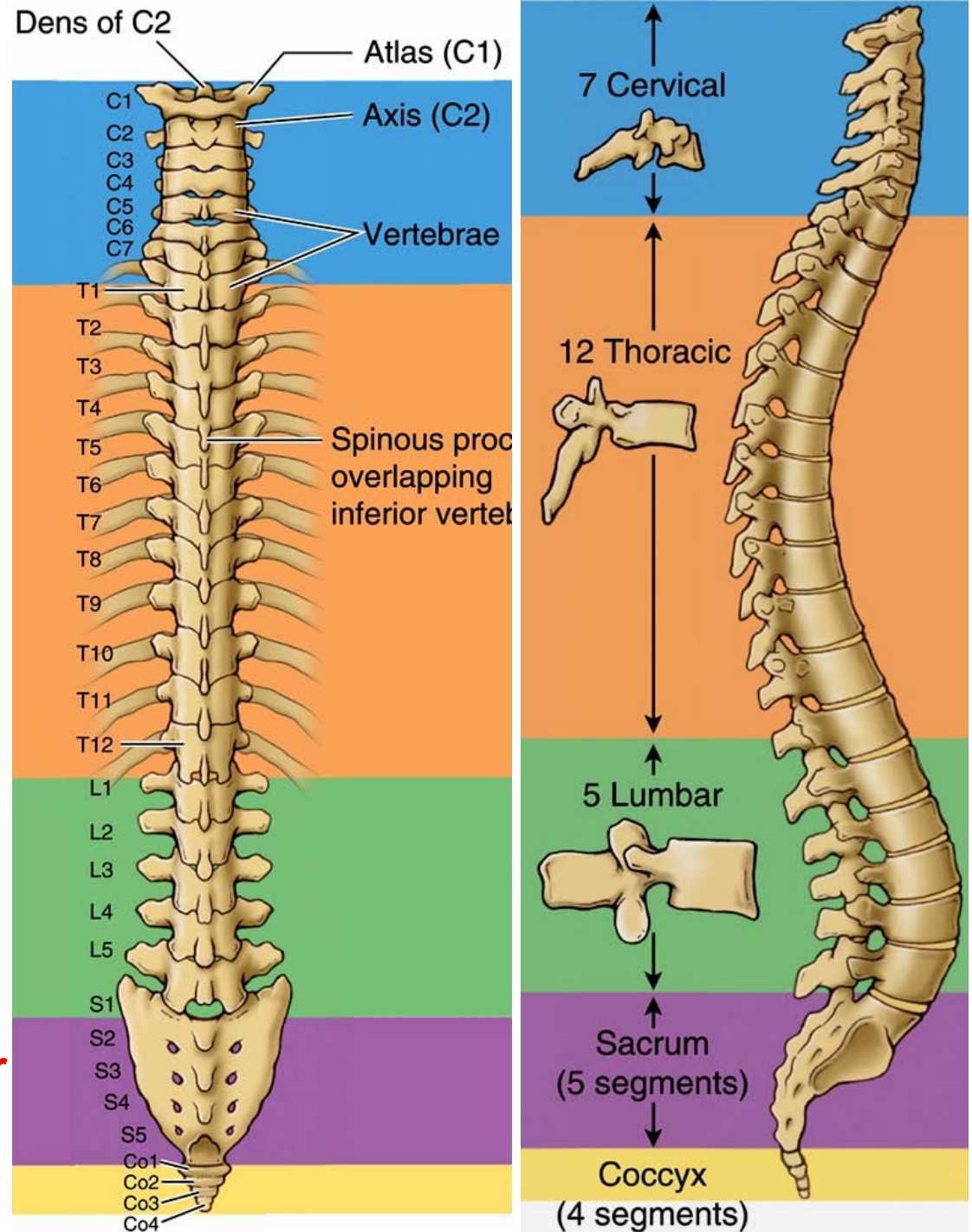


Vertebral column

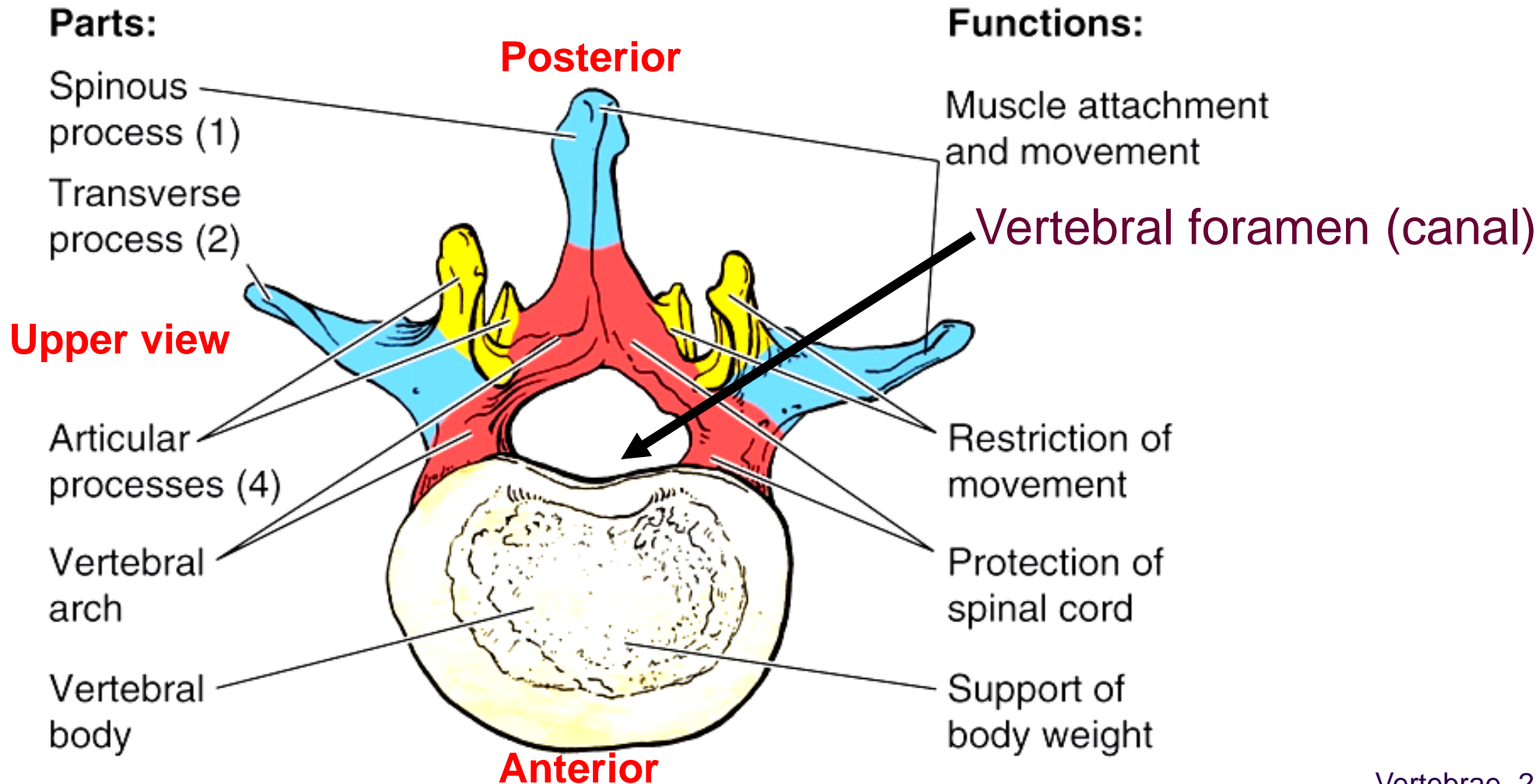
- Cervical (C): Lordosis
- Thoracic (T): Kyphosis (rib)
- Lumbar (L): Lordosis
- Sacral (S) (pelvic bone)
- Coccyx (Cx)
 - Intervertebral joints

Posterior
view



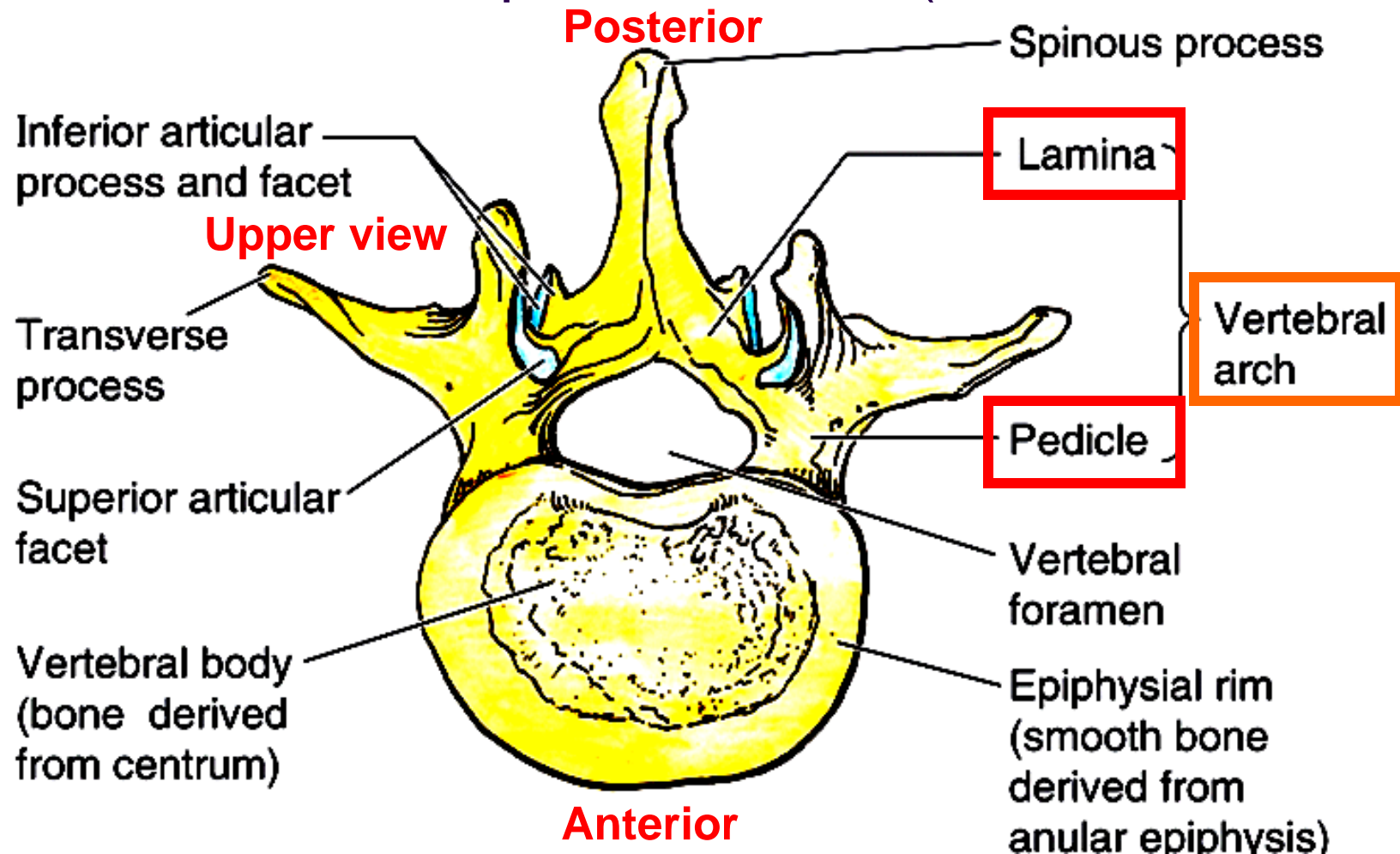
Vertebra (Spine)

- Vertebral Body; Vertebral foramen (canal)
- Vertebral Arch: Pedicle, Lamina, Process
- Vertebral notch: superior, inferior (intervertebral foramen)

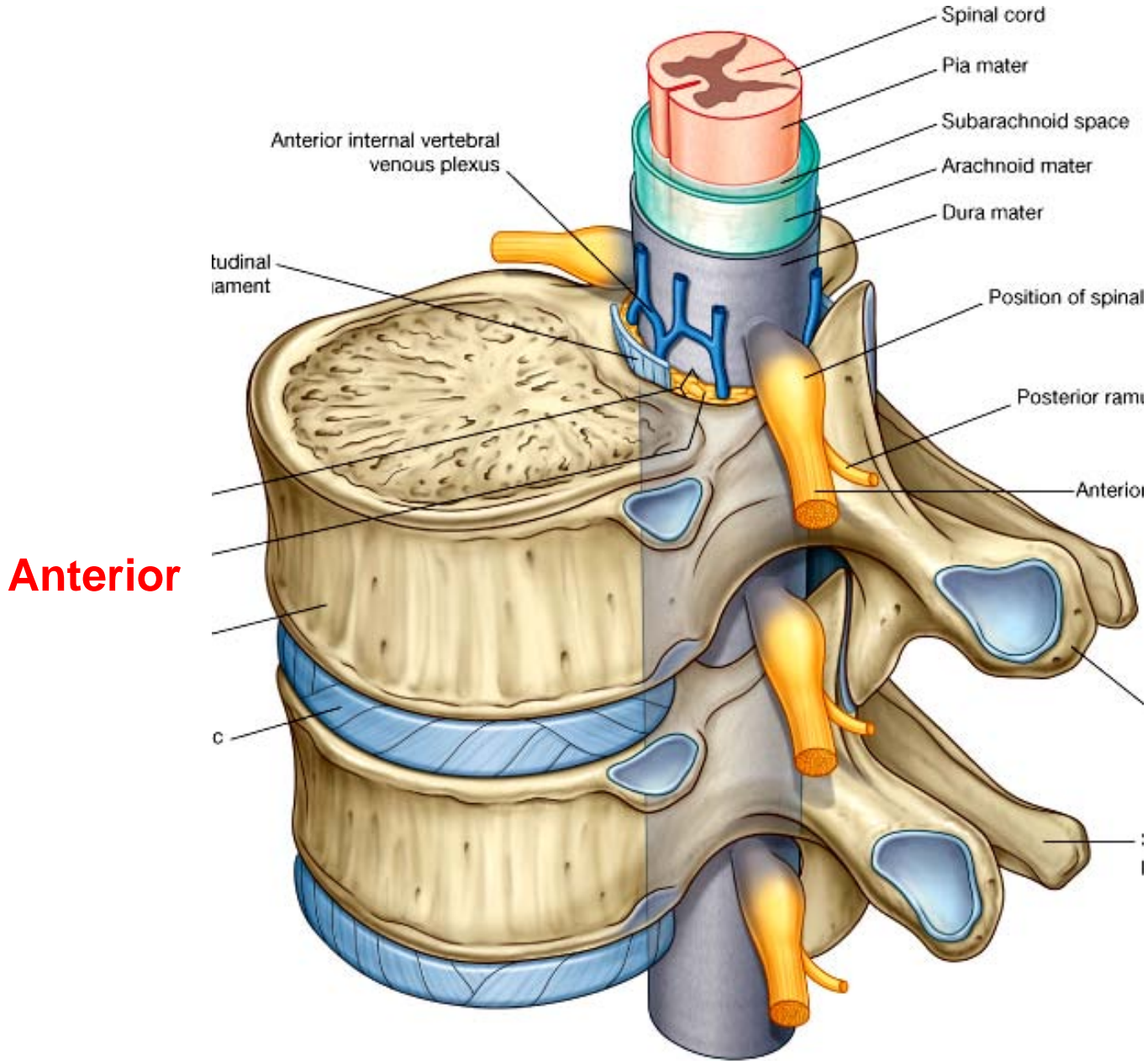


Vertebra (Spine)

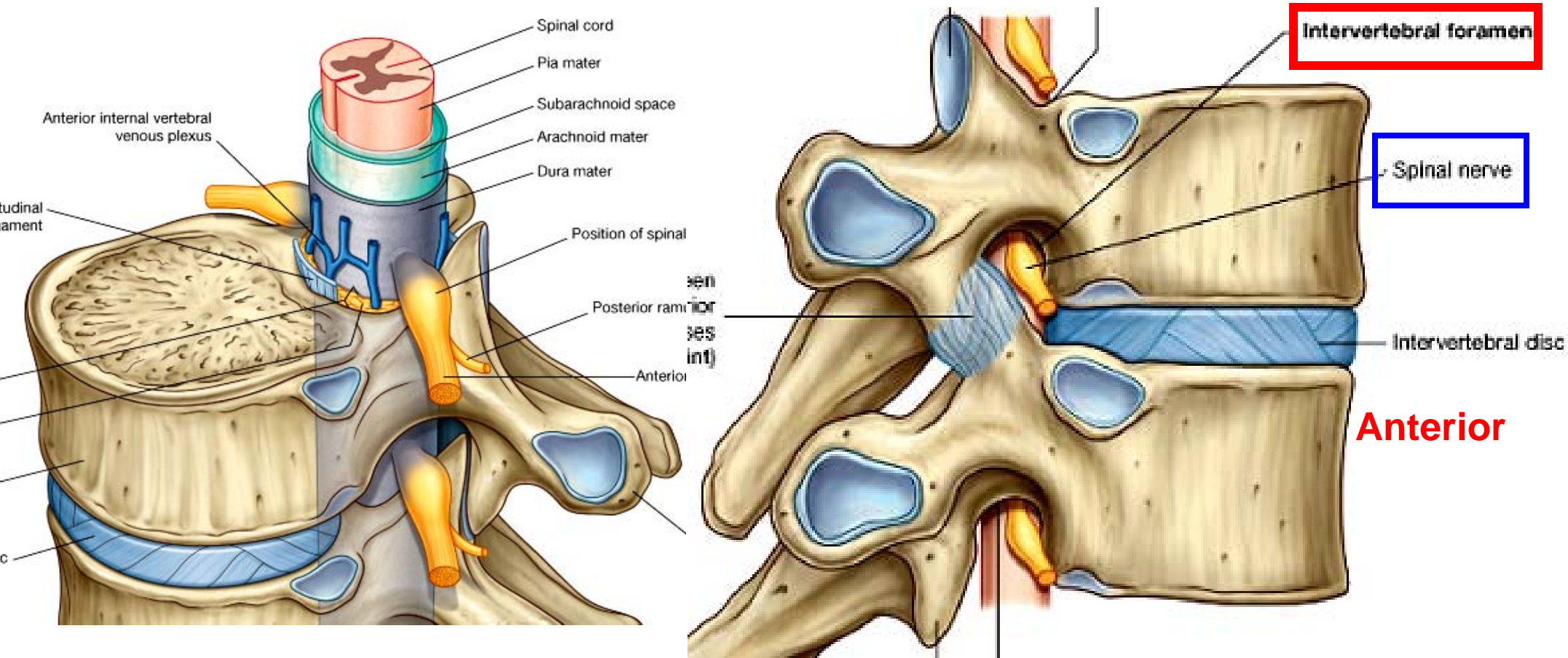
- Vertebral Body; Vertebral foramen (canal)
- Vertebral Arch: Pedicle, Lamina, Process
- Vertebral notch: superior, inferior (intervertebral foramen)



Vertebral foramen (canal) and spinal cord



Intervertebral foramen and spinal nerves



Superior articular process

Transverse process

Spinous process

Inferior articular facet

Superior vertebral notch

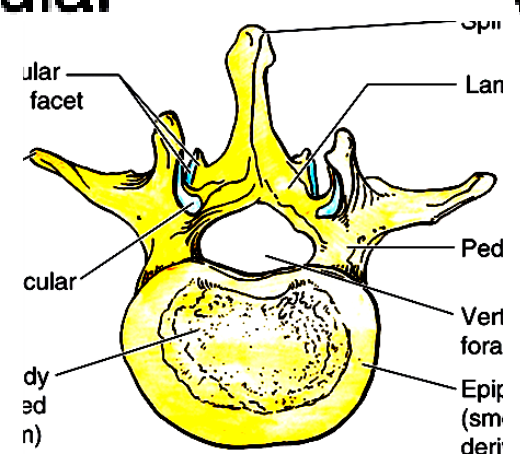
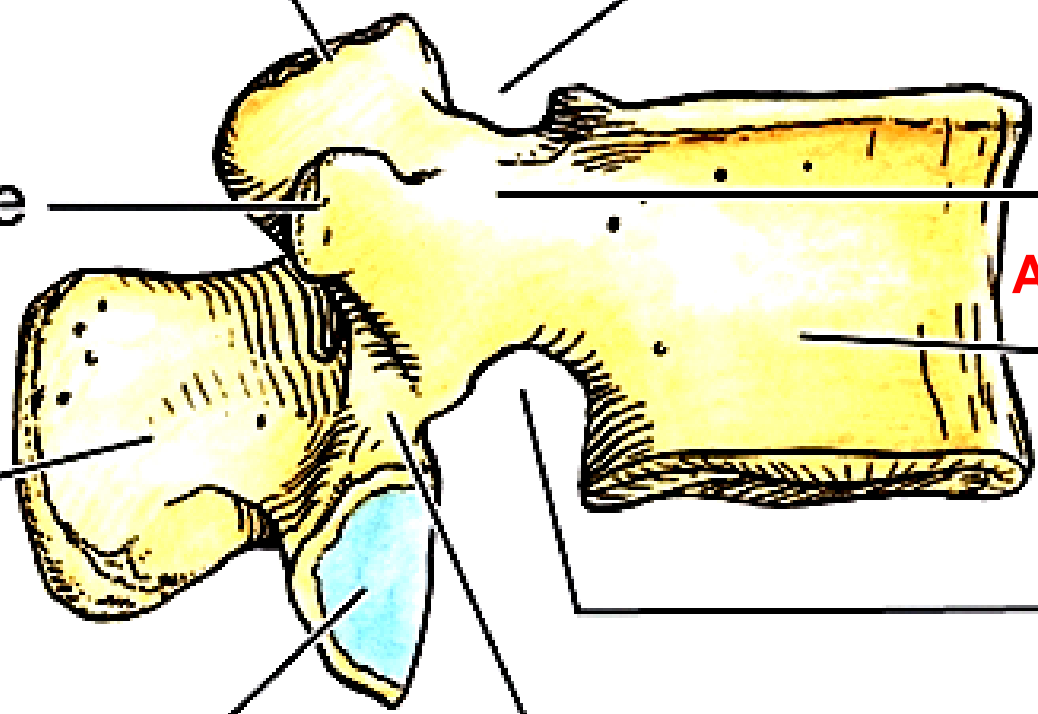
Pedicle

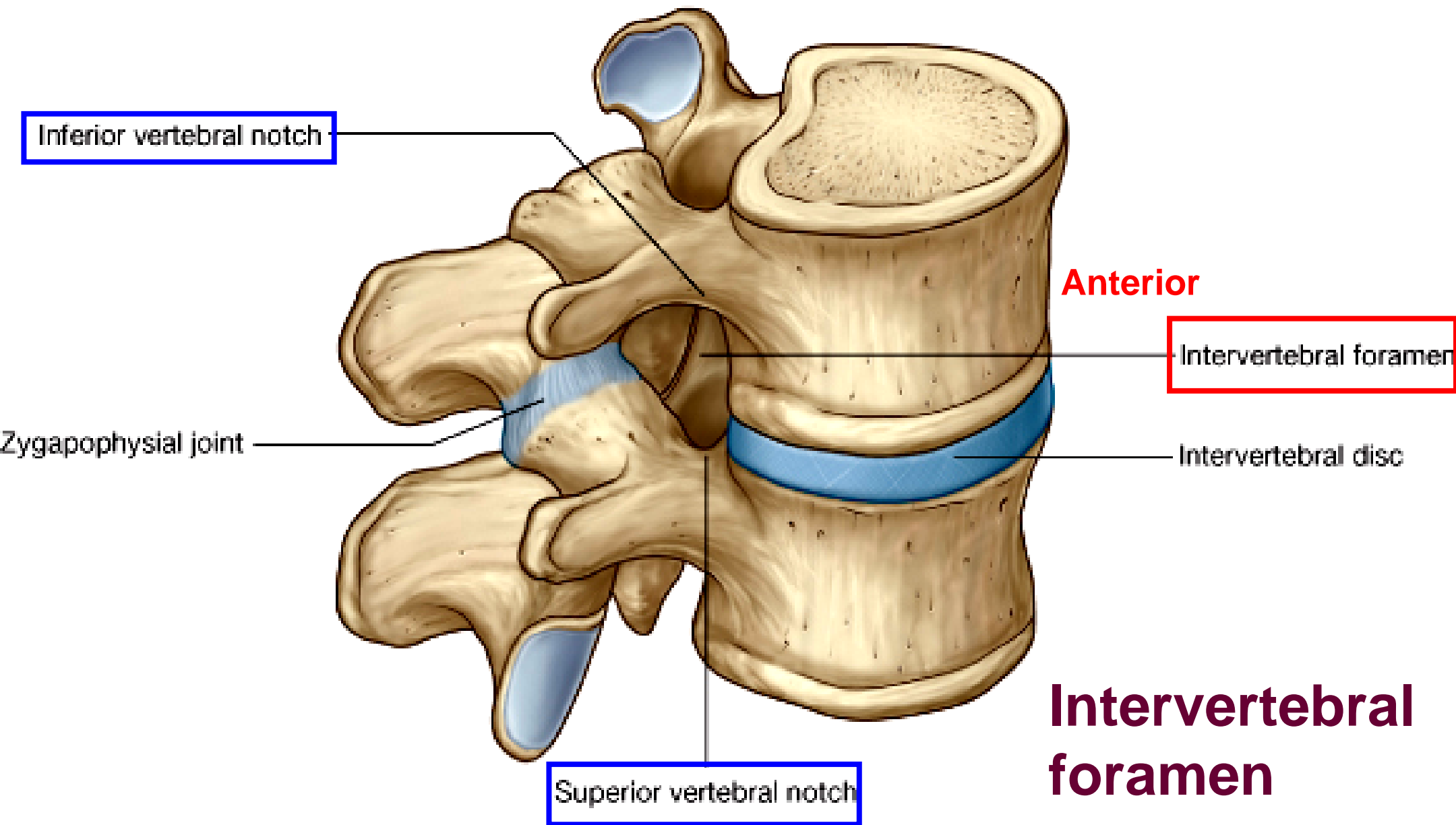
Anterior

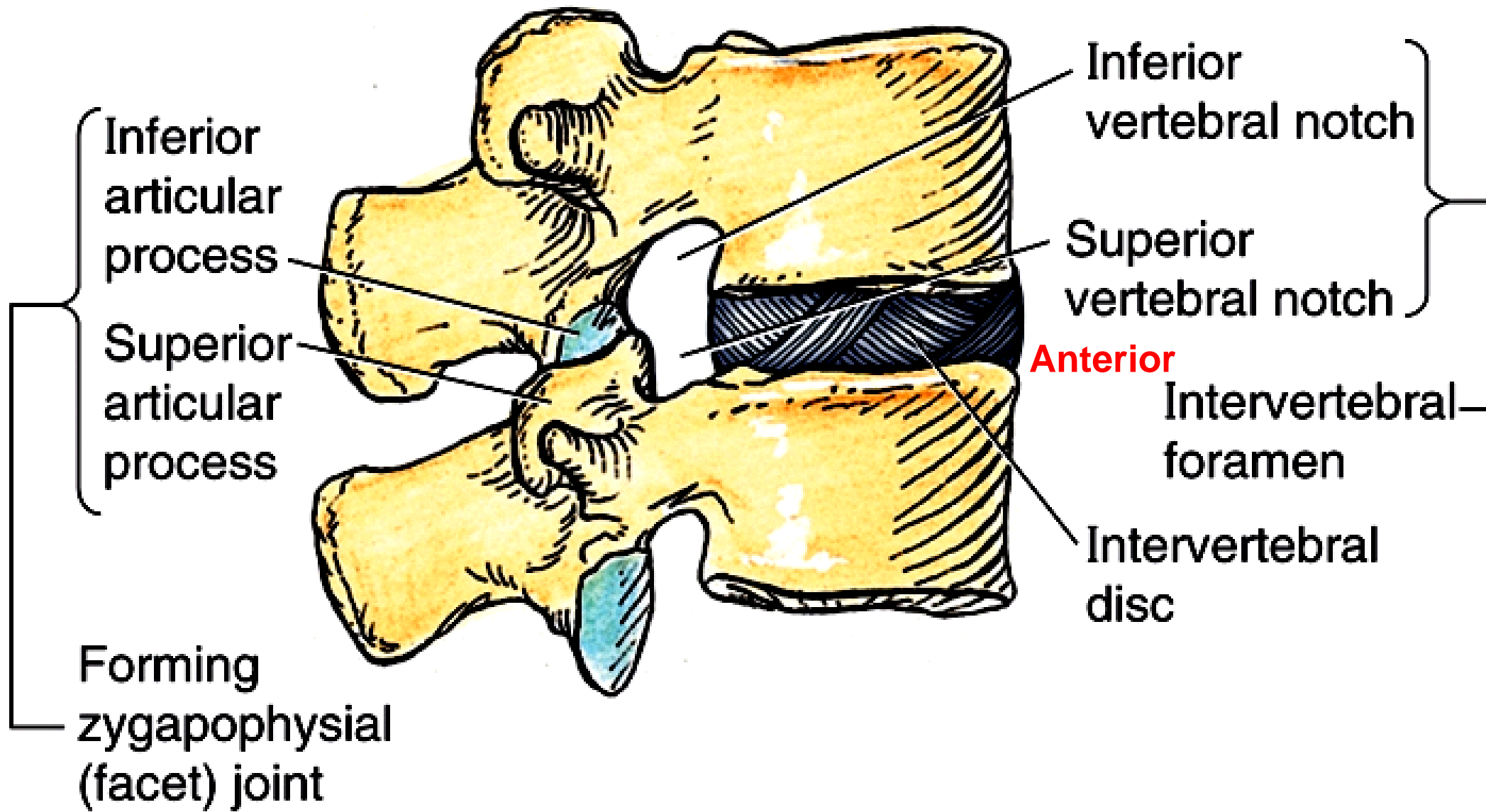
Vertebral body

Inferior vertebral notch

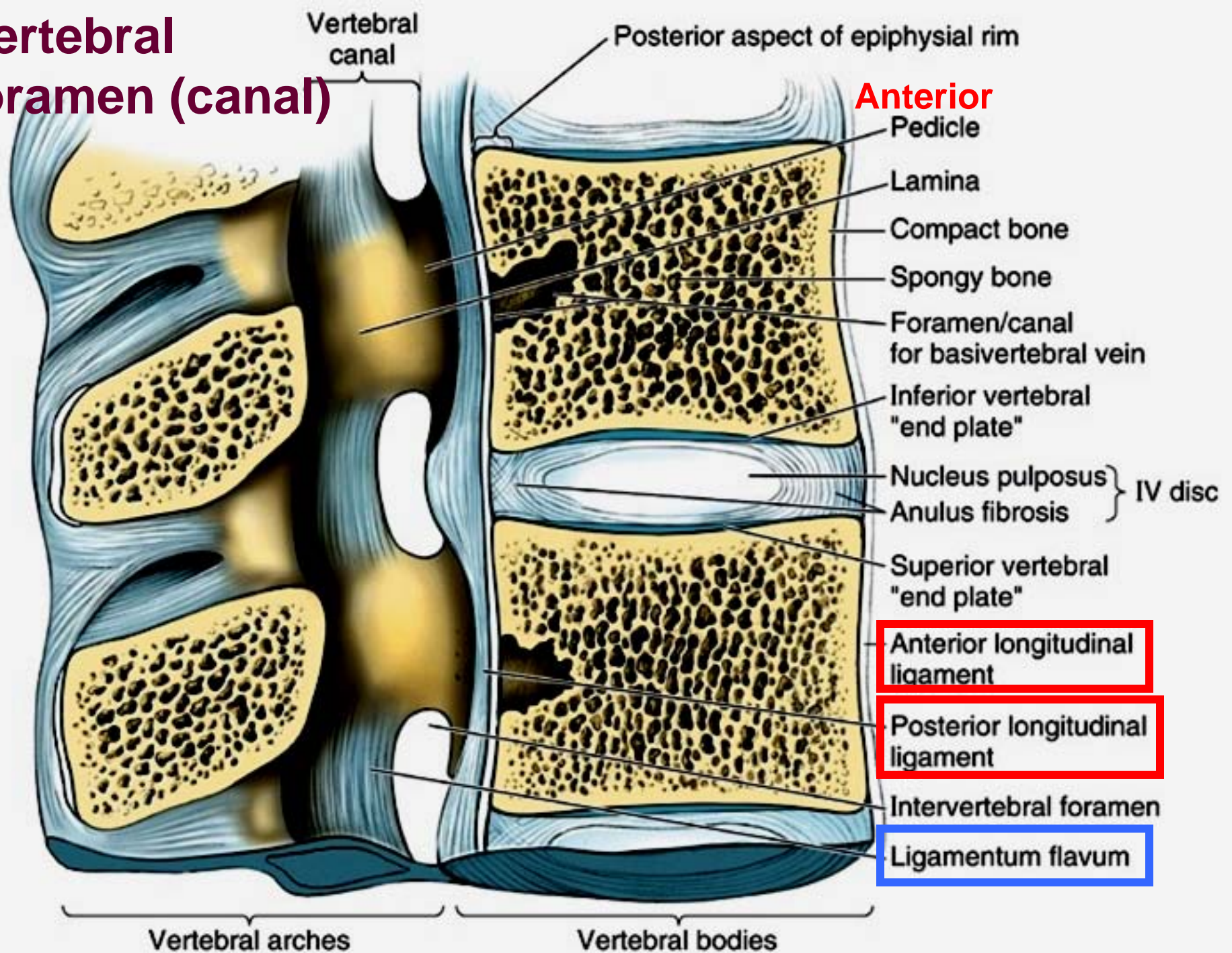
Lamina (interarticular part)





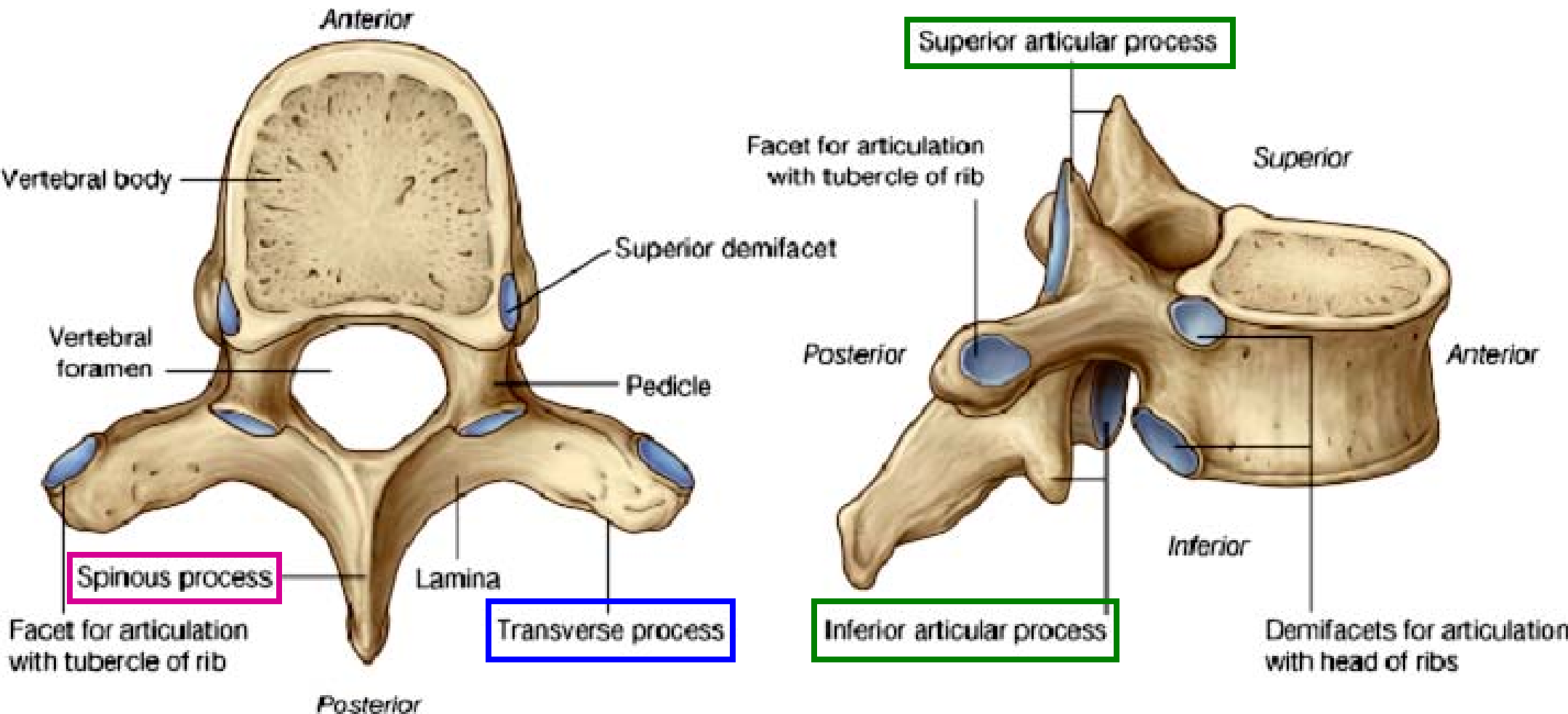


Vertebral foramen (canal)



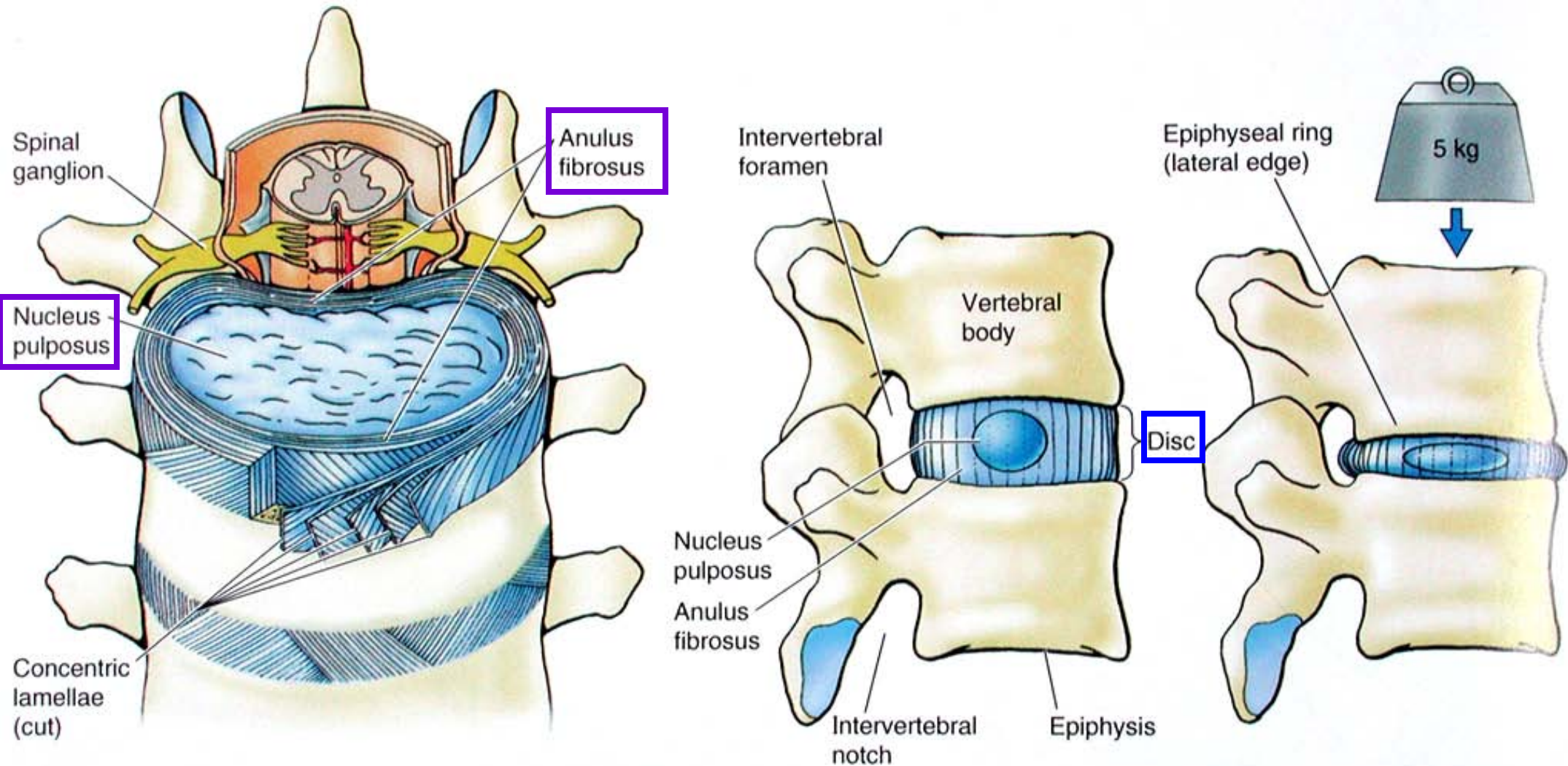
Vertebral process

- Spinous process, Transverse process
- Articular process (facet): superior, inferior

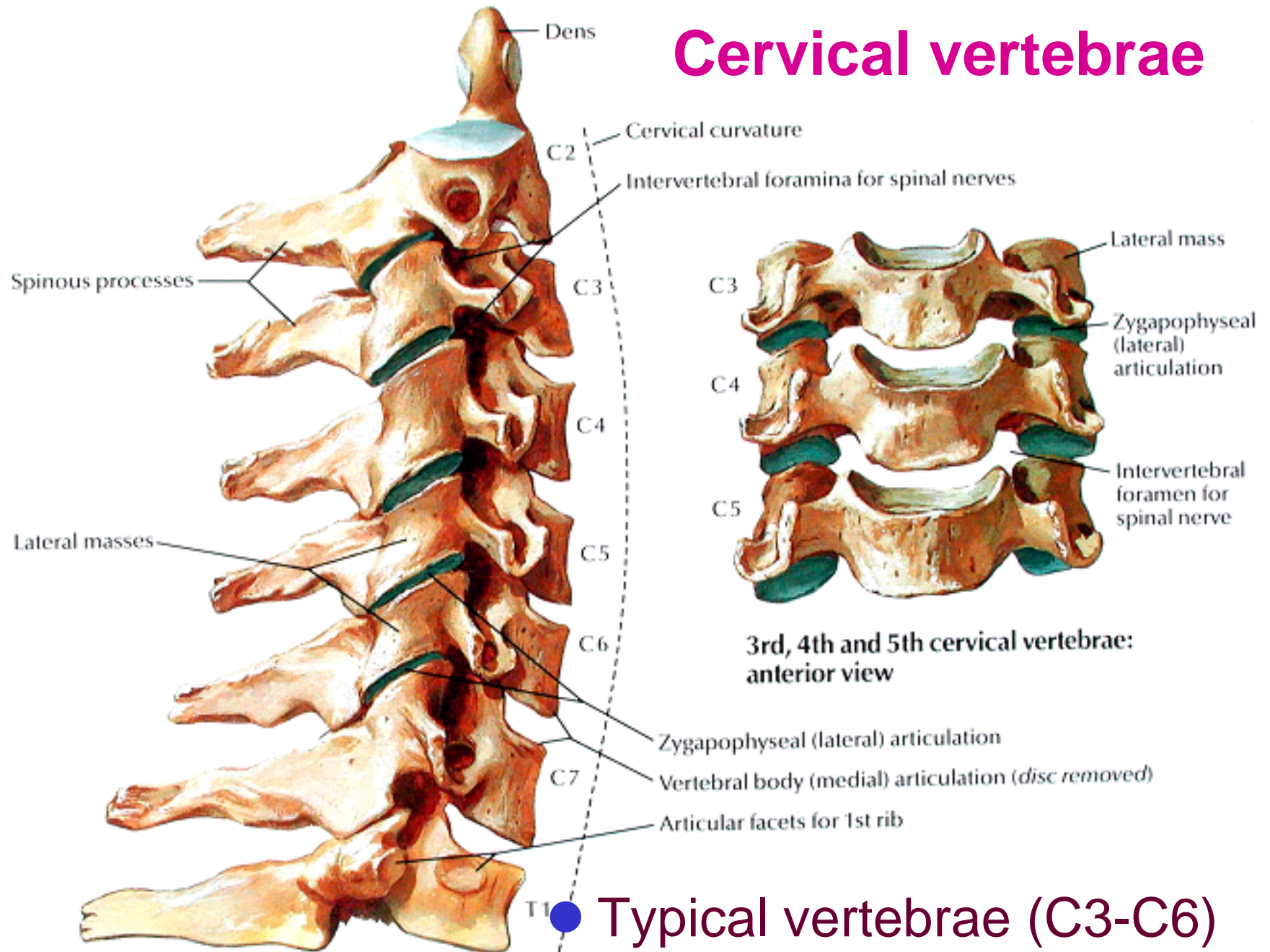


Intervertebral joints

- Hyaline cartilage
- Intervertebral disc: Annulus fibrosus + Nucleus pulposus



Cervical vertebrae



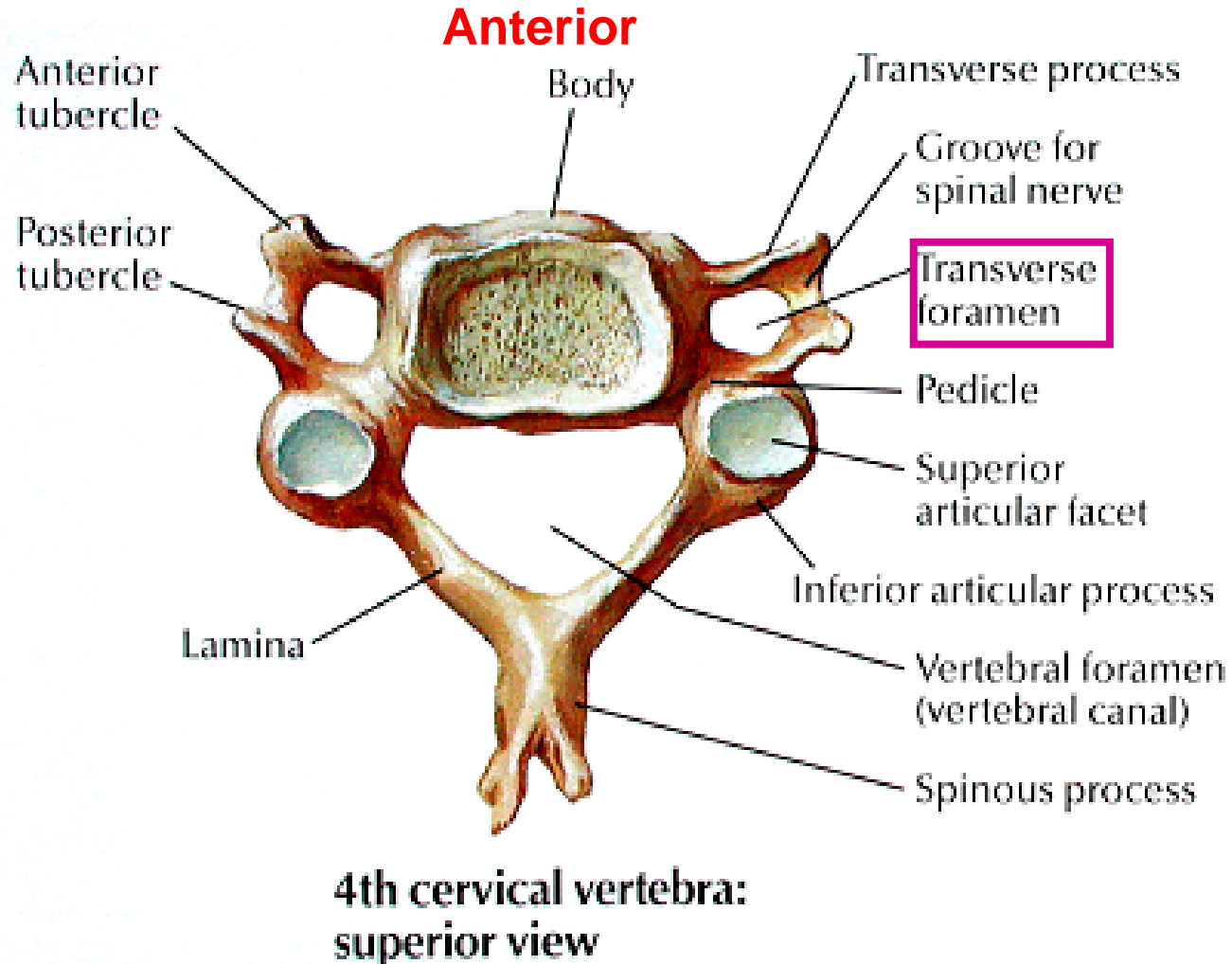
2nd cervical to 1st thoracic vertebrae:

● Typical vertebrae (C3-C6)

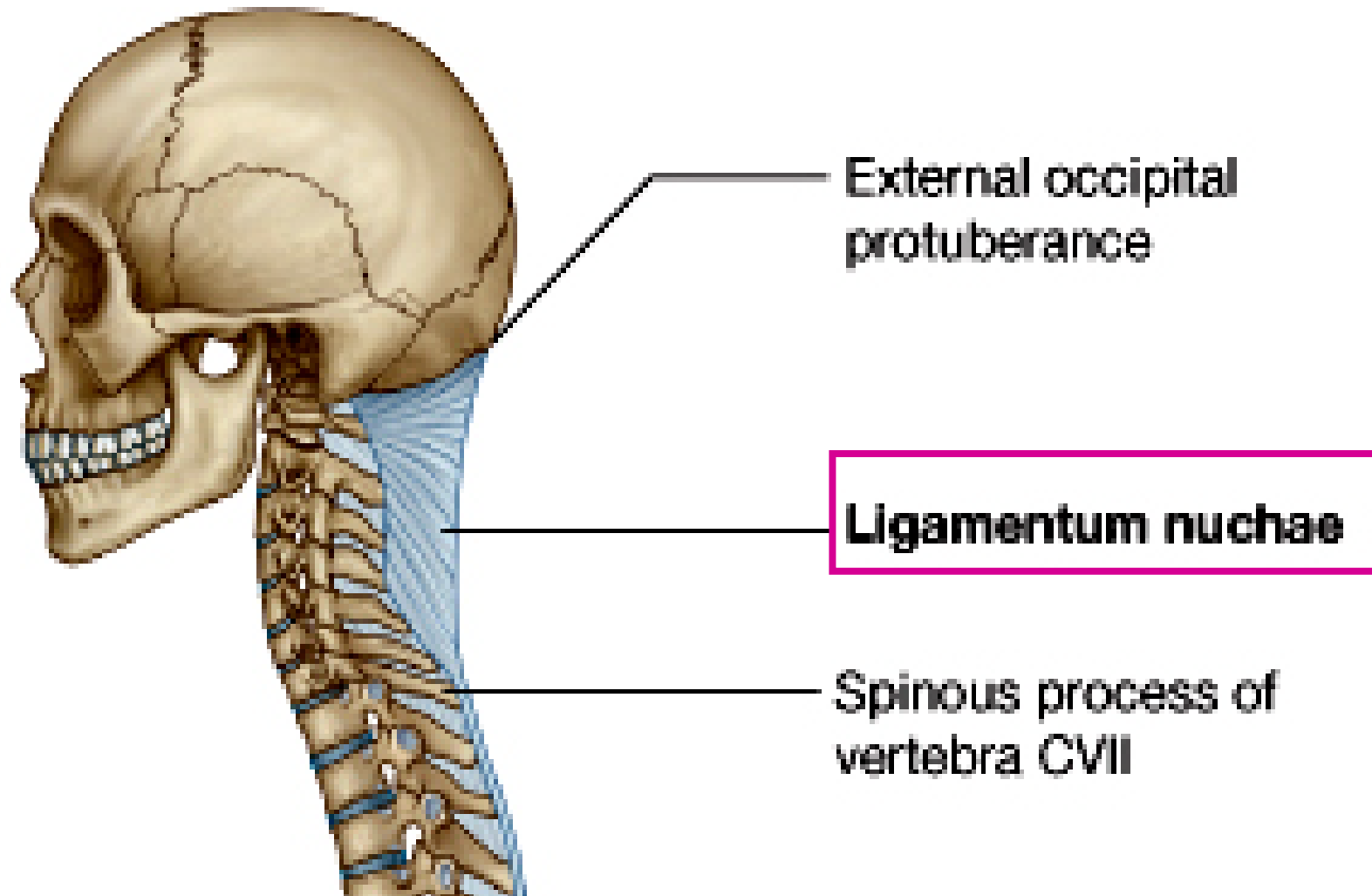
● C1: atlas, C2: axis

Cervical vertebrae: Typical (C3-C6)

- small body; large, triangular canal; arch
- Transverse process: end as post. & ant. tubercle; foramen transversarium
- Articular process: sup. & inf.; sup. facet
- Short, bifid spinous process; attachment of ligamentum nuchae

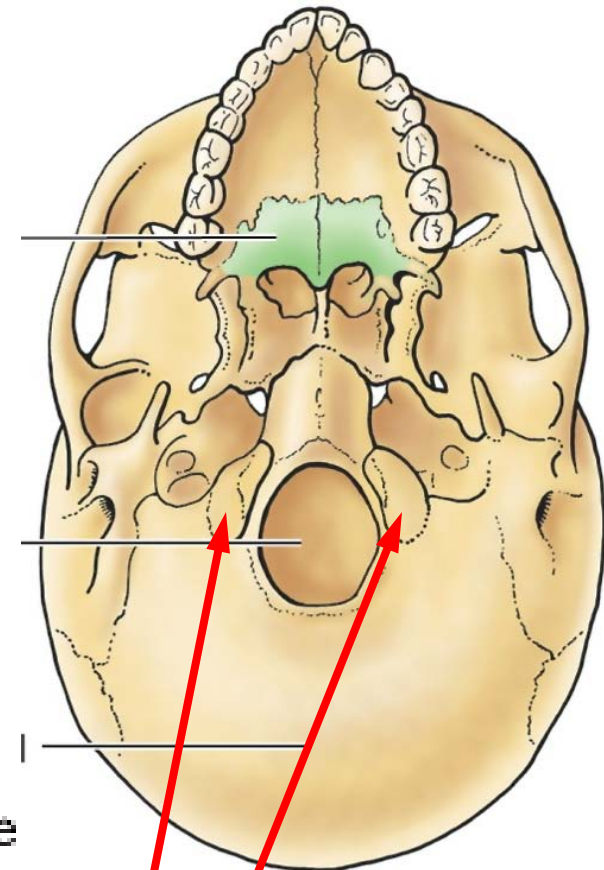
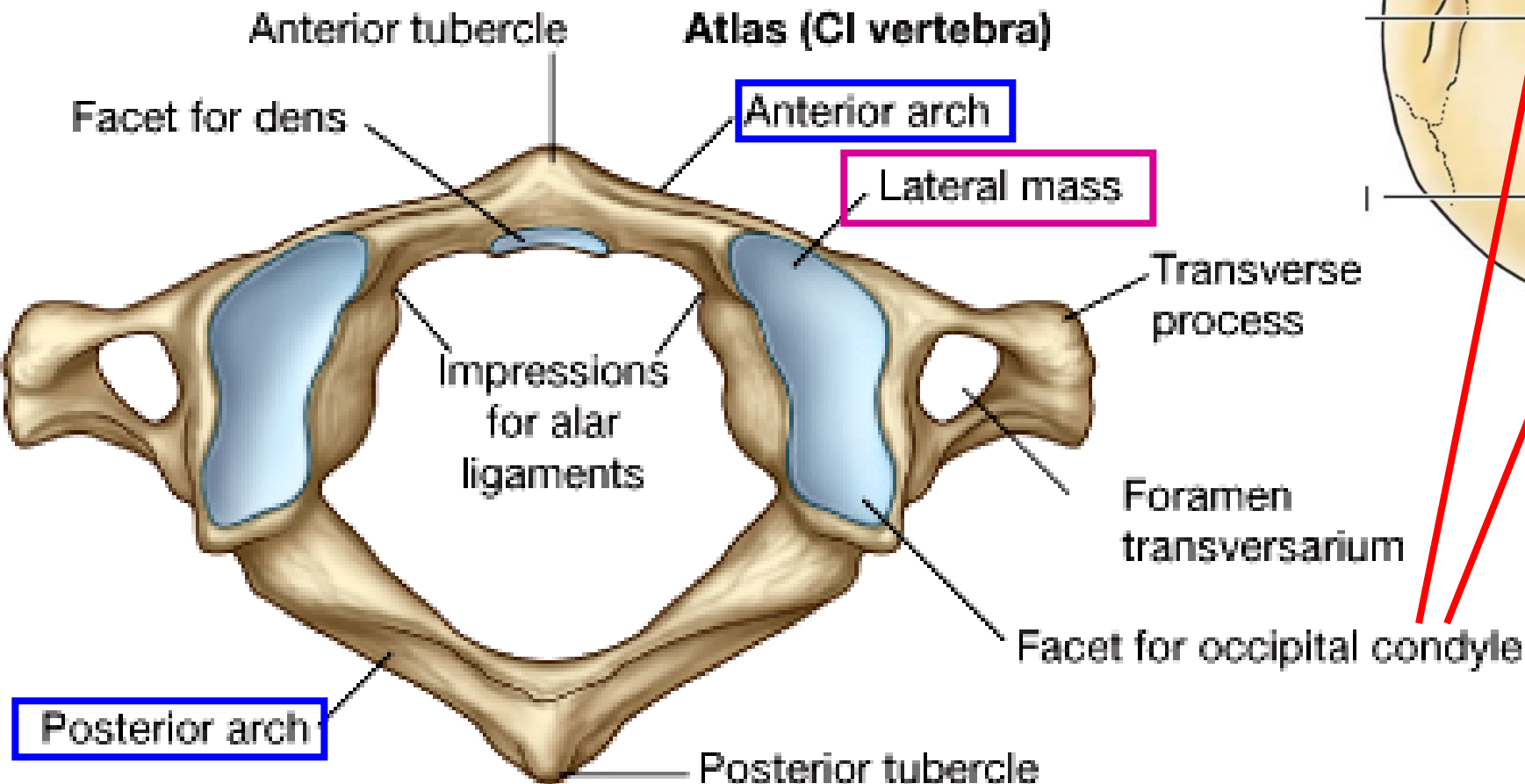


Ligamentum nuchae



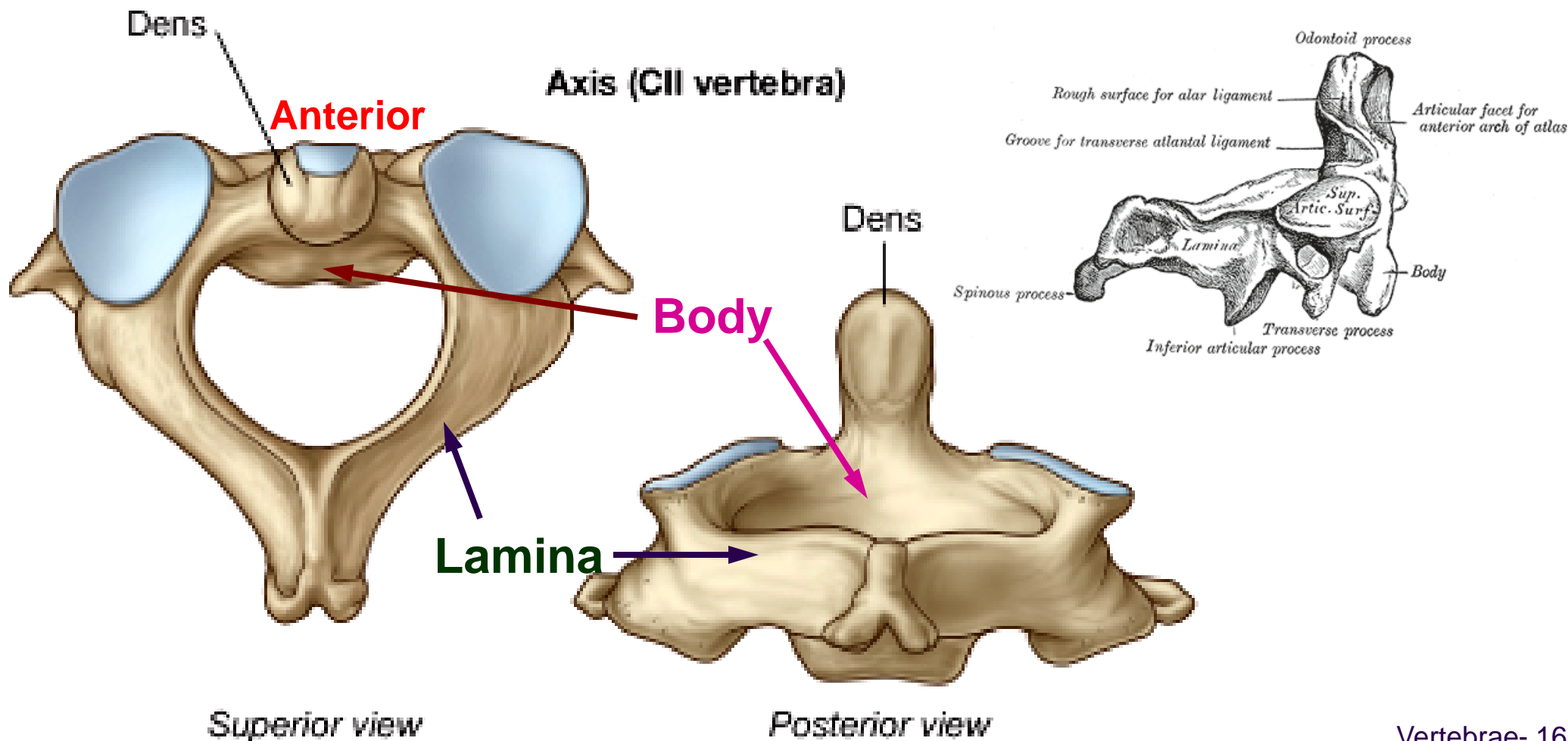
C1: atlas

- Sup. articular facet; with occipital condyle
- No body; No spinous proc.; Lateral mass: ant., & post. arch
- Long transverse proc.

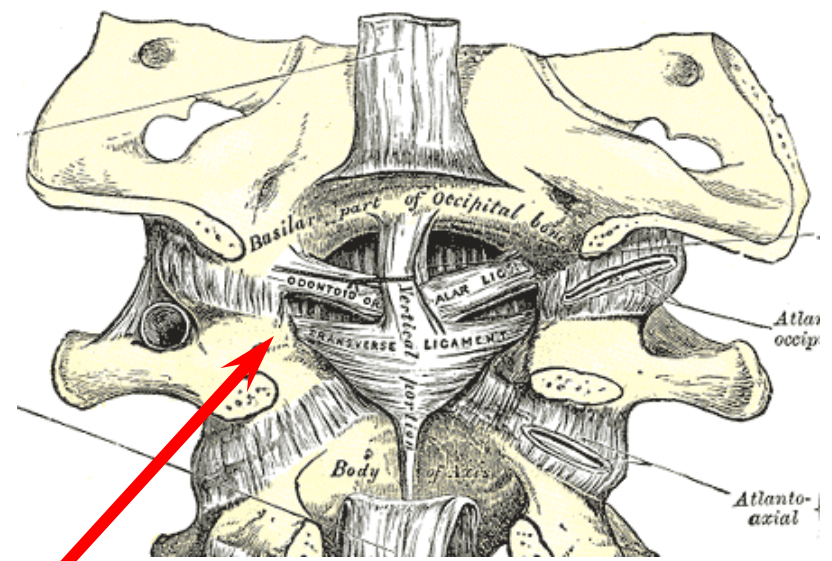


C2: axis

- Dens (odontoid proc)
- Sup. articular facet; Inf. articular facet
- Body, pedicle; Spinous proc.; Transverse proc.



Assembling of C1 and C2



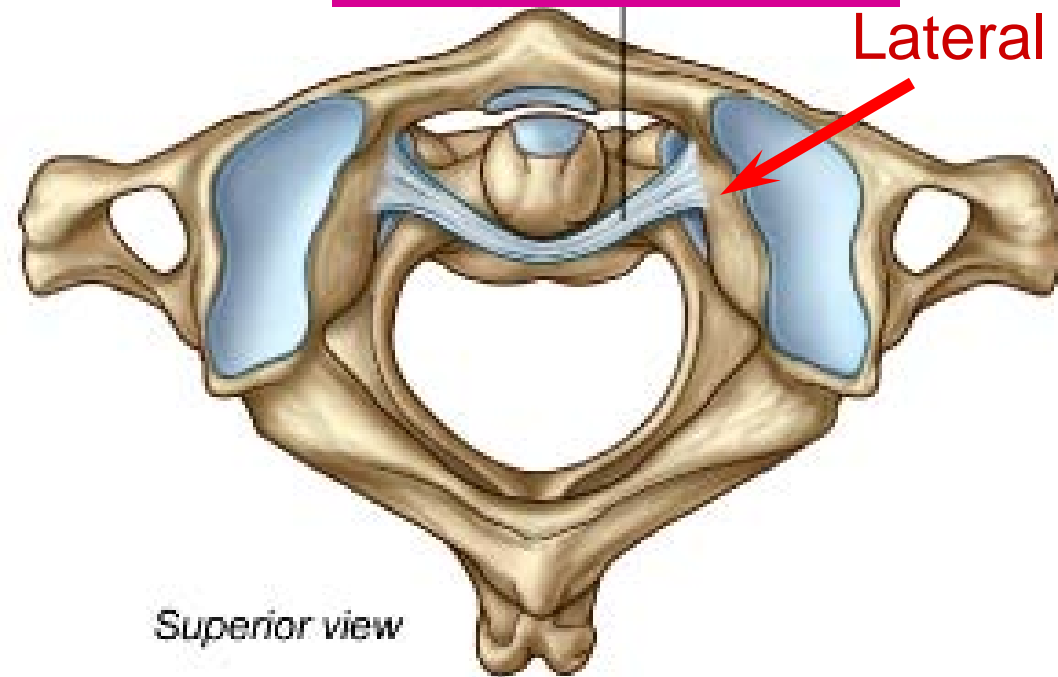
Anterior

Transverse ligament of atlas

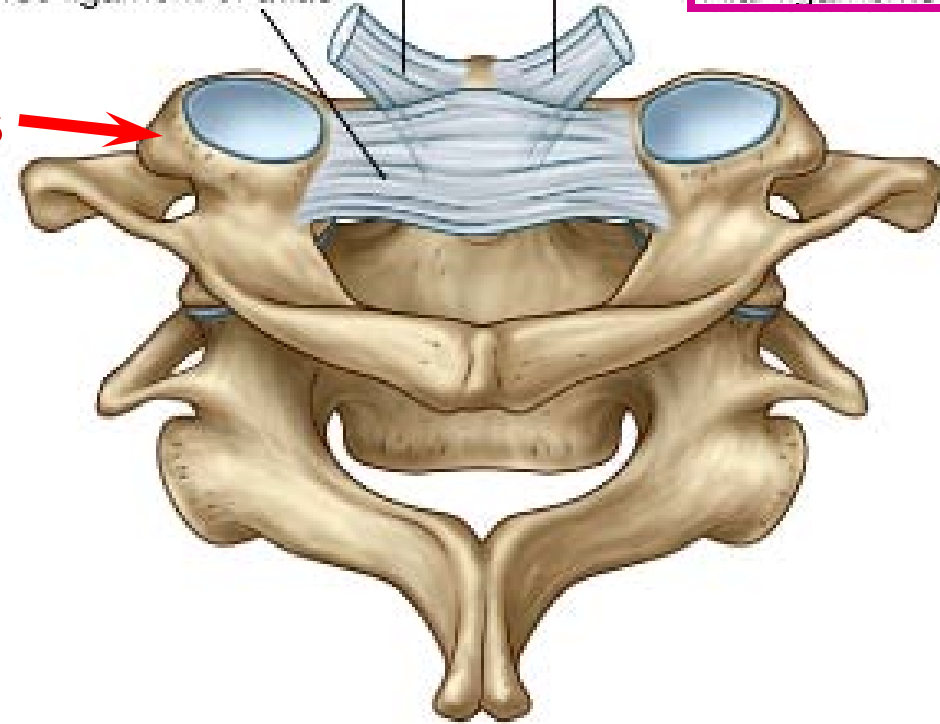
Lateral mass

Transverse ligament of atlas

Alar ligaments



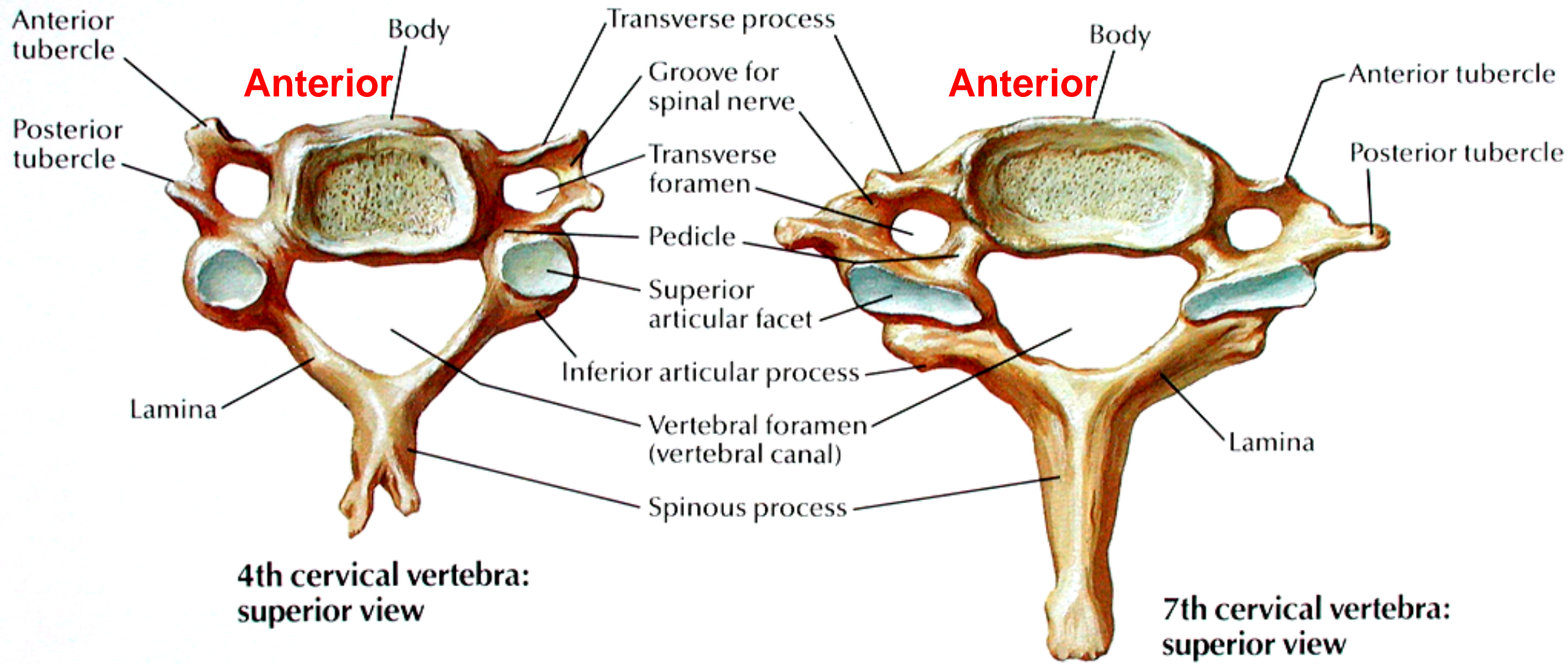
Superior view



Posterosuperior view

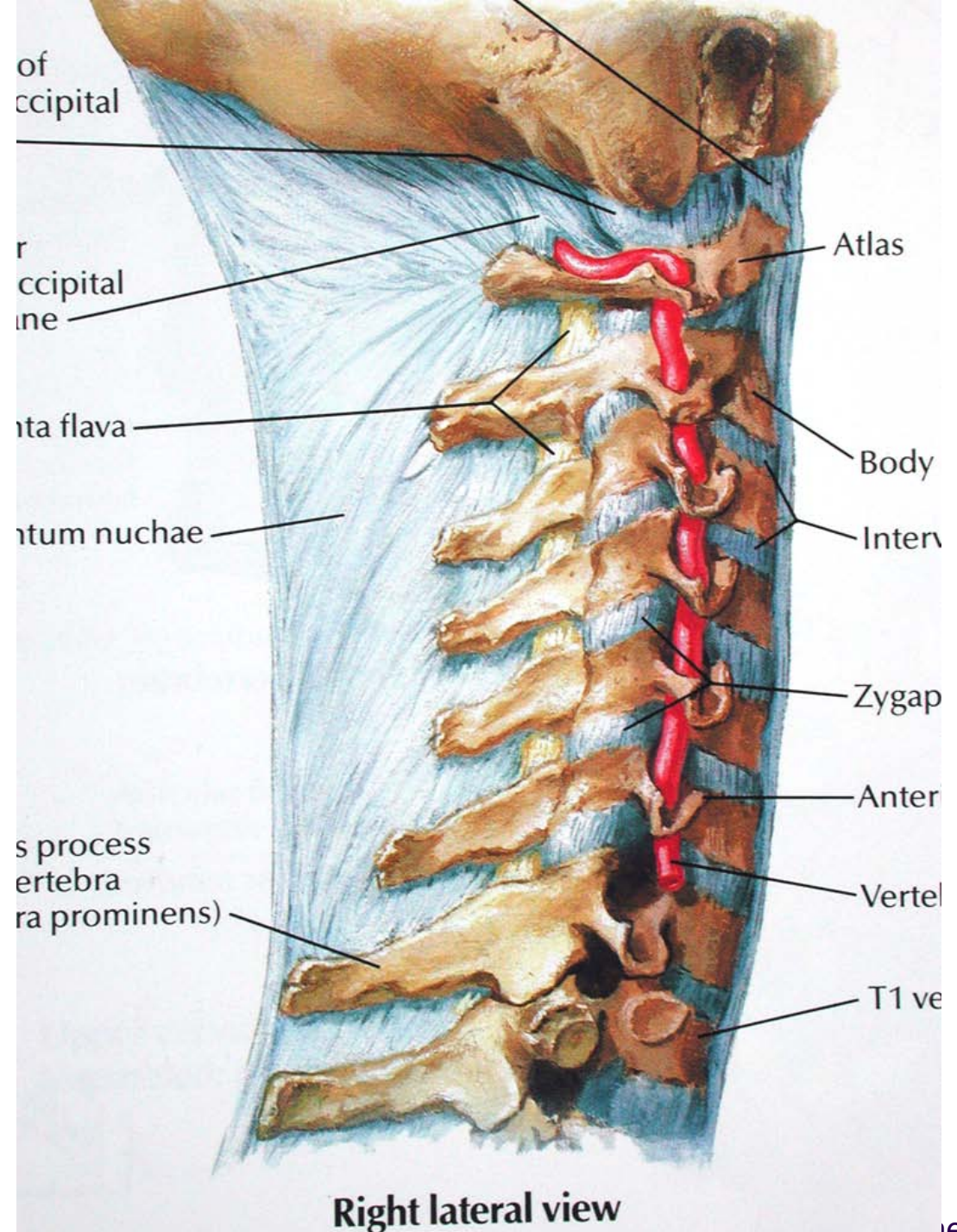
C7 vertebra

- Large, long spinous process
 - Caudal end of lig. nuchae as a landmark
- No vertebral a. through transverse foramen



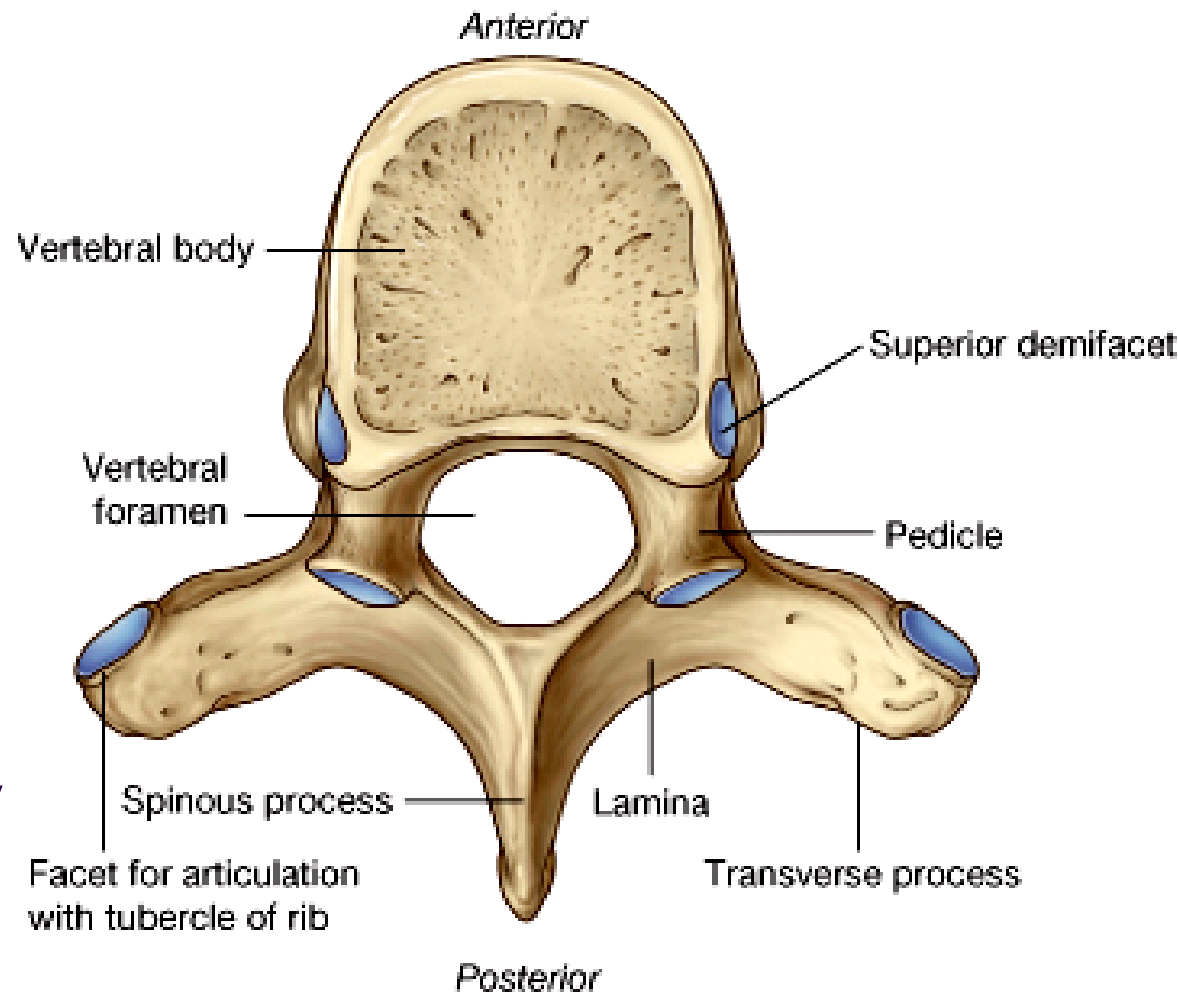
Vertebral artery in transverse foramens

- Through transverse foramens of C1-6; but no C7 (only for accessory vertebral v.)
- Vascular insufficiency during forceful rotation of vertebral column



Thoracic vertebrae: “typical” [T2~T10(9-11)] 1/2

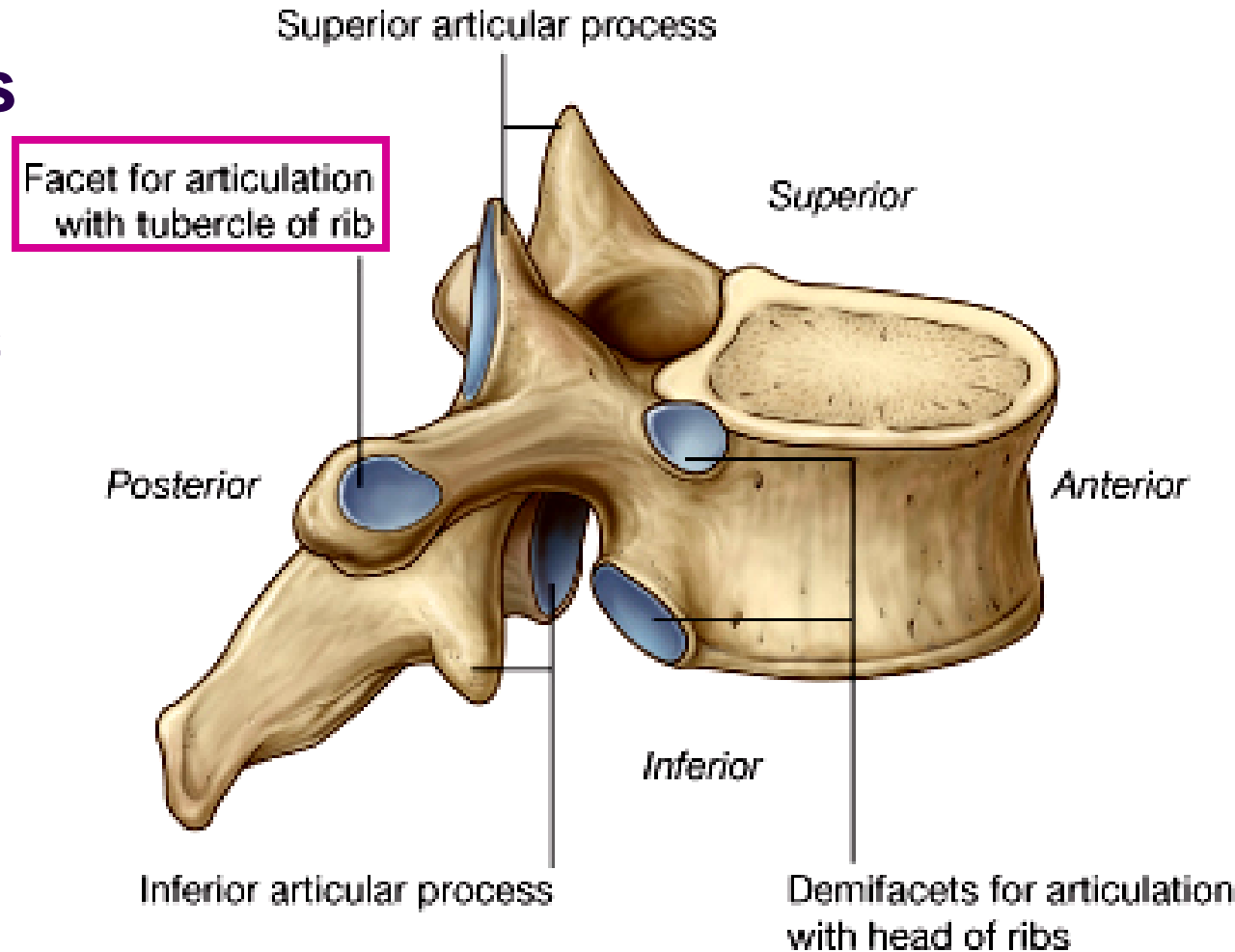
- Body: larger than C-vertebrae; round canal
- Upper and lower surfaces: parallel to each other
- Spinous proc.: directly posteriorly
- Vertical articular facets: sup. facet faces posteriorly



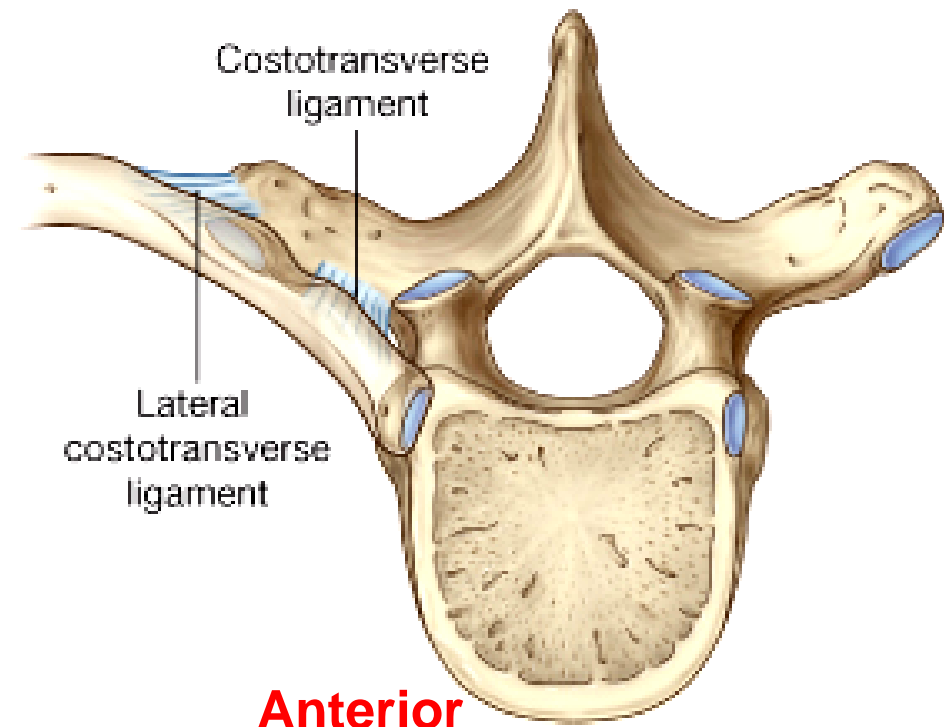
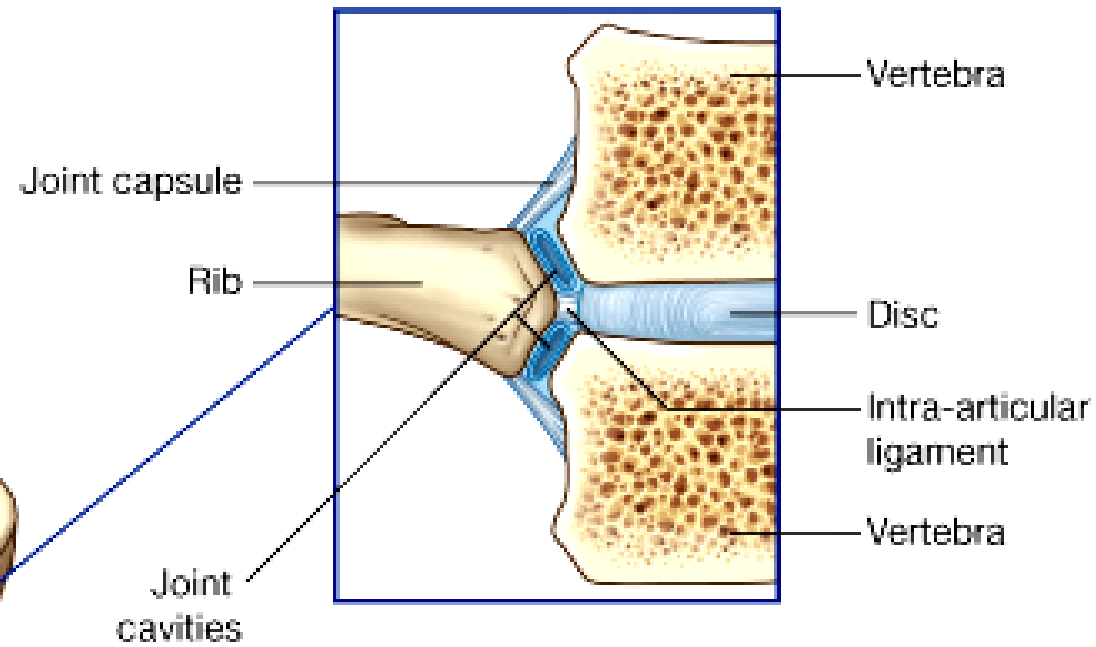
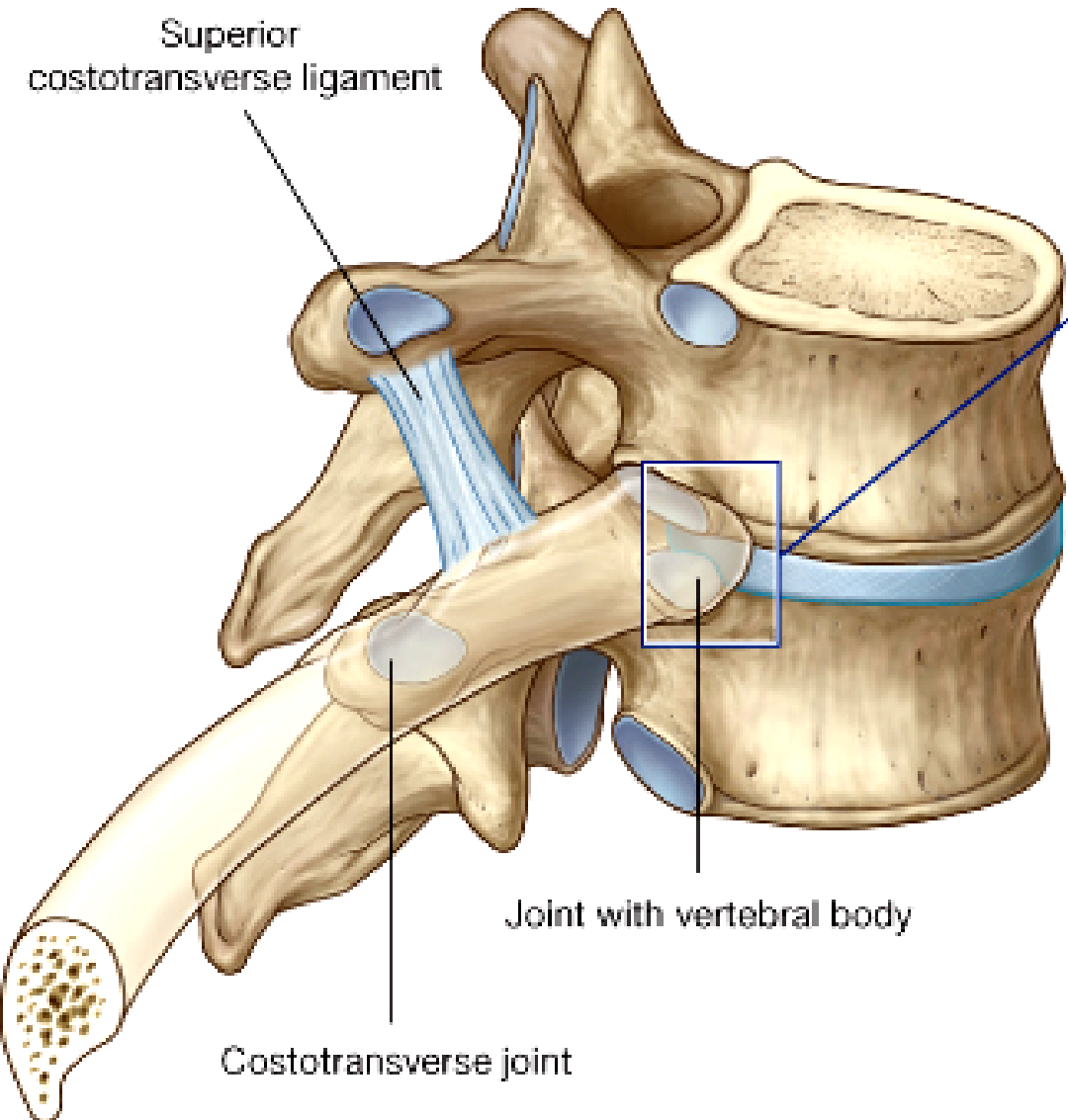
Thoracic vertebrae: “typical” [T2~T10(9-11)] 2/2

● Articular facets for ribs

- With rib head: sup. & inf. costal demifacet at upper & lower border of body
- With tubercle of rib: costal facet on trans. proc.



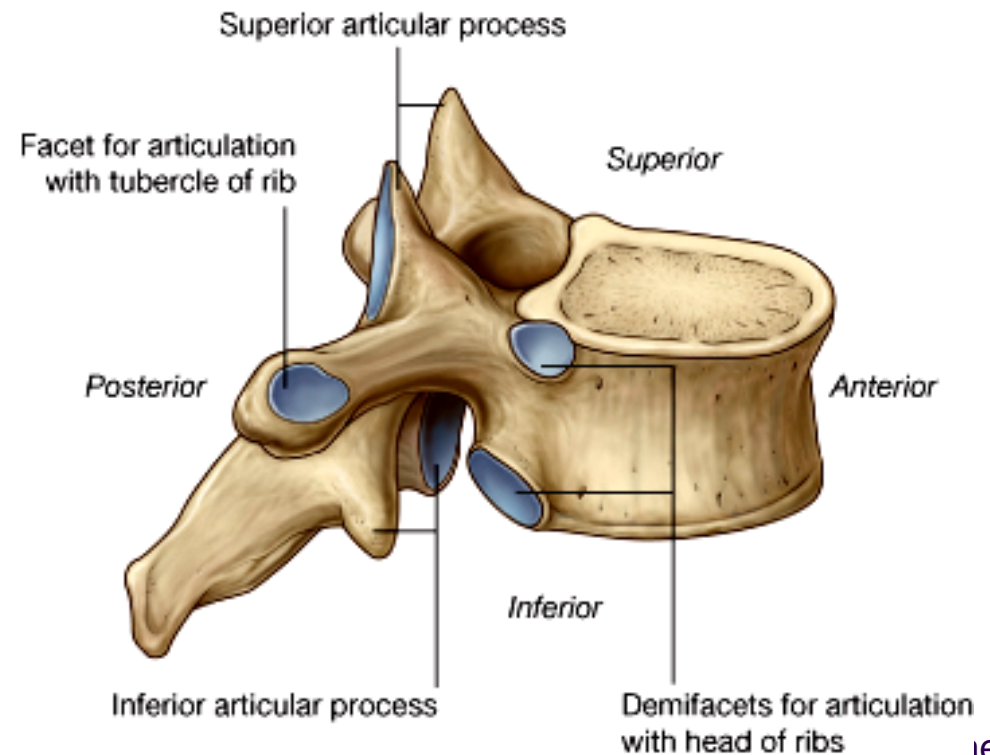
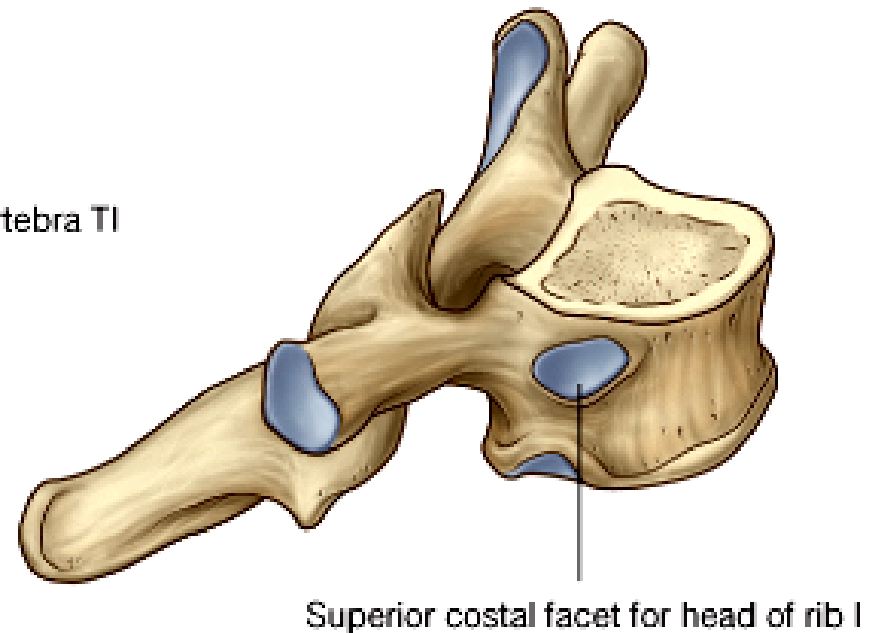
Vertebra and rib



Vertebra T1

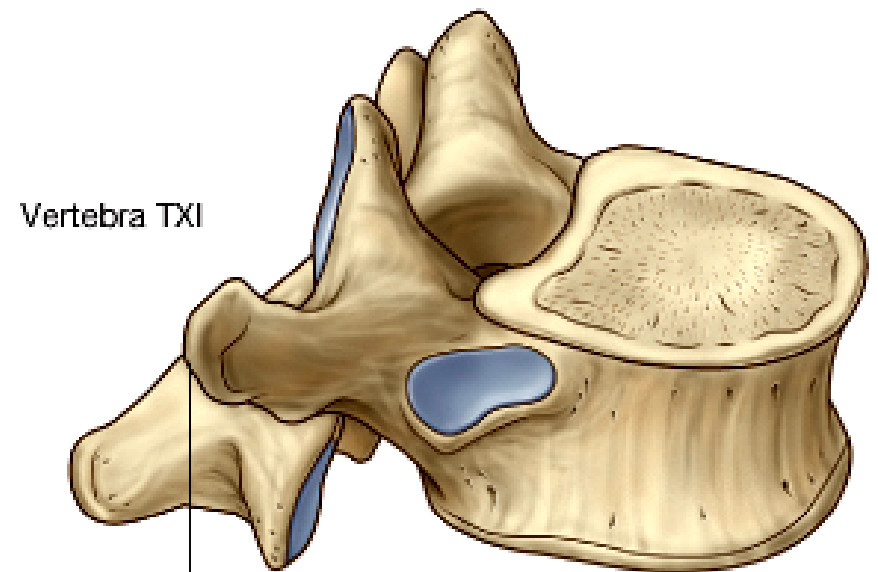
- Upper surface of body: saddle-shaped
- Intermediate between C and T
- Triangular canal
- Rib1 contact T1 body only

Vertebra T1

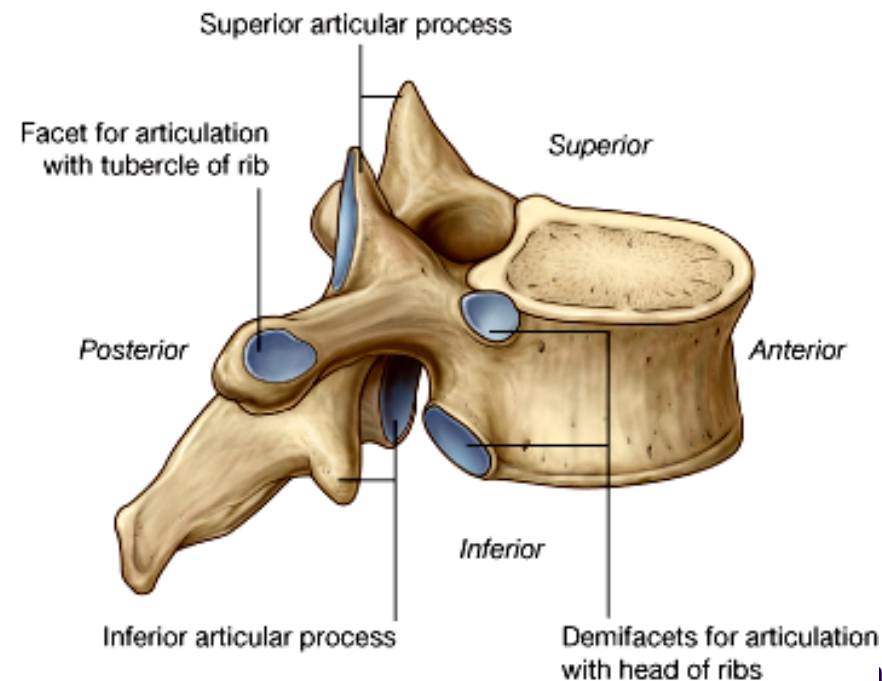


Vertebra T11-T12

- Single rib articular facet; no rib articular facet on trans. proc.
- T12: intermediate between T and L
- Sup. articular facet: resembles T-vertebrae
- Inf. articular facet: resembles L-vertebrae



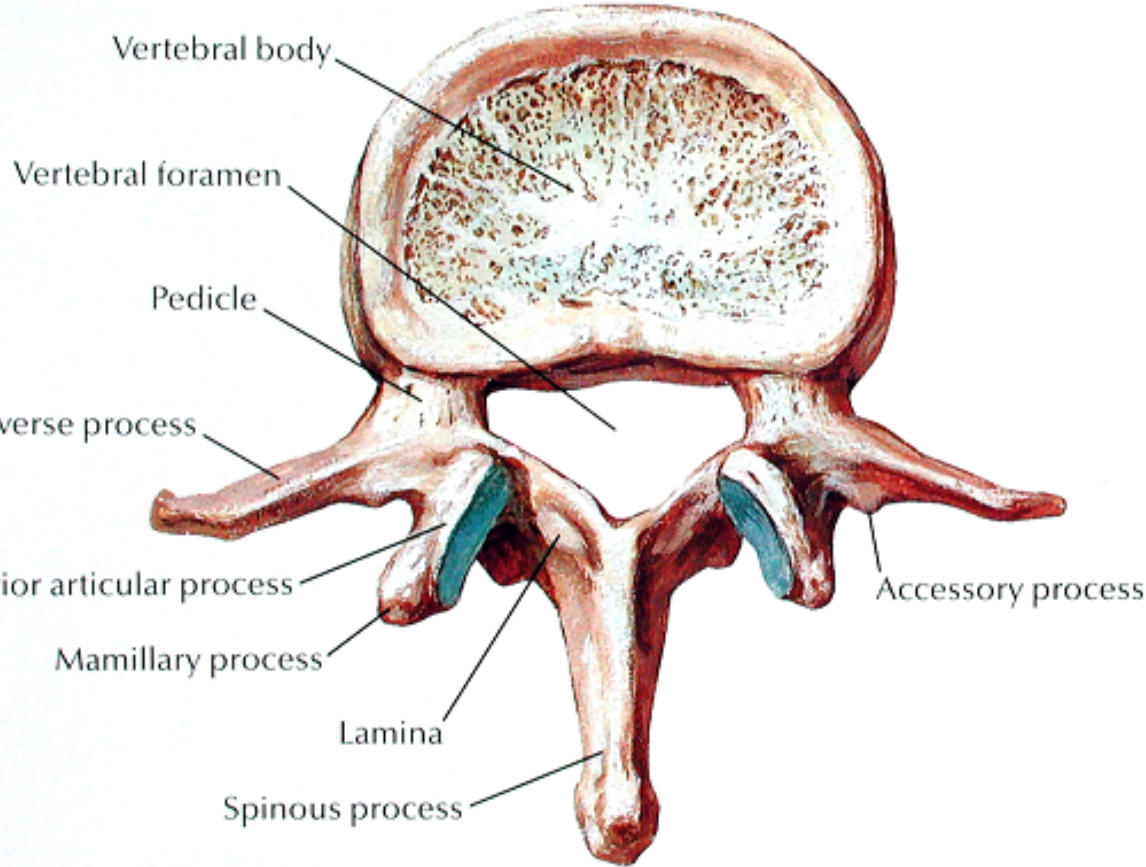
No costal facet on transverse process



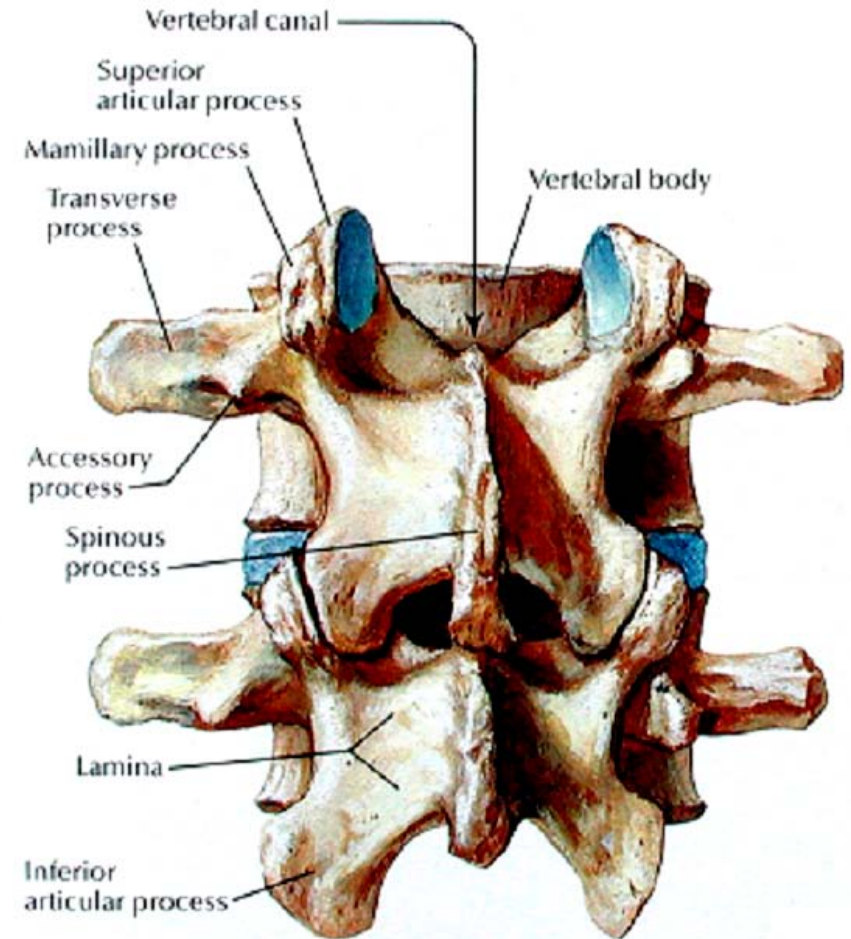
Lumbar vertebrae: typical L1-L4

- Massive body; Small, triangular canal
- Short, square spinous proc.; sup. facet: faces medially

Anterior



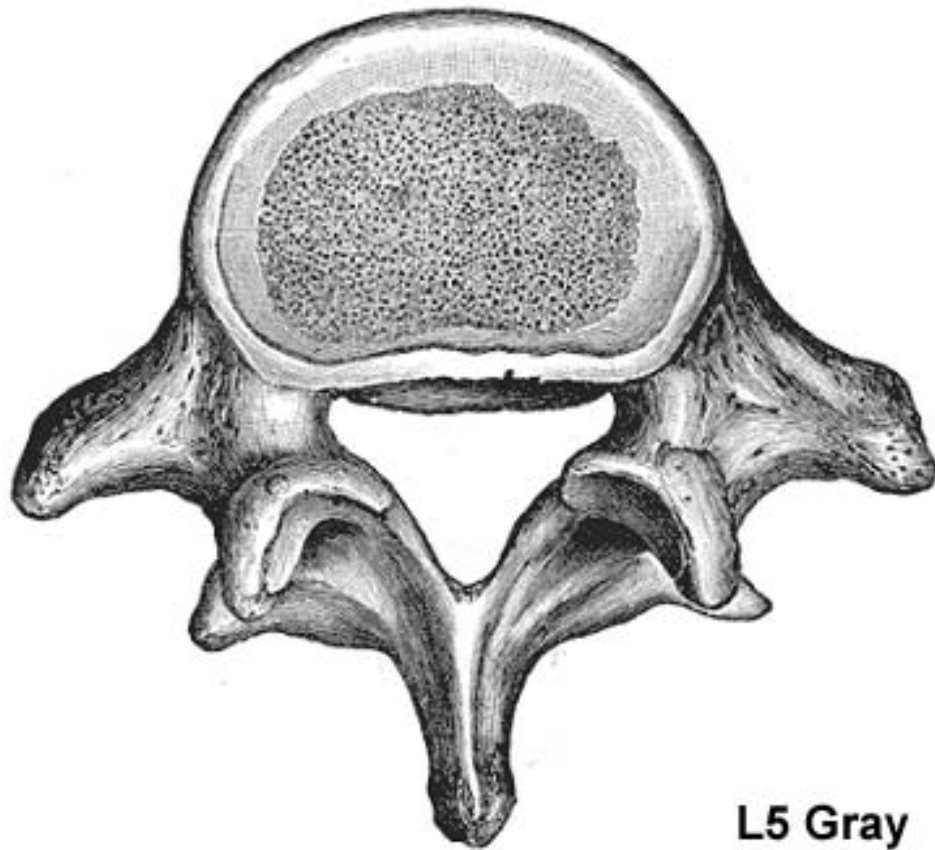
2nd lumbar vertebra:
superior view



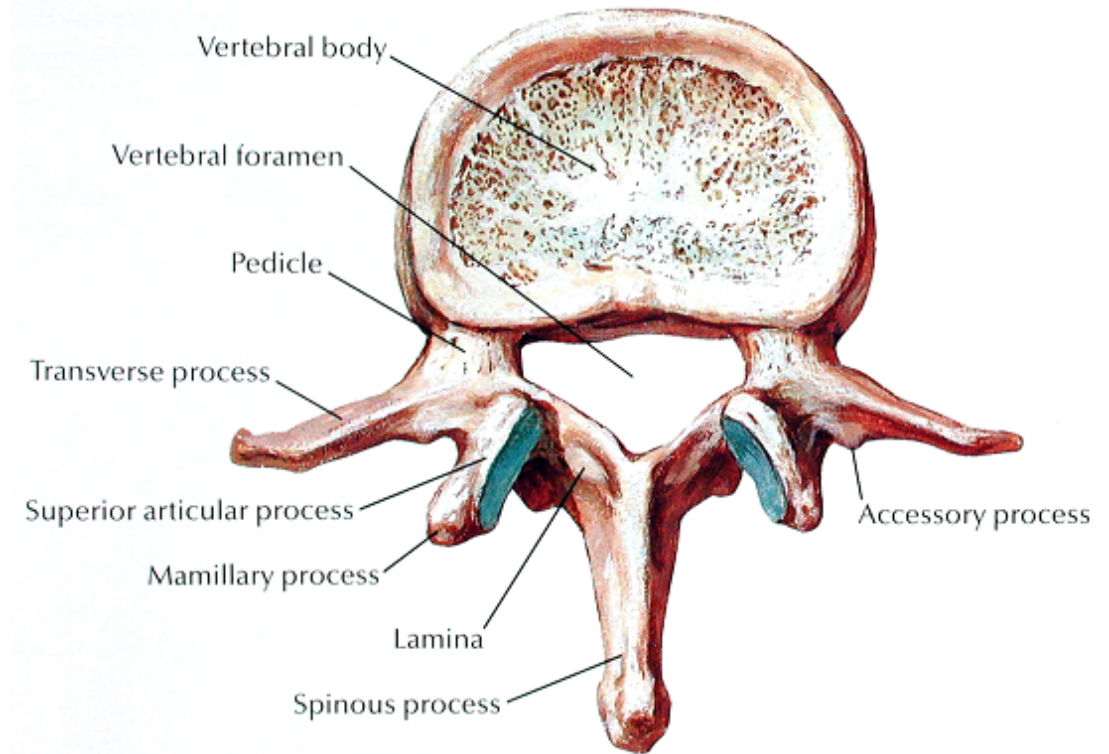
3rd and 4th lumbar vertebrae:
posterior view

Lumbar vertebra: L5

- body: deeper anteriorly than posteriorly; lordosis
- Short massive transverse proc.; attached by ilio-lumbar lig



L5 Gray



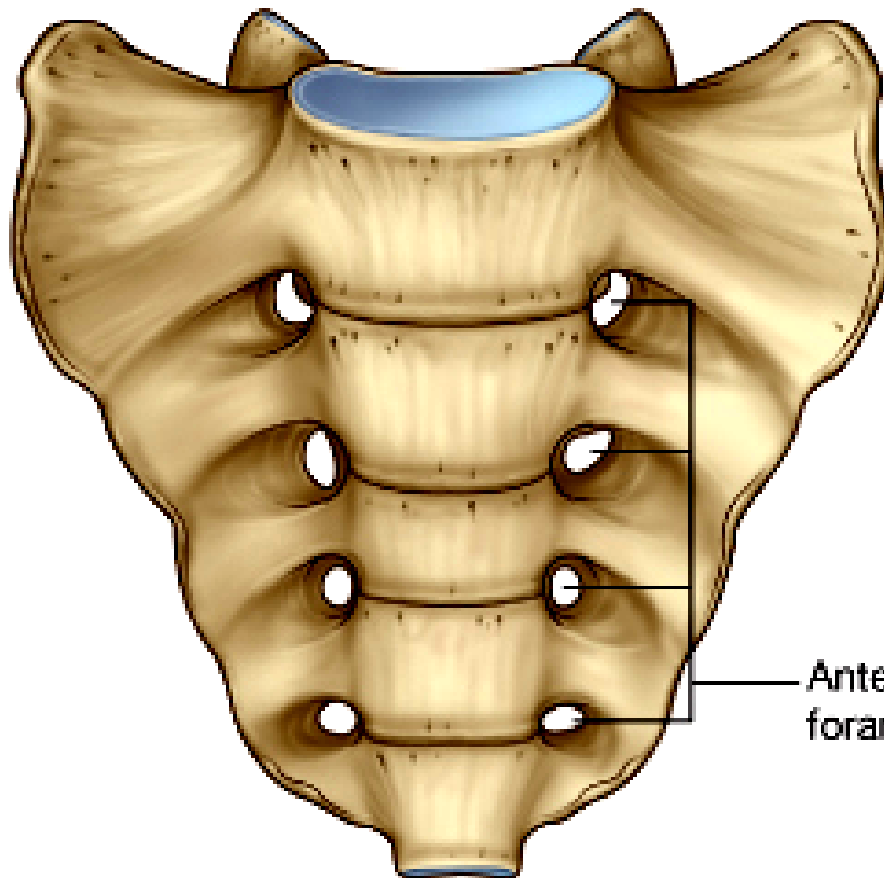
2nd lumbar vertebra:
superior view

Sacrum and Coccyx: Sacrum

- Sacrum (5)
- Transfer body weight from vertebrae to pelvis

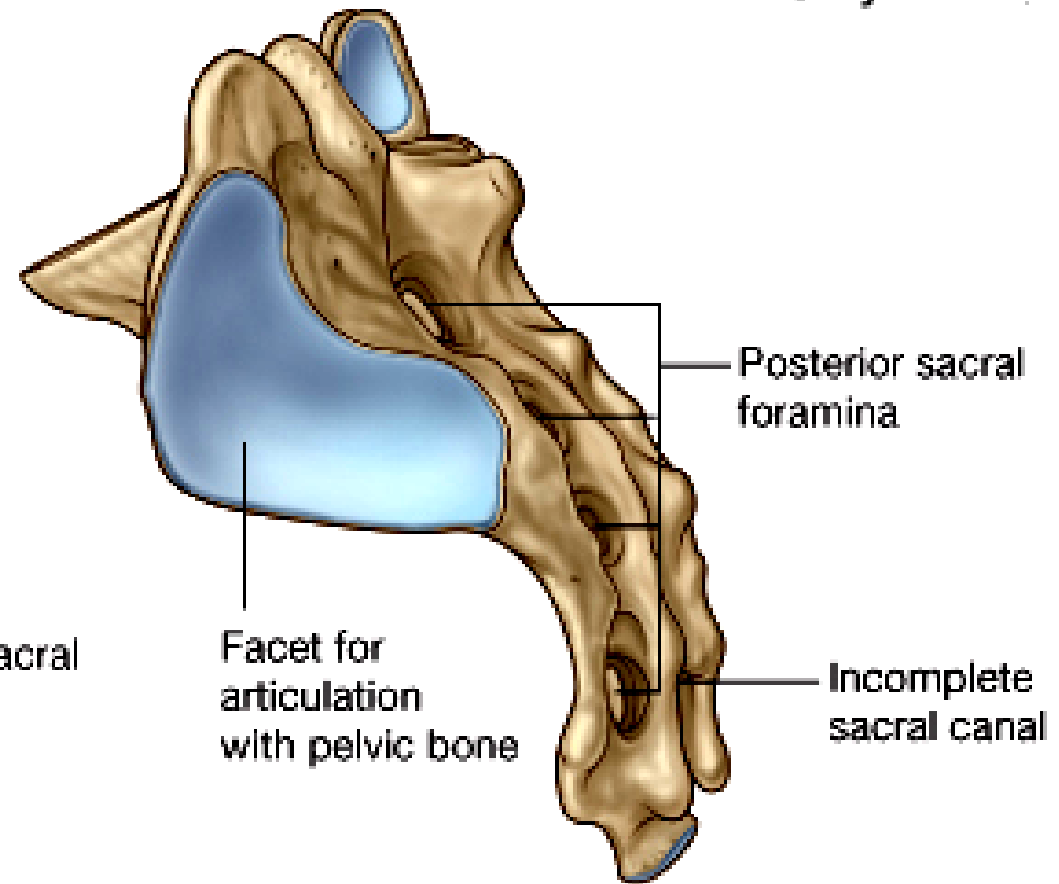
E

Gray 2-21 E



Anterior sacral foramina

Anterior view



Facet for articulation with pelvic bone

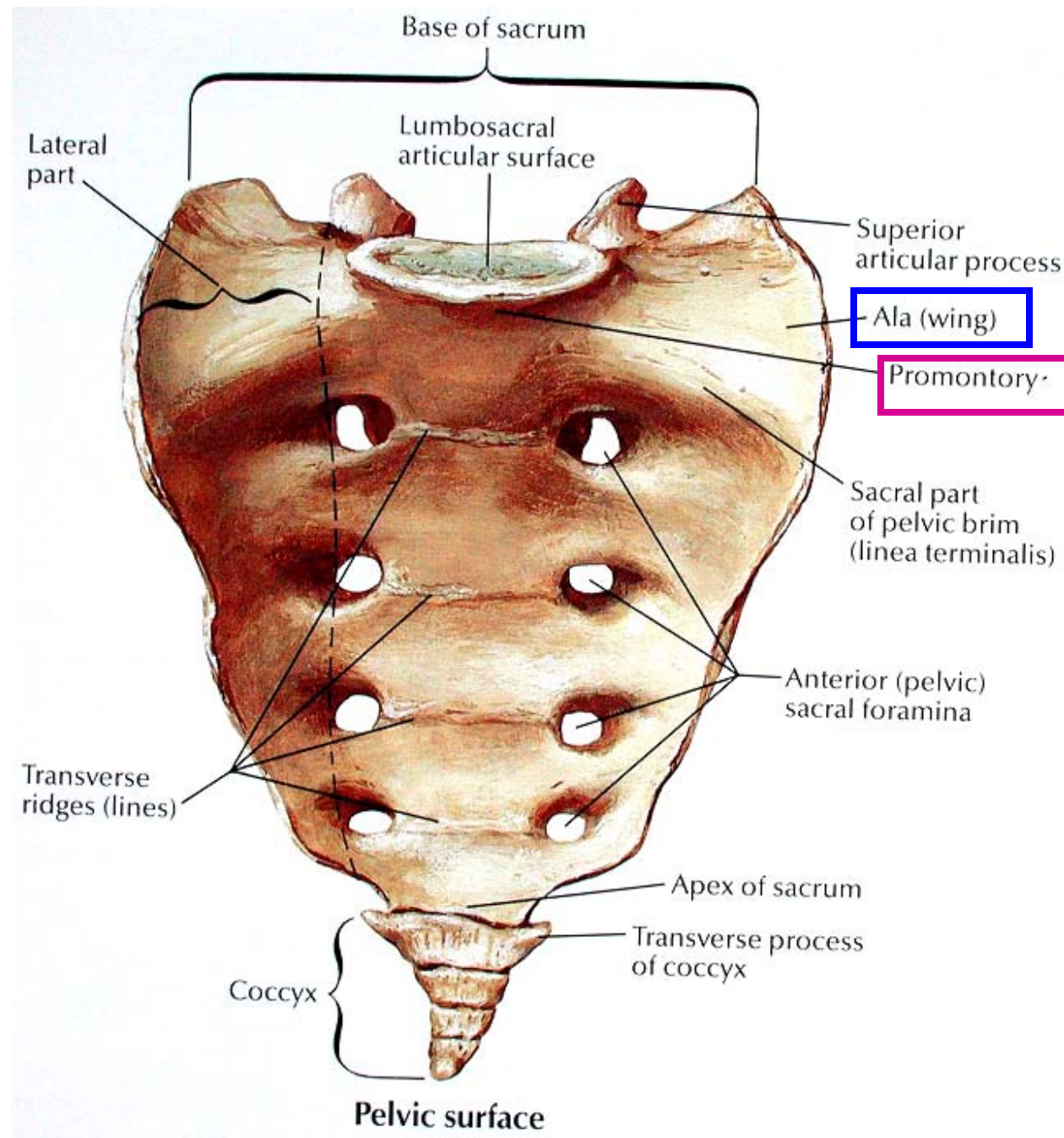
Posterior sacral foramina

Incomplete sacral canal

Dorsolateral view

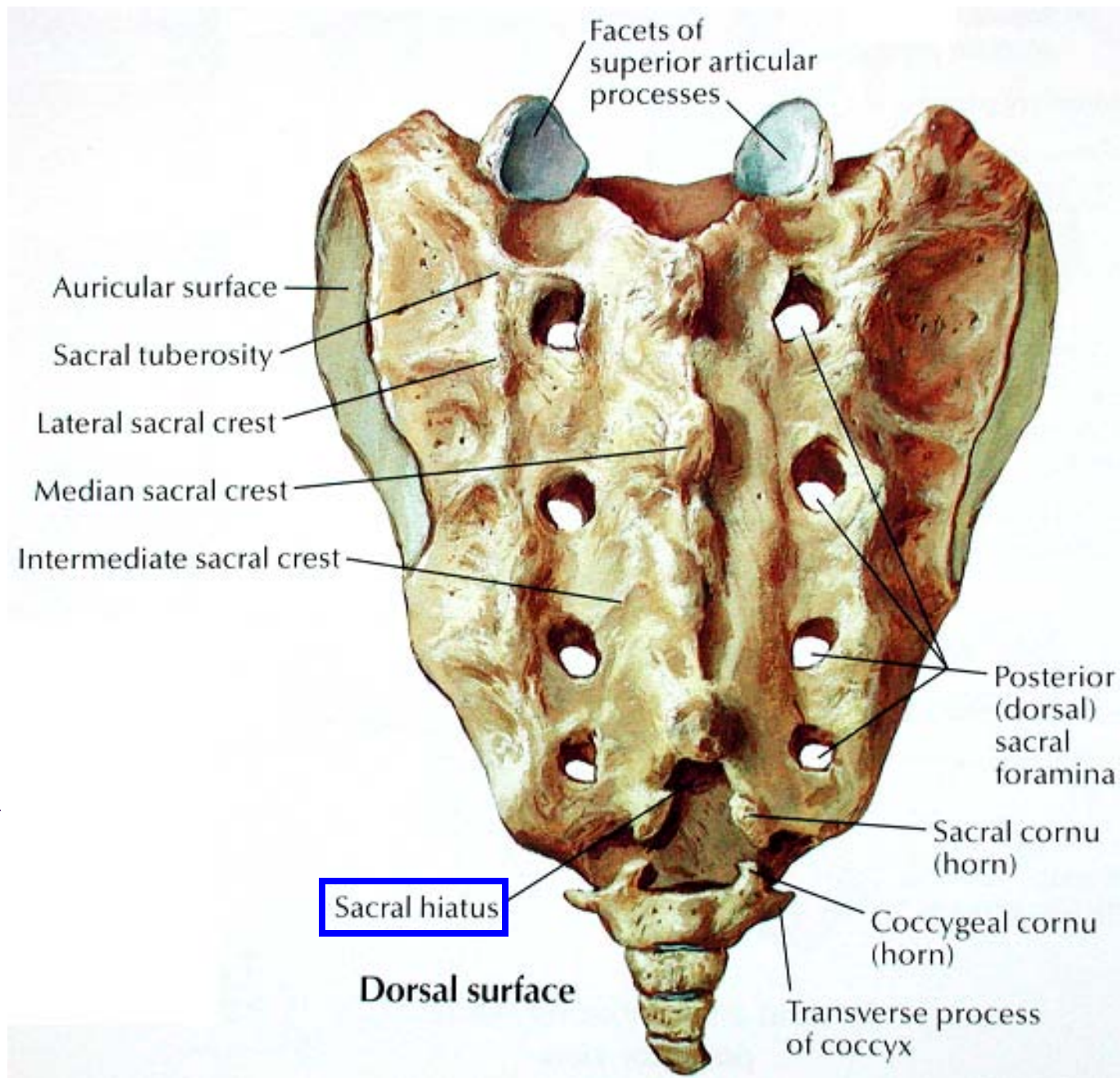
Sacrum: ant. surface

- Ala of sacrum
- Promontory
- Sacro-iliac joint: articular surface
- 4 ant. sacral foramina: S1-4 ant. primary rami



Sacrum: post. surface

- Sacral hiatus
- Median sacral crest
- Intermediate sacral crest
- Lateral sacral crest
- Post. sacral foramina



Coccyx

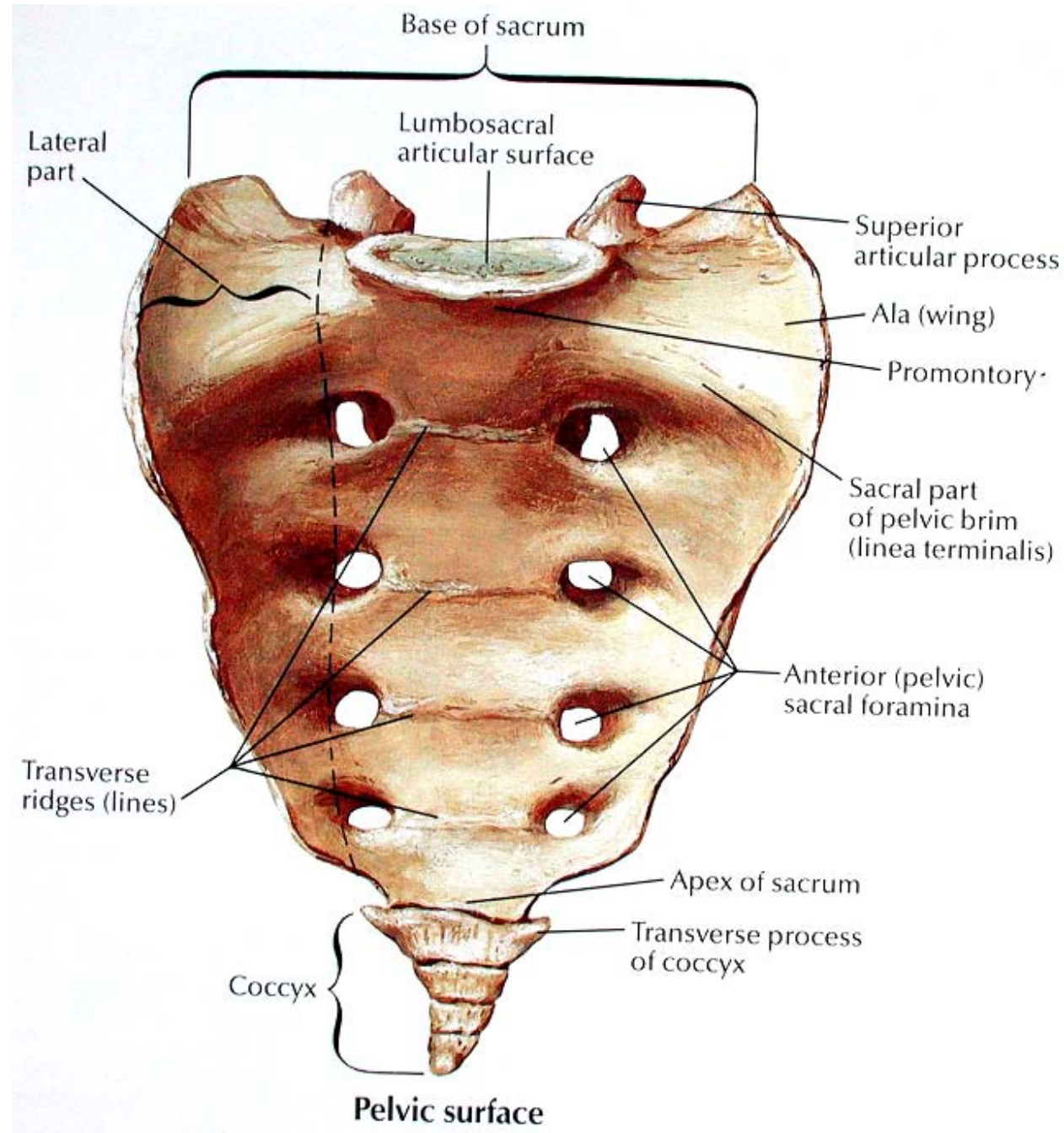
- Formed by 3-5 fused vertebrae

F Gray 2-21

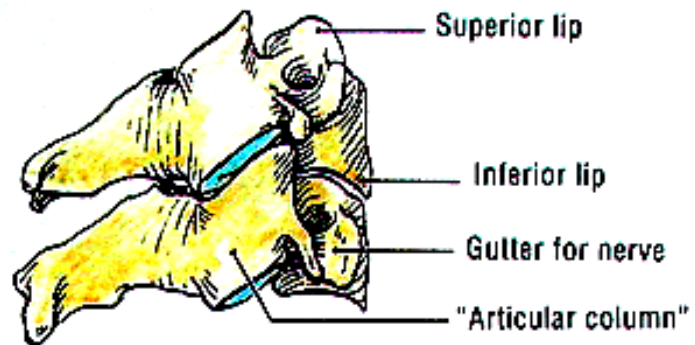
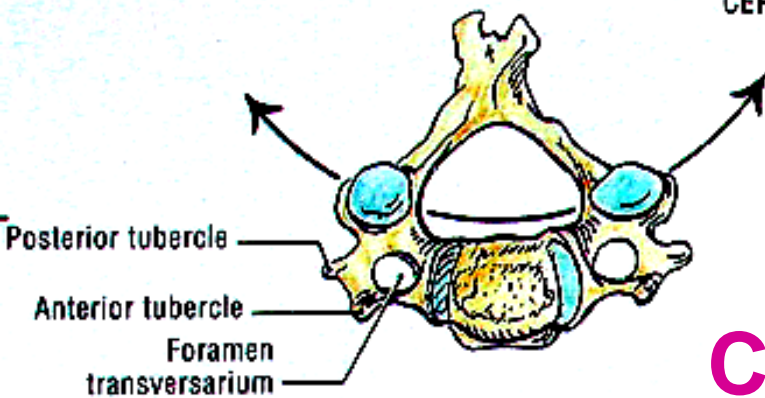
Coccygeal cornu



Posterior view

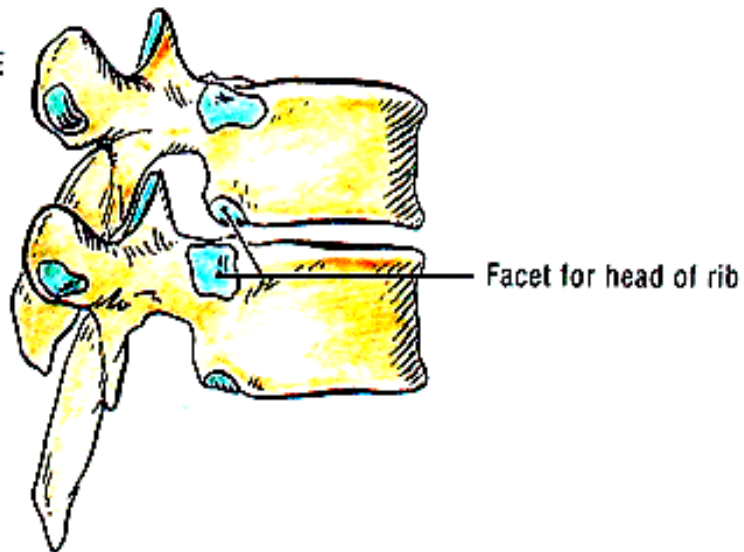
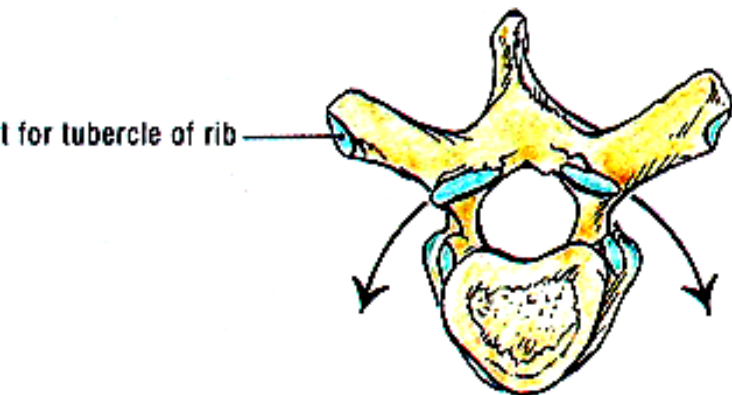


CERVICAL VERTEBRAE

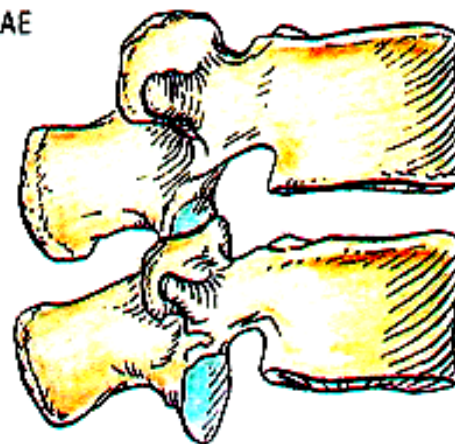
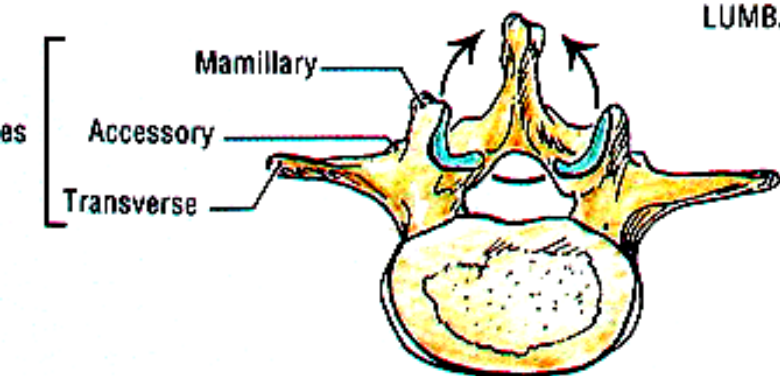


Comparison of vertebrae

THORACIC VERTEBRAE

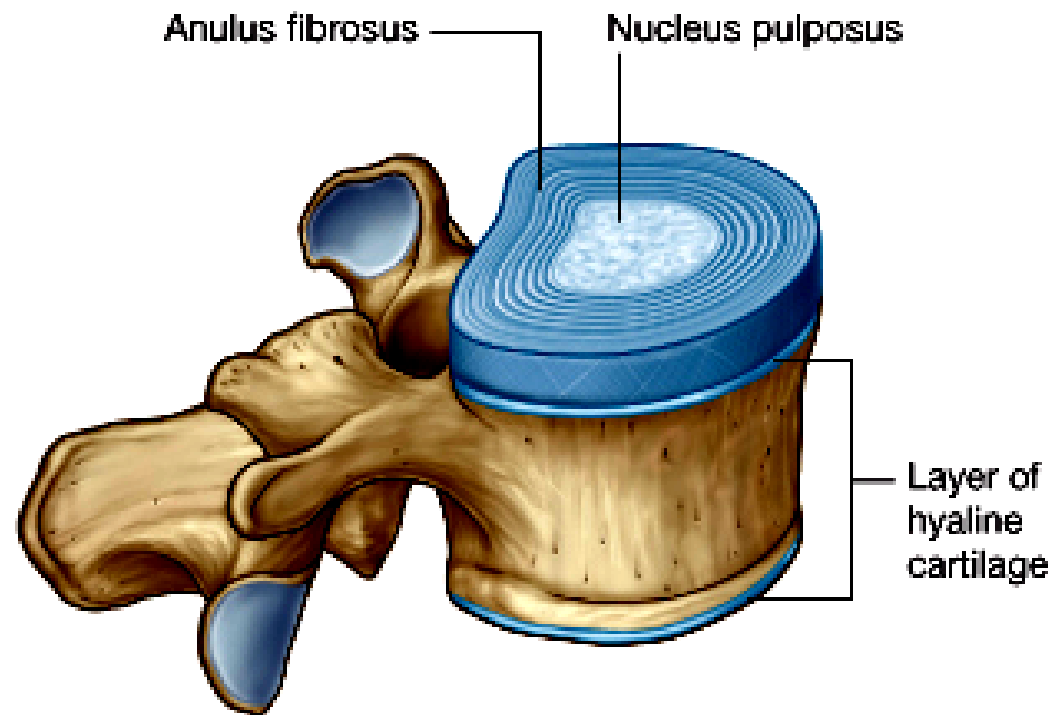
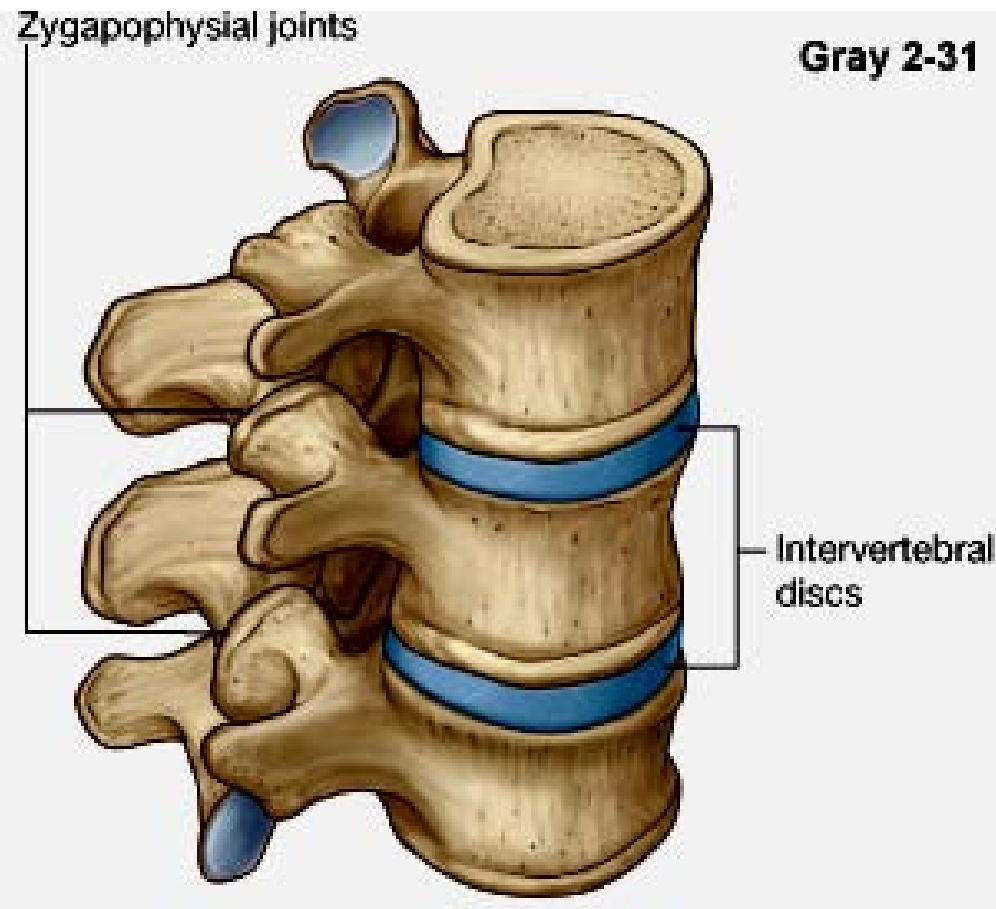


LUMBAR VERTEBRAE

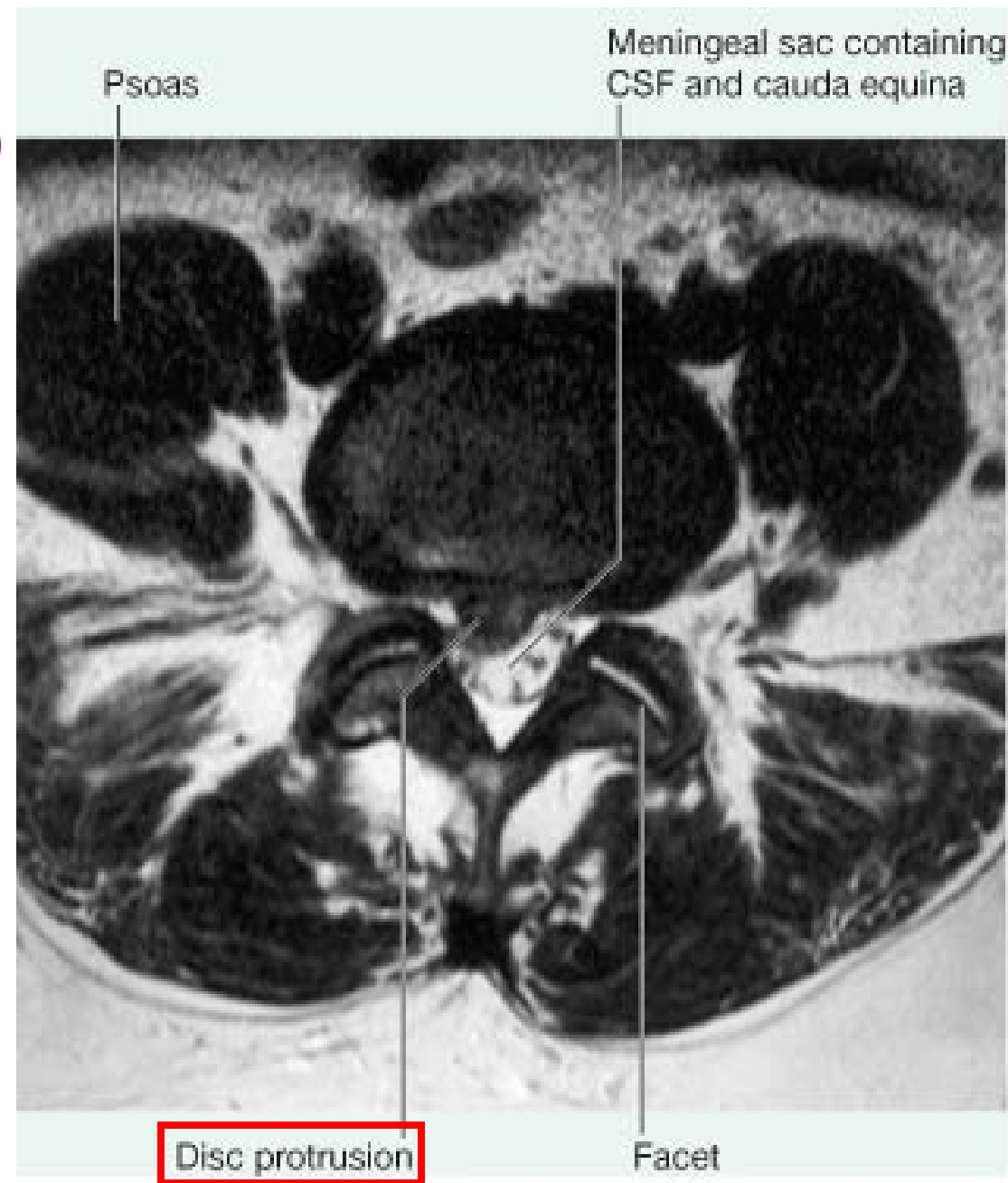


Intervertebral disc

- between bodies, cartilaginous joint
 - Annulus fibrosus (fibrocartilage) + nucleus pulposus

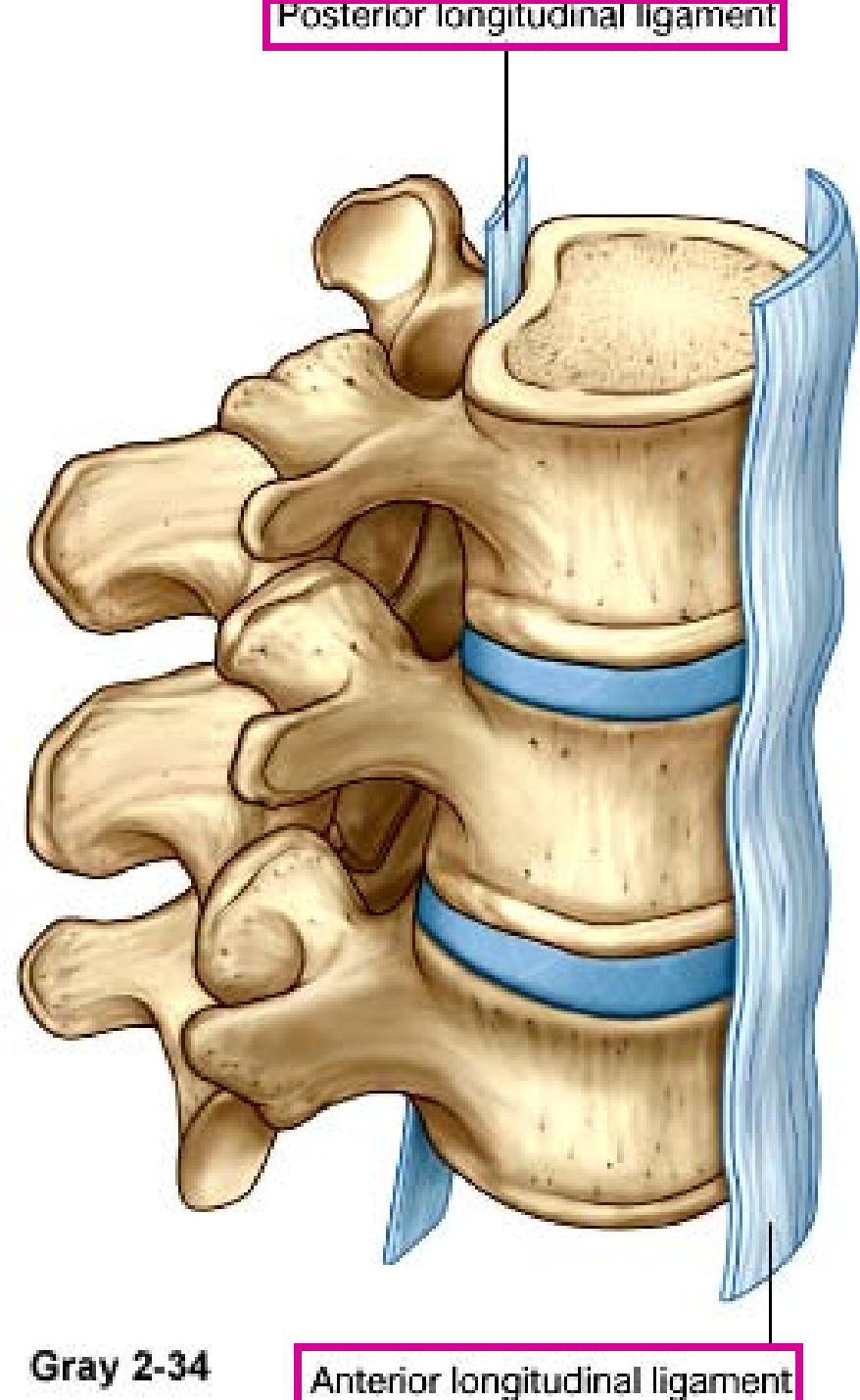


Herniation of intervertebral disc (HIVD)



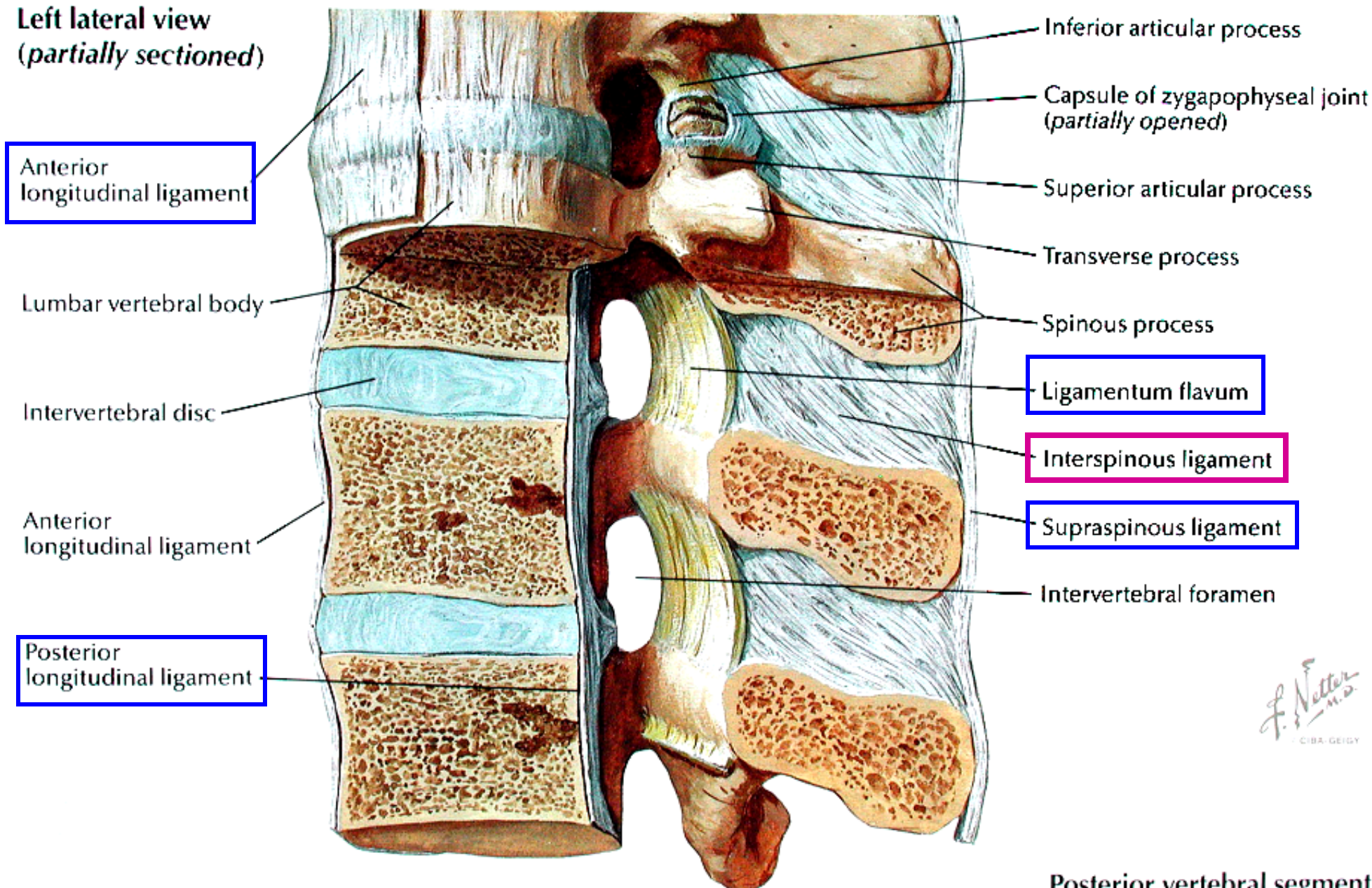
Lig. between adjacent vertebrae

- body
 - Ant. Longitudinal lig.
 - Post. Longitudinal lig.
- lamina
 - Ligmentum flavum
- Spinous proc
 - Interspinous lig.
 - Supraspinous lig.:
ligamentum nuchae of
cervical region



Interspinous ligament

Left lateral view
(partially sectioned)



F. Netter
M.D.
CIBA-GEIGY

Review on Vertebrae

- Common features of vertebrae
 - Characters of C, T, L, S vertebrae
 - Typical vs. Atypical vertebrae for different levels