Lumbar Spine and Related Lower Limb Pain

**ICD-9-CM code:** 722.10 Displacement of lumbar intervertebral disc without myelopathy

**ICF codes:**
- **Activities and Participation Domain code:** d4153 Maintaining a sitting position (Staying in a seated position, on a seat or the floor, for some time as required, such as when sitting at a desk or table.)
- **Body Structure code:** s76002 Lumbar vertebral column
- **Body Functions code:**
  - b28013 Pain in back
  - b28015 Pain in lower limb

**Common Historical Findings:**
- Recurring episodes of low back pain (> one year)
- Recent episode precipitated by bending/twisting or lifting strain
- Symptoms worse with prolonged sitting or repetitive forward bending activities

**Common Impairment Findings** - Related to the Reported Activity Limitation or Participation Restrictions:
- "Flat" back (reduction in normal lumbar lordosis)
- May have lateral shift of thorax
- Location of symptoms peripheralize or centralize following a specific repeated movement

**Physical Examination Procedures:**

- **Right Lateral Shift**
- **Repeated Forward Bending**

**Performance Cues:**
- Establish baseline location of symptoms - remember to ask "Anywhere else?"
Demonstrate as you say "Slide your hands down your thigh and bend forward as far as you comfortable can and return"
After returning to the standing position inquire, "Did that motion cause a change in your pain (or symptoms?)"
If yes, "At this moment, WHERE is your pain (or symptoms)? Anywhere else?"
If the location of symptoms moves peripherally - perform one more repetition to verify
If the location of symptoms moves centrally - perform five more repetitions to verify
If the location of symptoms does not change - perform five more repetitions to verify

Repeated Backward Bending

Performance Cues:
Re-establish baseline
Demonstrate and say "Spread your feet apart, place your hands on your buttocks, and bend backward as far as you comfortable can then return back up."
Utilize standard inquires (above in forward bending cues) to determine if the location of symptoms peripheralized or centralized following completion of the motion(s)

Lumbar Spine and Related Lower Limb Pain:
Description, Etiology, Stages, and Intervention Strategies

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

Description: As the degeneration of the intervertebral disc progresses the outer layers of the disc (annulus fibrosus) becomes weak and allow protrusion or extrusion of the inner portion of the
disc (nucleus pulposus). The bulging disc can produce low back and leg pain. The bulging disc may also put pressure on the spinal cord or any of the nerve roots that branch from it – thus producing a lumbar radiculopathy

**Etiology:** Traumatic onset such as with awkward and/or heavy lifting using poor body mechanics may initiate the slow process of disc degradation – which may take years before symptoms are noted. Non-traumatic onset, associated with prolonged sitting and repetitive flexion/bending activities, may also create degenerative changes in the disc over time.

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

*ICF Body Functions codes:*  
\[\text{b28013.3} \text{ SEVERE pain in back; and b28015.3 SEVERE pain in lower limb}\]

- Reduced lumbar lordosis
- May have a lateral trunk shift
- Repeated flexion movement worsen or peripheralize the patient’s symptoms
- Central posterior-to-anterior pressures on the involved segment reproduce the reported symptoms
- Limited straight leg raise (SLR) due to mobility deficits in the sciatic nerve or hamstrings

**Sub Acute / Moderate Condition:** Physical Examinations Findings (Key Impairments)

*ICF Body Functions codes:*  
\[\text{b28013.2} \text{ MODERATE pain in back; and b28015.2 MODERATE pain in lower limb}\]

- As above
- Specific repeated movements, commonly extension or lateral shift movements, may centralize or reduce the patient’s symptoms

**Settled Stage / Mild Condition:** Physical Examinations Findings (Key Impairments)

*ICF Body Functions codes:*  
\[\text{b28013.1} \text{ MILD pain in back; and b28015.1 MILD pain in lower limb}\]

- As above

**Intervention Approaches / Strategies**

**Acute Stage / Severe Condition**

**Goals:** Decrease pain  
Centralize symptoms
• **Physical Agents**
  
  Ice  
  Electrical stimulation (e.g., interferential or TENS)

• **Re-injury Prevention Instruction**
  Educate patient to avoid activities (typically flexion activities) that aggravate the low back or leg pain – especially avoid movements and positions that peripheralize the patient’s symptoms

• **External Devices (Taping/Splinting/Orthotics)**
  Consider using taping or a brace to remind the patient to maintain his/her lumbar lordosis during daily activities and limit forward bending

• **Therapeutic Exercise**
  Instruct in positions or exercises (typically lumbar extension postures or exercises) that centralize the symptoms

• **Manual Therapy**
  Lateral shift procedures, manual traction, or mechanical traction may allow centralization of symptoms when positions/exercises are ineffective in centralizing the symptoms

### Sub Acute Stage / Moderate Condition

Goals: As above  
Improve activity tolerance for performing normal ADL’s

• Approaches / Strategies listed above

• **Therapeutic Exercise**
  Initiate lumbar stabilization exercises (i.e., trunk flexor and extensor strengthening to maintain the lumbar spine in its neutral positions during performance of daily activities
  Initiate stretching exercises to myofascia with flexibility deficits (e.g., hamstrings)
  Initiate nerve mobility exercises the nerve with mobility limitations (e.g., sciatic nerve)
  Promote daily performance of low-stress aerobic activity (e.g., walking)

• **Neuromuscular Re-Education**
  Provide verbal, proprioceptive and manual cues for maintenance of neutral lumbar spine postitions during daily activites
Settled Stage / Mild Condition

Goals: Improve activity tolerance for performing normal ADL’s
Return to desired level of activity, including occupational and recreational activities.

Intervention for Higher Performance / High Demand Function in Workers or Athletes

Goal: Return patient to optimal activity level for performance of desired occupational and recreational activities

- Avoid re-injury Approaches / Strategies listed above
- Therapeutic Exercise
  Progress stretching, strengthening, and proprioception and nerve mobility exercises
  Maximize muscle performance of the relevant lower quadrant (hip, knee, ankle and lumbar) muscles or upper quadrant (scapular, shoulder, elbow, forearm) required to perform the desired occupational or recreational activities
- Ergonomic Instruction
  Provide job/sport specific training to lessen strain on the lumbar spine and to maximize activity tolerance

Selected References


Saal JA. Natural history and nonoperative treatment of lumbar disc herniation. *Spine*. 1996;21(24s):2S-9S.


<table>
<thead>
<tr>
<th>Body Function Label</th>
<th>Critical Impairments</th>
<th>Other Supportive Criteria</th>
<th>Interventions</th>
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<tbody>
<tr>
<td>Lumbar Spine Mobility Deficits</td>
<td>End-range pain</td>
<td>Acute low back pain</td>
<td>End-range stretching to maintain segmental ROM gained from manipulative procedures.</td>
</tr>
<tr>
<td>Other vernacular terms:</td>
<td>ROM limitations</td>
<td>Minimal/no previous history of LBP</td>
<td>Ergonomic instruction, trunk &amp; pelvic girdle strengthening &amp; stretching, as indicated, to prevent future disability.</td>
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<td>“Facet Syndrome”</td>
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<tr>
<td>Mobilization Exercises</td>
<td>Symptoms reproduced with sustained end range positions</td>
<td>Long history of progressively worsening symptoms (i.e., less tolerance to end range positions – such as sitting)</td>
<td>Isometric mobilizations to normalize pelvic girdle symmetry.</td>
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<td></td>
<td>Symptoms eased with neutral positions and midrange movements</td>
<td></td>
<td>Ergonomic cuing to maintain mid-range lumbar and pelvic girdle positions.</td>
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<td>Proprioceptive training and trunk/pelvic girdle strengthening to improve ability to stay in mid-range positions.</td>
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<td>Taping or bracing as indicated.</td>
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<td>Lumbar Spine and Related Lower Limb Pain</td>
<td>Location of symptoms move centrally with repeated lumbar extension or with repeated lateral trunk shifts</td>
<td>Difficulty with sitting and forward bending Multiple previous episodes of LBP (progression of “Ligamentous Instability”) Observable reduced lumbar lordosis – may have lateral trunk shift</td>
<td>Manual procedures, postures, or exercises that centralize the symptoms.</td>
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<tr>
<td>Other vernacular terms:</td>
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<td>Ergonomic cuing to maintain lumbar lordosis prevent peripheralization.</td>
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<td>“Disc Derangement” Extension Exercise, or Specific Exercise Group</td>
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<td>Progress to treatment of underlying segmental instability.</td>
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<td>Lumbar Spine and Related Lower Extremity Radicular Pain</td>
<td>Narrow band of lancinating pain</td>
<td>Nerve mobility deficits with lower limb tension testing</td>
<td>Dural and nerve mobility exercises as indicated to address the patient’s key impairments</td>
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<tr>
<td>Other vernacular terms:</td>
<td>Symptoms reproduced with SLR and/or slump testing</td>
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<td>Soft tissue and/or joint mobilization to areas of potential spinal and peripheral nerve entrapments</td>
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<td>“Nerve Root Adhesion” or “Dural Adhesion”</td>
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<tr>
<td>Nerve Mobility Exercises</td>
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Joe Godges, DPT, MA, OCS

KP So Cal Ortho PT Residency
References

Mobilization Exercises

Stabilization Exercises

Extension Exercises and Lateral Shift Correction/Exercises

Nerve Mobility Exercises

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