THE TRUNK and SPINAL COLUMN

Chapter 12

Bones of the Spinal Column

33 bones, 24 are flexible

A. Cervical - 7

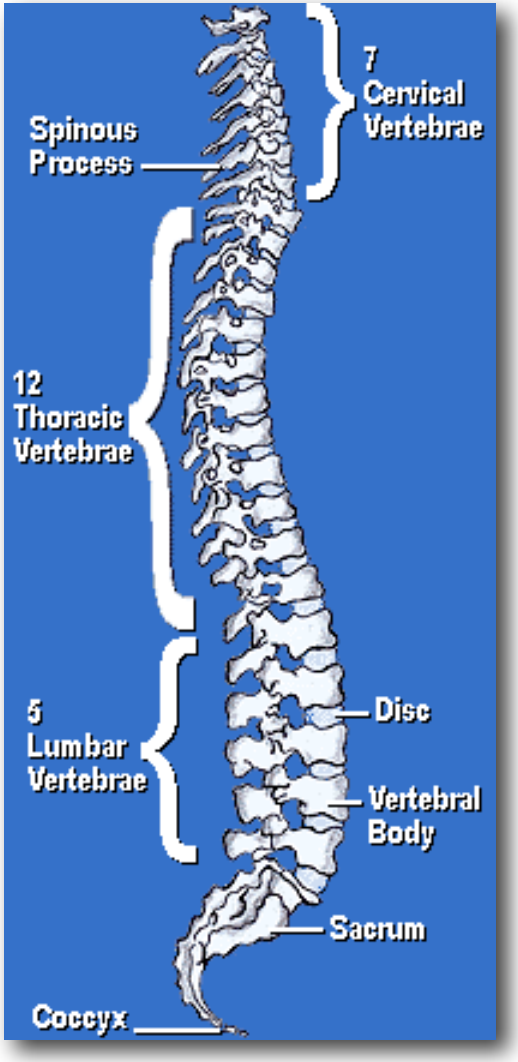
B. Thoracic - 12

C. Lumbar - 5

D. Sacrum - 5 (false vertebrae - fused together)

E. Coccyx - 4 (false vertebrae - fused together)

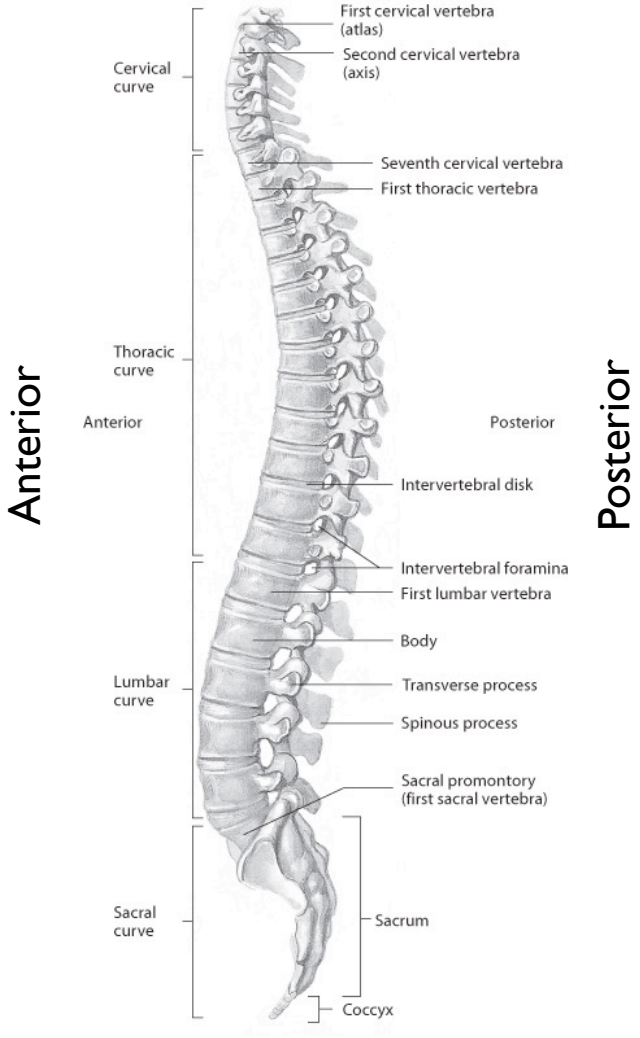
- LINK



Click on picture

Curves of the Spine

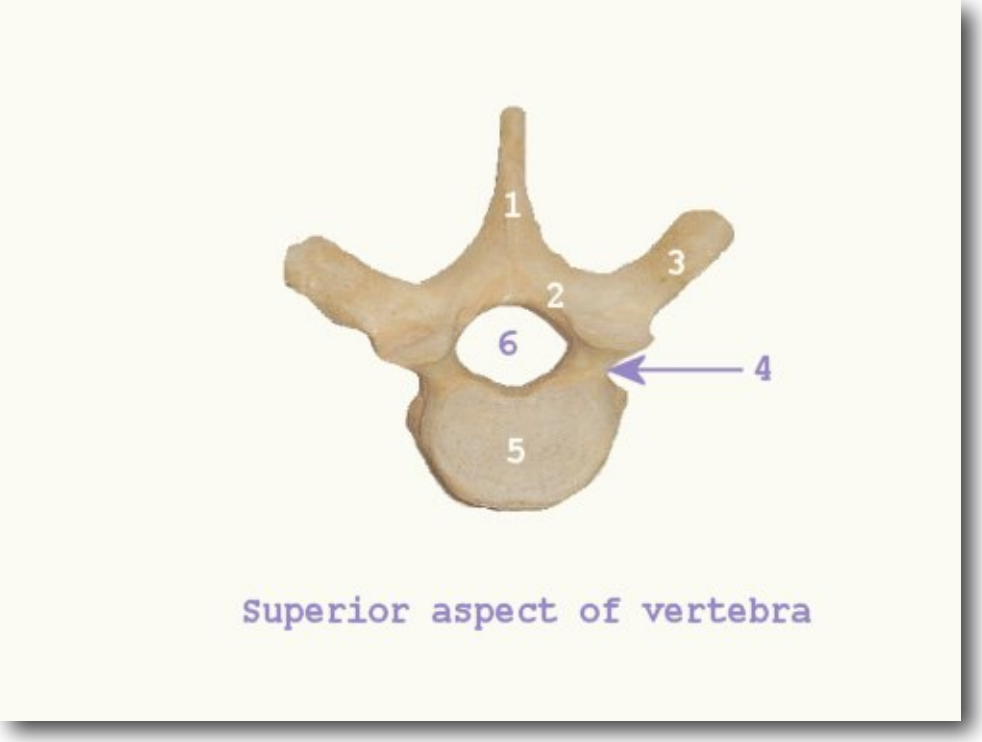
- Cervical - concave posteriorly
- Thorasic - concave anteriorly
- Lumbar - concave posteriorly



Markings of the Vertebrae

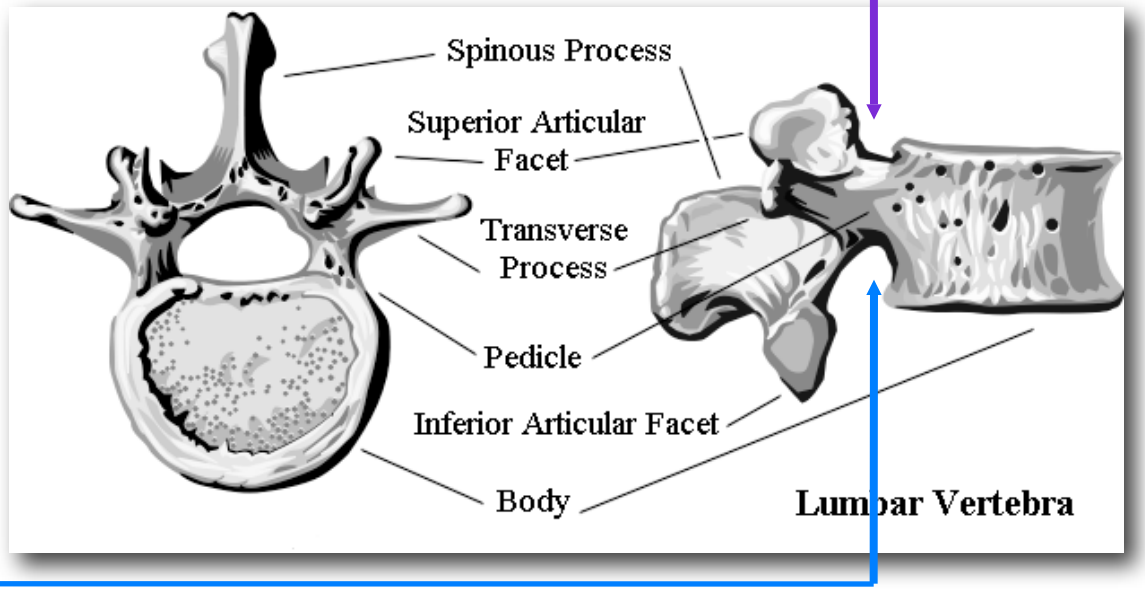
General Markings

1. **Spinous process**
3. **Transverse process** - tubercle of rib articulates
5. **Body**
6. **Vertebral foramen**

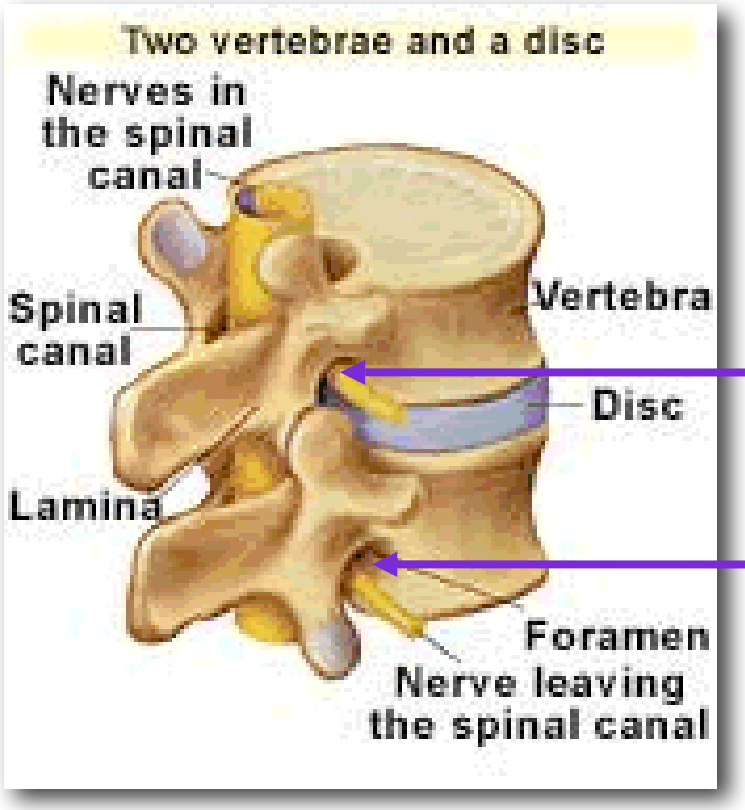


General Markings

- Vertebral notch
  - Superior
  - Inferior



General Markings

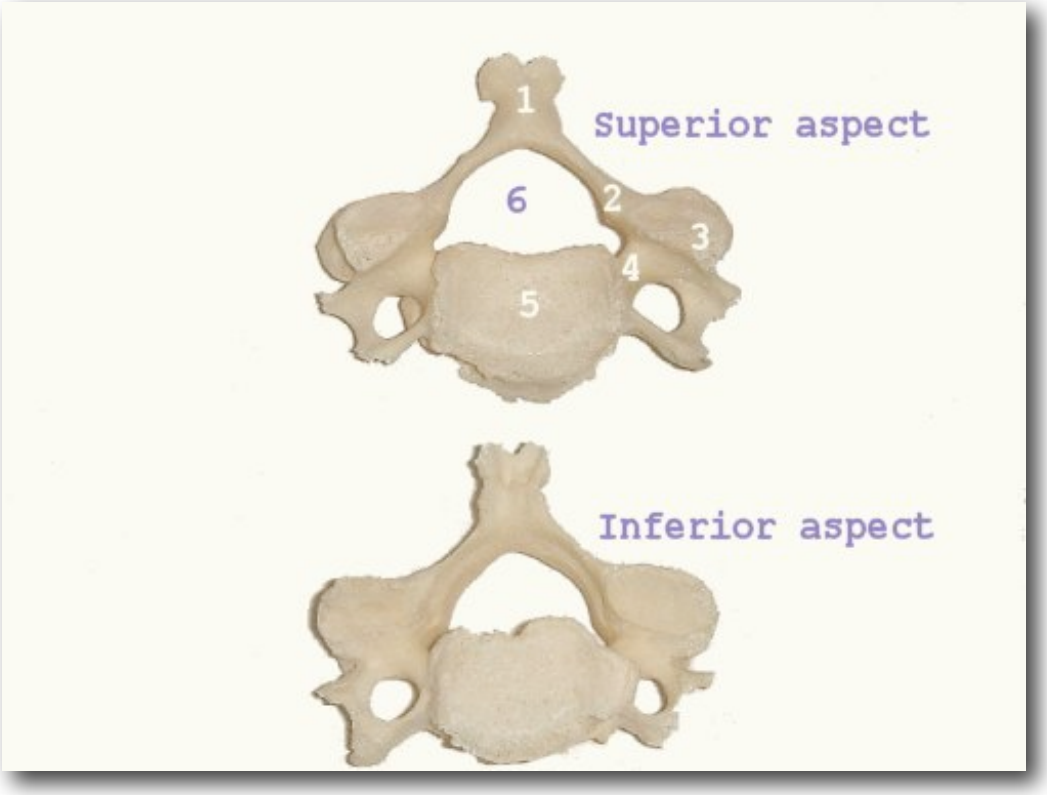


- **Intervertebral foramen**

Cervical Vertebrae

Cervical Vertebrae

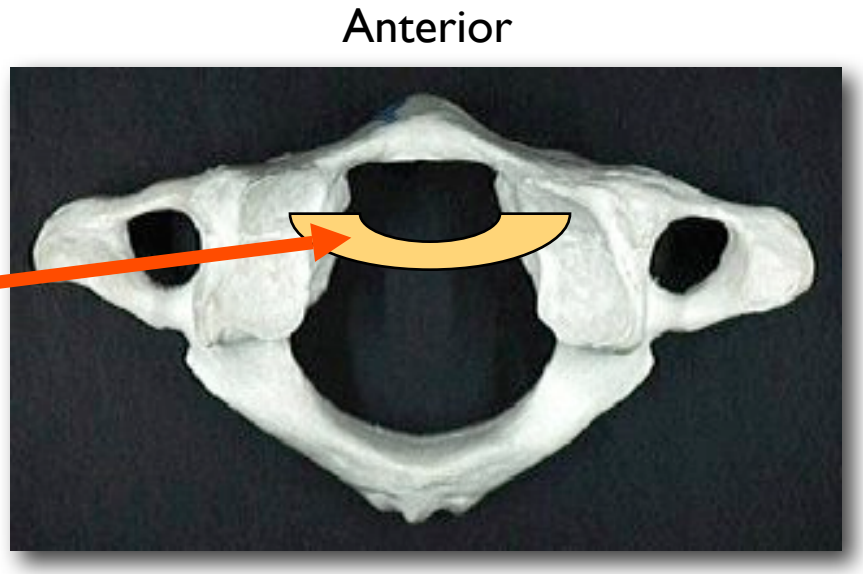
- First 7 vertebrae
- Identified as C1 – C7
- C1 = Atlas
- C2 = Axis
- C7 is the large protrusion at the posterior base of the neck



Atlas (C1)

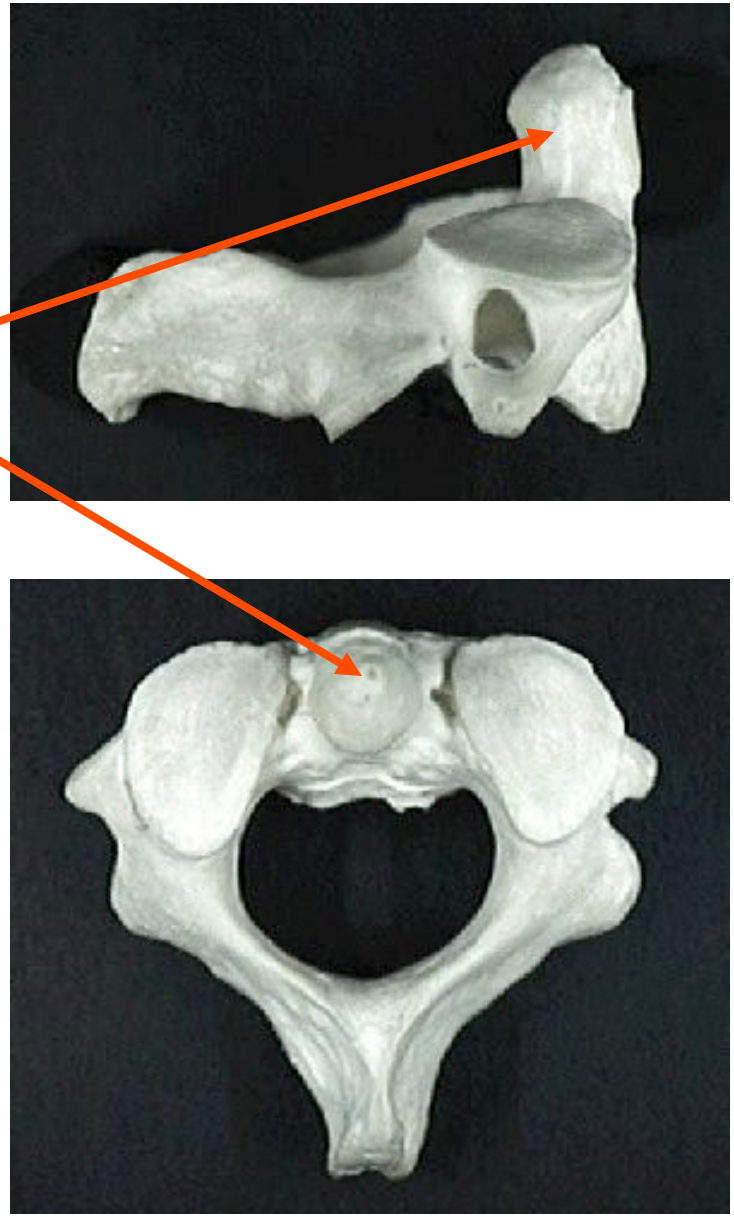
Large vertebral foramen

Transverse ligament

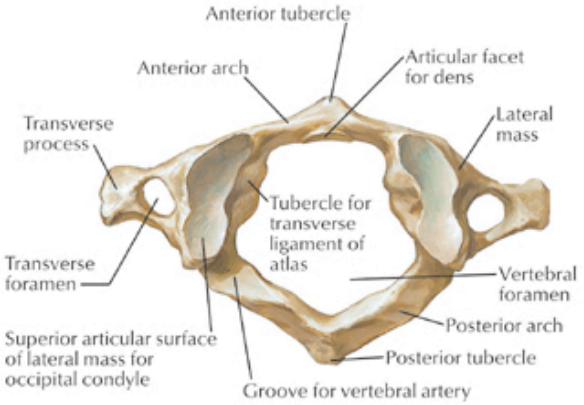


Axis (C2)

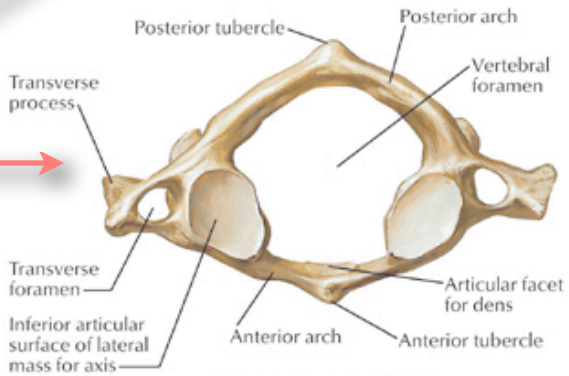
Dens or odontoid process



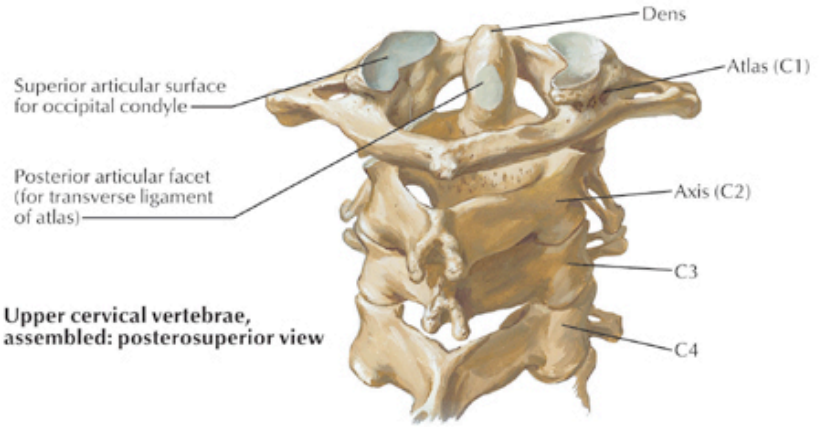
Atlas



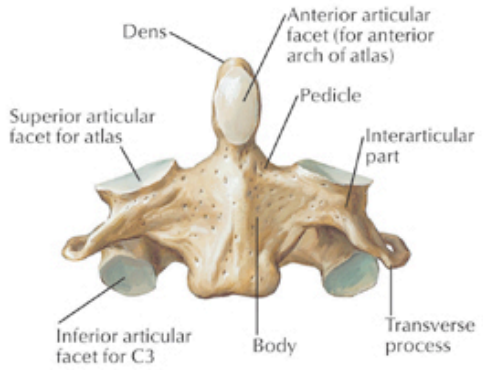
Atlas (C1): superior view



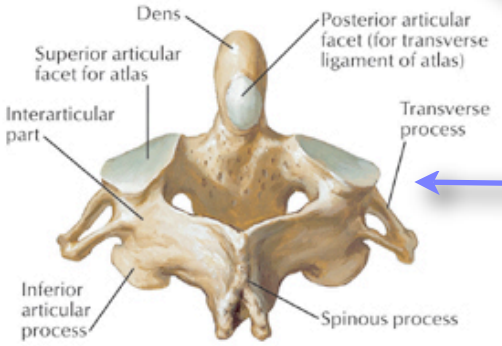
Atlas (C1): inferior view



Upper cervical vertebrae, assembled: posterosuperior view

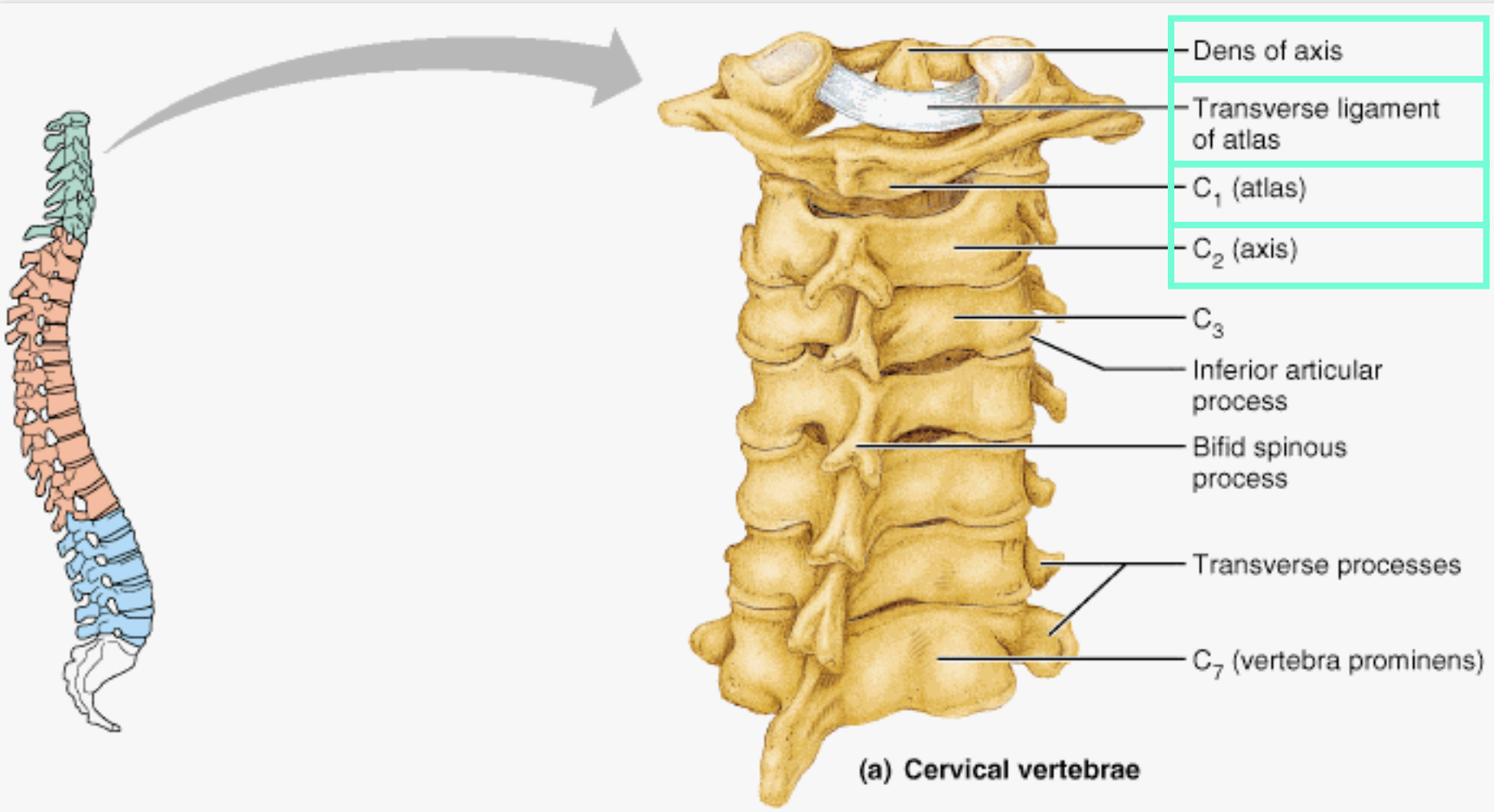


Axis (C2): anterior view



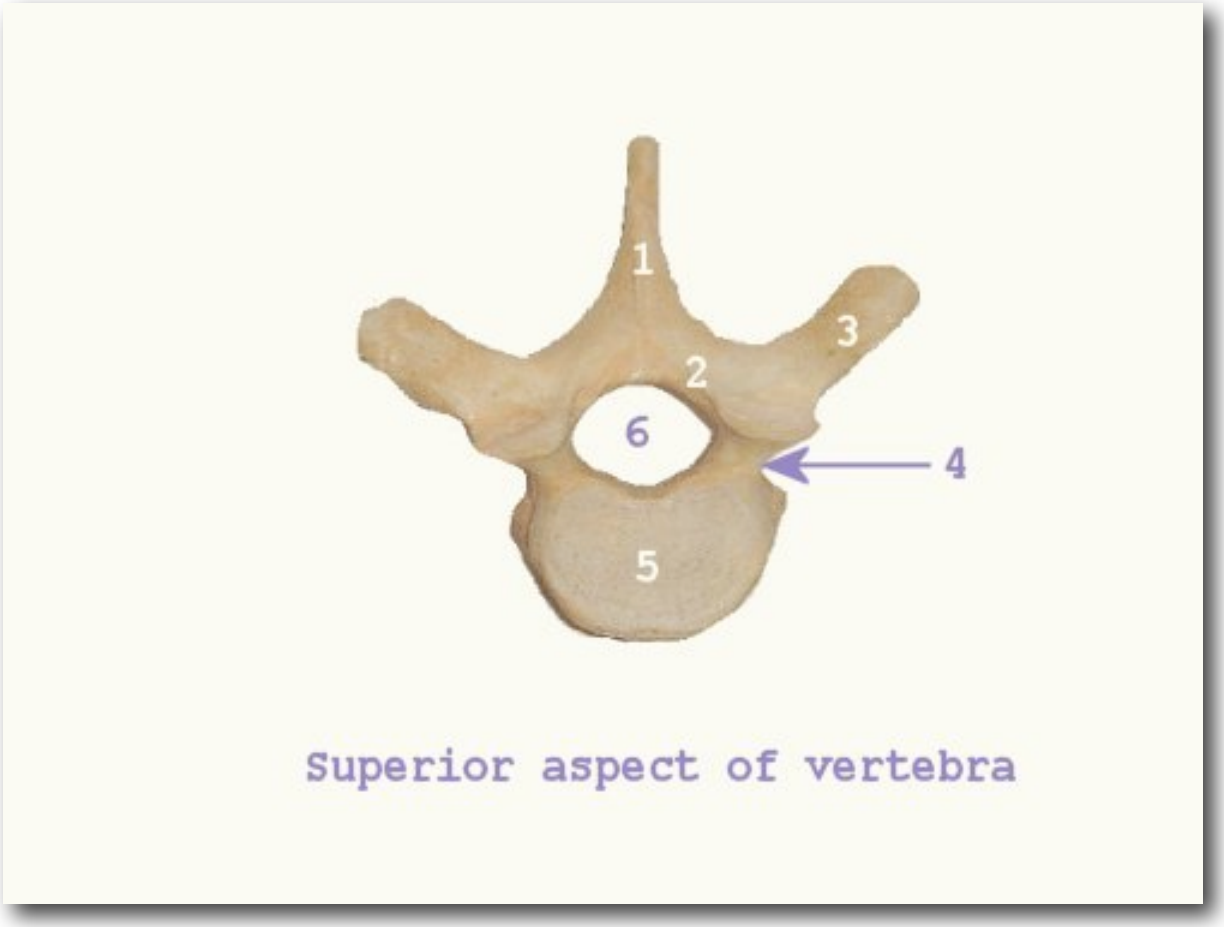
Axis (C2): posterosuperior view

Axis



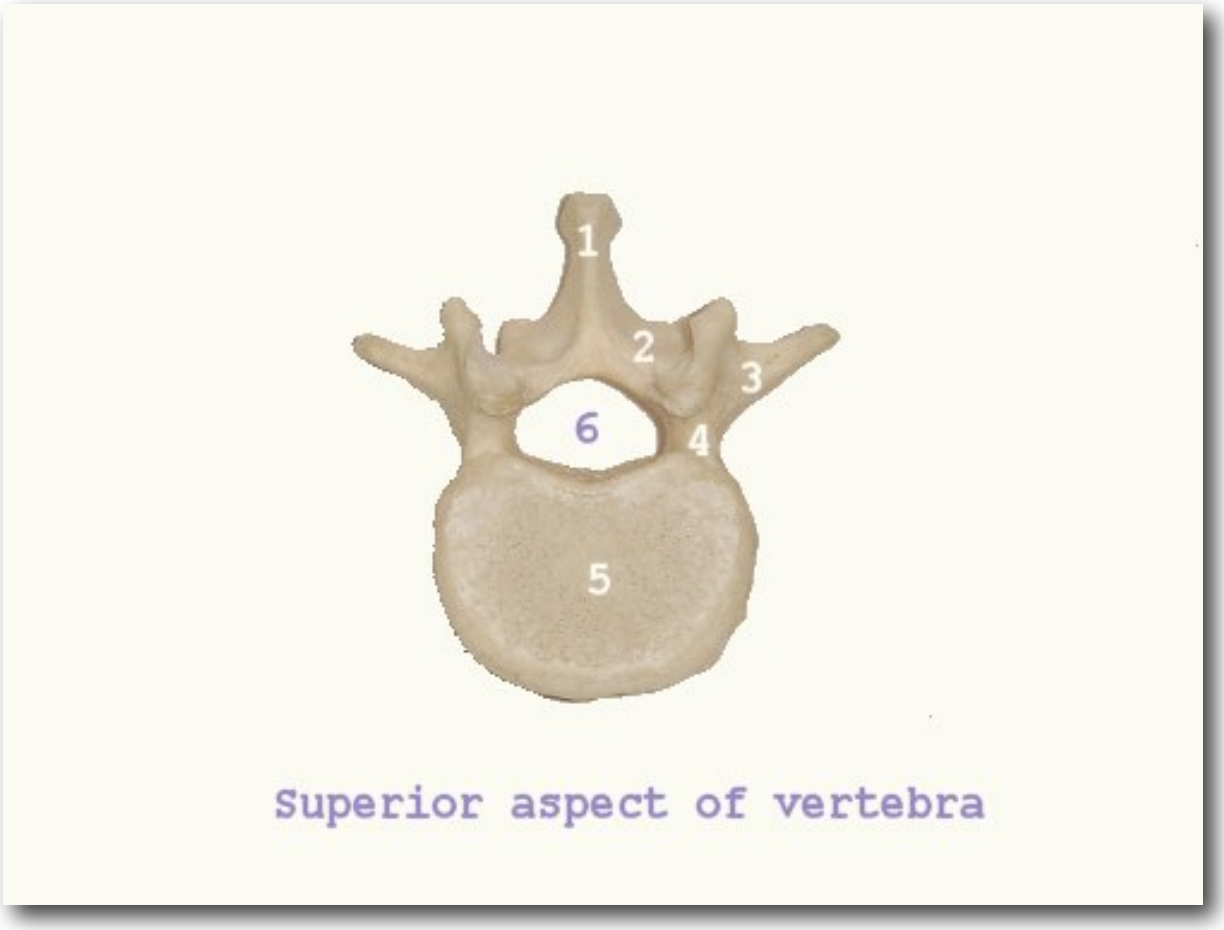
(a) Cervical vertebrae

Thoracic (T1-T12)



Thoracic (T1-T12)

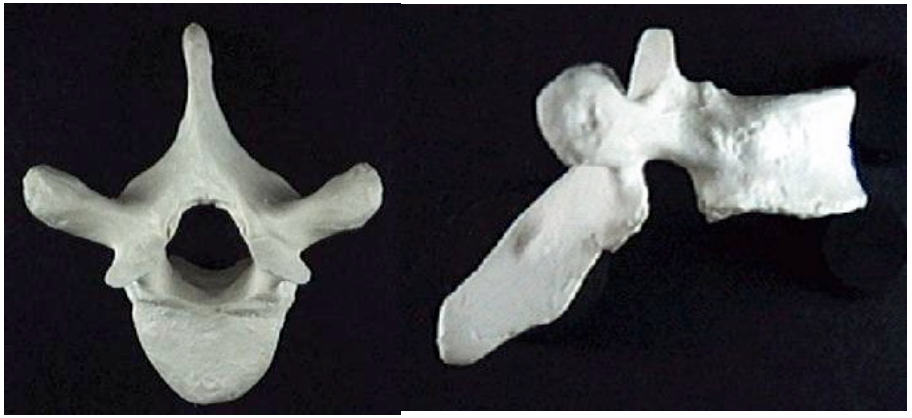
Lumbar (L1-L5)

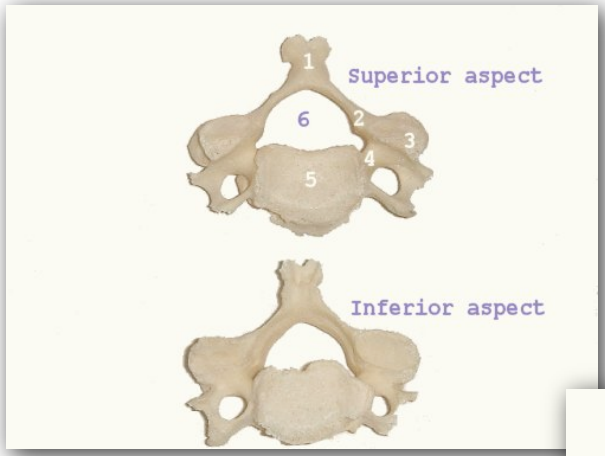


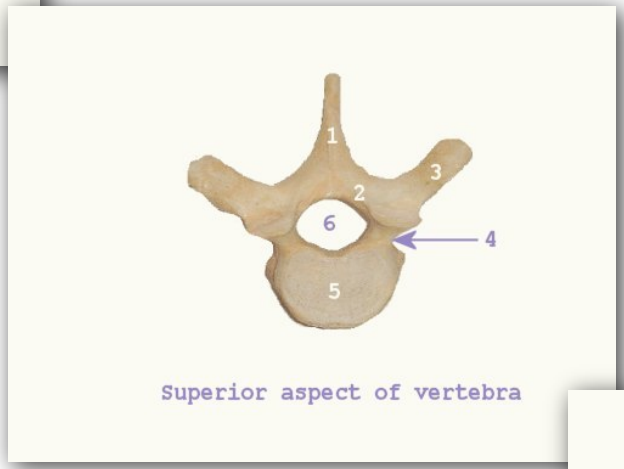
Lumbar (L1-L5)

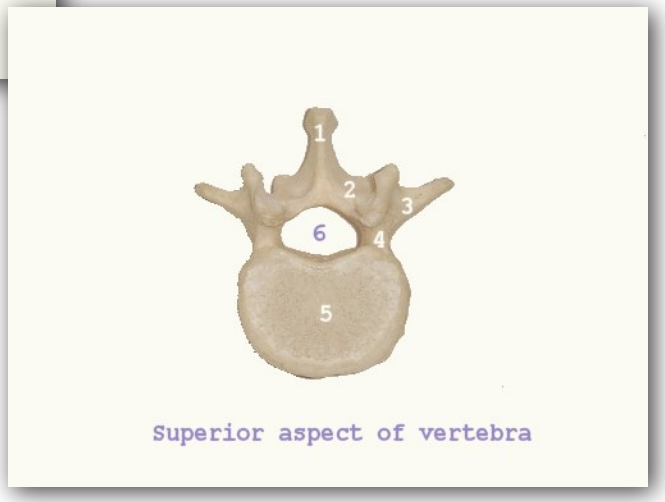
Note the differences:

1. Transverse process
2. Spinous process
3. Body







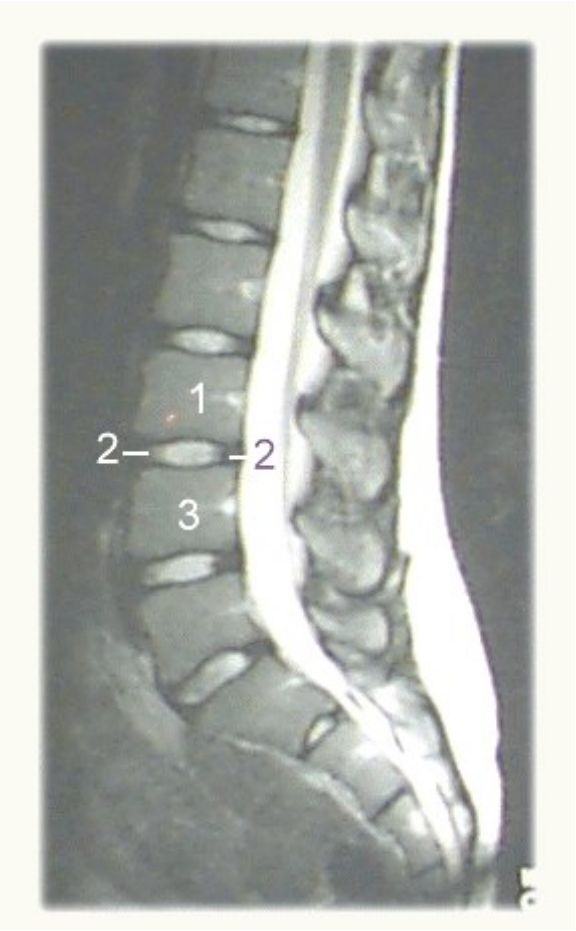


Note the differences:

1. Transverse process
2. Spinous process
3. Body

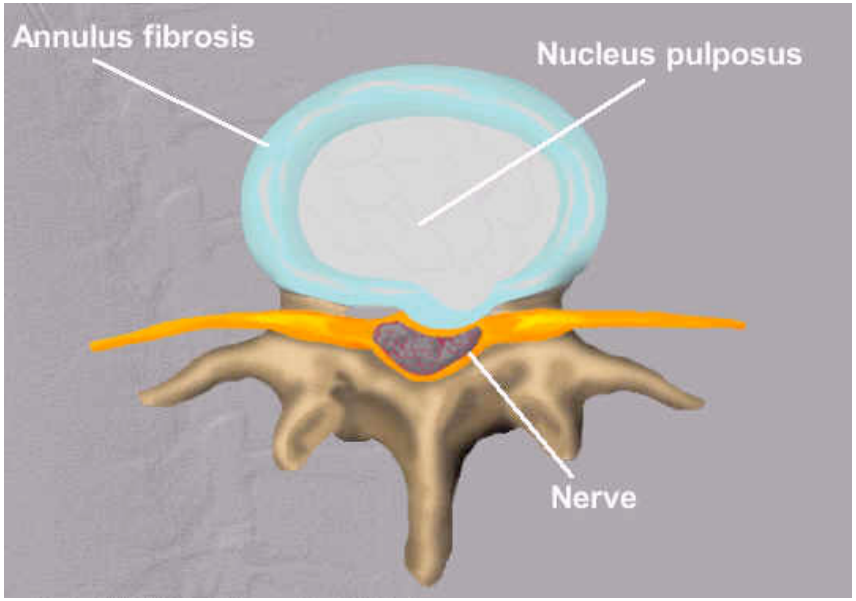
Sacrum

Intervertebral Disks



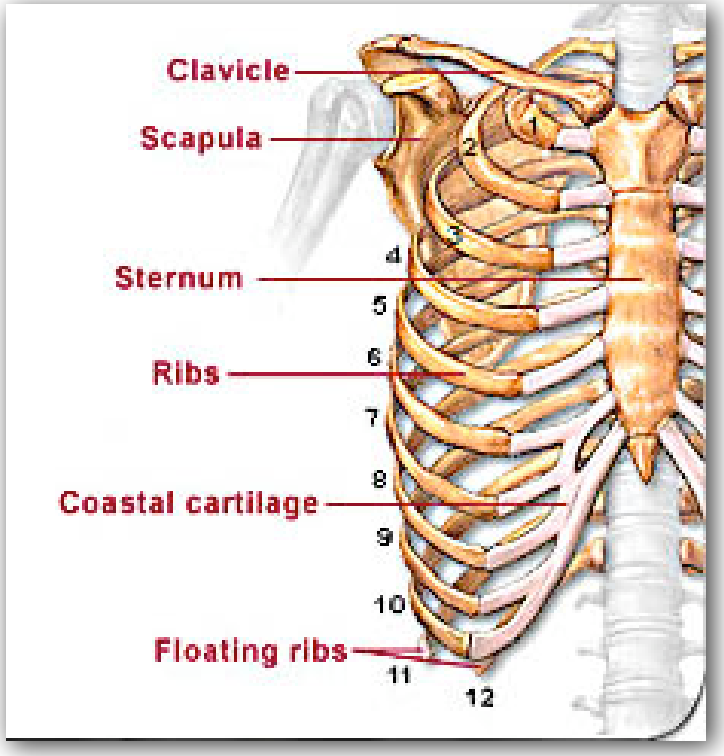
Intervertebral Disks

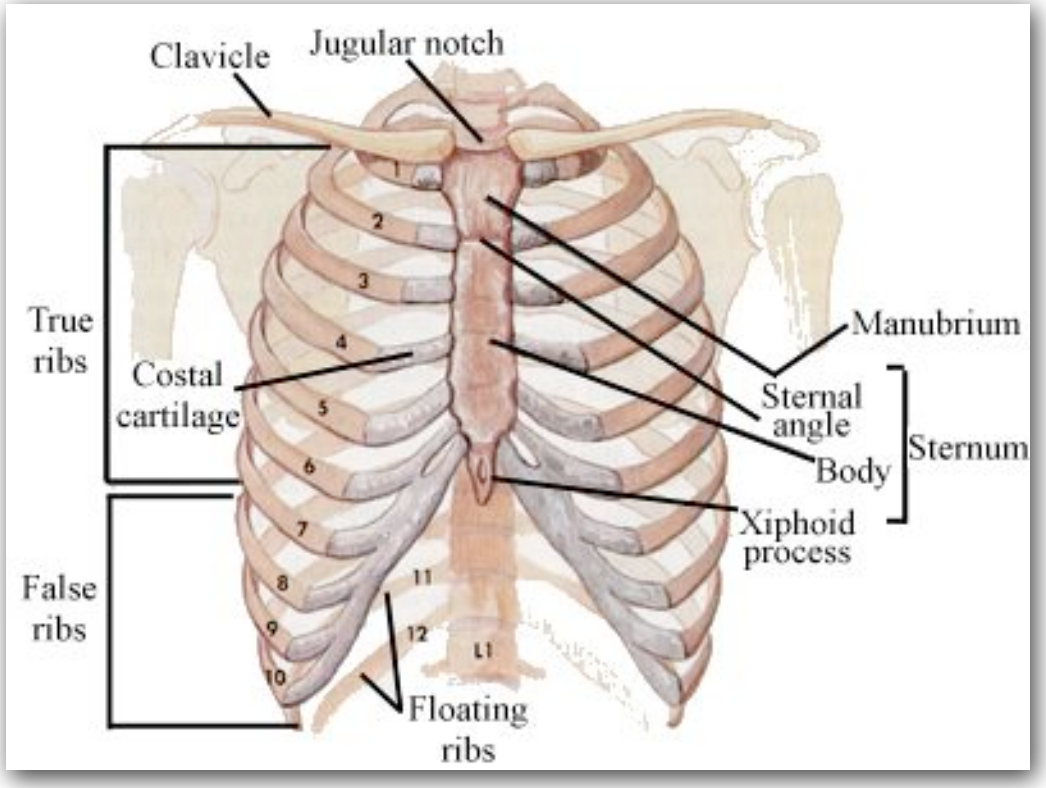
Annulus fibrosus - fibrous, outer portion
Nucleus pulposus -soft, inner portion



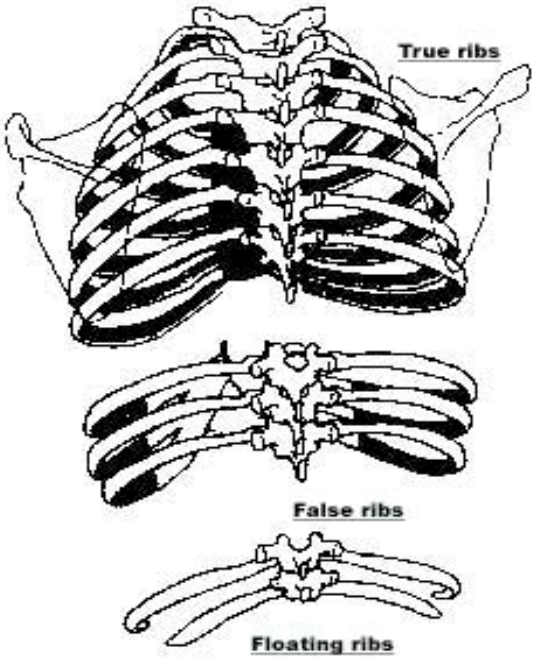
Thorax Bones

- 12 ribs and the sternum



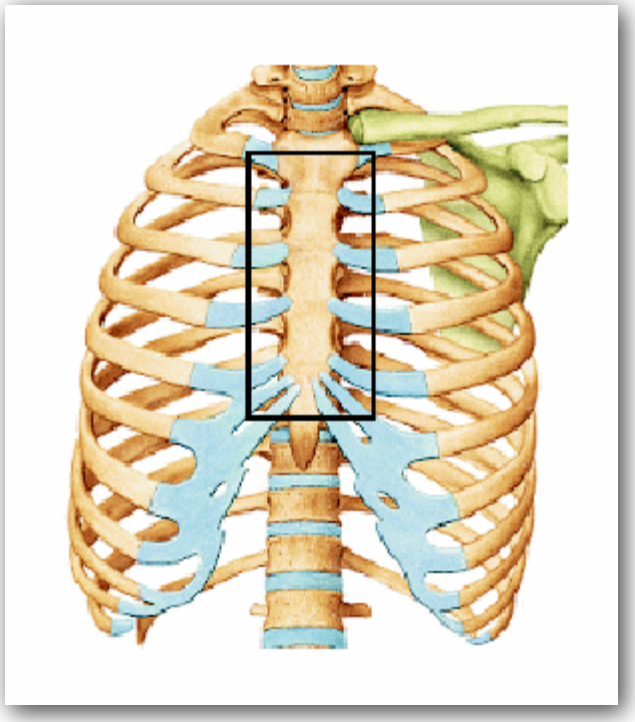


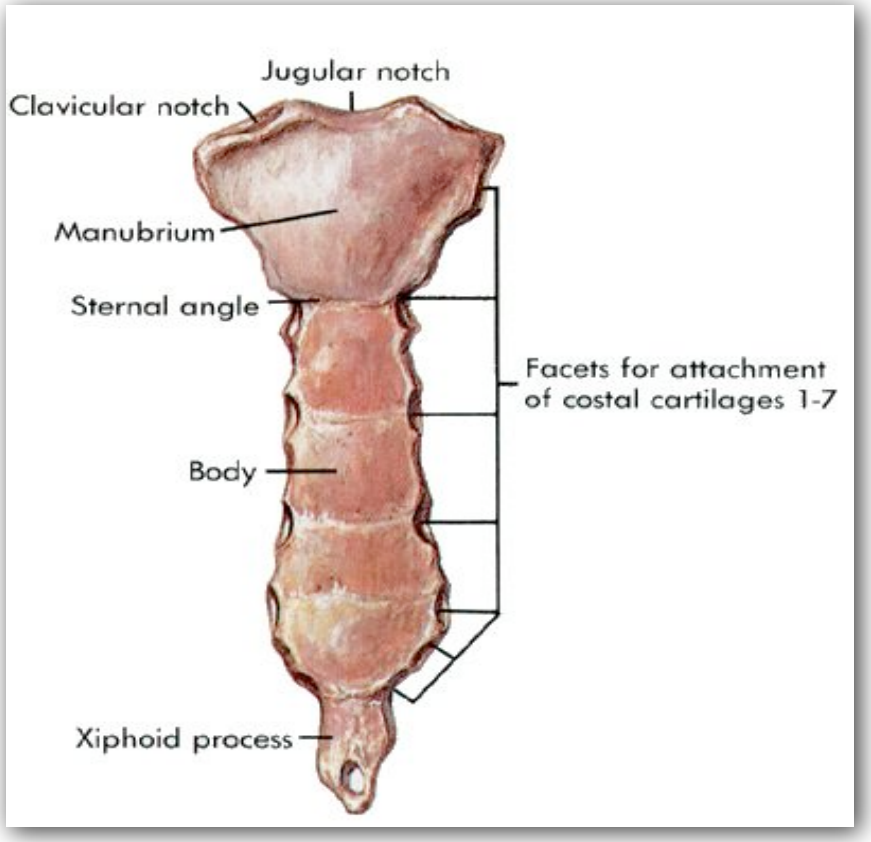
Ribs



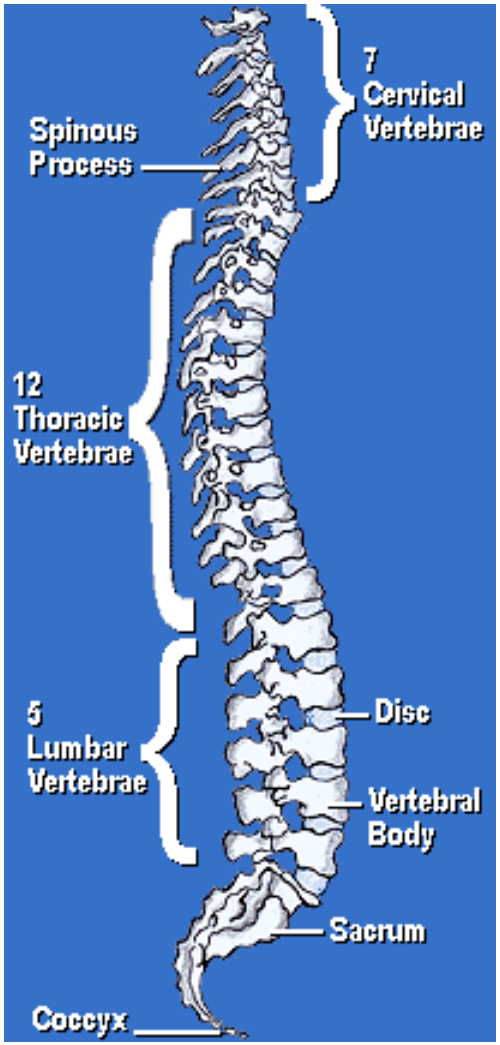
- 12 pairs
- 7 pair are 'true' ribs
- 5 pair are 'false' ribs
  - 3 pair attach indirectly to the sternum
  - 2 pair are 'floating ribs' that don't attach to the sternum
- All ribs attach posteriorly to thoracic vertebra

Sternum



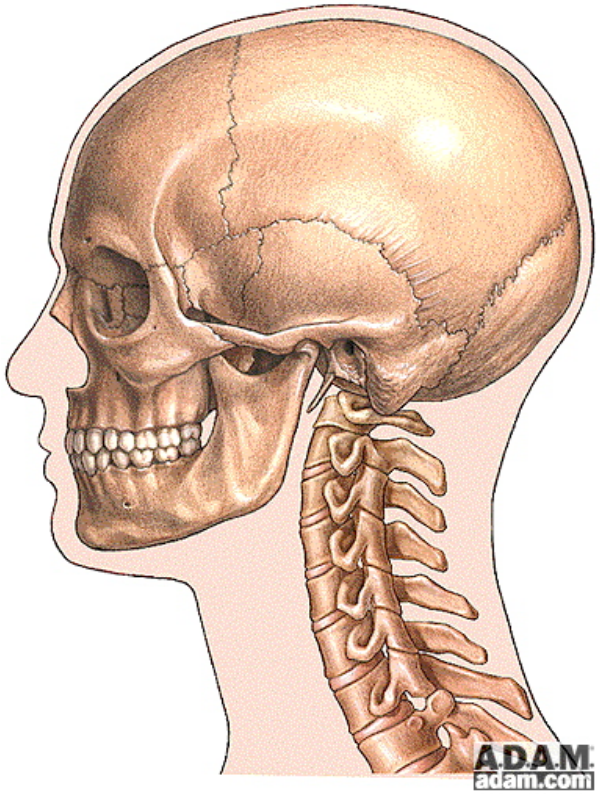

Jugular notch
Clavicular notch
Manubrium
Sternal angle
Facets for attachment of costal cartilages 1-7
Body
Xiphoid process

Joints of the Spinal Column



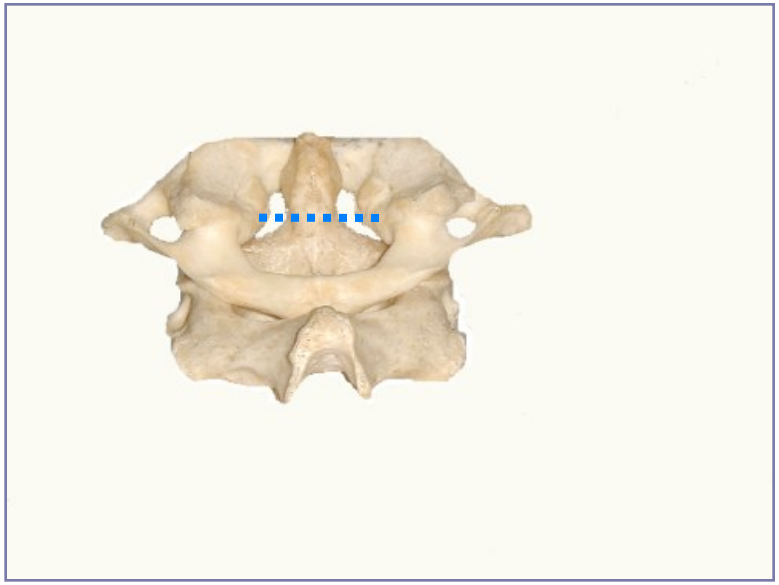
Atlantooccipital Joint

- Articulation between the head and neck
  - i. Atlas (C1)
  - ii. Occipital bone
- Acts as a <u>hinge joint;</u> **flexion** and **extension**
- No rotation at this joint



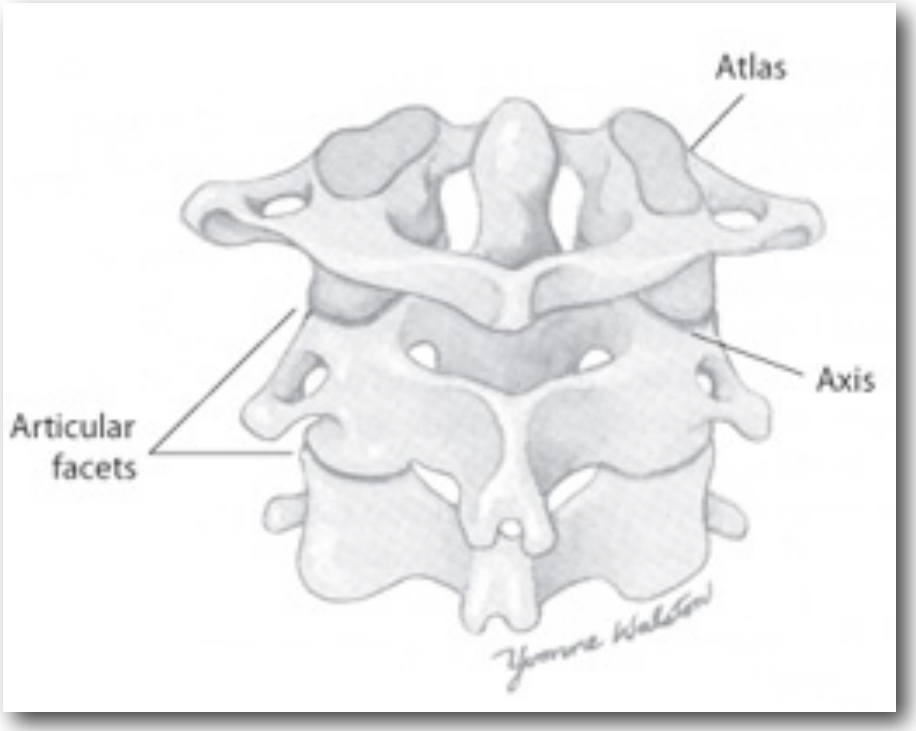
Atlantoaxial Joint

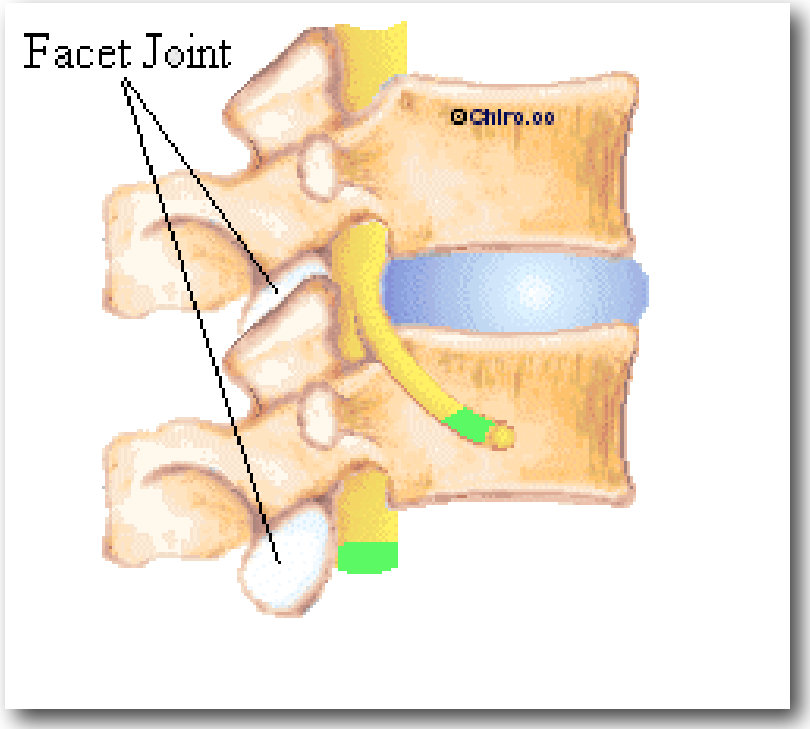
- Articulation between C1 and C2
- a. pivot joint - **Rotation**
- b. the dens or ondontoid process fits into the inner, anterior portion of the vertebral foramen
- with the help of the transverse ligament.



Facet Joints

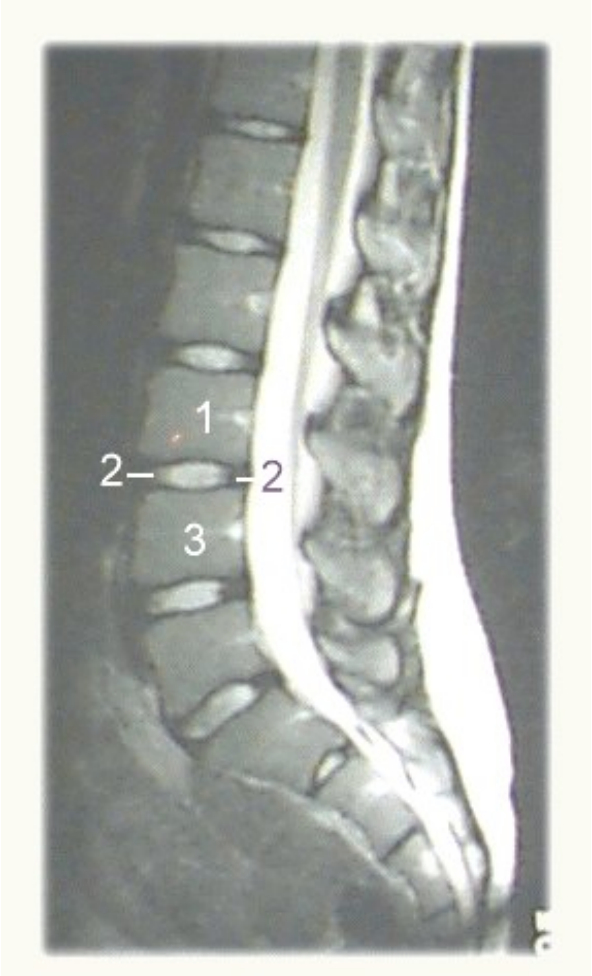
Synovial joint between two vertebrae





Inververtebral Disks

- Intervertebral disks attached to cell bodies
- Allow limited motion in all three planes

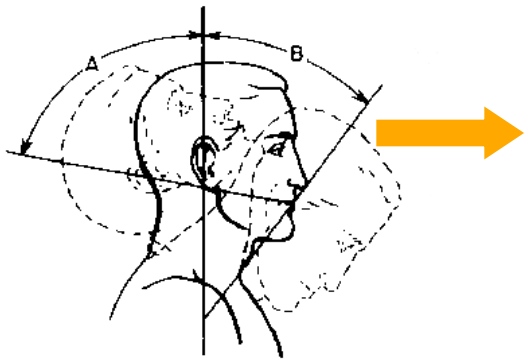


Actions of the Spinal Column

- Flexion (neck or trunk)
- Extension
- Lateral Flexion
- Rotation
  - Same side
  - Opposite side

Flexion

Cervical flexion

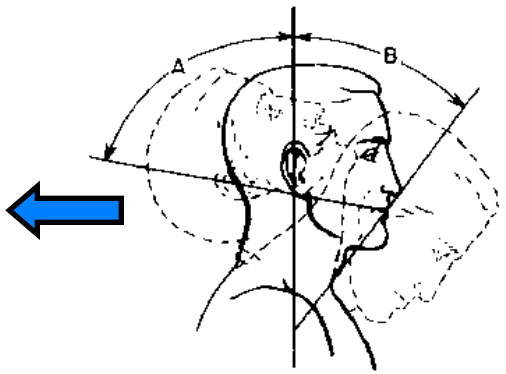


NECK FLEXION, DORSAL (A), VENTRAL (B)

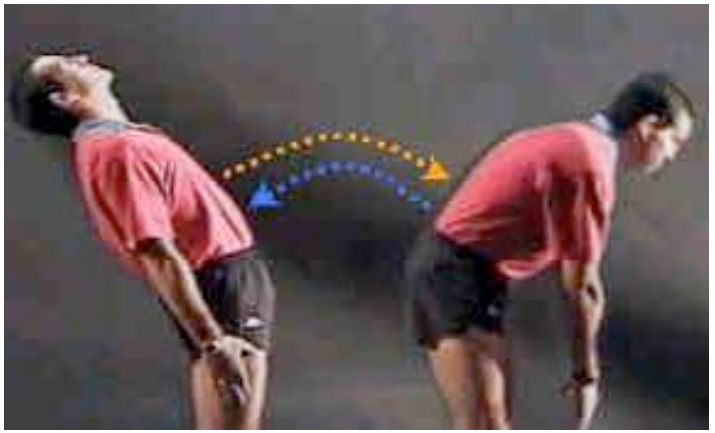
Lumbar flexion

Extension

Cervical extension



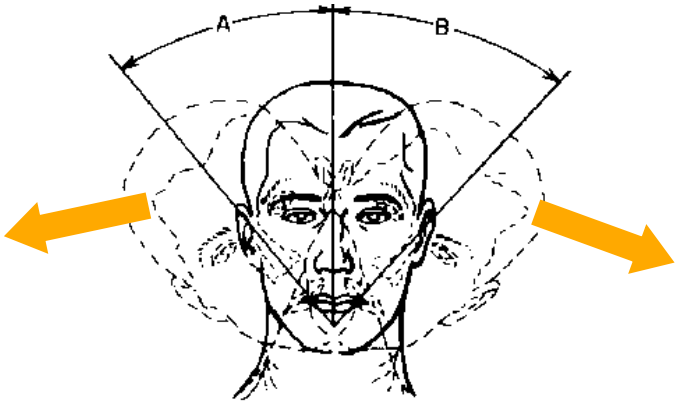
NECK FLEXION, DORSAL (A), VENTRAL (B)



Lumbar extension

Lateral flexion

Cervical lateral flexion



NECK FLEXION, RIGHT (A), LEFT (B)

Lumbar lateral flexion

Rotation

Cervical rotation

Lumbar rotation

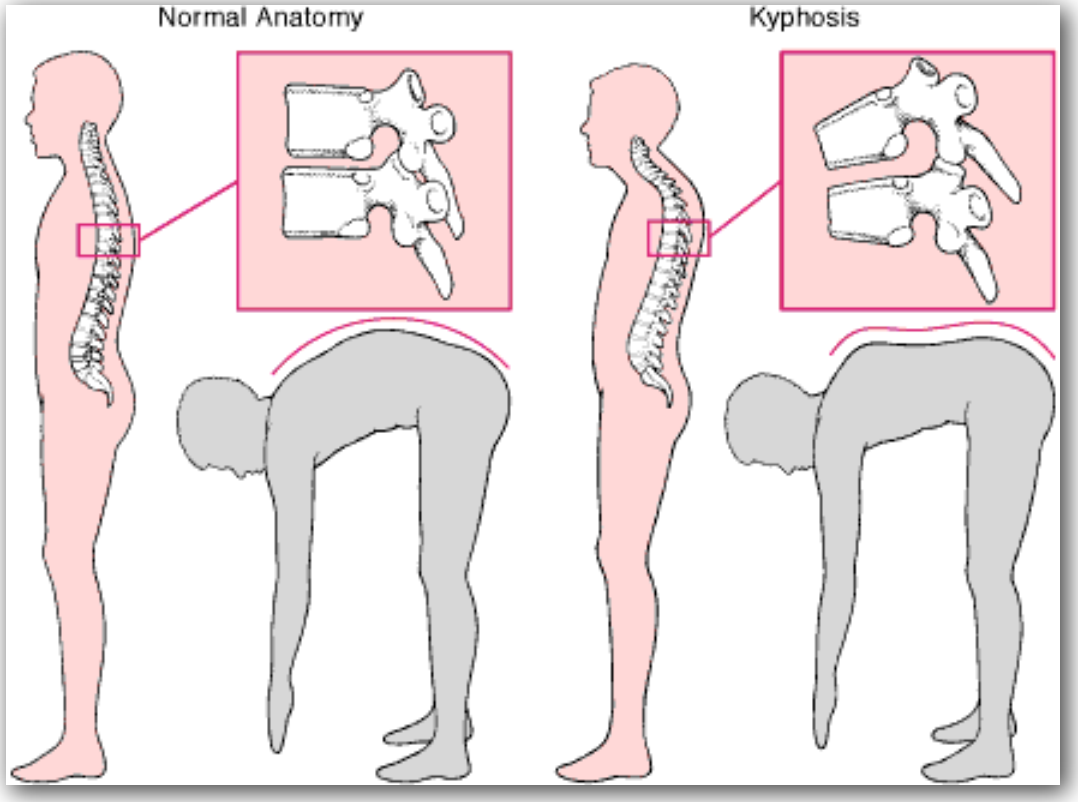
Defects of the Spine

Kyphosis

Lordosis

Scoliosis

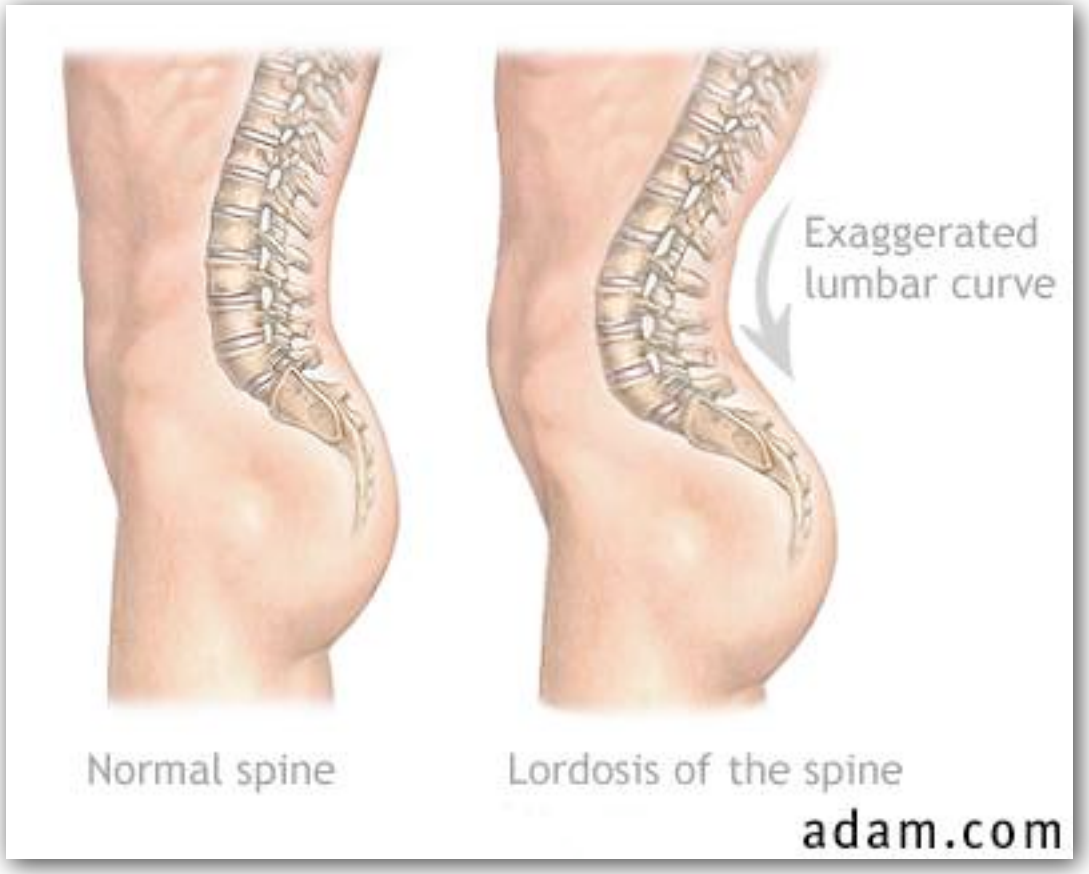
Kyphosis - hunchback



- Increase anterior concavity (or curvature) of the thoracic curve

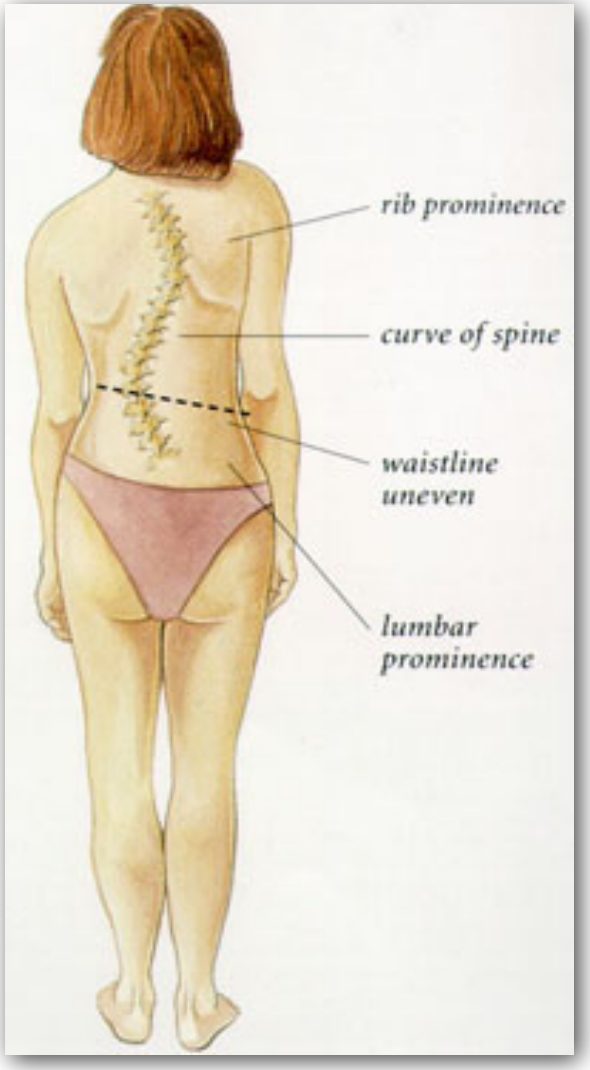
Lordosis - swayback

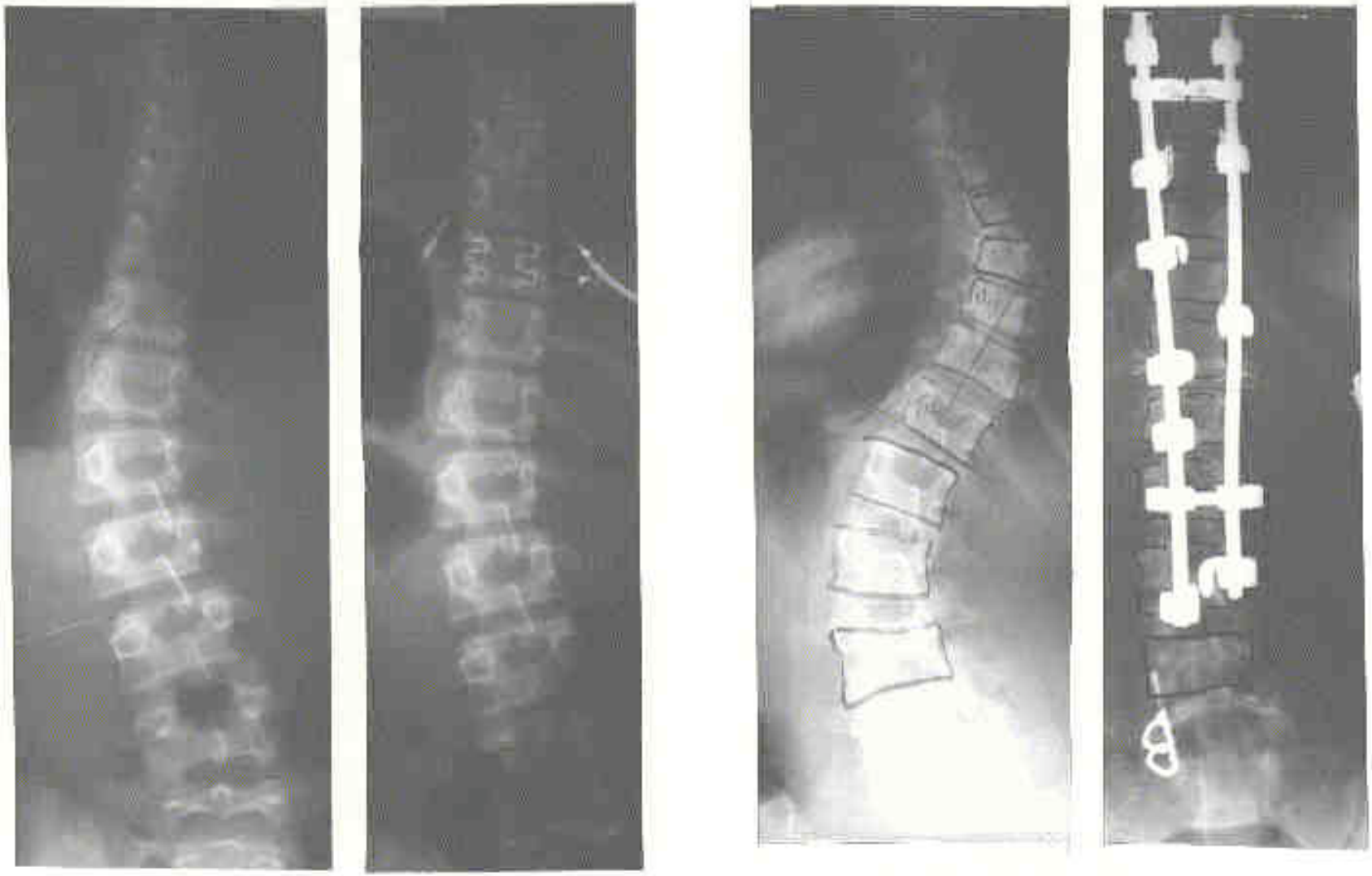
- Increase posterior concavity of the lumbar region.



Scoliois

- Lateral curvatures or sideward deviations of the spine.





- Mastoid bone and mastoid process
- Occipital bone
- Ligamentum nuchae

- Inguinal ligament
- Linea alba