

The Spine: Pathology and Rehabilitation

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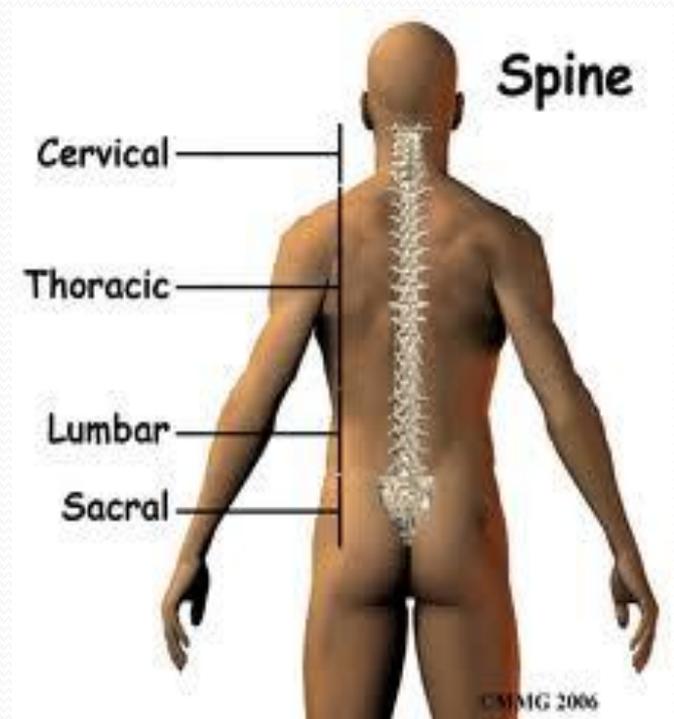
Demographics

- **Spinal pathology is seen across *all* demographics and age groups**
 - Affects people throughout their lives
 - Number one reason for PT referral
 - Highest cost to employers



Functions of the Spine

- Establishes our posture
- Provides an attachment site for many muscles
- Transmits forces
- Protects the spinal cord

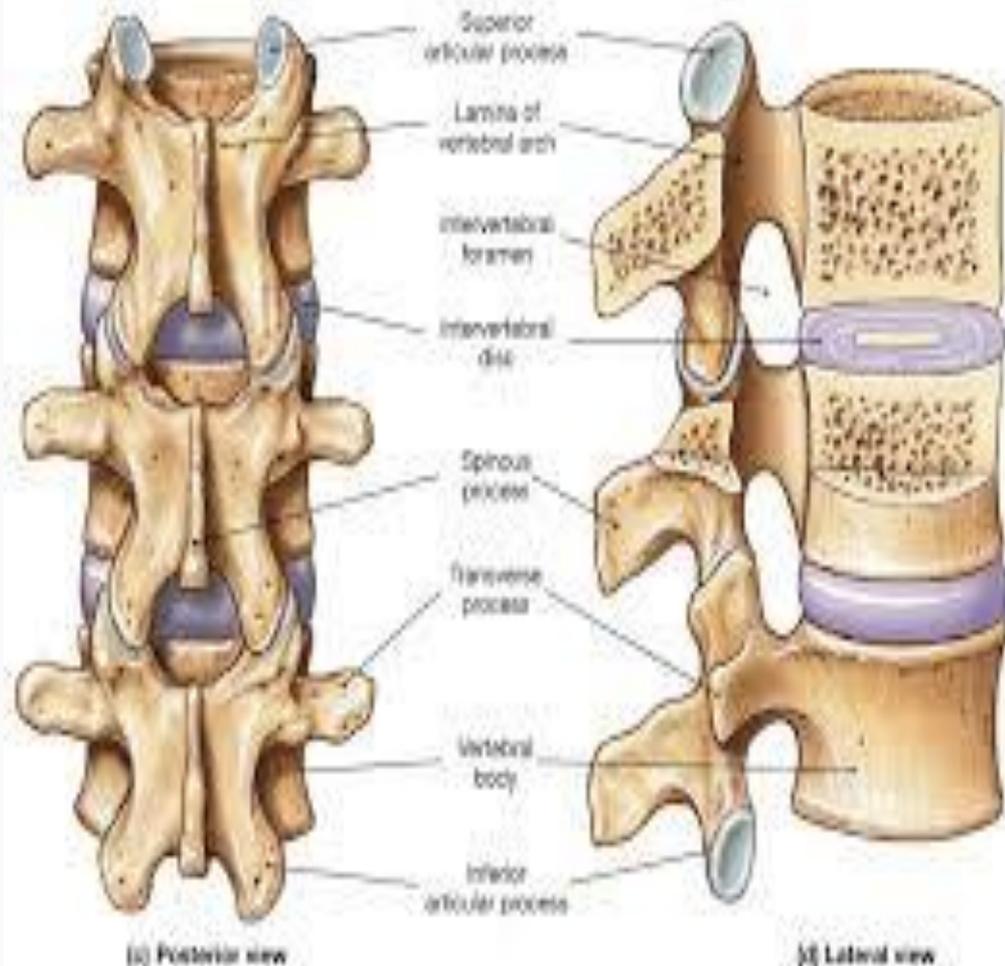
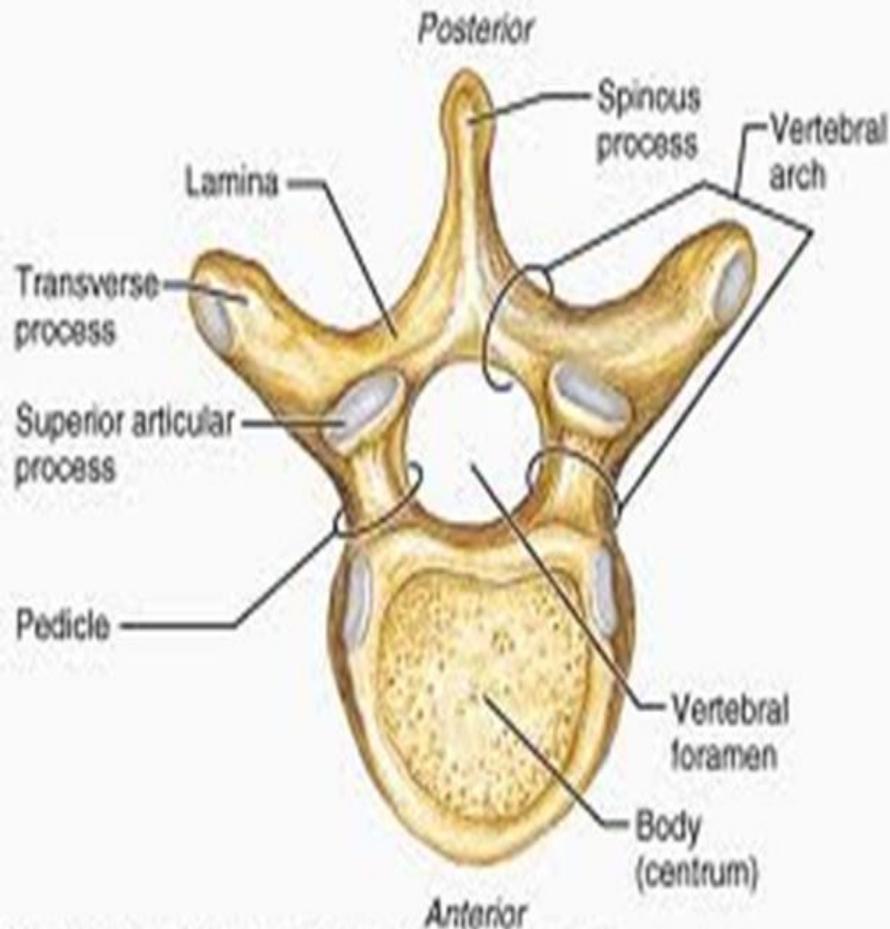


Spinal Anatomy

- **33 Vertebrae (Approximately)**
 - 7 Cervical
 - 12 Thoracic
 - 5 Lumbar
 - 5 Sacral (fused)
 - 4 Coccygeal (fused)

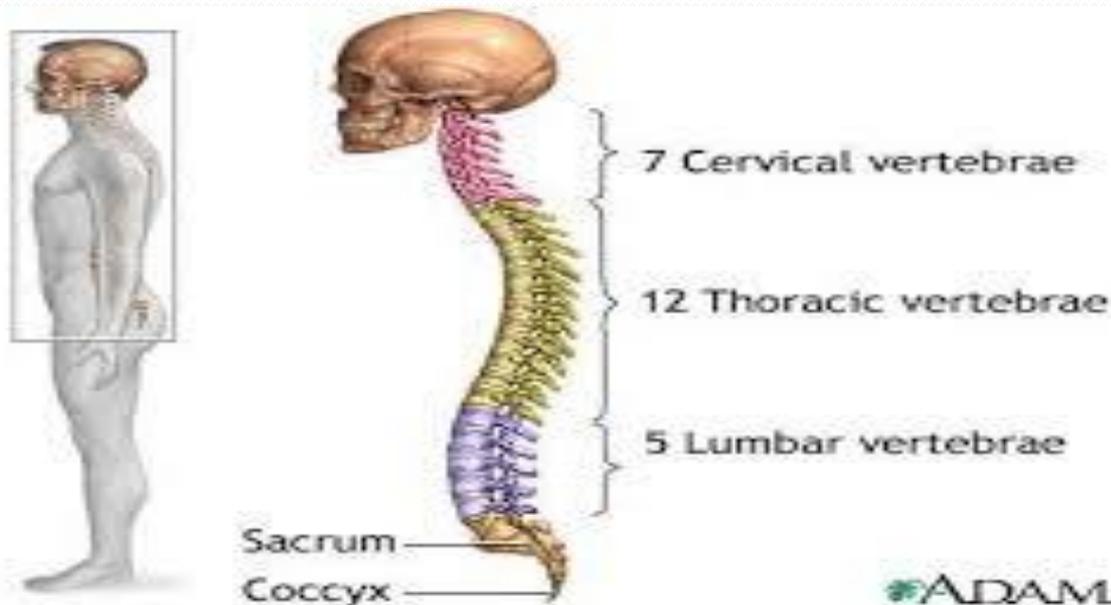


Spinal Anatomy

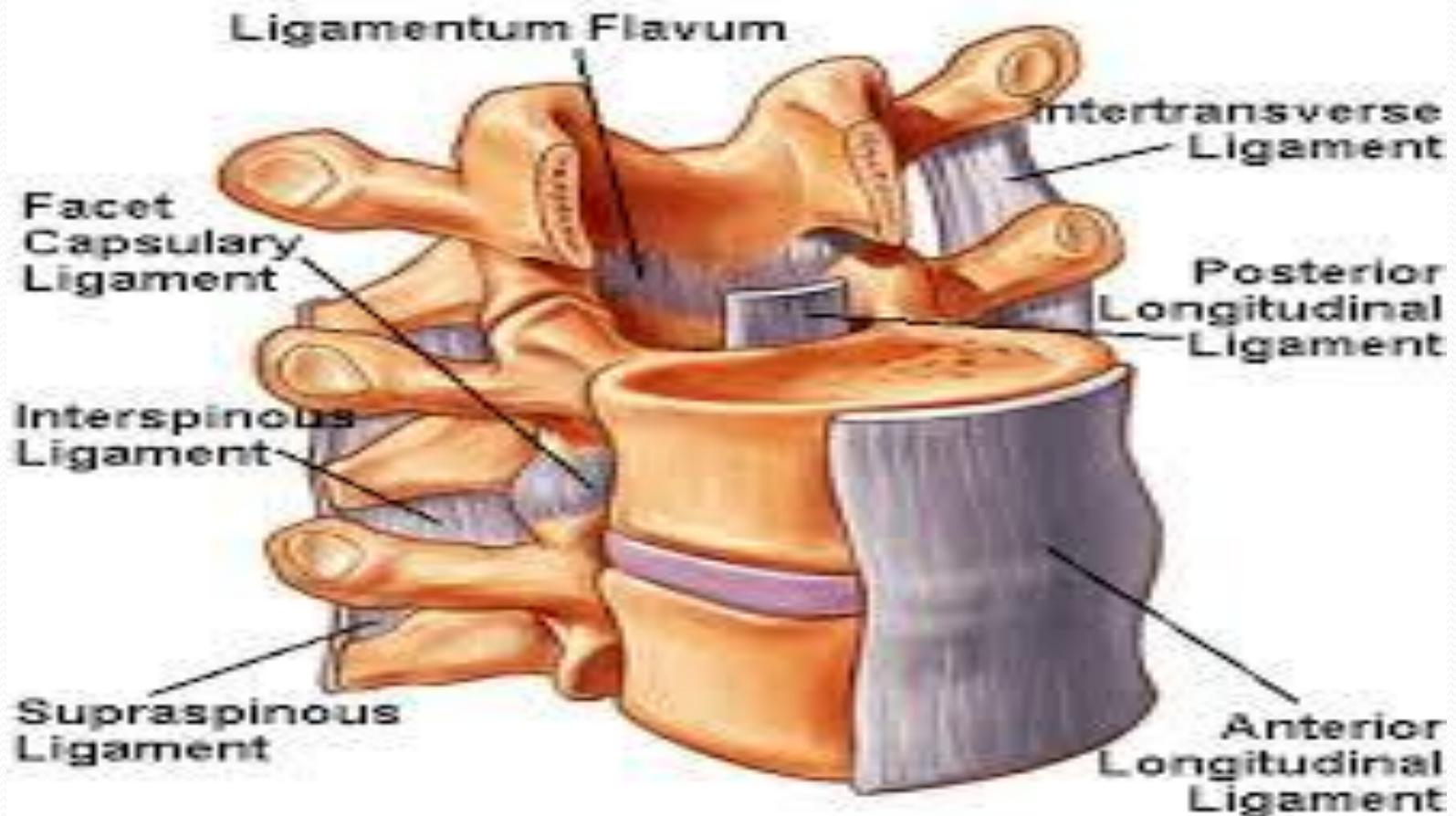


Spinal Anatomy

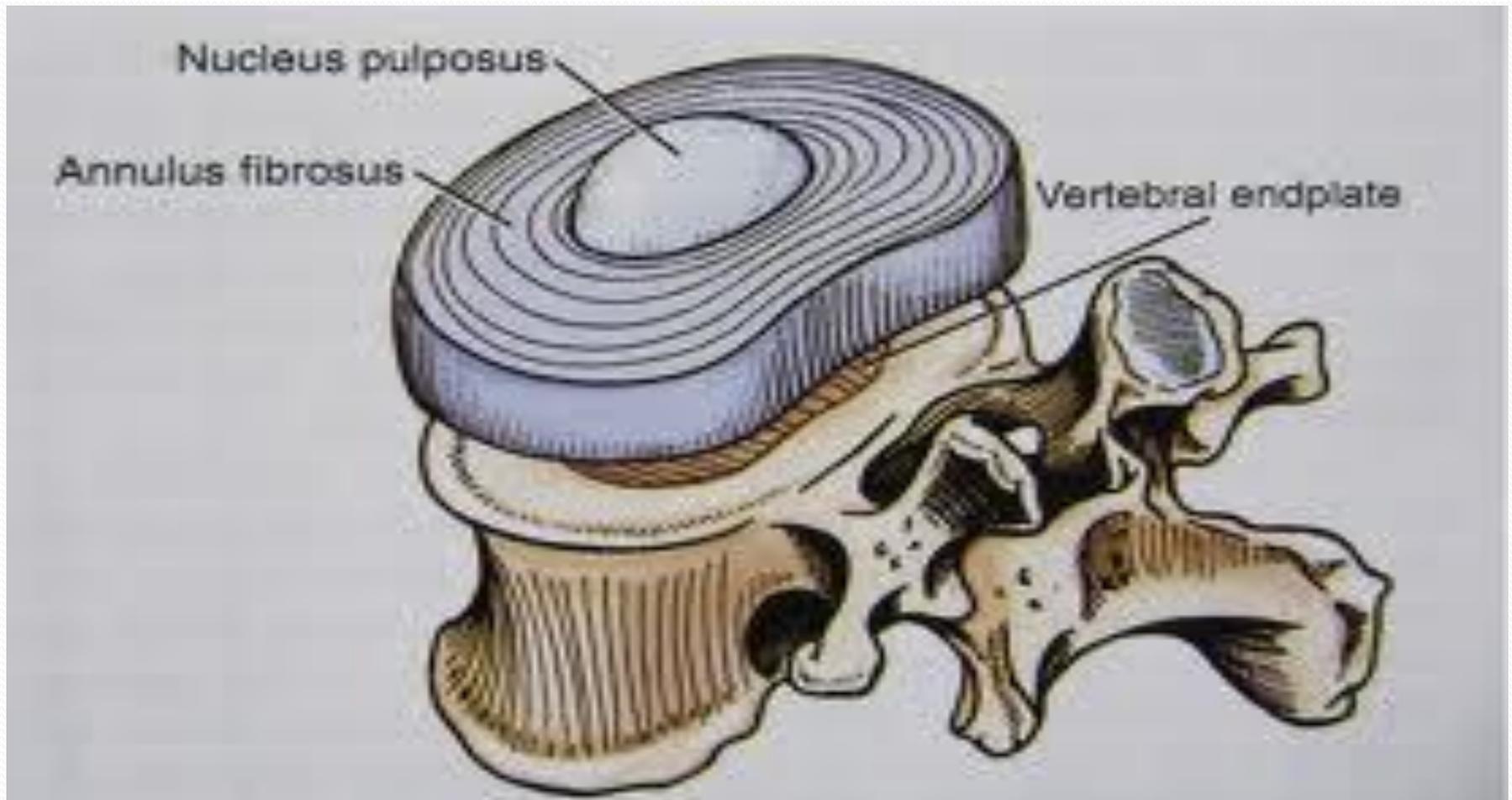
- **Cervical lordosis**
- **Thoracic kyphosis**
- **Lumbar lordosis**
 - *Curves of the spine help us to absorb shock!*



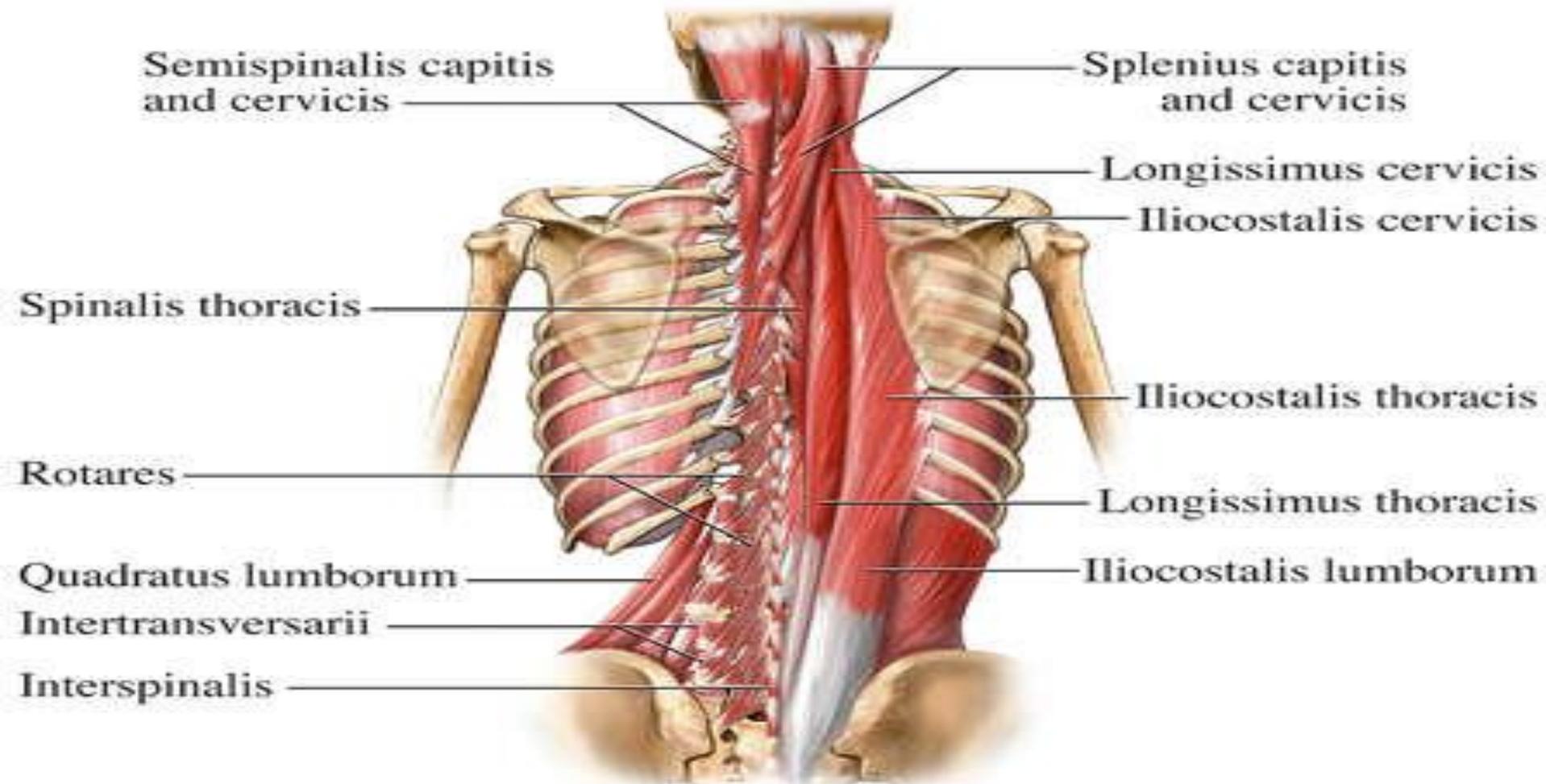
Spinal Anatomy: Ligaments



Spinal Anatomy: Intervertebral Disc

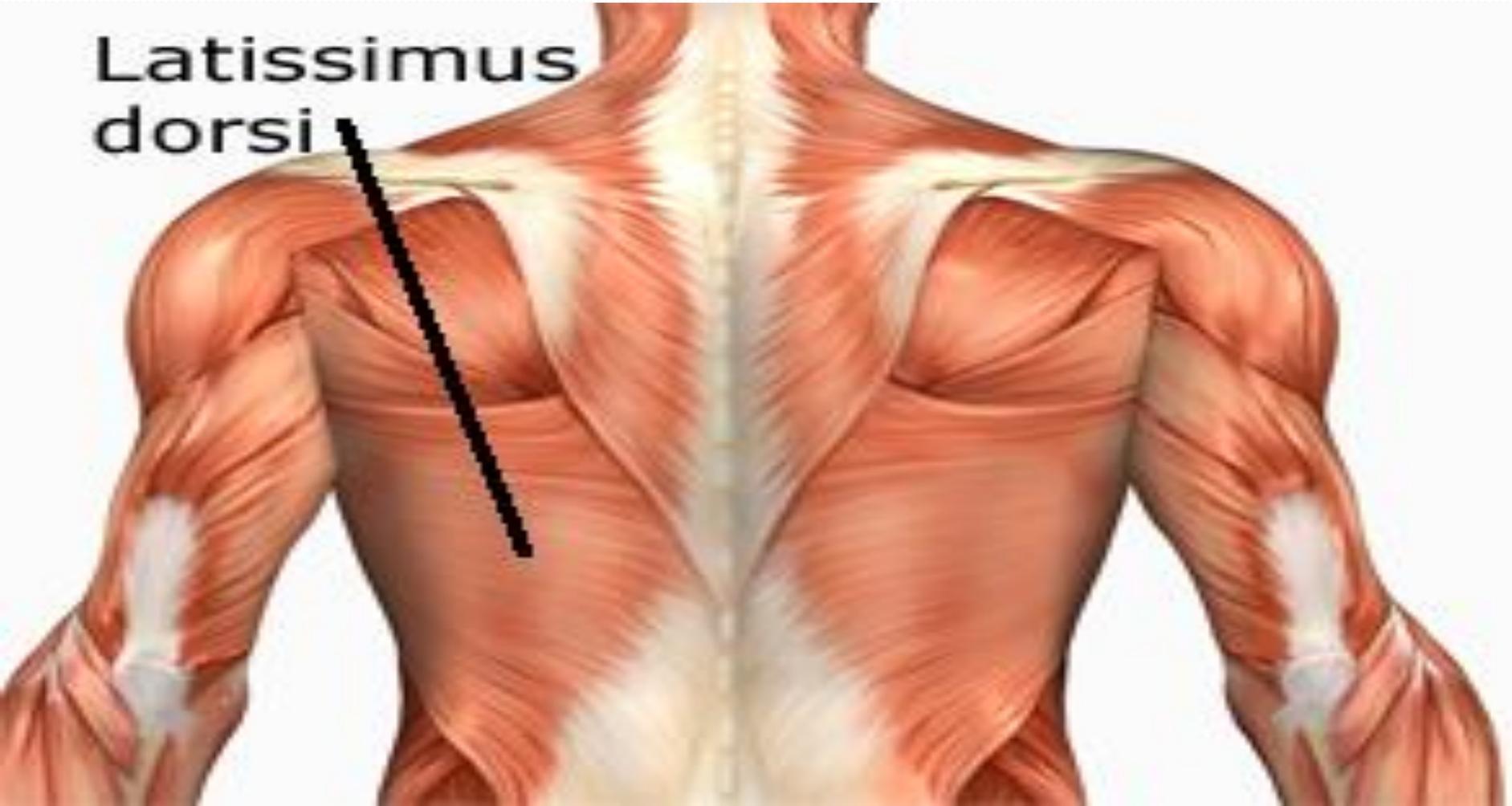


Posterior Musculature of the Spine

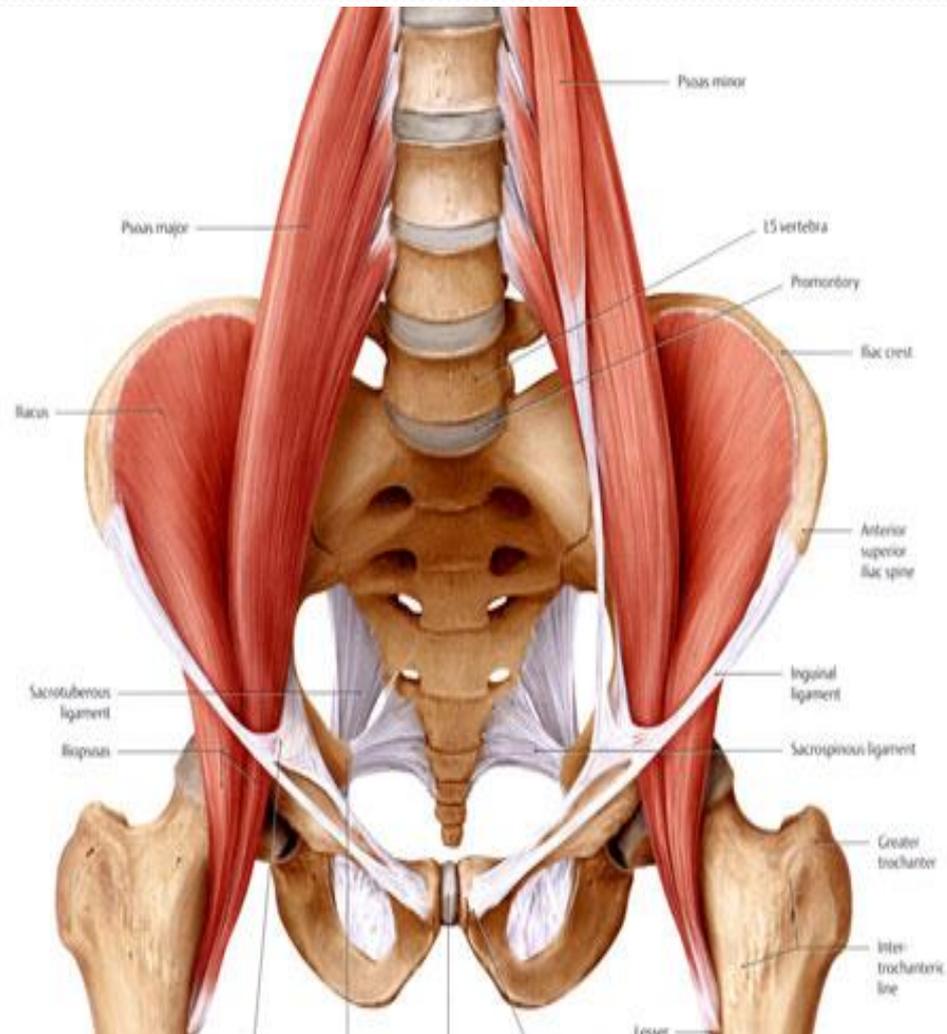


Posterior Musculature of the Spine

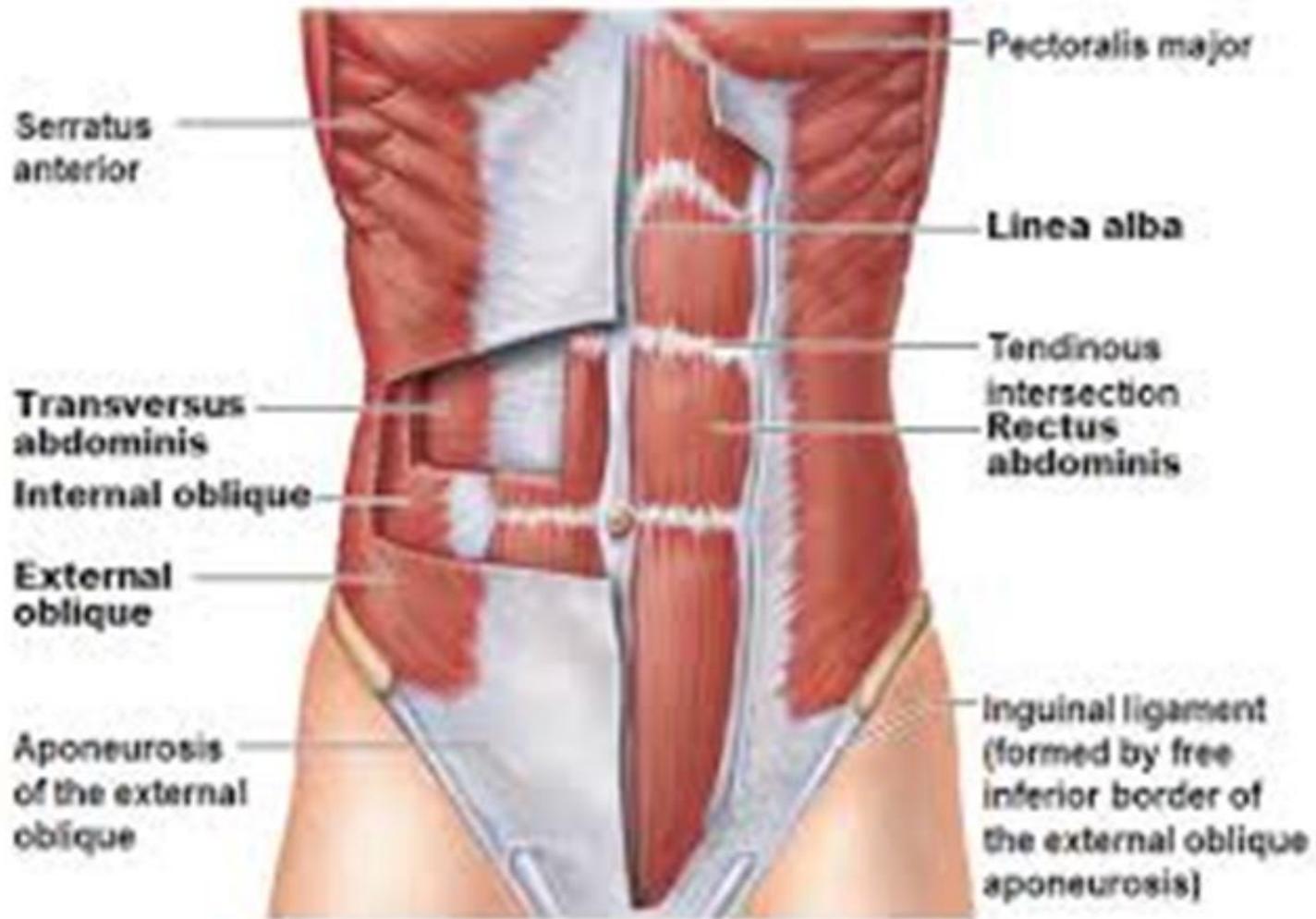
Latissimus
dorsi



Anterior Musculature of the Spine



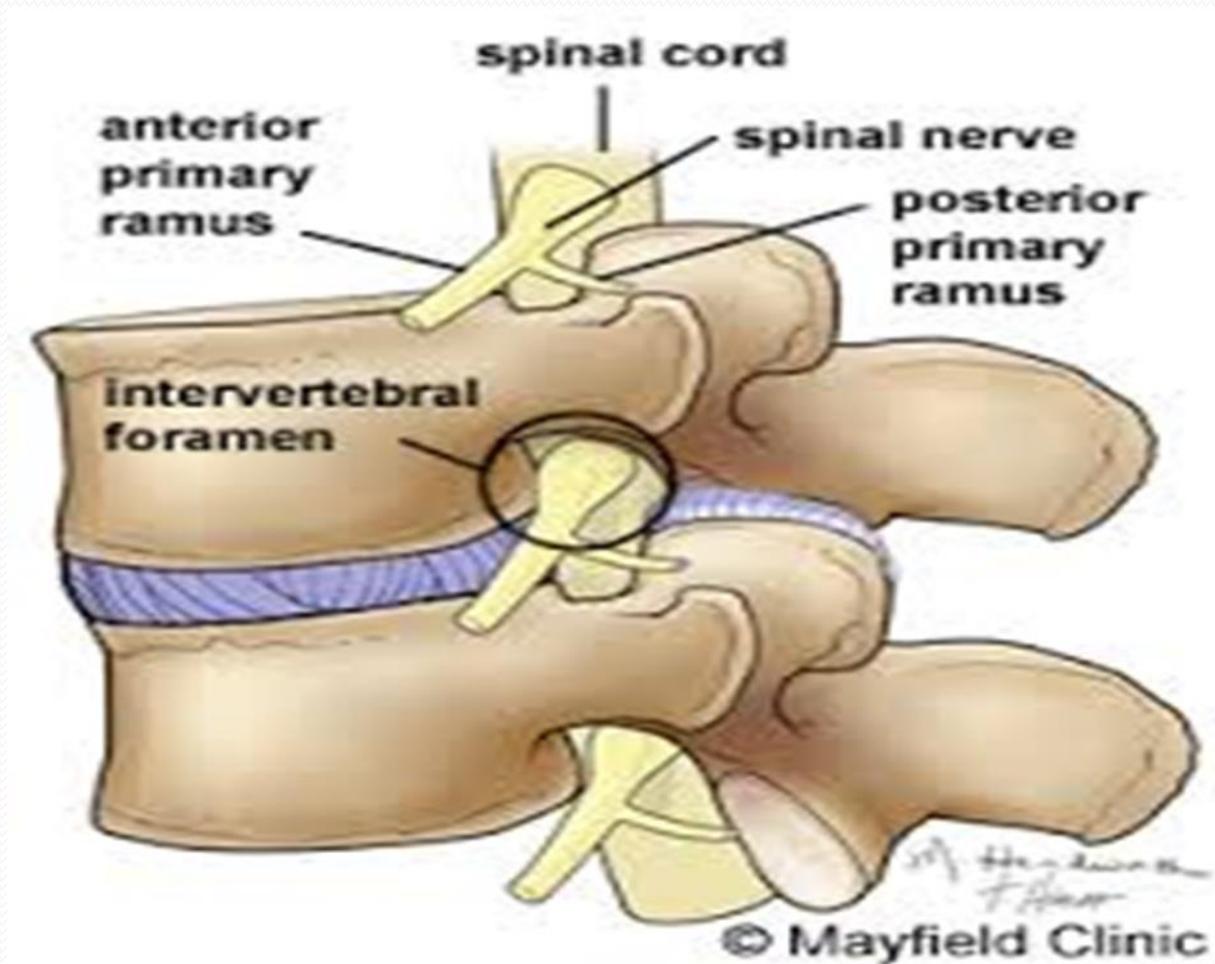
Anterior Musculature of the Spine



Pathologies: Spinal Stenosis

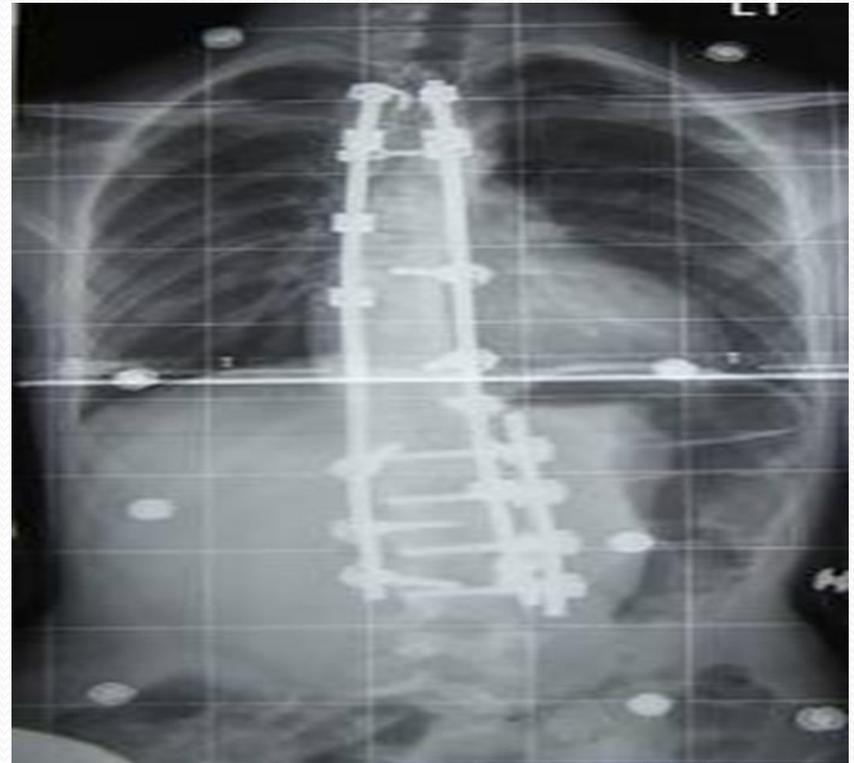
- **Stenosis**
 - **Diameter of intervertebral foramen is decreased**
 - **Management:**
 - *Relief with flexion*

Pathologies: Spinal Stenosis



Pathologies: Scoliosis

- **Scoliosis**
 - **Lateral curvature**



Pathologies: Spondylosis

- **Spondylosis**
 - Essentially OA of the spine



Pathologies: Spondylosis

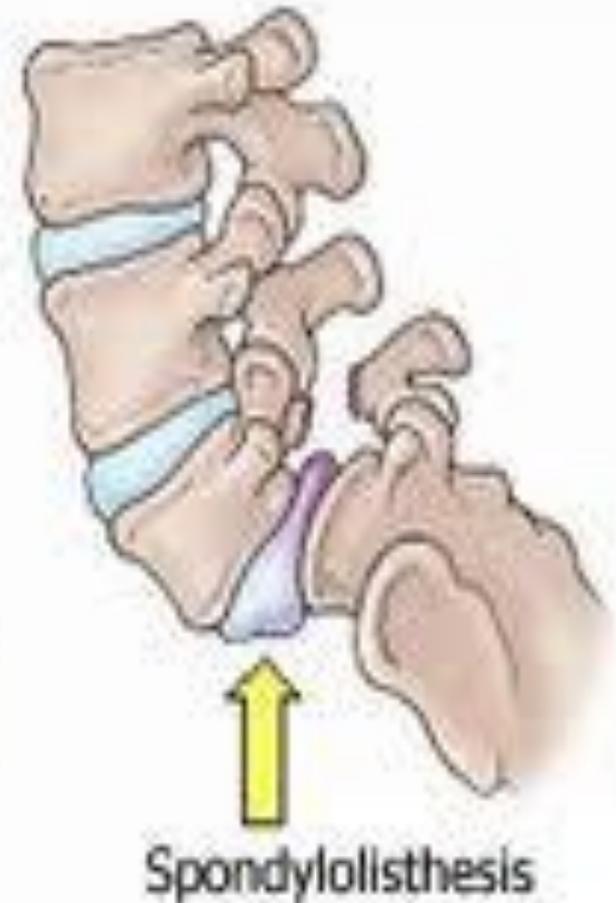


Figure 2. X-ray of the neck (side view) showing cervical spondylosis

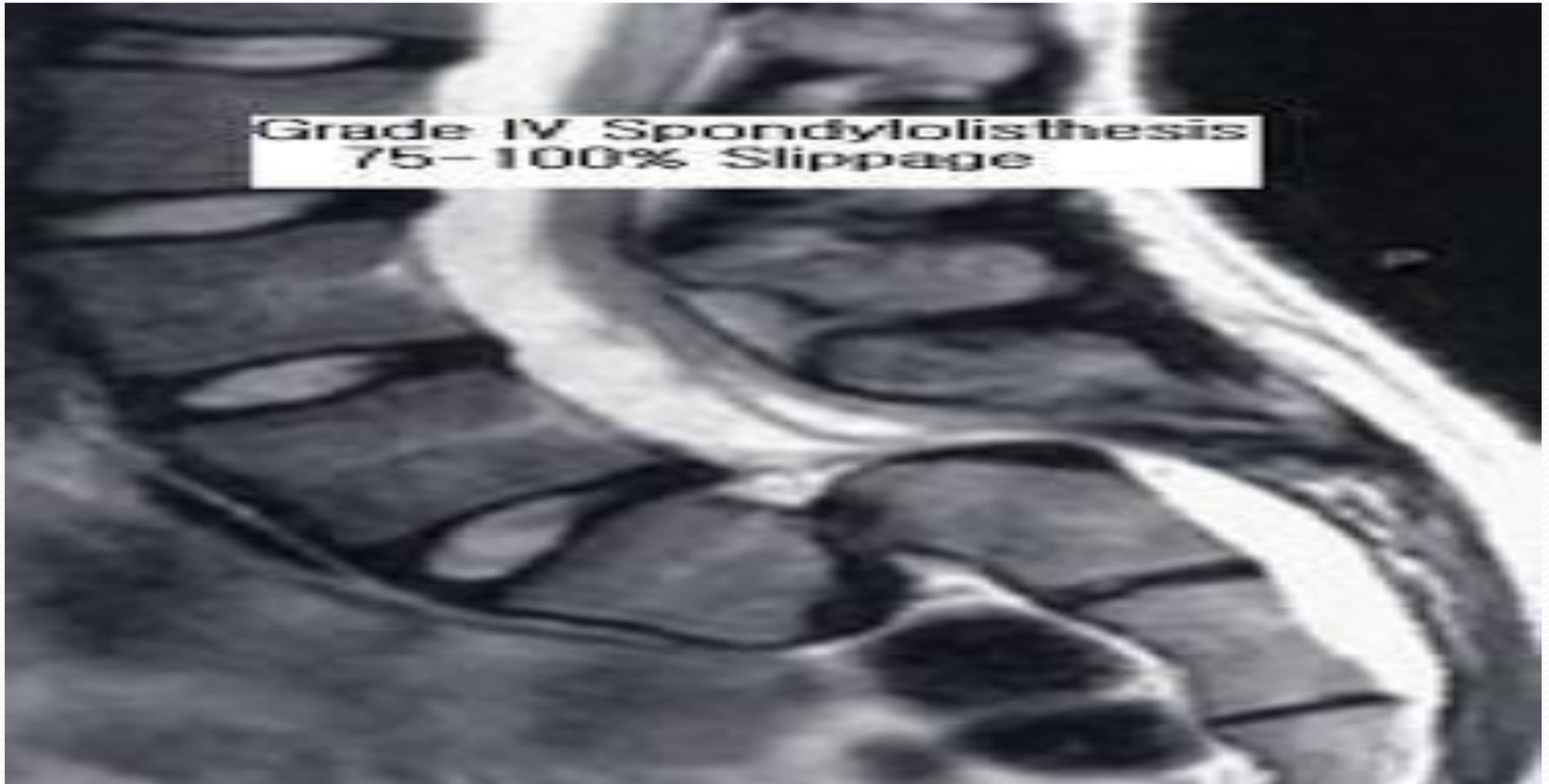
Pathologies: Spondylolysis and Spondylolisthesis

- **Congenital weakness in *pars interarticularis***
- **Associated with repeated spinal hyperextension**
 - *Gymnastics, dance, etc.*
- **Characterized by LBP**
- **Relief with flexion and modified activity**

Spondylolysis and Spondylolisthesis



Spondylolisthesis



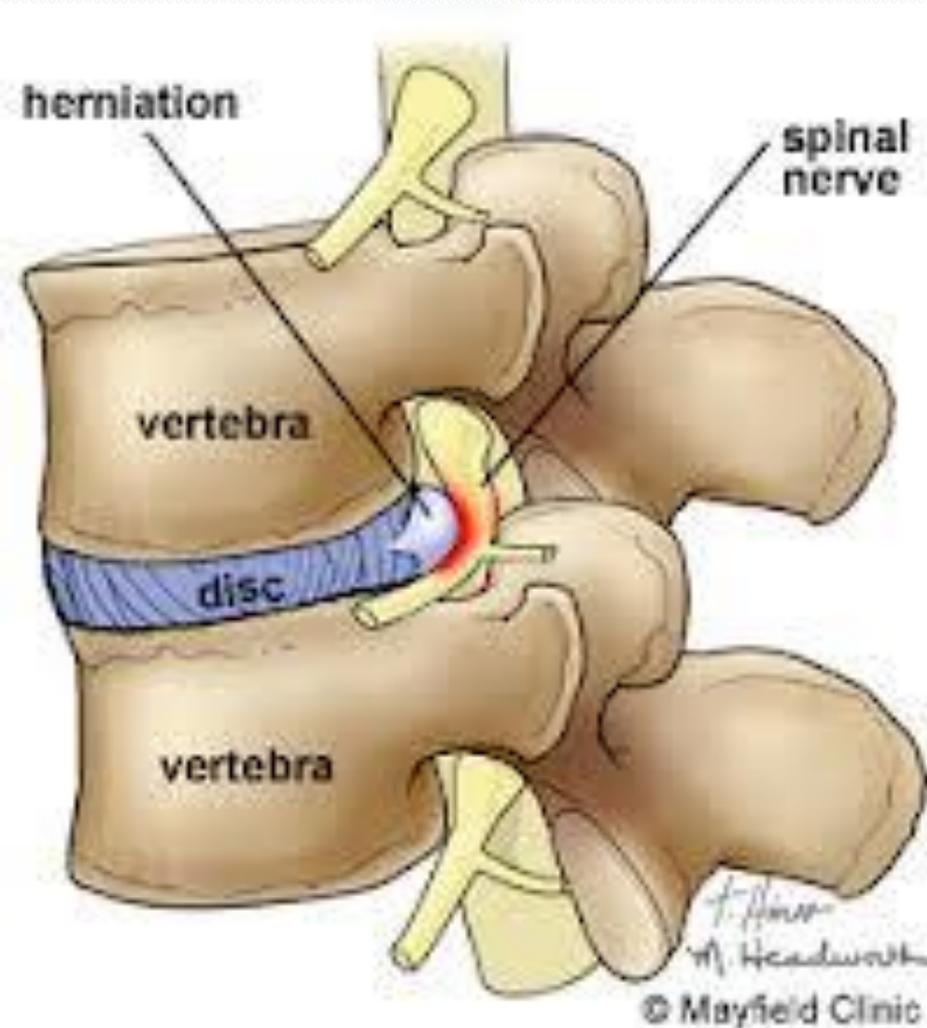
Treatment: Stenosis, Spondylosis, Spondylolysis/listhesis

- <https://www.youtube.com/watch?v=zYVGQwYfsKU>
- <https://www.youtube.com/watch?v=T1FrBPVCtgE>
- <https://www.youtube.com/watch?v=-9XwclhulSE>

Herniated Disc

- **Occurs with “fatigue failure” or traumatic rupture**
- **Difficult to heal**
- **Pain from increased pressure**
 - Disc can no longer withstand compressive forces as well

Herniated Disc



Treatment: Herniated Disc

- **Controlled rest**
- **Educate on positions to avoid/lifting mechanics**
 - *Flexion and rotation!*
- **Stability in area of herniation, mobility above and below!**
- **Postural re-education**
- **Goal is to have progressive centralization of symptoms!**

Treatment: Herniated Disc

- <https://www.youtube.com/watch?v=clfpWjqVP6U>

Core Training Options for Back Pain

- <https://www.youtube.com/watch?v=zEvy5CCvNLA>

Remember!

- If any exercise or activity that you are doing increases your back pain or related symptoms, ***STOP!***



Questions?

