# Bones of upper limb

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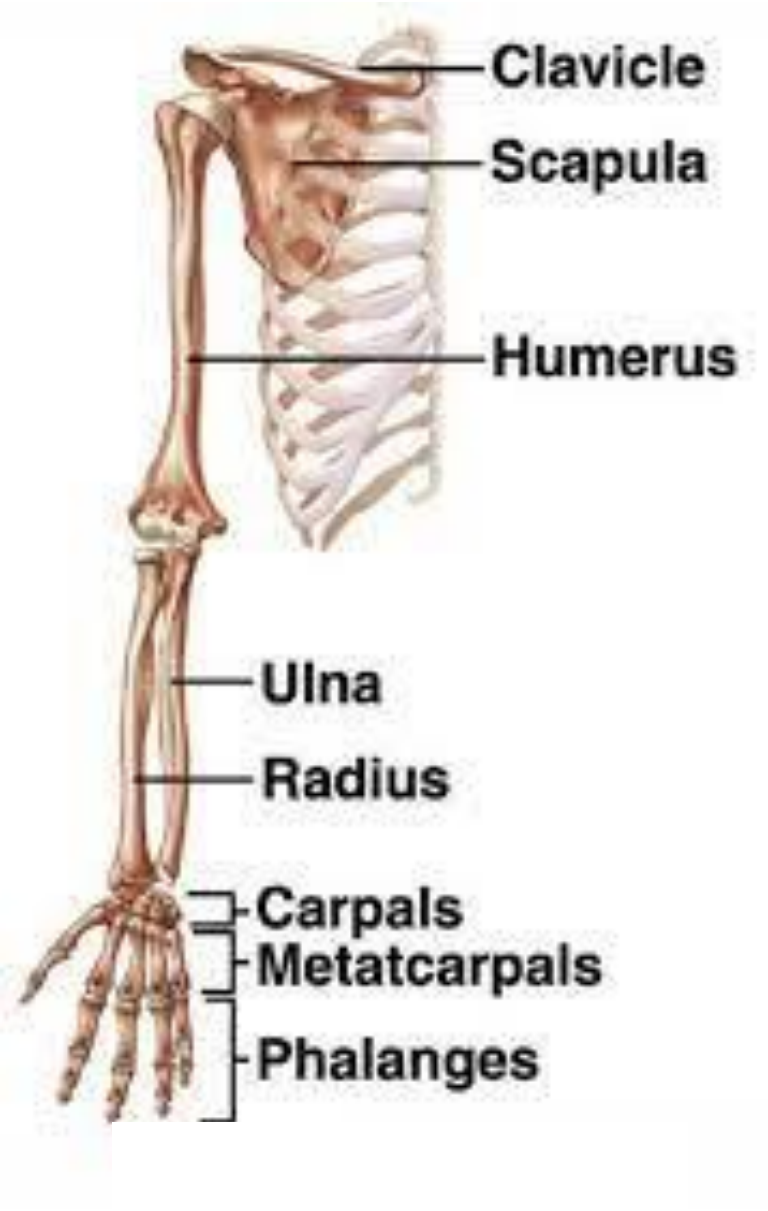
# Objectives

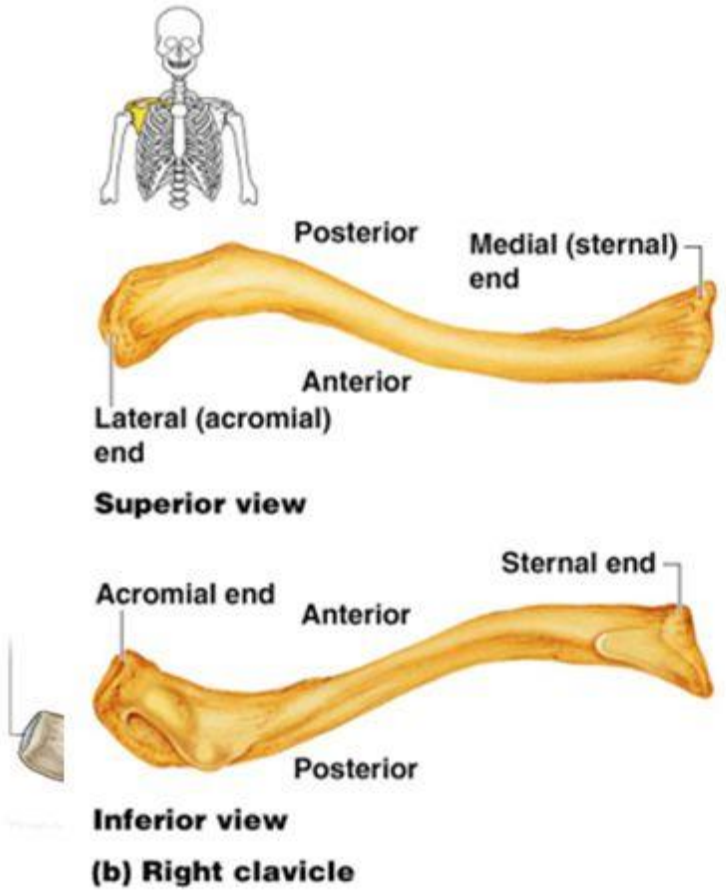
- Named all bones of upper limb
- Identify general features of clavicle, scapula , humerus , radius , ulna ,carpal , metacarpal and phalanges .
- Discussion  the clinical notes of these bones

# Bones of upper limb

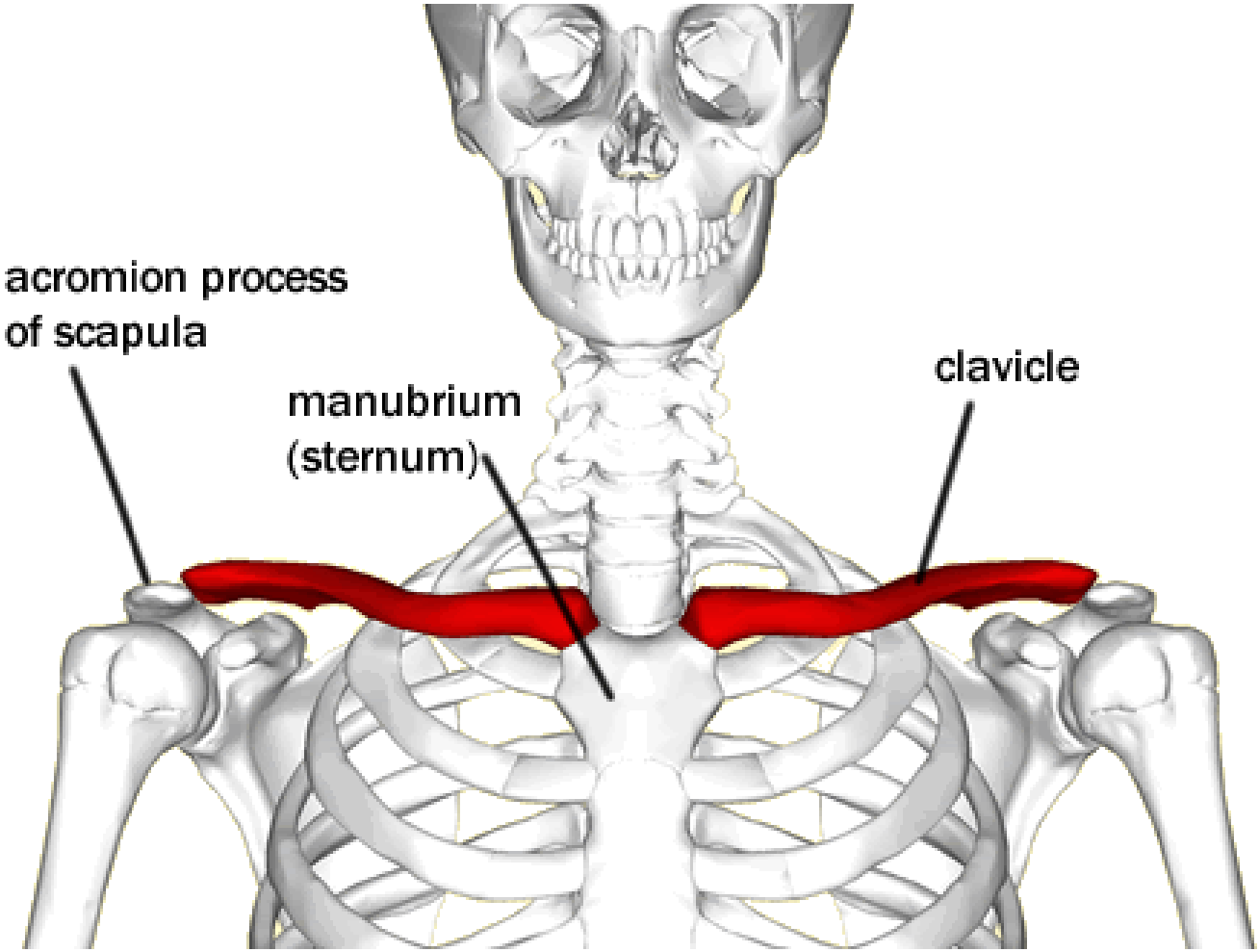


# Clavicle

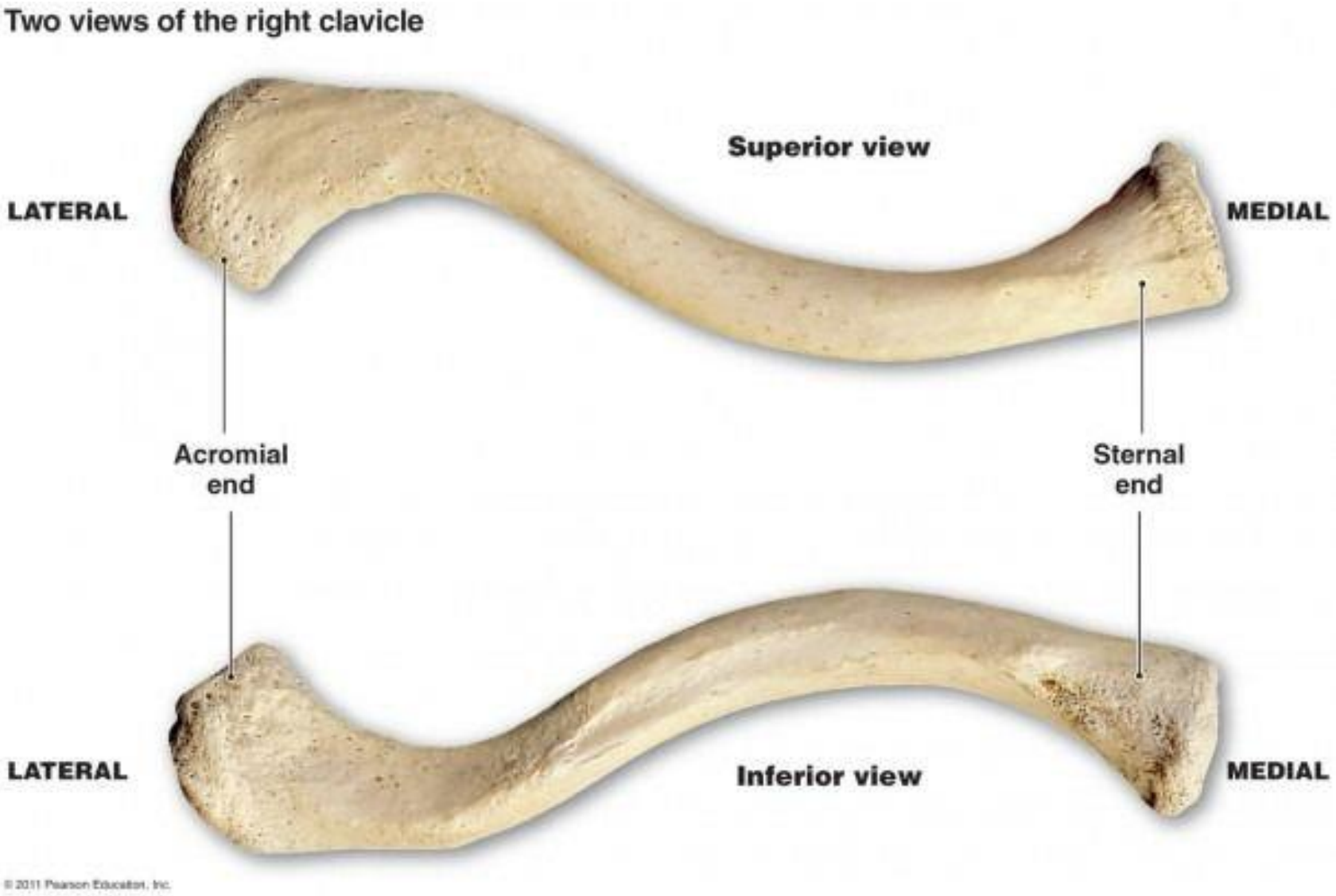
- It is considered as a long bone but it has no medullary (bone marrow) cavity.
- Its medial (Sternal) end is enlarged & triangular.
- Its lateral (Acromial) end is flattened.
- The medial 2/3 of the body (shaft) is convex forward.
- The lateral 1/3 is concave forward.
- These curves give the clavicle its appearance of an elongated capital (S)
- It has two surfaces:
  - **Superior:** smooth as it lies just deep to the skin.
  - **Inferior:** rough because strong ligaments bind it to the 1st rib.



- Horizontal bone on the anterior aspect of the junction between neck and trunk
- It is the only bony attachment between the trunk and upper limb
- Palpable along its entire length
- The first long bone to ossify



# clavicle


Two views of the right clavicle
Superior view
LATERAL
MEDIAL
Acromial end
Sternal end
LATERAL
Inferior view
MEDIAL
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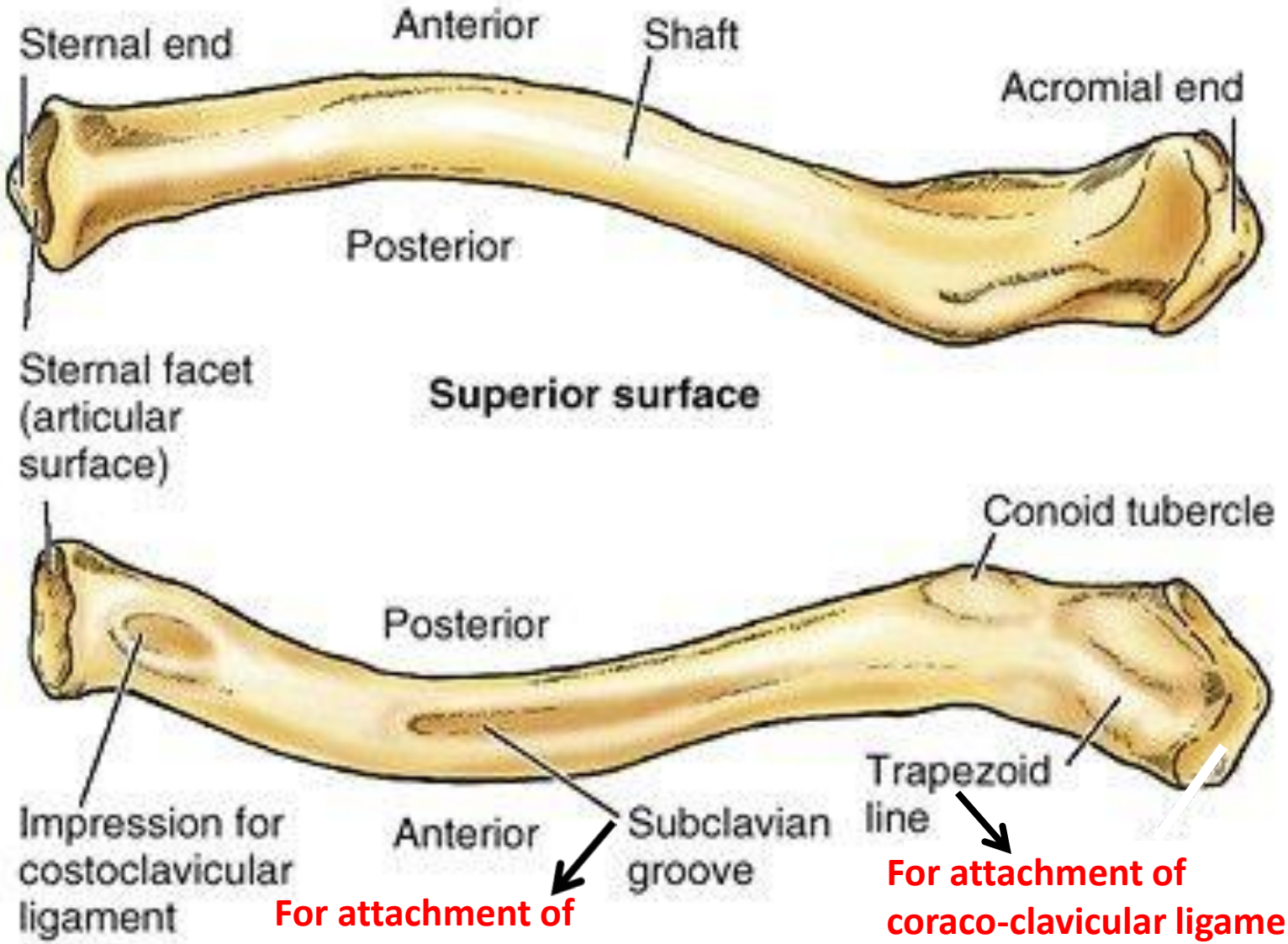
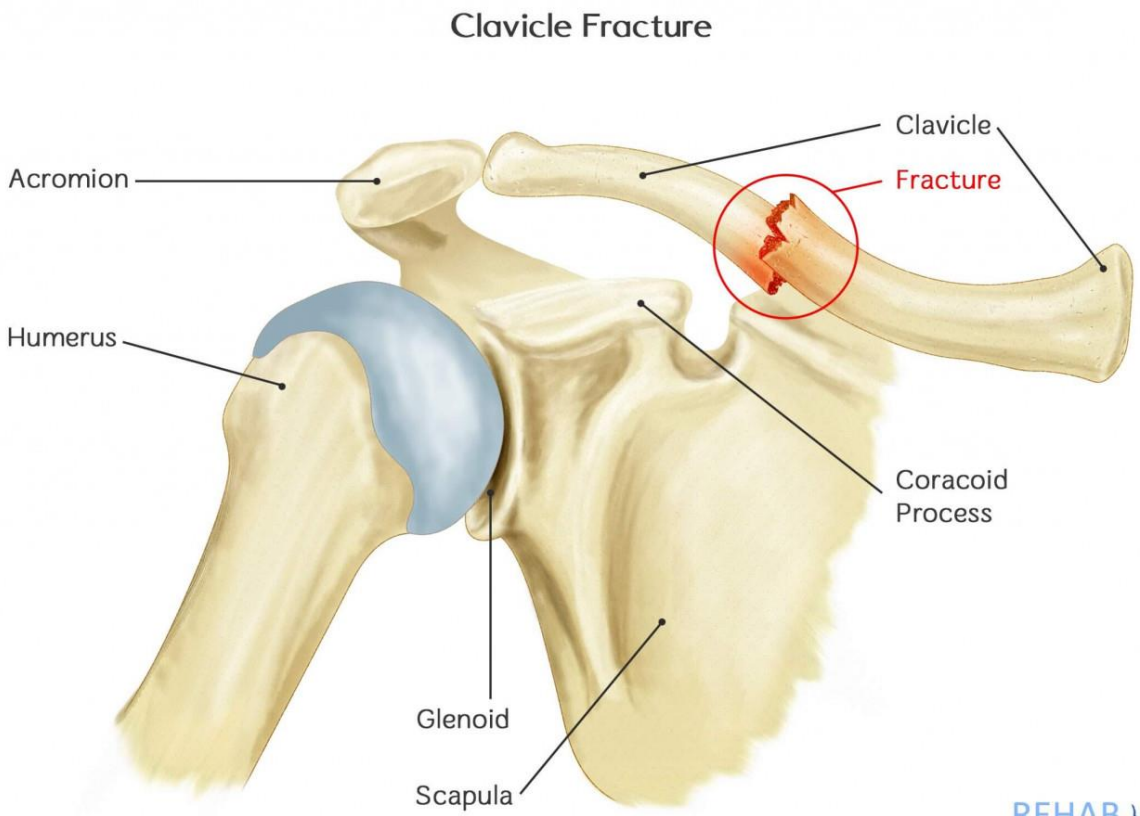
**Right clavicle**

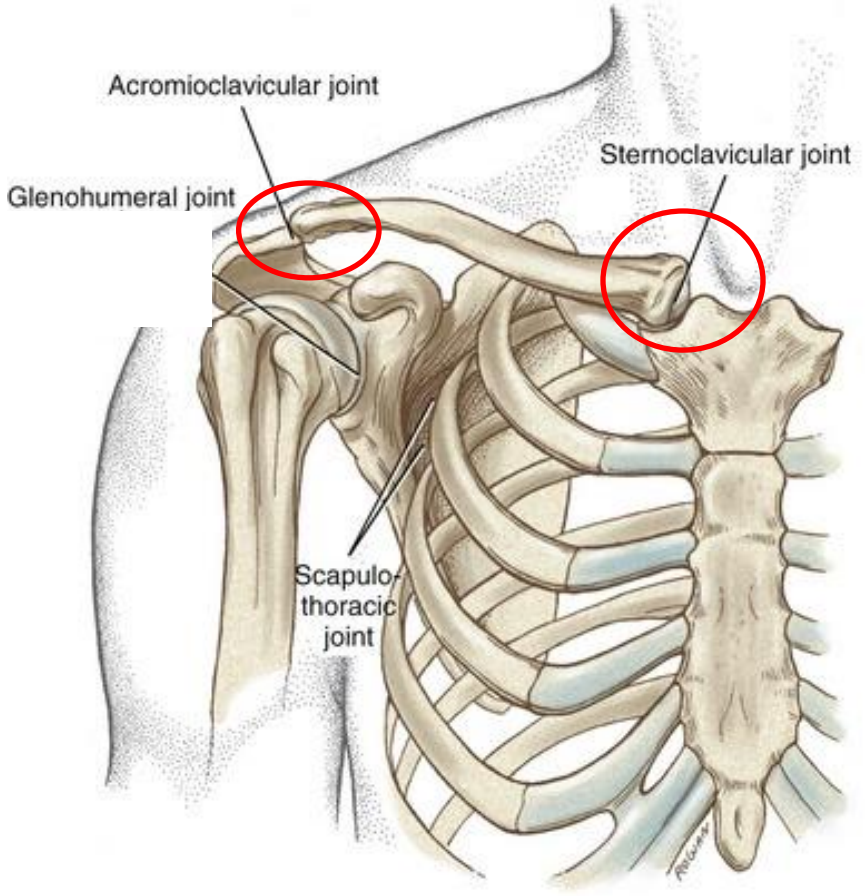


- It keeps the arm away from the trunk (act like a strut)
- t is used as a surface landmark in many clinical procedures
- It usually fractures at the junction between medial two thirds (rounded) and lateral one third (flat) of the shaft



# Articulation of clavicle

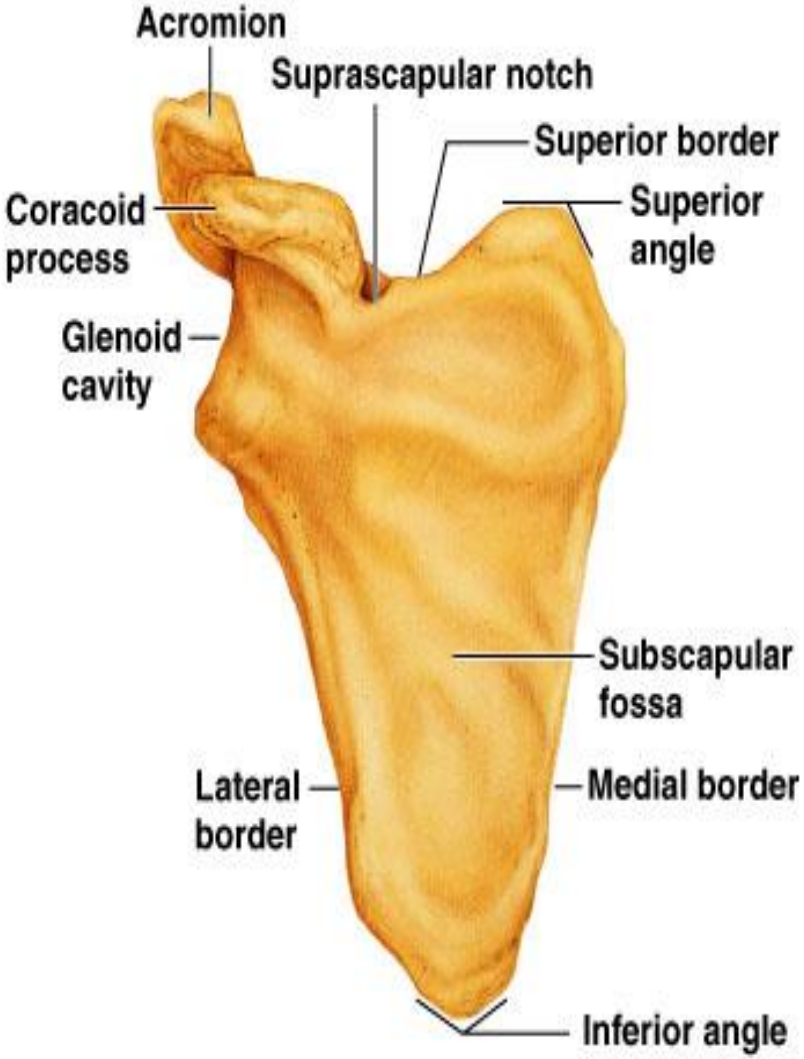
- **Acromioclavicular joint** (lateral end with the acromion process of the scapula
- **Sternoclavicular joint** (The only joint connecting the upper limb and its girdle to the axial skeleton )



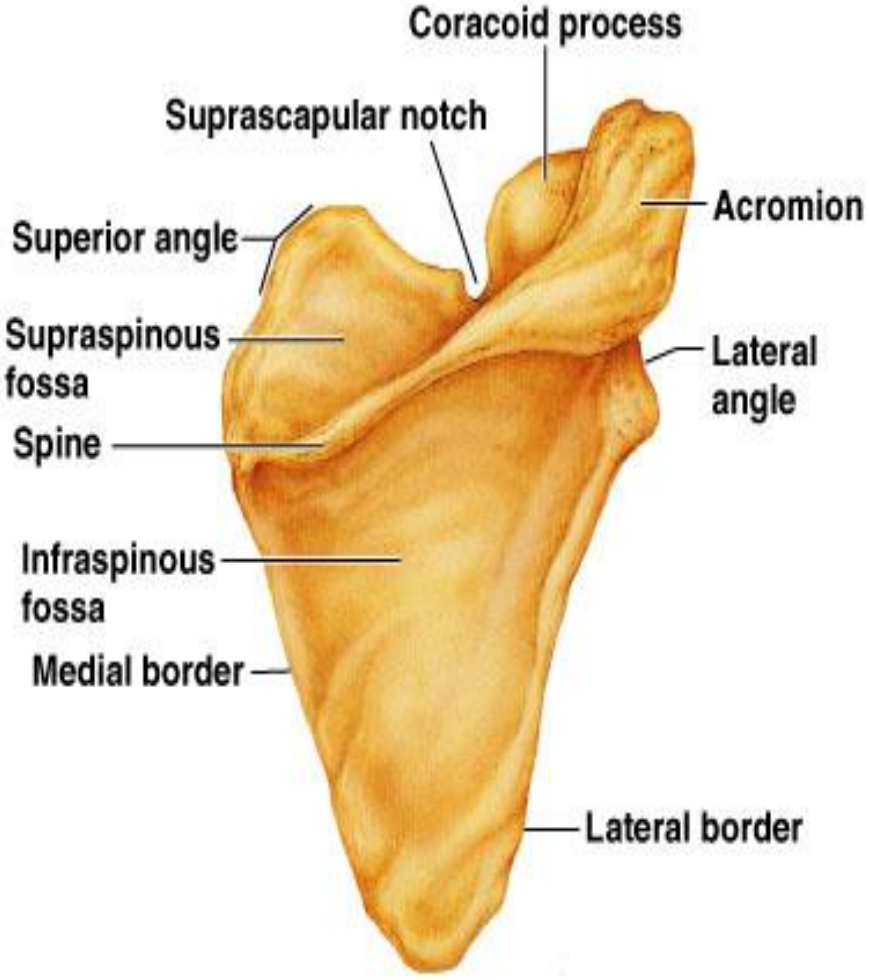
# Scapula

- Located on the posterior thoracic wall
- Articulates with the humerus at the shoulder joint and with the clavicle at the acromioclavicular joint.
- Has Two surfaces (costal & dorsal)
- Three borders (superior, medial & lateral)
- Three angles (lateral /glenoid, superior & inferior)
- Three processes (coracoid, acromion & spinous)
- It is capable of considerable movement on the thoracic wall
- Extending from 2nd to 7th ribs
- Its medial border runs ≈ 5 cm lateral to the spinous processes of thoracic vertebrae (A fact to remember when auscultating the chest from the back)

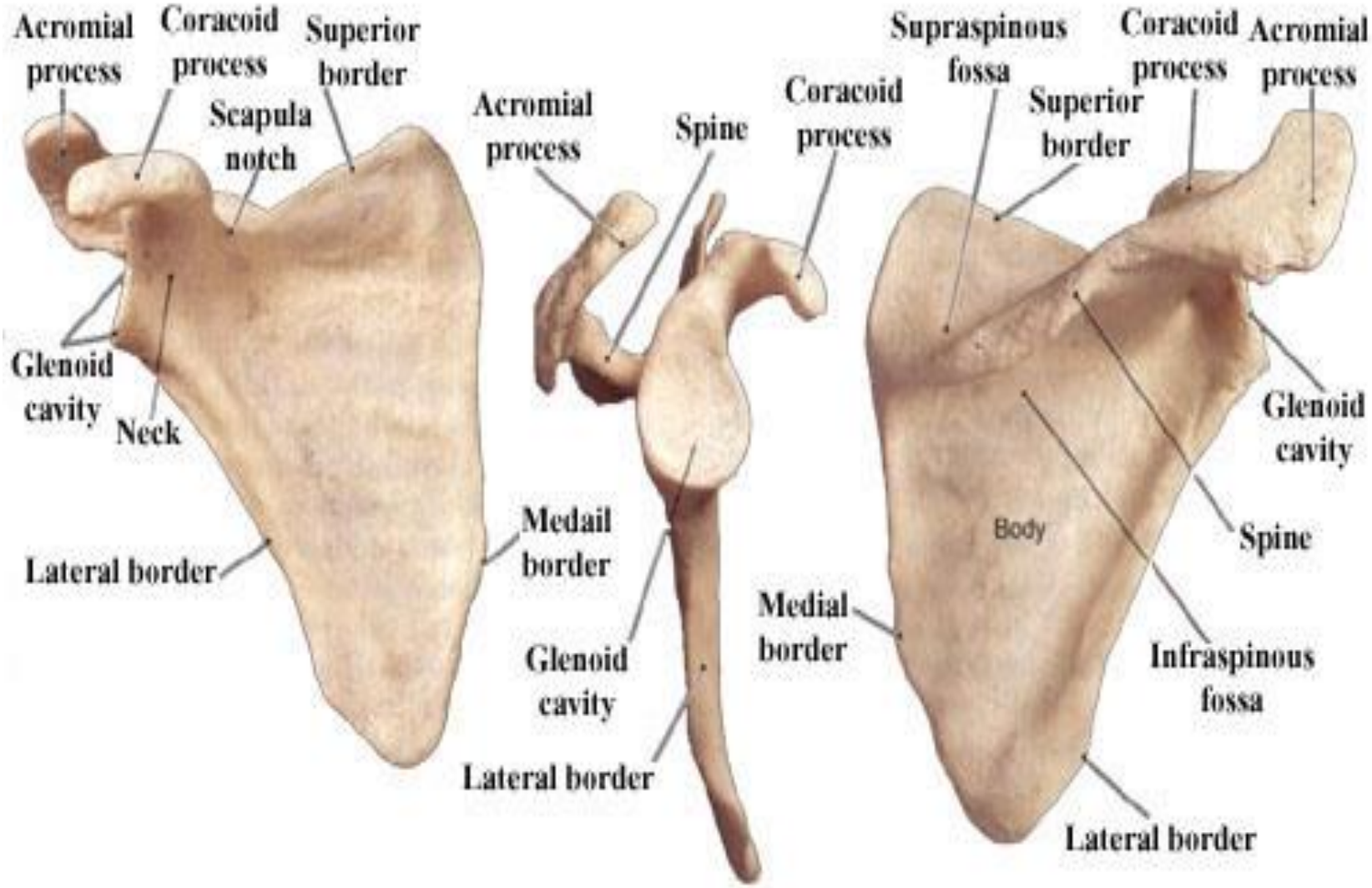
# scapula




(d) Right scapula, anterior aspect




(e) Right scapula, posterior aspect


Acromial process
Coracoid process
Superior border
Scapula notch
Glenoid cavity
Neck
Lateral border
Medail border
Acromial process
Spine
Coracoid process
Glenoid cavity
Lateral border
Supraspinous fossa
Coracoid process
Acromial process
Superior border
Glenoid cavity
Body
Spine
Medial border
Infraspinous fossa
Lateral border

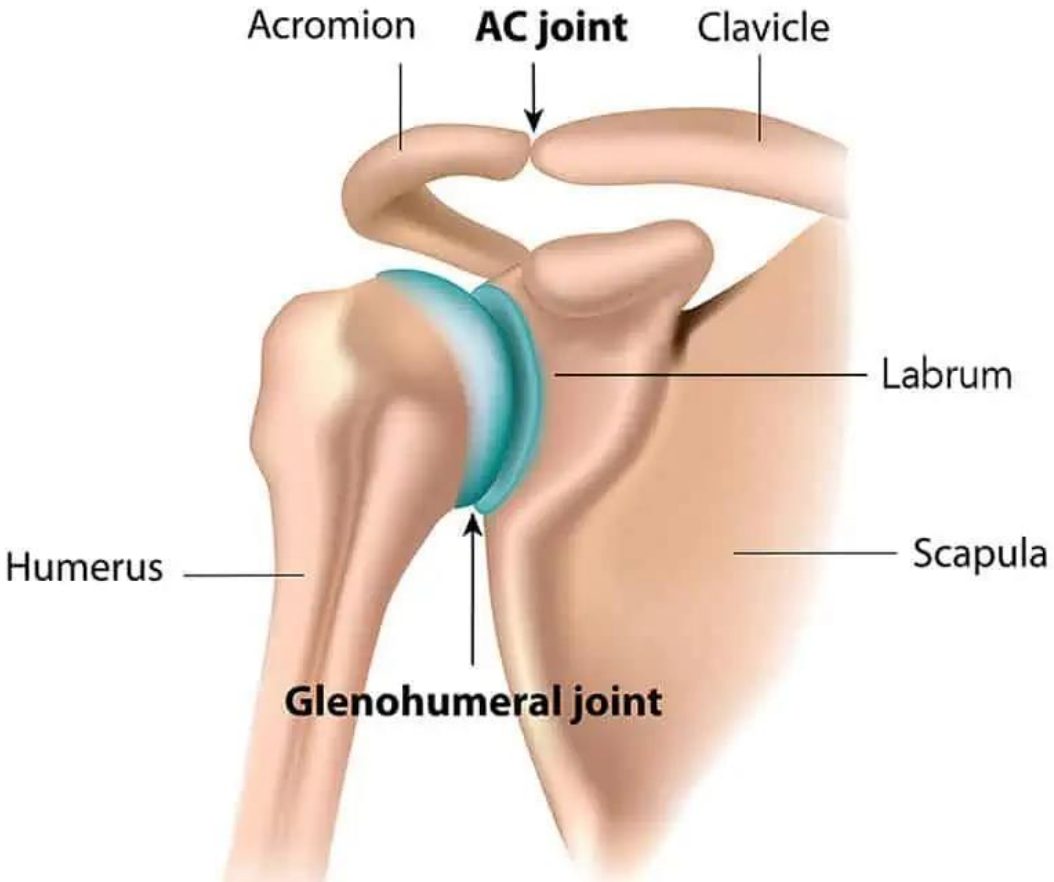
# Articulation of scapula

- **Glenohumeral (shoulder) joint**

(The glenoid cavity (surrounded by labrum) with head of humerus

- **Acromioclavicular joint**

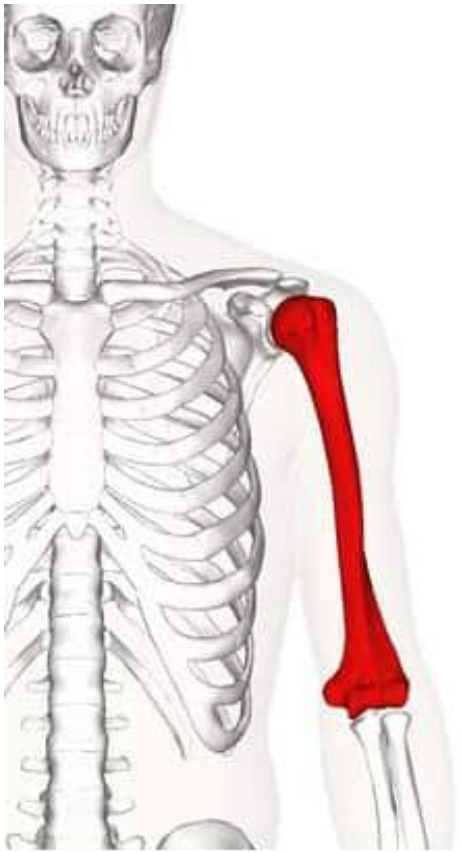
(lateral end with the acromion process of the scapula

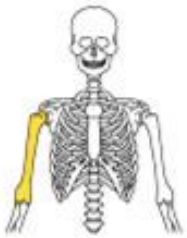


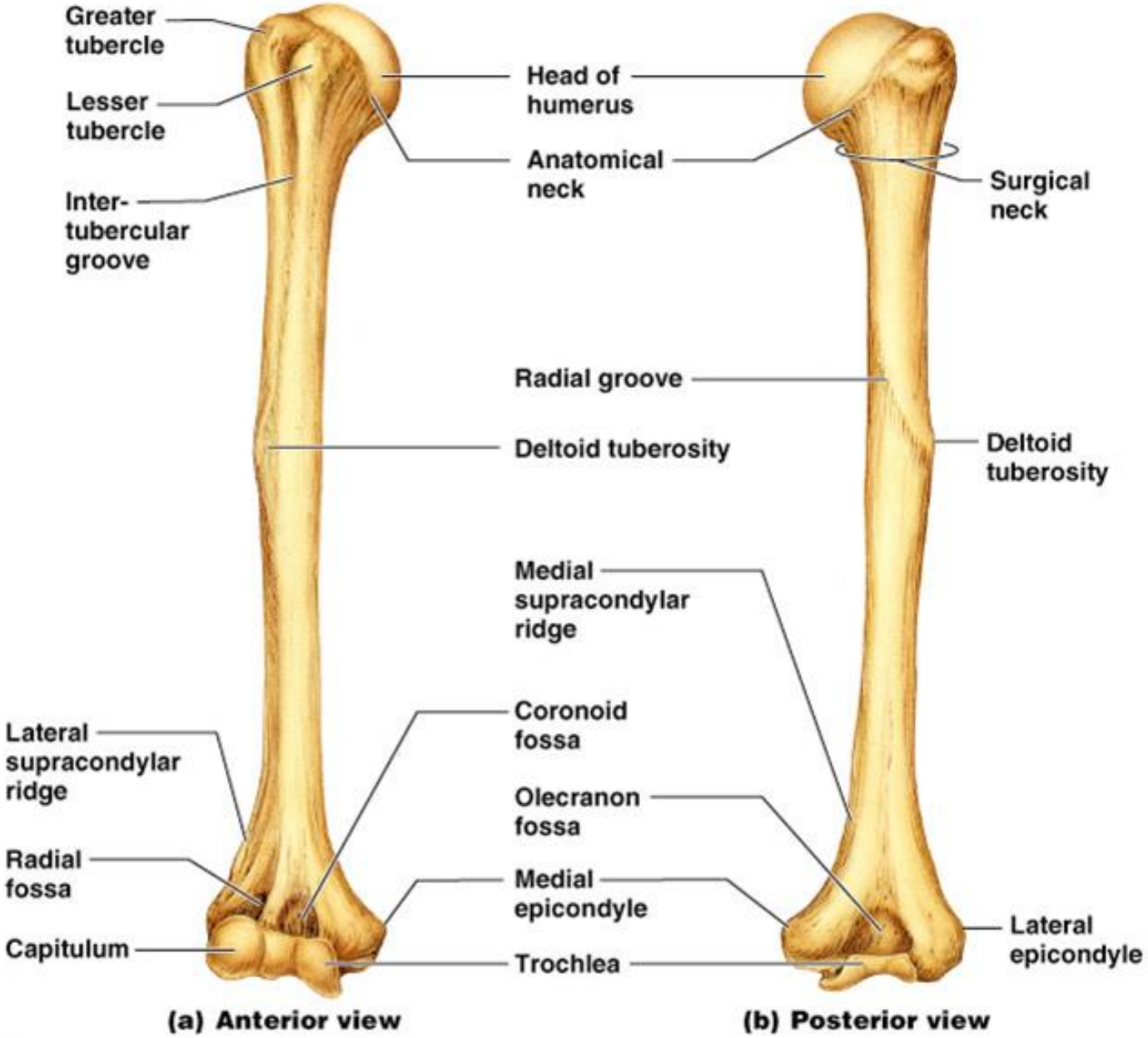
# Humerus

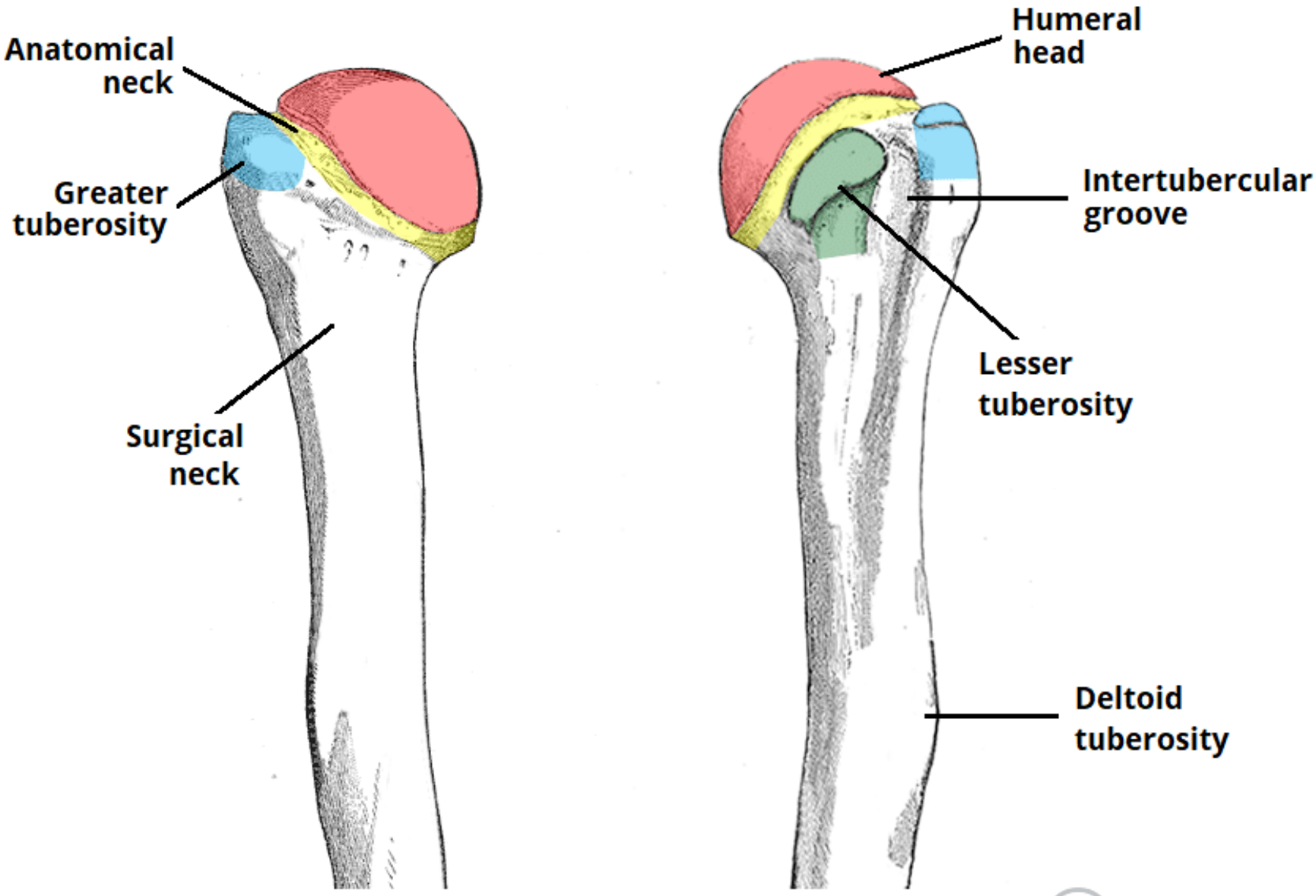
- The longest and strongest bone of the upper limb
- Three parts: upper (proximal) end, shaft, and lower (distal) end
- 2 necks (anatomical and surgical)

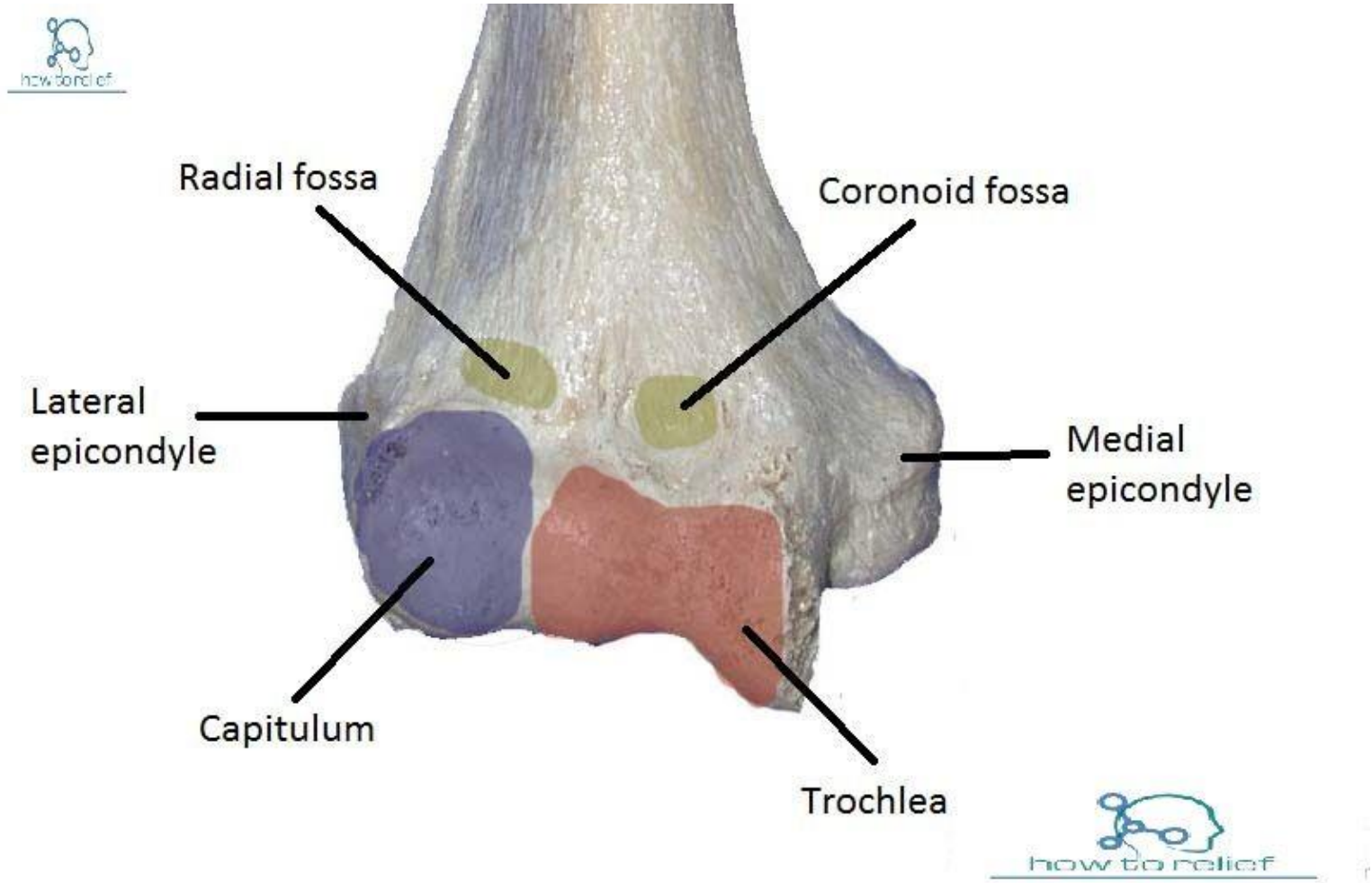
- The surgical neck is named so because the upper end of the humerus commonly fractures at this site



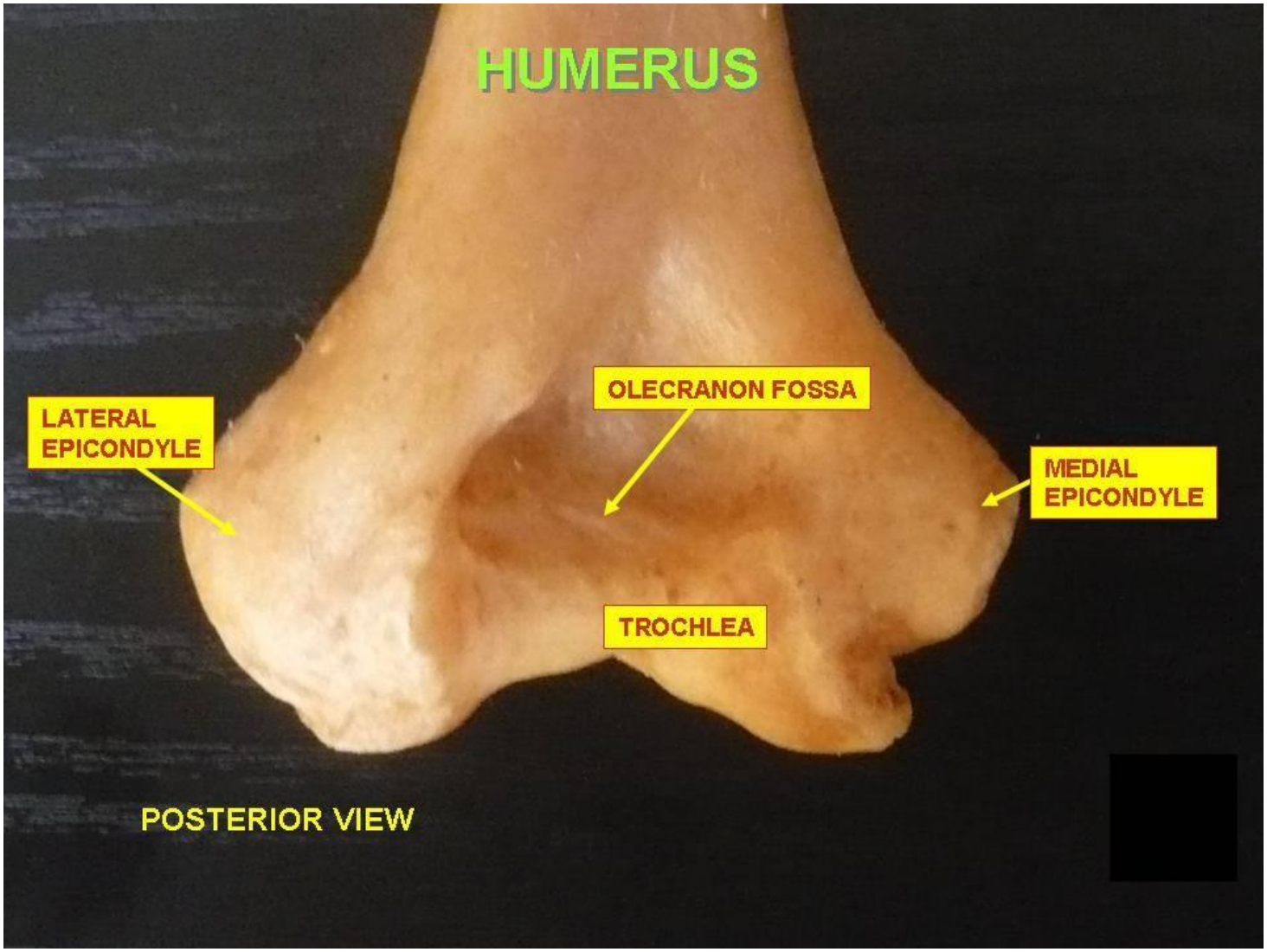








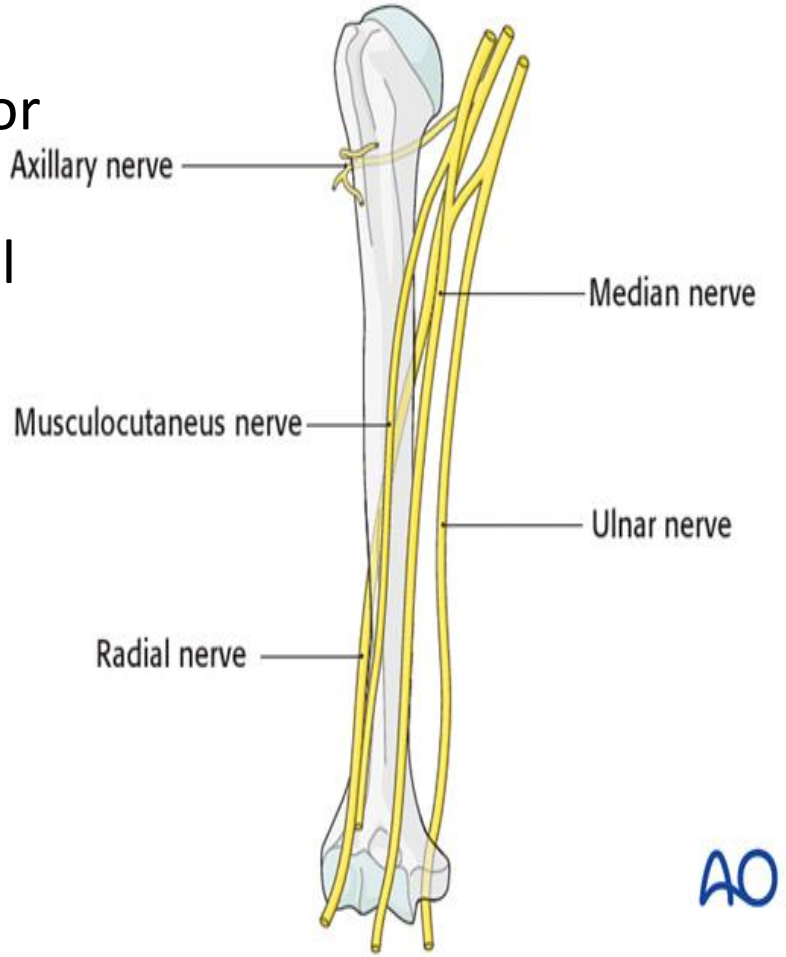

**Lower end of humerus  anterior view**




**Lower end of humerus posterior view**

# Clinical notes

- Fracture of the surgical neck can damage the axillary nerve and posterior circumflex humeral vessels as these structures are closely related to medial part of surgical neck
- Fractures of the shaft of the humerus can damage the radial nerve and the profunda brachii artery as they are related to spiral groove
- Ulnar nerve can be palpated and compressed near the posterior aspect of the medial epicondyle (funny bone)



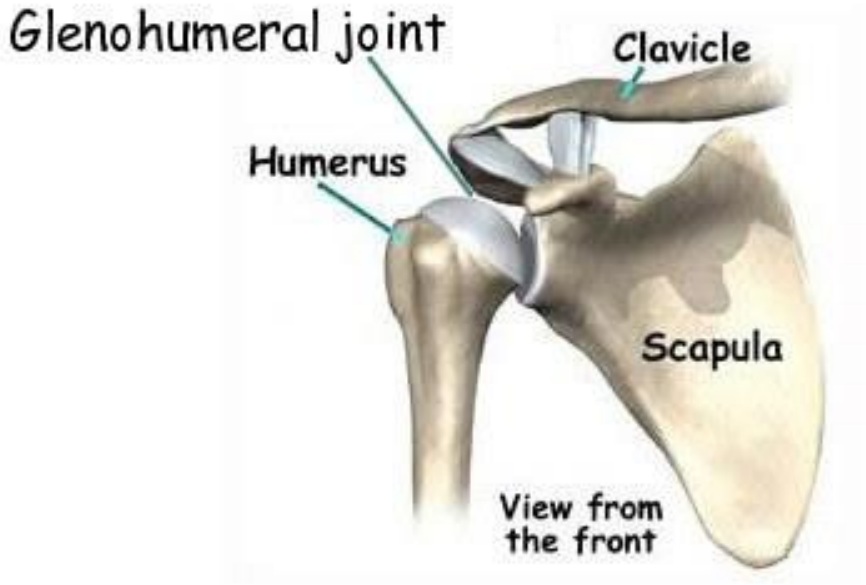
# Articulation of humerus

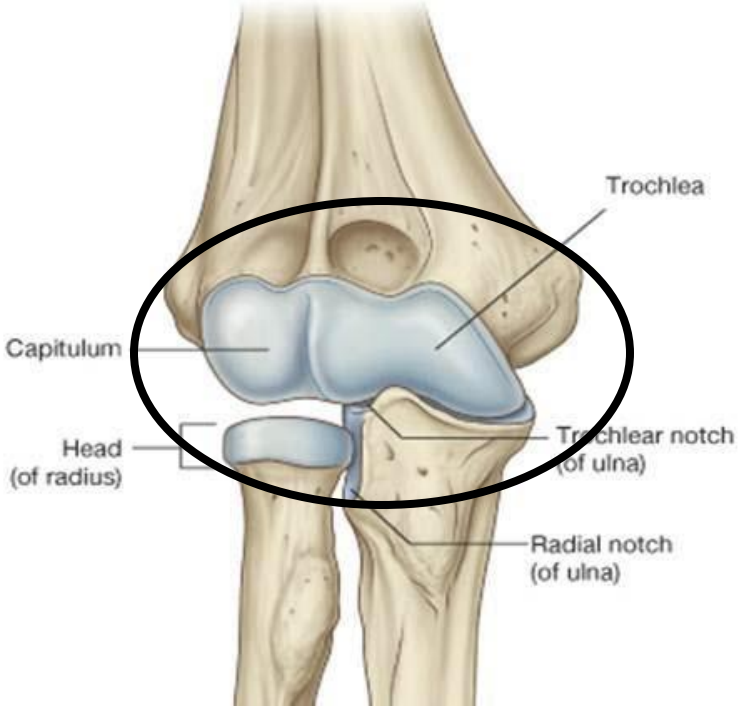
- **Shoulder joint**

Head of humerus with the glenoid cavity of the scapula

- **Elbow joint**

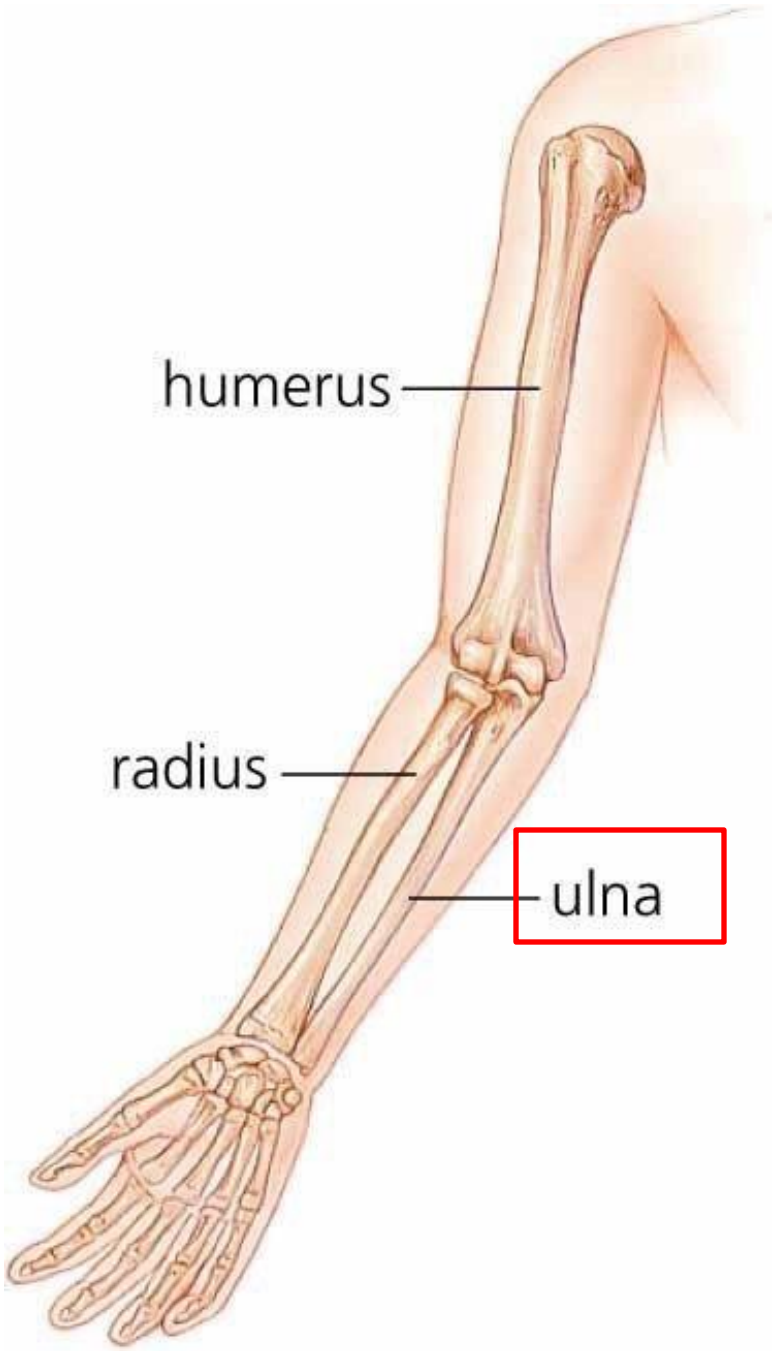
Condyles of humerus with the radius and ulna



# Ulna

- The ulna is the medial long bone of forearm
- Three parts: upper end, shaft, and lower end
- The head of the ulna is in its lower end (in contrast to the radius

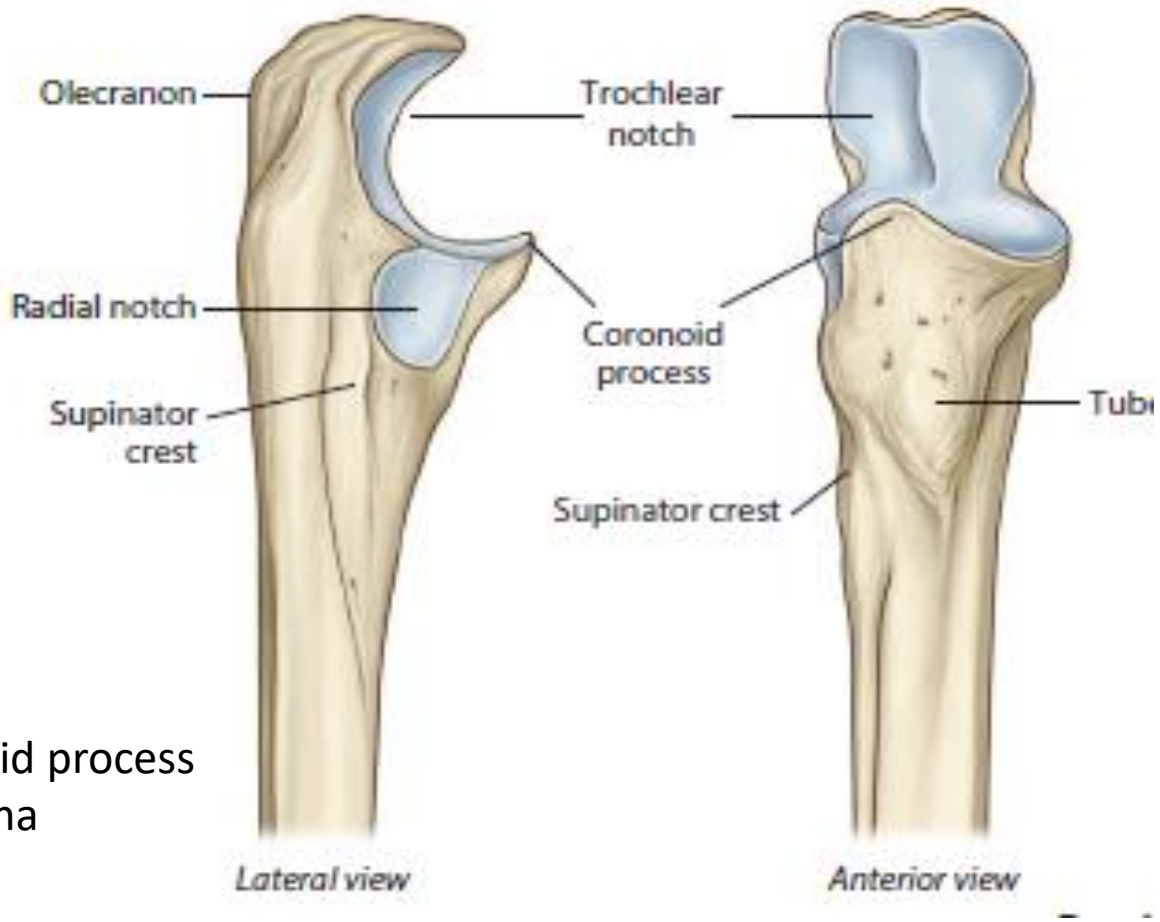


# Ulna

Head of ulna

Styloid process of ulna

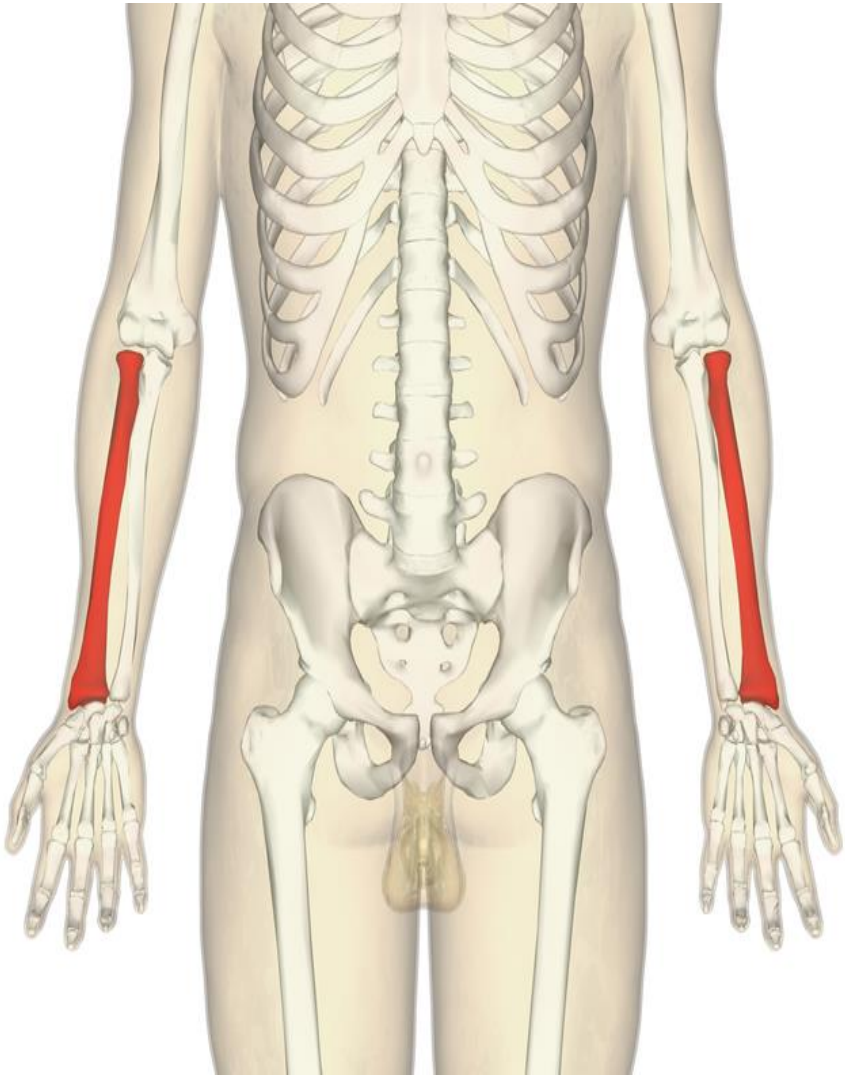
Distal end of ulna




Proximal end of ulna

# Radius

- It is the lateral long  bone of the forearm
- It is the weight bearing bone, hence more prone to fractures compared to ulna



# Parts of radius

## Upper end

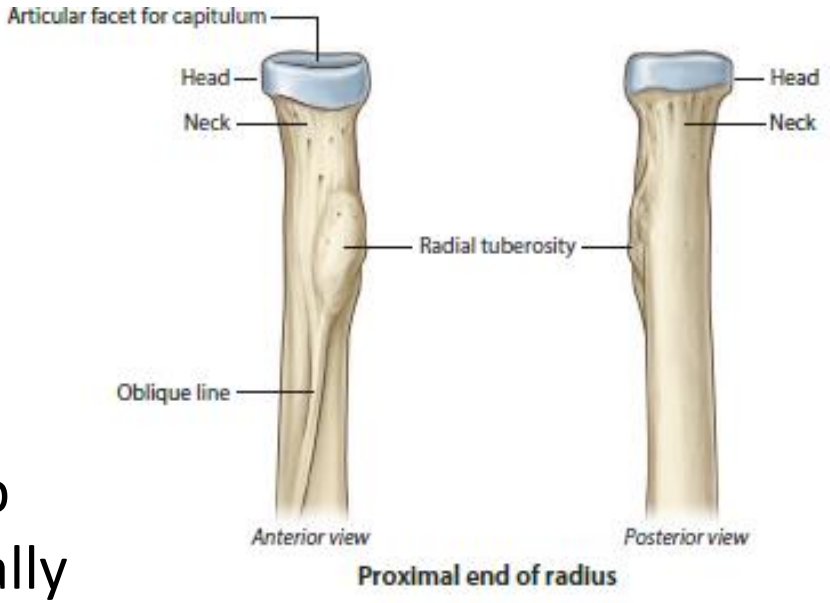
- Disc shaped head
- Constricted neck below it

## Shaft

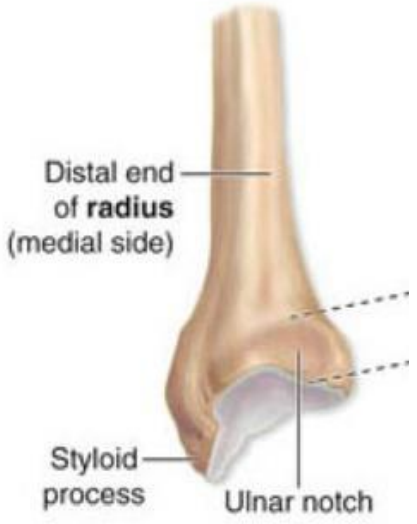
- Convex laterally with sharp interosseous border medially

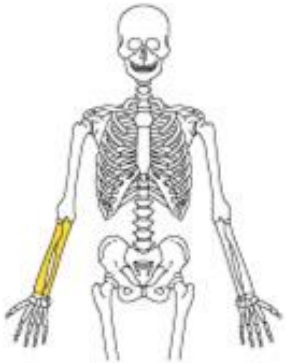
## Lower end

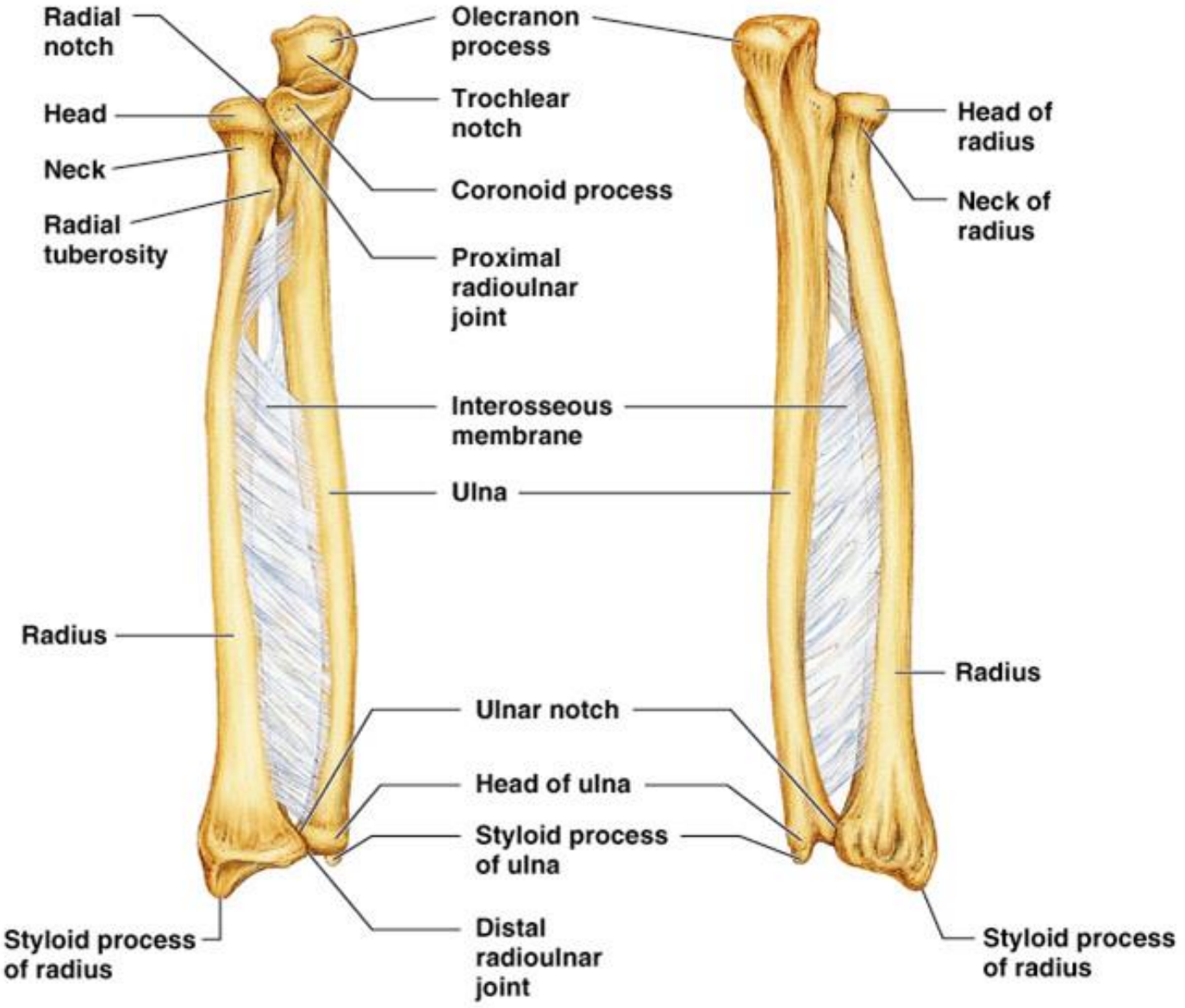
- Widest part of the bone
- Styloid process extends from the lateral surface
- Ulnar notch on the medial surface (articulate with?)
- Distal articular surface



Proximal end of radius





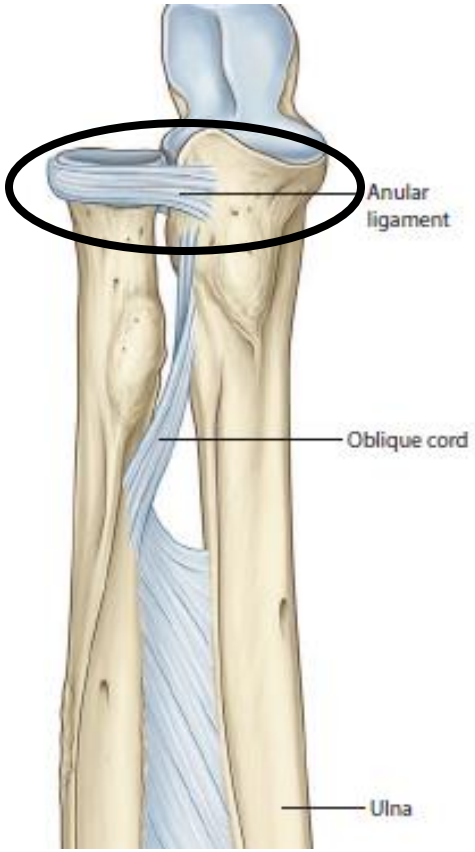


# Articulation of radius and ulna

- **Superior radioulnar joint**
  Radial notch of ulna with the head of the radius

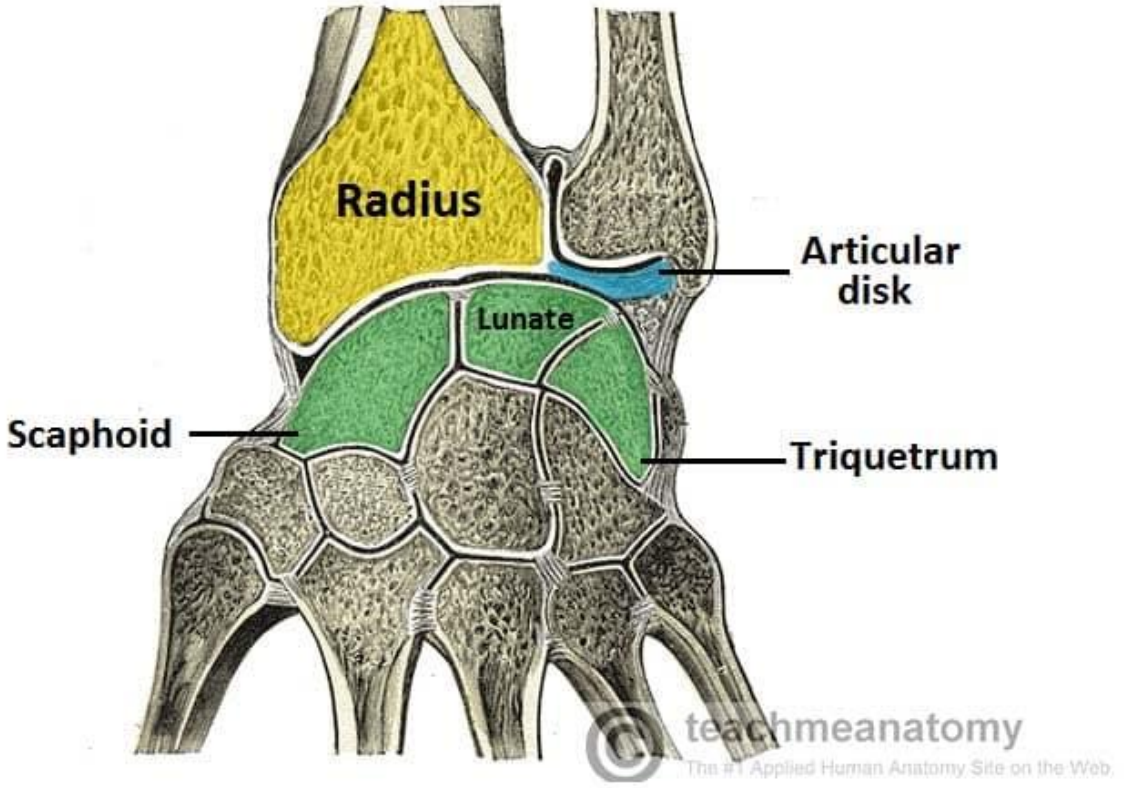
- **Inferior radioulnar joint**

Ulnar notch of radius with the head of the ulna

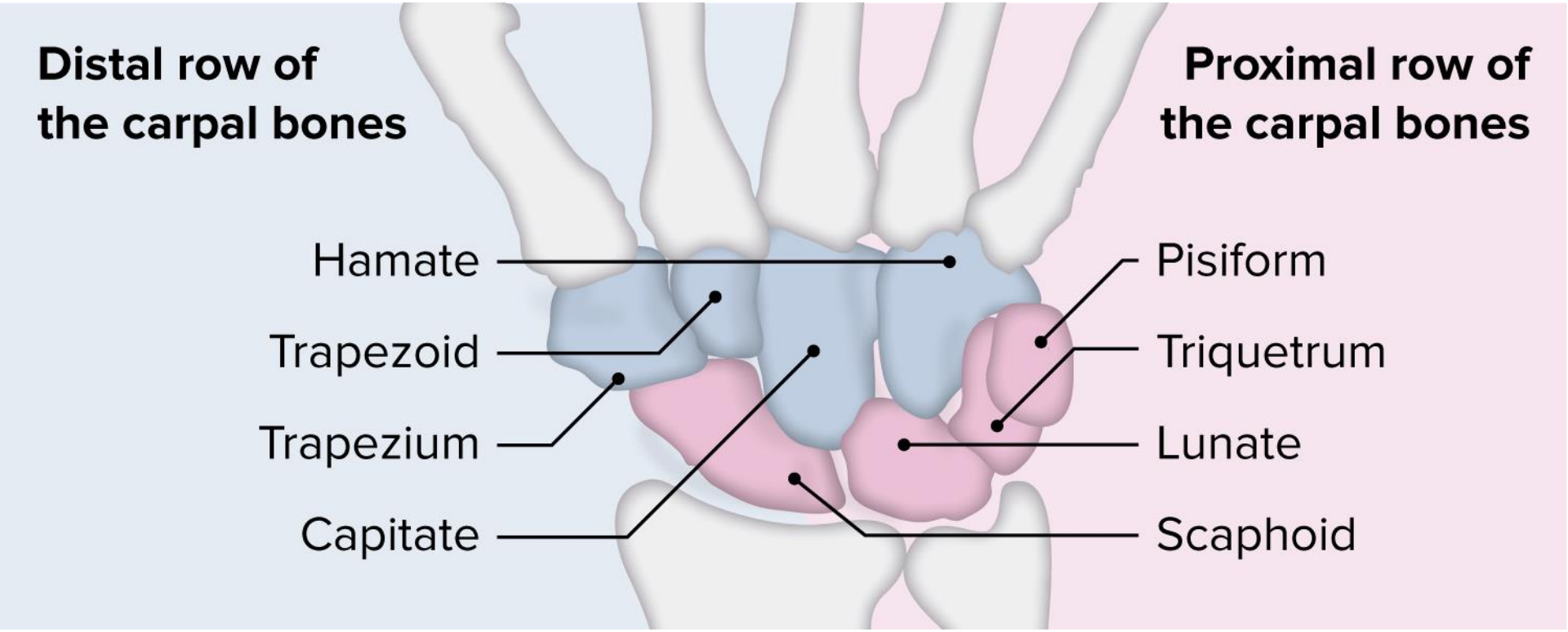


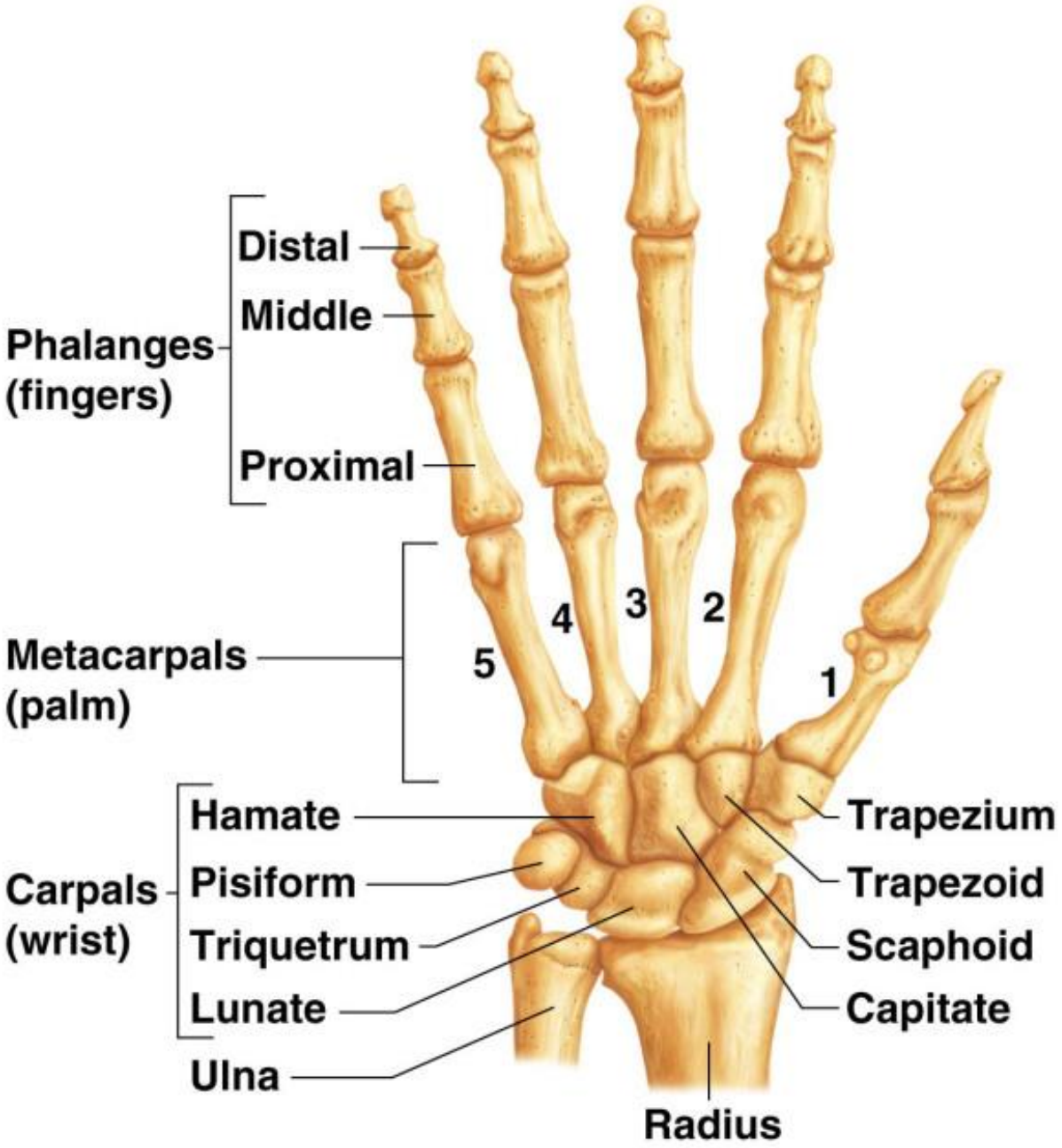

# Wrist joint

The distal articular surface of the radius with scaphoid, lunate and triquetral bones

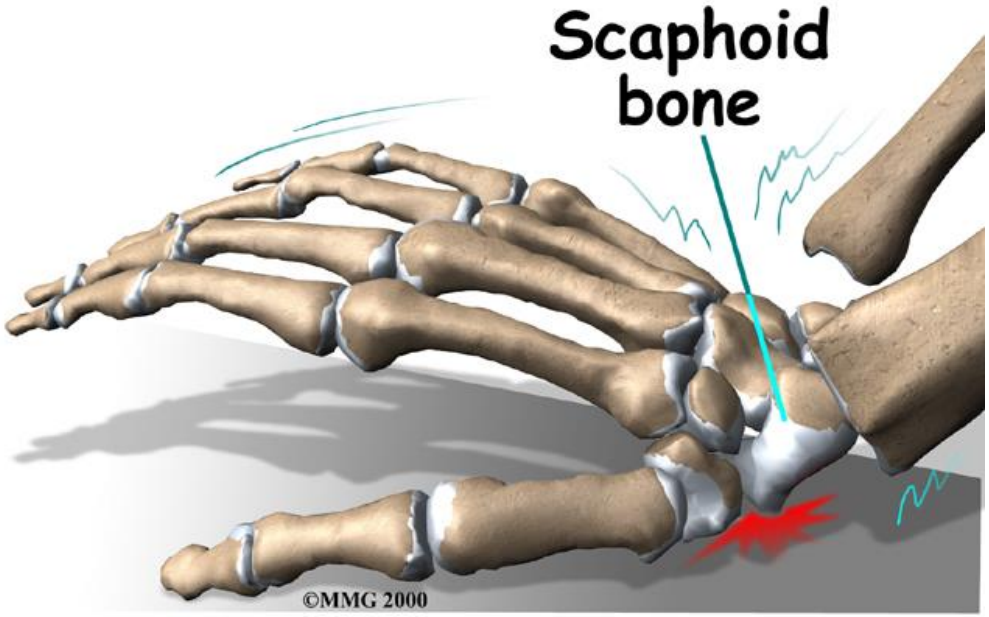


# Carpal bones

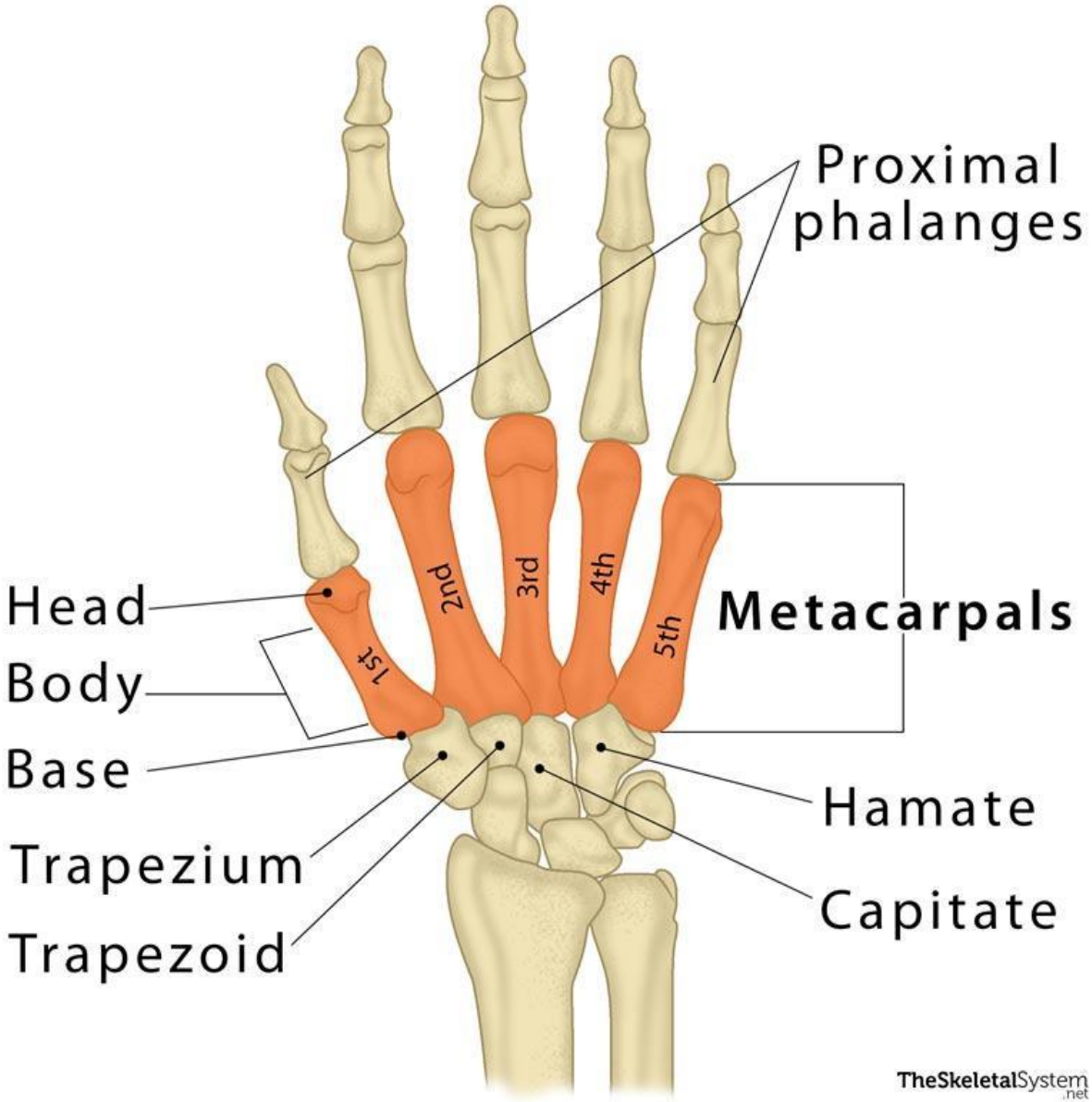




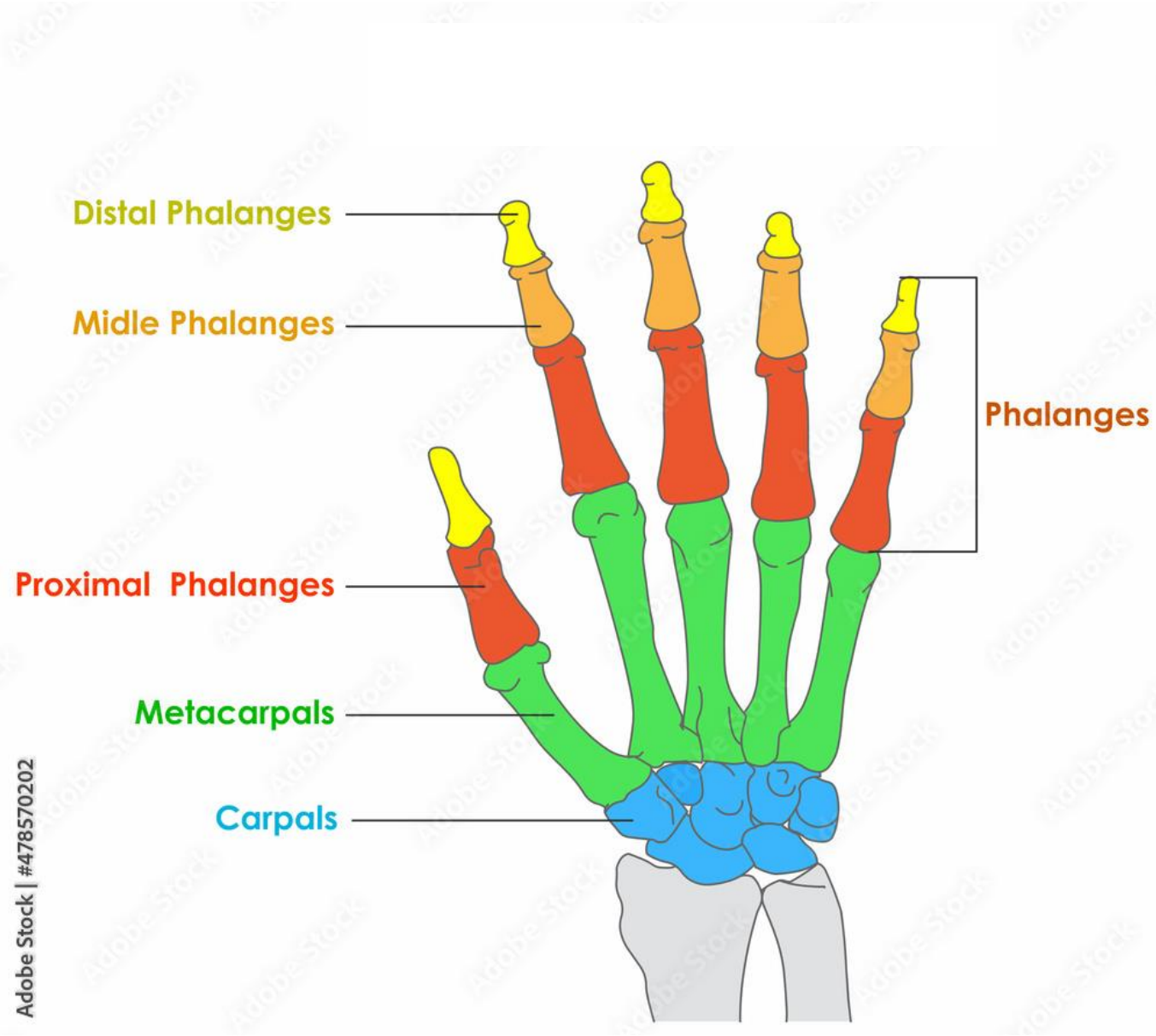
- Scaphoid bone has a proximal and distal parts connected by a narrow waist
- The proximal part may undergoes avascular necrosis after fracture at the waist because nutrient artery enters the distal part of the bone

# The Metacarpal Bones

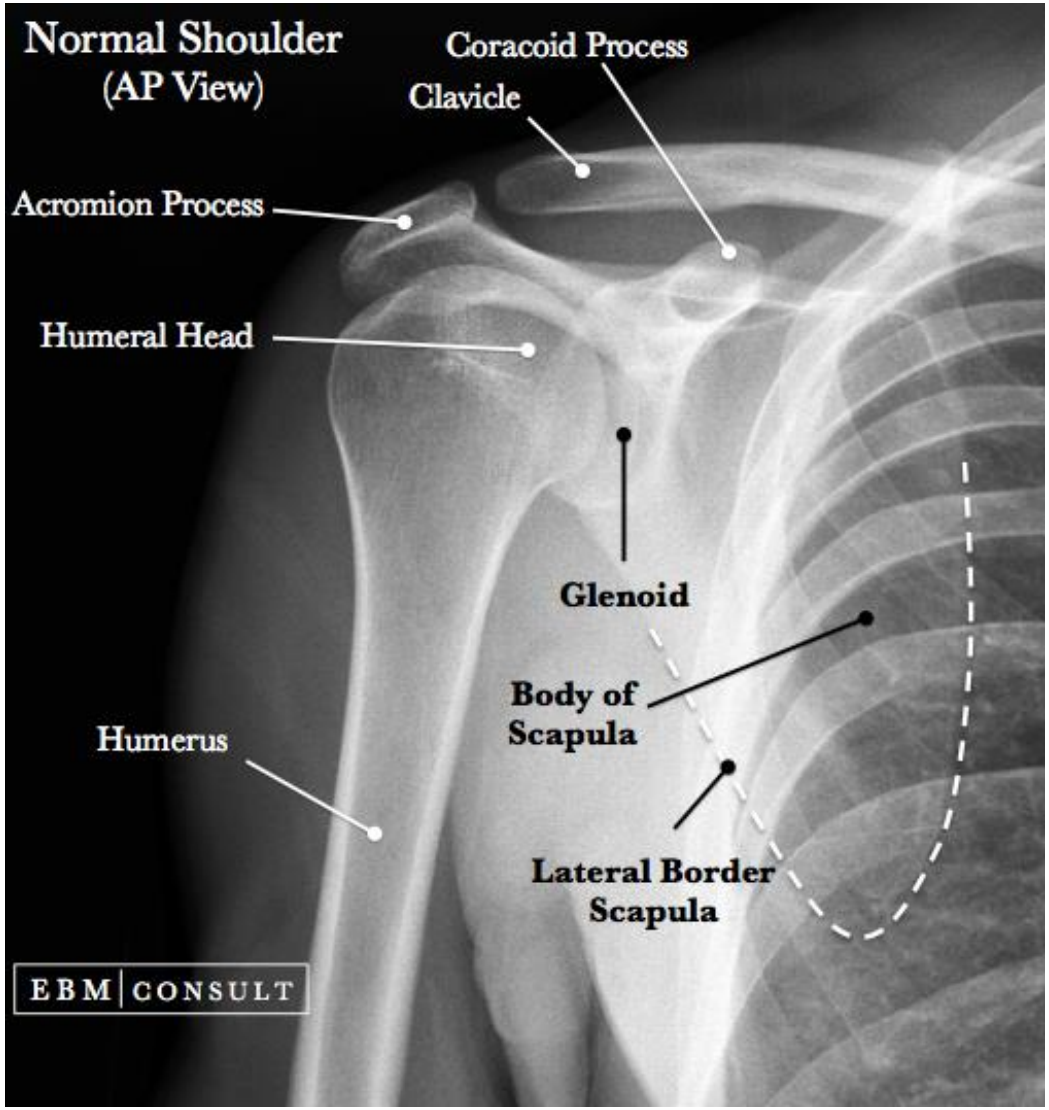


# Phalanges bones



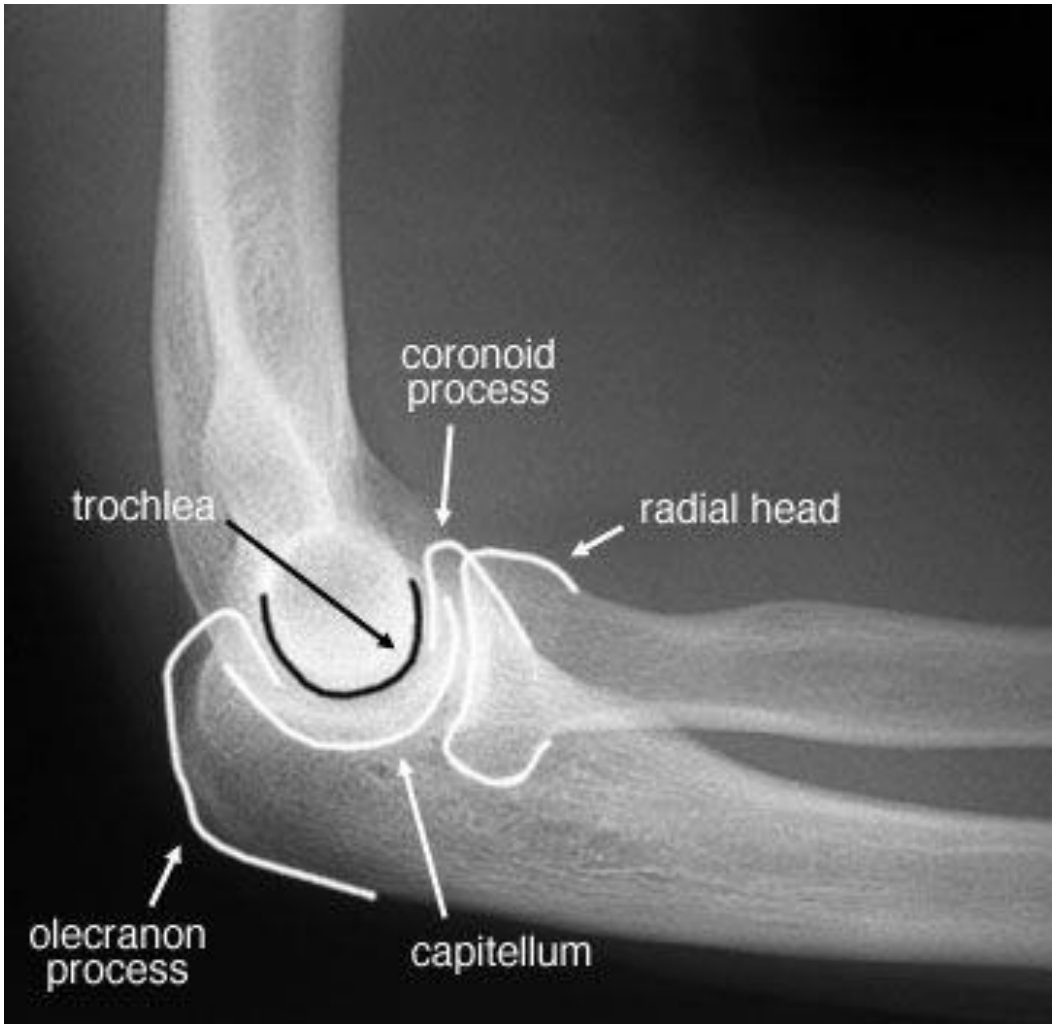
# Radiographic anatomy

Shoulder region



## Hand


## Elbow region



# Trauma can cause bone fracture and joint dislocation


**Fracture line**


**Joint dislocation**


Thank
you