Artificial Intervertebral Disc: Lumbar Spine

**Introduction**

The bones of the spine are called vertebrae. Between each of vertebra is a disc, which acts as a shock absorber and prevents the bones from rubbing together. As a person ages, these often become thinner as they lose water and the gel-like substance that’s inside of each disc. This is known as degenerative disc disease. Studies show that most adults over the age of forty have some level of degenerative disc disease. Often, no treatment is needed because the degeneration isn’t severe enough to cause pain in the lower back (lumbar spine). When there is pain, the usual first step is to try nonsurgical treatment, which often works. In cases where it doesn’t work, surgery may be considered. One type of surgery calls for placing an artificial disc between the vertebrae. The goal is to imitate how a natural disc works in the body. There is not enough medical evidence demonstrating the effectiveness of this procedure for the lower back. Artificial disc replacement in the lower back is considered investigational (unproven).

**Note:** The Introduction section is for your general knowledge and is not to be taken as policy coverage criteria. The rest of the policy uses specific words and concepts familiar to medical professionals. It is intended for providers. A provider can be a person, such as a doctor, nurse, psychologist, or dentist. A provider also can be a place where medical care is given, like a hospital, clinic, or lab. This policy informs them about when a service may be covered.
# Policy Coverage Criteria

## Treatment

<table>
<thead>
<tr>
<th>Artificial intervertebral discs – lumbar spine</th>
<th>Investigational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial intervertebral discs of the lumbar spine are considered investigational.</td>
<td></td>
</tr>
</tbody>
</table>

## Coding

### Code | Description
--- | ---
CPT 0163T | Total disc arthroplasty (artificial disc), anterior approach, including discectomy to prepare interspace (other than for decompression), each additional interspace, lumbar (List separately in addition to code for primary procedure)
0164T | Removal of total disc arthroplasty (artificial disc), anterior approach, each additional interspace, lumbar (List separately in addition to code for primary procedure)
0165T | Revision including replacement of total disc arthroplasty, anterior approach, each additional interspace, lumbar (List separately in addition to code for primary procedure)
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

**Note:** CPT codes, descriptions and materials are copyrighted by the American Medical Association (AMA). HCPCS codes, descriptions and materials are copyrighted by Centers for Medicare Services (CMS).

## Related Information

Artificial intervertebral discs for treating the cervical spine are addressed in a separate medical policy (see Related Policies).
Evidence Review

Description

Total disc replacement, using an artificial intervertebral disc designed for the lumbar spine, is proposed as an alternative to spinal fusion in patients with degenerative disc disease that leads to disabling symptoms.

Background

When conservative treatment of degenerative disc disease (DDD) fails, a common surgical approach is spinal fusion. More than 200,000 spinal fusions are performed each year. However, outcomes with spinal fusion have been controversial, in part due to the difficulty in determining if a patient’s back pain is related to DDD, and in part due to the success rate of the procedure itself. Also, spinal fusion alters the spine biomechanics, potentially leading to premature disc degeneration at adjacent levels, a particular concern for younger patients. During the past 30 years, various artificial intervertebral discs have been investigated as an alternative approach to fusion. This approach, also referred to as total disc replacement or spinal arthroplasty, is intended to maintain motion at the operative level once the damaged disc has been removed as well as the normal biomechanics of the adjacent vertebrae.

Potential candidates for artificial disc replacement have chronic low back pain attributed to DDD, lack of improvement with nonoperative treatment, and have none of the contraindications for the procedure, which include multilevel disease, spinal stenosis, spondylolisthesis, scoliosis, previous major spine surgery, neurologic symptoms, and other minor contraindications. These contraindications make artificial disc replacement suitable for a subset of patients in whom fusion is indicated. Patients who require procedures in addition to fusion (eg, laminectomy, decompression) are not candidates for the artificial disc.

Use of a motion-preserving artificial disc increases the potential for various types of implant failure. They include device failure (device fracture, dislocation, or wear); bone-implant interface failure (subsidence, dislocation-migration, vertebral body fracture); and host response to the implant (osteolysis, heterotopic ossification, and pseudotumor formation).
Summary of Evidence

For individuals with lumbar degenerative disc disease who receive a lumbar artificial intervertebral disc, the evidence includes randomized controlled trials (RCTs) with 5-year outcomes and case series with longer-term outcomes. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. Five-year outcomes for the ProDisc-L RCT have provided evidence for the noninferiority of artificial disc replacement. The superiority of ProDisc-L with circumferential fusion was achieved at 2 but not at 5 years in this unblinded trial. The potential benefits of the artificial disc (eg, faster recovery, reduced adjacent-level disc degeneration) have not been demonstrated. Also, considerable uncertainty remains whether response rates will continue to decline over longer time periods and long-term complications with these implants will emerge. Although some randomized trials have concluded that this technology is noninferior to spinal fusion, outcomes which would make noninferiority sufficient to demonstrate the clinical benefit of the artificial lumbar disc have not been established. The evidence is insufficient to determine the effects of the technology on health outcomes.

Ongoing and Unpublished Clinical Trials

Some currently unpublished trials that might influence this review are listed in Table 1.

Table 1. Summary of Key Trials

<table>
<thead>
<tr>
<th>NCT No.</th>
<th>Trial Name</th>
<th>Planned Enrollment</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing</td>
<td>French Lumbar Total Disk Replacement Observational Study (FLTDR Observational Study)</td>
<td>600</td>
<td>Dec 2020</td>
</tr>
</tbody>
</table>

NCT: national clinical trial
Clinical Input Received from Physician Specialty Societies and Academic Medical Centers

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

In response to requests, input was received from 1 physician specialty society and 3 academic medical centers while this policy was under review in 2008. The 4 reviewers disagreed with the policy statement that artificial intervertebral discs for the lumbar spine are investigational.

After consideration of the clinical input in 2008, it was concluded that due to limitations of the randomized controlled trial (described above), combined with the marginal benefit compared with fusion, evidence was insufficient to determine whether artificial lumbar discs are beneficial in the short term. Also, serious questions remain about potential long-term complications with these implants.

Practice Guidelines and Position Statements

North American Spine Society

The North American Spine Society (2019) issued coverage recommendations for lumbar artificial disc replacement. The following recommendation was made:

“Lumbar artificial disc replacement is indicated for patients with discogenic low back pain who meet ALL of the following criteria:

- Symptomatic single level lumbar disc disease at L3-L4, L4-L5 or L5-S1 level
- Presence of symptoms for at least 6 months or greater and that are not responsive to multi-modal nonoperative treatment over that period that should include a physical therapy/rehabilitation program but may also include (but not limited to) pain management, injections, cognitive behavior therapy, and active exercise programs
- Any underlying psychiatric disorder, such as depression, should be diagnosed and the management optimized prior to surgical intervention
- Primary complaint of axial pain, with a possible secondary complaint of lower extremity pain
Lumbar Disc Arthroplasty is NOT indicated in ANY of the following scenarios:

- Any case that does not fulfill ALL of the above criteria
- Presence of symptomatic degenerative disk disease at more than one level
- Presence of spinal instability with spondylolisthesis greater than Grade I
- Chronic radiculopathy (unremitting pain with predominance of leg pain symptoms greater than back pain symptoms extending over a period of at least one year)
- Osteopenia as evidenced by a DEXA bone mineral density T-score less than or equal to -1.0
- Poorly managed psychiatric disorder
- Significant facet arthropathy at the index level 8. Age greater than 60 years or less than 18 years 9. Presence of infection or tumor

**American Pain Society**

In 2009, the American Pain Society’s practice guidelines concluded there was “insufficient evidence” to adequately evaluate long-term benefits and harms of intervertebral disc replacement.\(^1\)\(^9\) The guidelines were based on a systematic review commissioned by the Society and conducted by the Oregon Evidence-Based Practice Center.\(^2\)\(^0\) The rationale for the recommendation was that, although artificial disc replacement has been associated with similar outcomes similar to fusion, the trial results were only applicable to a narrowly defined subset of patients with single-level degenerative disease, and the type of fusion surgery in the trials is no longer widely used due to frequent poor outcomes. Also, all trials had been industry-funded, and data on long-term (> 2 years) benefits and harms following artificial disc replacement were limited.

**National Institute for Health and Care Excellence**

The National Institute for Health and Care Excellence (2009) updated its guidance on the safety and efficacy of prosthetic intervertebral disc replacement in the lumbar spine with studies reporting 13-year follow-up, but with most of the “evidence from studies with shorter durations of follow-up.”\(^2\)\(^1\) The Institute concluded that evidence was “adequate to support the use of this procedure.”
Medicare National Coverage

Effective for services performed on or after August 14, 2007, Centers for Medicare & Medicaid Services (CMS) found “that LADR [lumbar artificial disc replacement] is not reasonable and necessary for the Medicare population older than 60 years of age; therefore, LADR is non-covered for Medicare beneficiaries older than 60 years of age.”22 “For Medicare beneficiaries 60 years of age and younger, there is no national coverage determination for LADR, leaving such determinations to be made by the local contractors.”

The national coverage determination (NCD) was revised in September 2007 to reflect a change from noncoverage for a specific implant (the Charité), to noncoverage for the LADR procedure for the Medicare population older than 60 years of age.23 CMS provided this explanation:

The original NCD for LADR was focused on a specific lumbar artificial disc implant (Charité™) because it was the only one with FDA approval at that time. In the original decision memorandum for LADR, CMS stated that when another lumbar artificial disc received FDA approval CMS would reconsider the policy. Subsequently, another lumbar artificial disc, ProDisc®-L, received FDA approval, which initiated the reconsideration of the NCD on LADR. After reviewing the evidence, CMS is convinced that indications for the procedure of LADR exclude the populations older than age 60; therefore, the revised NCD addresses the procedure of LADR rather than LADR with a specific manufacturer’s implant.24

Regulatory Status

Three artificial lumbar disc devices (activL®, Charité®, ProDisc®-L) have been approved by the U.S. Food and Drug Administration (FDA) through the premarket approval process. Because the long-term safety and effectiveness of these devices were not known when approved, approval was contingent on completion of postmarketing studies. The activL® (Aesculap Impant Systems) Charité® (DePuy), and ProDisc®-L (Synthes Spine) devices are indicated for spinal arthroplasty in skeletally mature patients with degenerative disc disease (DDD) at 1 level. DDD is defined as discogenic back pain with degeneration of the disc confirmed by patient history and radiographs. Production under the name Charité® was stopped in 2010.

A number of other artificial lumbar discs are in development or available only outside of the United States:
• The INMOTION® lumbar artificial disc (DePuy Spine) is a modification of the Charité®
device with a change in name under the same premarket approval. The INMOTION® is not
currently marketed in the United States.

• The Maverick™ artificial disc (Medtronic) is not marketed in the United States due to patent
infringement litigation.

• The metal-on-metal FlexiCore® artificial disc (Stryker Spine) has completed the
investigational device exemption trial as part of the FDA process of approval and is currently
being used under continued access. (Artificial intervertebral discs for treating the cervical
spine are considered in a separate policy, see Related Policies.)

• Kineflex-L™ (Spinal Motion) is a 3-piece modular metal-on-metal implant. An FDA advisory
committee meeting on the Kineflex-L, scheduled in 2013, was cancelled without explanation.

FDA product code: MJO

References

1. Blue Cross and Blue Shield Association Technology Evaluation Center (TEC). Artificial vertebral disc replacement. TEC
   Assessments. 2005;Volume 20:Tab 1.

2. Blue Cross and Blue Shield Association Technology Evaluation Center (TEC). Artificial lumbar disc replacement. TEC
   Assessments. 2007;Volume 22:Tab 2.

   2013;Volume 28:Tab 7.


   investigational device exemption study of the ProDisc-L total disc replacement versus circumferential fusion for the treatment

7. Zigler JE, Delamarter RB. Five-year results of the prospective, randomized, multicenter, Food and Drug Administration
   investigational device exemption study of the ProDisc-L total disc replacement versus circumferential arthrodesis for the

8. Zigler JE, Glenn J, Delamarter RB. Five-year adjacent-level degenerative changes in patients with single-level disease treated
   PMID 23082849

degenerative disc: two year follow-up of randomised study. BMJ. May 19 2011;342:d2786. PMID 21596740


<table>
<thead>
<tr>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/12/03</td>
<td>Add to Surgery Section - New policy. Hold for notification, effective date December 15, 2003.</td>
</tr>
<tr>
<td>01/01/04</td>
<td>Replace policy - CPT code updates only.</td>
</tr>
<tr>
<td>05/10/05</td>
<td>Replace policy - Policy updated with February 2005 TEC Assessment; references added; policy statement unchanged.</td>
</tr>
<tr>
<td>04/21/06</td>
<td>Codes Updated - No other changes</td>
</tr>
<tr>
<td>07/11/06</td>
<td>Replace policy - Policy updated with Medicare noncoverage decision; policy statement unchanged.</td>
</tr>
<tr>
<td>09/12/06</td>
<td>Replace policy - Updated Description and Benefit Application sections to include information on FDA approval of ProDisk L. No other changes.</td>
</tr>
<tr>
<td>01/26/07</td>
<td>Codes Updated - No other changes</td>
</tr>
<tr>
<td>02/26/07</td>
<td>Update Codes - No other changes</td>
</tr>
<tr>
<td>03/13/07</td>
<td>Replace policy - Title expanded for clarification with the addition of “Lumbar Spine”; cross reference added.</td>
</tr>
<tr>
<td>04/10/07</td>
<td>Cross Reference Update - No other changes</td>
</tr>
<tr>
<td>08/14/07</td>
<td>Replace policy - Policy updated with 2007 TEC Assessment; new reference added. Policy statement unchanged.</td>
</tr>
<tr>
<td>02/12/08</td>
<td>Replace policy - Policy updated with literature review; no change in policy statement. References added.</td>
</tr>
<tr>
<td>01/13/09</td>
<td>Replace policy - Policy updated with literature search; no change to the policy statement. Rationale section extensively revised references and codes added.</td>
</tr>
<tr>
<td>12/08/09</td>
<td>Replace policy - Policy updated with literature search; no change to the policy statement. References added.</td>
</tr>
<tr>
<td>09/14/10</td>
<td>Cross Reference Update - No other changes</td>
</tr>
<tr>
<td>12/14/10</td>
<td>Replace policy - Policy updated with literature search through August 2010. References have been added and reordered; the policy statement remains unchanged.</td>
</tr>
<tr>
<td>12/16/11</td>
<td>Replace policy – Policy updated with literature search through August 2011; Rationale section revised; references 11 and 14 added and references reordered; policy statement unchanged.</td>
</tr>
<tr>
<td>11/27/12</td>
<td>Replace policy - Rationale section revised based on literature review through June 2012. References 12, 14,19,20,23 29 added; others renumbered. Policy statement unchanged.</td>
</tr>
<tr>
<td>01/10/13</td>
<td>Coding update. CPT code 22586, effective 1/1/13, added to policy.</td>
</tr>
<tr>
<td>04/17/13</td>
<td>Update Related Policies – Add 7.01.542.</td>
</tr>
<tr>
<td>Date</td>
<td>Comments</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>09/30/13</td>
<td>Update Related Policies. Change title to 7.01.120.</td>
</tr>
<tr>
<td>12/09/13</td>
<td>Replace policy. Rationale section updated. Added references 8,9,11,12,13,23,31,32. No change to policy statement. CPT codes 63030 and 63035 removed from policy; these do not apply.</td>
</tr>
<tr>
<td>03/25/14</td>
<td>Replace policy. Policy updated with literature search through October, 2013. References 12, 16, 17 and 24 added; others renumbered/removed. Policy statement unchanged. ICD-9 diagnosis and ICD-10-CM codes removed from the policy; these are not utilized in adjudication.</td>
</tr>
<tr>
<td>08/12/14</td>
<td>Update Related Policies. Change title to 7.01.542.</td>
</tr>
<tr>
<td>01/08/15</td>
<td>Update Related Policies. Add 7.01.551.</td>
</tr>
<tr>
<td>06/09/15</td>
<td>Coding update. ICD-10-PCS codes added to support remediation efforts.</td>
</tr>
<tr>
<td>08/11/15</td>
<td>Annual Review. Policy updated with literature review through November 25, 2014; references 15, 27-28, and 37 added; policy statement unchanged.</td>
</tr>
<tr>
<td>10/28/16</td>
<td>Coding update. Removed ICD-10 codes from coding section.</td>
</tr>
</tbody>
</table>

**Disclaimer:** This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. The Company adopts policies after careful review of published peer-reviewed scientific literature, national guidelines and local standards of practice. Since medical technology is constantly changing, the Company reserves the right to review and update policies as appropriate. Member contracts differ in their benefits. Always consult the member benefit booklet or contact a member service representative to determine coverage for a specific medical service or supply. CPT codes, descriptions and materials are copyrighted by the American Medical Association (AMA). ©2019 Premera All Rights Reserved.

**Scope:** Medical policies are systematically developed guidelines that serve as a resource for Company staff when determining coverage for specific medical procedures, drugs or devices. Coverage for medical services is subject to the limits and conditions of the member benefit plan. Members and their providers should consult the member
benefit booklet or contact a customer service representative to determine whether there are any benefit limitations applicable to this service or supply. This medical policy does not apply to Medicare Advantage.
Discrimination is Against the Law

Premera Blue Cross complies with applicable Federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability, or sex. Premera does not exclude people or treat them differently because of race, color, national origin, age, disability or sex.

Premera:
- Provides free aids and services to people with disabilities to communicate effectively with us, such as:
  - Qualified sign language interpreters
  - Written information in other formats (large print, audio, accessible electronic formats, other formats)
- Provides free language services to people whose primary language is not English, such as:
  - Qualified interpreters
  - Information written in other languages

If you need these services, contact the Civil Rights Coordinator.

If you believe that Premera has failed to provide these services or discriminated in another way on the basis of race, color, national origin, age, disability, or sex, you can file a grievance with:

Civil Rights Coordinator - Complaints and Appeals
PO Box 91102, Seattle, WA 98111
Toll free 855-332-4535, Fax 425-918-5592, TTY 800-842-5357
Email AppealsDepartmentInquiries@Premera.com

You can also file a civil rights complaint with the U.S. Department of Health and Human Services, Office for Civil Rights, electronically through the Office for Civil Rights Complaint Portal, available at https://ocrportal.hhs.gov/ocr/portal/lobby.jsf, or by mail or phone at:

U.S. Department of Health and Human Services
200 Independence Avenue SW, Room 509F, HHH Building
Washington, D.C. 20201, 1-800-368-1019, 800-537-7697 (TDD)

Getting Help in Other Languages

This Notice has Important Information. This notice may have important information about your application or coverage through Premera Blue Cross. There may be key dates in this notice. You may need to take action by certain deadlines to keep your health coverage or help with costs. You have the right to get this information and help in your language at no cost.

Call 800-722-1471 (TTY: 800-842-5357).

Oromoo (Cushite):

Italiano (Italian):