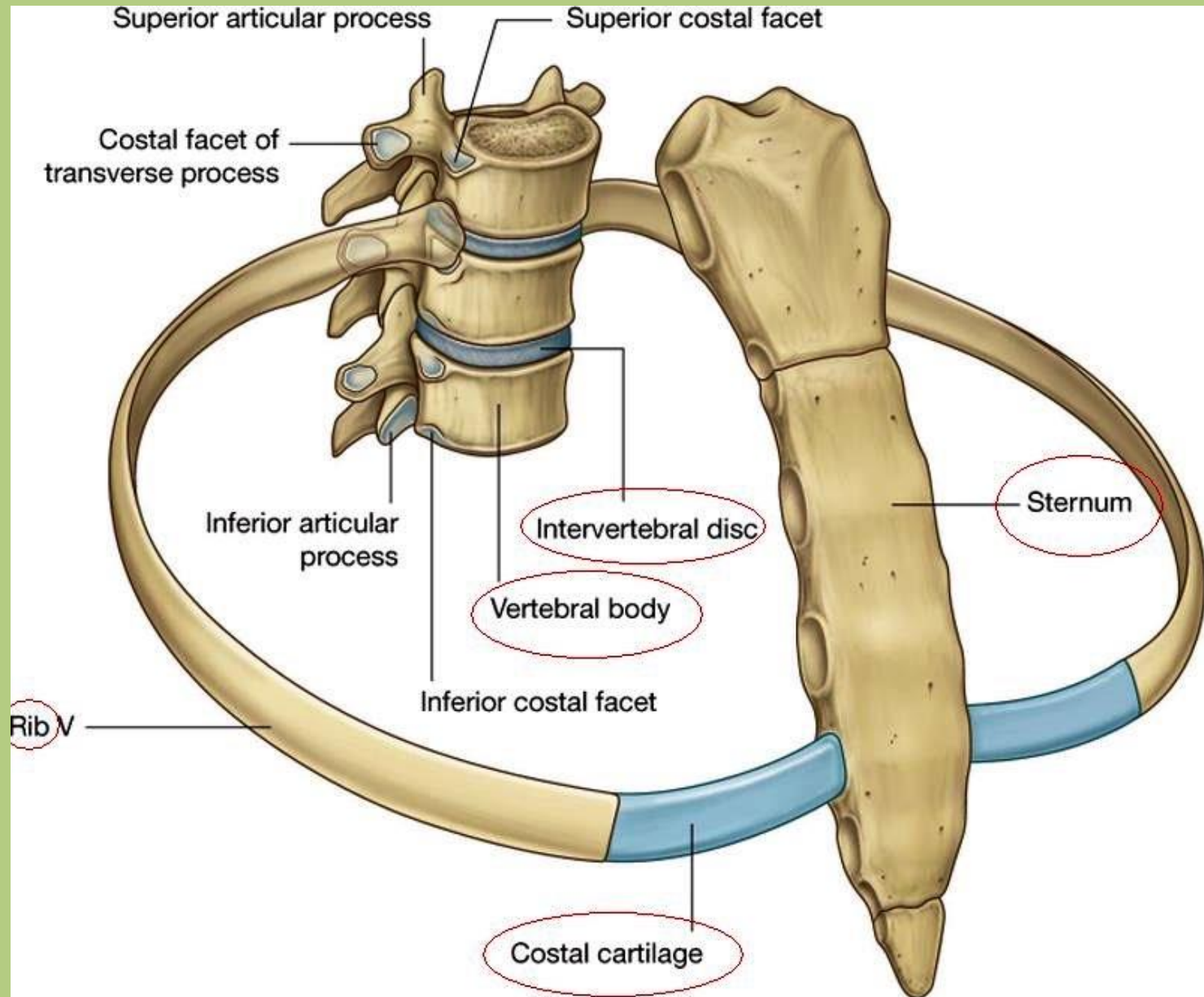




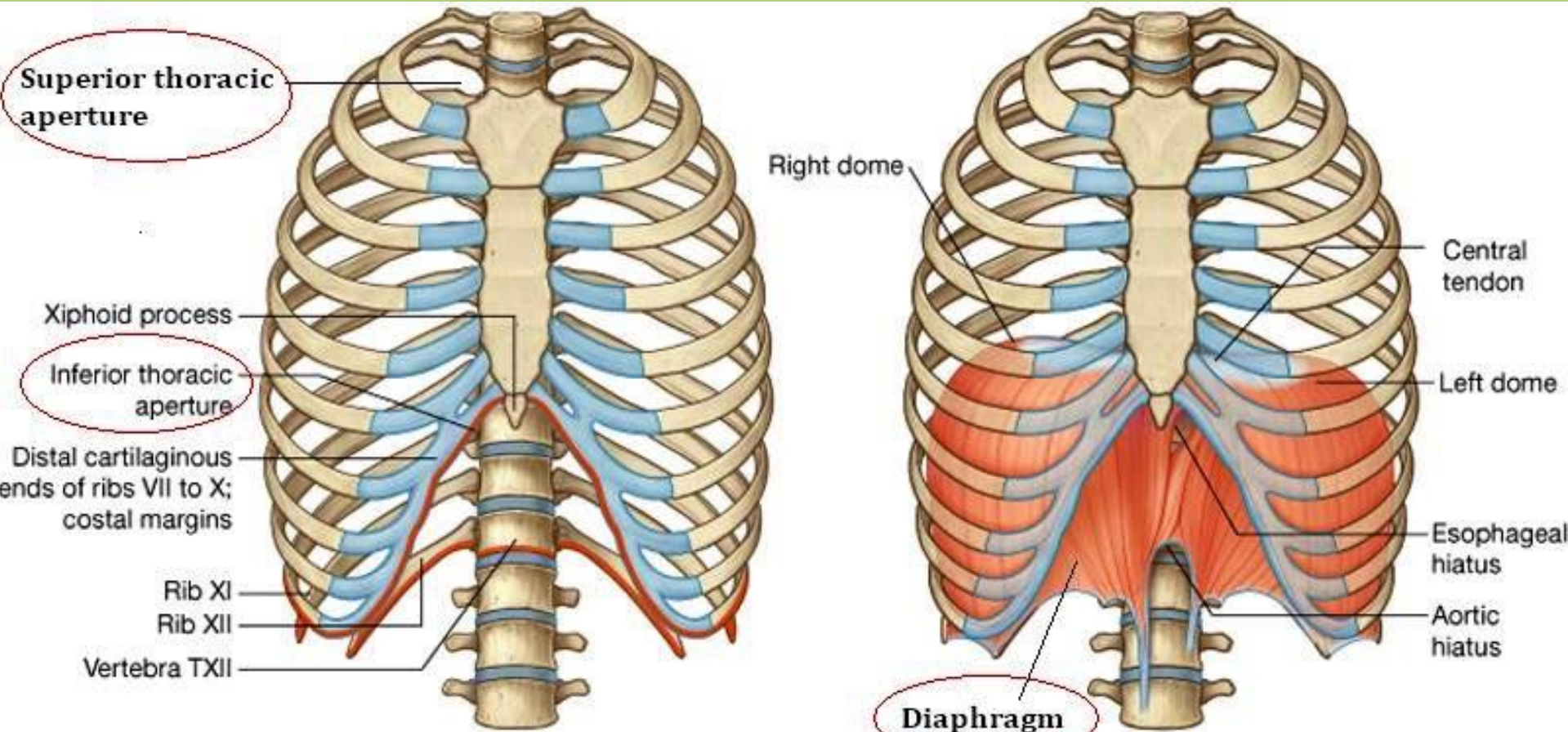
Chest cavity and respiratory muscles.
Bones of the lower limb.

Sándor Katz M.D., Ph.D.

Chest cavity - bony structures



Chest cavity- bony structures



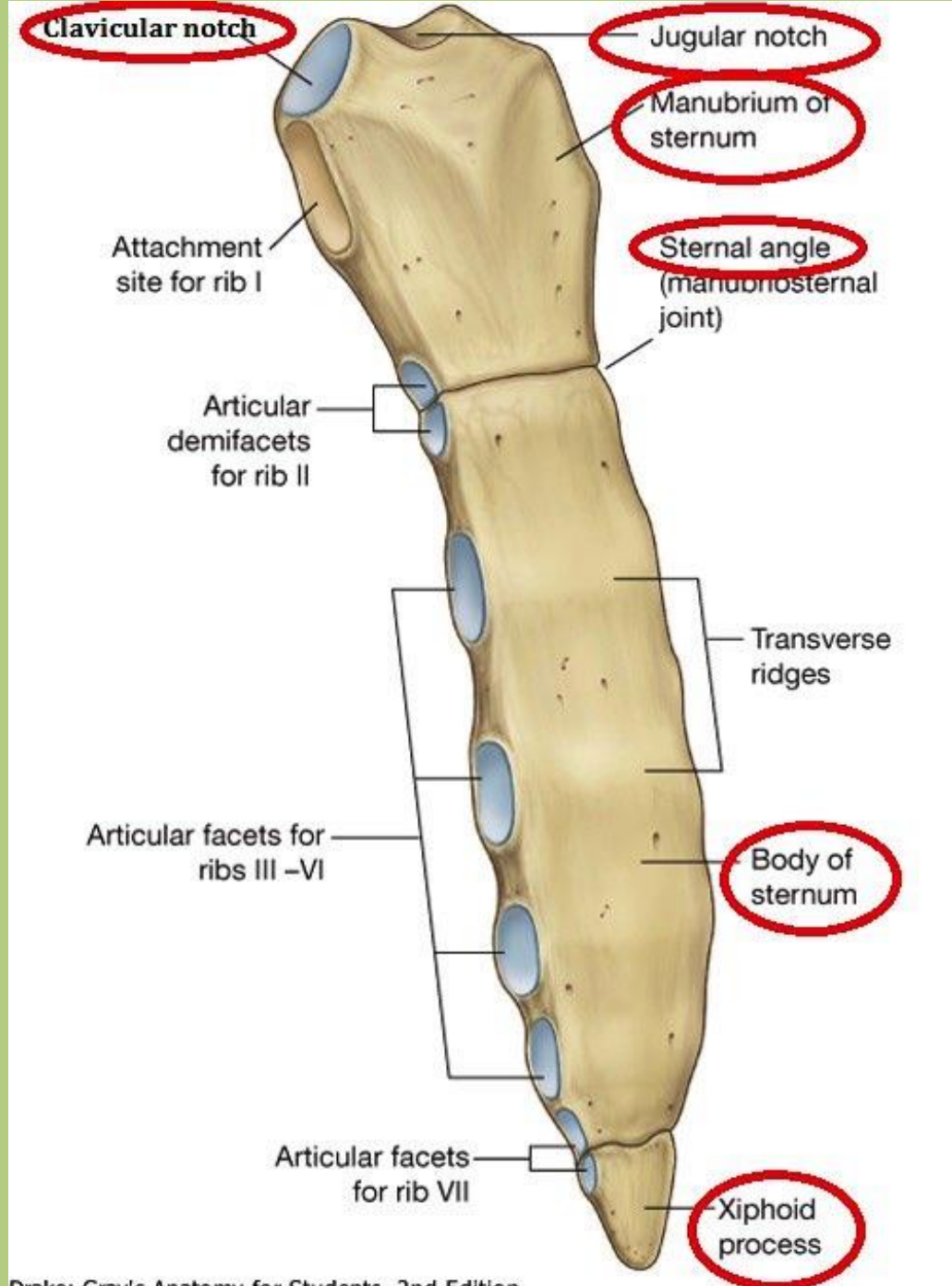
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Sternum

manubrium

body

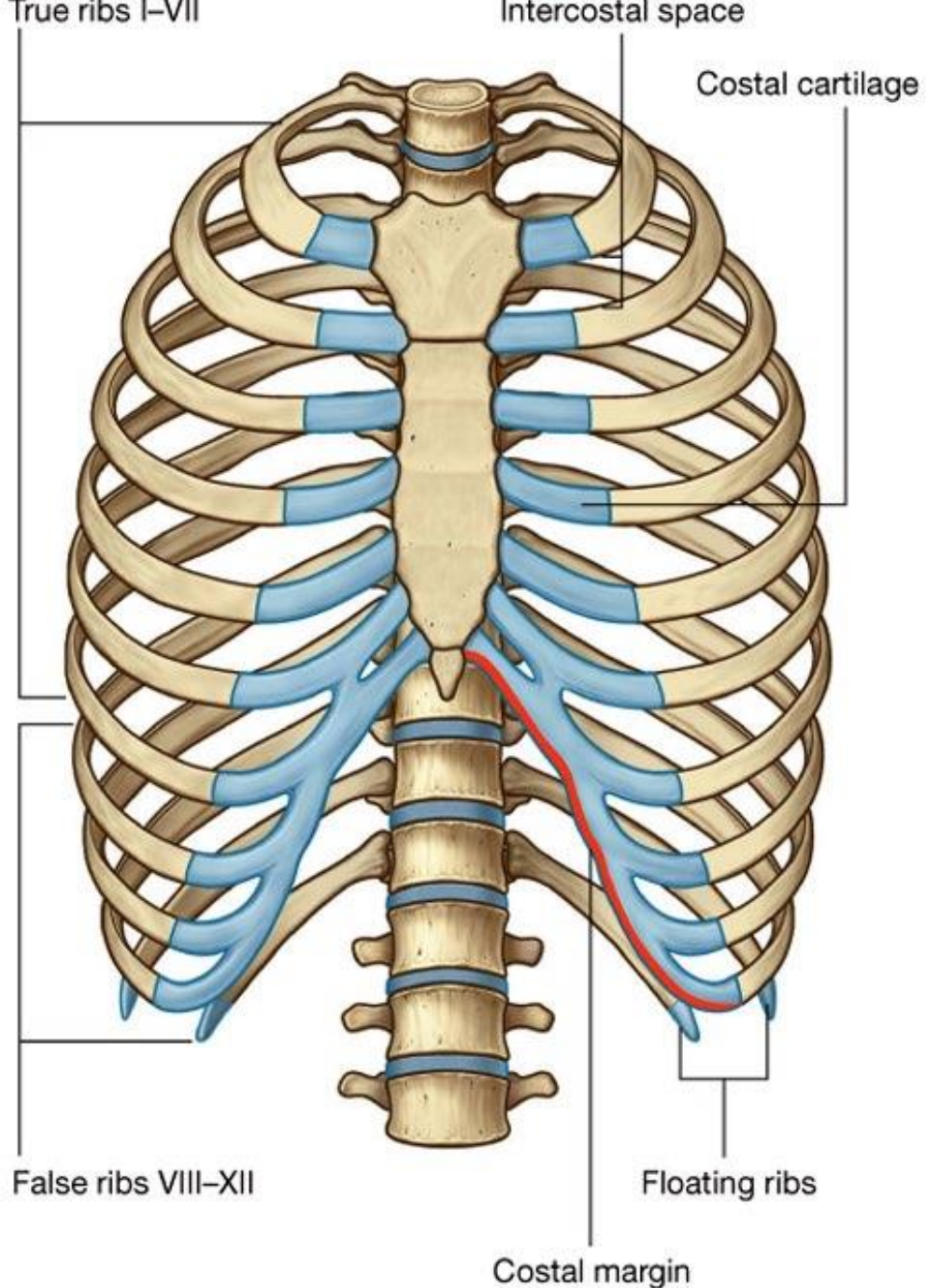
xiphoid process



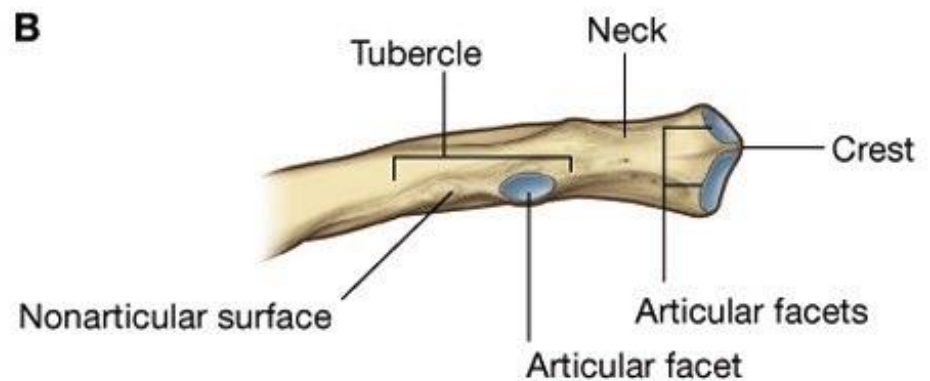
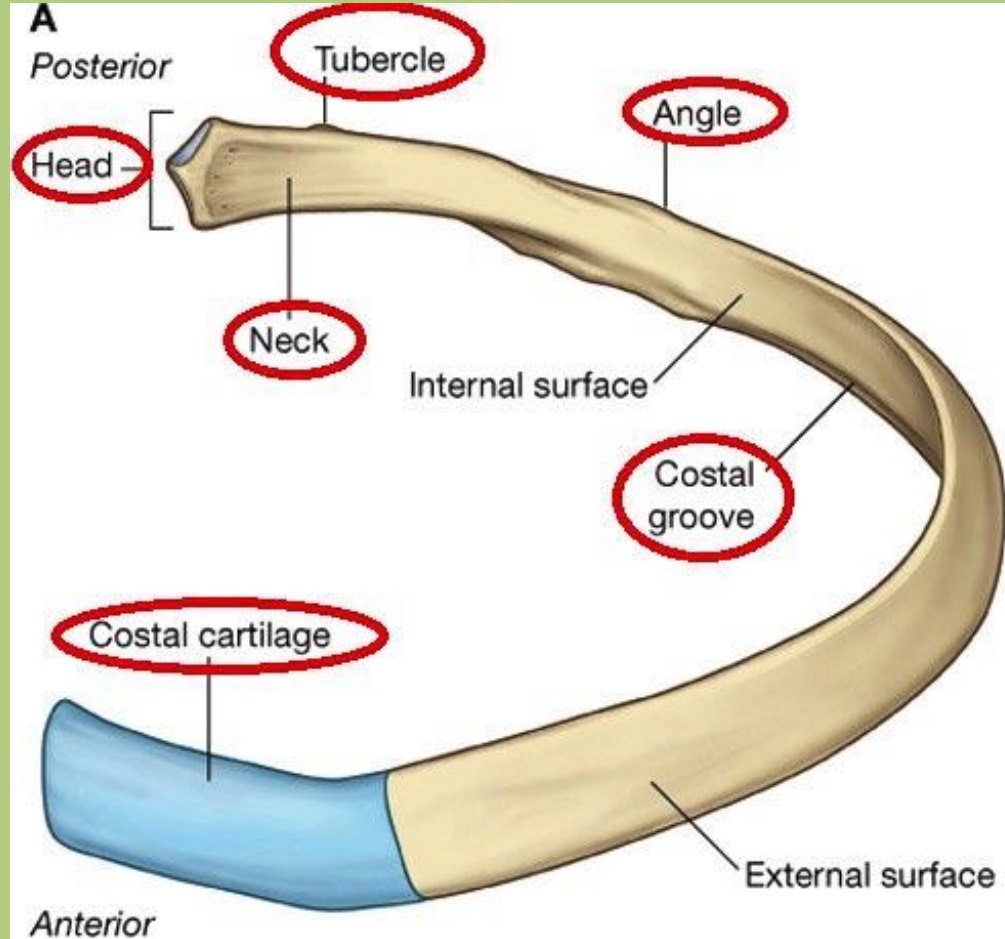
Ribs

True ribs: first seven pairs connect to the sternum directly by costal cartilages.

False ribs: remaining five pairs connect to the sternum indirectly, forming costal arch.
Last two pairs: *floating ribs*.

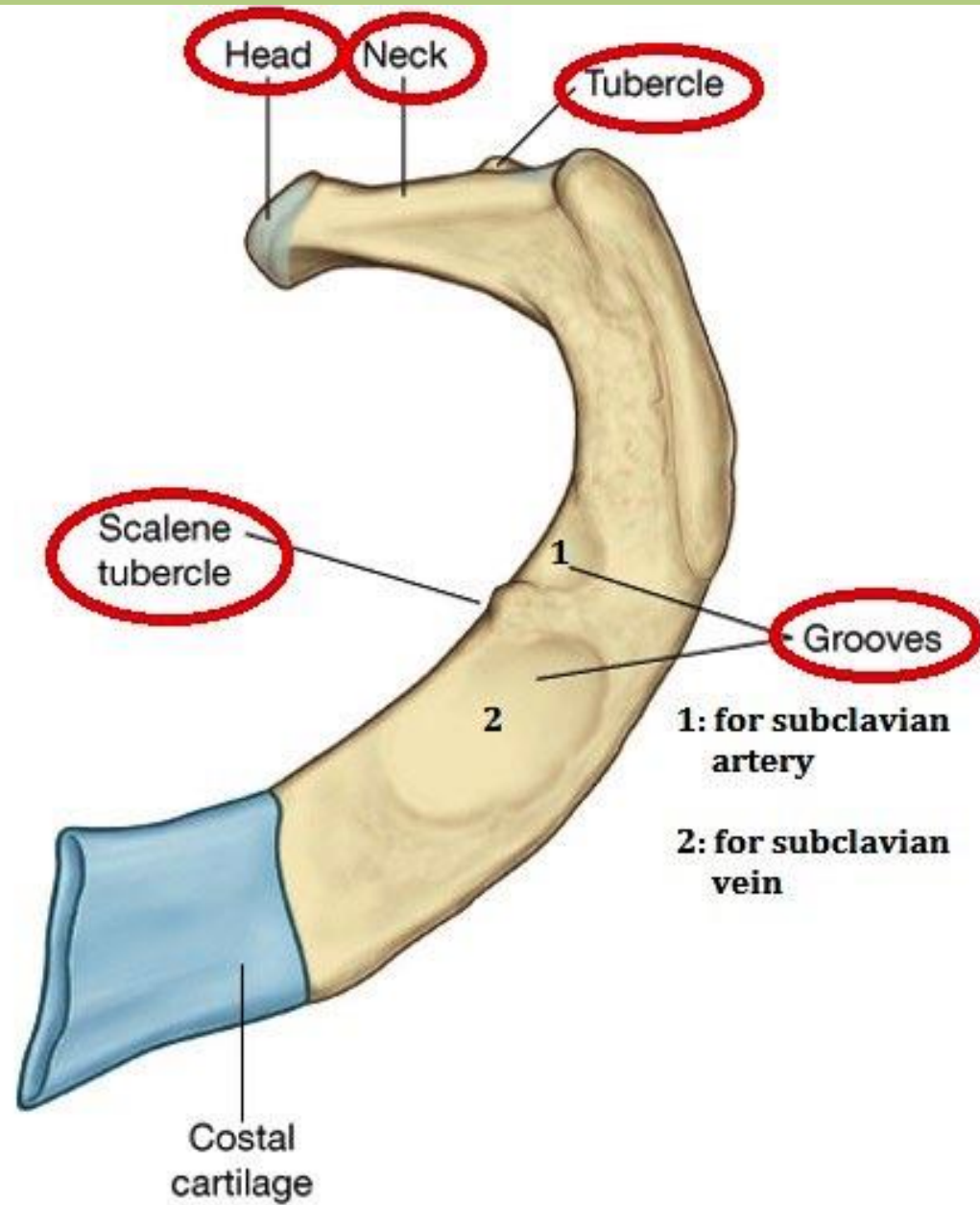


General features of ribs



I. rib

Rib I



Respiratory muscles

- **Intercostal muscles**
- **Diaphragm**
- **Accessory muscles**

Intercostal muscles

External intercostal muscles:

Arise from the lower border of the ribs and *insert on the upper border of the ribs below*.

Function:

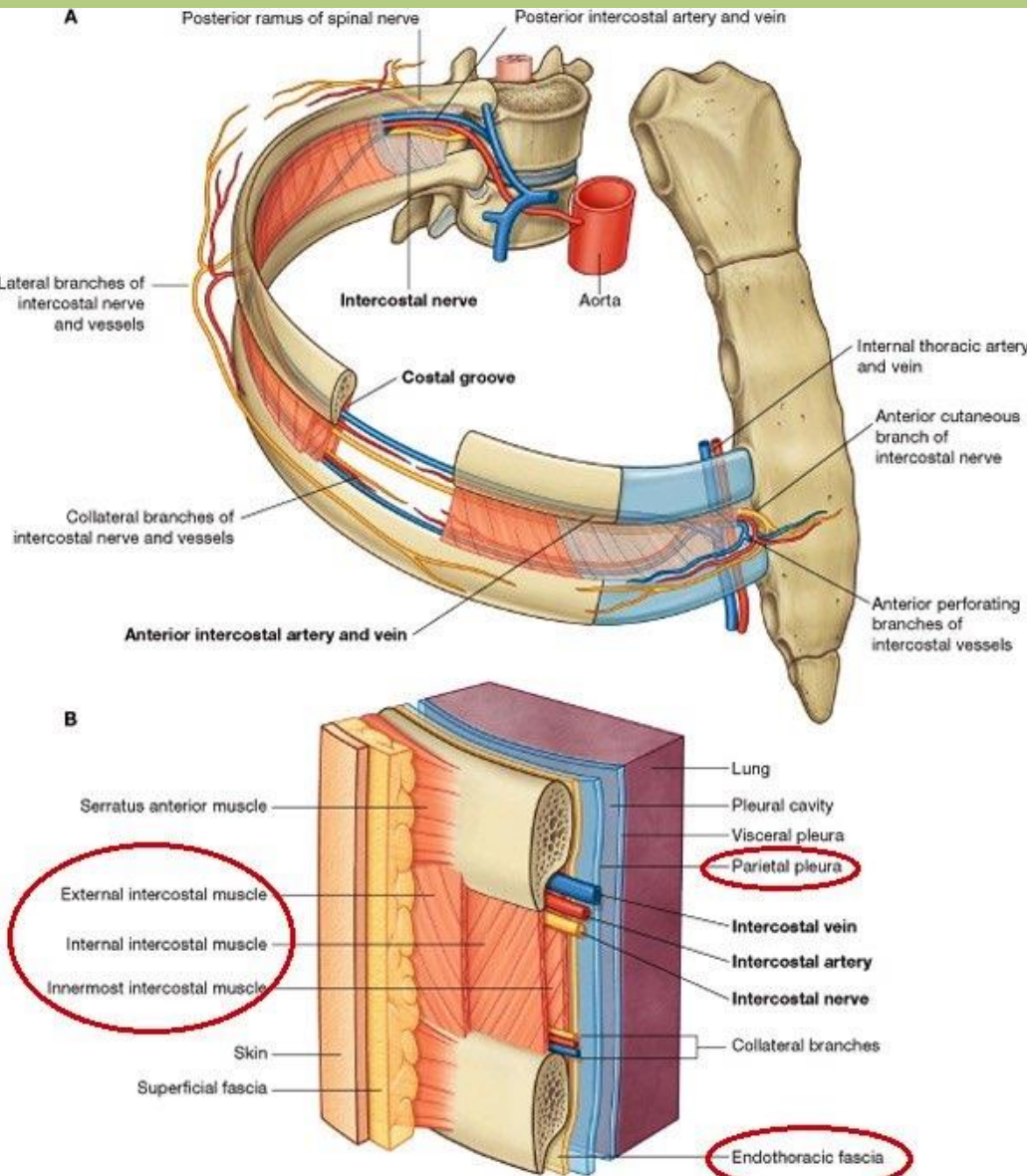
Elevation of the ribs, they reinforce the intercostal space during the deep inspiration.

Internal intercostal muscles:

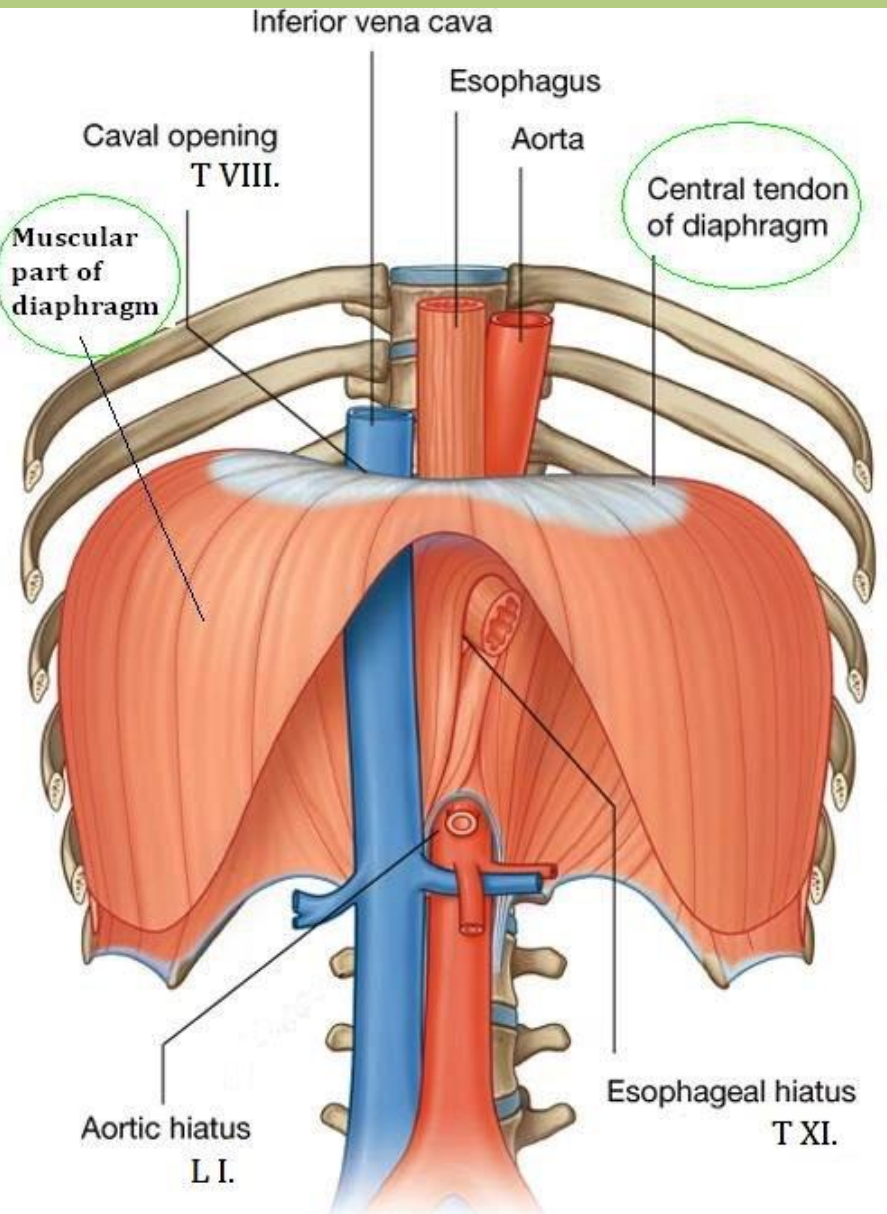
Arise from the ridge of the inner surface of ribs and *insert on the inferior border of the ribs above*.

Function:

Depression of the ribs, they reinforce the intercostal space during the deep expiration.



Diaphragm - (inspiration)



CENTRAL TENDON

Caval hiatus for the inferior vena cava - T8

MUSCULAR PART:

- **Sternal part**

Superior epigastric vessels

- **Costal part**

- **Lumbar part:**

Left and right crus, and both have medial and lateral parts.

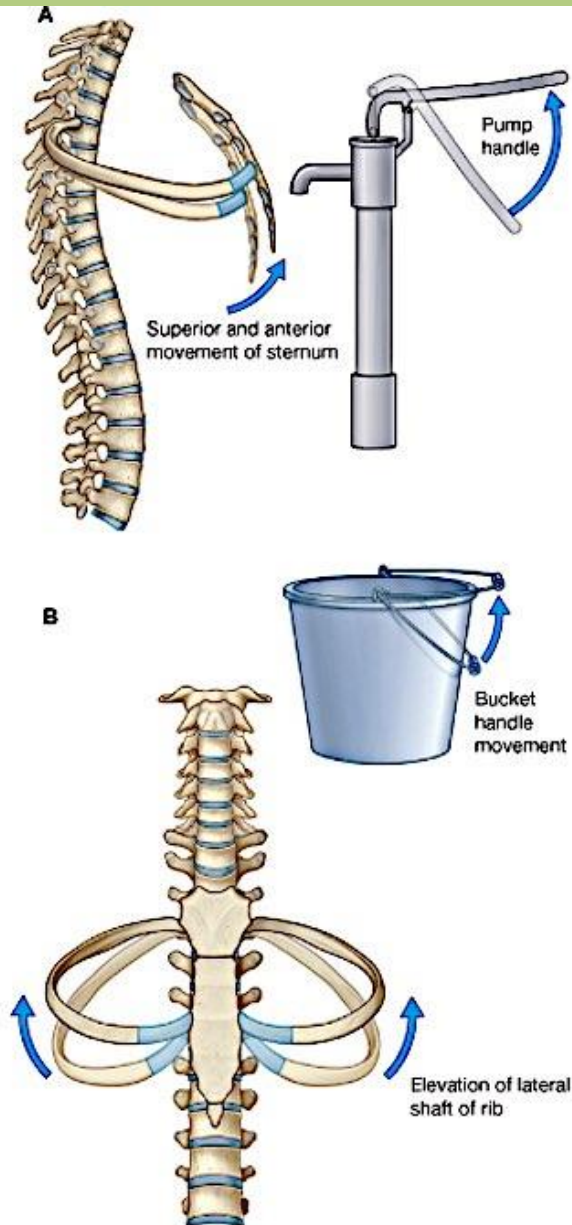
Esophageal hiatus for the esophagus - T10-11

Aortic hiatus for the aorta and thoracic duct - T12-L1

No hiatus for the azygos, hemiazygos veins, sympathetic trunk and greater and lesser splanchnic nerves - L2

Innervation: phrenic nerves

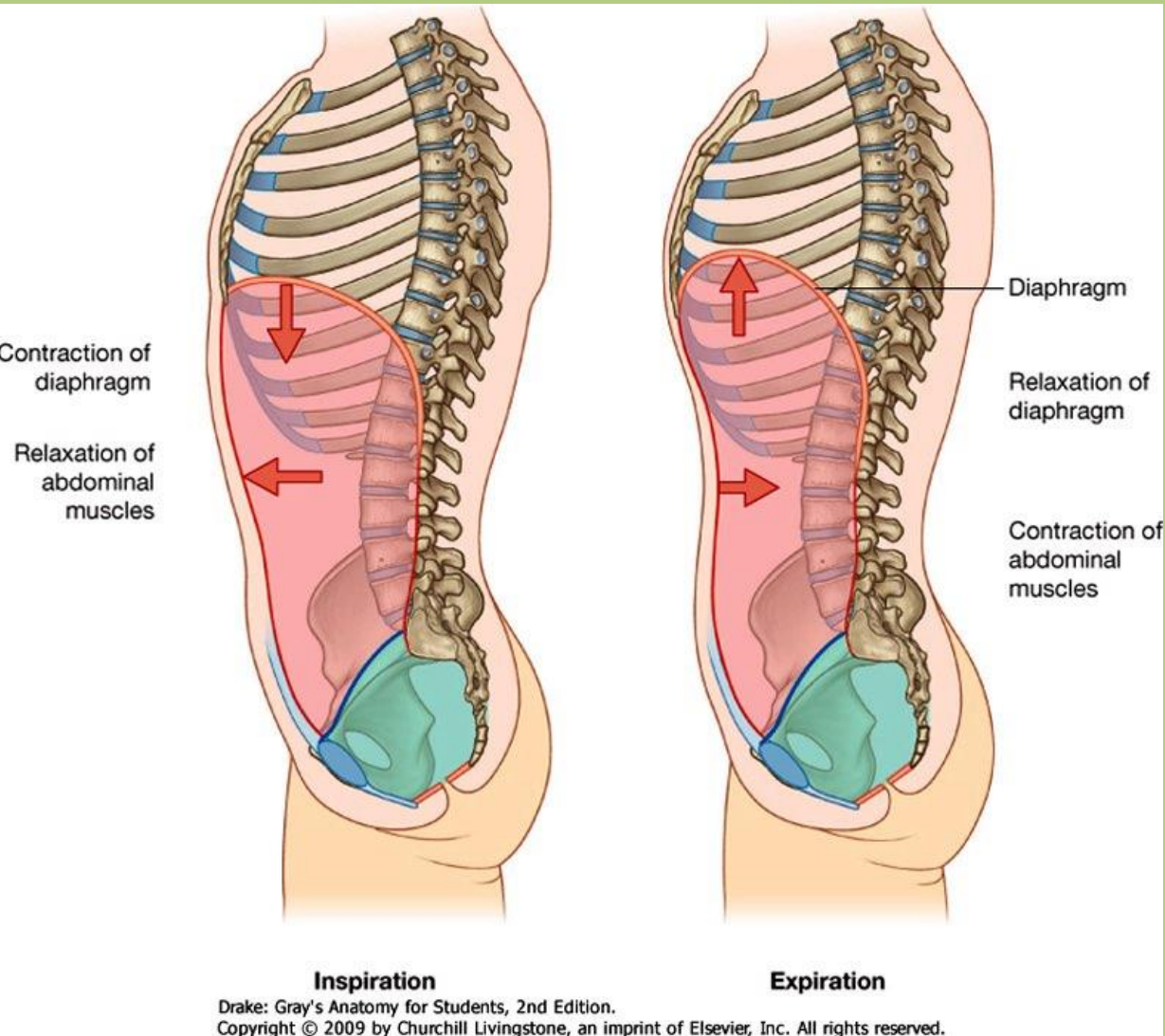
Movements of the thoracic wall during breathing



A: ***Pump handle*** movement of ribs and sternum - ***superior and anterior movement***.

B: ***Bucket handle*** movement of ribs - ***elevation of ribs***.

Accessory respiratory muscles

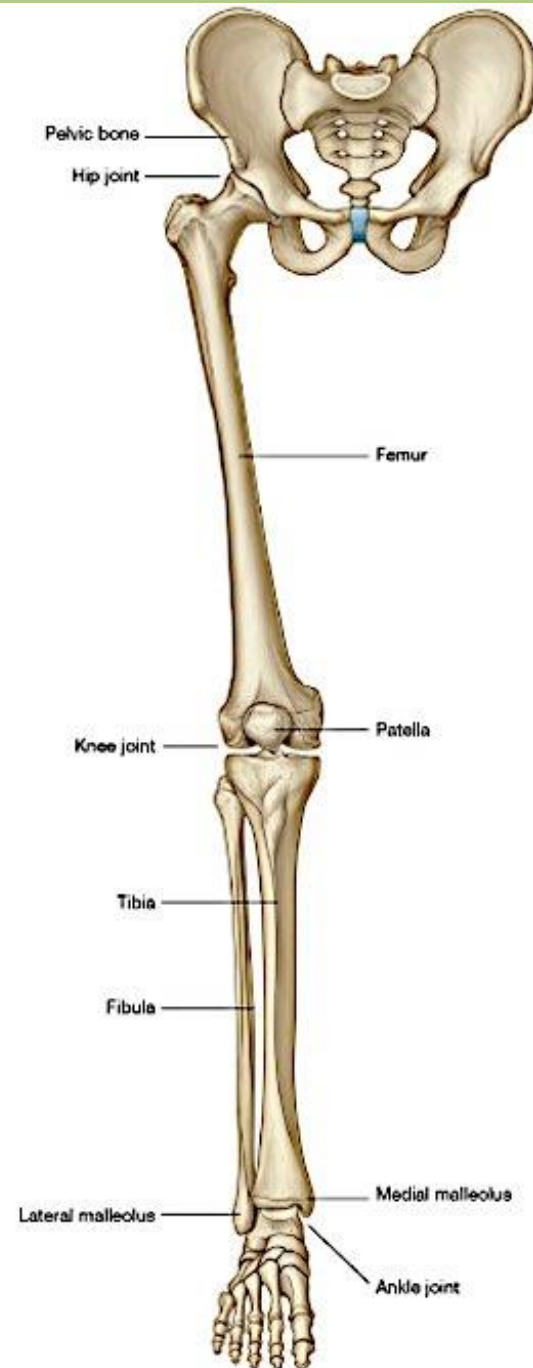


Inspiration: scalene muscles and sternocleidomastoid.

Expiration: abdominal muscles.

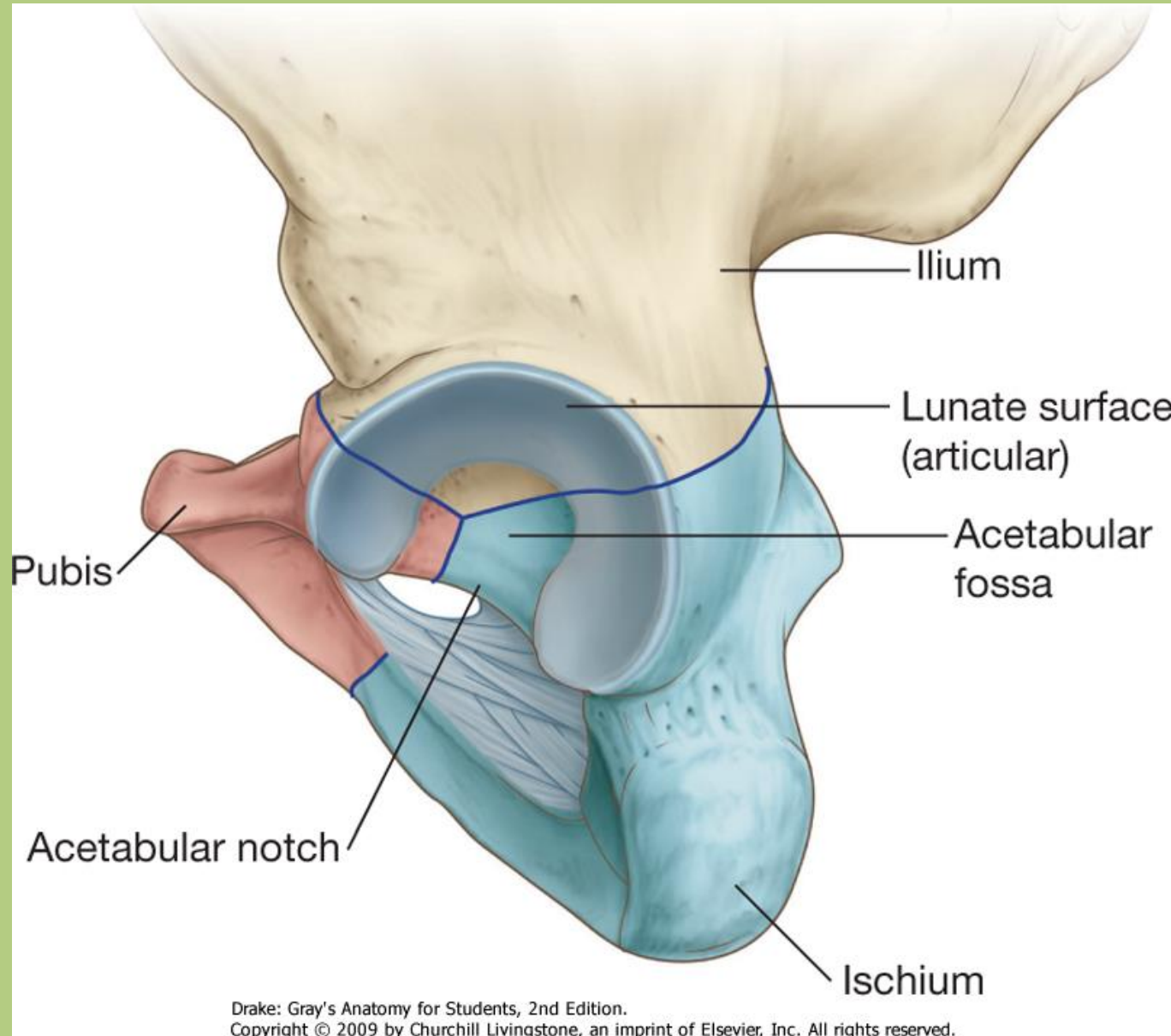
Lower limb

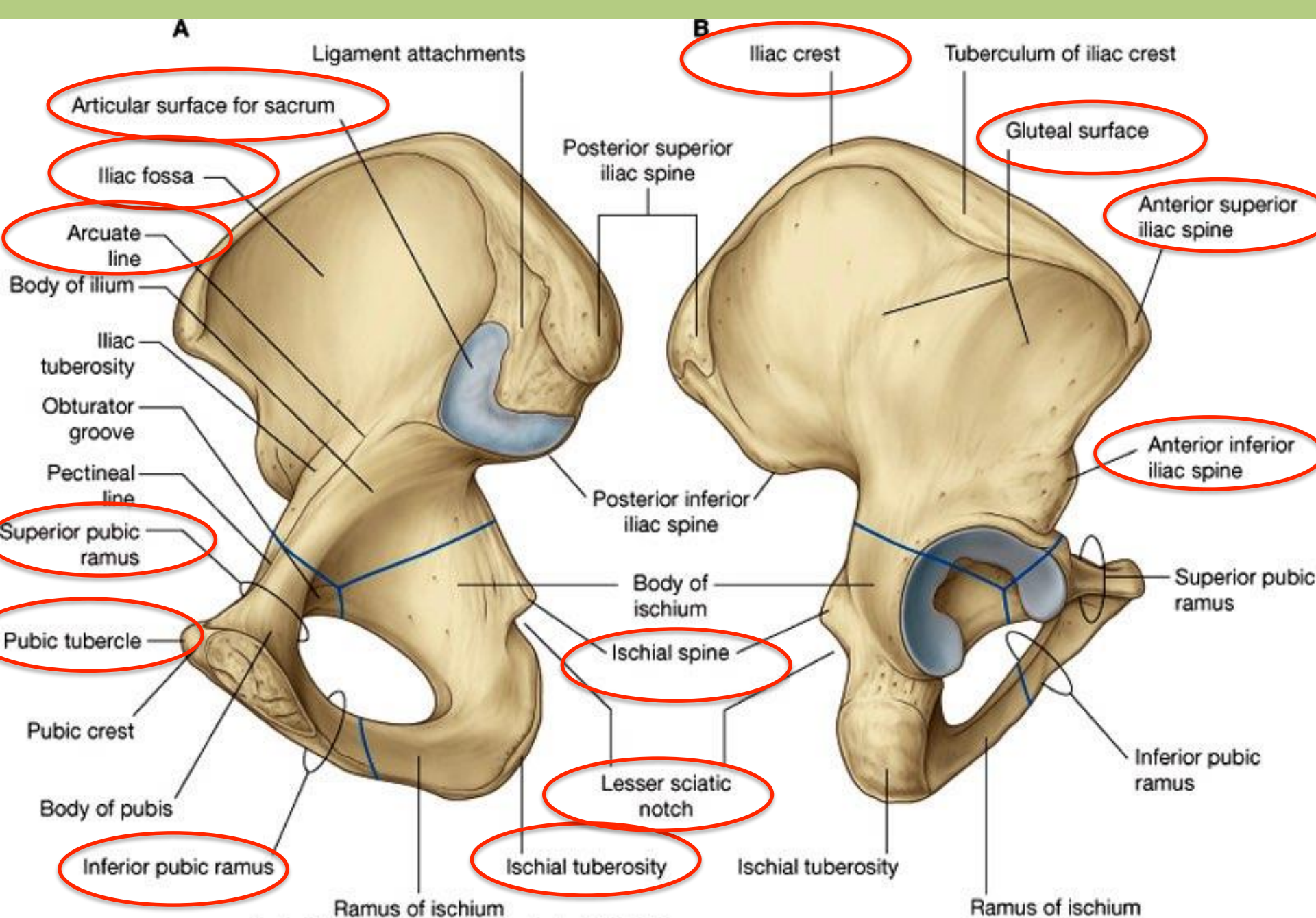
- **Pelvic girdle:** hip bones
- **Free lower extremity:** femur, patella, tibia, fibula, tarsal bones, metatarsals and phalanges

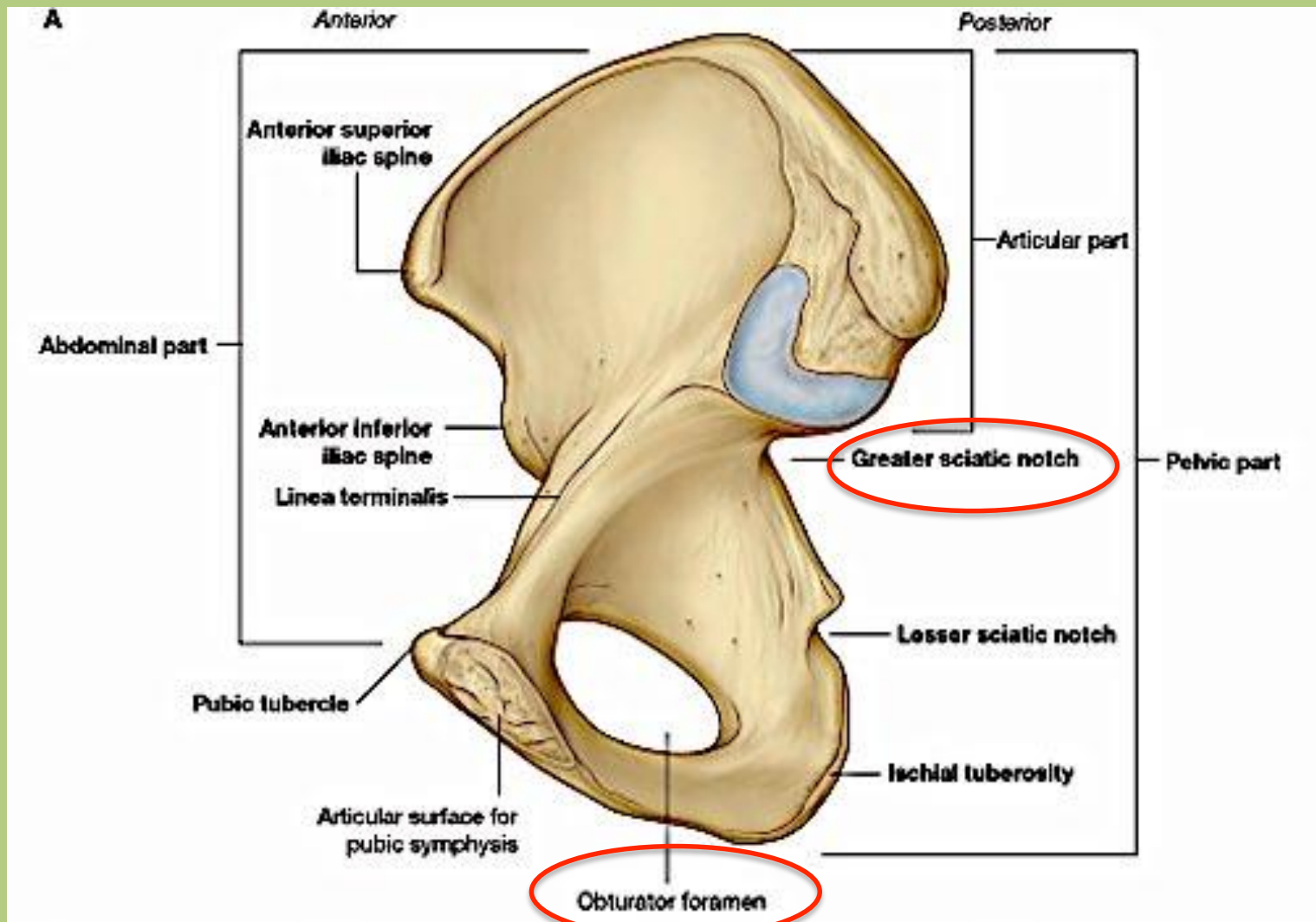


Hip bone

Definitive fusion of the Y-shaped growth plate occurs 16th - 18th year.



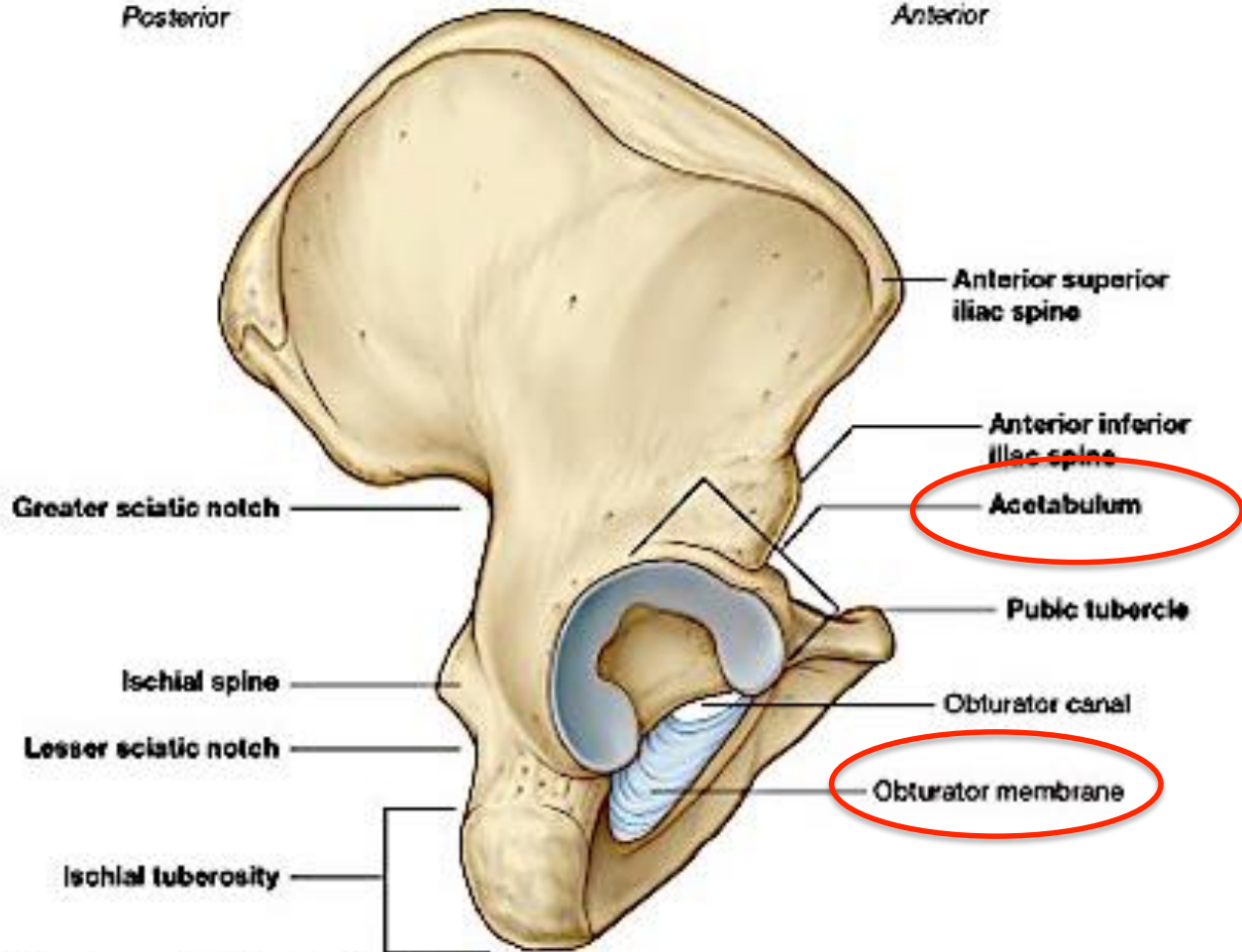




B

Posterior

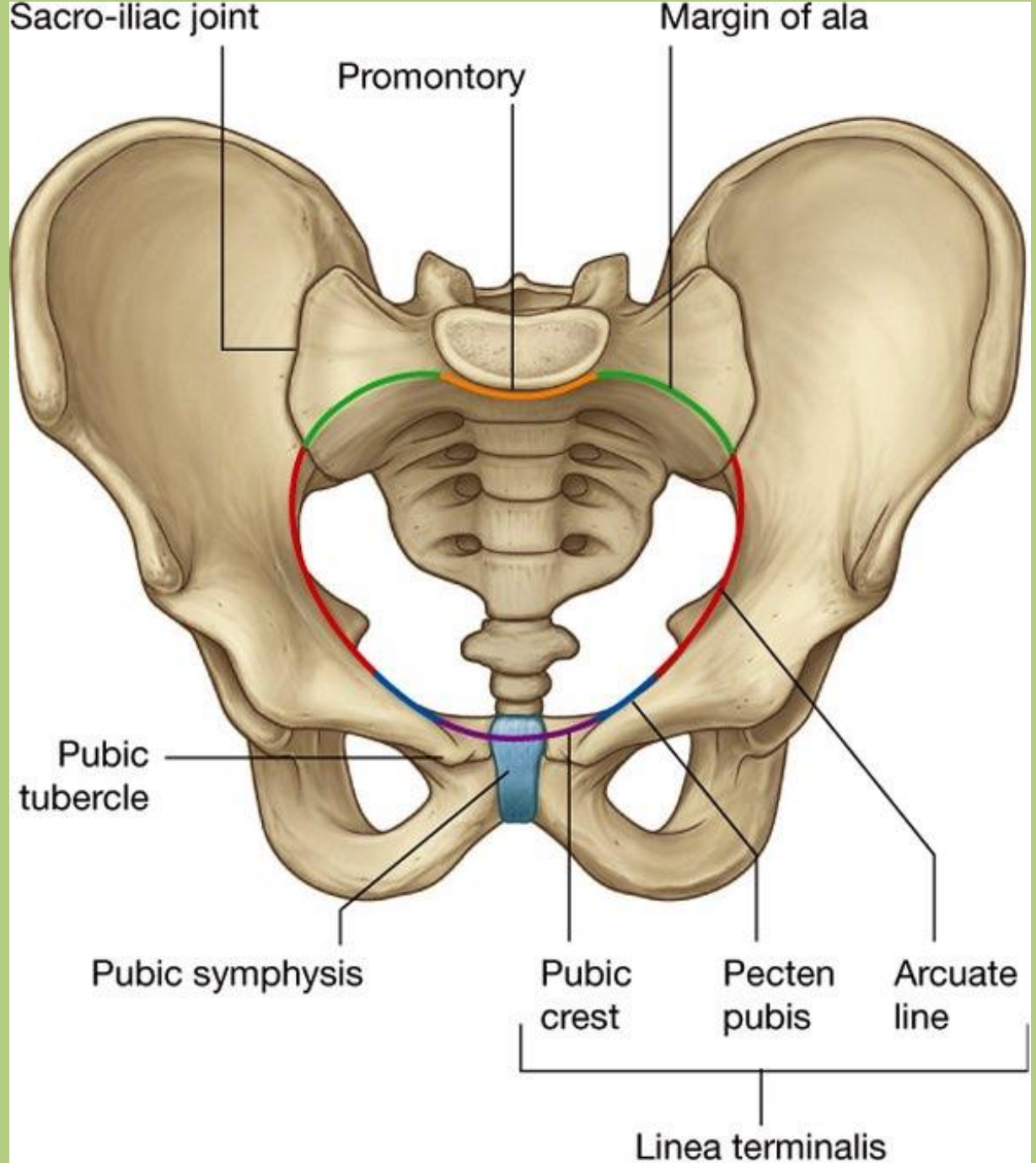
Anterior



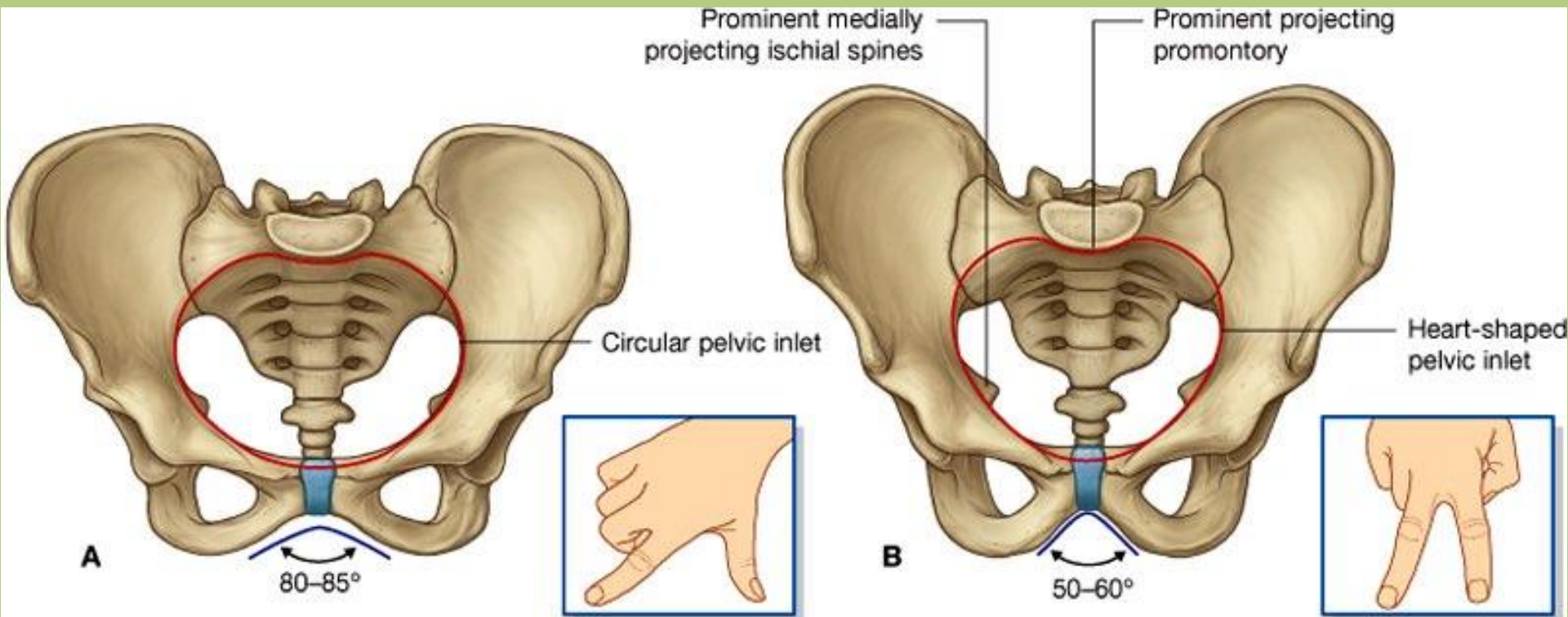
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Pelvis



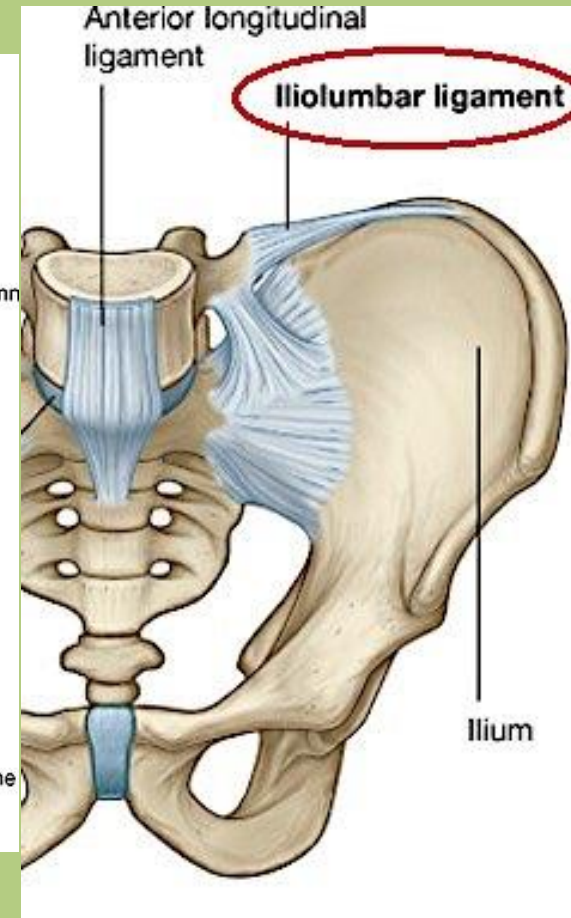
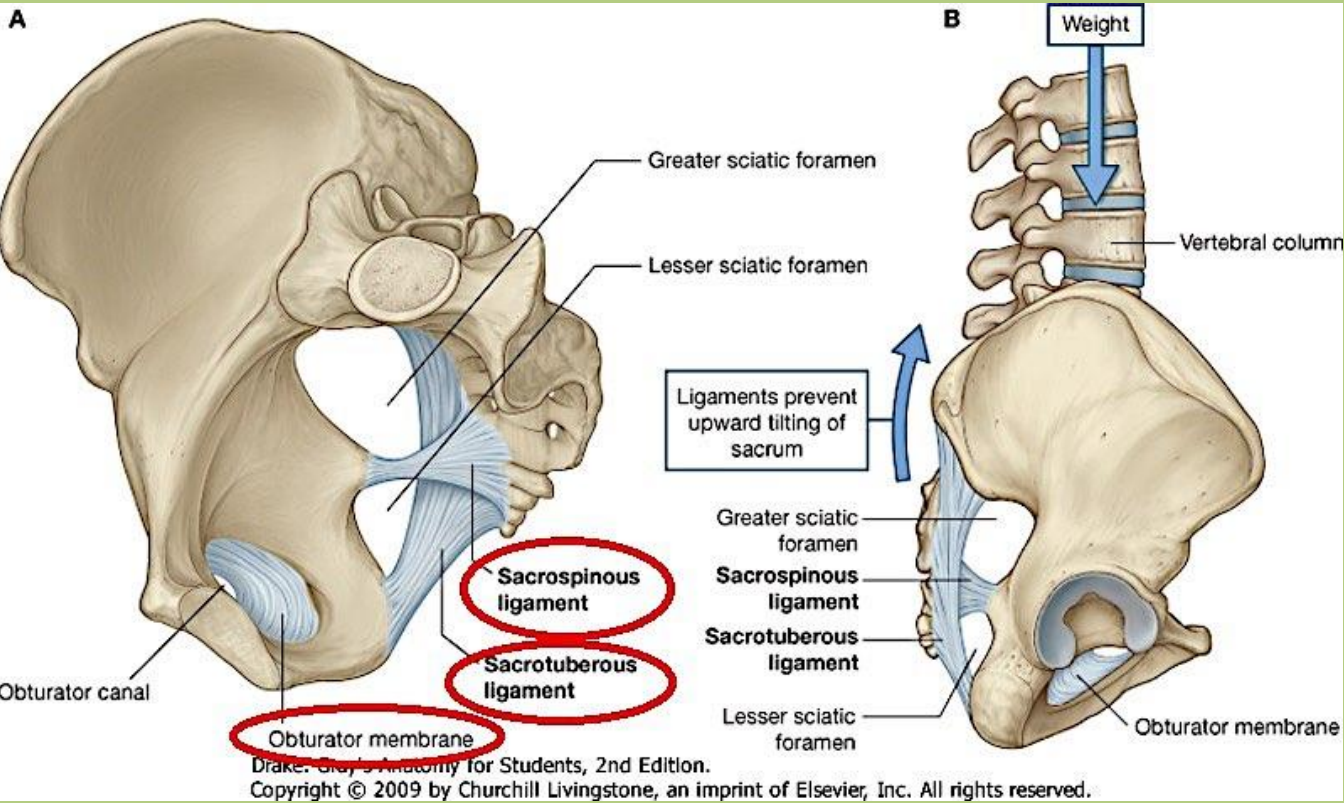
Comparison of the female and male pelvises



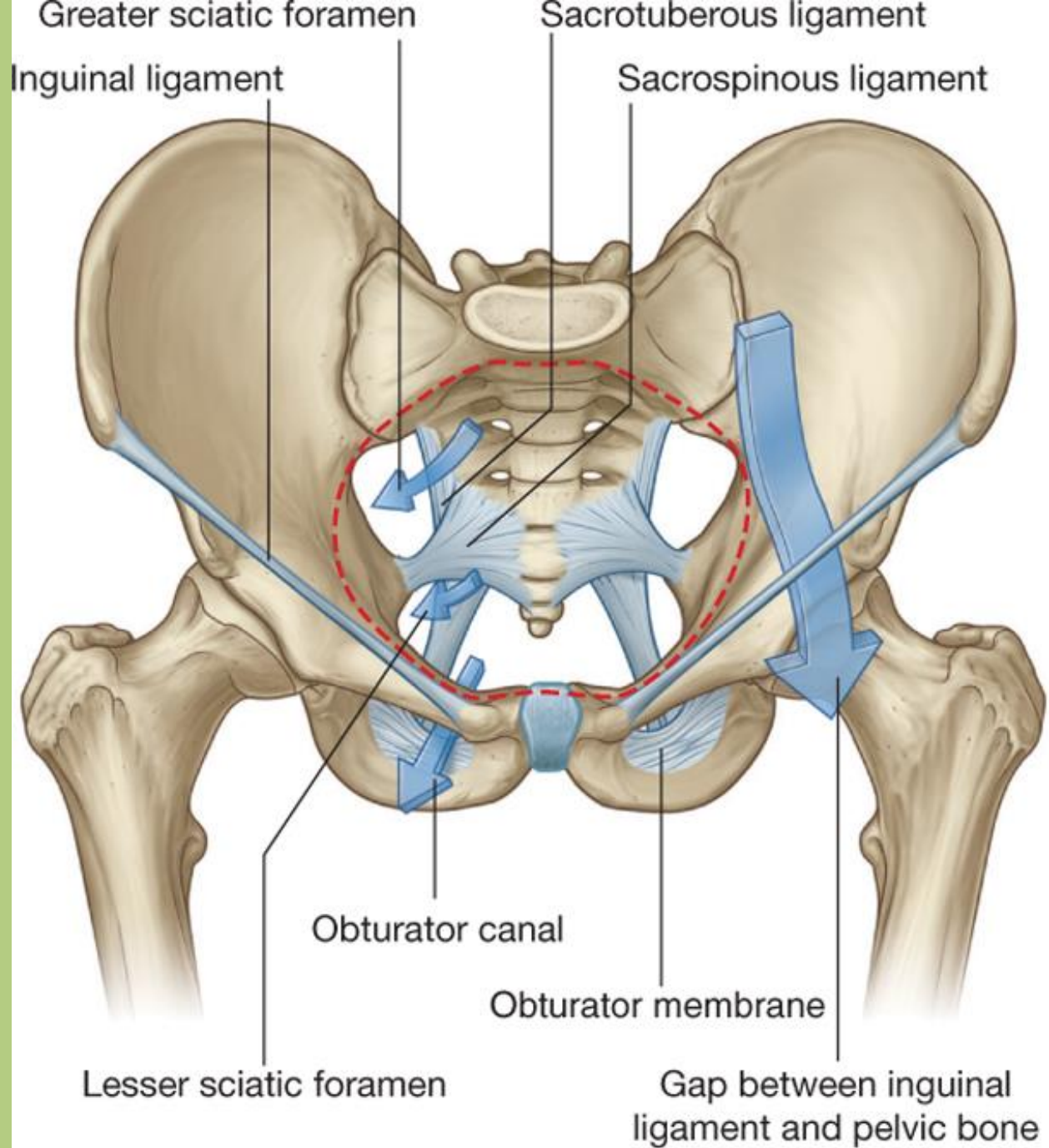
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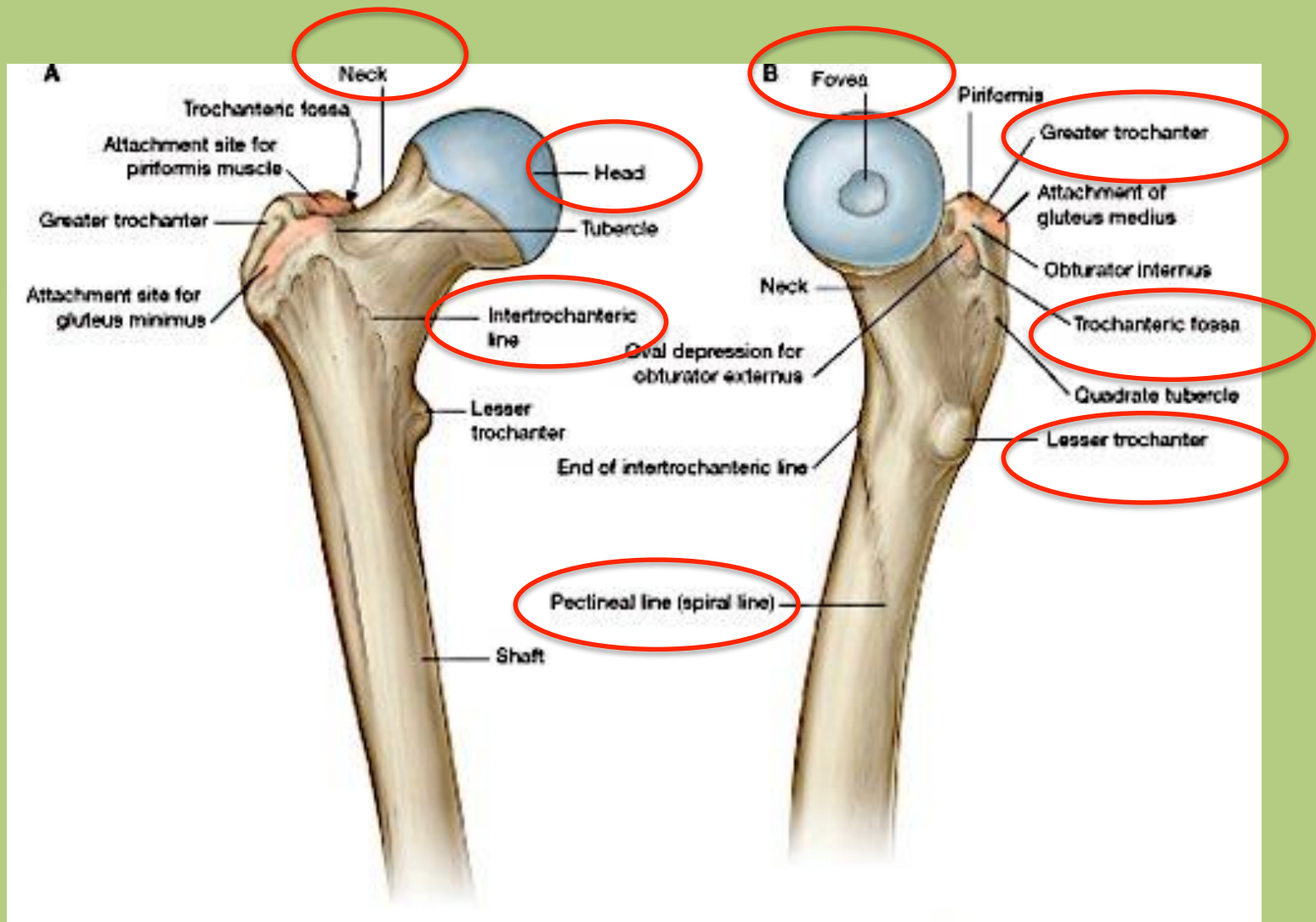
Pelvic ligaments



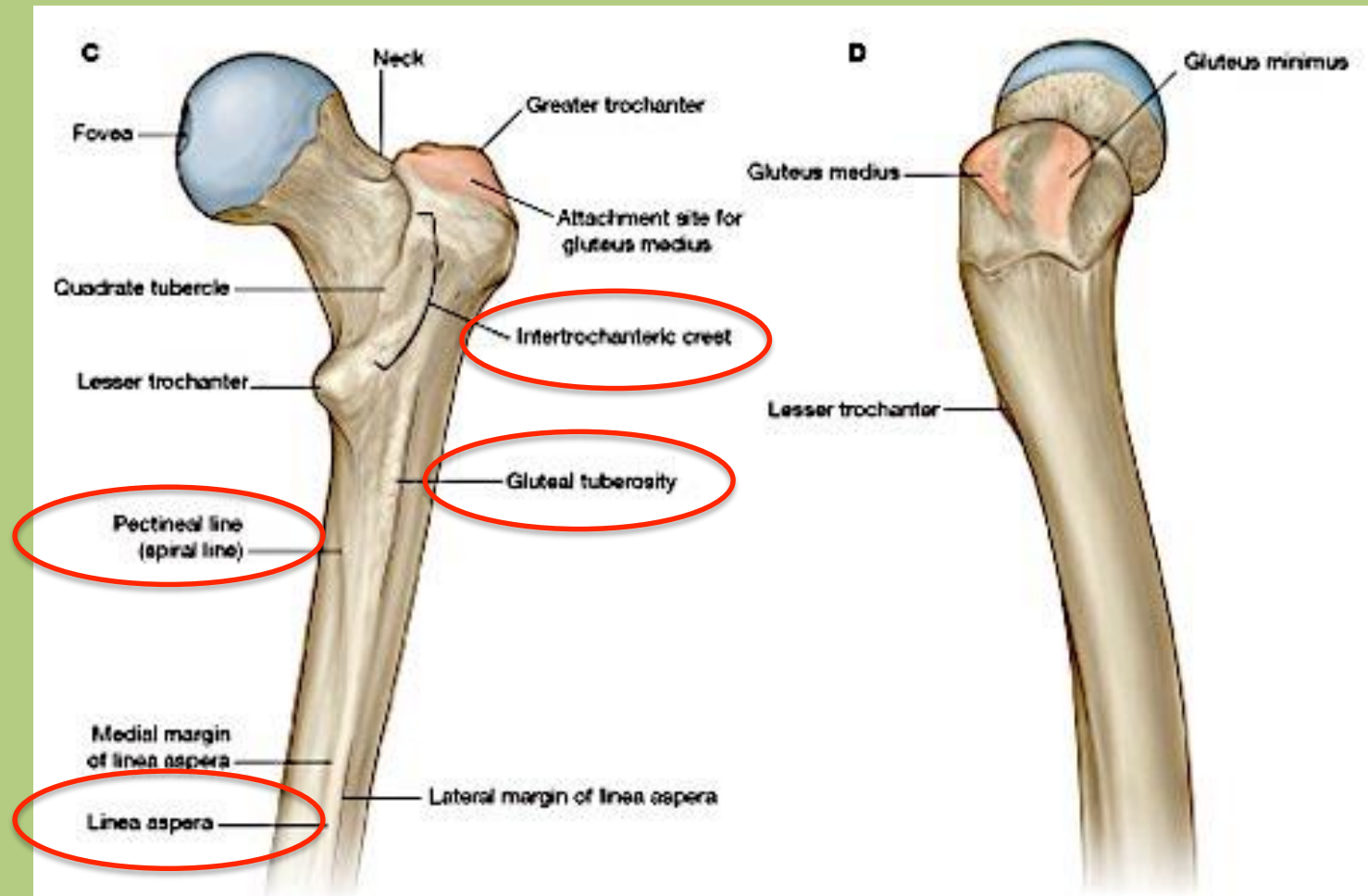
Pelvis



Femur



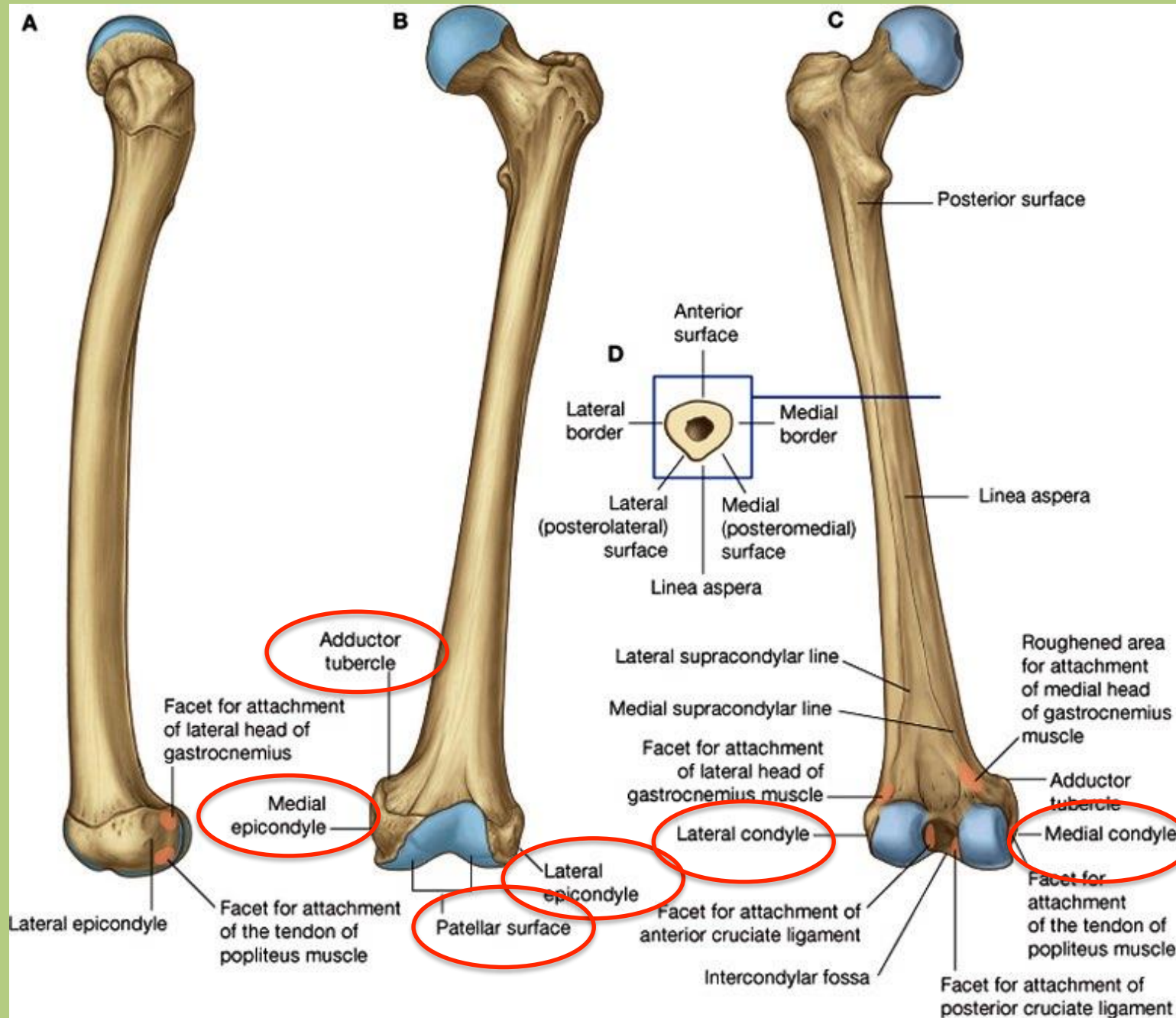
Femur

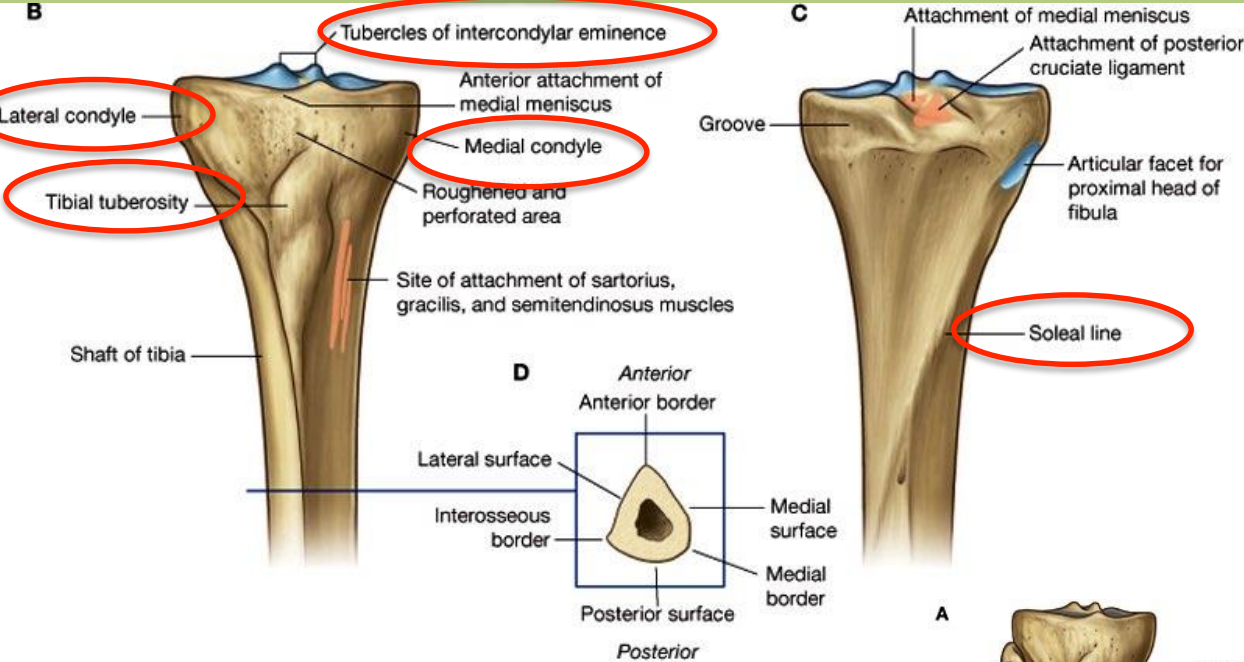


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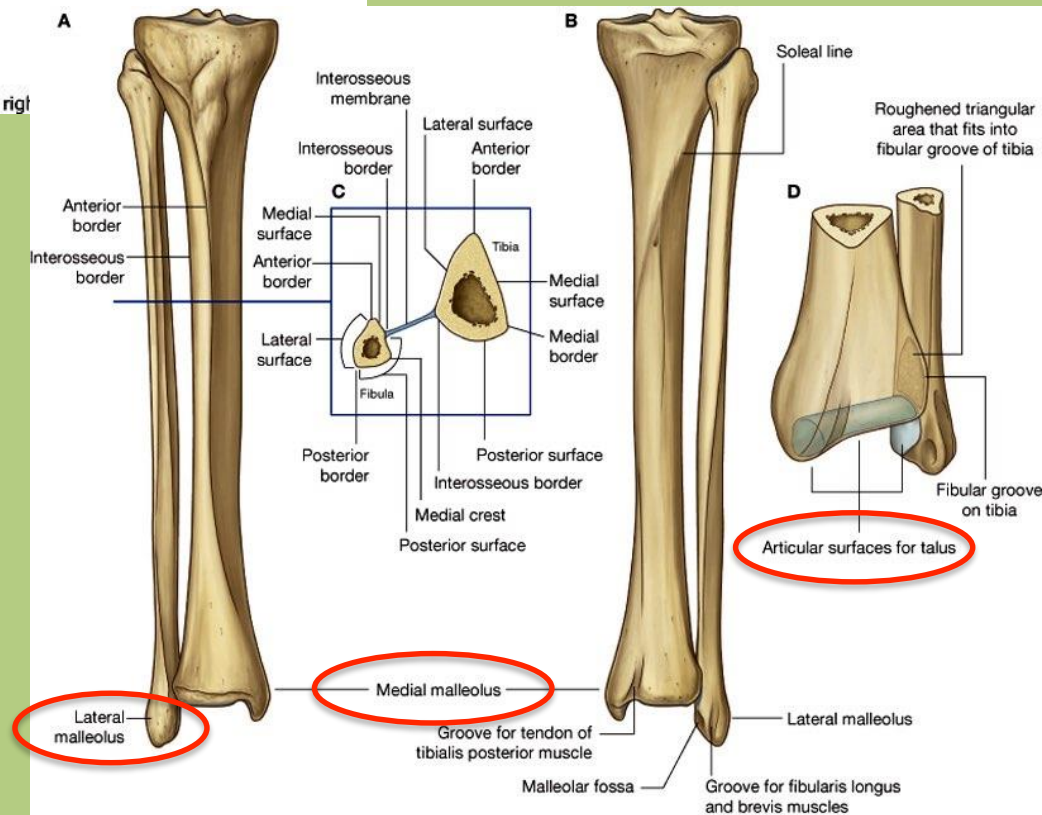
Femur





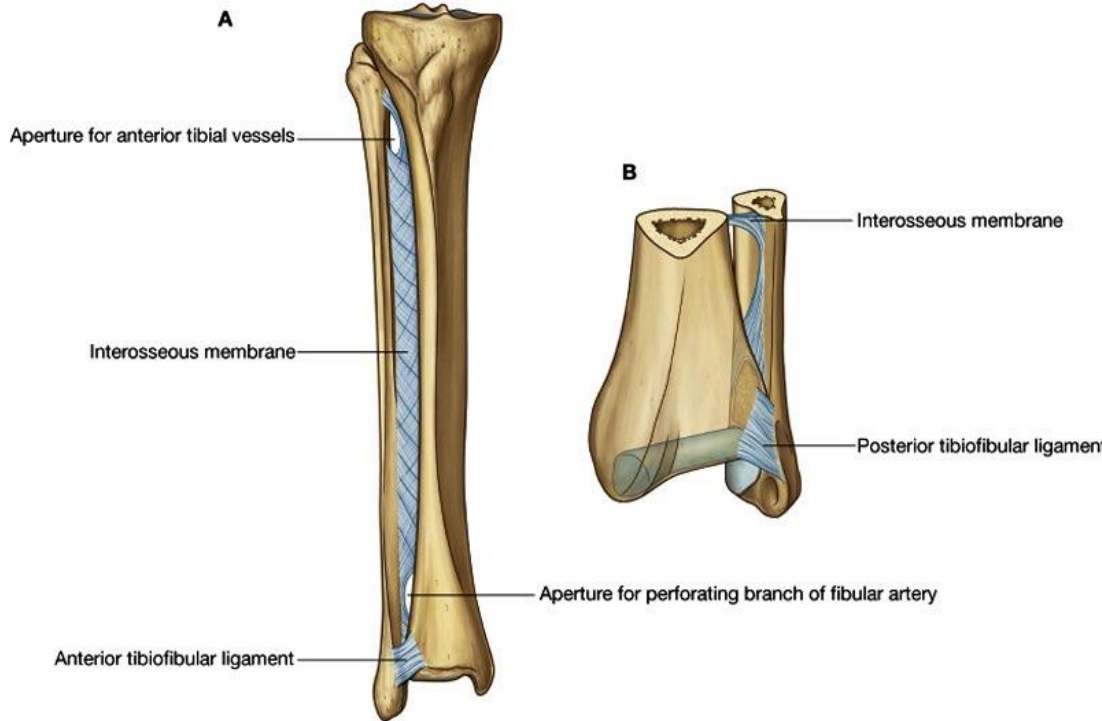
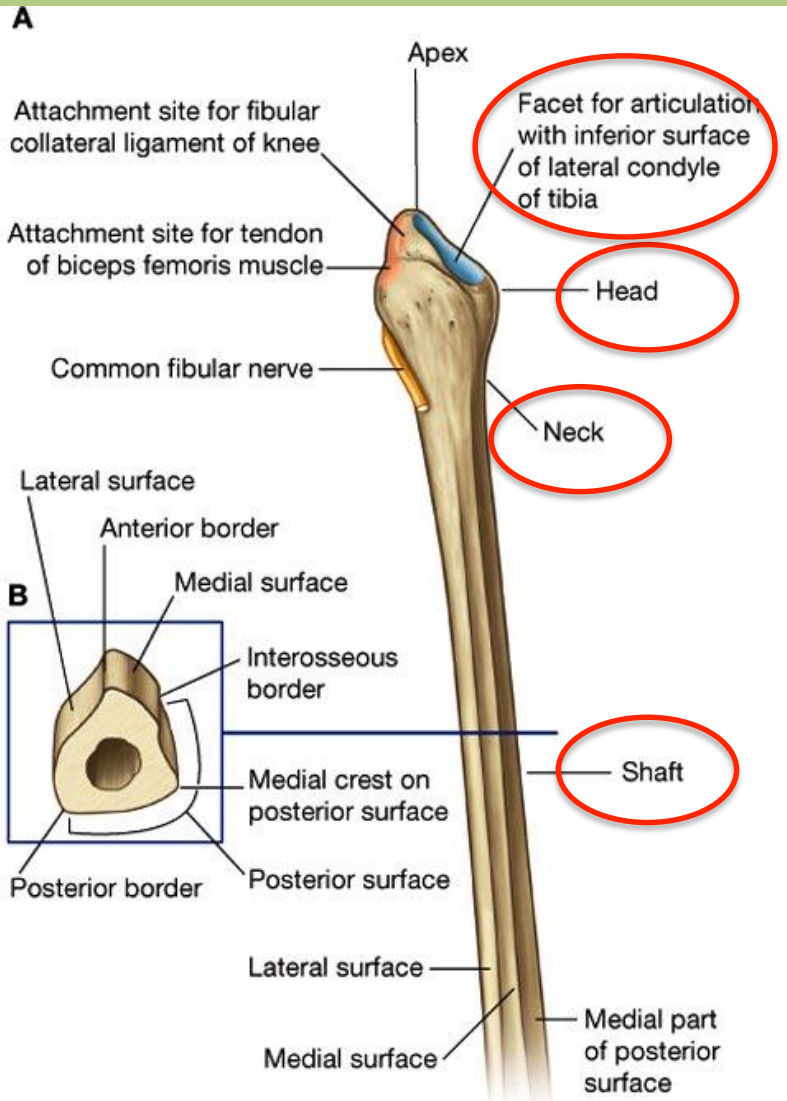
Tibia

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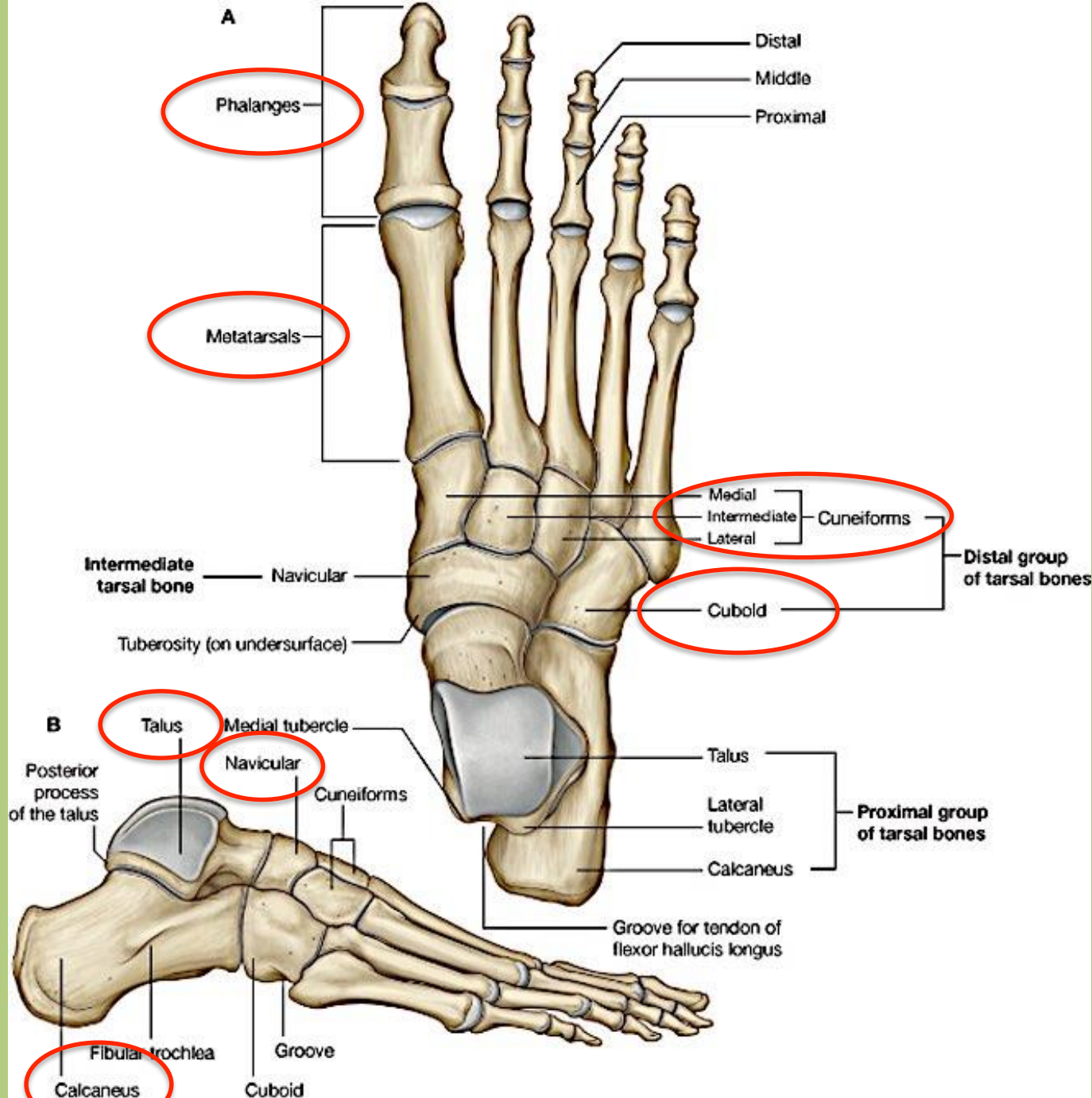
Fibula



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Bones of the foot:

tarsal bones
metatarsals
phalanges



Thank you for your attention.

Reference: Gray's Anatomy for Student
Thieme Atlas of Anatomy