Lumbar Spine Mobility Deficits

ICD-9-CM code: 724.2 Lumbago (low back pain, low back syndrome, lumbalgia)

ICF codes:

- Activities and Participation Domain code: **d4105** Bending (Tilting the back downward or to the side, at the torso, such as in bowling or reaching down for an object)
- Body Structure code: **s76002** Lumbar vertebral column
- Body Functions code: **b7101** Mobility of several joints

Common Historical Findings:
- Felt "catch" in low back following a misstep, fall, bending, twisting, or lifting activity
- Unilateral pain in low back, buttock, or posterior thigh (depending on level of segmental involvement)
- If subacute, may report stiffness

Common Impairment Findings - Related to the Reported Activity Limitation or Participation Restrictions:
- Increase in pain at end range of sidebending left or sidebending right
- Symptoms reproduced with unilateral posterior-to-anterior pressure over the involved spinal segment

Physical Examination Procedures:

![Lumbar Side Bending](image)

**Performance Cues:**
- "Do you have any discomfort at this moment?"
- Demonstrate as you say "Bend to the side as far as you comfortably can and return"
- "Did that motion cause an increase in your pain?"
- "**WHEN** during the movement did you notice an increase in your pain?"
Unilateral Posterior-to-Anterior Pressures

Performance Cues:
Localize pressure to one transverse process
Sink deep enough to incriminate or "clear" the segment
When using thumbs - contact same side
When using a “dummy” thumb under pisiform - contact opposite side - fingers face away from iliac crest – using a flat, relaxed hand

Other physical examination procedures to identify the involved segment:

TP Assessment in flexion

Performance Cues:
Ensure that spinal extensors are relaxed ("Let your arms hang toward the floor")
Keep thumbs at same level of the segment’s transverse process
Match right and left thumb PA pressure intensity
Determine symmetry of depth
Determine symmetry of resistance
Determine symptom response
TP Assessment in Extension

**Performance Cues:**
Ensure that the spinal extensors are relaxed ("Let your chin rest in your hands")
Remember to line up your dominant eye

**Lumbar Spine Mobility Deficits: Description, Etiology, Stages, and Intervention Strategies**

The below description is consistent with descriptions of clinical patterns associated with the vernacular term “Lumbar Facet Syndrome”

**Description:** Dysfunction of the movement of the one vertebra of the lumbar spine relative to its adjacent vertebrae – commonly due to facet irregularities, muscle imbalances or trauma.

**Etiology:** The suspected cause of this disorder is a movement abnormality where one segment of the spine is unable to either flex, extend, side bend or rotate in a normal pain free manner on its adjacent vertebrae. There is anatomical evidence that this movement abnormality is caused by either a displacement of fibro-fatty tissue within the outer borders of the facet capsule or posttraumatic fibrosis of the facet capsule. The cause of the movement abnormalities and the associated pain is believed to be an awkward, sudden, twisting or bending motion, (resulting in a reversible displacement of fibro-fatty tissue) or healing of the a posttraumatic facet capsule with its accompanying capsular contracture and shortening of the adjacent segmental myofascia.

**Acute Stage / Severe Condition:** Physical Examinations Findings (Key Impairments)

*ICF Body Functions code: b7101.3* SEVERE impairment of mobility of several joints

- The patient’s reported complaint of unilateral low back and/or buttock pain increases at the end ranges of left or right sidebending
- Repeated flexion and extension movements do not improve or worsen the patient’s baseline level of pain
- Limited or pain-limited lumbar inclinometer measures are common
- Unilateral posterior-to-anterior pressures at the involved segment reproduce the patient’s pain complaint
- Motion restrictions are present at the involved segment
- Myofascia associated with the involved segment is usually hypertonic and painful
Sub Acute Stage / Moderate Condition: Physical Examinations Findings (Key Impairments)

ICF Body Functions code: b7101.2 MODERATE impairment of mobility of several joints

As above with the following differences
- The patient’s unilateral symptoms are reproduced only with overpressures at end ranges of left or right sidebending
- Improved segmental mobility is commonly associated with improving symptomatology

Settled Stage / Mild Condition

ICF Body Functions code: b7101.1 MILD impairment of mobility of several joints

As above with the following differences
- The patient’s unilateral symptoms are reproduced only with end range overpressures in either a combined extension and sidebending motion or a combined flexion and sidebending motion

Now when less acute – examine for muscle flexibility and strength deficits that may predispose the patient to future injury. For example:

- Muscles that commonly exhibit flexibility deficits in patients with facet abnormalities are latissimus dorsi/thoracolumbar fascia, hip flexors, hamstrings/sciatic nerve, and the gastrosoleus complex
- Muscles that are commonly weak are the trunk extensors, trunk flexors, hip flexors, hip extensors, and hip abductors

Intervention Approaches / Strategies

Acute Stage / Severe Condition

Goal: Restore painfree active spinal mobility

- Physical Agents
  Electrical stimulation, ice (or heat) to provide pain relief and reduce muscle guarding

- Manual Therapy
  Soft tissue mobilization primarily to multifidus and rotatores of the involved segment
  Joint mobilization/manipulation using isometric mobilization and contract/relax procedures to the involved segment to reduce associated rotatores or multifidi muscle guarding
  Passive stretching procedures to restore normal lumbar segmental mobility to the involved segment
Therapeutic Exercise
Instruct in exercise and functional movements to maintain the improvements in mobility gained with the soft tissue and joint manipulations

Re-injury Prevention Instruction
Instruct the patient in efficient, painfree, motor performance of movements that are related by the patient to be the cause of the current episode of low back pain

Sub Acute Stage / Moderate Condition
Goal: Restore normal, painfree response to overpressures at end ranges of sidebending

- Approaches / Strategies listed above – focusing on soft tissue mobilization and joint mobilization/manipulation to normalize segmental mobility followed by mobility exercises to maintain the improvements gained from the manual procedures

Settled Stage / Mild Condition
Goal: Restore normal, painfree responses to overpressures of combined extension and sidebending and/or combined flexion and sidebending
Normalize lumbar, pelvic, and hip muscle flexibility and strength deficits

- Approaches / Strategies listed above

- Therapeutic Exercises
  Instruct in stretching exercises to address the patient’s specific muscle flexibility deficits
  Instruct in strengthening exercises to address the patient’s specific muscle strength deficits

Intervention for High Performance / High Demand Functioning in Workers or Athletes
Goal: Return to desired occupational or leisure time activities

- Approaches / Strategies listed above

- Therapeutic Exercises
  Encourage participation in regular low stress aerobic activities as a means to improve fitness, muscle strength and prevent recurrences
Selected References


Manual Therapy for Lumbar Spine Segmental Motion Impairments

**Flexion (opening) Impairment**

**Examination**  
Active ROM – Sidebending movement/pain relation  
Position – TP provocation/symmetry in sitting flexion  
Passive ROM – Unilateral PA’s movement/pain relation  
Palpation – Segmental myofascial hypertonicity/tenderness  
Passive ROM – Segmental (physiologic) motion tests

**Treatment**  
Soft Tissue Mobilization:  
- Quadratus Lumborum  
- Erector Spinae/Thoracolumbar Fascia  
- Segmental Myofascia  
Joint Mobilization/Manipulation:  
- Lumbar Sidebending in Neutral  
- Lumbar Sidebending/Rotation in Flexion

**Extension (closing) Impairment**

**Examination**  
Active ROM – Sidebending movement/pain relation  
Position – TP provocation/symmetry in prone extension  
Passive ROM – Unilateral PA’s movement/pain relation  
Palpation – Segmental myofascial hypertonicity/tenderness

**Treatment**  
Soft Tissue Mobilization:  
- Psoas  
Joint Mobilization/Manipulation:  
- Lumbar Rotation in Neutral  
- Lumbar Sidebending/Rotation in Extension
Quadratus Lumborum
Soft Tissue Mobilization

Psoas
Soft Tissue Mobilization

Lumbar Segmental Myofascia STM
Impairment: Limited Lumbar Segmental Rotation

Forward Bend up to Involved Segment

Rotate Down to the Involved Segment
Lumbar Rotation in Neutral

Cues:  Forward bend to midrange of involved segment
       Rotate until motion just begins at the involved segment
       Keeping involved segment perpendicular
       Ensure that forces and contacts on the rib cage (not humerus) and ilium (not trochanter)
       are comfortable
       Contract/relax, oscillation, and high velocity-low amplitude procedures can be employed
       as indicated
       Utilize compression, slight lumbar sidebending, slight lumbar flexion or extension to
       create a “crisp” barrier at the involved segment prior to manipulation procedures

The following references provides additional information regarding this procedure:
Stanley Paris PT: Spinal Manipulative Therapy. Clinical Orthopaedics and Related Research,
Freddy Kaltenborn PT: The Spine: Basic Evaluation and Mobilization Techniques, p. 134, 137,
1993
John Bourdillon FRCS, EA Day MD, and Mark Bookhout MS, PT: Spinal Manipulation, p. 184-
185, 1992
Impairment: Limited Lumbar Segmental Flexion, Left Sidebending, and Left Rotation

Cues: Position the upper knee anterior to the bottom knee to allow the pelvis to rotate
Flex up from below to the involved segment
Flex down from above to the involved segment
Retract the upper shoulder (don’t pull the bottom arm)
Keep the involved segment perpendicular to the table
Push the pelvis superiorly and anteriorly to promote the sidebending and rotation

The following references provide additional information regarding this procedure:
John Bourdillon FRCS, EA Day MD, and Mark Bookhout MS, PT: Spinal Manipulation, p. 178, 1992
Impairment: Limited Lumbar Segmental Extension, Left Sidebending, and Left Rotation

Lumbar Left Rotation/Sidebending in Extension

Cues: A sheet between the patient and the table reduces friction during the set-up
Localize to the involved segments by 1) anterior translation of spine, 2) extension of the
leg near table, 3) extension of the trunk, 4) simultaneous counter rotation with
sidebending of the trunk and pelvis (maintain perpendicular at the involved
segment)

The following references provides additional information regarding this procedure:
John Bourdillon FRCS, EA Day MD, and Mark Bookhout MS, PT: Spinal Manipulation, p. 180-
182, 1992