

Lumbar disc herniation

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What is a herniated disc?

- The spine is made up of a series of connected bones called "vertebrae."
- The disc is a combination of strong connective tissues which hold one vertebra to the next and acts as a cushion between the vertebrae.
- The disc is made of a tough outer layer called the "annulus fibrosus" and a gel-like center called the "nucleus pulposus."
- As you get older, the center of the disc may start to lose water content, making the disc less effective as a cushion.

- A herniated lumbar disc can press on the nerves in the spine and may cause pain, numbness, tingling or weakness of the leg called "sciatica." Sciatica affects about 1-2% of all people, usually between the ages of 30 and 50.
- A herniated lumbar disc may also cause back pain, although back pain alone (without leg pain) can have many causes other than a herniated disc.

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Film Interpretation

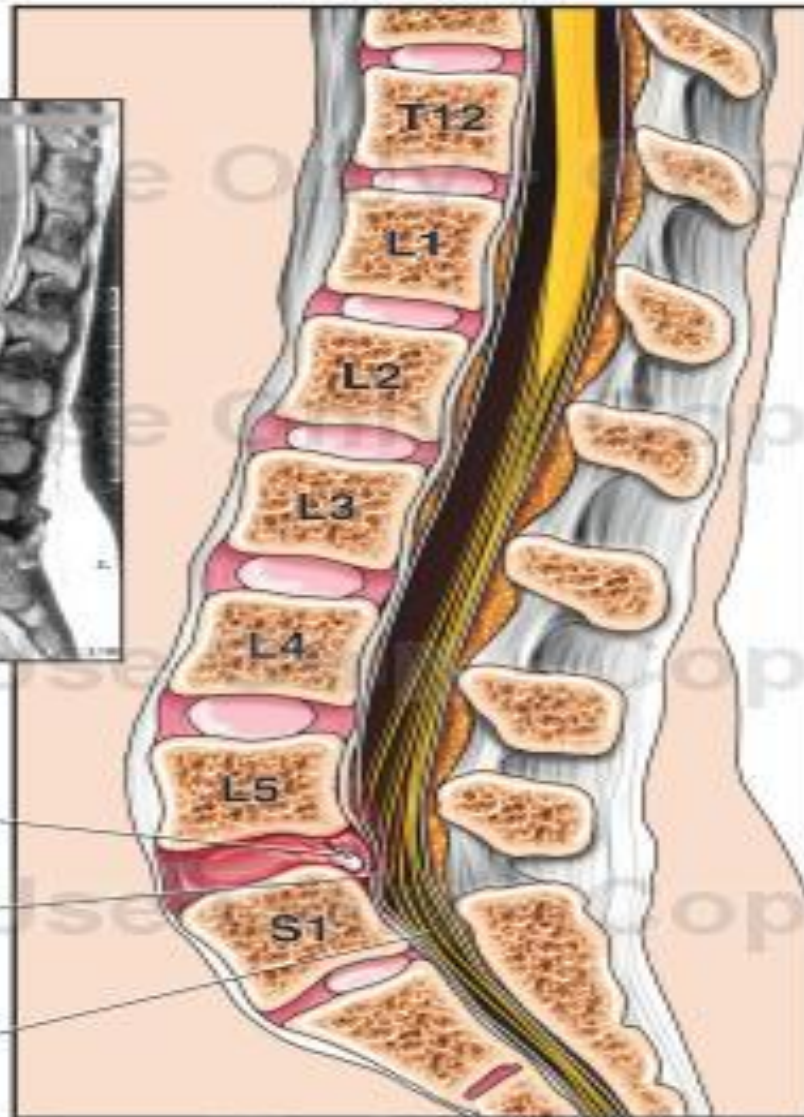


Area of Injury

L5-S1 central herniation of the nucleus pulposus

Deformity of the thecal sac impinging on the cauda equina

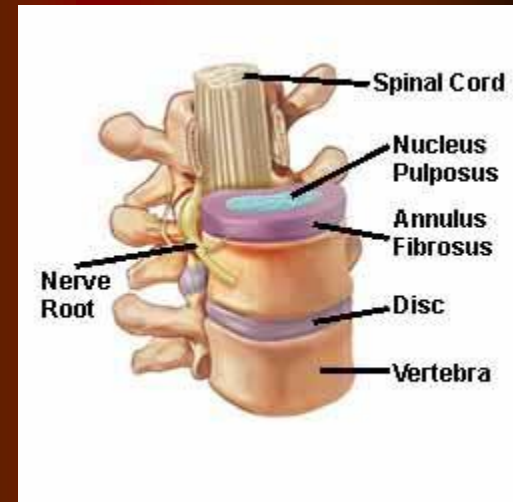
Cauda equina of spinal cord



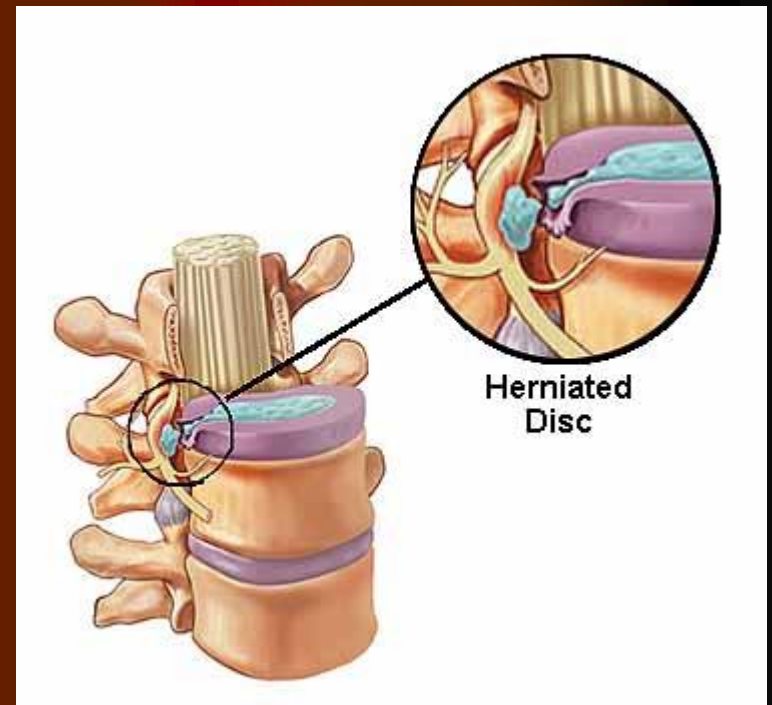
Anatomy - Normal Lumbar Disc

- In between each of the five lumbar vertebrae (bones) is a disc, a tough fibrous shock-absorbing pad.
- Endplates line the ends of each vertebra and help hold individual discs in place.
- Each disc contains a tire-like outer band (called the annulus fibrosus) that encases a gel-like substance (called the nucleus pulposus).

- Nerve roots exit the spinal canal through small passageways between the vertebrae and discs.
- Pain and other symptoms can develop when the damaged disc pushes into the spinal canal or nerve roots



- Disc herniation occurs when the annulus fibrosus breaks open or cracks, allowing the nucleus pulposus to escape.
- This is called a Herniated Nucleus Pulposus (HNP) or herniated disc



Signs and Symptoms

- The lumbar spine consists of the five vertebrae in the lower part of the spine, each separated by a disc, also called a lumbar disc.
- The discs in this part of the spine can be injured by certain movements, bad posture, being overweight and disc dehydration that occurs with age.

Signs and Symptoms

- Although the lumbar vertebrae are the biggest and strongest of the spinal bones, risk of lumbar injury increases with each vertebrae down the spinal column because this part of the back has to support more weight and stress than the upper spinal bones.

Signs and Symptoms

- The lumbar disc is the most frequent site of injury in several sports including gymnastics, weightlifting, swimming and golf, although athletes in general have a reduced risk of disc herniation and back problems.

Signs and Symptoms

Symptoms of disc herniation in the lower back are slightly different from symptoms in the cervical or thoracic parts of the spine.

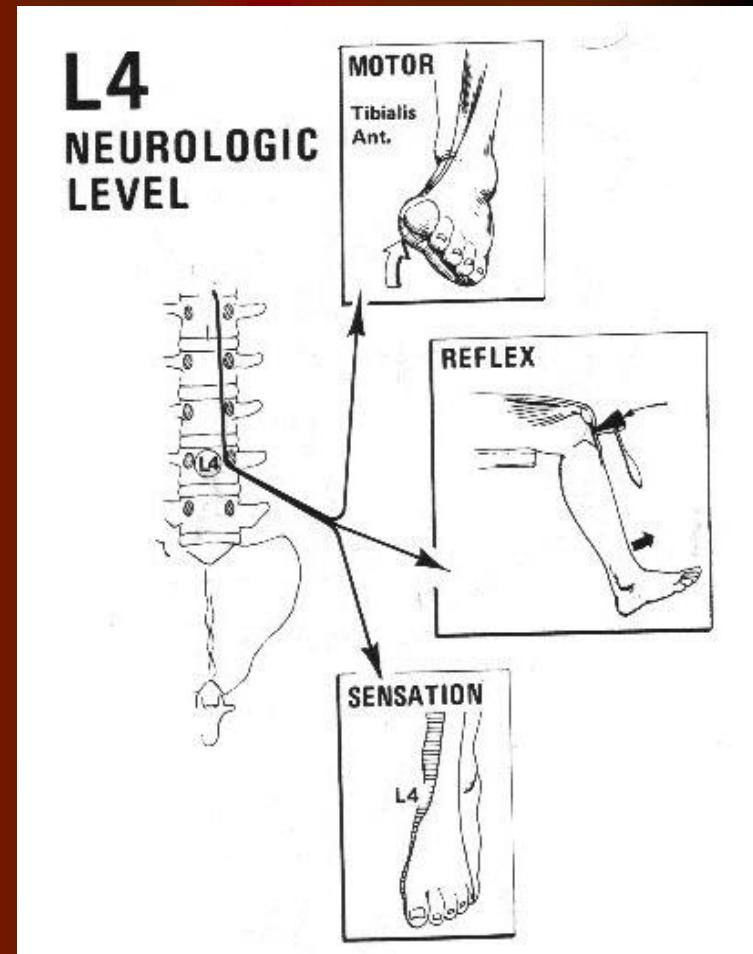
The spinal cord ends near the top lumbar vertebrae but the lumbar and sacral nerve roots continue through these spinal bones.

lumbar disc herniation may cause:

- Lower back pain
- Pain, weakness or tingling in the legs, buttocks and feet
- Difficulty moving your lower back
- Problems with bowel, bladder or erectile function, in severe cases

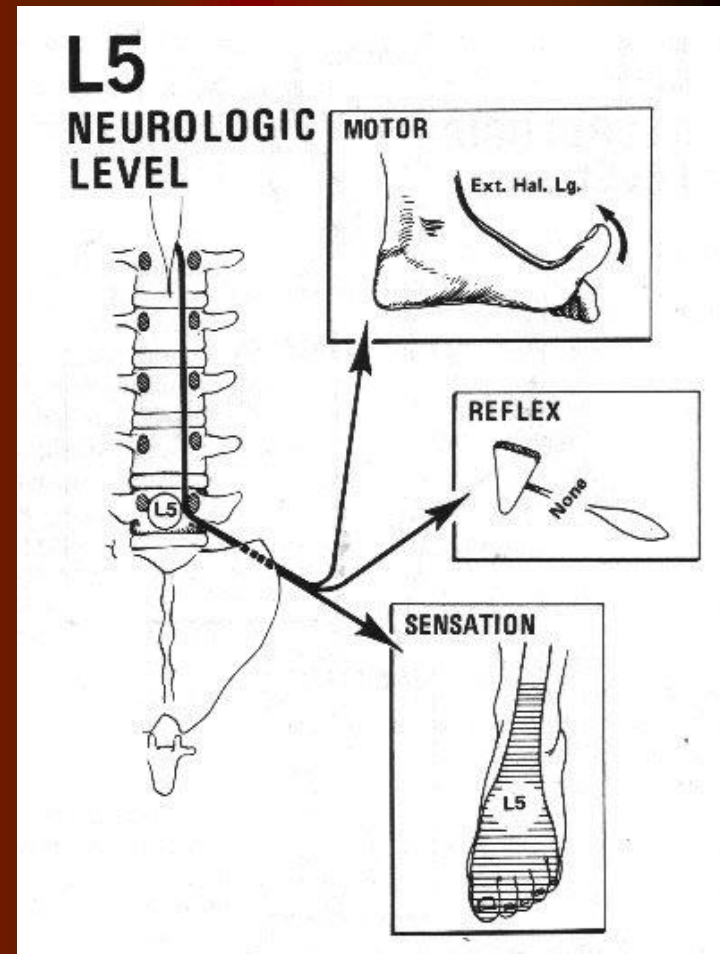
- L4

- Quads/Tibialis Anterior
- Patellar reflex
- Sensory Great toe and medial leg



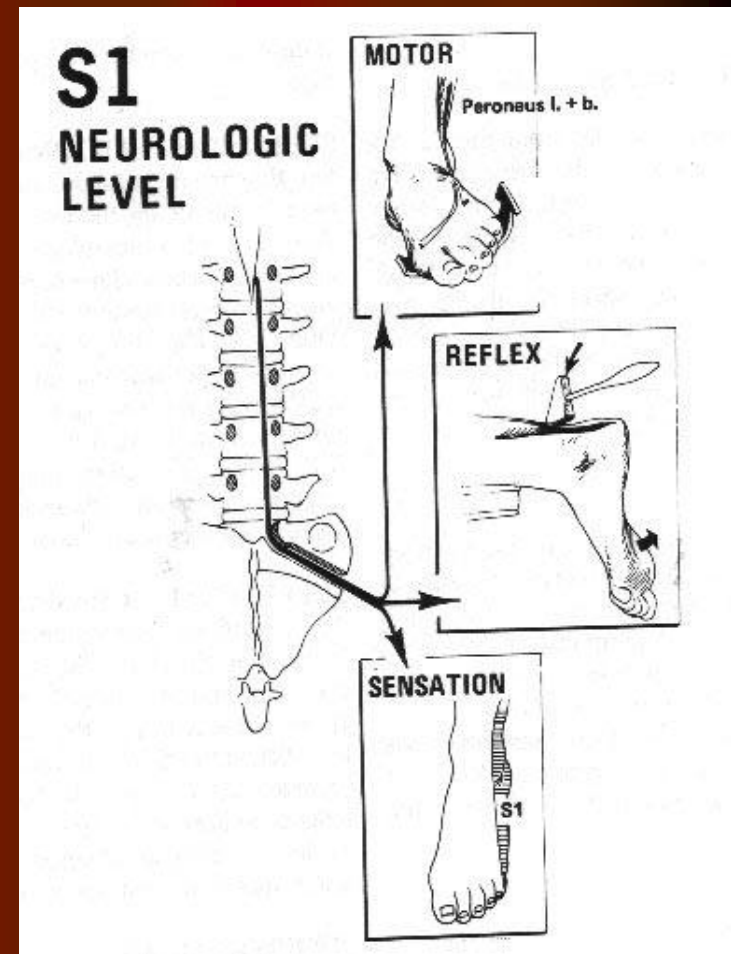
- L5

- Strength of Ankle and great toe dorsiflexion
- Extensor Hallucis Longus
- Sensory to dorsum of foot



- S1

- Ankle reflexes and sensation of posterior calf and lateral foot
- Peroneals/Gastroc
- Achilles reflex
- Sensory to lateral and plantar foot



Diagnosis

Initial diagnosis of lumbar herniation generally is based on the symptoms of lower back pain.

Your doctor will examine your sensation, reflexes, gait and strength. Your doctor also may suggest the following tests:

- **X-ray** -- High-energy radiation is used to take pictures of the spine.
- **Magnetic Resonance Imaging (MRI)** -- An MRI provides detailed pictures of the spine that are produced with a powerful magnet linked to a computer.
- **Computed Tomography (CT) Scan** -- A CT scan uses a thin X-ray beam that rotates around the spine area. A computer processes data to construct a three-dimensional, cross-sectional image.
- **Electromyography (EMG)** -- This test measures muscle response to nervous stimulation.

Treatment

Conservative treatment of lower disc pain usually is successful over time.

It includes:

- Pain medication or pain therapies such as ultrasound, massage or transcutaneous electrical nerve stimulation
- Anti-inflammatory medication such as aspirin, ibuprofen and acetaminophen
- Physical therapy
- Steroid injections
- Education in proper stretching and posture
- Rest

Treatment

- However, if your pain doesn't respond to conservative treatment in two to four weeks, your condition affects your bowel or bladder function, or if it threatens permanent nerve damage, your doctor may suggest surgery.
- Modern methods of surgery allow some spine operations to be performed through tiny incisions using miniature instruments while a microimaging instrument called an endoscope is used to view the surgery site

Treatment

- The surgery usually includes removing the part of the disc that has squeezed outside its proper place, called a discectomy.
- The surgeon also may want to remove the back part of the vertebrae, called the lamina, in a laminectomy; or to surgically open the foramen, the holes on the side of the vertebrae through which the nerves exit, in a foramenotomy.
- Only about 10 percent of adult lumbar disc patients require surgery and even fewer children and adolescents

Treatment

- UCSF Spine Center orthopedic surgeons also are investigating the effectiveness of an implant that may replace damaged lower back discs.