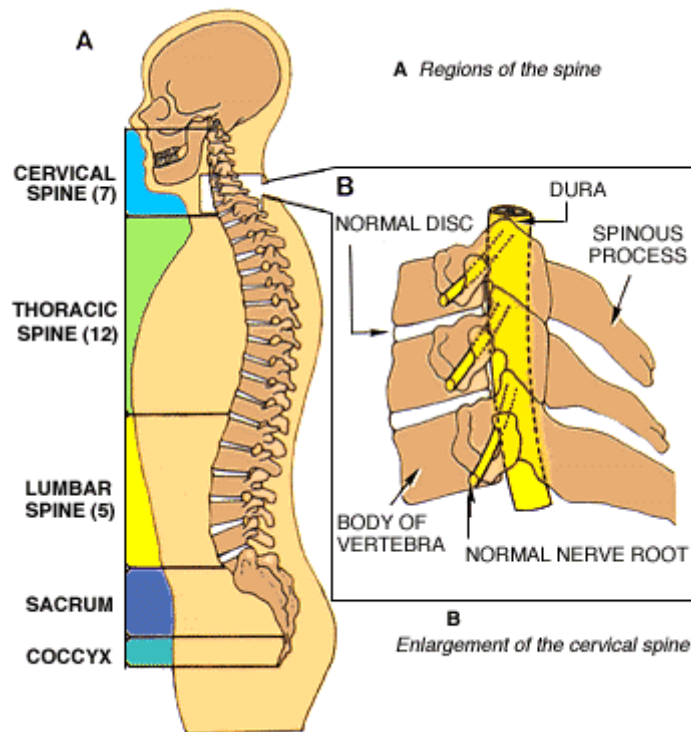


Spinal Anatomy

The Spinal Column

The spinal column consists of 24 separate bones, called vertebrae, plus the fused bones of the sacrum and the coccyx. Your spinal column is the central support for the upper body, carrying most of the weight of your head, chest, and arms. Together with the muscles and ligaments of your back, your spinal column enables you to walk upright.

The cervical region has seven vertebrae (C1 through C7), the thoracic region has 12 vertebrae (T1 through T12) and the lumbar region has five vertebrae (L1 through L5). The sacral region consists of five vertebrae, all fused together to form one continuous bone mass known as the sacrum. The coccygeal region consists of four vertebrae, all fused together to form the coccyx or tailbone.



Vertebrae and Discs

The Cervical Vertebrae

The vertebrae in the cervical (or upper back) portion of your spine carry the weight of your head. The pressure from this weight along with the "wear and tear" associated with the constant turning and bending of your head and neck is what usually leads to problems associated with the cervical vertebrae.

The Lumbar Vertebrae

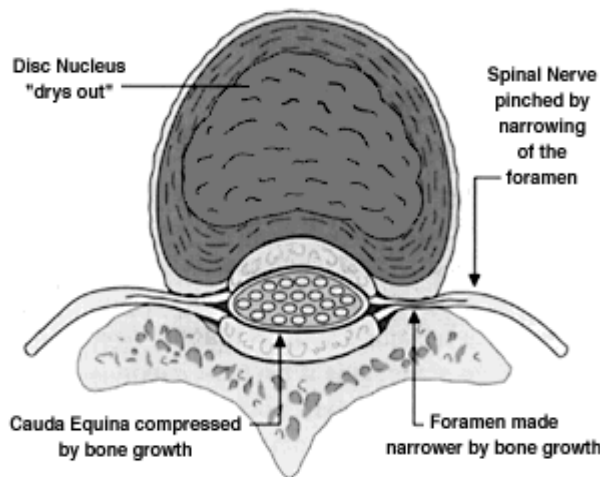
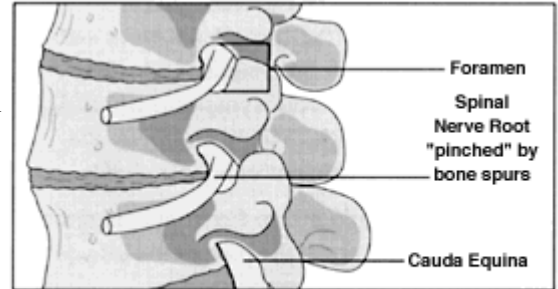
The vertebrae in the lumbar (or lower back) portion of your spine are under constant pressure from the weight of your upper body, even when you are simply sitting in a chair. The "wear and tear" of this pressure is what usually leads to problems associated with the lower back.

The Intervertebral Discs

The intervertebral discs are composed of a fiber-like outer lining (the annulus) and a gelatin-like inner core (the nucleus). These discs act as the spine's "shock absorbers," preventing vertebra from rubbing against one another and providing much of the flexibility found in your spine. Because they are under constant pressure, it is the intervertebral discs which first show signs of the "wear and tear" associated with the aging process.

The Spinal Nerves

Running through the center of the spinal column is the spinal cord, which ends in the lumbar spine in a bundle of nerves called the cauda equina. At each disc level, a pair of spinal nerve roots branch off from the spinal cord or cauda equina and pass through an opening called the foramen.



The Aging Spine process.

The Growth of Bone Spurs

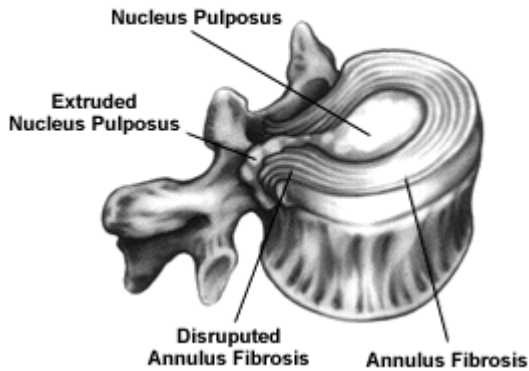
As your spine ages, the gelatin-like centers of your discs begin to dry out, thereby reducing their effectiveness as "shock absorbers." As this protection is lost, the simple "wear and tear" of everyday activity can cause the bone matter of your vertebrae to develop jagged edges, called bone spurs. As these spurs develop and extend outward, they can cause both the spinal canal and the foramen to become narrowed. The result is often the pinching (compression) of the spinal cord and/or a spinal nerve root.

The "Slowly Closing Window"

As discs dry out, your vertebrae begin to "settle." This "settling" causes the window-like openings of the foramen and the spinal canal to become smaller and smaller. Eventually, these openings can become so small that a spinal nerve(s) becomes "pinched" against a vertebra. It's similar to slowly closing a window on your hand. There will be a point at which you begin to feel the pressure. The more the window is closed, the greater the pressure and the greater the pain.

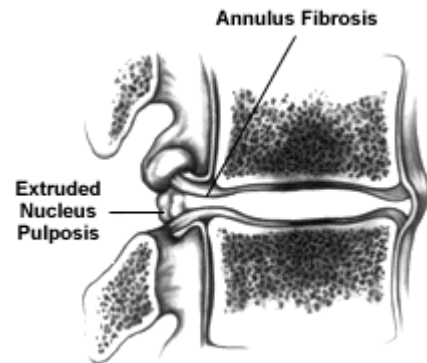
Abnormal Spinal Anatomy

Ruptured Disc



The drawings to the right and below represent the appearance of a herniated or ruptured disc. Both drawings show the disruption of the annulus fibrosus, the outer ring-like portion of an intervertebral disc.

The tissue located in the center of the intervertebral disc, the nucleus pulposus, is partially extruded from the intervertebral disc. The extruded nucleus pulposus material can exert pressure on nerves thus causing pain, numbness, and muscle weakness due to nerve damage.

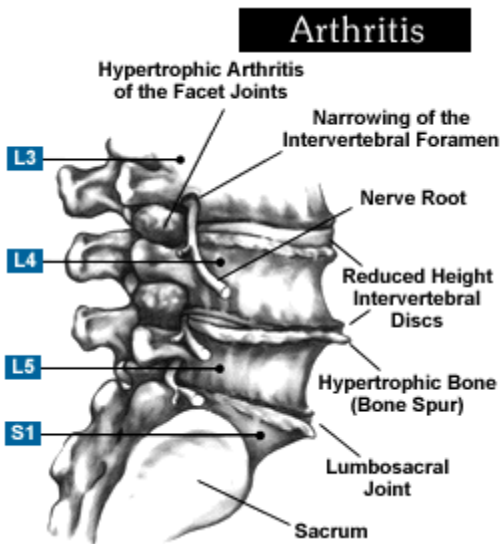
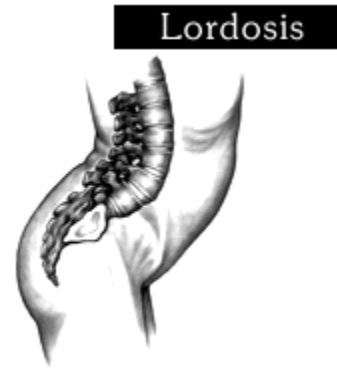


Scoliosis



An abnormal spinal condition known as scoliosis is shown in this drawing. Scoliosis is a lateral (sideways) curvature of the spine.

This drawing represents the spinal condition of lordosis. Lordosis is the abnormal increase in normal lordotic (anterior) curvature of the lumbar spine. This can lead to a noticeable "sway-back" appearance.



This drawing illustrates degenerative and hypertrophic arthritis between the 3rd, 4th, and 5th lumbar vertebrae, as well as the lumbosacral joint (L5-S1 disc space). The degeneration of the intervertebral discs has reduced the height of the discs.

There are bone spurs or hypertrophic bone adjacent to the discs and hypertrophic arthritis of the facet joints. This results in reduced range of motion of the spine. Also, the hypertrophic bone and narrowing of the intervertebral foramen can produce nerve root impingement thereby causing back and leg pain, as well as numbness and weakness of leg muscles.