Epidural Steroid Injections for Back Pain

Policy Number: 2.01.94
Origination: 12/2014
Last Review: 12/2018
Next Review: 12/2019

Policy
Blue Cross and Blue Shield of Kansas City (Blue KC) will provide coverage for Epidural Steroid Injections for Back Pain when it is determined to be medically necessary because the criteria shown below are met.

When Policy Topic is covered
Epidual steroid injections performed with fluoroscopic guidance may be considered medically necessary for the treatment of back pain when the following criteria are met:

- Lumbar or cervical radiculopathy (sciatica) that is not responsive to at least 4 weeks of conservative management (see Considerations section); AND
- Persistent pain is present of at least moderate-severe intensity; AND
- Short-term relief of pain is the anticipated outcome.

Repeat treatment of persistent pain due to lumbar or cervical radiculopathy/sciatica may be considered medically necessary under the following conditions:

- Previous epidural steroid injections were successful at relieving pain; AND
- At least 30 days have elapsed since the prior injection (see Considerations for maximum number of injections); AND
- No more than 6 injections given over a 12 month period.

Simultaneous treatment of two vertebral levels may be considered medically necessary if criteria are met at each level.

When Policy Topic is not covered
Repeat treatment is considered not medically necessary if the initial treatment did not result in substantial pain relief.

Simultaneous treatment of more than two vertebral levels is considered not medically necessary.
Epidural steroid injections are considered **investigational** in all other situations, including but not limited to treatment of spinal stenosis and nonspecific low back pain.

The use of fluorography (imaging of the epidural space) as a component of epidural steroid injections is considered **incidental** and is not separately payable.

**Considerations**

The diagnosis of lumbar radiculopathy is typically made by a combination of suggestive signs and symptoms in conjunction with imaging that demonstrates compression of a spinal nerve root. Symptoms are due to irritation of the spinal nerve root at L4, L5, or S1, and may include posterior leg pain that extends past the knee, a loss of sensation in a dermatomal pattern, and/or loss of deep tendon reflexes. However, all of these symptoms may not be present. On exam, provocative tests such as the straight leg maneuver are positive. Magnetic resonance imaging (MRI) is the most useful imaging modality and can confirm or exclude the presence of nerve root compression, most commonly due to herniated disc.

There are several aspects of epidural steroid injection therapy that are not standardized. Expert opinion was sought through clinical vetting on the following issues:

- **The optimal time for assessing a response to epidural steroid injections.** Expert opinion supports that response can be assessed anytime from immediately to several weeks after the procedure, with the most popular time to assess response being 1 to 2 weeks after injection.
- **The definition of a clinically significant response to injections.** Expert opinion supports that a reasonable definition of response is at least a 20-point improvement on a 0-100 VAS scale, or an improvement of at least 50% in functional status, when measured using a validated scale.
- **The maximum number of injections in 1 year.** There is not agreement on the maximum number of injections that should be given in one year. Some experts agree that no more than 3 injections should be given in 1 year, but other experts believe that more than 3 per year can be used safely. None of the expert opinion supported more than 6 injections given over a 12 month period.

Conservative nonsurgical therapy for at least 4 weeks should include the following:

- **Use of prescription strength analgesics for several weeks at a dose sufficient to induce a therapeutic response**
  - Analgesics should include anti-inflammatory medications with or without adjunctive medications such as nerve membrane stabilizers or muscle relaxants AND
- **Participation in at least 4 weeks of physical therapy (including active exercise) or documentation of why the patient could not tolerate physical therapy, AND**
- **Evaluation and appropriate management of associated cognitive and behavioral issues**
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### Description of Procedure or Service

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<td>Comparators of interest are:</td>
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Epidural steroid injections (ESIs) are a treatment for back pain that has not responded to conservative measures. Local steroid injections may improve pain by reducing inflammation, thus relieving pressure on nerve roots or other structures that may be the origin of pain.

For individuals who have lumbar or cervical radiculopathy who receive ESI, the evidence includes many small randomized controlled trials (RCTs) and a number of systematic reviews of these RCTs. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, medication use, and treatment-related morbidity. The evidence base lacks large-scale, high-quality trials and has a high degree of variability among the available trials in terms of patient populations, epidural injection techniques, and comparison treatments. The results of individual trials are mixed, with some reporting significant benefits for the ESI group and others reporting no benefit. Most systematic reviews do not perform pooled analyses due to the heterogeneity of trials. In the 2 reviews that reported quantitative results, short-term pain relief at up to 6 months follow-up was superior in patients treated with epidural steroids. None of the analyses reported long-term benefits for treatment with ESIs. Adverse events were generally mild but were not well reported in these trials. Serious adverse events can occur, but their rate is unknown. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.
For individuals who have spinal stenosis who receive ESIs, the evidence includes a moderately large RCT, a few small RCTs, and systematic reviews of these RCTs. Relevant outcomes include symptoms, functional outcomes, health status measures, quality of life, medication use, and treatment-related morbidity. The largest RCT and the majority of smaller trials do not report a benefit for ESIs. The evidence is insufficient to determine the effects of technology on health outcomes.

For individuals who have nonspecific low back pain who receive ESIs, the evidence includes a number of small RCTs and systematic reviews of these RCTs. Relevant outcomes include symptoms, functional outcomes, health status measures, quality of life, medication use, and treatment-related morbidity. The majority of trials are of low quality and did not report a benefit for ESIs. The evidence is insufficient to determine the effects of the technology on health outcomes.

**Background**

Back pain is an extremely common condition. Most episodes are self-limited and will resolve within 1 month, but a small percentage will persist and become chronic. (1) Patients with chronic back pain may suffer from serious disability and may use a high volume of medical services. Despite high utilization, many patients with chronic back pain do not improve with available treatments including surgical interventions. Therefore, there is a high unmet need to determine the efficacy of different treatments for chronic back pain and to determine specific patient populations who may benefit from specific interventions. Along with this unmet need for efficacious treatments in patients with chronic back pain, there has been a proliferation of new technologies, and large increases in the number of patients treated and in the intensity of treatment. Therefore, there is a concern for overtreatment of patients who may not benefit from interventions for back pain. (2)

Back pain can result from a variety of underlying causes. Sciatica is a subset of low back pain that is associated with irritation of 1 or more lumbar spinal nerve roots, which results in symptoms of radiculopathy. Symptoms of radiculopathy include pain that radiates down the leg to below the knee, numbness, muscle weakness, and lack of reflexes in a dermatomal distribution. (3) Most patients with sciatica respond to conservative care with resolution of their symptoms between several weeks and several months following onset. In a subset of patients, symptoms and signs of progressive muscle weakness prompt a more aggressive intervention to prevent permanent dysfunction. In other patients, symptoms persist, despite conservative management, without progression of neurologic signs, and further treatment options are sought for pain relief.

Spinal stenosis is another common source of back pain. Spinal stenosis is caused by narrowing of the spinal canal due to degenerative changes, leading to impingement of the spinal cord and the spinal nerve roots. Symptoms of spinal stenosis can include back pain, leg pain with exertion (neurogenic claudication), muscle weakness, and sensory deficits. Definitive treatment for spinal stenosis is surgery, which includes decompression of the spinal canal with or without spinal
fusion. Epidural steroids may reduce inflammation from pressure on the spinal cord, and thus reduce symptoms of compression.

Nonspecific low back pain, sometimes called mechanical low back pain, is diagnosed when no specific etiology of pain can be identified. While the origin of nonspecific low back pain is not certain, many experts feel that the pain is of discogenic origin or due to painful movement of the vertebrae. In these instances, epidural steroid injections may reduce swelling of the vertebral disc and/or surrounding structures, leading to pain relief.

Regardless of specific etiology, conservative management is the first-line treatment for most patients with back pain. Nonsteroidal anti-inflammatory drugs (NSAIDs) or other analgesics are used for symptom relief. These agents should be used at a sufficient dose to induce a therapeutic response for at least several weeks. Modification of activity in conjunction with some form of exercise therapy, often involving a physical therapist, is usually also prescribed early in the course of symptoms. For patients with persistent nonradicular back pain, current guidelines recommend interdisciplinary rehabilitation, which is defined as an integrated approach using physical rehabilitation in conjunction with a psychological or psychosocial intervention.(1)

For patients who fail conservative therapy, there are a number of interventional techniques available, ranging from minimally invasive procedures such as injections to major surgeries such as spinal decompression with fusion. Injections can be given in different locations (soft tissues, intraspinal, SI joints, etc.) and can use different therapeutic agents (eg, botulinum toxin, steroids, proteolytic enzymes). Other interventional techniques include radiofrequency ablation, prolotherapy, and chemonucleolysis. Most of these nonsurgical interventions do not have high-quality evidence demonstrating efficacy.(4) Numerous different surgical interventions are available, such as discectomy and spinal fusion, each of which can be performed by a variety of different techniques. The decision to undertake surgery is best made in the setting of shared decision making between the patient and surgeon, with thorough considerations of the risks and benefits of surgery.

**Epidural Steroid Injections**
Epidural injection therapy is one of several second-line therapies available for patients who fail conservative treatment and is one of the most common modalities used for patients who fail initial conservative treatment. (5) Epidural injections are performed by inserting a needle into the space between the dura and ligamentum flavum and injecting a steroid preparation. There is considerable variability in the technical aspects of epidural injections. There are several different approaches possible for entering the epidural space (translaminar, transforaminal, caudal). In addition, the procedure may be performed with or without fluoroscopic guidance. A national survey published in 2002(6) reported that 30% of academic institutions and 77% of private practices use fluoroscopy. Other authors have estimated that lack of correct needle position in the epidural space may occur in 25% of more of injections. (2) Further variability of technique
may involve factors such as the depth of injection into the epidural space, volume of injectate, and the filling patterns of the injectate.\(^{(5)}\)

Treatment is generally given as 1 to 3 injections, each performed at least 1 month apart. Treatment is generally limited to no more than 3 injections in a 12-month period, owing to concerns about the adverse effects of chronic steroid administration, both locally and systemically.

**Regulatory Status**

Steroids are not U.S. Food and Drug Administration (FDA)–approved for use as epidural injections, such use represents off-label use of an FDA-approved medication. The specific preparations used for epidural injections are steroids added to a sterile saline solution, which are prepared by a compounding pharmacy.

**Rationale**

This evidence review was created in October 2014 and has been updated regularly with searches of the MEDLINE database. The most recent literature update was performed through September 11, 2017.

Assessment of efficacy for therapeutic intervention involves a determination of whether an intervention improves health outcomes. The optimal study design for this purpose is a randomized controlled trial (RCT) that includes clinically relevant measures of health outcomes. Intermediate outcome measures, also known as surrogate outcome measures, may also be adequate if there is an established link between the intermediate outcome and true health outcomes. Nonrandomized comparative studies and uncontrolled studies can sometimes provide useful information on health outcomes but are prone to biases such as noncomparability of treatment groups, placebo effect, and variable natural history of the condition.

The evidence base on the efficacy of epidural steroid injections (ESIs) for back pain is large, with many RCTs published. In addition to the RCTs, there have been numerous systematic reviews of RCTs published. This literature review will, therefore, concentrate on a representative sample of the available systematic reviews of RCTs, emphasizing those published most recently.

**Radiculopathy and Sciatica**

**Lumbar Radiculopathy/Sciatica**

Bhatia et al (2016) published the results of a systematic review and meta-analysis of 8 RCTs including 771 patients (366 in steroid and 405 in comparator groups) that evaluated transforaminal ESIs to treat lumbosacral radicular pain secondary to herniated intervertebral discs. The control groups received local anesthetic with saline or saline alone.\(^{7}\) Strength of evidence for each included study was classified with the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. Of the 8 studies included, two were rated as high risk of bias, two with unclear risk of bias, and the remaining four with low risk of bias.
Although this review minimized variability by including studies that used only transforaminal administration of steroid as opposed to interlaminar and caudal administration, reviewers acknowledged variability on account of steroid dose, frequency, and number of procedures. Reported results indicate that after 3 months of ESI resulted in statistically significant but clinically modest reduction of 0.97 points in mean pain scores (0 to 10 scale) (95% confidence interval [CI], -1.42 to -0.51; p<0.001, $I^2=90\%$) compared with local anesthetic or saline with a GRADE weak recommendation based on moderate-quality evidence. Epidural steroids did not decrease physical disability at 1 to 3 months after the intervention (GRADE strong recommendation based on high-quality evidence) or incidence of surgery at 12 months after the intervention (GRADE strong recommendation based on moderate-quality evidence) compared with local anesthetic or saline. Reviewers concluded that well-designed, large, RCTs would be required to evaluate appropriate dosages, adverse events, number of procedures, and measure the effect on psychological disability and quality of life.

A systematic review of ESIs for the management of sciatica was published by Pinto et al in 2012.\textsuperscript{3} This review included RCTs that provided information on at least one of the outcomes of overall pain, leg pain, back pain, or disability status. Twenty-five publications were included in the review, representing 23 unique trials. The sample size in the trials ranged from 23 to 325 patients, with most studies enrolling fewer than 100 patients. Using the GRADE classification, the level of quality was determined to be high for each outcome. Pooled results for each of the outcomes are summarized in Table 1. The magnitude of the between-group differences is small and statistically significant only for the outcomes of short-term leg pain and short-term disability. The greatest magnitude of difference was 6.2 units on a 0-to-100 visual analog scale (VAS) for short-term leg pain. This magnitude of difference is below the minimally important difference for a 0 to 100 pain scale, which is generally considered to be in the range of 10 to 30 units.\textsuperscript{8}

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<th>Outcome (0-100 Scale)</th>
<th>Weighted Mean Difference Between Groups (95% CI)</th>
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<td></td>
<td>Short-Term</td>
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<tr>
<td>Leg pain</td>
<td>-6.2 (-9.0 to -3.0)</td>
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<td>Back pain</td>
<td>0.5 (-3.9 to 4.8)</td>
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<tr>
<td>Disability</td>
<td>-3.1 (-5.0 to -1.2)</td>
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Adapted from Pinto et al (2012).\textsuperscript{3}

CI: confidence interval; ESI: epidural steroid injection.

In 2012, Benyamin et al published a systematic review that included RCTs and non-RCTs of epidural injections in patients with low back pain and/or leg pain.\textsuperscript{2} Nineteen studies met the inclusion criteria. Most of these trials (13/19) compared epidural steroids with an active control, and 5 of 19 used a placebo control. A qualitative summary of studies was performed, without any quantitative meta-analysis. Subgroup analysis was performed on studies that included patients with disc herniation and radiculopathy. Reviewers also separated the intervention into studies that used fluoroscopic guidance. Of the 8 studies that did, all reported
short-term results that favored ESIs. Among 4 trials that reported longer term follow-up at 1 year, results from two were positive and two were negative.

In 2009, Chou et al reviewed the evidence for ESIs in the treatment of low back pain with radiculopathy, as part of their examination of nonsurgical interventional therapies for low back pain. Reviewers identified 17 RCTs reporting on short-term benefit, and 4 RCTs reporting on longer term benefit. For short-term benefits, the results were mixed. Ten of 17 trials reported no benefit for ESIs, and 7 of 17 reported a statistically significant benefit. Of the 7 trials that were rated higher quality, 4 of 7 reported a benefit for ESIs and 3 of 7 reported no benefit. Subgroup analysis by type of placebo control (epidural or soft-tissue injection) revealed that most trials using a soft-tissue control injection (5/6) reported a benefit, while most of the trials using an epidural control injection (9/11) reported no benefit. Other subgroup analyses based on the duration of symptoms, use of imaging to confirm prolapsed disc, and study quality did not show any significant differences.

Several individual RCTs have been completed since publication of the most recent systematic reviews. These trials have corroborated the results of previous research, generally reporting a small benefit for treatment with ESI. The largest of these trials was a double-blind, sham-controlled study that compared ESI with gabapentin in 145 patients with lumbar radiculopathy. There were no differences between groups for the primary outcome of change in pain scores. At 1 month, the change in pain scores in the ESI group was -2.2 vs -1.7 in the gabapentin group (p=0.25); at 3 months, the change in pain scores were -2.0 in the ESI group vs -1.6 in the gabapentin group (p=0.43). ESI was superior to gabapentin on some secondary outcomes at 1 month (eg, percent successful outcome, 66% in ESI group vs 46% in gabapentin group; p=0.02); however, at 3 months, these differences were no longer significant.

In the RCT with the longest follow-up of 2 years, 120 patients were randomized to ESI or sham control. Primary outcome measures were at least 50% improvement on the Oswestry Disability Index and the numeric rating scale for pain. There were no differences between groups reporting a good response, with 57% in the ESI group and 65% in the sham group reporting at least 50% improvement at 2 years (p=NS). Another RCT allocated 63 patients from general medical practices in the Netherlands to usual care or usual care plus 1 injection of ESI. The main outcomes were change in numeric pain scores and the Roland-Morris Disability Questionnaire (RMDQ) score (range, 0-24; higher scores indicate greater disability). A small, statistically significant difference was found favoring the ESI group on both outcomes but was considered too small to be clinically relevant.

Cervical Radiculopathy
There are a smaller number of published trials on the use of epidural steroids for cervical radiculopathy. Two systematic reviews were identified that summarized the literature on cervical epidural injections for treatment of cervical radiculopathy.
A 2009 review by Benyamin et al included studies of epidural injections for neck pain that was present for more than 3 months, with or without radiculopathy. Reviewers identified 3 RCTs that met inclusion criteria, all of which treated patients with cervical radiculopathy, but only one of which compared epidural steroids with a control condition. One of the other trials compared two different preparations of steroids, and the third trial compared steroids plus morphine with steroids alone. In the single trial comparing steroids with control, 42 patients were randomized to ESIs (n=24) or to steroid injections in the adjacent neck muscle (n=18). One week after the last epidural injection, more patients in the epidural group reported good pain relief compared with control (76% vs 36%, p not reported), and at 1-year follow-up, the difference in the percentage of patients reporting good pain improvement persisted in favor of the epidural steroid group (68% vs 12%, p not reported).

In 2012, Diwan et al performed a systematic review of ESIs for chronic neck and upper-extremity pain and reported separately on the evidence for cervical radiculopathy. This analysis included 4 RCTs, three of which were included in the Benyamin 2009 review. The fourth RCT, which was the largest (N=120) and rated the highest in quality, randomized patients to epidural steroid plus local anesthetic vs local anesthetic alone, and reported on pain relief at 6 and 12 months. At 6 months, the percentage of patients experiencing pain relief was 82% for the steroid group vs 73% for the control group, a difference that was not statistically significant. At 12 months, outcomes were also similar, with 72% of patients in the steroid group reporting pain relief compared with 68% in the control group.

Since these systematic reviews were published, Cohen et al reported the results of an RCT in 2014, which compared ESI, conservative treatment, and a combination of both for patients with cervical radiculopathy. A total of 169 patients were randomized to conservative care (physical therapy plus medications), ESIs, or a combination of both treatments. The primary outcomes were neck and arm pain measured at 1 and 3 months posttreatment. There were no differences noted between ESI and conservative care on any of the outcome measures. The group receiving combination therapy had a greater reduction in arm pain at 1 month compared with the 2 individual treatments and had a greater success rate at 3 months (56.9% vs 26.8%, p=0.006).

**Section Summary: Lumbar Radiculopathy/Sciatica and Cervical Radiculopathy**

There are a large number of small RCTs evaluating ESIs for treatment of lumbar radiculopathy/sciatica and cervical radiculopathy, and a number of systematic reviews summarizing these trials. For short-term pain relief, the direction of benefit in virtually all trials favoring epidural injections, and the differences between groups examined in the studies was statistically significant in some trials but not others. Most systematic reviews did not perform a quantitative meta-analysis, thus limiting their ability to examine these small trials with increased power. In a meta-analysis that reported pooled results, there was a statistically significant improvement in pain at 6 months, but the mean difference was less than the minimally important clinical difference for a 0-to-100 VAS designated for
pain measurement. For long-term pain relief at 1 year or beyond, most trials have reported negative results, and lacked pooled analysis of significant differences.

**Spinal Stenosis**

In the 2012 systematic review by Benyamin et al, 6 RCTs identified assessed patients with spinal stenosis, 5 of which compared steroid injections with a local anesthetic alone.2 Two trials reported between-group differences in favor of steroid injections, three reported significant improvement in pain for the steroid group but did not report between-group differences, and the final trial reported no significant improvement for the steroid group.

The 2009 systematic review by Chou et al identified 3 small placebo-controlled trials on treatment of spinal stenosis, but in two of them, only a subset of treated patients had spinal stenosis.4 Reviewers rated the quality of this evidence as poor and concluded that it was not possible to determine whether epidural steroids offer a benefit for spinal stenosis.

In 2012, Manchikanti et al identified 4 RCTs of ESIs for treatment of lumbar spinal stenosis.5 Although two compared epidural steroids with control and reported on pain relief and/or disability, neither reported that pain relief with epidural steroids was superior to control, either in the short or the long-term.

The 2012 systematic review by Diwan et al identified 1 RCT that treated cervical spinal stenosis in 60 patients.13 In this trial, there were no significant differences in the percentage of patients reporting pain relief in the epidural group compared with control at 6 months (87% vs 80%) or at 12 months (73% vs 70%).

Since the publication of these systematic reviews, a moderately large-sized RCT of ESIs for the treatment of spinal stenosis was published by Friedly et al in 2014.15 This double-blind trial randomized 400 patients with lumbar central spinal stenosis and at least moderate to severe leg pain (≥4 on 0-10 VAS) or disability (≥7 on RMDQ, 0-24 scale) due to spinal stenosis to treatment with ESIs plus lidocaine or lidocaine alone. One repeat injection could be given at 3 weeks at the discretion of the patient and treating physician. The primary outcomes were the patient’s rating of pain in the buttocks, hip, or leg at 6 weeks following initial treatment and the RMDQ score at 6 weeks. Secondary outcomes included the same outcome measures at 3 weeks posttreatment, measures of back pain, percent responders (defined either as ≥30% reduction in pain, or ≥50% reduction in pain), and scores on several quality of life scales. At 6-week follow-up, there were no significant differences in the primary outcomes between groups. The change in pain on the VAS for the steroid group was -2.8 compared with -2.6 for the control group (adjusted between-group mean difference, -0.2 points; 95% CI, -0.8 to 0.4; p=0.48), and the change in the RMDQ score was -4.2 points for the steroid group vs -3.1 points for the control group (adjusted between-group mean difference, -1.0 points; 95% CI, -2.1 to 0.1; p=0.07). There were small, statistically significant differences in measures of pain and disability at 3 weeks, but these were less than the minimal clinical difference for the scales, and differences did not persist at 6 weeks. On the secondary outcomes at 6 weeks, there were generally no between-
group differences except for 2 subscales of the quality of life measures (symptoms of depression on 8-item Patient Health Questionnaire, and satisfaction on the Swiss Spinal Stenosis Questionnaire). The authors subsequently published 12-month follow-up data because the trial protocol offered participants the option to crossover to the alternate treatment after 6 weeks while remaining masked to treatment assignment. Results showed that ESIs offered no benefits from 6 weeks to 12 months beyond that of injections of lidocaine alone in terms of self-reported pain and function or reduction in the use of opioids and spine surgery. At 12 months, the adjusted mean difference from baseline between the groups was -0.4 for RMDQ score (95% CI, 1.6 to 0.9) and was 0.1 for leg pain (95% CI, -0.5 to 0.7).

**Section Summary: Spinal Stenosis**
A few RCTs have evaluated epidural steroids for spinal stenosis, and the published systematic reviews did not perform pooled analysis of the available trials. Most published trials do not report a significant benefit for epidural steroids, including a 2014 moderately large-sized RCT. This evidence does not support that ESIs improve outcomes for patients with spinal stenosis.

**Nonspecific Low Back Pain**
A Cochrane review was published in 2008 on injection therapy for subacute and chronic low back pain. This review included RCTs enrolled patients with low back pain for at least 1 month and reported pain outcomes. Eighteen studies met the inclusion criteria, ten of which were considered to be at low risk for bias. Due to high levels of heterogeneity, pooled analysis was not performed. Of the 18 selected studies, 5 reported a benefit for treatment with epidural steroids. There were 2 placebo-controlled studies of short-term outcomes of leg pain. Neither study reported a significant improvement of pain associated with epidural injections. Three studies compared epidural steroids with nonsteroidal anti-inflammatory drugs, and none of them reported significant improvements for patients treated with epidural steroids.

The 2012 review by Benyamin et al identified 3 trials of ESIs for nonspecific low back pain, 1 randomized and 2 nonrandomized. The randomized trial reported a greater percentage of patients with pain relief following ESI (83%) compared with local anesthetic alone (73%), but this between-group difference was not statistically significant. The 2 nonrandomized studies reported improvements for patients treated with epidural steroids, but no between-group comparisons were done.

Manchikanti et al (2012) addressed the indication of nonspecific low back pain (axial low back pain) in their systematic review. However, no RCTs met their inclusion criteria, and only 3 nonrandomized studies were included. This evidence was insufficient to form conclusions on the efficacy of epidural steroids for nonspecific low back pain.
Section Summary: Nonspecific Low Back Pain
The evidence on ESIs for nonspecific low back pain is limited. Small RCTs have been published, but they were generally judged to be of low quality, and most studies did not report significant improvements in the group receiving ESIs.

Mixed Indications
A systematic review by Choi et al (2013) included trials of ESIs for back pain, regardless of specific indication. Twenty-nine studies included in the review, of which 23 met at least 5 of 11 quality criteria. Reviewers noted evidence for noncomparability of groups (selection bias) at baseline, particularly for the baseline pain levels. For pain outcomes, the combined analysis revealed a statistically significant difference favoring epidural steroids at 6 months (weighted mean difference, -0.41; 95% CI, -0.66 to -0.16) but a nonsignificant result at 12 months. For disability level, there were no statistically significant differences between groups at either 6- or 12-month follow-up. There was also no difference reported in need for future surgery for patients receiving ESIs.

Safety
Potential adverse events of ESIs can include complications of the injection itself, such as inadvertent puncture of the dura, bleeding, and infections. Additional complications may be related to the administration of steroids, including suppression of the hypothalamic-pituitary axis and the immune system.

The adverse events of ESIs are not well reported in the treatment trials. In 1 systematic review (1995), only 4 of 15 included trials reported on adverse events. In addition to this lack of reporting, the available trials are generally small and therefore not adequate for determining rates of uncommon adverse events. A consensus panel (2015) convened in part by the U.S. Food and Drug Administration (FDA) reviewed the literature on serious neurologic complications following ESI. The evidence was restricted to case reports and reports of malpractice claims. Reports included direct needle injury to the spinal cord, arterial injury, swelling of an unrecognized epidural lesion, and paraplegia/stroke. Based on the pattern of reports, the report concluded that stroke and paraplegia were likely caused by intraarticular injection of particulate steroids. Therefore, the rate of adverse events is mostly uncertain.

In the systematic review by Chou et al (2009), it was noted that while there are case reports in the literature of serious adverse events such as paralysis and infection due to epidural injections, serious adverse events were rarely reported in the clinical trials. Of the 17 trials included in the review that reported on the use of epidural injections for treatment of low back pain with radiculopathy, 10 of 17 did not report adverse events at all, and the adverse events reported in the other trials were generally transient and mild. In 1 high-quality trial with systematic reporting of adverse events, 3.3% (4/120) of patients experienced a postinjection headache, 0.8% (1/120) experienced post-dural puncture headache, 1.7% (2/120) experienced postinjection nausea, and 4.2% (5/120) experienced other adverse events.
In 2014, FDA issued a drug safety communication on rare but serious neurologic problems associated with ESIs\(^1\). This communication stated that the safety of ESIs has not been established and that FDA has not approved corticosteroids for this use. Potential serious adverse neurologic events include loss of vision, stroke, paralysis, and death. FDA subsequently assembled an expert panel that issued a report in 2015\(^2\). This report included a series of recommendations regarding the ESI technique, including clinically relevant issues related to its performance, such as the use of particulate steroids, use of contrast, and use of sedation.

Epidural steroids are generally compounded medications because the specific preparations for clinical use are prepared at a pharmacy rather than by the manufacturer of the drug. In 2012, several patients were identified who developed fungal meningitis complications following ESI due to contaminated medication obtained from a single pharmacy\(^3\). The U.S. Centers for Disease Control and Prevention subsequently obtained preliminary data on 137 patients across 10 states affected by this outbreak. Of those, 12 (9\%) of 137 patients died, 3 (2\%) of 137 had suffered a stroke, and 3 (2\%) of 137 had osteomyelitis or epidural abscess. The contamination was attributed to faulty sterilization procedures at the pharmacy that compounded the medications.

**Section Summary: Safety**

Adverse events, both minor and serious, can occur following ESIs. For serious neurologic events, the evidence consists of case reports and, as a result, the rate of SAEs is uncertain. Few serious adverse events have been reported in the RCTs, but there is also a lack of systematic reporting in the available trials. Minor adverse events that are self-limited (eg, headache) are more common, but the evidence is not sufficient to determine the actual rate of such events. Further research is needed to determine the true rate of adverse events attributable to ESIs. An FDA consensus panel has issued guidelines for the technical performance of ESI with the goal of reducing potential serious neurologic events.

**Summary of Evidence**

For individuals who have lumbar or cervical radiculopathy who receive ESI, the evidence includes many small RCTs and a number of systematic reviews of these RCTs. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, medication use, and treatment-related morbidity. The evidence base lacks large-scale, high-quality trials and has a high degree of variability among the available trials in terms of patient populations, epidural injection techniques, and comparison treatments. The results of individual trials are mixed, with some reporting significant benefits for the ESI group and others reporting no benefit. Most systematic reviews do not perform pooled analyses due to the heterogeneity of trials. In the 2 reviews that reported quantitative results, short-term pain relief at up to 6 months follow-up was superior in patients treated with epidural steroids. None of the analyses reported long-term benefits for treatment with ESIs. Adverse events were generally mild but were not well reported in these trials. Serious adverse events can occur, but their rate is unknown. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.
For individuals who have spinal stenosis who receive ESIs, the evidence includes a moderately large RCT, a few small RCTs, and systematic reviews of these RCTs. Relevant outcomes include symptoms, functional outcomes, health status measures, quality of life, medication use, and treatment-related morbidity. The largest RCT and the majority of smaller trials do not report a benefit for ESIs. The evidence is insufficient to determine the effects of technology on health outcomes.

For individuals who have nonspecific low back pain who receive ESIs, the evidence includes a number of small RCTs and systematic reviews of these RCTs. Relevant outcomes include symptoms, functional outcomes, health status measures, quality of life, medication use, and treatment-related morbidity. The majority of trials are of low quality and did not report a benefit for ESIs. The evidence is insufficient to determine the effects of the technology on health outcomes.

Supplemental Information

Clinical Input From Physician Specialty Societies and Academic Medical Centers
While the various physician specialty societies and academic medical centers may collaborate with and make recommendations during this process, through the provision of appropriate reviewers, input received does not represent an endorsement or position statement by the physician specialty societies or academic medical centers, unless otherwise noted.

In response to requests for clinical input on ESIs, input was received from 5 academic medical centers and 6 specialty societies while this policy was being developed under review in 2014. Consensus was reached among reviewers that: treatment of cervical radiculopathy is medical necessary with the same criteria as for lumbar radiculopathy; the minimum period of time for conservative therapy should be 4 weeks or less; fluoroscopic guidance should be used in all cases of epidural steroid injections; and, fluorography imaging of the epidural space is investigational. There was mixed input on the optimal timing to assess response, the number of levels that should be treated at one time, and the maximum number of injections to be given in 1 year.

Practice Guidelines and Position Statements

American Association of Neurological Surgeons
The 2014 update of the guidelines on the performance of fusion procedures for degenerative disease of the lumbar spine from the American Association of Neurological Surgeons stated that lumbar epidural steroid injections (ESIs) are an option for short-term relief of chronic low back pain without radiculopathy in patients with degenerative disease of the lumbar spine (level III evidence). Caudal ESIs are an option for reducing low back pain without radiculopathy of greater than 6 weeks in duration in patients with degenerative disease of the lumbar spine (level III evidence).
Agency for Healthcare Research and Quality
The Agency for Healthcare Research and Quality issued an evidence-based practice center systematic review protocol in 2014. The protocol indicated that systematic reviews of injection therapies have come to conflicting conclusions regarding the benefits of injection therapies, and clinical practice guidelines provide discordant recommendations regarding their use. Important challenges in conducting a review of this topic include sparse data from randomized trials for most injection therapies (with the exception of epidural steroids), inconsistency of results across trials, as well as variability across studies in the methods used to select patients for inclusion, the specific techniques used, the comparisons evaluated, and the outcomes assessed.

North American Spine Society
The 2012 North American Spine Society (NASS) clinical guidelines on multidisciplinary spine care diagnosis and treatment of lumbar disc herniation with radiculopathy stated there were no studies available which directly addressed the role of ESIs or selective nerve root blocks in the diagnosis of patient selection for subsequent surgical treatment of a lumbar disc herniation with radiculopathy.

In 2011, NASS revised its clinical guidelines on multidisciplinary spine care diagnosis and treatment of degenerative lumbar spinal stenosis. NASS made the following recommendation: a multiple injection regimens of radiographically-guided transforaminal ESI or caudal injections is suggested to produce medium-term (3 to 36 months) relief of pain in patients with radiculopathy or neurogenic intermittent claudication from lumbar spinal stenosis (grade C recommendation).

The 2013 NASS issued a review and recommendation statement on lumbar transforaminal ESIs (LTFESI). The following recommendations were made:

“Patients with lumbar sciotic stenosis and radiculopathy experience significantly higher success rates if their symptoms were present for less than three months. Level of evidence IV.”

“There is no significant difference between EMG [electromyography] positive and negative groups in terms of pain difference, but a mild functional improvement in an EMG positive patient undergoing LTFESI. Level of evidence V.”

In 2011 NASS issued a review and recommendation statement for cervical ESIs. The following recommendation was made: Both transforaminal and interlaminar ESIs may be considered to provide short- and long-term relief of cervical radiculitis (grade C recommendation).

American Society of Anesthesiologists
The 2010 guidelines on chronic pain management from the American Society of Anesthesiologists recommended that transforaminal epidural injections should be performed with appropriate image guidance to confirm correct needle position and spread of contrast before injecting therapeutic substances. Image guidance
might be considered for interlaminar epidural injections to confirm correct needle position and spread of contrast before injecting therapeutic substance.

**American College of Physicians**
The American College of Physicians issued a 2007 guidelines on the diagnosis and treatment of low back pain that stated: “Patients with persistent low back pain and signs and symptoms of radiculopathy or spinal stenosis should be evaluated with MRI (preferred) or CT [computed tomography] only if they are potential candidates for surgery or ESI. (Strong recommendation, moderate-quality evidence)”

**American Pain Society**
The American Pain Society published guidelines on the use of interventional therapies for low back pain in 2009, based on a systematic review of the evidence published in the same year. These guidelines made the following recommendations regarding ESIs:

- In patients with persistent radiculopathy due to herniated lumbar disc, it is recommended that clinicians discuss risks and benefits of ESIs as an option (weak recommendation, moderate-quality evidence). It is recommended that shared decision making regarding ESI include a specific discussion about inconsistent evidence showing moderate short-term benefits and lack of long-term benefits.
- There is insufficient evidence to adequately evaluate benefits and harms of ESI for spinal stenosis.
- There is insufficient evidence to adequately evaluate benefits of local injections, botulinum toxin injection, ESI, intradiscal electrothermal therapy, therapeutic medial branch block, radiofrequency denervation, sacroiliac joint steroid injection, or intrathecal therapy with opioids or other medications for nonradicular back pain.

**American Society of Interventional Pain Physicians**
In 2013, the American Society of Interventional Pain Physicians updated its guidelines on interventional techniques in chronic spinal pain. The following recommendations were made regarding ESIs of the lumbar spine:

- “The evidence is good in managing disc herniation or radiculitis for caudal, interlaminar, and transforaminal epidural injections;
- [the evidence] is fair for axial or discogenic pain without disc herniation, radiculitis or facet joint pain with caudal, and interlaminar epidural injections, and limited for transforaminal epidural injections;
- [the evidence] is fair for spinal stenosis with caudal, interlaminar, and transforaminal epidural injections; and
- [the evidence] is fair for post surgery syndrome with caudal epidural injections and limited with transforaminal epidural injections.”

The following recommendations were made regarding ESIs of the cervical spine:
The evidence is good for cervical interlaminar epidural injections for cervical disc herniation or radiculitis; and

[the evidence] is fair for axial or discogenic pain, spinal stenosis, and post-surgery cervical syndrome.

American Academy of Neurology
The American Academy of Neurology published guidelines in 2007 on the use of epidural steroids for lumbosacral radiculopathy. These guidelines made the following recommendations:

- “[E]pidural steroid injections may result in some improvement in radicular lumbosacral pain when determined between 2 and 6 weeks following the injection, compared to control treatment (Level C, Class I-III). The average magnitude of effect is small, and the generalizability of the observation is limited by the small number of studies, limited to highly selected patient populations, the few techniques and doses studied, and variable comparison treatments.”
- “[I]n general, epidural steroid injections for radicular lumbosacral pain have shown no impact on average impairment of function, on need for surgery, or on long-term pain relief beyond 3 months. Their routine use for these indications is not recommended (Level B, Class I-III).”
- “[T]here is insufficient evidence to make any recommendation for the use of epidural steroid injections to treat radicular cervical pain (Level U).”

U.S. Preventive Services Task Force Recommendations
Not applicable.

Medicare National Coverage
There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

Ongoing and Unpublished Clinical Trials
A search did not identify any ongoing or currently unpublished trials that might influence this review.

References


**Billing Coding/Physician Documentation Information**

**62320** Injection(s), of diagnostic or therapeutic substance(s) (eg, 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) (eg, 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 (ie, fluoroscopy or CT)

**62322** Injection(s), of diagnostic or therapeutic substance(s) (eg, 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) (eg, 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 (ie, fluoroscopy or CT)
substances, including needle or catheter placement, interlaminar epidural or subarachnoid, lumbar or sacral (caudal); with imaging guidance (ie, fluoroscopy or CT)

62324  Injection(s), including indwelling catheter placement, continuous infusion or intermittent bolus, of diagnostic or therapeutic substance(s) (eg, 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) (eg, anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, interlaminar epidural or subarachnoid, cervical or thoracic; with imaging guidance (ie, fluoroscopy or CT)

62326  Injection(s), including indwelling catheter placement, continuous infusion or intermittent bolus, of diagnostic or therapeutic substance(s) (eg, 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) (eg, anesthetic, antispasmodic, opioid, steroid, other solution), not including neurolytic substances, interlaminar epidural or subarachnoid, lumbar or sacral (caudal); with imaging guidance (ie, 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 steroid, transforaminal epidural, with imaging guidance (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)

ICD-10 Codes:

M47.22  Other spondylosis with radiculopathy, cervical region
M47.23  Other spondylosis with radiculopathy, cervicothoracic region
M47.25  Other spondylosis with radiculopathy, thoracolumbar region
M47.26  Other spondylosis with radiculopathy, lumbar region
M47.27  Other spondylosis with radiculopathy, lumbosacral region
M50.10-  Cervical disc disorders with radiculopathy code range
M50.13
M51.14-  Thoracic, thoracolumbar or lumbosacral intervertebral disc disorders
M51.17 with radiculopathy code range
M54.12 Radiculopathy, cervical region
M54.13 Radiculopathy, cervicothoracic region
M54.15 Radiculopathy, thoracolumbar region
M54.16 Radiculopathy, lumbar region
M54.17 Radiculopathy, lumbosacral region
M54.30 Sciatica, unspecified side
M54.31 Sciatica, right side
M54.32 Sciatica, left side
M54.40 Lumbago with sciatica, unspecified side
M54.41 Lumbago with sciatica, right side
M54.42 Lumbago with sciatica, left side
M96.1 Postlaminectomy syndrome, not elsewhere classified

62310 and 62311 deleted as of 1/1/2017

Additional Policy Key Words
N/A

Policy Implementation/Update Information

12/1/14 New Policy. Epidural steroid injections are medically necessary for treatment of lumbar sciatica/radiculopathy when criteria are met, not medically necessary if previous epidural injections were not successful, and investigational for all other situations

12/1/15 No policy statement changes.

4/1/16 Added CPT’s: 64479, 64480, 64483, 64484. No policy statement changes.

12/1/16 No policy statement changes.

12/1/17 No policy statement changes.

12/1/18 No policy statement changes.

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