Overview

- Spinal Anatomy
- Building the PCS Code
- Fusion (Arthrodesis)
- New Guidelines
- X Codes
- Case Studies
Anatomy of the Spine
Anatomy of the Spine

**Anterior**
Made up of the vertebral body

**Posterior**
Made up of pedicles, spinous/transverse processes, and facet joints
Spinal Fusion Procedure & Reasons

From WebMD
## Building the PCS Code

<table>
<thead>
<tr>
<th>Section</th>
<th>0 Medical and Surgical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body System</td>
<td>R upper joints  S lower joints</td>
</tr>
<tr>
<td>Root Operation</td>
<td>G Fusion</td>
</tr>
<tr>
<td>Body Part</td>
<td>0 Lumbar vert joint; 1 lumbar vert joint—2 or more, etc. (around 11 total choices)</td>
</tr>
<tr>
<td>Approach</td>
<td>0 Open—almost always</td>
</tr>
<tr>
<td></td>
<td>3 Percutaneous—occasionally</td>
</tr>
<tr>
<td>Device</td>
<td>7 Autologous Tissue  K Non-autologous</td>
</tr>
<tr>
<td>Tissue</td>
<td>J Synthetic Substitute</td>
</tr>
<tr>
<td></td>
<td>A Interbody fusion device</td>
</tr>
<tr>
<td>Qualifier</td>
<td>0 Anterior Approach—Anterior column</td>
</tr>
<tr>
<td></td>
<td>1 Posterior Approach—Posterior Column</td>
</tr>
<tr>
<td></td>
<td>J Posterior Approach—Anterior Column</td>
</tr>
</tbody>
</table>
## Upper Joints – Fusion

**Fusion: Joining together portions of an articular body part rendering the articular body part immobile**

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Approach</th>
<th>Device</th>
<th>Qualifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Occipital-cervical Joint 1 Cervical Vertebral Joint 2 Cervical Vertebral Joints, or more 4 Cervicothoracic Vertical Joint 6 Thoracic Vertebral Joint 7 Thoracic Vertebral Joints, 2 to 7 8 Thoracic Vertebral Joints, 8 or more A Thoracolumbar Vertebral Joint</td>
<td>0 Open 3 Percutaneous 4 Percutaneous Endoscopic</td>
<td>7 Autologous Tissue Substitute J Synthetic Substitute K Nonautologous Tissue Substitute</td>
<td>0 Anterior Approach, Anterior Column 1 Posterior Approach, Posterior Column J Posterior Approach, Anterior Column</td>
</tr>
<tr>
<td>0 Occipital-cervical Joint 1 Cervical Vertebral Joint 2 Cervical Vertebral Joints, 2 or more 4 Cervicothoracic Vertebral Joint 6 Thoracic Vertebral Joint 7 Thoracic Vertebral Joint, 2 to 7 8 Thoracic Vertebral Joints, 8 or more A Thoracolumbar Vertebral Joint</td>
<td>0 Open 3 Percutaneous 4 Percutaneous Endoscopic</td>
<td>A Interbody Fusion Device</td>
<td>0 Anterior Approach, Anterior Column J Posterior Approach, Anterior Column</td>
</tr>
</tbody>
</table>

*Note: The table above lists various body parts and their corresponding surgical approaches, devices, and qualifiers for fusion procedures.*
For spinal fusion we will choose either upper joints or lower joints.

“R” Upper Joints are Cervical down through Thoracolumbar

“S” Lower Joints are Lumbar to Sacrum
3rd Character: Root Operation

Fusion Definition: “Joining together portions of an articular body part rendering the articular body part immobile”

To qualify as spinal fusion there must be some type of graft used

Rods and screws are types of instrumentation and are included in fusion and not coded separately

If only instrumentation is done without graft then this would be coded with root operation of ‘insertion’ of a fixation device and not as fusion
What is Fusion (Arthrodesis)?

Bringing bone against bone to trick the body into healing into a solid mass, called a “Fusion mass” The fusion happens just like a fractured bone heals:

FUSION does NOT happen in the OR, it happens over a period of months.
Fusion Root Operation

- **Fusion-Root operation G**

**Definition:** Joining together portions of an articular body part rendering the articular body part immobile.

**Explanation:** The body part is jointed together by fixation device, bone graft, or other means

**Examples:** Spinal fusion, ankle arthrodesis

All limited range of procedures is represented in the root operation Fusion, because fusion procedures are by definition only performed on the joints. Qualifier values are used to specify whether a vertebral joint fusion uses an anterior or posterior approach, and whether the anterior or posterior column of the spine is fused.
Fusion Requires Bone-on-Bone

- Spinal Fusion
- Other Joint Fusion
Question: When does fusion actually occur?

Answer: Fusion is a surgical technique in which one or more of the vertebrae of the spine are united together ("fused") so that motion no longer occurs between them. The concept of fusion is similar to that of welding in industry. Spinal fusion surgery, however, does not weld the vertebrae immediately during surgery. Rather, bone grafts are placed around the spine during surgery. The body then heals the grafts over several months – similar to healing a fracture – which joins, or "welds," the vertebrae together. The process of fusion happens over several months as the body heals.
Spinal Fusion Procedures without Bone Graft

Question:
Advice published in Coding Clinic, Second Quarter 2017, page 23, stated spinal fusion procedures without bone graft cannot be coded to the root operation “Fusion.” However, this advice appears to conflict with the root operation explanation, which states, “The body part is joined together by fixation device, bone graft, or other means.” Could you provide an explanation?

Answer:
The previously published advice is accurate. There is no discrepancy in the case of spinal fusion, because there is a specific guideline for spinal fusion that goes beyond the basic root operation definition of “Fusion.” While the root operation of “fusion” does not require the use of bone graft, the spinal fusion guideline indicates that a spinal fusion requires bone graft.
Refusion

- **Pseudarthrosis, or nonunion of joint**
  Previous fusion did not form a solid mass

- **Removal indicates that refusion is performed**

- **Internal fixation device from anterior or posterior spinal joints**
- **Interbody fusion cage from joints**
- **Bone grafts if identified in the documentation**
  - Always code the removal of hardware/device from the previous fusion
What body part is being fused?

- Cervical
- Thoracic
- Lumbar

Subdivisions:
- Cervicothoracic
- Thoracolumbar
- Lumbosacral
Don’t Forget to Code Each Body Part

- **Coding Guideline B3.10a says:**
  The body part coded for a spinal vertebral joint(s) rendered immobile by a spinal fusion procedure is classified by the level of the spine (e.g. thoracic). There are distinct body part values for a single vertebral joint and for multiple vertebral joints at each spinal level.

- **Coding Guideline B3.2:**
  During the same operative episode, multiple procedures are coded if:
  
a. The same root operation is performed on different body parts as defined by distinct values of the body part character.

  a. The same root operation is repeated in multiple body parts, and those body parts are separate and distinct body parts classified to a single ICD-10-PCS body part value.
Multiple Vertebral Joint Fusion

If multiple vertebral joints are fused, a separate procedure is coded for each vertebral joint that uses a different device and/or qualifier.

Example: T8-L4 fusion:

**T8-T9-T10-T11-T12-L1-L2-L3-L4**

- 4 Thoracic vertebral joints
- 1 Thoracolumbar vertebral joint
- 3 Lumbar vertebral joints
Another example is C5-T2 fusion:

C5-C6-C7-T1-T2

- 2 Cervical vertebral joints
- 1 Cervicothoracic vertebral joint
- 1 Thoracic vertebral joint
5th Character: Approach

Approach is usually always "open"

Some helpful tips are to look for incisions made and exposure to the site being looked at

There have been some advancements in a percutaneous approach for some spinal fusions, so be sure to keep that in mind
Approach Clue

Supine
Approach = Anterior

Prone
Approach = Posterior
Choosing the Anterior Approach

It means coming from the front

Anterior approach may be documented as ALIF, DLIF, LLIF, XLIF, or retroperitoneal

Patient will be positioned on back or side
ALIF and PLIF on Same Day?

Why or Why not?

Yes, ALIF and PLIF can be done on the same day.
Choosing the Posterior Approach

- Means coming from the back
- Look for terms such as PLIF, TLIF, posterolateral fusion
- Patients are almost always positioned on stomach (prone)
Are these the same?

Yes- PLIF—posterior lumbar interbody fusion. For a PLIF, the surgeon makes incisions on your back that line up with the middle of your vertebra.
PLIF
PLIF
Bone also placed over the rods and screws to form a posterior fusion.
Choosing the Columns

There are two types of columns: Anterior and Posterior

**Anterior:**
The intervertebral body joint

**Posterior:**
Made up of the rest of the spine: made up of pedicles, lamina, facets, transverse and spinous processes
Anterior Column Fusion

(ALIF) Anterior lumbar interbody fusion

(DLIF) Direct lateral interbody fusion

(XLIF) Extreme lateral interbody fusion

(AxiaLIF) Axial lumbar interbody fusion

(PLIF) Posterior lumbar interbody fusion

(TLIF) Transforaminal lumbar interbody fusion

Retroperitoneal approach
**Trivia!**

**Question:**
What is the difference between Anterior and Posterior?

**Answer:**
Anterior is defined as going in from the front while the patient is positioned on their back or side. Posterior is defined as going in from the back while the patient is positioned prone—meaning on their stomach.
‘7’ Autologous Tissue (bone from patient—usually same site but could be other)

‘K’ Non-autologous Tissue (bone bank, cadaver bone)

‘J’ Synthetic Substitute (bone matrix, BMP, etc)

‘A’ Interbody fusion device (cage, PEEK, BAK) *always ant
# Insertion of Spinous Process Stabilization Device

**Definition:**
Insertion: Putting in a non-biological appliance that monitors, assists, performs, or prevents a physiological function but does not physically take the place of a body part.

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Approach</th>
<th>Device</th>
<th>Qualifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber Vertebral J</td>
<td>Open</td>
<td>Infusion Device</td>
<td>Z No Qualifier</td>
</tr>
<tr>
<td>Lumbosacral Joint</td>
<td>3 Percutaneous</td>
<td>4 Internal Fixation Device</td>
<td></td>
</tr>
<tr>
<td>4 Percutaneous Endoscopic</td>
<td></td>
<td>8 Spacer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>B Spinal Stabilization Device, Interspinous Process</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>C Spinal Stabilization Device, Pedicle-Based</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>D Spinal Stabilization Device, Facet Replacement</strong></td>
<td></td>
</tr>
<tr>
<td>Lumber Vertebral Disc</td>
<td>Open</td>
<td>Infusion Device</td>
<td>Z No Qualifier</td>
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<tr>
<td>Lumbosacral Disc</td>
<td>3 Percutaneous</td>
<td>4 Internal Fixation Device</td>
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</tr>
<tr>
<td>4 Percutaneous Endoscopic</td>
<td></td>
<td>8 Spacer</td>
<td></td>
</tr>
</tbody>
</table>
### Other Interbody Fusion Devices

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Approach</th>
<th>Device / Substance / Technology</th>
<th>Qualifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occipital-cervical Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Nanotextured Surface</td>
<td>2 New Technology Group 2</td>
</tr>
<tr>
<td>Occipital-cervical Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Radiolucent Porous</td>
<td>3 New Technology Group 3</td>
</tr>
<tr>
<td>Cervical Vertebral Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Nanotextured Surface</td>
<td>2 New Technology Group 2</td>
</tr>
<tr>
<td>Cervical Vertebral Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Radiolucent Porous</td>
<td>3 New Technology Group 3</td>
</tr>
<tr>
<td>Thoracic Vertebral Joints, 8 or more</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Nanotextured Surface</td>
<td>2 New Technology Group 2</td>
</tr>
<tr>
<td>Thoracic Vertebral Joints, 8 or more</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Radiolucent Porous</td>
<td>3 New Technology Group 3</td>
</tr>
<tr>
<td>Thoracic Vertebral Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Nanotextured Surface</td>
<td>2 New Technology Group 2</td>
</tr>
<tr>
<td>Thoracic Vertebral Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Radiolucent Porous</td>
<td>3 New Technology Group 3</td>
</tr>
<tr>
<td>Lumbar Vertebral Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Nanotextured Surface</td>
<td>2 New Technology Group 2</td>
</tr>
<tr>
<td>Lumbar Vertebral Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Radiolucent Porous</td>
<td>3 New Technology Group 3</td>
</tr>
<tr>
<td>Lumbar Vertebral Joint, 2 or more</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Nanotextured Surface</td>
<td>2 New Technology Group 2</td>
</tr>
<tr>
<td>Lumbar Vertebral Joint, 2 or more</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Radiolucent Porous</td>
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<td>Lumbosacral Joint</td>
<td>0 Open</td>
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</tr>
<tr>
<td>Lumbosacral Joint</td>
<td>0 Open</td>
<td>Interbody Fusion Device, Radiolucent Porous</td>
<td>3 New Technology Group 3</td>
</tr>
<tr>
<td>ICD Code</td>
<td>ICD Description</td>
<td>Hospitalizations- Annualized (Present on Admission- All)</td>
<td>Oct 2015 to Sep 2018 (Present on Admission- All)</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>XRGC092</td>
<td>Fusion of 2 or more Lumbar Vertebral Joints using Nanotextured Surface Interbody Fusion Device, Open Approach, New Technology Group 2</td>
<td>27</td>
<td>130</td>
</tr>
</tbody>
</table>

Traditional Interbody Fusion Device made of **Polyetheretherketone** (PEEK)

NanoLOCK® Interbody Fusion Device by Titan Spine, Inc.
Nanotextured versus Non-Porous PEEK

Nanotextured
(Creates Bone Formation)

Non-Porous PEEK
(Creates Fibroblasts, not Bone)
Nanotextured versus Non-Porous PEEK

**Nanotextured**
(Creates Bone Formation)

**Non-Porous PEEK**
(Does Not Fuse Well)
Radiolucent Porous PEEK

Spinal interbody fusion devices have traditionally been classified by the implant material, either synthetic or tissue-derived alternative (e.g. autograft and allograft). However, as more advanced orthopedic biomaterials are developed, the use of a single coding identifier for all synthetic device may no longer be appropriate for accurately describing fusion procedures. Five years of basic science, preclinical and clinical research\textsuperscript{1-3} have shown that porous PEEK possesses several performance characteristics that distinguish it from other fusion devices by combining the osseointegration capabilities of porous metallic devices with the favorable imaging properties of non-porous plastic devices. This valuable combination of device attributes was introduced with FDA clearance of the COHERE device, prompting the issuance of the new ICD-10 code by CMS.
COALESCE® - in the trademark process
COHERE® for cervical fusion

Both by Vertera, Inc.
What to Do When Two or More Devices are Used

- If interbody fusion device is used then 6th character is ‘A’

- Interbody fusion device. If autograft only is used—6th character is ‘7’ autologous tissue substitute

- If allograft only is used—6th character is ‘K’ nonautologous tissue substitute

- If mix of auto and allo are used, then use ‘7’ autologous as 6th character

- Synthetic graft—BMP or bone matrix use “J”. If mixed with auto or allo refer to above
B3.10c Combinations of devices and materials are often used on a vertebral joint to render the joint immobile. When combinations of devices are used on the same vertebral joint, the device value coded or the procedure is as follows:

- If an interbody fusion device is used to render the joint immobile (alone or containing other material like bone graft), the procedure is coded with the device value Interbody Fusion Device.
- If bone graft is the only device used to render the joint immobile, the procedure is coded with the device value Non-autologous Tissue Substitute or Autologous Tissue Substitute.
- If a mixture of autologous and non-autologous bone graft (with or without biological or synthetic extenders or binders) is used to render the joint immobile, code the procedure with the device value Autologous Tissue Substitute.
Device Values – Guideline B3.10c

✧ If an interbody fusion device is used to render the joint immobile (alone or containing other material like bone graft), the procedure is coded with the device value **Interbody Fusion Device**

✧ If bone graft is the only device used to render the joint immobile, the procedure is coded with the device value **Nonautologous Tissue Substitute or Autologous Tissue Substitute**

✧ If a mixture of autologous and nonautologous bone graft (with or without biological or synthetic extenders or binders) is used to render the joint immobile, code the procedure with the device value **Autologous Tissue Substitute**
The qualifier for spinal fusion encompasses two parts:

- The column - anterior or posterior
- The approach - anterior or posterior
Two Parts But Only Three Options

‘0’ Anterior Approach, Anterior Column

‘1’ Posterior Approach, Posterior Column

‘J’ Posterior Approach, Anterior
Section X Codes – Standalone Codes

Section X codes are standalone codes

They are not supplemental codes.

They fully represent the specific procedure described in the code title

They do not require any additional codes from other sections of ICD-10-PCS

When Section X contains a code title which describes a specific new technology procedure, only that X code is reported for the procedure

There is no need to report a broader, non-specific code in another section of ICD-10-PCS
<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spondylosis:</strong></td>
<td>A term used interchangeably with “osteoarthritis,” indicates ankylosis (stiffening) of a vertebral joint. Also indicates degenerative spinal changes due to osteoarthritis.</td>
</tr>
<tr>
<td><strong>Spondylolisthesis:</strong></td>
<td>Forward displacement of one vertebra over another.</td>
</tr>
<tr>
<td><strong>Spinal Stenosis:</strong></td>
<td>Term for the narrowing of the vertebral canal, nerve root canals, or intervertebral foramina of the lumbar spine that is caused by encroachment of bone.</td>
</tr>
<tr>
<td><strong>Myelopathy:</strong></td>
<td>Term for various functional disturbances or pathological changes in the spinal cord; often refers to nonspecific lesions, in contrast to the inflammatory lesions associated with myelitis.</td>
</tr>
<tr>
<td><strong>Radiculopathy:</strong></td>
<td>Disease of the nerve roots, due to such things as inflammation or impingement from a tumor or bony spur.</td>
</tr>
<tr>
<td><strong>Disc Herniation/Bulging Disc:</strong></td>
<td>Protrusion of the nucleus pulposus or annulus fibrosus of an intervertebral disc, which may impinge on nerve roots.</td>
</tr>
</tbody>
</table>
Discectomy

Discectomy?

Operative Step to Fusion

Release Spinal Cord or Nerve Root
List 3 characteristics of Section X Codes?

Section X Codes are NOT standalone codes.

Section X Codes are NOT supplemental codes.

Section X Codes fully represent the specific procedure described in the code title.
Microdiscectomy Technique

Laminotomy performed over nerve root
Microdiscectomy Technique
Laminectomy
Laminotomy
X-Stop – What’s Happening Here?

- X STOP Device
- Nerve Root
- Spinous Processes
CASE STUDIES
Case Study 1

**Anesthesia:** General

**Preoperative Diagnoses**
1. L-3 anterolisthesis
2. L3-4, L4-S1 and L5-S1 degenerative disk disease.
3. Lumbar Stenosis with lumbar claudication from L3 to S1.

**Postoperative Diagnosis:**
1. L3-4, anterolisthesis.
2. L3-4, L4-S1 and L5-S1 degenerative disk disease.
3. **Lumbar Stenosis** with lumbar claudication from L3 to S1.

**Procedure:**
1. Anterior lumbar discectomy for neurological decompression with bilateral foraminotomies at L4-5 and L5-S1
2. Lumbar anterior interbody arthrodesis at L4-5 and L5-S1 using Globus Independence PEEK cages.
3. Use of the Globus Independence stand alone screw system for anterior instrumentation from L4 through S1

- **Indication for the Procedure:**

  This is a 69-year-old female with a history of lumbar stenosis with lumbar claudication with significant degenerative disk disease from L3 to S1 with loss of lumbar lordosis. She was, therefore, consented and scheduled for an ALIF operation at L4-5 and L5-S1 as a stage procedure. The second stage procedure would be an L3 through S1 instrumented fusion with an L3-4 TLIF. The patient and her son understood the risks, benefits, and alternatives of surgery. She agreed to the surgery.
Case Study 1

Description of the Procedure:
The patient was brought to the operating room where a time-out was done to identify the correct patient, procedure and site. She was given 2 g of Ancef In the prior skin incision. She was then incubated without difficulty. She did have a Foley catheter placed. She had a bilateral SCDs for DVT prevention. She was then placed in the supine position on an OSI flat board with the arms in the crucifix position. All pressure points were well padded. The area of the lumbar spine was then built up with work lordosis with sheets. The anterior area of the abdomen was been prepped and draped in the standard sterile fashion. Dr. Miller was needed for the exposure given the complexity of the Venus anatomy to minimize any risk of injury to the blood vessels or the bowels. Please see his operative note for further details on the exposure. Once the exposure was completed, I scrubbed into the case where localization was confirmed with the C-arm. At this point, the L4-5 disc was then incised with a 15 blade followed by the curettes and the pituitary. A complete discectomy was then carried out. The disks were found to be very degenerated. These were then removed. The end plates were then decorticated. Trials were then placed, and ultimately a Globus Independence PEEK cage with a small footprint of 13 mm of height with 8 degrees of lordosis was then placed. This was filled with DBM and BPM.
Case Study 1

Description of the Procedure Continued:

Two screws were placed into L4 and one screw was placed into L5. These were 25 mm. These where final tightened. X-rays revealed good placement of the hardware. Once this was done, attention was then placed to the L5 – S1 one level. With the 15 blade, this was then in size with the use of the pituitary. A discectomy was then carried out. Bilateral foraminotomies had been accomplished of both levels. The end plates were then decorticated. Trails for than placed, and ultimately a Globus Independence PEEK cage with a medium footprint of 13 mm of height with 15 degrees of lordosis was tamped into the interbody space at L5 – S1. This was filled with BPM and DBM as well. The Globus independence anterior instrumentation was also used at this level. There were two screws placed at S1 and one screw placed into L5. These were 25 mm as well. These were also final tightened. AP and lateral x-rays showed good placement of the hardware. At this point, Dr. Miller scrubs back in for the closure. Please see his operative note for further details. There were no complications.

EBL: Approximately 50 ml.
IV Fluids: Please see anesthesia report.
Specimens: None.
Case Study 1

(2nd Operative Report)

Preoperative Diagnosis
1. Status post anterior lumbar interbody fusion at L4-5 and L5-S1
2. Severe Lumbar stenosis from L3-S1

Postoperative Diagnosis
1. Status post anterior lumbar interbody fusion at L4-5 and L5-S1
2. Severe Lumbar stenosis from L3-S1

 Procedures
1. Posterior segmental instrumentation using the Stryker Xia CT system from L3-S1
2. Posterior interbody arthrodesis at L3-4 using Stryker Tritanium transforaminal lumbar interbody fusion cage.
3. Posterolateral arthrodesis from L3-S1 using autologous bone, bone morphogenic protein, and cancellous bone chips
4. L3, L4, and L5 lumbar laminectomies for neurological decompression with bilateral foraminotomies for the exiting L3, L4 and L5 nerve roots.
5. Use of the Medtronic O-arm for stereotactic placement of the pedicle screws at L3, L4, L5, and S1.
Indications for the Procedure: This is the planned stage 2 operation on this patient

Descriptions of Procedure:

The patient was brought to the operating room where a time—out was done to identify the correct patient, procedure and site. She was given 2g of Ancef immediately prior to skin incision. She was then intubated without difficulty. She did have a Foley catheter placed. She had bilateral SCDs for DVT prevention. She was then placed in the prone position on a Jackson Frame equipped with hip and thigh pads. The area over the lumbar spine was then prepped and draped in standard sterile fashion. C-arm had been used for localization. After a call to order, an incision was then made with the Bovie. A subperiosteal dissection was then carried out, identifying the spinous processes and lamina of L3 through S1. The spinous process of L2 was also exposed. Once this was done, this was confirmed with C-arm. At this point, the reference arc was then placed on the L2 spinous process and with the 2 three-quarter drapes, the O-arm was steriley brought into the field for an AP and Lateral X-ray. Then the O-arm was used to create a 3D CT scan and this was sent to the stealth station for registration. Once this was done, the O-arm was then removed as well as the 2 three-quarter drapes. With the use of the navigation probe, the trajectories of the cortical screws at L3, L4, L5, and S1 where then identified, drilled and tapped. These were then placed. These were 5.0 x 30mm on the right S1. The left Leksell was then used to remove the spinous processes and lamina of L3, L4, L5, and S1. The bone was saved for local autograft. With the high speed Burr drill, the remaining bone was then drilled down to a thin level.
Descriptions of Procedure Continued:

With the Kerrison and the Woodsons, the laminectomies were then completed. At this point, the foraminotomies were accomplished for the exiting L3, L4, L5 nerve roots. The left L3-4 facet was then removed with the high speed burr drill. This was saved for local autograft. At this point, a rod was then placed on the right side, then distracted at L3-4. This allowed for the opening of the disk space. The thecal sac was then retracted medially with the use of the 15 blade, followed by the pituitaries and curettes, and the shavers. The discectomy was then carried out at L3-4. The endplates were then decorticated and the trials were then placed. At this point, BPM was then placed as well as autograft bone into the 3-4 interbody space followed by Stryker Tritanium cage of 23x11x11 with 6 degrees of lordosis. This was filled with BPM and bone as well. This allowed for the posterior interbody arthrodesis at L3 and L4. The left L4 screw was then placed. It was 5.0 x 30 mm. The wound was then copiously irrigated with antibiotic-impregnated solution and hemostasis was obtained with the bipolar and Surgifoam. Rods were then placed and contoured and final tightened with set screws. At this point, the O-arm was steriley brought back into the field for another AP and lateral ray, as well as the 3D CT scan. This revealed good placement of the hardware. The O-arm was then removed.
Case Study 1

(2nd Operative Report)

The instrumentation was confirmed that it was final tightened. The posterolateral gutters from L3-S1 were then decorticated. The morselized local autograft bone with cancellous bone chips and which BMP was then placed for posterolateral arthrodesis from L3-S1. Meticulous hemostasis was obtained. A drain was then placed to bulb suction. The wound was then closed using interrupted 0 Vicryl sutures, followed by 2-0 Vicryl sutures, followed by 4-0 Monocryl, followed by Dermabond. The drain was secured to the skin using a 3-0 nylon. Multiple Valsalva maneuvers revealed that there was no evidence of a CSF leak prior to closure.

Complications  None.

It should be noted bones can be fused together by:
  a. using the body's natural healing process
  b. using bone from another place in the body (autograft)
  c. using bone from bone bank (allograft)
  d. with the aid of cage devices
## Case Study 1: Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0SG00A0 Principal Fusion of Lumber Vertebral Joint with interbody Fusion Device, Anterior Approach, Anterior Column, Open Approach</td>
<td>✔</td>
</tr>
<tr>
<td>2</td>
<td>0SG1071 Fusion of 2 or more Lumbar Vertebral Joints with Autologous Tissue Substitute, Posterior Approach, Posterior Column, Open Approach</td>
<td>✔</td>
</tr>
<tr>
<td>3</td>
<td>0SG30A0 Fusion of Lumbosacral Joint with Interbody Fusion Device, Anterior Approach, Anterior Column, Open Approach.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0SG3071 Fusion of Lumbosacral Joint with Autologous Tissue Substitute, Posterior Approach, Posterior Column, Open Approach</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0ST20ZZ Resection of Lumbar Vertebral Disc, Open Approach</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3E0U0GB Introduction of Recombinant Bone Morphogenetic Protein into Joints, Open Approach</td>
<td></td>
</tr>
</tbody>
</table>
Case Study 2

**Indications:**
This is an 81-year-old female who presented to the Spine Center with a history of progressively worsening left lower extremity radicular pain and axial lower back pain. On imaging, she was found to have a mobile grade 1 spondylolisthesis at L4-L5, with severe lateral recess and neural foraminal stenosis. After reviewing the risks, benefits, and alternatives of above procedure with the patient and her family, she elected to proceed.

**Technique:**
The Patient was brought back to the operating theater. She underwent general endotracheal intubation on the stretcher. A transurethral catheter was inserted along with 2 large-bore Iv’s, and she was flipped prone onto an open bottom Jackson table. Her face was well padded with foam. Her knees Her arms were placed at 90 degrees and her wrists and elbows were well padded with foam as well. Her knees were well padded. Her legs were elevated. Sequential compression devices were placed on her calves. Her back was prepped with Chloraprep and alcohol. She was draped in usual sterile fashion. She was given preoperative IV antibiotics, and a small stab incision was made over the right posterior superior iliac spine. An iliac pin was then inserted and a fiducial was placed on that pin. The patient was then covered with 2 quarter sheets and O-arm was brought in. An AP and lateral fluoroscopy shot were taken with the O-arm for positioning over the L4-L5 levels. An O-arm CT spin was performed an uploaded into the Stealthstation. We registered all the instruments and then used the awl-tip tap to determine our entry points bilaterally. We then made 2 separate incisions based on those markings on either side of her back, on the right and left. Starting on the left-hand side, we used an awl-tip tap to cannulate the pedicles of L4 and L5 with a 5.5 mm tap. We did not place any screws at this time because we were going to do the TLIF on the left side.
Case Study 2

 Technique Continued:

On the right side we did the same, making an incision with a 15 blade, then using an awl-tip tap to cannulate the pedicles. We felt it with a ball-tipped probe and then inserted 6.5x 40mm screws in L4 and L5. At this point we turned attention to a TLIF. We used the navigated tubes to dilate down on the left side to the L4-5 disk space and L4 lamina. We then inserted a 7mm tube. Once we were satisfied with the positioning, it was attached to the METRx tube holder, and Bovie cauterization was used to go through the muscle. Then it was pushed deeper down over the L4 lamina for our approach. We then drilled the lamina and pars and elevated and lifted off the inferior articular process, and this was handed off for morcellation to be used as morselized autologous bone graft. Bipolar cauterization was used to coagulate any epidural veins. A 15 blade was used to create an annulotomy and then pituitary was used to remove the disk. We then used shavers, curettes and pituitary to remove the disk. Once the disk was completely removed, we irrigated with copious amounts of bacitracin-impregnated irrigation and the disk space was packed with the morselized autologous bone graft. A 10mm expandable spacer fit well. Therefore we opened a 10mm expandable spacer, and it was filled with morselized autologous bone graft and tamped into the disk space under fluoroscopy. It was expanded maximally and then tubes were inserted, 6.5 x 40mm screws. We then inserted the rods along with the locking caps. The O-arm was brought in for an x-ray. An AP and lateral fluoroscopy shot were taken which showed good placement of hardware and reduction of the slip. Therefore, we final-tightened the locking caps, broke off the tabs and removed the iliac crest pin. We irrigated with copious amounts of bacitracin-impregnated irrigation. Hemostasis was obtained with bipolar cauterization and Surgifoam. We injected Exparel circumferentially into each incision, and closed with 0 Vicryl for the fascia, 2-0 inverted interrupted Vicryl for the deep dermis, 4-0 Monocryl and Dermabond for the skin. The patient was flipped supine, extubated, and brought to PACU in stable condition. I was present and scrubbed for the entire surgery.
### Case Study 2: Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0SG00AJ Principal Fusion of Lumber Vertebral Joint with Interbody Fusion Device, Posterior Approach, Anterior Column, Open Approach</td>
<td>✔</td>
</tr>
<tr>
<td>2</td>
<td>0SG0071 Fusion of Lumber Vertebral Joint with Autologous Tissue Substitute, Posterior Approach, Posterior Column, Open Approach</td>
<td>✔</td>
</tr>
<tr>
<td>3</td>
<td>0ST20ZZ Resection of Lumbar Vertebral Disc, Open Approach</td>
<td></td>
</tr>
</tbody>
</table>
Case Study 3: Sample of Auditor Comments

- Recommend re-sequencing M40.299 for kyphosis as the principal diagnosis which results in DRG movement from 460 to 458. Change procedure code 0SG107J to -0SG10AJ for posterolateral fusion with interbody cage (posterior approach, anterior column), add 0SG1071 for posterolateral fusion with mix of allograft and autograft. Add procedure code 0SB20ZZ for discectomy and procedure code 3E0U0GB for BMP.

- Patient is a 69 year old female admitted with kyphosis, spinal stenosis and lumbar radiculopathy underwent spinal fusion per History & Physical and Operative Report. It should be noted that extreme lateral interbody fusion (XLIF) is for treating scoliosis/kyphosis. Kyphosis is also known as hunchback, individual has excessive curvature of the spine, undergoes spinal reconstructive surgery such as spinal fusion. This condition is the diagnosis closely related to principal procedure and should be reported as principal diagnosis per Coding Clinic, Fourth Quarter 1990, UHDDS Reporting of Procedures Codes-Guidelines, page 5 to 6. In addition, please change procedure code 0SG107J to -0SG10AJ for posterolateral fusion with interbody cage (posterior approach, anterior column), add 0SG1071 for posterolateral fusion with mix of allograft and autograft per Operative Report description. Moreover, add procedure code 0SB20ZZ for discectomy and procedure code 3E0U0GB for BMP, per Operative Report.

- References: Coding Guidelines B3.10a and B3.10c and Coding Clinic, First Quarter 2018, Placement of Bone Morphogenetic Protein & Spinal Fusion Surgery, page 8
Case Study 3: Sample of Auditor Comments

- Recommend adding procedure code add 0SG1071 for posterolateral fusion with mix of allograft and autograft which results in DRG movement from 460 to 455.
- Patient is a 74 year old male admitted with L5-S1 spinal stenosis along with spondylolisthesis. The treatment included posterolateral fusion with autologous bone and DBM which is posterior approach, posterior column=posterolateral fusion. In addition, patient underwent posterior lumbar interbody fusion with WAVE cage placed which is posterior approach, anterior column. Please review Operative Report the highlighted sections for more details. So, spinal fusion done with both an anterior approach and a posterior approach yet coded posterior column only. It should be noted that Coding Guideline B3.10b states: If multiple vertebral joints are fused, a separate procedure is coded for each vertebral joint that uses a different device and/or qualifier.
- Reference: Coding Guideline B3.10b
Case Study 4

Instrumentation: Providence medical- dtrax
Complications: None

Indications:
The patient is a 63/F who was admitted with s/p c46 ACDF with C67 pseudoarthrosis with neck pain and C6 screw impinging on C67 disc space. Risk benefits and alternatives were explained and informed consent obtained.

Description of Procedure:
The patient was brought to the OR and given GETA and then turned in the prone position, and confirmed adequate positioning, making sure all the bony prominences and pressure points were well padded and the head was above the heart. I then brought in bi-plane fluoroscopy, AP and lateral, confirmed good exposure and then prepped and draped in the usual sterile fashion.

I then localized the incision using lateral fluoroscopy and then made a paramedian incision in the low cervical spine and exposed, and using access chisel and, under multiple AP and fluoro shots, I accessed the left 67 facet joint on the left side. Once the chisel was in the facet joint, I used decorticator and decorticated the C 67 lateral masses. Both lateral masses were decorticated, and then I used a guiding cannula over the chisel and removed the chisel, and then using a drill and visualizing it under AP and lateral fluoro, I decorticated the joint itself with a rasp. Throughout the case, I remained within the confines of the lateral masses under AP and within the facet joint under lateral fluoroscopy and under direct fluoroscopic vision.
I then had the manufacturer-provided cage that was made of titanium, and the dimensions are 4 mm x 5mm x 10 mm, and this was packed with demineralized bone matrix, and then the cage was inserted inside the facet joint on the left side to obtain stabilization and fusion at that level. Next, I switched the manufacturer-provided screw for a screw that would pass through the articulating cage into the lateral mass. We locked the facet joint together and broke off after final tightening. Throughout the case, we did multiple AP and lateral fluoro to confirm all locations and landmarks.

I then packed 0.5 cc of demineralized bone matrix over the decorticated facet joint on that side before removing the access cannula.

I then repeated the same steps on the right side facet joint. There was a small osteophyte that was easily broken using the access chisel and gentle tapping with a mallet at that level on that side.

The wound was then copiously irrigated with antibiotic saline and then stitched in layers using 2-0 Vicryl, 3-0 Vicryl, Monocryl, and glue for the skin. There were no complications during the case.
## Case Study 4: Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>0RG1371</td>
</tr>
<tr>
<td>2</td>
<td>01N13ZZ</td>
</tr>
</tbody>
</table>

- **These are the codes that resulted via this pathway in 3M:**
  - DT
  - DTRAX indirect decompression and posterior cervical (interfacet) fusion
  - Cervical Vertebral Joint
  - Percutaneous
  - Nonautologous Tissue Substitute
Question:
The patient, who has been diagnosed with cervical spinal stenosis, myelopathy and radiculopathy, presents for surgical treatment consisting of percutaneous posterior placement of DTRAX interfacet stabilization device with bone graft (C3 through C6). Under fluoroscopic guidance, procedures performed included posterior laminectomy for decompression and partial facetectomy. Harvesting of bone graft from the left iliac crest was accomplished via an open approach. Would the placement of the DTRAX interfacet stabilization device be coded using the root operation “Insertion” of “Fusion”? What are the correct ICD-10-PCS code assignments?

Answer:
Assign the following procedure codes:
- 0RG2371: Fusion of two or more cervical vertebral joints with autologous tissue substitute, posterior approach, posterior column, percutaneous approach, for the cervical spinal fusion
- 00NW3ZZ: Release cervical spinal cord, percutaneous approach, for the cervical decompression
- 0QB30ZZ: Excision of left pelvic bone, open approach, for the harvesting of the iliac crest bone graft

The DTRAX Spinal System is a set of instruments intended and indicated for access and preparation of a spinal joint to aid in fusion. When assigning ICD-10-PCS codes for procedures using DTRAX spinal instruments, coding professionals should code the procedure based on what was done, rather than the device used. In this case, a posterior fusion between the facet (interfacet) was done, not an interbody fusion. If the documentation is unclear, query the physician for clarification.
Questions??
Sources


Thank You