Laminectomy

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Origination: 8/2015
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Policy
Blue Cross and Blue Shield of Kansas City (Blue KC) will provide coverage for Laminectomy when it is determined to be medically necessary because the criteria shown below are met.

When Policy Topic is covered
Laminectomy (cervical, thoracic, lumbar) may be considered medically necessary for mass occupying lesions of the spinal cord and/or spinal canal.

- Primary or metastatic tumors
- Abscesses, or other localized infections

Cervical laminectomy may be considered medically necessary when ALL of the following conditions are met:

- Spinal cord or nerve root compression due to one of the following conditions:
  - Spinal stenosis (with or without spondylolisthesis)
  - Ossification of the posterior longitudinal ligament or the yellow ligament; or hypertrophy of the ligamentum flavum.
- Signs and/or symptoms that meet at least one of the following criteria:
  - Neurologic deficits that are rapidly progressive; OR
  - Symptoms of cervical myelopathy (see Considerations section) or cervical cord compression, (with or without radiculopathy); OR
  - Persistent debilitating pain that is refractory to at least 6 weeks of conservative nonsurgical therapy (See Considerations section).
- Imaging studies (preferably MRI) with findings of spinal cord compression, nerve root compression, and/or myelographic changes, at a level corresponding to the patient’s signs and symptoms.

Lumbar laminectomy may be considered medically necessary when ALL of the following conditions are met:

- Spinal cord or nerve root compression due to spinal stenosis (with or without spondylolisthesis):
- Signs and/or symptoms that meet at least one of the following criteria:
  - Neurologic deficits that are rapidly progressive; OR
Neurologic claudication that is persistent and refractory to at least 6 weeks of conservative nonsurgical therapy (see Considerations section); OR Persistent debilitating pain that is refractory to at least 6 weeks of conservative nonsurgical management (see Considerations section)

- Imaging studies (preferably MRI) with findings of spinal cord or nerve root compression, at a level corresponding to the patient’s signs and symptoms

When Policy Topic is not covered
Laminectomy, cervical or lumbar, is considered not medically necessary for spinal stenosis when the above criteria are not met.

Laminectomy is considered investigational for all other indications.

Considerations
Cervical Myelopathy And/Or Cord Compression
Signs and symptoms of cervical myelopathy and/or cord compression include the following (Epstein, 2003):

- Difficulty with fine movements of the hand and upper extremity
- Incoordination of the hand and upper extremity
- Atrophy of the thenar and hypothenar eminence
- Diffuse hyperreflexia and bilateral Babinski responses
- Decreased sensation, vibratory sense, and proprioception at a level of C5 or below
- Inability to perform tandem walk
- Bowel and bladder incontinence

Conservative nonsurgical therapy for the duration specified 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 6 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, behavioral, or addiction issues
- Documentation of patient compliance with the preceding criteria.

Persistent debilitating pain is defined as:

- Significant level of pain on a daily basis defined on a visual analog scale (VAS) as greater than 4; AND
- Pain on a daily basis that has a documented impact on activities of daily living in spite of optimal conservative nonsurgical therapy as outlined above and appropriate for the patient.
Laminectomy may occasionally be performed for the sole indication of radiculopathy due to herniated disc. In these cases, discectomy alone is not sufficient to relieve compression on vital structures, and laminectomy is required for adequate decompression. This is expected to be an uncommon situation for patients with radiculopathy due to herniated disc, and there are no standardized preoperative criteria to determine which patients may require laminectomy in addition to discectomy.

The following procedures can be considered as alternatives to laminectomy for decompression of the spinal cord. The specific indications for these alternative procedures are not standardized, and the evidence is not sufficient to determine the comparative effectiveness of these different procedures compared with laminectomy.

- Hemi-laminectomy
- Laminotomy
- Foraminotomy

Medical necessity is established by documentation of medical history, physical findings, and diagnostic imaging results that demonstrate spinal nerve compression and support the surgical intervention. Documentation in the medical record must clearly support the medical necessity of the surgery and include medical history, physical examination, and diagnostic testing.

**Medical History**
- Assessment of comorbid physical and psychological health conditions (eg, morbid obesity, current smoking, diabetes, renal disease, osteoporosis, and severe physical deconditioning)
- History of back surgery, including minimally invasive back procedures
- Prior trial, failure, or contraindication to conservative medical/non-operative interventions that may include but are not limited to the following:
  - Activity modification for at least 6 weeks
  - Oral analgesics and/or anti-inflammatory medications
  - Physical therapy
  - Chiropractic manipulation
  - Epidural steroid injections

**Physical Examination**
- Clinical findings including the patient’s stated symptoms and duration

**Diagnostic Testing**
- Radiologist’s report of a magnetic resonance image (MRI) or computerized tomography (CT) scan with myelogram of the spine within the past 6 months showing a spine abnormality
- Report of the selective nerve root injection results, if applicable to the patient’s diagnostic workup.
### Description of Procedure or Service

<table>
<thead>
<tr>
<th>Populations</th>
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<tr>
<td><strong>Individuals:</strong> • With lumbar spinal stenosis and spinal cord or nerve root compression</td>
<td>Interventions of interest are: • Lumbar laminectomy</td>
<td>Comparators of interest are: • Conservative, nonsurgical care</td>
<td>Relevant outcomes include: • Symptoms • Functional outcomes • Health status measures • Quality of life • Treatment-related mortality • Treatment-related morbidity</td>
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<tr>
<td><strong>Individuals:</strong> • With mass-occupying lesions of the spinal canal and spinal cord or nerve root compression</td>
<td>Interventions of interest are: • Cervical, thoracic, or lumbar laminectomy</td>
<td>Comparators of interest are: • Resection/drainage alone</td>
<td>Relevant outcomes include: • Symptoms • Functional outcomes • Health status measures • Quality of life • Treatment-related mortality • Treatment-related morbidity</td>
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Laminectomy is a surgical procedure in which a portion of the vertebra (the lamina) is removed to decompress the spinal cord. Removal of the lamina creates greater space for the spinal cord and the nerve roots, thus relieving compression on these structures. Laminectomy is typically performed to alleviate compression due to spinal stenosis or a space-occupying lesion.

For individuals who have lumbar spinal stenosis and spinal cord or nerve root compression who receive lumbar laminectomy, the evidence includes randomized controlled trials (RCTs) and nonrandomized comparative studies. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and treatment-related mortality and morbidity. For this indication, 2 RCTs have reported that laminectomy is superior to nonsurgical management for reducing pain and improving functional status. These RCTs have methodologic limitations, but both reported significant benefits for surgery for their main outcomes. Most nonrandomized comparative studies have also reported greater benefits for surgery than for conservative management. Generally, among published studies and clinical practice guidelines, there is consistency in the indications for surgery, including those with progressive or persistent neurologic deficits despite conservative therapy. However, beyond broad guidelines, there is little uniformity in recommendations for specific procedures in specific patient groups, lack of standardized severity measures to judge thresholds for surgical intervention, and lack of good predictive models to assess the risks of laminectomy. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.
For individuals who have cervical spinal stenosis and spinal cord or nerve root compression who receive cervical laminectomy, the evidence includes RCTs and nonrandomized comparative studies. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and treatment-related mortality and morbidity. There is a lack of high-quality, comparative evidence for this indication, although what evidence there is offers outcomes similar to those for lumbar spinal stenosis. Given the parallels between cervical laminectomy and lumbar laminectomy, chain of evidence can be developed that the benefit reported for lumbar laminectomy supports a benefit for cervical laminectomy. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have space-occupying lesions of the spinal canal or nerve root compression who receive cervical, thoracic, or lumbar laminectomy, the evidence includes case series. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and treatment-related mortality and morbidity. Most case series are small and retrospective. They have reported that most patients with myelopathy experience improvements in symptoms or abatement of symptom progression after laminectomy. However, this uncontrolled evidence does not provide a basis to determine the efficacy of the procedure compared to alternatives. The evidence is insufficient to determine the effects of the technology on health outcomes.

Current standard of care, clinical input, clinical practice guidelines, and the absence of alternative treatments all support the use of laminectomy for space-occupying lesions of the spinal canal. As a result, laminectomy may be considered medically necessary for patients with space-occupying lesions of the spinal cord.

**Background**

Laminectomy is a surgical procedure that removes a portion of a vertebra (the lamina) to decompress the spine. Removal of the lamina provides greater space for the spinal cord and the nerve roots, thus relieving compression on these structures.

The most common diagnosis treated with laminectomy is spinal stenosis. In spinal stenosis, the spinal canal (vertebral foramen) is narrowed, thus compressing the spinal cord. Narrowing of the spinal canal may be congenital or degenerative in origin. Other conditions that cause pressure on the spine and spinal nerve roots include those where a mass lesion is present (eg, tumor, abscess, other localized infection).

Laminectomy is an inpatient procedure performed under general anesthesia. An incision is made in the back over the affected region, and the back muscles are dissected to expose the spinal cord. The lamina is then removed from the vertebral body, along with any inflamed or thickened ligaments that may be contributing to compression. Following resection, the muscles are reapproximated and the soft tissues sutured back into place. The extent of laminectomy varies, but
most commonly extends 2 levels above and below the site of maximal cord compression.¹

There are numerous variations on the basic laminectomy procedure. It can be performed by minimally invasive techniques, although the extent of resection is less when minimally invasive techniques are used. Laminoplasty is a more limited procedure in which the lamina are cut but not removed, thus allowing expansion of the spinal cord. Foraminotomy and/or foramenectomy, which involve partial or complete removal of the facet joints, may be combined with laminectomy when the spinal nerve roots are compressed at the foramen. Spinal fusion is combined with laminectomy when instability of the spine is present preoperatively, or if the procedure is sufficiently extensive to expect postoperative spinal instability.

Hemilaminotomy and laminotomy, sometimes termed laminoforaminotomy, are less invasive than laminectomy. These procedures focus on the interlaminar space, where most of the pathologic changes are concentrated, minimizing resection of the stabilizing posterior spine. A laminotomy typically removes the inferior aspect of the cranial lamina, superior aspect of the subjacent lamina, ligamentum flavum, and the medial aspect of the facet joint. Unlike laminectomy, laminotomy does not disrupt the facet joints, supra- and interspinous ligaments, a major portion of the lamina, or the muscular attachments. Muscular dissection and retraction are required to achieve adequate surgical visualization.

Microendoscopic decompressive laminotomy (MEDL) is similar to laminotomy but uses endoscopic visualization. The position of the tubular working channel is confirmed by fluoroscopic guidance, and serial dilators (METRx™ lumbar endoscopic system, Medtronic) are used to dilate the musculature and expand the fascia. For MEDL, an endoscopic curette, rongeur, and drill are used for the laminotomy, facetectomy, and foraminotomy. The working channel may be repositioned from a single incision for multilevel and bilateral dissections.

Complications of laminectomy can include spinal cord and nerve roots injuries, which occur at rates from 0% to 10%.¹ Worsening myelopathy and/or radiculopathy can occur in a small percentage of patients independent of surgical injuries. Worsening of symptoms is usually temporary, but in some cases has been permanent. Infection and bleeding can occur, hematomas following surgery often require reoperation if they are close to critical structures. Leakage of spinal fluid may occur and occasionally be persistent requiring treatment. Instability of the spine can result from extensive laminectomy involving multiple levels. This is usually an indication for spinal fusion as an adjunct to laminectomy, but if fusion is not performed, the instability may lead to progressive symptoms and additional surgery. Specific complication rates depend on the indication and location treated, surgical approach, and extent of surgery.
Rationale
This evidence review was originally created in January 2015 and has been updated regularly with searches of the MEDLINE database. The most recent literature review was performed through February 23, 2017.

Assessment of efficacy for therapeutic interventions 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. However, in this case, laminectomy is a surgical procedure that has been accepted as standard of care for patients requiring surgical decompression of the spine. As such, this procedure is assumed to be appropriate for at least some indications, and the review of evidence will focus on determining appropriate indications for use of laminectomy. Key trials for specific conditions will be reviewed, as well as existing clinical practice guidelines.

Spinal Stenosis

Lumbar Spinal Stenosis
Two RCTs comparing laminectomy to nonsurgical management for patients with spinal stenosis were identified. In the larger trial, Weinstein et al reported findings from the multicenter controlled trial (Spine Patient Outcomes Research Trial [SPORT]) that compared surgical and nonsurgical treatment for lumbar degenerative spondylolisthesis.\(^2\)\(^-\)\(^3\) All patients had neurogenic claudication or radicular leg pain associated with neurologic signs, spinal stenosis shown on cross-sectional imaging, and degenerative spondylolisthesis shown on lateral radiographs with symptoms persisting for at least 12 weeks. Patients were assigned to a randomized cohort (n=304) or an observational (nonoperative) cohort (n=303). About 40% of the randomized cohort crossed over in each direction by the 2-year follow-up. At the 4-year follow-up, 54% of patients allocated to nonoperative care had undergone surgery. Five percent of the surgically treated patients received decompression only and 95% had decompression with fusion.

Intention-to-treat (ITT) analysis of results showed no differences in outcomes between groups. However, this analysis was limited by the high rate of crossover, with the rate in patients assigned to nonsurgical management (54%) only slightly lower than the rate of surgery in patients assigned to surgical management (66%). Therefore, analysis by treatment received was also performed. This analysis, controlled for baseline factors, showed a significant advantage for surgery up to the 4-year follow-up for all primary and secondary outcome measures. The differences in the primary outcomes were: 17 points on the 36-Item Short-Form Health Survey (SF-36) bodily pain score (score range, 0-100; 95% confidence interval [CI], 13 to 20.9); 16.1 points on the SF-36 physical function score (score range, 0-100; 95% CI, 12.3 to 19.8); and -12.6 points on the Oswestry Disability Index (ODI; score range, 0-100; 95% CI, -15.5 to -9.7). All group differences were substantially larger than the minimally important clinical change for these measures.
Lurie et al (2015) published a follow-up analysis of SPORT at 8 years. At that time point, 55% of the original randomized cohort was available. Of available patients, 70% assigned to surgery and 52% assigned to medical care had undergone surgery. On ITT analysis, there were no differences on the primary outcomes. On as-treated analysis, the differences for the SF-36 and ODI measures were statistically significant at 4-year follow-up, but not at the 6- to 8-year follow-up time points.

In a small 2007 RCT from Finland, 94 patients from 4 university hospitals were randomized to laminectomy with or without fusion or to conservative therapy and followed for 2 years. All patients had lumbar spinal stenosis, persistent back pain for at least 6 months, and imaging studies demonstrating spinal stenosis at a level corresponding with the patient’s symptoms. Crossover was allowed for progressive symptoms, and 4 of 44 patients assigned to nonoperative treatment underwent surgery over the 2-year follow-up. The primary outcome measures were ODI scores and visual analog scale (VAS) scores of leg pain and back pain (ranges, 0-10). At 2-year follow-up, the surgical group showed greater improvement on all 3 primary outcome measures. The mean difference in the ODI score was 7.8 points (95% CI, 0.8 to 14.9 points); the mean difference in VAS leg pain score was 1.51 points (95% CI, 0.25 to 2.77 points) and the mean difference in VAS back pain score was 2.13 points (95% CI, 0.98 to 3.28 points). There were 8 perioperative complications, 7 of which were injuries to the dural sac. An additional 4 complications occurred postoperatively (1 hematoma requiring reoperation, 1 respiratory distress due to pulmonary edema, 2 additional surgeries).

The literature includes a number of nonrandomized comparative studies, a representative sample of which studies is reviewed here. The Maine Lumbar Spine Study was a prospective comparative cohort assessment (2005) of patients with lumbar spinal stenosis followed for 10 years. Clinical data at baseline were obtained from a physician questionnaire, and follow-up patient surveys were solicited by mail at regular intervals. The surveys evaluated the primary outcomes of back pain, leg pain, functional status, and satisfaction with treatment. A total of 148 patients were initially enrolled; 105 patients were alive at 10 years, and 97 had long-term follow-up data. At baseline, patients who underwent surgery were more severely ill, as evidenced by worse symptoms and functional status, compared with patients who underwent nonsurgical care. At follow-ups between 1 and 4 years, there were greater improvements in the 4 outcome measures for the surgical groups, but at 8 to 10 years, the groups had similar improvements in outcomes for pain, functional status, and satisfaction with care.

Amundsen et al (2000) reported a nonrandomized comparative study of long-term outcomes for 100 patients with symptomatic lumbar spinal stenosis. Nineteen were allocated to surgery for severe symptoms; 50 to conservative care for moderate symptoms; and 31 were randomized to surgery or conservative care with intermediate symptoms. Thirty-one patients were treated surgically and 68 were treated conservatively. After 4 years, the authors reported that 80% of patients treated with surgery had “excellent” or “fair” results compared with 50%
of patients treated conservatively (scale, excellent, fair, unchanged, worse; p not reported).

**Section Summary: Lumbar Spinal Stenosis**
There is some evidence from RCTs on the efficacy of laminectomy versus nonsurgical treatment for lumbar spinal stenosis, but the RCTs have methodologic limitations. One RCT was small and follow-up limited to 2 years; the second RCT had a very high rate of crossover that might have subverted the randomization process. Both RCTs reported greater improvements in pain and functional status with surgery than with nonsurgical treatment over the 2- to 4-year time frame. Results of nonrandomized comparative studies have corroborated the findings of the RCTs, reporting greater improvements with surgical treatment. The benefit of surgery may diminish over time, with 1 long-term cohort study reporting that the initial benefit of surgery was no longer present at the 8 to 10 years.

**Cervical Spinal Stenosis**
Many of the studies of laminectomy for cervical spinal stenosis have included either or both patients with spondylosis or posterior longitudinal ligament ossification. Those that specifically address the posterior longitudinal ligament ossification are addressed separately.

**Cervical Myelopathy**
There are few controlled trials comparing laminectomy to conservative management for patients with symptomatic cervical spinal stenosis. One small 2002 RCT was identified, comparing decompressive surgery to nonsurgical treatment, for patients with mild or moderate cervical myelopathy. The surgical techniques used were variations on laminectomy (ie, anterior decompression with fusion, corpectomy, laminoplasty); standard laminectomy was not used. Other published RCTs have compared various surgical techniques and therefore did not address the efficacy of surgery itself.9-12

One small, prospective, nonrandomized, multicenter study (2000) evaluated surgical and nonsurgical treatments in 62 patients with cervical myelopathy.13 Follow-up data were obtained for 43 (69%) of 62 patients, 20 of whom underwent surgery and 23 of whom had nonsurgical treatment. Details on the specific types of surgery were sparse, though authors indicated that the primary procedure was posterior laminotomy or laminectomy with or without foraminotomy. Patients in the surgical group improved significantly on the overall functional status measure (worst pain rating) and average pain rating, while patients in the nonsurgical group only showed significant improvements on average pain rating. No between-group comparisons or complications were reported.

The AOSpine North America Prospective Multi-Center Study, a single-arm cohort study (2013), evaluated surgical decompression outcomes for cervical myelopathy. The study enrolled 278 consecutive patients, presenting to 12 North American centers, with symptomatic cervical myelopathy, objective cord compression on magnetic resonance imaging (MRI), and no evidence of lumbar spinal stenosis. The treating surgeon decided the specific surgical approach.
Details on the approach were not reported, but approximately one-third of patients received laminectomy. At 1-year follow-up, there was significant improvement on multiple measures of symptoms and functional status, including improvement on 7 of 8 SF-36 scales. Complications occurred in 18.7% of patients. The most common complications were postoperative dysphagia (3.6%), superficial infection (2.9%), and need for revision surgery (2.2%). Worsening myelopathic symptoms postoperatively developed in 3 patients, 2 of whom returned to baseline by 1 year.

A separate 2012 publication from the AOSpine study reported on short- and long-term surgical complications. Perioperative complications occurred in 15.6% (47/302) of patients, the most common being minor cardiopulmonary events (3.0%), dysphagia (3.0%), and superficial wound infection (2.3%). Worsening of perioperative myelopathy occurred in 1.3% (n=4) of patients. Of patients who completed 2-year follow-up, late complications occurred in 4.4% (14/275), of which 6 were considered major.

Some studies have compared laminectomy with alternative surgical approaches. A meta-analysis by Liu et al (2016) summarized studies comparing laminectomy plus fusion with laminoplasty for cervical compressive myelopathy. Across the 23 studies meeting inclusion criteria, with 743 and 774 patient treated with laminectomy and laminoplasty and fusion, respectively, there were generally no significant differences in most clinical outcomes, although laminoplasty-treated patients had lower rates of C5 palsy (pooled odds ratio [OR], 0.26; 95% CI, 0.15 to 0.44).

A 2017 meta-analysis with more restrictive selection criteria compared laminectomy and fusion with expansive laminectomy for multiple-level cervical spondylotic myelopathy. Reviewers included 10 studies—2 prospective RCTs and 8 retrospective observational studies. For most clinical outcomes, there were no significant differences between groups, with the exception of a higher complication rate in the laminectomy plus fusion group.

**Ossification of the Posterior Longitudinal Ligament**

In 2016, Singhatanadgige et al reported on a systematic review of studies comparing laminoplasty with laminectomy plus fusion in patients with ossification of the posterior longitudinal ligament leading to myelopathy. Four studies were identified, 1 prospective and 3 retrospective cohort studies (total N=334 patients; range 38-164 patients); the overall body of evidence was assessed with GRADE. Follow-up ranged from 12 to 72 months. Outcomes were not pooled, but primary outcomes were summarized. Myelopathy recovery rates did not differ significantly at 12 months in 2 studies, but in 2 other retrospective studies recovery rates were higher in the laminoplasty group than in the laminectomy plus fusion group (65.2 vs 50.8%, p = reported as significant) in 1 study but the opposite in the other (25.1% vs 43.5%). The 2 studies that reported on pain did not find differences between groups. All 4 studies that reported on the incidence of cranial nerve 5 palsy found that it was higher in patients treated with laminectomy with fusion (range, 9.6%-25%) than laminoplasty (range, 0%-8%). The authors concluded that their analysis did not establish the superiority of either procedure.
In 2016, Nakashima et al reported on the prospective, multicenter AOSpine CSM International study, which was designed to evaluate whether the underlying mechanism of disease (eg, cervical spondylotic myelopathy, posterior longitudinal ligament ossification) in degenerative cervical myelopathy has an impact on the outcomes of surgical decompression. The study included 479 patients with symptomatic degenerative cervical myelopathy, of whom 135 (28.2%) had radiographic evidence of posterior longitudinal ligament ossification. Patients were treated at the discretion of their surgeons—anteriorly by cervical discectomy and/or corpectomy with fusion, or posteriorly by laminectomy with or without fusion or laminoplasty. At 2-year follow-up, there were no significant differences between groups in symptoms or functional outcomes.

A prospective study of 63 patients who underwent cervical decompressive surgery for ossification of the posterior longitudinal ligament was published in 2014. Laminectomy was performed by 1 of 2 methods, either the anterior or posterior approach. The primary outcome measure was the Nurick Scale for myelopathy (score range, 0-5), with higher numbers representing more severe myelopathy. At 24-month follow-up, improvement in the Nurick Scale grade was reported for 54 (86%) of 63 patients, and mean Nurick grade improved from 2.82 at baseline to 2.03 at final follow-up (p<0.05).

Lee et al (2016) published a retrospective study of 57 patients who underwent surgery for cervical myelopathy caused by ossification of the posterior longitudinal ligament and had at least 24 months of follow-up. Three surgical variations were used: laminectomy alone, laminectomy plus fusion, and laminoplasty. Outcomes reported included radiographic evidence of cervical sagittal balance, Neck Disability Index, and VAS for pain. Progressive improvements were reported in the radiographic and clinical outcomes over time in all groups. Progression of posterior longitudinal ligament ossification was seen more commonly in the group treated with laminectomy alone than with laminectomy plus fusion.

**Section Summary: Cervical Spinal Stenosis**

For cervical spinal stenosis, the evidence is more limited than for lumbar spinal stenosis, with no published RCTs. Some nonrandomized comparative evidence is available on treatment of cervical spondylotic myelopathy with decompressive surgery versus nonsurgical management, but this evidence assesses spinal stenosis and other etiologies, and includes various techniques for decompression, without reporting on laminectomy separately. Single-arm studies have reported significant improvements in postsurgical pain and functional status, but have not provided relevant evidence on the comparative efficacy of surgical versus nonsurgical management.

**Space-Occupying Lesions of the Spinal Canal**

For indications other than spinal stenosis, the evidence consists primarily of case reports and retrospective case series. Representative examples of the types of studies available for specific indications are provided next.
Neoplasms of the Spine
Zong et al (2013) published a retrospective study of 110 patients with extramedullary schwannomas treated surgically. Three variations of laminectomy were used: laminectomy plus microscopic excision, hemilaminectomy plus microscopic excision, and laminectomy plus microscopic excision and pedicle screw fixation. The authors compared various surgical parameters across procedures, such as blood loss, operative time, and length of stay. No clinical outcomes were reported.

Tredway et al (2006) reported on 6 patients with intradural spinal neoplasms (4 lumbar, 1 thoracic, 1 cervical) treated with laminectomy and dural resection by minimally invasive techniques. The authors reported that all patients underwent successful resection without complications. On follow-up MRI, complete resection was seen in all cases, with no evidence of residual tumor.

Epidural Abscess
Piccolo et al (1999) reported a series of 5 patients with cervical epidural abscess treated with surgical drainage plus laminectomy or surgical drainage alone, depending degree of cervical spinal involvement. Surgical outcome was poor in 1 of 2 patients treated with laminectomy, who had extensive disease spanning more than 3 vertebral segments.

Summary of Evidence
The evidence for lumbar laminectomy in individuals who have lumbar spinal stenosis and spinal cord or nerve root compression includes randomized controlled trials (RCTs) and nonrandomized comparative studies. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and treatment-related mortality and morbidity. For this indication, 2 RCTs have reported that laminectomy is superior to nonsurgical management for reducing pain and improving functional status. These RCTs have methodologic limitations, but both report significant benefits for surgery on their main outcomes. Most nonrandomized comparative studies have also reported greater benefit for surgery than for conservative management. Generally, among published studies and clinical practice guidelines, there is consistency in the indications for surgery, including those with progressive or persistent neurologic deficits despite conservative therapy. However, beyond broad guidelines, there is little uniformity in recommendations for specific procedures in specific patient groups, lack of standardized severity measures to judge thresholds for surgical intervention, and lack of good predictive models to assess the risks of laminectomy. The evidence is sufficient to determine qualitatively that the technology results in a meaningful improvement in the net health outcome.

The evidence for cervical laminectomy in individuals who have cervical spinal stenosis and spinal cord or nerve root compression includes RCTs and nonrandomized comparative studies. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and treatment-related mortality and morbidity. There is a lack of high-quality, comparative evidence for this indication, although what evidence there is has outcomes similar to those for
lumbar spinal stenosis. Given the parallels between cervical laminectomy and lumbar laminectomy, it can be inferred that the benefit reported for lumbar laminectomy supports a benefit for cervical laminectomy. The evidence is sufficient to determine qualitatively that the technology results in a meaningful improvement in the net health outcome.

The evidence for cervical, thoracic, or lumbar laminectomy in individuals with space-occupying lesions of the spinal canal or nerve root compression includes case series. Relevant outcomes are symptoms, functional outcomes, health status measures, quality of life, and treatment-related mortality and morbidity. Most case series are small and retrospective. They have reported that most patients with myelopathy experience improvement in symptoms or abatement of symptom progression following laminectomy. However, this uncontrolled evidence does not provide a basis to determine the efficacy of the procedure compared to alternatives. 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, input was received from 2 specialty societies and 4 academic medical centers when this policy was in development in 2015. Based on input from reviewers, criteria for medical necessity were changed for the indications of mass lesions and cervical laminectomy.

**Practice Guidelines and Position Statements**
In 2011, the North American Spine Society (NASS) issued an evidence-based clinical guidelines on the diagnosis and treatment of degenerative lumbar spinal stenosis. The guidelines stated that patients with mild symptoms of lumbar spinal stenosis are not considered surgical candidates; however, decompressive surgery was suggested to improve outcomes in patients with moderate-to-severe symptoms of lumbar spinal stenosis (grade B recommendation). NASS also indicated that current evidence was insufficient to recommend for or against the placement of interspinous process spacing devices as a treatment for spinal stenosis.

**U.S. Preventive Services Task Force Recommendations**
Not applicable.
Medicare National Coverage
There is no national coverage determination (NCD). In the absence of an NCD, coverage decisions are left to the discretion of local Medicare carriers.

Ongoing and Unpublished Clinical Trials
A search of ClinicalTrials.gov in March 2017 did not identify any ongoing or unpublished trials that would likely influence this review.

References


**Billing Coding/Physician Documentation Information**

63001 Laminectomy with exploration and/or decompression of spinal cord and/or cauda equina, without facetectomy, foraminotomy or discectomy (eg, spinal stenosis), 1 or 2 vertebral segments; cervical

63005 Laminectomy with exploration and/or decompression of spinal cord and/or cauda equina, without facetectomy, foraminotomy or discectomy (eg, spinal stenosis), 1 or 2 vertebral segments; lumbar, except for spondylolisthesis

63015 Laminectomy with exploration and/or decompression of spinal cord and/or cauda equina, without facetectomy, foraminotomy or discectomy (eg, spinal stenosis), more than 2 vertebral segments; cervical

63017 Laminectomy with exploration and/or decompression of spinal cord and/or cauda equina, without facetectomy, foraminotomy or discectomy (eg, spinal stenosis), more than 2 vertebral segments; lumbar

63270 Laminectomy for excision of intraspinal lesion other than neoplasm, intradural; cervical

63272 Laminectomy for excision of intraspinal lesion other than neoplasm, intradural; lumbar

63275 Laminectomy for biopsy/excision of intraspinal neoplasm; extradural,
cervical

63277 Laminectomy for biopsy/excision of intraspinal neoplasm; extradural, lumbar
63280 Laminectomy for biopsy/excision of intraspinal neoplasm; intradural, extramedullary, cervical
63282 Laminectomy for biopsy/excision of intraspinal neoplasm; intradural, extramedullary, lumbar
63285 Laminectomy for biopsy/excision of intraspinal neoplasm; intradural, intramedullary, cervical
63287 Laminectomy for biopsy/excision of intraspinal neoplasm; intradural, intramedullary, thoracolumbar

ICD-10 Codes
C72.0 Malignant neoplasm of spinal cord
C79.40 Secondary malignant neoplasm of unspecified part of nervous system
G06.1 Intraspinal abscess and granuloma
M48.00-M48.08 Spinal stenosis, code range
M48.8X1-M48.8X9 Other specified spondylopathies code range (includes ossification of posterior longitudinal ligament NOS)

Additional Policy Key Words
N/A

Policy Implementation/Update Information
8/1/15 New Policy. Laminectomy may be considered medically necessary for spinal stenosis or mass lesions of the spine when criteria are met.
8/1/16 No policy statement changes.
8/1/17 No policy statement changes.

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