

# Musculoskeletal Program Clinical Appropriateness Guidelines

# Spine Surgery

**EFFECTIVE JULY 01, 2018**

**LAST REVIEWED DECEMBER 12, 2017**



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2063-0718  
V.2

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# Description and Application of the Guidelines

AIM's Clinical Appropriateness Guidelines (hereinafter "AIM's Clinical Appropriateness Guidelines" or the "Guidelines") are designed to assist providers in making the most appropriate treatment decision for a specific clinical condition for an individual. As used by AIM, the Guidelines establish objective and evidence-based, where possible, criteria for medical necessity determinations. In the process, multiple functions are accomplished:

- To establish criteria for when services are medically necessary
- To assist the practitioner as an educational tool
- To encourage standardization of medical practice patterns
- To curtail the performance of inappropriate and/or duplicate services
- To advocate for patient safety concerns
- To enhance the quality of healthcare
- To promote the most efficient and cost-effective use of services

AIM's guideline development process complies with applicable accreditation standards, including the requirement that the Guidelines be developed with involvement from appropriate providers with current clinical expertise relevant to the Guidelines under review and be based on the most up to date clinical principles and best practices. Relevant citations are included in the "References" section attached to each Guideline. AIM reviews all of its Guidelines at least annually.

AIM makes its Guidelines publicly available on its website twenty-four hours a day, seven days a week. Copies of the AIM's Clinical Appropriateness Guidelines are also available upon oral or written request. Although the Guidelines are publicly-available, AIM considers the Guidelines to be important, proprietary information of AIM, which cannot be sold, assigned, leased, licensed, reproduced or distributed without the written consent of AIM.

AIM applies objective and evidence-based criteria and takes individual circumstances and the local delivery system into account when determining the medical appropriateness of health care services. The AIM Guidelines are just guidelines for the provision of specialty health services. These criteria are designed to guide both providers and reviewers to the most appropriate services based on a patient's unique circumstances. In all cases, clinical judgment consistent with the standards of good medical practice should be used when applying the Guidelines. Guideline determinations are made based on the information provided at the time of the request. It is expected that medical necessity decisions may change as new information is provided or based on unique aspects of the patient's condition. The treating clinician has final authority and responsibility for treatment decisions regarding the care of the patient and for justifying and demonstrating the existence of medical necessity for the requested service. The Guidelines are not a substitute for the experience and judgment of a physician or other health care professionals. Any clinician seeking to apply or consult the Guidelines is expected to use independent medical judgment in the context of individual clinical circumstances to determine any patient's care or treatment.

The Guidelines do not address coverage, benefit or other plan specific issues. If requested by a health plan, AIM will review requests based on health plan medical policy/guidelines in lieu of the AIM's Guidelines.

The Guidelines may also be used by the health plan or by AIM for purposes of provider education, or to review the medical necessity of services by any provider who has been notified of the need for medical necessity review, due to billing practices or claims that are not consistent with other providers in terms of frequency or some other manner.

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# Cervical Decompression With or Without Fusion

## Description

Cervical spine surgery is most commonly performed for radiculopathy or cervical myelopathy. The goal of surgery is adequate decompression of the nerve roots and/or spinal cord and stabilization of the spine.

Cervical decompression is performed with or without a fusion procedure and may be broadly divided into anterior, posterior, or combined surgical approach. The choice of procedure depends on many factors including:

- Location of the compression
- Presence of deformity or instability
- Number of levels involved
- Patient age and surgical fitness

Laminoplasty is a related procedure for achieving decompression without the need for fusion, and is most commonly utilized to treat multilevel central stenosis or ossification of the posterior longitudinal ligament (OPLL).

This guideline addresses the following interventions when performed as an **elective, non-emergent** procedure and not as part of the care of an acute or traumatic event.

- **Anterior cervical corpectomy and fusion (ACCF)** - for long anterior compression of the spinal cord from spondylosis, large disc extrusions or OPLL
- **Anterior cervical discectomy/fusion/internal fixation (ACDF)** - decompression of the nerve roots or spinal cord by disc or osteophyte removal, with or without a fusion
- **Posterior cervical foraminotomy** - for nerve root decompression in cases of soft posterolateral disc herniation or bony foraminal stenosis
- **Posterior laminectomy with or without fusion** - for congenital stenosis, multilevel central stenosis from spondylosis, or multiple discontinuous levels where fusion is recommended to prevent kyphotic deformity. Note that a regional kyphosis (greater than 13°) has been associated with unfavorable outcomes following posterior-only surgery
- **Posterior laminoplasty** - osteoplastic enlargement of the spinal canal (for example, by one sided laminectomy and hinge opening of the contralateral side)

## Definitions

**Conservative management** should include a combination of strategies to reduce inflammation, alleviate pain, and improve function, including but not limited to the following:

- Prescription strength anti-inflammatory medications and analgesics
- Adjunctive medications such as nerve membrane stabilizers or muscle relaxants
- Physician-supervised therapeutic exercise program or physical therapy
- Manual therapy or spinal manipulation
- Alternative therapies such as acupuncture
- Appropriate management of underlying or associated cognitive, behavioral, or addiction disorders

Documentation of compliance with a plan of therapy that includes elements from these areas is required. Exceptions may be considered on a case-by-case basis.

*The requirement for a period of conservative treatment as a prerequisite to a surgical procedure is waived when there is evidence of progressive nerve or spinal cord compression resulting in a significant neurologic deficit, or when myelopathy, weakness, or bladder disturbance is present.*

**Reporting of symptom severity** – Severity of pain and its impact on activities of daily living (ADLs) is a key factor in determining the need for intervention. For purposes of this guideline, significant pain and functional impairment refers to pain that is at least 3 out of 10 in intensity and is associated with inability to perform at least two (2) ADLs.

**Tobacco cessation** – Due to risk of pseudoarthrosis, adherence to a tobacco-cessation program resulting in abstinence from tobacco for at least six (6) weeks prior to spinal surgery is recommended. Documentation of nicotine-free status by laboratory testing (e.g., cotinine level or carboxyhemoglobin) is recommended. After six (6) weeks of tobacco cessation, labs should be performed with ample time afforded to submit this confirmation and complete the prior authorization process.

**Imaging studies** – All imaging must be performed and read by an independent radiologist. If discrepancies should arise in the interpretation of the imaging, the radiologist report will supersede. The results of all imaging studies should correlate with the clinical findings in support of the requested procedure.

**Osteotomy** – Spinal osteotomy procedures are reported when a portion or portions of the vertebral segment or segments is (are) cut and removed in preparation for realigning the spine as part of a spinal deformity correction. These procedures may be required for congenital, developmental, and degenerative spinal deformities.

**Corpectomy** – Corpectomy typically reflects a longitudinal resection of the vertebral body from disc space to disc space often resulting in a destabilization of the complex. In the cervical spine, at least 50% of the vertebral body is removed and in the thoracic/lumbar spine, at least 30% of the corpus is removed.

## Criteria

**Cervical decompression with or without fusion** may be indicated to treat any of the following conditions:

**Instability** of the cervical spine due to any of the following conditions, where instability is caused by the condition itself, or when treatment of the condition is anticipated to result in instability (i.e., resection or debridement)

- Tumor of the spine or spinal canal
- Infection (osteomyelitis, discitis, or spinal abscess)
- Fracture or dislocation; may be traumatic or pathologic
- Symptomatic, non-traumatic cervical spondylosis as demonstrated by either of the following radiographic findings:
  - Sagittal plane angulation of greater than 11 degrees between adjacent segments
  - Subluxation or translation of greater than 3 mm on static lateral views or dynamic radiographs

**Spondylotic cervical myelopathy** when both of the following requirements are met:

- Clinical signs and symptoms of myelopathy which may include: loss of dexterity, urinary urgency, new-onset bowel or bladder incontinence, frequent falls, hyperreflexia, Hoffmann sign, increased tone or spasticity, gait abnormality or pathologic Babinski sign
- Imaging studies which demonstrate cervical cord compression

**Cervical radiculopathy** when all of the following requirements are met:

- Progressive neurologic deficits (with or without associated pain) OR unremitting severe radicular pain (with or without associated neurologic deficits)
- Failure of at least six (6) weeks of conservative therapy
- Imaging studies which demonstrate nerve root compression correlating with the distribution of signs and symptoms

**Ossification of the Posterior Longitudinal Ligament (OPLL)**, with or without kyphosis, when both of the following requirements are met:

- Clinical signs and symptoms of myelopathy which may include: loss of dexterity, urinary urgency, new-onset bowel or bladder incontinence, frequent falls, hyperreflexia, Hoffmann sign, increased tone or spasticity, gait abnormality or pathologic Babinski sign
- Imaging studies which demonstrate cervical cord compression

**Cervical synovial cyst** (both are required)

- Radicular pain (with or without demonstrable neurologic deficits) which has not responded to at least six (6) weeks of conservative management
- Documentation of a synovial cyst on CT or MRI performed within the past six (6) months which correlates with symptoms and exam findings

**Degenerative cervical kyphosis** when both of the following requirements are met:

- Clinical signs and symptoms of myelopathy which may include: loss of dexterity, urinary urgency, new-onset bowel or bladder incontinence, frequent falls, hyperreflexia, Hoffmann sign, increased tone or spasticity, gait abnormality or pathologic Babinski sign
- Imaging studies which demonstrate cervical cord compression

**Pseudoarthrosis** when all of the following are demonstrated:

- Advanced imaging studies highly suggestive of nonunion at a motion segment at which a fusion had been previously attempted. This includes lack of bridging bone and /or dynamic motion demonstrated on flexion-extension radiographs
- At least nine (9) months have elapsed since the prior procedure, unless there is evidence of hardware breakage or loosening
- The patient experienced significant relief of symptoms following the procedure
- Recurrent symptoms or functional impairment has not responded to at least six (6) weeks of conservative management following confirmation of the diagnosis

**Implant/Instrumentation failure** demonstrated on standard or advanced imaging showing malposition or other evidence of failure (e.g., subsidence, surrounding radiolucency, dislocation/subluxation, vertebral body fracture or hardware breakage)

**Progressive neck pain or deformity** following prior posterior cervical decompressive laminectomy or laminoplasty

**Cervical laminoplasty** may be indicated for treatment of following conditions:

**Multilevel Spinal stenosis** of the cervical spine, when all of the following requirements are met:

- Clinical signs and symptoms of myelopathy which may include: loss of dexterity, urinary urgency, new-onset bowel or bladder incontinence, frequent falls, hyperreflexia, Hoffmann sign, increased tone or spasticity, gait abnormality or pathologic Babinski sign
- Imaging studies which demonstrate cervical cord compression
- Neutral to lordotic cervical alignment with no greater than 13 degrees of kyphosis

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary**, including but not limited to the following:

- Isolated neck pain and spinal stenosis without MRI evidence of intrinsic cord compression
- Asymptomatic spinal stenosis without MRI evidence of intrinsic cord compression



## Selected References

- 1 Bono CM, Ghiselli G, Gilbert TJ. An evidence-based clinical guideline for the diagnosis and treatment of cervical radiculopathy from degenerative disorders. *The spine journal : official journal of the North American Spine Society*. 2011;11(1):64-72.
- 2 Engquist M, Lofgren H, Oberg B. Surgery versus nonsurgical treatment of cervical radiculopathy: a prospective, randomized study comparing surgery plus physiotherapy with physiotherapy alone with a 2-year follow-up. *Spine*. 2013;38(20):1715-22.
- 3 Engquist M, Lofgren H, Oberg B. A 5- to 8-year randomized study on the treatment of cervical radiculopathy: anterior cervical decompression and fusion plus physiotherapy versus physiotherapy alone. *J Neurosurg Spine*. 2017;26(1):19-27.
- 4 Gebremariam L, Koes BW, Peul WC, et al. Evaluation of treatment effectiveness for the herniated cervical disc: a systematic review. *Spine*. 2012;37(2):E109-18.
- 5 Kadanka Z, Bednarik J, Novotny O. Cervical spondylotic myelopathy: conservative versus surgical treatment after 10 years. *Eur Spine J*. 2011;20(9):1533-8.
- 6 Lebl DR, Bono CM. Update on the Diagnosis and Management of Cervical Spondylotic Myelopathy. *The Journal of the American Academy of Orthopaedic Surgeons*. 2015;23(11):648-60.
- 7 Peolsson A, Soderlund A, Engquist M. Physical function outcome in cervical radiculopathy patients after physiotherapy alone compared with anterior surgery followed by physiotherapy: a prospective randomized study with a 2-year follow-up. *Spine*. 2013;38(4):300-7.

## CPT Codes

- 22551 Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophyctectomy and decompression of spinal cord and/or nerve roots; cervical below C2
- 22552 Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophyctectomy and decompression of spinal cord and/or nerve roots; cervical below C2, each additional interspace (List separately in addition to code for separate procedure)
- 22554 Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); cervical below C2
- 22585 Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); each additional interspace (List separately in addition to code for primary procedure)
- 22600 Arthrodesis, posterior or posterolateral technique, single level; cervical below C2 segment
- 22614 Arthrodesis, posterior or posterolateral technique, single level; each additional vertebral segment (List separately in addition to code for primary procedure)
- 22632 Arthrodesis, posterior interbody technique, including laminectomy and/or discectomy to prepare interspace (other than for decompression), single interspace; each additional interspace (List separately in addition to code for primary procedure)
- 22634 Arthrodesis, combined posterior or posterolateral technique with posterior interbody technique including laminectomy and/or discectomy sufficient to prepare interspace (other than for decompression), single interspace and segment; each additional interspace and segment (List separately in addition to code for primary procedure)
- 22830 Exploration of spinal fusion
- 22840 Posterior non-segmental instrumentation (eg, Harrington rod technique, pedicle fixation across 1 interspace, atlantoaxial transarticular screw fixation, sublaminar wiring at C1, facet screw fixation) (List separately in addition to code for primary procedure)
- 22841 Internal spinal fixation by wiring of spinous processes (List separately in addition to code for primary procedure)

- 22842 Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 3 to 6 vertebral segments (List separately in addition to code for primary procedure)
- 22843 Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 7 to 12 vertebral segments (List separately in addition to code for primary procedure)
- 22844 Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 13 or more vertebral segments (List separately in addition to code for primary procedure)
- 22845 Anterior instrumentation; 2 to 3 vertebral segments (List separately in addition to code for primary procedure)
- 22846 Anterior instrumentation; 4 to 7 vertebral segments (List separately in addition to code for primary procedure)
- 22847 Anterior instrumentation; 8 or more vertebral segments (List separately in addition to code for primary procedure)
- 22848 Pelvic fixation (attachment of caudal end of instrumentation to pelvic bony structures) other than sacrum (List separately in addition to code for primary procedure)
- 22849 Reinsertion of spinal fixation device
- 22853 Insertion of interbody biomechanical device(s) (eg, synthetic cage, mesh) with integral anterior instrumentation for device anchoring (eg, screws, flanges), when performed, to intervertebral disc space in conjunction with interbody arthrodesis, each interspace (List separately in addition to code for primary procedure)
- 22854 Insertion of intervertebral biomechanical device(s) (eg, synthetic cage, mesh) with integral anterior instrumentation for device anchoring (eg, screws, flanges), when performed, to vertebral corpectomy(ies) (vertebral body resection, partial or complete) defect, in conjunction with interbody arthrodesis, each contiguous defect (List separately in addition to code for primary procedure)
- 22859 Insertion of intervertebral biomechanical device(s) (eg, synthetic cage, mesh, methylmethacrylate) to intervertebral disc space or vertebral body defect without interbody arthrodesis, each contiguous defect (List separately in addition to code for primary procedure)
- 22864 Removal of total disc arthroplasty (artificial disc), anterior approach, single interspace; cervical
- 63001 Laminectomy with exploration and/or decompression of spinal cord and/or cauda equina, without facetectomy, foraminotomy or discectomy (e.g., spinal stenosis), 1 or 2 vertebral segments; cervical
- 63015 Laminectomy with exploration and/or decompression of spinal cord and/or cauda equina, without facetectomy, foraminotomy or discectomy (e.g., spinal stenosis), more than 2 vertebral segments; cervical
- 63020 Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc; 1 interspace, cervical
- 63035 Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc; each additional interspace, cervical or lumbar (List separately in addition to code for primary procedure)
- 63040 Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc, reexploration, single interspace; cervical

- 63043 Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc, reexploration, single interspace; each additional cervical interspace (List separately in addition to code for primary procedure)
- 63045 Laminectomy, facetectomy and foraminotomy (unilateral or bilateral with decompression of spinal cord, cauda equina and/or nerve root[s], [e.g., spinal or lateral recess stenosis]), single vertebral segment; cervical
- 63048 Laminectomy, facetectomy and foraminotomy (unilateral or bilateral with decompression of spinal cord, cauda equina and/or nerve root[s], [e.g., spinal or lateral recess stenosis]), single vertebral segment; each additional segment, cervical, thoracic, or lumbar (List separately in addition to code for primary procedure)
- 63050 Laminoplasty, cervical, with decompression of the spinal cord, 2 or more vertebral segments;
- 63051 Laminoplasty, cervical, with decompression of the spinal cord, 2 or more vertebral segments; with reconstruction of the posterior bony elements (including the application of bridging bone graft and non-segmental fixation devices [e.g., wire, suture, mini-plates], when performed)
- 63075 Discectomy, anterior, with decompression of spinal cord and/or nerve root(s), including osteophyctomy; cervical, single interspace
- 63076 Discectomy, anterior, with decompression of spinal cord and/or nerve root(s), including osteophyctomy; cervical, each additional interspace (List separately in addition to code for primary procedure)
- 63081 Vertebral corpectomy (vertebral body resection), partial or complete, anterior approach with decompression of spinal cord and/or nerve root(s); cervical, single segment
- 63082 Vertebral corpectomy (vertebral body resection), partial or complete, anterior approach with decompression of spinal cord and/or nerve root(s); cervical, each additional segment (List separately in addition to code for primary procedure)

## History

Status	Date	Action
Initial creation	11/01/2017	Original effective date
Reviewed	12/12/2017	Last Independent Multispecialty Physician Panel review
Revised	07/01/2018	Definitions, Conservative Management – Added osteotomy and corpectomy. Criteria, Instrument failure – Added implants and clarification of imaging evidence.

# Cervical Disc Arthroplasty

## Description

Cervical disc arthroplasty, also known as cervical artificial disc replacement (CADR), was developed as an alternative to cervical fusion for treatment of cervical radiculopathy due to severe degenerative disc disease.

For appropriately chosen indications, CADR has shown promising results in the available data, indicating at least equivalence to cervical fusion following adequate decompression.

This document addresses cervical disc arthroplasty when performed as an **elective, non-emergent** procedure and not as part of the care of an acute or traumatic event.

## Definitions

**Conservative management** should include a combination of strategies to reduce inflammation, alleviate pain, and improve function, including but not limited to the following:

- Prescription strength anti-inflammatory medications and analgesics
- Adjunctive medications such as nerve membrane stabilizers or muscle relaxants
- Physician-supervised therapeutic exercise program or physical therapy
- Manual therapy or spinal manipulation
- Alternative therapies such as acupuncture
- Appropriate management of underlying or associated cognitive, behavioral, or addiction disorders

Documentation of compliance with a plan of therapy that includes elements from these areas is required. Exceptions may be considered on a case-by-case basis.

*The requirement for a period of conservative treatment as a prerequisite to a surgical procedure is waived when there is evidence of progressive nerve or spinal cord compression resulting in a significant neurologic deficit, or when myelopathy, weakness, or bladder disturbance is present.*

**Reporting of symptom severity** – Severity of pain and its impact on activities of daily living (ADLs) is a key factor in determining the need for intervention. For purposes of this guideline, significant pain and functional impairment refers to pain that is at least 3 out of 10 in intensity and is associated with inability to perform at least two (2) ADLs.

**Tobacco cessation** – Due to risk of pseudoarthrosis, adherence to a tobacco-cessation program resulting in abstinence from tobacco for at least six (6) weeks prior to spinal surgery is recommended. Documentation of nicotine-free status by laboratory testing (e.g., cotinine level or carboxyhemoglobin) is recommended. After six (6) weeks of tobacco cessation, labs should be performed with ample time afforded to submit this confirmation and complete the prior authorization process.

**Imaging studies** – All imaging must be performed and read by an independent radiologist. If discrepancies should arise in the interpretation of the imaging, the radiologist report will supersede. The results of all imaging studies should correlate with the clinical findings in support of the requested procedure.

## Criteria

**Cervical artificial disc replacement (CADR)** may be indicated for the following diagnoses:

**Radiculopathy** related to nerve root compression caused by one or two-level degenerative disease between C3-4 and C6-7, with or without neck pain, when both of the following requirements are met:

- Objective neurologic findings which correlate with a cervical nerve root impingement, and/or unremitting radicular pain which has not responded to at least six (6) weeks of appropriate conservative management
- Imaging studies demonstrating nerve root compression due to herniated disc or spondylotic osteophyte correlating with the distribution of signs and symptoms

**Myelopathy or myeloradiculopathy** related to central spinal stenosis caused by one or two-level degenerative disease between C3-4 and C6-7, with or without neck pain, when both of the following requirements are met:

- Clinical signs and symptoms of myelopathy which may include: loss of dexterity, urinary urgency, new-onset bowel or bladder incontinence, frequent falls, hyperreflexia, Hoffmann sign, increased tone or spasticity, gait abnormality or pathologic Babinski sign
- Imaging studies demonstrating cervical cord compression due to herniated nucleus pulposus or osteophyte formation

**Additional requirements for cervical artificial disc replacement** (radiculopathy and myelopathy):

- The individual is skeletally mature as documented by growth plate closure
- An FDA-approved cervical artificial intervertebral device is used in accordance with FDA labeling, and will be implanted using an anterior approach

**Simultaneous cervical artificial disc replacement at two contiguous levels** requires that the above criteria be met for each disc level, and that the device being utilized is FDA-approved for two levels (i.e., Mobi-C or Prestige LP).

## Contraindications

- Active systemic infection or infection localized to the site of implantation
- Osteoporosis defined as dual energy X-ray absorptiometry (DEXA) bone density measured T-score of negative 2.5 or lower

- Marked cervical instability on neutral resting lateral or flexion/extension radiographs; with greater than or equal to 3 mm translation or greater than 11 degrees of angular difference to either adjacent level
- Clinically compromised vertebral bodies at the affected level due to current or past trauma, anatomic deformity or cervical spine malignancy
- Focal kyphosis at the level of planned arthroplasty
- Moderate or severe spondylosis at the level to be treated, characterized by bridging osteophytes, loss of greater than 50% of normal disc height, or severely limited range of motion (i.e., less than 2 degrees) at the affected level
- Severe facet joint arthropathy
- Ossification of the posterior longitudinal ligament (OPLL)
- Sensitivity or allergy to implant materials

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary**, including but not limited to the following:

- Cervical total disc arthroplasty at more than two (2) levels or at two (2) non-contiguous levels
- Hybrid constructs in a single procedure, involving cervical fusion with cervical total disc arthroplasty
- Cervical total disc arthroplasty in an individual with a previous fusion at another cervical level

## Selected References

- 1 Bono CM, Ghiselli G, Gilbert TJ. An evidence-based clinical guideline for the diagnosis and treatment of cervical radiculopathy from degenerative disorders. *The spine journal : official journal of the North American Spine Society*. 2011;11(1):64-72.
- 2 McAfee PCR, C.; Gilder, K.; Eisermann, L.; Cunningham, B. A meta-analysis of comparative outcomes following cervical arthroplasty or anterior cervical fusion: Results from 4 prospective multicenter randomized clinical trials and up to 1226 patients. *Spine*. 2012;37(11):943-52.
- 3 Radcliff K, Kepler C, Hilibrand A, et al. Epidural steroid injections are associated with less improvement in patients with lumbar spinal stenosis: a subgroup analysis of the Spine Patient Outcomes Research Trial. *Spine*. 2013;38(4):279-91.

## CPT Codes

- 22856 Total disc arthroplasty (artificial disc), anterior approach, including discectomy with end plate preparation (includes osteophylectomy for nerve root or spinal cord decompression and microdissection); single interspace, cervical
- 22858 Total disc arthroplasty (artificial disc), anterior approach, including discectomy with end plate preparation (includes osteophylectomy for nerve root or spinal cord decompression and microdissection); second level, cervical (List separately in addition to code for primary procedure)
- 22861 Revision including replacement of total disc arthroplasty (artificial disc), anterior approach, single interspace; cervical
- 22864 Removal of total disc arthroplasty (artificial disc), anterior approach, single interspace; cervical

# History

Status	Date	Action
Created	11/01/2017	Original effective date
Reviewed	06/13/2017	Last Independent Multispecialty Physician Panel review

# Lumbar Disc Arthroplasty

## Description

Lumbar disc arthroplasty, also known as lumbar artificial disc surgery or total disc arthroplasty (TDA), was developed as an alternative to lumbar fusion for treatment of back pain due to severe degenerative disc disease.

The procedure is similar to lumbar interbody fusion, in that an anterior approach is required. Unlike fusion, motion at the level of disc replacement is maintained, which would seem to be advantageous in terms of preventing secondary degenerative changes and preserving spine mechanics.

This document addresses lumbar disc arthroplasty when performed as an **elective, non-emergent** procedure and not as part of the care of an acute or traumatic event.

## Definitions

**Conservative management** should include a combination of strategies to reduce inflammation, alleviate pain, and improve function, including but not limited to the following:

- Prescription strength anti-inflammatory medications and analgesics
- Adjunctive medications such as nerve membrane stabilizers or muscle relaxants
- Physician-supervised therapeutic exercise program or physical therapy
- Manual therapy or spinal manipulation
- Alternative therapies such as acupuncture
- Appropriate management of underlying or associated cognitive, behavioral, or addiction disorders

Documentation of compliance with a plan of therapy that includes elements from these areas is required. Exceptions may be considered on a case-by-case basis.

*The requirement for a period of conservative treatment as a prerequisite to a surgical procedure is waived when there is evidence of progressive nerve or spinal cord compression resulting in a significant neurologic deficit, or when cauda equina syndrome or conus medullaris syndrome is present, and urgent intervention is indicated.*

**Reporting of symptom severity** – Severity of pain and its impact on activities of daily living (ADLs) is a key factor in determining the need for intervention. For purposes of this guideline, significant pain and functional impairment refers to pain that is at least 3 out of 10 in intensity and is associated with inability to perform at least two (2) ADLs.



**Tobacco cessation** – Due to risk of pseudoarthrosis, adherence to a tobacco-cessation program resulting in abstinence from tobacco for at least six (6) weeks prior to spinal surgery is recommended. Documentation of nicotine-free status by laboratory testing (e.g., cotinine level or carboxyhemoglobin) is recommended. After six (6) weeks of tobacco cessation, labs should be performed with ample time afforded to submit this confirmation and complete the prior authorization process.

**Imaging Studies** – All imaging must be performed and read by an independent radiologist. If discrepancies should arise in the interpretation of the imaging, the radiologist report will supersede. The results of all imaging studies should correlate with the clinical findings in support of the requested procedure.

## Criteria

Lumbar artificial disc replacement may be indicated when all of the following requirements are met:

- Primary complaint of axial pain determined to be of discogenic origin
- Symptoms for at least one year, which have not responded to a multifaceted program of conservative treatment over that period of time
- Presence of single level, advanced disc disease at L4-5 or LS-SI, as documented by MRI and plain radiographs demonstrating moderate to severe degeneration of the disc with Modic changes (peridiscal bone signal above and below the disc space in question)
- Absence of disease at all other lumbar levels, as documented by normal radiographs, and MRI showing no abnormalities or mild degenerative changes.

## Contraindications

- Significant facet arthropathy at the operated level
- Disease above L4-L5
- Bony lumbar spinal stenosis
- Pars defect
- Clinically compromised vertebral bodies at affected level due to current or past trauma
- Lytic spondylolisthesis or degenerative spondylolisthesis of grade greater than 1
- Allergy or sensitivity to implant materials (cobalt, chromium, molybdenum, polyethylene, titanium)
- Presence of infection or tumor
- Osteopenia or osteoporosis (defined as DEXA bone density measured T-score less than -1.0)

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary**, including but not limited to the following:

- Disc replacement at more than one spinal level
- Arthroplasty below, or in combination with, spinal fusion or other stabilizing-type procedure
- Isolated radicular compression syndromes, especially due to disc herniation
- Hybrid lumbar TDA/Lumbar Fusion (lumbar total disc arthroplasty at one level at the same time as lumbar fusion at a different level)
- Arthroplasty using devices other than those which are FDA approved, or use of an FDA-approved device in a manner which does not meet FDA requirements

## Selected References

- 1 Jacobs W, Van der Gaag NA, Tuschel A, et al. Total disc replacement for chronic back pain in the presence of disc degeneration. The Cochrane database of systematic reviews. 2012(9):Cd008326.
- 2 National Institute for Health and Care Excellence, Low back pain and sciatica in over 16s: assessment and management, (2016) London UK,
- 3 Nie H, Chen G, Wang X, et al. Comparison of Total Disc Replacement with lumbar fusion: a meta-analysis of randomized controlled trials. Journal of the College of Physicians and Surgeons–Pakistan : JCPSP. 2015;25(1):60-7.
- 4 Skold C, Tropp H, Berg S. Five-year follow-up of total disc replacement compared to fusion: a randomized controlled trial. Eur Spine J. 2013;22(10):2288-95.

## CPT Codes

- 22857 Total disc arthroplasty (artificial disc), anterior approach, including discectomy to prepare interspace (other than for decompression), single interspace, lumbar
- 22862 Revision including replacement of total disc arthroplasty (artificial disc), anterior approach, single interspace; lumbar
- 22865 Removal of total disc arthroplasty (artificial disc), anterior approach, single interspace; lumbar

## History

Status	Date	Action
Created	11/01/2017	Original effective date
Reviewed	06/13/2017	Last Independent Multispecialty Physician Panel review

# Lumbar Discectomy, Foraminotomy, and Laminotomy

## Description

Lumbar decompression procedures, performed alone or in combination with spinal fusion, are designed to relieve symptoms of neural compression.

Lumbar discectomy involves removal of the disc, in whole or part. Foraminotomy and laminotomy involve removal of a portion of the bony arch, or lamina, on the dorsal surface of a vertebra. These are typically performed to access the disc space and relieve pressure on the nerve roots and spinal cord.

This document addresses lumbar discectomy, foraminotomy, and laminotomy when performed as an **elective, non-emergent** procedure and not as part of the care of an acute or traumatic event.

## Definitions

**Conservative management** should include a combination of strategies to reduce inflammation, alleviate pain, and improve function, including but not limited to the following:

- Prescription strength anti-inflammatory medications and analgesics
- Adjunctive medications such as nerve membrane stabilizers or muscle relaxants
- Physician-supervised therapeutic exercise program or physical therapy
- Manual therapy or spinal manipulation
- Alternative therapies such as acupuncture
- Appropriate management of underlying or associated cognitive, behavioral, or addiction disorders

Documentation of compliance with a plan of therapy that includes elements from these areas is required. Exceptions may be considered on a case-by-case basis.

*The requirement for a period of conservative treatment as a prerequisite to a surgical procedure is waived when there is evidence of progressive nerve or spinal cord compression resulting in a significant neurologic deficit, or when cauda equina syndrome or conus medullaris syndrome is present, and urgent intervention is indicated.*

**Reporting of symptom severity** – Severity of pain and its impact on activities of daily living (ADLs) is a key factor in determining the need for intervention. For purposes of this guideline, significant pain and functional impairment refers to pain that is at least 3 out of 10 in intensity and is associated with inability to perform at least two (2) ADLs.

**Imaging studies** – All imaging must be performed and read by an independent radiologist. If discrepancies should arise in the interpretation of the imaging, the radiologist report will supersede. The results of all imaging studies should correlate with the clinical findings in support of the requested procedure.

## Criteria

**Acute Neurologic Deterioration** including signs and symptoms of cauda equina syndrome or rapid progression of neurologic deficits confirmed by imaging, regardless of underlying pathology.

**Lumbar Herniated Intervertebral Disc (Initial)** when all of the following criteria are met:

- Radicular pain with significant functional impairment
- Physical exam findings that correlate with imaging studies
  - Nerve root tension sign
  - Dermatomal sensory loss
  - Motor strength deficit (myotomal)
  - Abnormal reflex changes
- Documentation of nerve root compression or thecal sac impingement on MRI or other advanced imaging performed within the past six (6) months that correlates with clinical findings.
- All other reasonable sources of pain have been ruled out
- Failure of at least six (6) weeks of conservative management

*Note: Laminectomy is indicated for a large central disc herniation in the spinal canal when bilateral symptoms are present, or when an iatrogenic neurological deficit would be a risk with a less invasive unilateral laminotomy approach to discectomy. See Lumbar Laminectomy guideline.*

**Lumbar Herniated Intervertebral Disc (Recurrent)** when all of the following criteria are met:

- Requirements for initial herniation
- Failure of at least 12 weeks of conservative management

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary**, including but not limited to the following:

- Axial low back pain without a neural component
- Disc bulge or herniation without nerve compression
- Asymptomatic disc herniation
- Spinal stenosis that is asymptomatic, or with symptoms limited to low back pain

## Selected References

- 1 Ammendolia C, Stuber K, de Bruin LK, et al. Nonoperative treatment of lumbar spinal stenosis with neurogenic claudication: a systematic review. *Spine*. 2012;37(10):E609-16.
- 2 Ammendolia C, Stuber KJ, Rok E, et al. Nonoperative treatment for lumbar spinal stenosis with neurogenic claudication. *Cochrane Database Syst Rev*. 2013(8):CD010712.
- 3 Delitto A, Piva SR, Moore CG, et al. Surgery versus nonsurgical treatment of lumbar spinal stenosis: a randomized trial. *Ann Intern Med*. 2015;162(7):465-73.
- 4 Dhall SS, Choudhri TF, Eck JC, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 5: correlation between radiographic outcome and function. *Journal of neurosurgery Spine*. 2014;21(1):31-6.
- 5 Fritz JM, Lurie JD, Zhao W, et al. Associations between physical therapy and long-term outcomes for individuals with lumbar spinal stenosis in the SPORT study. *Spine J*. 2014;14(8):1611-21.
- 6 Ghogawala Z, Resnick DK, Watters WC, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 2: assessment of functional outcome following lumbar fusion. *Journal of neurosurgery Spine*. 2014;21(1):7-13.
- 7 Kaiser MG, Eck JC, Groff MW, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 17: bone growth stimulators as an adjunct for lumbar fusion. *Journal of neurosurgery Spine*. 2014;21(1):133-9.
- 8 Kovacs FM, Urrutia G, Alarcon JD. Surgery versus conservative treatment for symptomatic lumbar spinal stenosis: a systematic review of randomized controlled trials. *Spine*. 2011;36(20):E1335-51.
- 9 Lewis RA, Williams NH, Sutton AJ, et al. Comparative clinical effectiveness of management strategies for sciatica: systematic review and network meta-analyses. *Spine J*. 2015;15(6):1461-77.
- 10 Manchikanti L, Abdi S, Atluri S, et al. An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain. Part II: guidance and recommendations. *Pain physician*. 2013;16(2 Suppl):S49-283.
- 11 National Institute for Health and Care Excellence, *Low back pain and sciatica in over 16s: assessment and management*, (2016) London UK,
- 12 Zaina F, Tomkins-Lane C, Carragee E, et al. Surgical versus non-surgical treatment for lumbar spinal stenosis. *The Cochrane database of systematic reviews*. 2016(1):Cd010264.

## CPT Codes

- 63030 Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc; single interspace, lumbar
- 63035 Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc; each additional interspace, cervical or lumbar (List separately in addition to code for primary procedure)
- 63042 Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc, reexploration, single interspace; lumbar
- 63044 Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc, reexploration, single interspace; each additional lumbar interspace (List separately in addition to code for primary procedure)
- 63056 Transpedicular approach with decompression of spinal cord, equina and/or nerve root(s) (eg, herniated intervertebral disc), single segment; lumbar (including transfacet, or lateral extraforaminal approach) (eg, far lateral herniated intervertebral disc)
- 63057 Transpedicular approach with decompression of spinal cord, equina and/or nerve root(s) (eg, herniated intervertebral disc), single segment; each additional segment, thoracic or lumbar (List separately in addition to code for primary procedure)

## History

Status	Date	Action
Created	11/01/2017	Original effective date
Reviewed	06/13/2017	Last Independent Multispecialty Physician Panel review

# Lumbar Fusion and Treatment of Spinal Deformity (including Scoliosis and Kyphosis)

## Description

Lumbar fusion is one of the most commonly performed procedures in spinal surgery, and a well-established treatment for spinal instability resulting from a variety of conditions. In the majority of techniques, a bone graft is utilized to join two or more adjacent vertebral bodies into a single unit, which permanently immobilizes the involved section of the spine.

Techniques to achieve lumbar spinal fusion are numerous, and include different surgical approaches (anterior, posterior, lateral) to the spine, different areas of fusion (intervertebral body (interbody), transverse process (posterolateral), different fusion materials (bone graft and/or metal instrumentation), and a variety of ancillary techniques to augment fusion.

Lumbar fusion has been widely used to treat back pain associated with degenerative disc disease and spinal stenosis in the absence of instability. A large number of fusion operations are also performed for nonspecific low back pain which has not responded to standard treatment. Evidence to support the efficacy of fusion in treating these common conditions has been inconsistent, and many experts agree that the procedure is overused.

This document addresses lumbar and thoracolumbar fusion when performed as an **elective, non-emergent** procedure and not as part of the care of an acute or traumatic event such as fracture (excluding periprosthetic fracture).

## General Considerations

Discography results will not be used as a determining factor of medical necessity for any requested procedures.

When fusion at more than one level is planned, the criteria below apply to each level of lumbar fusion being considered. These criteria also apply to lumbar fusion of a level adjacent to a prior lumbar fusion.

Staged, multi-session\* spinal fusions are considered **not medically necessary** for fusion involving fewer than three (3) levels, unless being performed for treatment of severe scoliosis or other spinal deformities. The current standard of care for lumbar spinal fusion is a single-session, including multiple approach techniques.

*\*Multi-session is defined as procedures occurring on different days or requiring an additional anesthesia session.*

## Definitions

**Conservative management** should include a combination of strategies to reduce inflammation, alleviate pain, and improve function, including but not limited to the following:

- Prescription strength anti-inflammatory medications and analgesics
- Adjunctive medications such as nerve membrane stabilizers or muscle relaxants
- Physician-supervised therapeutic exercise program or physical therapy
- Manual therapy or spinal manipulation
- Alternative therapies such as acupuncture
- Appropriate management of underlying or associated cognitive, behavioral, or addiction disorders

Documentation of compliance with a plan of therapy that includes elements from these areas is required. Exceptions may be considered on a case-by-case basis.

*The requirement for a period of conservative treatment as a prerequisite to a surgical procedure is waived when there is evidence of progressive nerve or spinal cord compression resulting in a significant neurologic deficit, or when cauda equina syndrome or conus medullaris syndrome is present, and urgent intervention is indicated.*

**Reporting of symptom severity** – Severity of pain and its impact on activities of daily living (ADLs) is a key factor in determining the need for intervention. For purposes of this guideline, significant pain and functional impairment refers to pain that is at least 3 out of 10 in intensity and is associated with inability to perform at least two (2) ADLs.

**Tobacco cessation** – Due to risk of pseudoarthrosis, adherence to a tobacco-cessation program resulting in abstinence from tobacco for at least six (6) weeks prior to spinal surgery is recommended. Documentation of nicotine-free status by laboratory testing (e.g., cotinine level or carboxyhemoglobin) is recommended. After six (6) weeks of tobacco cessation, labs should be performed with ample time afforded to submit this confirmation and complete the prior authorization process.

**Imaging studies** – All imaging must be performed and read by an independent radiologist. If discrepancies should arise in the interpretation of the imaging, the radiologist report will supersede. The results of all imaging studies should correlate with the clinical findings in support of the requested procedure.

**Osteotomy** – Spinal osteotomy procedures are reported when a portion or portions of the vertebral segment or segments is (are) cut and removed in preparation for realigning the spine as part of a spinal deformity correction. These procedures may be required for congenital, developmental, and degenerative spinal deformities.

**Corpectomy** – Corpectomy typically reflects a longitudinal resection of the vertebral body from disc space to disc space often resulting in a destabilization of the complex. In the cervical spine, at least 50% of the vertebral body is removed and in the thoracic/lumbar spine, at least 30% of the corpus is removed.

## Criteria

**Lumbar fusion with or without decompression** may be indicated to treat any of the following conditions:

**Instability** due to any of the following conditions, where instability is caused by the condition itself, or when treatment of the condition is anticipated to result in instability (i.e., resection or debridement)

- **Tumor** of the spine or spinal canal
- **Infection** (osteomyelitis, discitis, or spinal abscess)
- **Fracture** or dislocation; may be traumatic or pathologic
- **Degenerative spondylolisthesis** with flexion and extension lateral spine x-rays showing a fixed slip of greater than or equal to 3 mm, or movement of greater than or equal to 3 mm.

### Scoliosis (lumbar or thoracolumbar)

**Progressive idiopathic scoliosis** when either of the following is present:

- Cobb angle greater than 40 degrees
- Spinal cord compression with neurogenic claudication or radicular pain that results in significant functional impairment in a patient who has failed at least three (3) months of conservative management

**Severe degenerative scoliosis** with a minimum Cobb angle of 30 degrees, or sagittal vertical axis greater than 5 cm, and at least one of the following:

- Documented progression of deformity with persistent axial (non-radiating) pain and functional impairment, unresponsive to at least three (3) months of conservative management
- Persistent and significant neurogenic symptoms (claudication or radicular pain) with functional impairment, unresponsive to at least three (3) months of conservative management

### Spinal Stenosis

Lumbar fusion may be indicated as an adjunct to decompression for treatment of spinal stenosis (central or foraminal) when instability (anterolisthesis) is demonstrated on imaging studies\*, or anticipated due to any of the following:

- Facet joint excision greater than 50% bilaterally or 75% unilaterally at the level fused
- Resection of the pars interarticularis at the level fused

*\*Instability may be demonstrated by flexion and extension lateral spine x-rays showing a fixed slip of greater than or equal to 3 mm, or movement of greater than or equal to 3 mm.*



**Additional criteria** (all are required)

- Neurogenic claudication or radicular pain with significant functional impairment
- Failure to respond to at least three (3) months of conservative management
- Documentation of central/lateral recess/or foraminal stenosis on MRI, CT or CT myelography performed within the past six (6) months

**Flat Back Syndrome** (iatrogenic or degenerative) as an adjunct to spinal osteotomy, where significant sagittal imbalance is present, as demonstrated by a vertical axis greater than 5 cm

**Isthmic spondylolisthesis** when all of the following conditions have been met:

- Congenital (Wiltse I) or acquired pars defect (Wiltse II) documented on x-ray
- Persistent back pain (with or without neurogenic symptoms) with functional impairment
- Failure of at least three (3) months of conservative management

**Lumbar Synovial Cyst** (both are required)

- Radicular pain (with or without demonstrable neurologic deficits) or neurogenic claudication which has not responded to at least six (6) weeks of conservative management
- Documentation of a synovial cyst on CT or MRI performed within the past six (6) months which correlates with symptoms and exam findings

**Recurrent, same level, disc herniation** when all of the following are demonstrated:

- At least three (3) months have elapsed since the prior procedure
- The patient experienced significant relief of symptoms following the procedure
- Recurrent symptoms or functional impairment have not responded to at least 12 weeks of conservative management
- Neural compression correlating with the clinical presentation and instability is demonstrated on imaging studies

*Note: Fusion for same-level disk herniation without instability may be considered following two prior discectomies at that level.*

**Pseudoarthrosis** when all of the following are demonstrated:

- Advanced imaging studies highly suggestive of nonunion at a motion segment at which a fusion had been previously attempted
- At least nine (9) months have elapsed since the prior procedure
- The patient experienced significant relief of symptoms following the procedure
- Recurrent symptoms or functional impairment has not responded to at least twelve (12) weeks of conservative management following confirmation of the diagnosis

## Failed lumbar disc arthroplasty

Implant failure demonstrated on standard or advanced imaging showing malposition or other evidence of failure (e.g., subsidence, surrounding radiolucency, dislocation/subluxation, vertebral body fracture)

In the absence of imaging demonstrating implant failure, all of the following are required:

- At least six (6) months have elapsed since the most recent disc implant procedure, following which the patient experienced significant relief of symptoms
- Symptoms of radicular pain, neurogenic claudication, or worsening refractory back pain correlate with imaging findings of neural compression
- Impairment or loss of function has not responded to a minimum of twelve (12) weeks of conservative management since the previous surgery.

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary**, including but not limited to the following:

- Isolated axial low back pain, with or without imaging findings of degenerative disc disease, annular tears, disc bulges, protrusion, extrusion or sequestration
- Chronic nonspecific low back pain
- Facet joint syndrome
- Degenerative lumbar spondylosis without stenosis or spondylolisthesis

## Selected References

- 1 Andrade NSF, J. P.; Bartanusz, V. Twenty-year perspective of randomized controlled trials for surgery of chronic nonspecific low back pain: citation bias and tangential knowledge. *The spine journal : official journal of the North American Spine Society*. 2013;13(11):1698-704.
- 2 Bydon M, De la Garza-Ramos R, Macki M, et al. Lumbar fusion versus nonoperative management for treatment of discogenic low back pain: a systematic review and meta-analysis of randomized controlled trials. *Journal of spinal disorders & techniques*. 2014;27(5):297-304.
- 3 Choudhri TF, Mummaneni PV, Dhall SS, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 4: radiographic assessment of fusion status. *Journal of neurosurgery Spine*. 2014;21(1):23-30.
- 4 Cohen SP, Hayek S, Semenov Y, et al. Epidural steroid injections, conservative treatment, or combination treatment for cervical radicular pain: a multicenter, randomized, comparative-effectiveness study. *Anesthesiology*. 2014;121(5):1045-55.
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- 6 Dhall SS, Choudhri TF, Eck JC, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 5: correlation between radiographic outcome and function. *Journal of neurosurgery Spine*. 2014;21(1):31-6.
- 7 Diwan S, Manchikanti L, Benyamin RM, et al. Effectiveness of cervical epidural injections in the management of chronic neck and upper extremity pain. *Pain physician*. 2012;15(4):E405-34.
- 8 Froholdt A, Holm I, Keller A, et al. No difference in long-term trunk muscle strength, cross-sectional area, and density in patients with chronic low back pain 7 to 11 years after lumbar fusion versus cognitive intervention and exercises. *Spine J*. 2011;11(8):718-25.
- 9 Institute of Health Economics. *Toward Optimized Practice. Guideline for the evidence-informed primary care management of low back pain*. 2011:37.
- 10 International Society for the Advancement of Spine Surgery, ISASS Policy Statement – Lumbar Spinal Fusion, (2011) Aurora IL, 17 pgs.
- 11 Kreiner DS, Shaffer WO, Baisden JL, et al. An evidence-based clinical guideline for the diagnosis and treatment of degenerative lumbar spinal stenosis (update). *The spine journal : official journal of the North American Spine Society*. 2013;13(7):734-43.
- 12 Manchikanti LB, R. M.; Falco, F. J.; Kaye, A. D.; Hirsch, J. A. Do Epidural Injections Provide Short- and Long-term Relief for Lumbar Disc Herniation? A Systematic Review. *Clin Orthop*. 2015;473(6):1940-56.

- 13 Mannion AF, Brox JL, Fairbank JC. Comparison of spinal fusion and nonoperative treatment in patients with chronic low back pain: long-term follow-up of three randomized controlled trials. *Spine J.* 2013;13(11):1438-48.
- 14 National Institute for Health and Care Excellence, *Low back pain and sciatica in over 16s: assessment and management*, (2016) London UK,
- 15 North American Spine Society, *Lumbar Fusion - NASS Coverage Policy Recommendations*, (2014) Burr Ridge IL, 17 pgs.
- 16 Wang XW, P.; Tian, J. H.; Hu, L. Meta-analysis of randomized trials comparing fusion surgery to non-surgical treatment for discogenic chronic low back pain. *J Back Musculoskeletal Rehabil.* 2015;28(4):621-7.

## CPT Codes

- 22206 Osteotomy of spine, posterior or posterolateral approach, 3 columns, 1 vertebral segment (e.g., pedicle/vertebral body subtraction); thoracic
- 22207 Osteotomy of spine, posterior or posterolateral approach, 3 columns, 1 vertebral segment (e.g., pedicle/vertebral body subtraction); lumbar
- 22208 Osteotomy of spine, posterior or posterolateral approach, 3 columns, 1 vertebral segment (e.g., pedicle/vertebral body subtraction); each additional vertebral segment (List separately in addition to code for primary procedure)
- 22210 Osteotomy of spine, posterior or posterolateral approach, 1 vertebral segment; cervical
- 22212 Osteotomy of spine, posterior or posterolateral approach, 1 vertebral segment; thoracic
- 22214 Osteotomy of spine, posterior or posterolateral approach, 1 vertebral segment; lumbar
- 22216 Osteotomy of spine, posterior or posterolateral approach, 1 vertebral segment; each additional vertebral segment (List separately in addition to primary procedure)
- 22220 Osteotomy of spine, including discectomy, anterior approach, single vertebral segment; cervical
- 22222 Osteotomy of spine, including discectomy, anterior approach, single vertebral segment; thoracic
- 22224 Osteotomy of spine, including discectomy, anterior approach, single vertebral segment; lumbar
- 22226 Osteotomy of spine, including discectomy, anterior approach, single vertebral segment; each additional vertebral segment (List separately in addition to code for primary procedure)
- 22533 Arthrodesis, lateral extracavitary technique, including minimal discectomy to prepare interspace (other than for decompression); lumbar
- 22534 Arthrodesis, lateral extracavitary technique, including minimal discectomy to prepare interspace (other than for decompression); thoracic or lumbar, each additional vertebral segment (List separately in addition to code for primary procedure)
- 22558 Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); lumbar
- 22585 Arthrodesis, anterior interbody technique, including minimal discectomy to prepare interspace (other than for decompression); each additional interspace (List separately in addition to code for primary procedure)
- 22610 Arthrodesis, posterior or posterolateral technique, single level; thoracic (with lateral transverse technique, when performed)
- 22612 Arthrodesis, posterior or posterolateral technique, single level; lumbar (with lateral transverse technique, when performed)
- 22614 Arthrodesis, posterior or posterolateral technique, single level; each additional vertebral segment (List separately in addition to code for primary procedure)
- 22630 Arthrodesis, posterior interbody technique, including laminectomy and/or discectomy to prepare interspace (other than for decompression), single interspace; lumbar

- 22632 Arthrodesis, posterior interbody technique, including laminectomy and/or discectomy to prepare interspace (other than for decompression), single interspace; each additional interspace (List separately in addition to code for primary procedure)
- 22633 Arthrodesis, combined posterior or posterolateral technique with posterior interbody technique including laminectomy and/or discectomy sufficient to prepare interspace (other than for decompression), single interspace and segment; lumbar
- 22634 Arthrodesis, combined posterior or posterolateral technique with posterior interbody technique including laminectomy and/or discectomy sufficient to prepare interspace (other than for decompression), single interspace and segment; each additional interspace and segment (List separately in addition to code for primary procedure)
- 22800 Arthrodesis, posterior, for spinal deformity, with or without cast; up to 6 vertebral segments
- 22802 Arthrodesis, posterior, for spinal deformity, with or without cast; 7 to 12 vertebral segments
- 22804 Arthrodesis, posterior, for spinal deformity, with or without cast; 13 or more vertebral segments
- 22808 Arthrodesis, anterior, for spinal deformity, with or without cast; 2 to 3 vertebral segments
- 22810 Arthrodesis, anterior, for spinal deformity, with or without cast; 4 to 7 vertebral segments
- 22812 Arthrodesis, anterior, for spinal deformity, with or without cast; 8 or more vertebral segments
- 22818 Kyphectomy, circumferential exposure of spine and resection of vertebral segment(s) (including body and posterior elements); single or 2 segments
- 22819 Kyphectomy, circumferential exposure of spine and resection of vertebral segment(s) (including body and posterior elements); 3 or more segments
- 22830 Exploration of spinal fusion
- 22840 Posterior non-segmental instrumentation (eg, Harrington rod technique, pedicle fixation across 1 interspace, atlantoaxial transarticular screw fixation, sublaminar wiring at C1, facet screw fixation) (List separately in addition to code for primary procedure)
- 22841 Internal spinal fixation by wiring of spinous processes (List separately in addition to code for primary procedure)
- 22842 Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 3 to 6 vertebral segments (List separately in addition to code for primary procedure)
- 22843 Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 7 to 12 vertebral segments (List separately in addition to code for primary procedure)
- 22844 Posterior segmental instrumentation (eg, pedicle fixation, dual rods with multiple hooks and sublaminar wires); 13 or more vertebral segments (List separately in addition to code for primary procedure)
- 22845 Anterior instrumentation; 2 to 3 vertebral segments (List separately in addition to code for primary procedure)
- 22846 Anterior instrumentation; 4 to 7 vertebral segments (List separately in addition to code for primary procedure)
- 22847 Anterior instrumentation; 8 or more vertebral segments (List separately in addition to code for primary procedure)
- 22848 Pelvic fixation (attachment of caudal end of instrumentation to pelvic bony structures) other than sacrum (List separately in addition to code for primary procedure)
- 22849 Reinsertion of spinal fixation device

- 22853 Insertion of interbody biomechanical device(s) (eg, synthetic cage, mesh) with integral anterior instrumentation for device anchoring (eg, screws, flanges), when performed, to intervertebral disc space in conjunction with interbody arthrodesis, each interspace (List separately in addition to code for primary procedure)
- 22854 Insertion of intervertebral biomechanical device(s) (eg, synthetic cage, mesh) with integral anterior instrumentation for device anchoring (eg, screws, flanges), when performed, to vertebral corpectomy(ies) (vertebral body resection, partial or complete) defect, in conjunction with interbody arthrodesis, each contiguous defect (List separately in addition to code for primary procedure)
- 22859 Insertion of intervertebral biomechanical device(s) (eg, synthetic cage, mesh, methylmethacrylate) to intervertebral disc space or vertebral body defect without interbody arthrodesis, each contiguous defect (List separately in addition to code for primary procedure)
- 22865 Removal of total disc arthroplasty (artificial disc), anterior approach, single interspace; lumbar
- 63085 Vertebral corpectomy (vertebral body resection), partial or complete, transthoracic approach with decompression of spinal cord and/or nerve root(s); thoracic, single segment
- 63086 Vertebral corpectomy (vertebral body resection), partial or complete, transthoracic approach with decompression of spinal cord and/or nerve root(s); thoracic, each additional segment (List separately in addition to code for primary procedure)
- 63087 Vertebral corpectomy (vertebral body resection), partial or complete, combined thoracolumbar approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic or lumbar; single segment
- 63088 Vertebral corpectomy (vertebral body resection), partial or complete, combined thoracolumbar approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic or lumbar; each additional segment (List separately in addition to code for primary procedure)
- 63090 Vertebral corpectomy (vertebral body resection), partial or complete, transperitoneal or retroperitoneal approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic, lumbar, or sacral; single segment
- 63091 Vertebral corpectomy (vertebral body resection), partial or complete, transperitoneal or retroperitoneal approach with decompression of spinal cord, cauda equina or nerve root(s), lower thoracic, lumbar, or sacral; each additional segment (List separately in addition to code for primary procedure)
- 63101 Vertebral corpectomy (vertebral body resection), partial or complete, lateral extracavitary approach with decompression of spinal cord and/or nerve root(s) (e.g., for tumor or retropulsed bone fragments); thoracic, single segment
- 63102 Vertebral corpectomy (vertebral body resection), partial or complete, lateral extracavitary approach with decompression of spinal cord and/or nerve root(s) (e.g., for tumor or retropulsed bone fragments); lumbar, single segment
- 63103 Vertebral corpectomy (vertebral body resection), partial or complete, lateral extracavitary approach with decompression of spinal cord and/or nerve root(s) (e.g., for tumor or retropulsed bone fragments); thoracic or lumbar, each additional segment (List separately in addition to code for primary procedure)
- 63300 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, cervical
- 63301 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, thoracic by transthoracic approach
- 63302 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, thoracic by thoracolumbar approach

- 63303 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; extradural, lumbar or sacral by transperitoneal or retroperitoneal approach
- 63304 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, cervical
- 63305 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, thoracic by transthoracic approach
- 63306 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, thoracic by thoracolumbar approach
- 63307 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; intradural, lumbar or sacral by transperitoneal or retroperitoneal approach
- 63308 Vertebral corpectomy (vertebral body resection), partial or complete, for excision of intraspinal lesion, single segment; each additional segment (List separately in addition to codes for single segment)

## History

Status	Date	Action
Created	11/01/2017	Original effective date
Reviewed	12/12/2017	Last Independent Multispecialty Physician Panel review
Revised	07/01/2018	Definitions, Conservative Management – Added osteotomy and corpectomy. Criteria, Spinal Stenosis – Added <i>anterolisthesis</i> to specify source of instability. Removed <i>need for bilateral or wide decompression</i> .

# Lumbar Laminectomy

## Description

Lumbar decompression procedures, performed alone or in combination with spinal fusion, are designed to relieve symptoms of neural compression. Laminectomy is the most widely utilized, and involves removal of a portion of the bony arch, or lamina, on the dorsal surface of a vertebra. Removal of the lamina on only one side of the bone is referred to as a hemilaminectomy. The most common indication for laminectomy is spinal stenosis; a chronic narrowing of the spinal canal due to degenerative arthritis and disc degeneration.

In addition to spinal fusion, it is not uncommon for a laminectomy to be performed in combination with other decompression procedures, including removal of the intervertebral disc (discectomy).

This document addresses lumbar laminectomy when performed as an **elective, non-emergent** procedure and not as part of the care of an acute or traumatic event.

## Definitions

**Conservative management** should include a combination of strategies to reduce inflammation, alleviate pain, and improve function, including but not limited to the following:

- Prescription strength anti-inflammatory medications and analgesics
- Adjunctive medications such as nerve membrane stabilizers or muscle relaxants
- Physician-supervised therapeutic exercise program or physical therapy
- Manual therapy or spinal manipulation
- Alternative therapies such as acupuncture
- Appropriate management of underlying or associated cognitive, behavioral, or addiction disorders

Documentation of compliance with a plan of therapy that includes elements from these areas is required. Exceptions may be considered on a case-by-case basis.

*The requirement for a period of conservative treatment as a prerequisite to a surgical procedure is waived when there is evidence of progressive nerve or spinal cord compression resulting in a significant neurologic deficit, or when cauda equina syndrome or conus medullaris syndrome is present, and urgent intervention is indicated.*

**Reporting of symptom severity** – Severity of pain and its impact on activities of daily living (ADLs) is a key factor in determining the need for intervention. For purposes of this guideline, significant pain and functional impairment refers to pain that is at least 3 out of 10 in intensity and is associated with inability to perform at least two (2) ADLs.

**Imaging studies** – All imaging must be performed and read by an independent radiologist. If discrepancies should arise in the interpretation of the imaging, the radiologist report will supersede. The results of all imaging studies should correlate with the clinical findings in support of the requested procedure.

## Criteria

**Acute Neurologic Deterioration** including signs and symptoms of cauda equina or conus medullaris syndrome or rapid progression of neurologic deficits confirmed by imaging, regardless of underlying pathology

**Lumbar Spinal Stenosis** (with or without spondylolisthesis)

Laminectomy may be considered medically necessary when all of the following criteria are met:

- Neurogenic claudication or radicular pain (VAS at least 4) with significant functional impairment
- Symptoms aggravated by standing and/or walking
- Symptoms alleviated by sitting and/or forward flexion
- Failure to respond to at least three (3) months of conservative management
- Documentation of central/lateral recess/or foraminal stenosis on MRI, CT or CT myelography performed within the past six (6) months

## Lumbar Disc Herniation

Laminectomy may be considered medically necessary for a large central disc herniation in the spinal canal when an iatrogenic neurological deficit would be a risk with a less invasive unilateral laminotomy approach to discectomy.

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary**, including but not limited to the following:

- Axial low back pain without a neural component
- Disc bulge or herniation without nerve compression
- Spinal stenosis that is asymptomatic, or with symptoms limited to low back pain
- Annular tears

## Selected References

- 1 Ammendolia C, Stuber K, de Bruin LK, et al. Nonoperative treatment of lumbar spinal stenosis with neurogenic claudication: a systematic review. *Spine*. 2012;37(10):E609-16.
- 2 Ammendolia C, Stuber KJ, Rok E, et al. Nonoperative treatment for lumbar spinal stenosis with neurogenic claudication. *Cochrane Database Syst Rev*. 2013(8):CD010712.
- 3 Delitto A, Piva SR, Moore CG, et al. Surgery versus nonsurgical treatment of lumbar spinal stenosis: a randomized trial. *Ann Intern Med*. 2015;162(7):465-73.



- 4 Dhall SS, Choudhri TF, Eck JC, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 5: correlation between radiographic outcome and function. *Journal of neurosurgery Spine*. 2014;21(1):31-6.
- 5 Fritz JM, Lurie JD, Zhao W, et al. Associations between physical therapy and long-term outcomes for individuals with lumbar spinal stenosis in the SPORT study. *Spine J*. 2014;14(8):1611-21.
- 6 Ghogawala Z, Resnick DK, Watters WC, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 2: assessment of functional outcome following lumbar fusion. *Journal of neurosurgery Spine*. 2014;21(1):7-13.
- 7 Kaiser MG, Eck JC, Groff MW, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 17: bone growth stimulators as an adjunct for lumbar fusion. *Journal of neurosurgery Spine*. 2014;21(1):133-9.
- 8 Kovacs FM, Urrutia G, Alarcon JD. Surgery versus conservative treatment for symptomatic lumbar spinal stenosis: a systematic review of randomized controlled trials. *Spine*. 2011;36(20):E1335-51.
- 9 Lewis RA, Williams NH, Sutton AJ, et al. Comparative clinical effectiveness of management strategies for sciatica: systematic review and network meta-analyses. *Spine J*. 2015;15(6):1461-77.
- 10 Manchikanti L, Abdi S, Atluri S, et al. An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain. Part II: guidance and recommendations. *Pain physician*. 2013;16(2 Suppl):S49-283.
- 11 National Institute for Health and Care Excellence, *Low back pain and sciatica in over 16s: assessment and management*, (2016) London UK,
- 12 Zaina F, Tomkins-Lane C, Carragee E, et al. Surgical versus non-surgical treatment for lumbar spinal stenosis. *The Cochrane database of systematic reviews*. 2016(1):Cd010264.

## CPT Codes

- 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
- 63012 Laminectomy with removal of abnormal facets and/or pars inter-articularis with decompression of cauda equina and nerve roots for spondylolisthesis, lumbar (Gill type procedure)
- 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
- 63047 Laminectomy, facetectomy and foraminotomy (unilateral or bilateral with decompression of spinal cord, cauda equina and/or nerve root[s], [eg, spinal or lateral recess stenosis]), single vertebral segment; lumbar
- 63048 Laminectomy, facetectomy and foraminotomy (unilateral or bilateral with decompression of spinal cord, cauda equina and/or nerve root[s], [eg, spinal or lateral recess stenosis]), single vertebral segment; each additional segment, cervical, thoracic, or lumbar (List separately in addition to code for primary procedure)

## History

Status	Date	Action
Created	11/01/2017	Original effective date
Reviewed	06/13/2017	Last Independent Multispecialty Physician Panel review

# Noninvasive Electrical Bone Growth Stimulation

## Description

Bone growth stimulators, also known as osteogenesis stimulators, are utilized to promote bone healing in spinal fusion through delivery of electrical current to the fusion site. Noninvasive devices are worn externally, beginning at any time from the date of surgery until up to six (6) months after surgery.

## Criteria

### Primary cervical or lumbar fusion

Noninvasive electrical stimulation of the spine to augment primary lumbar or cervical spinal fusion is considered medically necessary in individuals at high risk for pseudoarthrosis based on one or more of the following comorbidities:

- Diabetes
- Metabolic bone disease (including osteoporosis, osteopenia, and bone disease secondary to renal disease, nutritional deficiency, or conditions in which bone healing is likely to be compromised)
- Immunocompromise
- Systemic vascular disease
- History of long term use of corticosteroids

### All spinal levels

Noninvasive electrical stimulation of the spine to augment spinal fusion in all regions of the spine is considered medically necessary in any of the following scenarios:

- Fusion revision (e.g., repeat surgery due to prior unhealed fusion attempt) when at least six (6) months has passed since the original surgery and imaging studies confirm that healing has not progressed in the preceding three (3) months
- Fusion performed at two (2) or more adjacent levels for lumbar fusion
- Fusion performed at three (3) or more adjacent levels for cervical fusion
- Current smokers in whom smoking cessation prior to surgery was not feasible because the surgery is not being performed on an elective basis

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary**, including but not limited to the following:

- Treatment of spondylolysis or pars interarticularis defect
- Semi-invasive electrical bone growth stimulation for any indication
- As an adjunct for primary bone healing of a spinal fracture
- As a nonsurgical treatment of an established pseudoarthrosis

## CPT/HCPCS Codes

20974 Electrical stimulation to aid bone healing; noninvasive (nonoperative)

E0748 Osteogenesis stimulator, electrical, non-invasive, spinal applications

## History

Status	Date	Action
Created	11/01/2017	Original effective date
Reviewed	06/13/2017	Last Independent Multispecialty Physician Panel review

# Vertebroplasty/Kyphoplasty

## Description

Vertebral augmentation procedures have been developed as a treatment option for debilitating pain due to bony destruction of the vertebral body. These are interventional techniques in which bone cement is injected via percutaneous insertion of a needle into the vertebral body under image guidance. The most commonly utilized material is polymethylmethacrylate (PMMA).

Vertebroplasty involves direct injection of material into the bone to stabilize an area of collapse, while kyphoplasty utilizes inflatable bone tamps to create a cavity, thus reducing the fracture and creating a space into which material is then injected.

The objective in both procedures is to alleviate pain and strengthen bone. Their efficacy has been well established for treatment of pain related to malignant lytic bone lesions. The evidence regarding their use in treating pain due to osteoporotic fractures and other bone pathology is less compelling.

## Criteria

Percutaneous vertebroplasty or kyphoplasty of the cervical, lumbar, or thoracic region may be considered medically necessary for treatment of the following conditions:

**Osteolytic vertebral metastasis, myeloma, or plasmacytoma** with severe back pain related to destruction of the vertebral body **not** involving the major part of the cortical bone, where chemotherapy or radiation therapy have failed to relieve symptoms

**Vertebral hemangiomas** with severe pain or nerve compression, or aggressive radiologic signs, when radiation therapy has failed to relieve symptoms

**Eosinophilic granuloma** with pain and spinal instability

**Vertebral compression fracture** due to osteoporosis or osteopenia, when all of the following requirements are met:

- Recent onset of back pain localized to the fracture site which has not responded to at least six (6) weeks of conservative medical management\*
- Tenderness to palpation directly over the fracture site
- Advanced imaging studies confirming a non-traumatic, acute compression fracture
- Recent imaging studies (MRI or CT) which eliminate disc herniation or other causes of spine pain
- Absence of imaging findings which would confer unacceptable risk to the spinal cord or related structures, including all of the following:

- Spinal stenosis of greater than 20% due to retropulsed fragments
- Vertebral body collapse to less than one third (33%) original height
- Vertebral plana (collapse greater than 90%)
- Anatomical damage of the vertebra that prevents safe access of the needle to the vertebral body
- Burst fracture with retropulsed fragments demonstrated by imaging

*\*Conservative management should include, but is not limited to, initial bed rest with progressive activity, analgesics, physical therapy, bracing and exercises to correct postural deformity and increase muscle tone, salmon calcitonin, bisphosphonates, and calcium supplementation.*

## Contraindications

- Severe cardiopulmonary disease
- Coagulation disorders
- Known allergy to any of the materials used in either procedure
- Active or incompletely treated infection

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary**, including but not limited to the following:

- Prophylaxis in patients deemed to be at risk but with no evidence of acute vertebral fracture
- Non-pathologic, acute, traumatic fractures of the vertebra
- Compression fractures shown by the medical record to be more than one year old
- Asymptomatic vertebral compression fracture
- Percutaneous sacroplasty is considered **not medically necessary** for all indications due to lack of conclusive evidence indicating a positive impact to overall health outcomes

## Selected References

1. McGuire R. AAOS Clinical Practice Guideline: the Treatment of Symptomatic Osteoporotic Spinal Compression Fractures. The Journal of the American Academy of Orthopaedic Surgeons. 2011;19(3):183-4.
2. Washington State Health Care Authority, Vertebroplasty, Kyphoplast and Sacroplasty Health Technology Assessment, (2010) Olympia WA, 126 pgs

## CPT Codes

- 22510 Percutaneous vertebroplasty (bone biopsy included when performed), 1 vertebral body, unilateral or bilateral injection, inclusive of all imaging guidance; cervicothoracic
- 22511 Percutaneous vertebroplasty (bone biopsy included when performed), 1 vertebral body, unilateral or bilateral injection, inclusive of all imaging guidance; lumbosacral [when specified as lumbar]

- 22512 Percutaneous vertebroplasty (bone biopsy included when performed), 1 vertebral body, unilateral or bilateral injection, inclusive of all imaging guidance; each additional cervicothoracic or lumbosacral vertebral body [when specified as other than sacral] (List separately in addition to code for primary procedure)
- 22513 Percutaneous vertebral augmentation, including cavity creation (fracture reduction and bone biopsy included when performed) using mechanical device (e.g., kyphoplasty), 1 vertebral body, unilateral or bilateral cannulation, inclusive of all imaging guidance; thoracic
- 22514 Percutaneous vertebral augmentation, including cavity creation (fracture reduction and bone biopsy included when performed) using mechanical device (e.g., kyphoplasty), 1 vertebral body, unilateral or bilateral cannulation, inclusive of all imaging guidance; lumbar
- 22515 Percutaneous vertebral augmentation, including cavity creation (fracture reduction and bone biopsy included when performed) using mechanical device (e.g., kyphoplasty), 1 vertebral body, unilateral or bilateral cannulation, inclusive of all imaging guidance; each additional thoracic or lumbar vertebral body (List separately in addition to code for primary procedure)

## History

Status	Date	Action
Created	11/01/2017	Original effective date
Reviewed	06/13/2017	Last Independent Multispecialty Physician Panel review

# Bone Graft Substitutes and Bone Morphogenetic Proteins

## Description

Iliac crest bone graft has long been the standard adjunct utilized in spinal fusion surgery. Morbidity associated with bone graft harvest has led to the development of alternative strategies for facilitating the fusion, including bone morphogenetic proteins, demineralized bone matrix, and graft expanders such as synthetic bone graft and allograft tissue.

Demineralized bone matrix (DBM) is comprised of allograft bone, typically harvested from cadavers, from which inorganic material has been removed. DBM products are produced as putty, paste and flexible sheets which are placed during the fusion procedure to induce new bone formation and facilitate healing.

Recombinant human bone morphogenetic protein (rhBMP-2) is one of a family of naturally occurring proteins which stimulate bone growth. It has been produced for commercial use utilizing recombinant DNA technology, and has shown some promise in facilitating bone graft healing.

This document addresses medical necessity for demineralized bone matrix and recombinant human bone morphogenetic protein when used as adjuncts to spinal fusion procedures.

## Definitions

Bone graft substitutes are typically used in patients who are at risk for graft failure (nonunion or pseudoarthrosis) and for those in whom autograft is not a viable option.

Established risk factors for pseudoarthrosis include the following:

- Diabetes
- Metabolic bone disease (including osteoporosis, osteopenia, and bone disease secondary to renal disease, nutritional deficiency, or conditions in which bone healing is likely to be compromised)
- Immunocompromise
- Systemic vascular disease
- History of long term corticosteroid use

## Criteria

### Demineralized Bone Matrix

Bone graft substitutes containing demineralized bone matrix (DBM) and synthetic bone graft extenders are considered **medically necessary** when used as bone graft extenders or in place of a bone graft when autograft is not available.

## Recombinant Human Bone Morphogenetic Protein-2 (rhBMP-2)

Recombinant human bone morphogenetic protein-2 (rhBMP-2) may be considered medically necessary in skeletally mature persons undergoing the following instrumented lumbar fusion procedures, with restrictions as noted:

### Anterior Lumbar Interbody Fusion (ALIF) or Lateral Lumbar Interbody fusion (i.e. XLIF)

- Appropriate in all patients other than males with reproductive intent

**Posterolateral or Intertransverse Lumbar Fusion** when autograft is not feasible for any of the following reasons:

- Autograft tissue is not available due to prior autograft
- There is insufficient autograft tissue for the intended procedure
- The patient is not an appropriate candidate for autograft due to any of the following:
- Increased risk for complications from harvesting procedure, including anatomic disruption at donor site, or comorbid conditions known to increase surgical risk
- Poor quality bone (Osteopenia/osteoporosis)
- Obesity
- Infection or fracture at donor site
- Lumbar pseudoarthrosis
- Lumbar fusion greater than or equal to 2 levels

## Exclusions

Indications other than those addressed in this guideline are considered **not medically necessary** as an adjunct to spinal fusion, including but not limited to the following:

- Use of rhBMP-2 as an adjunct to cervical or thoracic spinal fusion procedures
- Use of rhBMP-2 as an adjunct to posterior lumbar interbody fusion (PLIF) or transforaminal lumbar interbody fusion (TLIF)
- Use of mesenchymal stem cell therapy, progenitor cells, or bone marrow aspirates
- Porous hydroxyapatite bone graft substitute

## CPT Codes

- |       |   |
|-------|---|
| 20930 | Allograft, morselized, or placement of osteopromotive material, for spine surgery only (List separately in addition to code for primary procedure)  |
| 20931 | Allograft, structural, for spine surgery only (List separately in addition to code for primary procedure)   |
| 20936 | Autograft for spine surgery only (includes harvesting the graft); local (e.g., ribs, spinous process, or laminar fragments) obtained from same incision (List separately in addition to code for primary procedure) |
| 20937 | Autograft for spine surgery only (includes harvesting the graft); morselized (through separate skin or fascial incision) (List separately in addition to code for primary procedure)                                |
| 20938 | Autograft for spine surgery only (includes harvesting the graft); structural, bicortical or tricortical (through separate skin or fascial incision) (List separately in addition to code for primary procedure)     |



# History

Status	Date	Action
Created	11/01/2017	Original effective date
Reviewed	06/13/2017	Last Independent Multispecialty Physician Panel review