but they can result in erosion of the adjacent bone.
- Usually Tarlov cysts are benign, incidental findings on advanced diagnostic imaging studies. Further evaluation of a known or suspected Tarlov cyst can be performed with a MRI without and with contrast study (CPT® 72158) or with Lumbar CT/Myelography (CPT® 72132).

Other spinal lesions:

- MRI without and with contrast or a CT without contrast is appropriate if:
 - ◆ Other spinal lesions are seen on routine x-rays or a non-contrast MRI; **and**
 - ◆ These additional advanced imaging studies are recommended by a spine specialist or radiologist to further characterize or diagnose the lesion; **or**
 - ◆ Required for surgical planning.

SP-2.9: MRA Spinal Canal

- All requests for spinal MRA will be forwarded for Medical Director Review.
- Spine MRA imaging is utilized infrequently.
- Cerebrospinal Fluid (CSF) flow studies using MRI are included in CPT® codes 70551, 70552, and 70553 and should not be coded or reported separately.

Indications may include:

- Suspected spinal cord arteriovenous malformation (AVM) or arteriovenous fistula (AVF):
 - ◆ Spine MRI of the relevant spine region without and with contrast should be the initial imaging study.
 - ◆ If suspicion for a spinal AVM or AVF is high based upon the results of the spine MRI, catheter angiography is recommended (CPT® 72159 or CPT® 70496).
- Subarachnoid hemorrhage where no brain aneurysm has been previously identified
 - ◆ Catheter angiography (CPT® 70496) should be performed and is the most definitive study to define possible spinal pathology resulting in a spinal canal subarachnoid hemorrhage.
 - ◆ See HD-1.5: General Guidelines – CT and MR Angiography (CTA and MRA)
 - ◆ See HD-12.1: Intracranial Aneurysms
- Preoperative planning
 - ◆ Spinal canal MRA may be useful in identifying major intercostal feeder vessels to the spinal cord prior to surgical procedures that might interfere with this blood supply to the spinal cord. However, catheter angiography (CPT® 72159) is generally a more definitive study for this purpose.

SP-2.10: Spine PET

- At the present time there is controversy regarding spine PET due to inadequate scientific evidence to support the medical necessity of PET for the routine assessment of spinal disorders, other than for neoplastic disease.
- See ONC-31.5: Bone (including Vertebral) Metastases
- Spine PET should be considered experimental or investigational and will be forwarded to Medical Director Review.

SP-2.11: Cone-beam CT

- Cone-beam CT for imaging of the cervical spine should be considered experimental or investigational and will be forwarded to Medical Director Review.

References

1. American Academy of Neurology. Review of the literature on spinal ultrasound for the evaluation of back pain and radicular disorders. Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology*. 1998; 51:343-344. Reaffirmed July 13, 2013.
2. Weishaupt D, Schmid MR, Zanetti M, et al. Positional MR imaging of the lumbar spine: does it demonstrate nerve root compromise not visible at conventional MR imaging? *Radiology*. 2000;215:247-253.
3. Zhang L, Zeitoun D, Rangel A, et al. Preoperative evaluation of the cervical spondylotic myelopathy with flexion-extension magnetic resonance imaging. *Spine Journal*. 2011; 36(17): E1134-E1139.
4. Deyo RA, Dieh AK, Rosenthal M. Reducing roentgenography use. *Arch Intern Med*. 1987;147(1):141-145. doi:10.1001/archinte.1987.00370010139029.
5. North American Spine Society (NASS). Diagnosis and treatment of lumbar disc herniation with radiculopathy. Technical Report. 2012. Available at: <https://www.spine.org/researchclinicalcare/qualityimprovement/clinicalguidelines.aspx>. Accessed May 31, 2016.

SP-3: Neck (Cervical Spine) Pain Without/With Neurological Features (Including Stenosis) and Trauma

SP-3.1: Neck (Cervical Spine) Pain without and with Neurological Features (Including Stenosis)	23
SP-3.2: Neck (Cervical Spine) Trauma	23

SP-3.1: Neck (Cervical Spine) Pain without and with Neurological Features (Including Stenosis)

All of the following are required prior to advanced imaging:	
<ul style="list-style-type: none"> ◆ Initial clinical evaluation performed. ◆ A face-to-face evaluation within the last 60 days. ◆ The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of provider-directed treatment.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP-1.1: General Considerations)	
Advanced Diagnostic Imaging:	MRI Cervical Spine, without contrast (CPT® 72141).
Comments:	CT Cervical Spine without contrast (CPT® 72125) or CT Myelography (CPT® 72126) is appropriate when MRI is contraindicated. For surgery criteria, see the following: <ul style="list-style-type: none"> ◆ CMM-601: Anterior Cervical Discectomy and Fusion ◆ CMM-602: Cervical Total Disc Arthroplasty ◆ CMM-604: Initial Posterior Cervical Decompression with or without Fusion ◆ CMM-605: Cervical Microdiscectomy

SP-3.2: Neck (Cervical Spine) Trauma

All of the following are required prior to advanced imaging:	
<ul style="list-style-type: none"> ◆ Initial clinical evaluation performed. ◆ A face-to-face evaluation within the last 60 days. ◆ The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of provider-directed treatment.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP-1.1: General Considerations)	
Plain x-rays of cervical spine negative for fracture	
Advanced Diagnostic Imaging:	MRI Cervical Spine without contrast (CPT® 72141) or CT Cervical Spine without contrast (CPT® 72125). For patients with ankylosing spondylitis, both MRI Cervical Spine without contrast (CPT® 72141) and CT Cervical Spine without contrast (CPT® 72125) can be approved.
Comments:	Plain x-rays and a 6 week trial of provider-directed treatment and clinical re-evaluation are <i>not</i> required for patients with a high risk mechanism of cervical spine injury within the last 3 months (See below**).

****High risk mechanisms of cervical spine injury may include:**

- ◆ Head trauma and/or maxillofacial trauma
- ◆ Pedestrian in a motor vehicle accident
- ◆ Fall from elevation \geq 3 feet/5 stairs
- ◆ Diving accident
- ◆ Head-on motor vehicle collision without/with airbag deployment
- ◆ Rollover motor vehicle collision
- ◆ Ejection from the vehicle in a motor vehicle collision
- ◆ High speed of the vehicle at the time of collision
- ◆ Not wearing a seatbelt/shoulder harness in a motor vehicle collision
- ◆ Patients with ankylosing spondylitis are at high risk of cervical spine fractures even with minor direct/indirect trauma to the cervical spine which can result in quadriparesis/quadriplegia

➤ Red Flag Indications: See **SP-1.2: Red Flag Indications**

Practice Notes

- Pain radiation patterns from the cervical spine area into the thoracic spine area do not necessarily justify the addition of thoracic spine advanced diagnostic imaging.
- Cervical radiculopathy is often confused with shoulder disorders, brachial plexopathy, peripheral nerve entrapment and/or motor/sensory neuropathies. Electrodiagnostic testing (EMGs/NCVs) is generally used to confirm, not establish, a diagnosis of peripheral nerve entrapment and/or a motor/sensory neuropathy based upon history and physical examination findings. Electrodiagnostic testing is often considered when advanced imaging of the spine does not reveal neurocompressive pathology and/or after 6 weeks of unimproved symptoms of extremity pain, weakness, numbness and/or tingling.

References

1. Thompson WL, Stiell IG, Clement CM, et al. Association of injury mechanism with the risk of cervical spine fractures. *CJEM*. 2009;11(1):14-22.
2. Bogduk N, Karasek M. Precision diagnosis and treatment of back and neck pain. *Continuum: Pain and Palliative Care*. 2005;11(6):94-136.
3. Levin KH, Covington ED, Devereaux MW, et al. Neck and back pain part A. *Continuum*. 2001;7(1):142-151.
4. Werner, B, Samartzis, D, Shen, F. Spinal fractures in patients with ankylosing spondylitis: etiology, diagnosis and management. *JAAOS*. 2016;24(4):241-249.
5. Koivikko MP, Koskinen SK. MRI of cervical spine injuries complicating ankylosing spondylitis. *Skeletal Radiology*. 2008;37(9):813-819.
6. Hoffman JR, Mower WR, Wolfson AB, Todd KH, Zucker MI. Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. National Emergency X-Radiography. Utilization Study Group. *N Engl J Med*. 2000;343(2):94-99.
7. Stiell IG, Wells GA, Vandemheen KL, et al. The Canadian C-spine rule for radiography in alert and stable trauma patients. *JAMA*. 2001;286(15):1841-1848.
8. Eyre A. Overview and comparison of NEXUS and Canadian C-spine rules. *American Journal of Clinical Medicine*. 2006;3:12-15.
9. Daffner RH, Weissman BN, Wippold FJ, et. al. Expert Panels on Musculoskeletal and Neurologic Imaging. ACR Appropriateness Criteria®: Suspected Spine Trauma. American College of Radiology (ACR); Date of Origin: 1999. Last Review: 2012. Accessed on October 20, 2017. <https://acsearch.acr.org/docs/69359/Narrative/>
10. Newman JS, Weissman BN, Angevine PD, et. al. Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria®: Chronic Neck Pain. American College of Radiology (ACR); Date of Origin: 1998. Last Review: 2013. Accessed on October 20, 2017. <https://acsearch.acr.org/docs/69426/Narrative/>.
11. Bernard SA, Kransdorf MJ, Beaman FD, et. al. Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria®: Chronic Back Pain: Suspected Sacroiliitis/Spondyloarthropathy. American College of Radiology (ACR); Date of Origin: 2016. Accessed on October 20, 2017. <https://acsearch.acr.org/docs/3094107/Narrative/>.
12. Stiell IG, Clement CM, McKnight RD, et al. The Canadian c-spine rule versus the NEXUS low-risk criteria in patients with trauma. *N Engl J Med*. 2003;349:2510-2518. doi:10.1056/NEJMoa031375.

SP-4: Upper Back (Thoracic Spine) Pain Without/With Neurological Features (Including Stenosis) and Trauma

SP-4.1: Upper Back (Thoracic Spine) Pain without and with Neurological Features (Including Stenosis)	27
SP-4.2: Upper Back (Thoracic Spine) Trauma	27

SP-4.1: Upper Back (Thoracic Spine) Pain without and with Neurological Features (Including Stenosis)

All of the following are required prior to advanced imaging:	
<ul style="list-style-type: none"> ◆ Initial clinical evaluation performed. ◆ A face-to-face evaluation within the last 60 days. ◆ The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of provider-directed treatment.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see <u>SP-1.1: General Considerations</u>).	
Advanced Diagnostic Imaging:	MRI Thoracic Spine without contrast (CPT® 72146).
Comments:	A CT Thoracic spine without contrast (CPT® 72128) or CT Myelography (CPT® 72129) is appropriate when MRI is contraindicated.

SP-4.2: Upper Back (Thoracic Spine) Trauma

All of the following are required prior to advanced imaging:	
<ul style="list-style-type: none"> ◆ Initial clinical evaluation performed. ◆ A face-to-face evaluation within the last 60 days. ◆ The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of provider-directed treatment.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see <u>SP-1.1: General Considerations</u>).	
Plain x-rays of thoracic spine negative for fracture.	
Advanced Diagnostic Imaging:	MRI Thoracic Spine without contrast (CPT® 72146) or CT Thoracic Spine without contrast (CPT® 72128).

- Red Flag Indications: See **SP-1.2: Red Flag Indications**

Practice Notes

- Thoracic radiculopathy presents with pain radiation from the thoracic spine around the trunk. At upper thoracic spine levels, the pain radiation is from the thoracic spine around the rib cage following the sensory distribution of an intercostal nerve.
- Advanced diagnostic imaging is generally not appropriate in evaluation of axial low back pain with radiation toward the thoracic region unless there are documented clinical features indicating a thoracic spine disorder.

References

1. Nadgir R, Yousem DM. *Neuroradiology: the requisites*. Philadelphia, PA: Elsevier; 2017.
2. Daffner RH, Weissman BN, Wippold FJ, et. al. Expert Panels on Musculoskeletal and Neurologic Imaging. ACR Appropriateness Criteria®: Suspected Spine Trauma. American College of Radiology (ACR); Date of Origin: 1999. Last Review: 2012. Accessed on October 20, 2017. <https://acsearch.acr.org/docs/69359/Narrative/>.

SP-5: Low Back (Lumbar Spine) Pain/Coccydynia without Neurological Features

SP-5.1: Low Back (Lumbar Spine) Pain without Neurological Features	29
SP-5.2: Coccydynia without Neurological Features	29

SP-5.1: Low Back (Lumbar Spine) Pain without Neurological Features

All of the following are required prior to advanced imaging:	
<ul style="list-style-type: none"> ◆ Initial clinical evaluation performed. ◆ A face-to-face evaluation within the last 60 days. ◆ The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of provider-directed treatment.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP-1.1: General Considerations).	
Advanced Diagnostic Imaging:	MRI Lumbar Spine without contrast (CPT® 72148)
Comments:	A CT lumbar spine without contrast (CPT® 72131) or CT Myelography (CPT® 72132) is appropriate when MRI is contraindicated For surgery criteria, see CMM-610: Lumbar Total Disc Arthroplasty

SP-5.2: Coccydynia without Neurological Features

All of the following are required prior to advanced imaging:	
<ul style="list-style-type: none"> ◆ Initial clinical evaluation performed. ◆ A face-to-face evaluation within the last 60 days. ◆ The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit. 	
Failure of recent (within 3 months) 6-week trial of provider-directed treatment.	
Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see SP-1.1: General Considerations).	
Plain x-rays of the sacrum/coccyx are negative for fracture	
Advanced Diagnostic Imaging:	MRI pelvis without contrast (CPT® 72195)
Comments:	A CT pelvis without contrast (CPT® 72192) when MRI is contraindicated.

➤ Red Flag Indications: See **SP-1.2: Red Flag Indications**

Practice Notes

Coccydynia is often reported by patients as “tailbone” pain that is usually idiopathic or post-traumatic and generally follows a benign course.

References

1. Puhakka KB. Magnetic resonance imaging of sacroiliitis in early seronegative spondyloarthritis. Abnormalities correlated to clinical and laboratory findings. *Rheumatology*. 2003;43(2):234-237. doi:10.1093/rheumatology/keh008.
2. Rao, RD, Smuck M. Orthopaedic Knowledge Update 4: Spine, AAOS, 41:477-478.
3. American Academy of Orthopedic Surgeons (AAOS) clinical guidelines on low back pain/sciatica (acute) (phase I and II). Clinical Practice Guidelines..
4. NASS Task Force on clinical guidelines. Herniated disc. In: *Phase III clinical guidelines for multidisciplinary spine care specialists*. Unremitting low back pain. 1st ed. Burr Ridge, IL: North American Spine Society; 2000.
5. Chou R, Qaseem A, Owens DK, et al. Diagnostic imaging for low back pain: Advice for high-value health care from the American College of Physicians. *Ann Intern Med*. 2011;154:181-189.
6. Roudsari B, Jarvik JG. Lumbar spine MRI for low back pain: indications and yield. *AJR*. 2010;195:550-559.
7. Weinstein JN, Lurie JD, Tosteson TD, et al. Surgical versus nonoperative treatment for lumbar disc herniation. *Spine*. 2008;33(25):2789-2800.
8. Chou R, Qaseem A, Snow V, et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Ann Intern Med*. 2007;147:478-491.
9. Levin KH, Covington ED, Devereaux MW, et al. Neck and back pain part A. *Continuum*. 2001;7(1):142-151.
10. Roudsari B, Jarvik JG. Lumbar spine MRI for low back pain: indications and yield. *American Journal of Roentgenology*. 2010;195(3):550-559. doi:10.2214/ajr.10.4367.
11. Cherkin DC, Deyo RA, Battié 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. *New England Journal of Medicine*. 1998;339(15):1021-1029. doi:10.1056/nejm199810083391502.
12. Lieberman JR, ed. *AAOS comprehensive orthopaedic review 2009*. Rosemont, IL.: AAOS (American Academy of Orthopaedic Surgeons); 2009.
13. Deyo RA, Mirza SK, Turner JA, et al. Overtreating chronic back pain: time to back off? *J Am Board Fam Med*. 2009;22(1):62-68.
14. Jarvik JG, Deyo R. Diagnostic evaluation of low back pain with emphasis on imaging. *Ann Intern Med*. 2000;137:586-597.
15. Gillan MGC, Gilbert FJ, Andrew JE. Influence of imaging on clinical decision making in the treatment of low back pain. *Radiol*. 2001;220:393-395.
16. Deyo RA, Weinstein JN. Low back pain. *N Engl J Med*. 2001;344(5):363-370.
17. Carragee EJ. Persistent low back pain. *N Engl J Med*. 2005;352:1891-1898.
18. Sheybani EF, Khanna G, White AJ, Demertzis JL. Imaging of juvenile idiopathic arthritis: a multimodality approach. *Radiographics*. 2013;33(5):1253-1273.
19. Restropo R, Lee EY, Babyn PS. Juvenile idiopathic arthritis: Current practical imaging assessment with emphasis on magnetic resonance imaging. *Radiol Clin N Am*. 2013;51:703-719.
20. Landewe RBM, Hermann KGA, Van Der Heijde DMFM, Baraliakos X, et al. Scoring sacroiliac joints by magnetic resonance imaging. A multiple-reader reliability experiment. *The Journal of Rheumatology*. 2005;32:10.
21. Lambert RGW, Salonen D, Rahman P, Inman RD, et al. Adalimumab significantly reduces both spinal and sacroiliac joint inflammation in patients with ankylosing spondylitis. *Arthritis & Rheumatism*. 2007;56(12):4005-4014.
22. Modic M, Obuchowski N, Ross J, et al. Acute low back pain and radiculopathy: MR imaging findings and their prognostic role and effect on outcome. *Neuroradiology*. 2005;237:597-604. doi:10.1148/radiol.2372041509.
23. Jarvik JG, Gold LS, Comstock BA, et al. Association of early imaging for back pain with clinical outcomes in older patients. *JAMA*. 2015;313(11):1143-1153. doi:10.1001/jama.2015.1871.
24. Ayers JW, Leas EC, Dredze M, et al. Clinicians' perceptions of barriers to avoiding inappropriate imaging for low back pain-knowing is not enough. *JAMA*. 2014;311(14):1399-1400. doi:10.1001/jamainternmed.2016.6274.

25. Panagopoulos J, Hush J, Steffens D, et al. Do MRI findings change over a period of up to 1 year in patients with low back pain and/or sciatica. *Spine Journal*. 2017;42:504-512. doi:10.1097/BRS.0000000000001790.
26. Gilbert FJ, Grant AM, Gillan MG, et al. Low back pain: influence of early MR imaging or CT on treatment and outcome-multicenter randomized trial. *Radiology*. 2004; 231:343-351. doi:10.1148/radiol.2312030886.
27. Kerry S, Hilton S, Dundas D, et al. Radiography for low back pain: a randomized controlled trial and observational study in primary care. *British Journal of General Practice*. 2002;52:469-474.
28. Djais N, Kalim H. The role of lumbar spine radiography in the outcomes of patients with simple acute low back pain. *APLAR Journal of Rheumatology*. 2005;8:45-50.
29. Patel ND, Broderick DF, Burns J, et. al. Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria®: Low Back Pain. *American College of Radiology (ACR)*; Date of Origin: 1996. Last Review: 2015. Accessed on October 20, 2017. <https://acsearch.acr.org/docs/69483/Narrative/>.
30. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA*. 1992;268(6):760-765.
31. Patrick N, Emanski E, Knaub MA. Acute and Chronic Low Back Pain. *Med Clin N Am*. 2016; 100:169–181.

SP-6: Lower Extremity Pain with Neurological Features (Radiculopathy, Radiculitis, or Plexopathy and Neuropathy) With or Without Low Back (Lumbar Spine) Pain

SP-6.1: Lower Extremity Pain with Neurological Features (Radiculopathy, Radiculitis, or Plexopathy and Neuropathy) with or without Low Back (Lumbar Spine) Pain	33
SP-6.2: Low Back (Lumbar Spine) Trauma	33

SP-6.1: Lower Extremity Pain with Neurological Features (Radiculopathy, Radiculitis, or Plexopathy and Neuropathy) with or without Low Back (Lumbar Spine) Pain

All of the following are required prior to advanced imaging:

- ◆ Initial clinical evaluation performed.
- ◆ A face-to-face evaluation within the last 60 days.
- ◆ The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit.

Failure of recent (within 3 months) 6-week trial of provider-directed treatment.

Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see **SP-1.1: General Considerations**).

See **SP-9.1: Lumbar Spinal Stenosis**

Advanced Diagnostic Imaging:	MRI Lumbar Spine without contrast (CPT® 72148)
Comments:	<p>A CT lumbar spine without contrast (CPT® 72131) or CT Myelography (CPT® 72132) is appropriate when MRI is contraindicated.</p> <p>For surgery criteria, see the following:</p> <ul style="list-style-type: none"> ◆ CMM-606: Lumbar Microdiscectomy ◆ CMM-608: Lumbar Decompression ◆ CMM-609: Lumbar Fusion (Arthrodesis)

SP-6.2: Low Back (Lumbar Spine) Trauma

All of the following are required prior to advanced imaging:

- ◆ Initial clinical evaluation performed.
- ◆ A face-to-face evaluation within the last 60 days.
- ◆ The initial evaluation is not required within the last 60 days if another face-to-face evaluation was performed in that time frame. This may be satisfied by the initial evaluation, re-evaluation or another visit.

Failure of recent (within 3 months) 6-week trial of provider-directed treatment.

Clinical re-evaluation after treatment period (may consist of a face-to-face evaluation or other meaningful contact, see **SP-1.1: General Considerations**).

Plain x-rays of lumbar spine negative for fracture.

Advanced Diagnostic Imaging:	MRI Lumbar Spine without contrast (CPT® 72148) or CT Lumbar Spine without contrast (CPT® 72131).
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- Red Flag Indications: See **SP-1.2: Red Flag Indications**
- Definitions of radiculopathy, radiculitis and radicular pain: See **SP-1.3: Definitions**
- Sciatic Neuropathy, Femoral Neuropathy, Peroneal Neuropathy and Meralgia Paresthetica: See **PN-2: Focal Neuropathy**
- Lumbar and/or Lumbosacral Plexopathy: See **PN-5: Lumbar and Lumbosacral Plexus**

- Advanced imaging of the hip or pelvis is not generally required in the evaluation of apparent lumbar radiculopathy unless a separate recognized indication for such studies is documented. See **MS-24: Hip** in the Musculoskeletal Imaging Guidelines.

References

1. Puhakka KB, Jurik AG, Schiottz-Christensen B, et al. Magnetic resonance imaging of sacroiliitis in early seronegative spondyloarthritis. Abnormalities associated to clinical and laboratory findings. *Rheumatology* 2004;43(2):234-237.
2. Rao, RD, Smuck M. Orthopaedic Knowledge Update 4: Spine. AAOS. 41:477-478.
3. American Academy of Orthopedic Surgeons (AAOS) clinical guidelines on low back pain/sciatica (acute) (phase I and II). Clinical Practice Guidelines. .
4. NASS Task Force on clinical guidelines. *Herniated disc*. In: Phase III clinical guidelines for multidisciplinary spine care specialists. Unremitting low back pain. 1st ed. Burr Ridge, IL: North American Spine Society; 2000.
5. Chou R. Diagnostic imaging for low back pain: advice for high-value health care from the American College of Physicians. *Annals of Internal Medicine*. 2011;154(3):181-189. doi:10.7326/0003-4819-154-3-20110210-00008.
6. Roudsari B, Jarvik JG. Lumbar spine MRI for low back pain: indications and yield. *American Journal of Roentgenology*. 2010;195(3):550-559. doi:10.2214/ajr.10.4367.
7. Weinstein JN, Lurie JD, Tosteson TD, et al. Surgical versus nonsurgical treatment for lumbar degenerative spondylolisthesis. *New England Journal of Medicine*. 2007;356(22):2257-2270. doi:10.1056/nejmoa070302.
8. Chou R, Qaseam A, Snow V, et al. Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Ann Intern Med* 2007;147:478-491.
9. Levin KH, Covington ED, Devereaux MW, et al. Neck and back pain part A. *Continuum*. 2001;7(1):142-151.
10. Cherkin DC, Deyo RA, Battié 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. *New England Journal of Medicine*. 1998;339(15):1021-1029. doi:10.1056/nejm199810083391502.
11. Lieberman JR, ed. *AAOS comprehensive orthopaedic review 2009*. Rosemont, IL.: AAOS (American Academy of Orthopaedic Surgeons); 2009.
12. Deyo RA, Mirza SK, Turner JA, et al. Overtreating chronic back pain: time to back off? *J Am Board Fam Med*. 2009;22(1):62-68.
13. Jarvik JG, Deyo R. Diagnostic evaluation of low back pain with emphasis on imaging. *Ann Intern Med*. 2000;137:586-597.
14. Gillan MGC, Gilbert FJ, Andrew JE. Influence of imaging on clinical decision making in the treatment of low back pain. *Radiol*, 2001; 220:393-395.
15. Deyo RA, Weinstein JN. Low back pain. *N Engl J Med*. 2001;344(5):363-370.
16. Carragee EJ. Persistent low back pain. *N Engl J Med*. 2005;352:1891-1898.
17. Sheybani EF, Khanna G, White AJ, Demertzis JL. Imaging of juvenile idiopathic arthritis: A multimodality approach. *Radiographics*. 2013;33(5):1253-1273.
18. Restropo R, Lee EY, Babyn PS. Juvenile idiopathic arthritis: Current practical imaging assessment with emphasis on magnetic resonance imaging. *Radiol Clin N Am*. 2013;51:703-719.
19. Landewe RBM, Hermann KGA, Van Der Heijde DMFM, Baraliakos X, et al. Scoring sacroiliac joints by magnetic resonance imaging. A multiple-reader reliability experiment. *The Journal of Rheumatology*. 2005;32:10.
20. Lambert RGW, Salonen D, Rahman P, Inman RD, et al. Adalimumab significantly reduces both spinal and sacroiliac joint inflammation in patients with ankylosing spondylitis. *Arthritis & Rheumatism*. 2007; 56(12):4005-4014.
21. Panagopoulos J, Hush J, Steffens D, et al. Do MRI findings change over a period of up to 1 year in patients with low back pain and/or sciatica. *Spine Journal*. 2017;42:504-512. doi:10.1097/BRS.0000000000001790.

22. Gilbert FJ, Grant AM, Gillan MG, et al. Low back pain: influence of early MR imaging or CT on treatment and outcome-multicenter randomized trial. *Radiology*. 2004;231:343-351. doi:10.1148/radiol.2312030886.
23. Modic M, Obuchowski N, Ross J, et al. Acute low back pain and radiculopathy: MR imaging findings and their prognostic role and effect on outcome. *Neuroradiology*. 2005;237:597-604. doi:10.1148/radiol.2372041509.
24. Barzouhi A, Vleggeert-Lankamp C, Lycklama a Nijehold G, et al. Magnetic resonance imaging in follow-up assessment of sciatica. *N Engl J Med*. 2013;368;11:999-1007.
25. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA*. 1992;268(6): 760-765.
26. Patel ND, Broderick DF, Burns J, et. al. Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria®: Low Back Pain. American College of Radiology (ACR); Date of Origin: 1996. Last Review: 2015. <https://acsearch.acr.org/docs/69483/Narrative/>.
27. Daffner RH, Weissman BN, Wippold FJ, et. al. Expert Panels on Musculoskeletal and Neurologic Imaging. ACR Appropriateness Criteria®: Suspected Spine Trauma. American College of Radiology (ACR); Date of Origin: 1999. Last Review: 2012. <https://acsearch.acr.org/docs/69359/Narrative/>.

SP-7: Myelopathy

SP-7.1: Myelopathy

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SP-7.1: Myelopathy

- Myelopathy is the development of abnormal spinal cord function with long tract signs usually secondary to spinal cord compression, but also inflammation (transverse myelitis, MS, etc.), neoplastic disease or spinal cord infarction.
- Examination findings may include loss of manual dexterity, spastic legs and ataxia with hyperreflexia and upgoing toes (positive Babinski), Hoffmann's sign, sustained clonus, Lhermitte's sign, crossed radial reflex, inverted radial reflex and finger escape sign. Sensory level and urinary incontinence/retention may be seen. Advanced imaging is generally appropriate in the initial evaluation of documented or reasonably suspected myelopathy.
- Cervical, thoracic, and lumbar spine MRI without contrast, or without and with contrast, are appropriate for:
 - ◆ Initial evaluation of reasonably suspected myelopathy.
 - ◆ Suspected tethered cord.
 - ◆ Post-traumatic syrinx with increased spinal pain or a worsening neurological symptoms.
 - ◆ Sustained, prominent, and unexplained Lhermitte's sign.
 - ◆ Unexplained Babinski's sign.
 - ◆ Hoffmann's sign.
- Conservative treatment is not a requirement for advanced imaging in patients with potential myelopathy.
- CT/Myelography scan can also be considered, especially for surgical planning.
- For surgery criteria, see the following:
 - ◆ CMM-601: Anterior Cervical Discectomy and Fusion
 - ◆ CMM-602: Cervical Total Disc Arthroplasty
 - ◆ CMM-604: Posterior Cervical Decompression with or without Fusion
 - ◆ CMM-605: Cervical Microdiscectomy

Practice Notes

Lhermitte's sign – With the patient in the long leg sitting position on the examination table, the examiner passively flexes the patient's head and one hip simultaneously with the leg kept straight. A positive test occurs if there is sharp pain down the spine and into the upper or lower extremities.

Babinski's sign – The examiner runs a sharp instrument along the plantar surface of the foot from the calcaneus along the lateral border to the forefoot. A positive test occurs with extension of the great toe with flexion and splaying of the other toes. A negative test occurs with no movement of the toes at all or uniform bunching up of the toes.

Hoffman's sign – The examiner holds the patient's middle finger and briskly flicks the distal phalanx. A positive test is noted if the interphalangeal joint of the thumb of the same hand flexes.

References

1. Green C, Butler J, Eustace S, Poynton A, Obyrne JM. Imaging Modalities for Cervical Spondylotic Stenosis and Myelopathy. *Advances in Orthopedics*. 2012;2012:1-4. doi:10.1155/2012/908324.
2. Avadhani A, Rajasekaran S, Shetty AP. Comparison of prognostic value of different MRI classifications of signal intensity change in cervical spondylotic myelopathy. *Spine Journal*. 2010;10:475-485.
3. Harada T, Tsuji Y, Mikami Y et al. The clinical usefulness of preoperative dynamic MRI to select decompression levels for cervical spondylotic myelopathy. *Magnetic Resonance Imaging*. 2010;28:820-826.
4. Ohshio I, Hatayama K, Takahara M, Nagashima K. Correlation between histopathologic features and magnetic resonance images of spinal cord lesions. *Spine*. 1993;18:1140-1149.
5. Roth CJ, Angevine PD, Aulino JM, et. al. Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria®: Myelopathy. American College of Radiology (ACR); Date of Origin: 1996. Last Review: 2015. <https://acsearch.acr.org/docs/69484/Narrative/>.
6. Zhang L, Zeitoun D, Rangel A, et al. Preoperative evaluation of the cervical spondylotic myelopathy with flexion-extension magnetic resonance imaging. *Spine Journal*. 2011;36(17): E1134-E1139.
7. Magee DJ. *Orthopedic Physical Assessment*. 4th ed. Philadelphia, PA: Saunders;2002.
8. Hoppenfeld S. *Physical Examination of the Spine and Extremities*. Upper Saddle River: Prentice Hall; 1976.

SP-8: Lumbar Spine Spondylolysis/Spondylolisthesis

SP-8.1: Spondylolysis	40
SP-8.2: Spondylolisthesis	41

SP-8.1: Spondylolysis

- Spondylolysis is most often an incidental finding on plain x-rays, and advanced imaging is generally not indicated.
- If plain x-rays are negative, equivocal or indeterminate and clinical suspicion is high:
 - ◆ 99mTc-MDP SPECT bone scan (CPT® 78803) is indicated to identify stress reaction in early spondylolysis cases which are radiographically occult.
 - ◆ Lumbar spine MRI without contrast (CPT® 72148) is appropriate for **ANY** of the following:
 - SPECT bone scan is negative
 - To evaluate for stress reaction in bone, to visualize nerve roots
 - There is a documented need for preoperative planning
 - There is treatment failure following 6 weeks immobilization with a spinal orthosis and provider-directed treatment with clinical re-evaluation.
 - **Note:** MRI is not appropriate in the early diagnosis of spondylolysis due to the potential for false negative results.
- Lumbar spine CT without contrast (CPT® 72131) for ANY of the following:
 - ◆ MRI is contraindicated
 - ◆ SPECT bone scan is negative
 - ◆ To evaluate bony anatomy
 - ◆ To state a lesion seen on SPECT bone scan
 - ◆ There is a documented need for preoperative planning
 - ◆ There is treatment failure following 6 weeks immobilization with a spinal orthosis and provider-directed treatment with clinical re-evaluation. See **SP-1.2: Red Flag Indications**.
- For pediatric spondylolysis, See **PEDSP-2.4: Spondylolysis**
- Bony healing cannot be achieved non-surgically in an established well defined isthmic pars interarticularis defect whether it is developmental or the result of a pars interarticularis fracture non-union. Repeat advanced diagnostic imaging is not medically necessary in this setting.
 - ◆ Repeat lumbar spine CT without contrast (CPT® 72131) of the symptomatic spinal level is indicated to monitor healing of a pars interarticularis fracture that was determined to have healing potential on a prior CT (i.e., non-sclerotic lesion).
- For surgery criteria, see the following:
 - ◆ CMM-603: Electrical and Low Frequency Ultrasound Bone Growth Stimulation (Spine)
 - ◆ CMM-609: Lumbar Fusion (Arthrodesis)

SP-8.2: Spondylolisthesis

- CT lumbar spine without contrast (CPT® 72131) or MRI lumbar spine without contrast (CPT® 72148) can be considered after plain x-ray for the following:
 - ◆ Failure of 6 week trial of provider-directed treatment and clinical re-evaluation (see **SP-1.1: General Considerations**); **or**
 - ◆ Preoperative evaluation; **or**
 - ◆ See **SP-1.2: Red Flag Indications**
- For surgery criteria, see the following:
 - ◆ CMM-608: Lumbar Decompression
 - ◆ CMM-609: Lumbar Fusion (Arthrodesis)

Practice Notes

- Stress reactions and stress fractures of the pars interarticularis are most common in athletes and others whose activities involve repetitive flexion/extension loading of the lumbar spine and may be acute or chronic and unilateral or bilateral. Pars interarticularis defects can be an incidental finding on plain x-rays and is frequently asymptomatic.
- Spondylolisthesis is the forward (anterolisthesis) or backward (retrolisthesis, usually not clinically significant) displacement of one vertebra in relation to an adjacent vertebra, most commonly at L4-5 and L5-S1, although other levels of the spine may be involved. Spondylolisthesis is often an incidental finding on plain x-ray and is frequently asymptomatic.

References

1. Rao, RD, Smuck M. Orthopaedic Knowledge Update 4: Spine. AAOS. 41:477-478.
2. Lieberman JR, ed. *AAOS comprehensive orthopaedic review 2009*. Rosemont, IL.: AAOS (American Academy of Orthopaedic Surgeons); 2009. 771-775.
3. Kuhns BD, Kouk S, Buchanan C, et al. Sensitivity of magnetic resonance imaging in the diagnosis of mobile and non-mobile L4-5 degenerative spondylolisthesis. *The Spine Journal*; 2014. doi:10.1016/j.spinee.2014.08.006.
4. Foreman P, et al. L5 spondylolysis/spondylolisthesis: a comprehensive review with an anatomic focus. *Childs Nerv Syst*. 2013;29:209-16.
5. Harvey CJ, et. The radiological investigation of lumbar spondylolysis. *Clin Radiol*. 1998;53:723-28.
6. Kruse D, Lemmen B. Spine injuries in the sport of gymnastics. *Curr Sports Med Rep*. 2009;8:20-28.
7. Standaert CJ, Herring SA. Spondylolysis: a critical review. *British Journal of Sports Medicine*. 2000;34:415-422.
8. Leone A, et al. Lumbar spondylolysis: a review. *Skeletal Radiol*. 2011;40:683-700.
9. Kobayashi A, et al. Diagnosis of radiographically occult lumbar spondylolysis in young athletes by magnetic resonance imaging. *Am J Sports Med*. 2013;41:169-76.
10. Fujii K, Katoh S, Sairyō K, et al. Union of defects in the pars interarticularis of the lumbar spine in children and adolescents: the radiologic outcome after conservative treatment. *J Bone Joint Surg Br*. 2004;86:225-31.
11. Puhakka KB, Jurik AG, Schiøtz-Christensen B, et. al. Magnetic resonance imaging of sacroiliitis in early seronegative spondyloarthritis. Abnormalities correlated to clinical and laboratory findings. *Rheumatology*. 2004;43(2):234-237.

SP-9: Lumbar Spinal Stenosis

SP-9.1: Lumbar Spinal Stenosis

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SP-9.1: Lumbar Spinal Stenosis

- MRI lumbar spine without contrast (CPT® 72148) or CT Lumbar Spine without contrast (CPT® 72131) is appropriate for those patients with clinical suspicion of lumbar spinal stenosis if:
 - ◆ Failure of 6 week trial of provider-directed treatment and clinical re-evaluation (see **SP-1.1: General Considerations**); **or**
 - ◆ Red Flag Indications (see: **SP-1.2: Red Flag Indications**); **or**
 - ◆ Severe symptoms of neurogenic claudication restricting normal activity or requiring the frequent use of narcotic analgesics.
- A CT/Myelogram lumbar spine (CPT® 72132) may also be considered for patients who have failed 6-weeks of provider-directed treatment if requested by the operating surgeon for surgical planning, especially for multi-level lumbar spinal stenosis.
- For surgery criteria, see the following:
 - ◆ CMM-608: Lumbar Decompression
 - ◆ CMM-609: Lumbar Fusion (Arthrodesis)

Practice Notes

Lumbar spinal stenosis refers to a decrease in the space available for the neural elements within the spinal canal that include spinal nerve roots and the cauda equina. It is usually a degenerative condition of the aging spine which can be asymptomatic or a common cause of buttock/low back and/or leg pain (neurogenic claudication) in this population. Neurogenic claudication is a common symptom of lumbar spinal stenosis that is aggravated by walking, especially down hills or stairs, with prolonged standing and is often relieved by sitting and bending forward. Neurogenic claudication should be differentiated from vascular claudication (leg/calf pain) that is often aggravated by walking and relieved fairly rapidly by stopping and rest. The differential diagnosis for lumbar spinal stenosis should include peripheral vascular disease, hip disorders and peripheral neuropathy.

References

1. Patel ND, Broderick DF, Burns J, et. al. Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria®: Low Back Pain. American College of Radiology (ACR); Date of Origin: 1996. Last Review: 2015. <https://acsearch.acr.org/docs/69483/Narrative/>.
2. North Am Spine Society, *Clinical guidelines for multidisciplinary spine care specialists: spinal stenosis*. Version 1.02002. <http://www.guideline.gov>.
3. Grossman RI, Yousem DM. *Neuroradiology, the requisites*. 2nd Ed. Philadelphia, PA: Mosby; 2003. 784-786.
4. *Highlights from the 2007 North American Spine Society Meeting*. Sg2 Web Seminar, November 8, 2007.
5. Tosteson ANA, Lurie JD, Tosteson TD, et al. Surgical treatment of spinal stenosis with and without degenerative spondylolisthesis: cost-effectiveness after 2 years. *Ann Intern Med*. 2008;149(12):845-853.
6. Katz JN, Harris MB. Clinical practice. Lumbar spinal stenosis. *N Engl J Med*. 2008;358:818-825.
7. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA*. 1992; 268(6):760-765.
8. Devin CJ, McCullough KA, Morris BJ, et al. Hip-spine syndrome. *J Am Acad Orthrop Surg*. 2012;20:434-442.

SP-10: Sacro-Iliac (SI) Joint Pain, Inflammatory Spondylitis/Sacroiliitis and Fibromyalgia

SP-10.1: Sacro-Iliac (SI) Joint Pain/Sacroiliitis	45
SP-10.2: Inflammatory Spondylitis	45
SP-10.3: Fibromyalgia	45

SP-10.1: Sacro-Iliac (SI) Joint Pain/Sacroiliitis

- Pelvis CT without contrast (CPT® 72192) or MRI pelvis without contrast (CPT® 72195) is appropriate if:
 - ◆ Initial plain x-rays are equivocal or not diagnostic; **and**
 - ◆ Failure of 6 weeks of provider-directed treatment and clinical re-evaluation (See: **SP-1.1: General Considerations**); **or**
 - ◆ Any one of the following:
 - Fractures of the sacrum or sacroiliac joint(s); **or**
 - See: **SP-1.2: Red Flag Indications**; **or**
 - Preoperative planning
 - ◆ MRI pelvis without and with contrast as indicated for pediatric patients with juvenile idiopathic arthritis.
 - ◆ Suspicion of neoplastic, inflammatory, or infectious disease:
 - MRI pelvis without and with contrast (CPT® 72197) or MRI pelvis without contrast (CPT® 72195)
 - Pelvis CT without contrast (CPT® 72192) if MRI is contraindicated
- See also: MS-15.1: Rheumatoid Arthritis and Inflammatory Arthritis

SP-10.2: Inflammatory Spondylitis

- Initial plain x-rays are equivocal or not diagnostic.
 - ◆ MRI without and with contrast or MRI without contrast of the affected spinal region.
 - CT without contrast of the affected spinal region if MRI is contraindicated
 - ◆ MRI Cervical Spine without contrast (CPT® 72141) and CT Cervical Spine without contrast (CPT® 72125) if a patient with documented ankylosing spondylitis reports neck pain following any head/maxillofacial/neck injury.

SP-10.3: Fibromyalgia

- Advanced diagnostic imaging is not supported by the scientific evidence for the evaluation and treatment of fibromyalgia.

Practice Notes

- Sacroiliitis can present with pain localized to the SI joint or referred pain to the buttock and/or posterior thigh without neurologic signs or symptoms. Affected individuals can often point to the SI joint as the pain source. Provocative and/or therapeutic SI joint anesthetic/corticosteroid injections can have diagnostic value.
- There is no evidence demonstrating that advanced diagnostic imaging substantiates changes to patient management decisions in patients with proven SI joint disorders when visible on routine plain x-rays.
- MRI has shown inflammatory changes in the SI joints prior to visible x-ray changes in several studies. However, the ability of MRI to characterize inflammation in early ankylosing spondylitis, the ability of MRI to predict erosive changes, and the value of monitoring treatment effects using serial MRI studies remains controversial and investigational in adults.

References

1. Puhakka KB, Jurik AG, Schiottz-Christensen B, et al. Magnetic resonance imaging of sacroiliitis in early seronegative spondylarthropathy. Abnormalities correlated to clinical and laboratory findings. *Rheumatology* 2004;43:234-237.
2. Dreyfuss P, Dreyer SJ, Cole A, et al. Sacroiliac joint pain. *Am Acad Orthop Surg*. 2004;12:255-265.
3. Maigne JY, Tamalet B. Standardized radiologic protocol for the study of common coccygodynia and characteristics of the lesions observed in the sitting position. Clinical elements differentiating luxation, hypermobility, and normal mobility. *Spine*. 1996;21:2588-2593.
4. Maigne JY, Doursounian L, Chatellier G. Causes and mechanisms of common coccydynia: role of BMI and coccygeal trauma. *Spine*. 2000;25:3072-3079.
5. Landewe RBM, Hermann KGA, Van Der Heijde DMFM, Baraliakos X, et al. Scoring sacroiliac joints by magnetic resonance imaging. A multiple-reader reliability experiment. *The Journal of Rheumatology*. 2005;32:10.
6. Lambert RGW, Salonen D, Rahman P, Inman RD, et al. Adalimumab significantly reduces both spinal and sacroiliac joint inflammation in patients with ankylosing spondylitis. *Arthritis & Rheumatism*. 2007;56(12):4005-4014.
7. Sheybani EF, Khanna G, White AJ, Demertzis JL. Imaging of juvenile idiopathic arthritis: a multimodality approach. *Radiographics*. 2013;33(5):1253-1273.
8. Restropo R, Lee EY, Babyn PS. Juvenile idiopathic arthritis: Current practical imaging assessment with emphasis on magnetic resonance imaging. *RadiolClin N Am*. 2013;51:703-719.
9. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA*. 1992;268(6):760-765.
10. Bernard SA, Kransdorf MJ, Beaman FD, et. al. Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria®: Chronic Back Pain: Suspected Sacroiliitis/Spondyloarthropathy. American College of Radiology (ACR); Date of Origin: 2016. <https://acsearch.acr.org/docs/3094107/Narrative/>.

SP-11: Pathological Spinal Compression Fractures

SP-11.1: Pathological Spinal Compression Fractures

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SP-11.1: Pathological Spinal Compression Fractures

- MRI without contrast or CT without contrast of the affected spinal region can be considered after plain x-ray evaluation **and** the location of the patient's spinal pain is concordant with the spinal x-rays for any one of the following:
 - ◆ X-rays reveal a new spinal compression fracture; **or**
 - ◆ X-rays are non-diagnostic and severe spinal pain persists for more than one week in a patient already predisposed to low energy/insufficiency fractures; **or**
 - ◆ The acuity of the spinal compression fracture deformity on plain x-ray is indeterminate, **or**
 - ◆ Surgical planning following known insufficiency spinal compression fractures in individuals who are candidates for kyphoplasty, vertebroplasty or other spine surgical procedures; **or**
 - ◆ See **SP-1.2: Red Flag Indications**
- For surgery criteria, see CMM-607: Primary Vertebral Augmentation

Practice Notes

Insufficiency/low energy spinal compression fractures of the spine occur due to the lack of structural integrity to withstand physiologic loads and minor spinal trauma. Low bone mineral density is the primary etiology for most of these fractures but could also occur in the setting of other bone disease and medical conditions, in addition to neoplastic disease and infection. Sudden localized back pain, with or without trauma, is a typical presentation of insufficiency/low energy spinal compression fractures and can often be an incidental finding on plain x-rays and can be asymptomatic.

References

1. Patel ND, Broderick DF, Burns J, et. al. Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria®: Low Back Pain. *American College of Radiology (ACR)*; Date of Origin: 1996. Last Review: 2015. <https://acsearch.acr.org/docs/69483/Narrative/>.
2. McConnell CT, Wippold FJ, Ray CE, et. al. Expert Panels on Neurologic Imaging, Interventional Radiology, and Musculoskeletal Imaging. ACR Appropriateness Criteria®: Management of Vertebral Compression Fractures. *American College of Radiology (ACR)*; Date of Origin: 2010. Last Review: 2013. <https://acsearch.acr.org/docs/70545/Narrative/>.
3. Old JL, Calvert M. Vertebral compression fractures in the elderly. *Am Fam Physician*. 2004;69:111-116.
4. Brunton S, Carmichael B, Gold D, et al. Vertebral compression fractures in primary care. *J Fam Practice*. 2005 Sept. (Supplement):781-788.
5. McCarthy J, Davis A. Diagnosis and management of vertebral compression fractures. *Am Fam Physician*. 2016 94:44-50.
6. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA*. 1992;268(6):760-765.

SP-12: Spinal Pain in Cancer Patients

- For guidelines regarding advanced diagnostic imaging in this clinical setting, See **ONC-31.6: Spinal Cord Compression**.
- For metastatic disease of the spine without neurological signs or symptoms:
 - ◆ See: **ONC-31.5: Bone (including Vertebral) Metastases** for advanced diagnostic imaging guidelines in patients with spinal pain with a history of primary or metastatic neoplastic disease, especially cancer of the breast, lung, thyroid, kidney and prostate.

SP-13: Spinal Canal/Cord Disorders (e.g. Syringomyelia)

SP-13.1: Initial Imaging Pathway	51
SP-13.2: Follow-up Imaging	51

SP-13.1: Initial Imaging Pathway

- MRI cervical spine without and with contrast (CPT® 72156) is appropriate when syringomyelia is suspected.
- Once a syrinx is identified by the initial MRI cervical spine without and with contrast:
 - ◆ MRI of the brain, usually without contrast (CPT® 70551) to evaluate for syringobulbia; **and**
 - ◆ MRI of the thoracic spine without and with contrast (CPT® 72157) to define the lower most extent of the syrinx or to identify a skip lesion.
 - ◆ Advanced diagnostic imaging of the lumbar spine is generally not indicated unless tethered cord is suspected.

SP-13.2: Follow-up Imaging

- MRI cervical spine without contrast (CPT® 72141) and MRI brain without contrast (CPT® 70551) and/or MRI thoracic spine without contrast (CPT® 72146) when involved.
 - ◆ If there is a concern for malignancy, imaging can be performed without and with contrast.
 - ◆ Annual imaging until non-progression of the syringomyelia is established.
 - ◆ Following surgical treatment (including posterior fossa decompression).
 - ◆ Advanced diagnostic imaging every three years for life can be performed once non-progression of the syringomyelia is established.
 - ◆ Repeat advanced diagnostic imaging is appropriate when there is evidence of neurologic deterioration.
 - ◆ Repeat advanced diagnostic imaging in spinal cord injury patients with post-traumatic syrinx is not appropriate without evidence of neurological deterioration.

Practice Notes

Syringomyelia may begin to form in childhood but rarely becomes symptomatic before the adult years.

Reference

1. Mancall ER. *Syringomyelia*. In: Rowland LP, ed. *Merritt's Neurology*. 11th Ed. Philadelphia, PA: Lippincott; 2005:870-874.

SP-14: Spinal Deformities (e.g. Scoliosis/Kyphosis)

SP-14.1: Spinal Deformities (e.g. Scoliosis/Kyphosis)	53
SP-14.2: Revision Spinal Deformity Surgery	53

SP-14.1: Spinal Deformities (e.g. Scoliosis/Kyphosis)

- MRI without contrast or MRI without and with contrast of the affected spinal regions is appropriate after plain x-rays (e.g., Cobb radiographs) of the affected spinal regions:
 - ◆ For preoperative evaluation; **or**
 - ◆ For cases of congenital scoliosis and other atypical curves that may be associated with spinal canal/cord pathology such as tethered cord, syringomyelia, diastematomyelia, or tumors; **or**
 - ◆ For cases of scoliosis when there are associated neurologic signs and symptoms on physical examination; **or**
 - ◆ Scoliosis with a convex left thoracic curve due to a high association of a convex left thoracic curve with underlying spinal canal/cord pathology.
- CT of the affected spinal regions (contrast as requested) is appropriate in cases with a complex osseous deformity for preoperative evaluation.
- CTA or MRA is not medically necessary for preoperative planning for initial anterior spinal surgery for surgical correction of spinal deformities.

SP-14.2: Revision Spinal Deformity Surgery

- If requested by the operating surgeon, the following studies can be performed for preoperative planning for revision anterior spinal surgery:
 - ◆ CTA pelvis (CPT® 72191) and/or CTA abdomen (CPT® 74175); **or**
 - ◆ MRA pelvis (CPT® 72198) and/or MRA abdomen (CPT® 74185)

Practice Notes

Scoliosis is defined as a curvature of the spine in the coronal plane. Scoliosis can involve any or all levels of the spine but generally involves the thoracic and/or lumbar spine. Scoliosis initially occurs in the pediatric and adolescent population and persists throughout life. If scoliosis begins in adulthood, it is usually secondary to neurologic disorders (e.g., posttraumatic paralysis) or degenerative spondylosis. Sagittal plane spinal deformity (e.g., kyphosis, hyperlordosis) may be associated with scoliosis.

References

1. Boas SR. *Kyphoscoliosis: Adolescent Idiopathic Scoliosis and Congenital Scoliosis*. In: Kliegman RM, Behrman RE, Jenson HB, et al, eds. *Nelson Textbook of Pediatrics*. 18th Ed. Philadelphia, PA: Elsevier; 2007:1843-1844.
2. Spiegel DA, Hosalkar HS, Dormans JP. The Spine. In: Kliegman RM, Behrman RE, Jenson HB, et al., eds. *Nelson Textbook of Pediatrics*. 18th Ed. Philadelphia, PA: Elsevier; 2007:2811-2815.
3. Do T, Fras C, Burke S, et al. Clinical value of routine preoperative magnetic resonance imaging in adolescent idiopathic scoliosis. *J Bone Joint Surg Am*. 2001;83:577-579.
4. Dobbs MB, Lenke LG, Szymanski DA, et al. Prevalence of neural axis abnormalities in patients with infantile idiopathic scoliosis. *J Bone Joint Surg Am*. 2002;84:2230-2234.
5. Rao, RD, Smuck M. Orthopaedic Knowledge Update 4: Spine. *AAOS*. 41:477-478.
6. Lieberman JR. *AAOS comprehensive orthopaedic review*. Rosemont, IL.: American Academy of Orthopaedic Surgeons; 2009.
7. Pollak AN, Ficke JR. Extremity war injuries: Challenges in definitive reconstruction. *J Am Acad Orthop Surg*. 2008;16(11):407-417.
8. Swiontkowski MF. The journal of bone and joint surgery. *JBJS*. 1993;75A(9):1308-1317.
9. Bach HG, Goldberg BA. Posterior Capsular Contracture of the Shoulder. *J Am Acad Orthop Surg*. 2006;14(5):101-112.
10. Hedequist, D., Emans, J. Congenital scoliosis. *J Am Acad Orthop Surg*. 2004;12:266–275.
11. Gstottner M, Godny B, Petersen J., et al. CT angiography for anterior lumbar spine access: High radiation exposure and low clinical relevance. *Clin Orthop Relat Res*. 2011;469(3):819-824.
12. Kim H, Kim HS, Moon ES, et al. Scoliosis Imaging: what radiologists should know. *Radiographics*. 2010;30:1823-1842.

SP-15: Post-Operative Spinal Disorders

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*Following plain x-rays of the affected spinal regions post-surgical, See **SP-2.1: Anatomic Guidelines**.

SP-15.1: Greater than Six Months Post-Operative

- MRI without and with contrast, MRI without contrast, or CT without contrast of the affected spinal region(s) is appropriate when:
 - ◆ Patient is more than six months post-operative; **and**
 - ◆ No significant improvement after a recent (within 3 months) six week trial of provider-directed treatment with clinical re-evaluation; **or**
 - ◆ See **SP-1.2: Red Flag Indications**

SP-15.2: Routine Post-Fusion Imaging

- Requests will be forwarded to Medical Director Review. Following a clinically successful spinal fusion, advanced diagnostic imaging is generally not indicated.
- **PET** is not currently indicated for the routine assessment of spinal fusions or unsuccessful spine surgery (see: **SP-2.10: Spine PET**). Requests for PET will be forwarded to Medical Director Review.

SP-15.3: Prolonged Intractable Pain Following Spinal Surgery Within Six Months

Open discectomy and laminectomy:

- MRI without and with contrast of the affected spinal region(s) if there are residual, new, recurrent, or worsening symptoms related to the surgical site.
 - ◆ CT/Myelography of the affected spinal region(s) if MRI is contraindicated.

Spinal fusions with or without Open Discectomy and/or Laminectomy:

- These can be challenging problems that may require more than one advanced imaging study. Requests will be forwarded to Medical Director Review.
- For surgery criteria, see the following:
 - ◆ CMM-601: Anterior Cervical Discectomy and Fusion
 - ◆ CMM-604: Posterior Cervical Decompression with or without Fusion
 - ◆ CMM-605: Cervical Microdiscectomy
 - ◆ CMM-606: Lumbar Microdiscectomy
 - ◆ CMM-608: Lumbar Decompression
 - ◆ CMM-609: Lumbar Fusion (Arthrodesis)

SP-15.4: Revision Fusion Surgery

- If requested by the operating surgeon, the following studies can be performed for preoperative planning prior to surgical revision of a lumbar anterior spinal arthrodesis.
 - ◆ CTA pelvis (CPT® 72191) and/or CTA abdomen (CPT® 74175); *or*
 - ◆ MRA pelvis (CPT® 72198) and/or MRA abdomen (CPT® 74185)
- For surgery criteria, see the following:
 - ◆ CMM-601: Anterior Cervical Discectomy and Fusion
 - ◆ CMM-604: Posterior Cervical Decompression with or without Fusion
 - ◆ CMM-609: Lumbar Fusion (Arthrodesis)

References

1. Hayashi D, Roemer FW, Mian A, Gharaibeh M, et al. Imaging features of post-operative complications after spinal surgery and instrumentation. *AJR*. 2012;199:W123-W129.
2. Thakkar RS, Malloy JP, Thakkar SC, Carrino JA, Khanna AJ. Imaging the post-operative spine. *Rad Clin North Am*. 2012;50:731-747.
3. Kathuria S. Post-vertebral augmentation spine imaging. *Neuroimaging Clin N Am*. 2014;24(2):337-347.
4. Savage JW, Schroeder GD, Anderson PA. Vertebroplasty and kyphoplasty for the treatment of osteoporotic vertebral compression fractures. *J Am Acad Orthop Surg*. 2014;22:653-664.
5. Gstottner M, Godny B, Petersen J., et al. CT angiography for anterior lumbar spine access: high radiation exposure and low clinical relevance. *Clin Orthop Relat Res*. 2011;469(3):819-824.

SP-16: Other Imaging Studies and Procedures Related to the Spine Imaging Guidelines

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SP-16.1: Prior to Spine Surgery

- MRI/CT should be performed within the past six (6) months for preoperative planning prior to spine surgery when the criteria for advanced imaging studies of the spine are met as otherwise stated in the Spine Imaging Guidelines. (See: **SP-2.2: MRI of the Spine**, **SP-2.3: CT of the Spine**, **SP-2.4: CT/Myelography**)
- MRA and CTA are generally not indicated for preoperative planning of initial anterior spinal surgery unless abnormal vasculature is known or reasonably anticipated. Requests will be forwarded to Medical Director Review.
- For surgery criteria, see the following:
 - ◆ CMM-601: Anterior Cervical Discectomy and Fusion
 - ◆ CMM-604: Posterior Cervical Decompression with or without Fusion
 - ◆ CMM-605: Cervical Microdiscectomy
 - ◆ CMM-606: Lumbar Microdiscectomy
 - ◆ CMM-608: Lumbar Decompression
 - ◆ CMM-609: Lumbar Fusion (Arthrodesis)

SP-16.2: Prior to Interventional Spinal Injections

- Advanced diagnostic imaging studies of the spine are not required prior to facet joint injections, medial branch blocks or radiofrequency ablations unless the criteria for advanced imaging studies of the spine are met as otherwise stated in the Spine Imaging Guidelines.
- Advanced diagnostic imaging studies of the cervical spine and/or thoracic spine are indicated within 24 months prior to interlaminar or transforaminal epidural steroid injections of the cervical and/or thoracic spine when the criteria for advanced imaging studies of the spine are met as otherwise stated in the Spine Imaging Guidelines.
- Advanced diagnostic imaging studies of the lumbar spine are indicated prior to transforaminal epidural steroid injections of the lumbar spine when the criteria for advanced imaging studies of the spine are met as otherwise stated in the Spine Imaging Guidelines.
- Advanced diagnostic imaging studies of the lumbar spine are not required prior to lumbar spine interlaminar or caudal epidural steroid injections unless the criteria for advanced imaging studies of the spine are met as otherwise stated in the Spine Imaging Guidelines.
- For an individual with evidence of symptomatic spinal stenosis, MRI or CT with or without myelography demonstrating severe spinal stenosis at the level to be treated within the past twelve (12) months is required for an initial trial of a transforaminal, interlaminar or caudal epidural steroid injection when ALL of the following criteria are met:
 - ◆ Diagnostic evaluation has ruled out other potential causes of pain
 - ◆ Significant functional limitations resulting in diminished quality of life and impaired age-appropriate activities of daily living (ADLs)

- ◆ Failure of at least four (4) weeks of conservative treatment (e.g., exercise, physical methods including physical therapy and/or chiropractic care, NSAIDs, and/or muscle relaxants).
- See **SP-1.2: Red Flag Indications** for severe radicular pain
- For interventional pain criteria, see the following:
 - ◆ CMM-200: Epidural Steroid Injection
 - ◆ CMM-201: Facet Joint Injections
 - ◆ CMM-208: Radiofrequency Joint Ablation/Denervation

SP-16.3: Prior to Spinal Cord Stimulator (SCS) Placement/Removal

- MRI thoracic spine without contrast (CPT® 72146) is generally the study of choice prior to SCS placement. CT thoracic spine without contrast (CPT® 72128) or CT/Myelography thoracic spine (CPT® 72129) are acceptable alternatives.
- Imaging of the lumbar spine is not indicated for placement nor removal of spinal cord stimulators.
- Requests for advanced diagnostic imaging of the cervical spine prior to SCS placement will be forwarded to Medical Director Review.
- For interventional pain criteria, see the following:
 - ◆ CMM-211: Spinal Cord Stimulators

SP-16.4: Following Vertebral Augmentation Procedures

- CT without contrast of the affected spinal region(s) within 24 hours post-procedure to evaluate neurologic sequelae resulting from cement extravasation.
- For surgery criteria, see the following
 - ◆ CMM-607: Primary Vertebral Augmentation

Practice Note

MRI has not been shown to change the outcome of interventional pain procedures in recent scientific evidence-based studies and without substantial change in the clinical picture or intervening surgery. Repeat advanced diagnostic imaging studies are not necessary with each spinal injection or series of spinal injections.

References

1. Cohen SP. Effect of MRI on Treatment Results or Decision Making in Patients With Lumbosacral Radiculopathy Referred for Epidural Steroid Injections. *Archives of Internal Medicine*. 2012;172(2):134. doi:10.1001/archinternmed.2011.593.
2. North American Spine Society (NASS) Coverage Committee. Lumbar Epidural Injections: Defining Appropriate Coverage Positions. About Coverage Recommendations. <https://www.spine.org/PolicyPractice/CoverageRecommendations/AboutCoverageRecommendations.aspx>
3. Rathmell JP, Benzon HT, Dreyfuss P, et al. Safeguards to prevent neurologic complications after epidural steroid injections. *Anesthesiology*. 2015;122(5):974-984. doi:10.1097/ain.0000000000000614.
4. Ghahreman A, Ferch R, Bogduk N. The efficacy of transforaminal injection of steroids for the treatment of lumbar radicular pain. *Pain Medicine*. 2010;11:1149-1168.
5. Ghaly RF, Lissounov A, Candido KD, Knezevic NN. Should routine MRI of the lumbar spine be required prior to lumbar epidural steroid injection for sciatica pain? *Surg Neuro Int*. 2015;6:48.
6. Cohen SP, Gupta A, Strassels SA, et al. Effect of MRI on treatment results or decision making in patients with lumbosacral radiculopathy referred for epidural steroid injections. *Arch Intern Med*. 2012;172:134-142.
7. Benzon HT, Huntoon MA, Rathmell JP. Improving the safety of epidural steroid injections. *JAMA*. 2015;313:1713-1714.
8. Cohen SP, Maus T. Point/Counterpoint-The need for magnetic resonance imaging before epidural corticosteroid injection. *American Academy of Physical Medicine and Rehabilitation*. 2013;5:230-237.
9. Shim E, Lee JW, Lee E, et al. Fluoroscopically guided epidural injections of the cervical and lumbar spine. *RadioGraphics*. 2017; 37:537-561.

SP-17: Nuclear Medicine

- Nuclear Medicine
 - ◆ Nuclear medicine studies are rarely used in the evaluation of the spine, but are indicated in the following circumstances:
 - Bone scan (CPT® 78315) or Distribution of Radiopharmaceutical Agent SPECT (CPT® 78803) is indicated for evaluation of suspected loosening of orthopedic implants when recent plain x-ray is nondiagnostic.
 - Radiopharmaceutical Localization SPECT (CPT® 78803) or SPECT/CT (CPT® 78830 or 78831) can be used if there is back pain with suspected failed fusion surgery with suspected painful pseudoarthrosis and MRI/CT are nondiagnostic.
- Any of the following studies are indicated for initial evaluation of suspected osteomyelitis:
 - ◆ Bone scan (one of CPT® codes: 78300, 78305, 78306) or Distribution of Radiopharmaceutical Agent SPECT (CPT® 78803)
 - ◆ Nuclear Bone Marrow imaging (one of CPT® codes: 78102, 78103, or 78104)
 - ◆ Radiopharmaceutical inflammatory imaging (one of CPT® codes: 78800, 78801, 78802) or Distribution Of Radiopharmaceutical Agent SPECT (CPT® 78803)
- For follow-up imaging, any of the following studies are indicated for evaluation of response to treatment in established osteomyelitis. The appropriate follow-up advanced imaging time frame will depend on the nature of the underlying disease and prior imaging. Follow-up advanced imaging requests will be forwarded for medical director review:
 - ◆ Bone scan (one of CPT® codes: 78300, 78305, 78306, or 78315)
 - ◆ Nuclear Bone Marrow imaging (one of CPT® codes: 78102, 78103, or 78104)
- Radiopharmaceutical Localization Inflammatory Imaging (one of CPT® codes: 78800, 78801, 78802, or 78803) or Distribution Of Radiopharmaceutical Agent SPECT (CPT® 78803) is indicated for evaluation of facet arthropathy in patients with ankylosing spondylitis, osteoarthritis, or rheumatoid arthritis.
- Radiopharmaceutical Agent SPECT (CPT 78803) or SPECT/CT (CPT 78830 or 78831) is indicated for the evaluation of back pain and suspected spondylolysis.
- SPECT has been described to identify spinal pain generators, pseudoarthrosis of spinal fusion or hardware failure when conventional advanced diagnostic imaging studies are inconclusive, non-diagnostic or equivocal. Requests for SPECT for these indications will be reviewed on a case-by-case basis by the Medical Director.

Reference

1. Patel ND, Broderick DF, Burns J, et. al. Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria®: Low Back Pain. American College of Radiology (ACR); Date of Origin: 1996. Last Review: 2015. <https://acsearch.acr.org/docs/69483/Narrative/>.