CLINICAL GUIDELINES

CMM-200: Epidural Steroid Injections (ESI)

Version 1.0
Effective July 1, 2021

Clinical guidelines for medical necessity review of Comprehensive Musculoskeletal Management Services.
© 2021 eviCore healthcare. All rights reserved.

Definitions

- **Transforaminal epidural steroid injection (TFESI)** is a therapeutic injection of contrast (absent allergy to contrast) performed at a single or multiple spinal levels, followed by the introduction of a corticosteroid and possibly a local anesthetic by inserting a needle into the neuroforamen under fluoroscopic or computed tomography (CT) guidance.
- **Selective Nerve Root Block (SNRB)** is a diagnostic injection of contrast (absent allergy to contrast) of a single nerve root to assist with surgical planning, followed by the introduction of a local anesthetic by inserting a needle into the neuroforamen under fluoroscopic or computed tomography (CT) guidance. SNRBs are erroneously referred to as transforaminal epidural steroid injection (TFESI), although technically SNRBs involve the introduction of anesthetic only and are used for diagnostic purposes.
  - Selective nerve root blocks (SNRBs) performed for the purpose of treating pain (i.e., repeat SNRB at the same level) may be termed therapeutic selective nerve root blocks. There is insufficient evidence to support the clinical utility of therapeutic selective nerve root bocks (SNRBs).
- **Interlaminar epidural steroid injection (ILESI)** is an injection of contrast, (absent allergy to contrast), followed by the introduction of a corticosteroid and possibly a local anesthetic into the epidural space of the spine either through a paramedian or midline interlaminar approach under fluoroscopic guidance.
- **Caudal epidural steroid injection (CESI)** is an injection of contrast, (absent allergy to contrast), followed by the introduction of corticosteroids and possibly a local anesthetic into the epidural space of the spine by inserting a needle through the sacral hiatus under fluoroscopic guidance into the epidural space at the sacral canal.
- **Radiculopathy**, for the purpose of this policy, is defined as the presence of pain, dysesthesia(s), or paresthesia(s) reported by the individual in a level-specific referral pattern of an involved named spinal root(s) causing significant functional limitations, (i.e., diminished quality of life and impaired age-appropriate activities of daily living), and **EITHER** of the following:
  - Documentation of **ONE or MORE** of the following, concordant with nerve root compression of the involved named spinal root(s) demonstrated on a detailed neurologic examination within the prior three (3) months:
    - Loss of strength of specific named muscle(s) or myotomal distribution(s)
    - Altered sensation to light touch, pressure, pin prick, or temperature in the sensory distribution
    - Diminished, absent, or asymmetric reflex(es)
  - Documentation of **EITHER** of the following performed within the prior 24 months:
    - 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)
    - Electrodiagnostic studies (EMG/NCV's) diagnostic of nerve root compression of the involved named spinal nerve root(s).

©2021 eviCore healthcare. All Rights Reserved.

- **Radicular pain** is pain which radiates to the 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 on physical examination.
- **Spinal stenosis** refers to the narrowing of the spinal canal usually due to spinal degeneration that occurs with aging. It may also be the result of spinal disc herniation, osteoarthritis, or a tumor. Lumbar spinal stenosis results in low back pain as well as pain or abnormal sensations in the legs, thighs, feet or buttocks, or loss of bladder and bowel control. Neurogenic claudication is often a clinical condition that results from spinal stenosis.

General Guidelines

This guideline does not apply to epidural injections administered for obstetrical or surgical epidural anesthesia or for perioperative pain management. This guideline only applies to injections of an anesthetic, corticosteroid, and/or contrast agent as defined in this policy and not to other injectates including, but not limited to the following: Spinraza, chemotherapy, neurolytic substances, antispasmodics, antibiotics, antivirals, biologics (e.g., platelet rich plasma, stem cells, amniotic fluid, etc.), and any other injectates that are not in scope of eviCore's management.

- The determination of medical necessity for the performance of a diagnostic selective nerve root block (SNRB) or a therapeutic epidural steroid injection (ESI) is always made on a case-by-case basis.
- Benefits, coverage policies, and eligibility issues pertaining to each health plan may take precedence over eviCore's guidelines. Providers are urged to obtain written instructions and requirements directly from each payor.
  - eviCore may direct some prior authorization requests to the health plan (e.g., epidural injections in the clinical context of an implantable intrathecal drug pump for which eviCore is not delegated to prior authorization of the implantable intrathecal drug pump).
- An epidural steroid injection (ESI) should be performed with the use of fluoroscopic or CT guidance and the injection of a contrast, with the exception of an emergent situation or when fluoroscopic/CT guidance or the injection of contrast is contraindicated (e.g., pregnancy).
- The use of an indwelling catheter to administer a continuous infusion/intermittent bolus should be limited to use in a hospital setting only. It is inappropriate to represent the use of a catheter for single episode injection(s) that is/are commonly performed in an outpatient setting as an indwelling catheter for continuous infusion/intermittent bolus.
- There is insufficient scientific evidence to support the scheduling of a "series-of-three" injections in either a diagnostic or therapeutic approach. The medical necessity of subsequent injections should be evaluated individually and be based on the response of the individual to the previous injection with regard to clinically relevant sustained

©2021 eviCore healthcare. All Rights Reserved.

reductions in pain, decreased need for medication, and improvement in the individual's functional abilities.

- When performing therapeutic transforaminal epidural steroid injections (TFESIs) no more than two levels during same session/procedure.
- When performing a diagnostic selective nerve root block (SNRB), only an injection at a single level/single side during the same procedure should be performed.
- When medical necessity criteria is met, a total of three (3) epidural steroid injections (ESIs) per episode of pain, per region may be performed in six (6) months, not to exceed four (4) ESIs per region in 12 months.

Indications: Selective Nerve Root Block (SNRB)

- A diagnostic selective nerve root block (SNRB), performed at a single nerve root, involving the introduction of anesthetic only, is considered **medically necessary** when attempting to establish the diagnosis of radicular pain (including radiculitis) or radiculopathy when the diagnosis remains uncertain after standard evaluation (neurologic examination and either radiological studies and/or electrodiagnostic studies) in **ANY** of the following clinical situations:
  - When the physical signs and symptoms differ from that found on imaging studies
  - When there is clinical evidence of multi-level nerve root pathology
  - When the clinical presentation is suggestive, but not typical for both nerve root and peripheral nerve or joint disease involvement
  - When the clinical findings are consistent with radiculopathy in a level-specific referral pattern of an involved named spinal root(s), but the imaging studies do not corroborate the findings (positive straight leg raise test)
  - When the individual has had previous spinal surgery
  - For the purposes of surgical planning
- A diagnostic SNRB at a spinal level other than the initial level is considered **medically necessary** when **ALL** of the following criteria are met:
  - A response to the prior block of less than 80% relief based on the injectate utilized
  - Evidence of multilevel pathology
  - It has been at least seven (7) days since the prior block

Indications: Epidural Steroid Injections (Interlaminar, Caudal, or Transforaminal)

- An interlaminar or caudal epidural steroid injection (ESI) is considered **medically necessary** for **ANY** of the following:
  - Treatment of presumed radiculopathy when there has been failure of at least four (4) weeks of conservative treatment (e.g., exercise, physical therapy, chiropractic care, or medications to include nonsteroidal anti-inflammatory drugs [NSAIDs] or analgesics)

©2021 eviCore healthcare. All Rights Reserved.

- Treatment of presumed radiculitis or radicular pain when **ALL** of the following criteria are met:
  - Radicular pain, with or without motor weakness, which follows a level-specific referral pattern of an involved named spinal root(s)
  - A positive straight leg raise, crossed leg raise, and/or Spurling's
  - Failure of at least four (4) weeks of conservative treatment (e.g., exercise, physical therapy, chiropractic care,or medications to include NSAIDs or analgesics)
- As an initial trial when there is evidence of symptomatic spinal stenosis and **ALL** of the following criteria are met:
  - Diagnostic evaluation has ruled out other potential causes of pain
  - MRI or CT with or without Myelography within the past (24) months demonstrates moderate to severe spinal stenosis at the level to be treated
  - Significant functional limitations resulting in diminished quality of life and impaired, age-appropriate activities of daily living
  - Failure of at least four (4) weeks of conservative treatment (e.g., exercise, physical therapy, chiropractic care, or medications to include NSAIDS or analgesics)

- A transforaminal epidural steroid injection (TFESI) in addition to an intra-articular facet joint injection with synovial cyst aspiration is considered **medically necessary** when **BOTH** of the following criteria are met:
  - Advanced diagnostic imaging studies (e.g., MRI, CT, CT myelogram) within the past 24 months confirm compression or displacement of the corresponding nerve root by a facet joint synovial cyst
  - Clinical correlation with the individual's signs and symptoms of radicular pain or radiculopathy, based on history and physical examination
- A repeat interlaminar, caudal, or transforaminal epidural steroid injection (ESI) is considered **medically necessary** when there has been 50% or greater relief of radicular pain for two (2) or more weeks duration and **ONE** of the following additional criteria are met:
  - Increase in the level of function/physical activity (e.g., return to work)
  - Reduction in the use of pain medication and/or additional medical services such as physical therapy/chiropractic care

Non-Indications: SNRB

- A diagnostic selective nerve root blocks (SNRB) is considered **not medically necessary** for any other indication (e.g., post-herpetic neuralgia).
- A diagnostic SNRB at a spinal level other than the initial level is considered **not medically necessary** for **ALL** of the following:
  - An adequate response to the first block, as determined by the injectate utilized
  - An absence of multilevel pathology when the first injection is performed under fluoroscopy/CT guidance using contrast

©2021 eviCore healthcare. All Rights Reserved.

- Repeat diagnostic SNRB more frequently than every seven (7) days

- A diagnostic SNRB is considered **experimental, investigational, or unproven (EIU)** when using injectates other than anesthetic, corticosteroid, and/or contrast agent (e.g., biologics [platelet rich plasma, stem cells, amniotic fluid]), administered alone or in combination.
- A therapeutic SNRB (i.e., a repeat SNRB at the same level) is considered **EIU** for any indication.

Non-Indications: ESI

- Both of the following are considered **experimental, investigational, or unproven (EIU)**.
  - Epidural steroid injection (ESI) performed with ultrasound guidance
  - ESI for treatment of radicular pain or radiculopathy involving an injectate other than an anesthetic, corticosteroid, and/or contrast agent (e.g., biologics [platelet rich plasma, stem cells, amniotic fluid])
- An epidural steroid injection (ESI) is considered **not medically necessary** for **ALL** of the following:
  - When performed without imaging guidance (i.e., CT, fluoroscopy)
  - Transforaminal epidural steroid injection (TFESI) performed at more than two (2) contiguous foraminal levels (unilateral or bilateral) during the same session/procedure
  - An interlaminar epidural steroid injection (ILESI), performed at more than a single level during the same session/procedure
  - ESI administered on the same day of service with the exception of an ESI performed with an intra-articular facet joint injection with synovial cyst aspiration in accordance with criteria in **CMM-200.4: Indications: Epidural Steroid Injections**
  - Performed in isolation (i.e., without the individual participating in an active rehabilitation program/home exercise program/functional restoration program)
  - Repeating epidural steroid injections more frequently than every fourteen (14) days
  - More than three (3) sessions of epidural steroid injections (IESIs and/or TFESIs) per episode of pain, per region in six (6) months
  - More than four (4) sessions of epidural steroid injections (IESIs and/or TFESIs) per region, per twelve (12) months
  - For axial spinal pain (i.e., absence of radiculopathy, myelopathy, myeloradiculopathy)
  - A caudal epidural steroid injection (CESI) for levels above L4-L5 without supporting clinical rationale for use of alternative approaches (e.g., translaminar, transforaminal)

©2021 eviCore healthcare. All Rights Reserved.

- Performed for post-herpetic neuralgia

Procedure (CPT®) Codes

This guideline relates to the CPT® code set below. Codes are displayed for informational purposes only. Any given code's inclusion on this list does not necessarily indicate prior authorization is required.

CPT®	Code Description/Definition
62320	Injection(s), of diagnostic or therapeutic substance(s) (e.g., anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, including needle or catheter placement, interlaminar epidural or subarachnoid, cervical or thoracic; without imaging guidance
62321	Injection(s), of diagnostic or therapeutic substance(s) (e.g., anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, including needle or catheter placement, interlaminar epidural or subarachnoid, cervical or thoracic; with imaging guidance (i.e., fluoroscopy or CT)
62322	Injection(s), of diagnostic or therapeutic substance(s) (e.g., anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, including needle or catheter placement, interlaminar epidural or subarachnoid, lumbar or sacral (caudal); without imaging guidance
62323	Injection(s), of diagnostic or therapeutic substance(s) (e.g., anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, including needle or catheter placement, interlaminar epidural or subarachnoid, lumbar or sacral (caudal); with imaging guidance (i.e., fluoroscopy or CT)
62324	Injection(s), including indwelling catheter placement, continuous infusion or intermittent bolus, of diagnostic or therapeutic substance(s) (e.g., anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, interlaminar epidural or subarachnoid, cervical or thoracic; without imaging guidance
62325	Injection(s), including indwelling catheter placement, continuous infusion or intermittent bolus, of diagnostic or therapeutic substance(s) (e.g., anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, interlaminar epidural or subarachnoid, cervical or thoracic; with imaging guidance (i.e., fluoroscopy or CT)
62326	Injection(s), including indwelling catheter placement, continuous infusion or intermittent bolus, of diagnostic or therapeutic substance(s) (e.g., anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, interlaminar epidural or subarachnoid, lumbar or sacral (caudal); without imaging guidance
62327	Injection(s), including indwelling catheter placement, continuous infusion or intermittent bolus, of diagnostic or therapeutic substance(s) (e.g., anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, interlaminar epidural or subarachnoid, lumbar or sacral (caudal); with imaging guidance (i.e., fluoroscopy or CT)
64479	Injection(s), anesthetic agent and/or steroid, transforaminal epidural; with imaging guidance (fluoroscopy or CT); cervical or thoracic, single level
+64480	Injection(s), anesthetic agent and/or transforaminal epidural with imaging guidance

©2021 eviCore healthcare. All Rights Reserved.

	(fluoroscopy or CT); cervical or thoracic, each additional level (List separately in addition to code for primary procedure)
64483	Injection(s), anesthetic agent and/or steroid, transforaminal epidural, with imaging guidance (fluoroscopy or CT); lumbar or sacral, single level
+64484	Injection(s), anesthetic agent and/or steroid, transforaminal epidural, with imaging guidance (fluoroscopy or CT); lumbar or sacral, each additional level (List separately in addition to code for primary procedure)
This list may not be all inclusive and is not intended to be used for coding/billing purposes. The final determination of reimbursement for services is the decision of the health plan and is based on the individual's policy or benefit entitlement structure as well as claims processing rules.	

©2021 eviCore healthcare. All Rights Reserved.

References

1. Ackerman WE 3rd, Ahmad M. The efficacy of lumbar epidural steroid injections in patients with lumbar disc herniations. *Anesth Analg*. 2007; 104:1217-1222.
2. Akuthota V, Bogduk N, Easa J, Obrien D, Patel A, Prather H, Sharma A, Standaert C, Summers J. Lumbar Transforaminal Epidural Steroid Injections Review & Recommendation Statement. North American Spine Society, January 2013, 28-30.
3. Akuthota V, Meron A, Singh J et al. The utility of magnetic resonance imaging results in physician decision-making before initial lumbar spinal injection. *Spine J.* 2019;19(9):1455-1462. doi:10.1016/j.spinee.2019.04.016.
4. Albert H, Manniche C. The Efficacy of Systematic Active Conservative Treatment for Patients with Severe Sciatica. A Single-Blind, Randomized, Clinical, Controlled Trial. Spine. Vol 37, 7. 2012
5. Allen T, Tatli Y, Lutz G. Fluoroscopic percutaneous lumbar zygopophyseal joint cyst ruptur: a clinical outcome study. *Spine J*. 2009 May;9(5): 387-95.
6. American College of Occupational and Environmental Medicine. Occupational Medicine Practice Guideline, 2nd Ed. 2008.
7. American Medical Association. Current Procedural Terminology. 2016 Professional Edition.
8. Amoretti N, Huwart L, Foti P, Boileau P, Amoretti M, Pellegrin A, Marcy P, Hauger O. Symptomatic lumbar facet joint cysts treated by CT-guided ntracystic and intra-articular steroid injections. *Eur Radiol*. 2012 Dec; (12): 2836-40
9. Amr YM. Effect of addition of epidural ketamine to steroid in lumbar radiculitis: One-year follow-up. *Pain Physician*. 2011;14:475-481.
10. Anderberg L, Annertz M, Persson L, et al. Transforaminal steroid injections for the treatment of cervical radiculopathy: a prospective and randomised study. *Eur Spine J*. 2007;16(3):321-328.
11. Arden N, Price C, Reading I, et al. A multicentre randomized controlled trial of epidural corticosteroid injections for sciatica: the WEST study. *Rheumatology (Oxford)*. 2005; 44:1399-1406.
12. Arden NK, Price C, Reading I, Stubbing J, Hazelgrove J, Dunne C, et al; WEST Study Group. A multicentre randomized controlled trial of epidural corticosteroid injections for sciatica: The WEST study. *Rheumatology (Oxford)*. 2005;44:1399-1406.
13. Baron R, Wasner G. Prevention and treatment of postherpetic neuralgia. *The Lancet*. 2006;367(9506):186-188. doi:10.1016/s0140-6736(06)68010-0.
14. Becker C, Heidersdorf S, Drewlo S, de Rodriguez SZ, Krämer J, Willburger RE. Efficacy of epidural perineural injections with autologous conditioned serum for lumbar radicular compression: An investigator-initiated, prospective, double-blind, reference controlled study. *Spine* (Phila Pa 1976) 2007;32:1803-1808.
15. Benzon HT, Huntoon MA, Rathmell JP. Improving the safety of epidural steroid injections. *JAMA*. 2015 May 5;313(17):1713-4. doi: 10.1001/jama.2015.2912.
16. Blankenbaker D, De Smet A, Stanczak J, Fine J. Lumbar radiculopathy: treatment with selective lumbar nerve blocks–comparison of effectiveness of triamcinolone and betamethasone injectable suspensions. *Radiology*. 2005;237:738-741.
17. Botwin K, Baskin M, Rao S. Adverse effects of fluoroscopically guided interlaminar thoracic epidural steroid injections. Am J Phys Med Rehabil. 2006;85:14-23.
18. Botwin K, Gruber R, Bouchlas C, et. al. Fluoroscopically guided lumbar transforamational epidural steroid injections in degenerative lumbar stenosis: an outcome study. *Am J Phys Med Rehabil*. 2002;81(12):898-905.
19. Botwin K, Sakalkale D. Epidural steroid injections in the treatment of symptomatic lumbar spinal stenosis associated with epidural lipomatosis. *Am J Phys Med Rehabil*. 2004;83:926-993.
20. Buttermann G. Treatment of lumbar disc herniation: epidural steroid injection compared with discectomy. A prospective, randomized study. *J Bone Joint Surg Am*. 2004;86-A(4):670-679.
21. Candido KD, Rana MV, Sauer R, Chupatanakul L, Tharian A, Vasic V, Knezevic NN. Concordant pressure paresthesia during interlaminar lumbar epidural steroid injections correlates with pain relief in patients with unilateral radicular pain. *Pain Physician*. 2013;16:497-511.
22. Carette S, Leclaire R, Marcoux S, Morin F, Blaise GA, St-Pierre A, Truchon R, Parent F, Levesque J, Bergeron V, Montminy P, Blanchette C. Epidural corticosteroid injections for sciatica due to herniated nucleus pulposus. *N Engl J Med*. 1997;336:1634-1640.

©2021 eviCore healthcare. All Rights Reserved.

23. Chang Chien GC, Knezevic NN, McCormick Z, Chu SK, Trescot Am, Candido KD. Transforaminal versus interlaminar approaches to epidural steroid injections: A systematic review of comparative studies for lumbosacral radicular pain. *Pain Physician*. 2014;17:E509-E524.
24. Chou R, Loeser J, Owens D, Rosenquist R, Atlas S, Baisden J, Carragee E, Grabois M, Murphy D, Resnick D, Stanos S, Shafer W, Wall E. Interventional Therapies, Surgery, and Interdisciplinarry Rehabilitation for Low Back Pain. An Evidence Based Clinical Practice Guideline From the American Pain Society. *Spine*. 2009 34(10) 1066-77.
25. Cohen SP, Hanling S, Bicket MC, White RL, Veizi E, Kurihara C, Zhao Z, Hayek S, Guthmiller KB, Griffith SR, Gordin V, White MA, Vorobeychik Y, Pasquina PF. Epidural steroid injections compared with gabapentin for lumbosacral radicular pain: Multicenter randomized double blind comparative efficacy study. *BMJ.* 2015; 350:h1748.
26. Cohen S, Hayek S, Semenov Y, Pasquina P, White R, Veizi E, Huang J, Kurihara C, Zhoa Z, Guthmiller K, Griffith S, Verdun A, Giampetro D, VorobeychikY. Epidural steroid injections, conservative treatment, or combination treatment for cervical radicular pain: a multicenter, randomized, comparitive-effectiveness study. *Anesthesiology*. 2014 Nov; 121(5): 1045 – 55.
27. Cooper G, Lutz G, Boachie-Adjei O, Lin J. Effectiveness of transforaminal epidural steroid injections in patients with degenerative lumbar scoliotic stenosis and radiculopathy. *Pain Physician*. 2004; 7:311-317.
28. Christo P, Hobelmann G, Maine D. Post-Herpetic Neuralgia in Older Adults. *Drugs Aging*. 2007;24(1):1-19. doi:10.2165/00002512-200724010-00001.
29. Dashfield A, Taylor M, Cleaver J, Farrow D. Comparison of caudal steroid epidural with targeted steroid placement during spinal endoscopy for chronic sciatica: a prospective, randomized, double-blind trial. *Br J Anaesth*. 2005; 94:514-559.
30. Datta R, Upadhyay KK. A randomized clinical trial of three different steroid agents for treatment of low backache through the caudal route. *Med J Armed Forces India*. 2011;67:25-33.
31. Delitto A, George S, VanDillen L, Whitman J, Sowa G, Shekelle P, Denninger T, Godges J. Low Back Pain Clinical Practice Guidelines Linked to the International Classification of Functioning, Disability, and Health from the Orthopaedic Section of the American Physical Therapy Association. *J Orthop Sports Phys Ther*. 2012;42(4):A1 – A 57. Affirmed by the the American Academy of Physical Medicine and Rehabilitation Board of Governors.
32. DePalma M, Bhargava A, Slipman C. A critical appraisal of the evidence for selective nerve root injection in the treatment of lumbosacral radiculopathy. *Arch Phys Med Rehabil*. 2005;86(7):1477-1483.
33. Devillé WL, van der Windt DA, Dzaferagić A, Bezemer PD, Bouter LM. The test of Lasègue: systematic review of the accuracy in diagnosing herniated discs. *Spine (Phila Pa 1976)*. 2000 May 1;25(9):1140-7.
34. Donelson R, Long A, Spratt K, Fung, T. Influence of directional preference on two clinical dichotomies: acute versus chronic pain and axial low back pain versus sciatica. PM R. 2012;4:667.
35. Dreyfuss P, Baker R, Bogduk N. Comparative effectiveness of cervical transforaminal injections with particulate and nonparticulate corticosteroid preparations for cervical radicular pain. *Pain Med*. 2006;7:237-242.
36. Dubinsky R, Kabbani H, El-Chami Z, Boutwell C, Ali H. Practice Parameter: Treatment of postherpetic neuralgia: [RETIRED]. *Neurology*. 2004;63(6):959-965. doi:10.1212/01.wnl.0000140708.62856.72.
37. Eckel TS, Bartynski WS. Epidural steroid injections and selective nerve root blocks. *Tech Vasc Interv Radiol*. 2009 Mar 12(1):11–21.
38. Friedly JL, Comstock BA, Turner JA, et al. A randomized trial of epidural glucocorticoid injections for spinal stenosis. *N Engl J Med*. 2014; 371:11-21.
39. Fukusaki M, Kobayashi I, Hara T, Sumikawa K. Symptoms of spinal stenosis do not improve after epidural steroid injection. Clin J Pain 1998;14:148-151.
40. Furman M, Butler S, Kim R, Mehta A, Simon J, Patel R, Lee T, Reeves R . Injectate volumes needed to reach specific landmarks in S1 transforaminal epidural steroid injections. *Pain Medicine*. 2012; 13(10):1265-1274.
41. Furman M, Mehta A, Kim R, Simon J, Patel R, Lee T, Reeves R. Injectate volumes to reach specific landmarks in lumbar transforaminal epidural steroid injections. PM&R. 2010;2(7), 625-635.

©2021 eviCore healthcare. All Rights Reserved.

42. Furman MB, Johnson SC. Induced lumbosacral radicular symptom referral patterns: a descriptive study. *The Spine Journal*. 2019;19: 163-170.
43. Furman MB, Lee TS, Mehta A, Simon JI, Cano WG. Contrast flow selectivity during transforaminal epidural steroid injections. *Pain Physician*. 2008;11(6), 855-861.
44. Ghahreman A, Ferch R, Bogduk N. The efficacy of transforaminal injection of steroids for the treatment of lumbar radicular pain. *Pain Med*. 2010; 11:1149-1168.
45. Ghai B, Bansal D, Kay JP, Vadaje KS, Wig J. Transforaminal versus parasagittal interlaminar epidural steroid injection in low back pain with radicular pain: A randomized, double-blind, active-control trial. *Pain Physician*. 2014; 17:277-290.
46. Ghai B, Kumar K, Bansal D, Dhatt SS, Kanukula R, Batra YK. Effectiveness of parasagittal interlaminar epidural local anesthetic with or without steroid in chronic lumbosacral pain: A randomized, double-blind clinical trial. *Pain Physician*. 2015;18:237-248.
47. Ghanavatian S, Wie C, et al. Parameters associated with efficacy of epidural steroid injections in the management of post herpetic neuralgia: the Mayo Clinic experience. *J Pain Res*. 2019;12:1279-1286.
48. Hagen K, Hilde G, Jamtvedt G, Winnem M. The cochrane review of advice to stay as active as a single treatment for low back pain and sciatica. *Spine*. 2002 Aug 15; 27(16): 1736 – 41.
49. Harke H, Gretenkort P, Ulrich Ladleif H, Koester P, Rahman S. Spinal Cord Stimulation in Postherpetic Neuralgia and in Acute Herpes Zoster Pain. *Anesthesia & Analgesia*. 2002;94(3):694-700. doi:10.1097/00000539-200203000-00040.
50. Hooten W, Cohen S. Evaluation and treatment of low back pain: a clinically focused review for primary care specialists. Mayo Clin Proc. 2015 Dec;90(12): 1699-718.
51. Huang R, Shapiro G, Lim M, Set al. Cervical epidural abscess after epidural steroid injection. *Spine*. 2004; 29:E7-E9.
52. Huda N, Bansal P, Gupta SM, Ruhela A, Rehman M, Afzal M. The efficacy of epidural depomethylprednisolone and triamcinolone acetate in relieving the symptoms of lumbar canal stenosis: A comparative study. *J Clin Diagn Res*. 2010;4:2843-2847.
53. Iversen T, Solberg TK, Romner B, Wilsgaard T, Twisk J, Anke A, Nygaard O, Hasvold T, Ingebrigtsen T. Effect of caudal epidural steroid or saline injection in chronic lumbar radiculopathy: multicentre, blinded, randomised controlled trial. *BMJ*. 2011;343:d5278.
54. Jeong HS, Lee JW, Kim SH, Myung JS, Kim JH, Kang HS. Effectiveness of transforaminal epidural steroid injection by using a preganglionic approach: A prospective randomized controlled study. *Radiology*. 2007;245:584-590.
55. Karppinen J, Malmivaara A, Kurunlahti M, Kyllönen E, Pienimäki T, Nieminen P, Ohinmaa A, Tervonen O, Vanharanta H. Periradicular infiltration for sciatica: A randomized controlled trial. *Spine* (Phila Pa 1976) 2001;26:1059-1067.
56. Kaye AD, Manchikanti L, Abdi S, et al. Efficacy of epidural injections in managing chronic spinal pain: A best evidence synthesis. *Pain Physician*. 2015; in press.
57. Kennedy DJ, Plastaras C, Casey E, Visco CJ, Rittenberg JD, Conrad B, Sigler J, Dreyfuss P. Comparative effectiveness of lumbar transforaminal epidural steroid injections with particulate versus nonparticulate corticosteroids for lumbar radicular pain due to intervertebral disc herniation: a prospective, randomized, double-blind trial. *Pain Med*. 2014;15:548-55.
58. Kerezoudis P, Rinaldo L, Alvi MA, Hunt CL, Qu W, Maus TP, Bydon M. The Effect of Epidural Steroid Injections on Bone Mineral Density and Vertebral Fracture Risk: A Systematic Review and Critical Appraisal of Current Literature. *Pain Med*. 2018 Jan 2. doi: 10.1093/pm/pnx324.
59. King W, Miller DC, Smith CC. Systemic Effects of Epidural Corticosteroid Injection. *Pain Med*. 2018 Feb 1;19(2):404-405.
60. Kleimeyer J, Koltsov J, Smuck M, Wood K, Cheng I, Hu S. Cervical epidural steroid injections: incidence and determinants of subsequent surgery. *Spine J*. 2020;20(11):1729-1736. doi:10.1016/j.spinee.2020.06.012.
61. Koh WU, Choi SS, Park SY, Joo EY, Kim SH, Lee JD, Shin JY, Suh JH, Leem JG, Shin JW. Transforaminal hypertonic saline for the treatment of lumbar lateral canal stenosis: A doubleblinded, randomized, active-control trial. Pain Physician. 2013;16:197-211.
62. Koltsov JC, Smuck MW, Zagel A, et al. Lumbar epidural steroid injections for herniation and stenosis: incidence and risk factors of subsequent surgery. The Spine Journal. 2019;19(2):199-205. doi:10.1016/j.spinee.2018.05.034.

©2021 eviCore healthcare. All Rights Reserved.

63. Kreiner D, Hwang S, Easa J, Resnick D, Baisden J, Dougherty P, Fernand R, Ghiselli G, Haanna A, Lamer T, Lisi A, Mazanec D, Meagher R, Nucci R, Patel R, Sembrano J, Sharma A, Summers J, Taleghani C, Tontz W, Toton J. North American Spine Society Evidence Based Guideline for Multidisciplinary Spine Care. Clinical Guidelines for Diagnosis and Treatment of Lumbar Disc Herniation with Radiculopathy. 2012, page 30.
64. Kreiner D, Shaffer W, Baisden J, Gilbert T, Summers J, Toton J, Hwang S, Mendel R, Reitman C. Evidence – Based Clinical Guidelines for Multidisciplinary Spine Care. Diagnosis and Treatment of Degenerative Lumbar Spinal Stenosis. North American Spine Society 2011, 43-44. (43 references) Endorsed by the American Academy of Physical Medicine and Rehabilitation Board of Governors
65. Lee BS, Nault R, Grabowski M, et al. Utility of repeat magnetic resonance imaging in surgical patients with lumbar stenosis without disc herniation. The Spine Journal. 2019;19(2):191-198. doi:10.1016/j.spinee.2018.06.357.
66. Lee J, Choi K, Kang S et al. Nonsurgical treatments for patients with radicular pain from lumbosacral disc herniation. *The Spine Journal*. 2019;19(9):1478-1489. doi:10.1016/j.spinee.2019.06.004.
67. Lee JH, An JH, Lee SH. Comparison of the effectiveness of interlaminar and bilateral transforaminal epidural steroid injections in treatment of patients with lumbosacral disc herniation and spinal stenosis. Clin J Pain. 2009;25:206-210.
68. Lee J, Kim S, Lee I, et al. Therapeutic effect and outcome predictors of sciatica treated using transforaminal epidural steroid injection. AJR Am J Roentgenol. 2006; 187:1427-1431.
69. Lee JH, Kim DH, Shin KS, Park SJ, Lee GJ, Lee CH, Yang HS. Comparison of clinical efficacy of epidural injection with or without steroid in lumbosacral disc herniation: A systematic review and meta-analysis. Pain Physician 2018; in press.
70. Lee K, Lin C, Hwang S, et al. Transforaminal periradicular infiltration guided by CT for unilateral sciatica–an outcome study. Clin Imaging. 2005; 29:211-214.
71. Lipetz, J. Pathophysiology of inflammatory degenerative and compressive radiculopathies. PMR Clinics of North America. 2002; Aug: 13(3): 439-49
72. Liu K, Liu P, Liu R, Wu X, Cai M. Steroid for epidural injection in spinal stenosis: A systematic review and meta-analysis. Drug Des Devel Ther. 2015;9:707–716
73. Liu J, Zhou H, Lu L, Li X, Jia J, Shi Z, Yao X, Wu Q, Feng S. The Effectiveness of Transforaminal Versus Caudal Routes for Epidural Steroid Injections in Managing Lumbosacral Radicular Pain: A Systematic Review and Meta-Analysis. Medicine (Baltimore). 2016 May;95(18):e3373.
74. Lutz G, ShenT. Fluoroscopically guided aspiration of a symptomatic lumbar zygopopheseal joint cyst: a case report. Arch Phys Med Rehabil 2002 Dec; 83(12); 1789-91.
75. Machado LA, de Souza MS, Ferreira PH, Ferreira ML. The McKenzie method for low back pain: a systematic review of the literature with a meta-analysis approach. Spine (Phila Pa 1976). 2006;31(9):E254–E262.
76. Machado LA, Maher CG, Herbert RD, Clare H, McAuley JH. The effectiveness of the McKenzie method in addition to first-line care for acute low back pain: a randomized controlled trial. BMC Med. 2010;8:10.
77. Macvicar J, King W, Landers MH, Bogduk N. The effectiveness of lumbar transforaminal injection of steroids: A comprehensive review with systematic analysis of the published data. Pain Med. 2013; 14:14-28.
78. Manchikanti L, Abdi S, Atluri S, et al. An update of comprehensive evidence-based guidelines for interventional techniques of chronic spinal pain: Part II: Guidance and recommendations. Pain Physician. 2013;16:S49-S283.
79. Manchikanti L, Benyamin RM, Falco FJ, Kaye AD, Hirsch JA. Do epidural injections provide short- and long-term relief for lumbar disc herniation? A systematic review. Clin Orthop Relat Res. 2015;473:1940-1956.
80. Manchikanti L, Cash KA, McManus CD, Damron KS, Pampati V, Falco FJE. A randomized, double-blind controlled trial of lumbar interlaminar epidural injections in central spinal stenosis: 2-year follow-up. Pain Physician. 2015;18:79-92.
81. Manchikanti L, Cash KA, McManus CD, Pampati V. Fluoroscopic caudal epidural injections in managing chronic axial low back pain without disc herniation, radiculitis or facet joint pain. J Pain Res. 2012;5:381-390.

©2021 eviCore healthcare. All Rights Reserved.

82. Manchikanti L, Cash KA, McManus CD, Pampati V, Benyamin RM. A randomized, doubleblind, active-controlled trial of fluoroscopic lumbar interlaminar epidural injections in chronic axial or discogenic low back pain: Results of a 2-year follow-up. Pain Physician. 2013;16:E491- E504.
83. Manchikanti L, Cash KA, McManus CD, Pampati V, Benyamin R. Fluoroscopic lumbar interlaminar epidural injections in managing chronic lumbar axial or discogenic pain. J Pain Res. 2012; 5:301-311.
84. Manchikanti L, Cash KA, McManus CD, Pampati V, Fellows B. Results of 2-year follow-up of a randomized, double-blind, controlled trial of fluoroscopic caudal epidural injections in central spinal stenosis. Pain Physician. 2012;15:371-384.
85. Manchikanti L, Cash KA, Pampati V, Falco FJE. Transforaminal epidural injections in chronic lumbar disc herniation: A randomized, double-blind, active-control trial. Pain Physician. 2014;17:E489-E501.
86. Manchikanti L, Falco FJE, Pampati V, Hirsch JA. Lumbar interlaminar epidural injections are superior to caudal epidural injections in managing lumbar central spinal stenosis. Pain Physician 2014;17:E691-E702.
87. Manchikanti L, Cash KA, Pampati V, Malla Y. Fluoroscopic cervical epidural injections in chronic axial or disc-related neck pain without disc herniation, facet joint pain, or radiculitis. J Pain Res. 2012;5:227-236.
88. Manchikanti L, Cash KA, Pampati V, Malla Y. Two-year follow-up results of fluoroscopic cervical epidural injections in chronic axial or discogenic neck pain: A randomized, double-blind, controlled trial. Int J Med Sci. 2014;11:309-320.
89. Manchikanti L, Hirsch JA. An update on the management of chronic lumbar discogenic pain. Pain Manag. 2015;5:373-386.
90. Manchikanti L, Hirsch JA. Clinical management of radicular pain. Expert Rev Neurother. 2015;15:681-693.
91. Manchikanti L, Knezevic NN, Boswell MV, Kaye AD, Hirsch JA. Epidural injections for lumbar radiculopathy and spinal stenosis: A comparative systematic review and meta-analysis. Pain Physician 2016; E365-E410.
92. Manchikanti L, Nampiaparampil DE, Manchikanti KN, et al. Comparison of the efficacy of saline, local anesthetics, and steroids in epidural and facet joint injections for the management of spinal pain: A systematic review of randomized controlled trials. Surg Neurol Int. 2015;6:S194- S235.
93. Manchikanti L, Pampati V, Benyamin RM, Boswell MV. Analysis of efficacy differences between caudal and lumbar interlaminar epidural injections in chronic lumbar axial discogenic pain: Local anesthetic alone vs. local combined with steroids. Int J Med Sci. 2015;12:214-222.
94. Manchikanti L, Singh V, Cash KA, Pampati V, Damron KS, Boswell MV. Effect of fluoroscopically guided caudal epidural steroid or local anesthetic injections in the treatment of lumbar disc herniation and radiculitis: A randomized, controlled, double blind trial with a two year follow-up. Pain Physician 2012;15:273-286.
95. Manchikanti L, Singh V, Cash KA, Pampati V, Falco FJE. A randomized, double-blind, active control trial of the effectiveness of lumbar interlaminar epidural injections in disc herniation. Pain Physician. 2014; 7:E61-E74.
96. Manchikanti L, Singh V, Pampati V, Falco FJE, Hirsch JA. Comparison of the efficacy of caudal, interlaminar, and transforaminal epidural injections in managing lumbar disc herniation: Is one method superior to the other? Korean J Pain. 2015;28:11-21.
97. Manchikanti L, Staats PS. Nampiaparampil DE, Hirsch JA. What is the role of epidural injections in the treatment of lumbar discogenic pain: A systematic review of comparative analysis with fusion and disc arthroplasty. Korean J Pain. 2015;28:75-87.
98. Martha J, Swaim B, Wang D, Kim D Hll D, Bode R, Schwartz C. Outcome of percutaneous rupture of lumbar synovialcysts: a case series of 101 patients. Spine J 2009 Nov 9(11) 899-904.
99. Mattie R, Schneider B, Smith C. *FactFinders for Patient Safety: Frequency of Epidural Steroid Injections*. Spine Intervention Society (SIS) ©2020. http://www.spineintervention.org/page/FactFinders.
100. Matz P, Meagher R, Lamet T, Tontz W. Evidence – Based Clinical Guidelines for Multidisciplinary Spine Care. Diagnosis and Treatment of Degenerative Lumbar Spondylolisthesis. North American Spine Society 2014, 39. (87 references) Endorsed by the American Academy of Physical Medicine and Rehabilitation Board of Governors.

©2021 eviCore healthcare. All Rights Reserved.

101. McCormick Z, Cushman D, Casey E, Garvan C, Kennedy D, Plastares C. Factors associated with pain reduction after transforaminal epidural steroid injection for lumbosacral radicular pain. Arch Phys Med Rehabil 2014 Dec; 95(12): 2350-6.
102. Melfi R, AprillC. Percutaneous puncture of zygopophyseal joint synovial cyst with flouroscopic guidance. Pain Med 2005 Mar-0Apr;6(2):122-8.
103. Meng H, Fei Q, Wang B, Yang Y, Li D, Li J, Su N. Epidural injections with or without steroids in managing chronic low back pain secondary to lumbar spinal stenosis: a meta-analysis of 13 randomized controlled trials. Drug Des Devel Ther 2015; 9:4657-67.
104. Murakibhavi VG, Khemka AG. Caudal epidural steroid injection: A randomized controlled trial. Evid Based Spine Care J. 2011;2:19-26.
105. Ng L, Chaudhary N, Sell P. The efficacy of corticosteroids in periradicular infiltration for chronic radicular pain: A randomized, double-blind, controlled trial. Spine (Phila Pa 1976). 2005;30:857- 862.
106. North American Spine Society (NASS). *NASS Coverage Policy Recommendation: Cervical Epidural Injections and Diagnostic Spinal Nerve Blocks*. Lumbar Epidural Injections Facet Joint Intervention. Copyright© 2016 North American Spine Society
107. North American Spine Society (NASS). *NASS Coverage Policy Recommendations: Epidural Steroid Injections & Selective Spinal Nerve Blocks*. Burr Ridge: North American Spine Society; 2020:1-10.
108. North American Spine Society (NASS). *NASS Evidence-Based Clinical Guidelines for Multidisciplinary Spine Care. Diagnosis and Treatment of Cervical Radiculopathy from Degenerative Disorders*. Burr Ridge; IL. North American Spine Society (NASS). ©2010; 12-21.
109. Oliveira C, Maher C, Ferreira M et al. *Cochrane Database Syst Rev*. 2020; 4(CD013577):1-149. doi: 10.1002/14651858.CD013577.
110. Park KD, Lee J, Jee H, Park Y. Kambin triangle versus the supraneural approach for the treatment of lumbar radicular pain. Am J Phys Med Rehabil. 2012;91:1039-1050.
111. Park Y, Lee JH, Park KD, Ahn JK, Park J, Jee H. Ultrasound-guided vs. fluoroscopy-guided caudal epidural steroid injection for the treatment of unilateral lower lumbar radicular pain: A prospective, randomized, single-blind clinical study. Am J Phys Med Rehabil. 2013;92:575-586.
112. Parr AT, DiwanS, Abdi S. Lumbar interlaminar epidural injections in managing chronic low back pain and lower extremity pain: a systematic review. Pain Physician 2009 Jan-Feb; 12(1): 163 – 88.
113. Patel J, Schneider B, Smith C on behalf of SIS Patient Safety Committee. Intrarticular Corticosteroid Injections and hyperglycemia. 10/4/17.
114. Peng B, Wu, Li Z, Guo JWang X. Chemical Radiculitis. Pain. 2007; Jan (1-2): 11-6.
115. Pinto RZ, Maher CG, Ferreira ML, Hancock M, Oliveira VC, McLachlan AJ, Koes B, Ferreira PH. Epidural corticosteroid injections in the management of sciatica: A systematic review and meta-analysis. Ann Intern Med. 2012;157:865-877.
116. Pirbudak L, Karakurum G, Oner U, Gulec A, Karadasli H. Epidural corticosteroid injection and amitriptyline for the treatment of chronic low back pain associated with radiculopathy. Pain Clinic. 2003;15:247-253.
117. Rados I, Sakic K, Fingler M, Kapural L. Efficacy of interlaminar vs transforaminal epidural steroid injection for the treatment of chronic unilateral radicular pain: prospective, randomized study. Pain Med. 2011;12:1316-1321.
118. Rathmell JP, Benzon HT, Dreyfuss P, et al. Safegaurds to prevent neurologic complications after epidural steroid injections: consensus opinions from a multidisciplinary working group and national organizations. Anesthesiology. 2015;122: 974-84. doi: 10.1097/ALN.0000000000000614.
119. Riew KD, Yin Y, Gilula L, et al.. J Bone Joint Surg Am. 2000;82:1589-1593.
120. Riew K, Park J, Cho Y, et al. Nerve root blocks in the treatment of lumbar radicular pain. A minimum five-year follow-up. J Bone Joint Surg Am. 2006;88(8):1722-1725.
121. Sabers S, Ross S, Grogg B, Lauder T. Procedure-based nonsurgical management of lumbar zygopophyseal joint cyst-induced radicular pain. Arch Phys Med Rehabil 2005 Sep;86(9): 1767-71.
122. Saifuddin A, Mitchel R, Taylor B. Extradural inflammation associated with annular tears: Demonstration with gadolinium-enhanced lumbar spine MRI. Eur Spine J. 1999; 8 (1): 34-9.
123. Sasso R, Macadaeg K, Nordmann D, Smith M. Selective nerve root injections can predict surgical outcome for lumbar and cervical radiculopathy: comparison to magnetic resonance imaging. J Spinal Disord Tech. 2005;18:471-478.

©2021 eviCore healthcare. All Rights Reserved.

124. Sayegh FE, Kenanidis EI, Papavasiliou KA, Potoupnis ME, Kirkos JM, Kapetanos GA. Efficacy of steroid and nonsteroid caudal epidural injections for low back pain and sciatica: A prospective, randomized, double-blind clinical trial. Spine (Phila Pa 1976). 2009;34:1441-1447.
125. Schaufele M, Hatch L, Jones W. Interlaminar versus transforaminal epidural injections for the treatment of symptomatic lumbar intervertebral disc herniations. Pain Physician. 2006;9:361-366.
126. Shah RD, Cappiello D, Suresh S. Interventional procedures for chronic pain in children and adolescents: a review of the current evidence. World Institute of Pain. 2016: 359-369.
127. Shanthanna H, Busse JW, Thabane L, Paul J, Couban R, Choudhary H, Kaushal A, Suzumura E, Kim I, Harsha P. Local anesthetic injections with or without steroid for chronic non-cancer pain: a protocol for a systematic review and meta-analysis of randomized controlled trials. Syst Rev 2016; 5:18.
128. Slipman C, Lipetz J, DePalma M, Jackson H. Therapeutic selective nerve root block in the nonsurgical treatment of traumatically induced cervical spondylotic radicular pain. Am J Phys Med Rehabil. 2004; 83:446-454.
129. Slipman C, Lipetz J, Wakeshima Y, Jackson H. Nonsurgical treatment of zygopopheseal joint cyst-induced radicular pain. Arch Phys Med Rehabil 2000 Jul; 81(7): 973-7.
130. Southern D, Lutz GE, Cooper G, Barre L. Are fluoroscopic caudal epidural steroid injections effective for managing chronic low back pain? Pain Physician 2003 Apr;6(2): 167-72.
131. Spijker-Huiges A, Vermeulen K, Winters JC, van Wijhe M, van der Meer K. Epidural steroids for lumbosacral radicular syndrome compared to usual care: quality of life and cost utility in general practice. Arch Phys Med Rehabil. 2015 Mar;96(3):381.
132. Staal JB, de Bie R, de Vet HCW, Hildebrandt J, Nelemans P. Injection therapy for subacute and chronic low back pain: an updated Cochrane review. Spine 2009; 34(1):49.
133. Stout A. Epidural Steroid injection for low back pain. Phys Med Rehabil Clin N Am. 2010 Nov 21(4): 825–834.
134. Tafazal S, Ng L, Chaudhary N, Sell P. Corticosteroids in peri-radicular infiltration for radicular pain: A randomised double blind controlled trial: one year results and subgroup analysis. Eur Spine J. 2009;18:1220-1225.
135. Thomas E, Cyteval C, Abiad L, et al. Efficacy of transforaminal -versus interspinous corticosteroid injection in discal radiculalgia – A prospective, randomised, double-blind study. Clin Rheumatol.2003; 22:299-304.
136. Vad VB, Bhat AL, Lutz GE, Cammisa F. Transforaminal epidural steroid injections in lumbosacral radiculopathy: A prospective randomized study. Spine (Phila Pa 1976) 2002; 27:11-16.
137. Valat J, Genevay S, Marty M, Rozenberg S, Koes B. Sciatica. Best Pract Res Clin Rheumatol. 2010 Apr:24(2): 241-52.
138. Valat J, Giraudeau B, Rozenberg S, et al. Epidural corticosteroid injections for sciatica: a randomised, double blind, controlled clinical trial. Ann Rheum Dis. 2003;62:639-643.
139. Van Eijs F, Stanton-Hicks M, Van Zundert J et al. 16. Complex Regional Pain Syndrome. *Pain Practice*. 2010;11(1):70-87. doi:10.1111/j.1533-2500.2010.00388.x.
140. Van Helvoirt H, Apeldoorn A, Ostelo R, Knol D, Arts M, Kamper S, van Tulder M. Transforaminal epidural steroid injections followed by mechanical diagnosis and therapy to prevent surgery for lumbar disc herniation. Pain Med. 2014 Jul; 15(7): 1100-1108.
141. Van Wijck A, Opstelten W, Moons K et al. The PINE study of epidural steroids and local anaesthetics to prevent postherpetic neuralgia: a randomised controlled trial. *The Lancet*. 2006;367(9506):219-224. doi:10.1016/s0140-6736(06)68032-x.
142. Van Wijck A, Wallace M, Mekhail N, van Kleef M, et al. 17.Herpes Zoster and Post-Herpetic Neuralgia. *Pain Practice*. 2010;11(1):88-97. doi:10.1111/j.1533-2500.2010.00428.x.
143. Wei G, Liang J, Chen B, Zhou C, Ru N, Chen J, Zhang F. Comparison of transforaminal verse interlaminar epidural steroid injection in low back pain with lumbosacral radicular pain: a meta-analysis of the literature. Int Orthop. 2016 Dec;40(12):2533-2545. Epub 2016 May 20.
144. Wilson-MacDonald J, Burt G, Griffin D, Glynn C. Epidural steroid injection for nerve root compression. A randomised, controlled trial. J Bone Joint Surg Br 2005; 87:352-355.
145. Woodward J, Herring S, Windsor R, ed. Lennard T. Epidural Procedures in Spine Pain Management. Pain Procedures in Clinical Paractice. Second Edition. Hanley and Belfus Inc. Philidelphia. 2000, page 359.

©2021 eviCore healthcare. All Rights Reserved.

146. Zhai J, Zhang L, Li M, Tian Y, Zheng W, Chen J, Huang T, Li X, Tian Z. Epidural injection with or without steroid in managing chronic low back and lower extremity pain: A meta-analysis of ten randomized controlled trials. Int J Clin Exp Med. 2015;8(6):8304-8316.
147. Zhai J, Zhang L, Li M, Tian Y, Zheng W, Chen J, Huang T, Li X, Tian Z. Epidural injection with or without steroid in managing chronic low back and lower extremity pain: A meta-analysis of ten randomized controlled trials. Am J Ther. 2017 May;24(3):e259-e269.

©2021 eviCore healthcare. All Rights Reserved.