

Systemic Module

MSS

“Anatomy”

Appendicular Skeleton I

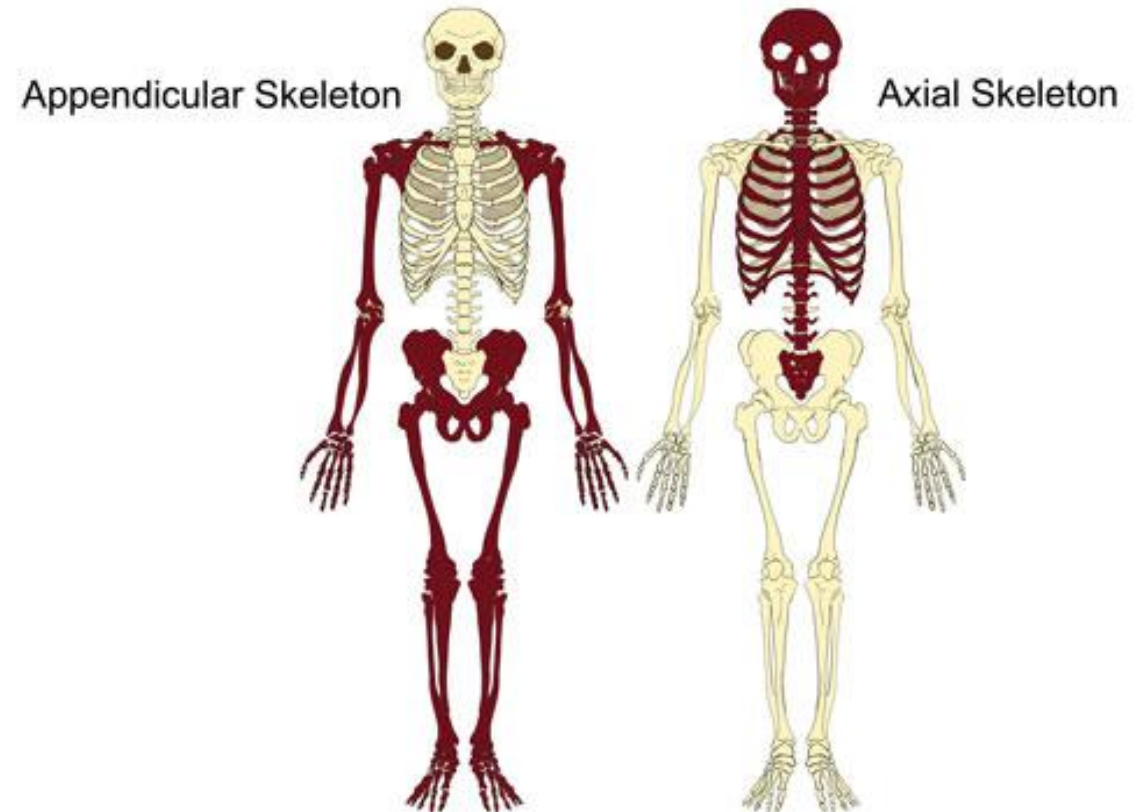
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Appendicular Skeleton

- **Consists of:**

1. **The pectoral girdle (Shoulder)**
2. **Pelvic girdle**
3. **The upper limbs**
4. **The lower limbs**



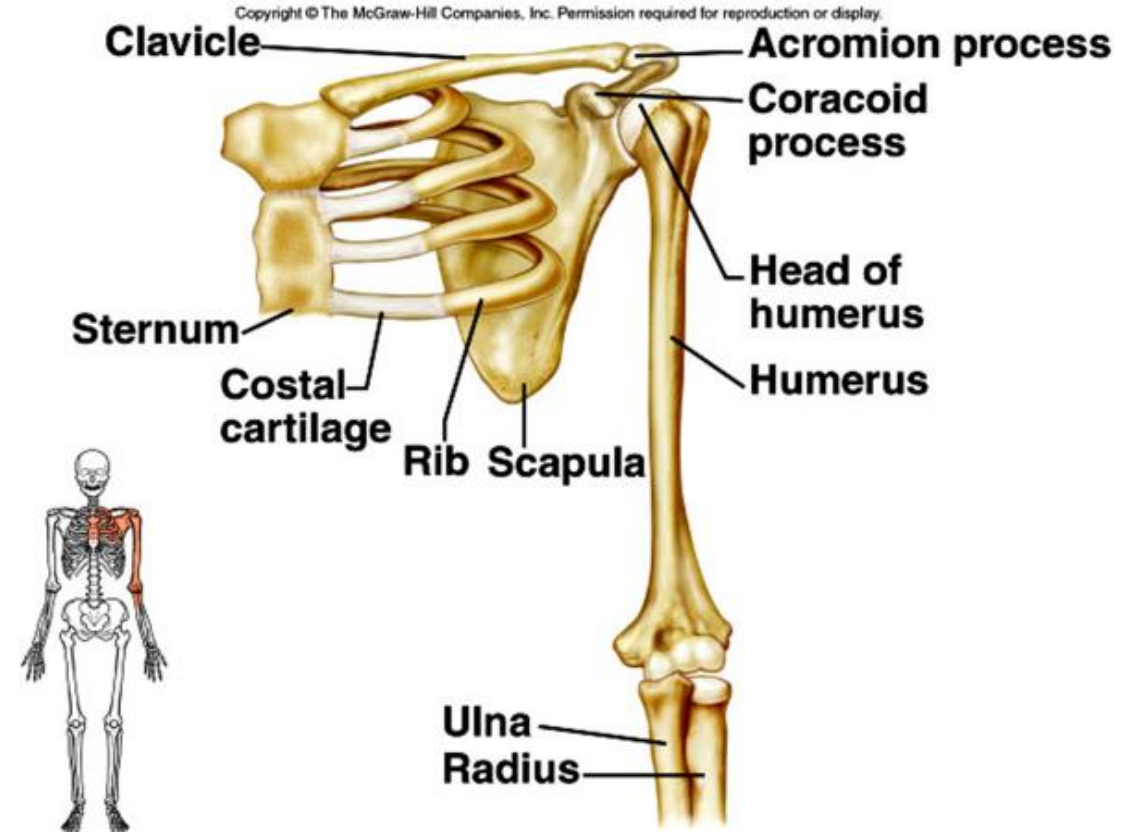
The Upper Limb

- **The upper limb is divided into:**
 1. **The shoulder** is the area of upper limb attachment to the trunk.
 1. **The arm** is the part of the upper limb between the shoulder and the elbow joint
 2. **The forearm** is between the elbow joint and the wrist joint.
 3. **The hand** is distal to the wrist joint.

Skeleton of Upper Limb

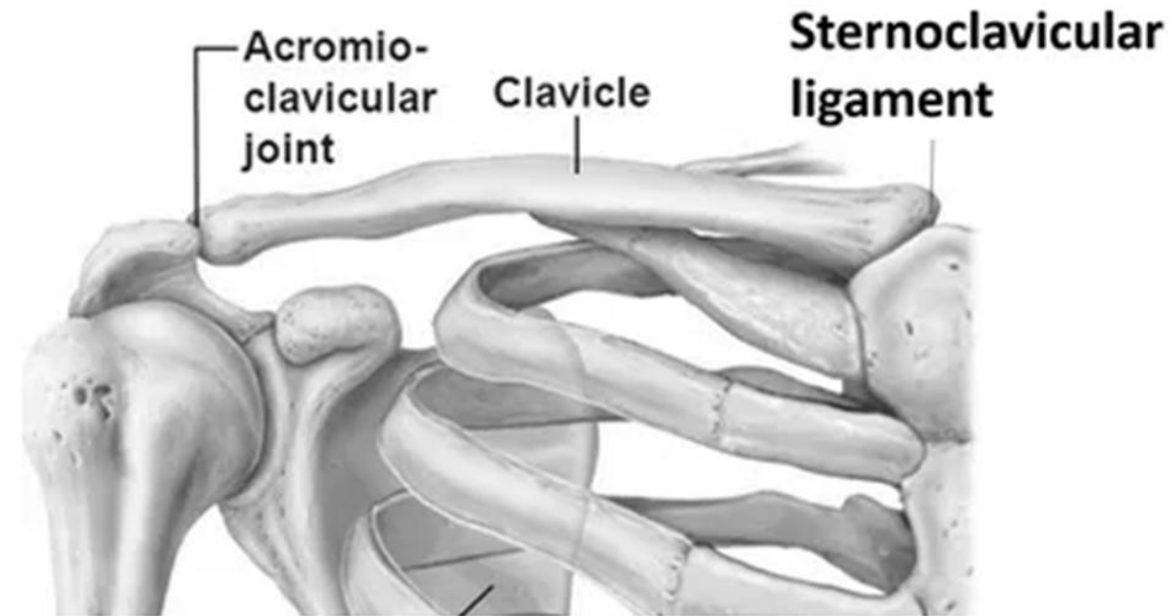
The Shoulder (Pectoral) Girdle

- Consists of a **clavicle** and a **scapula**
- Connects the upper limb to the axial skeleton



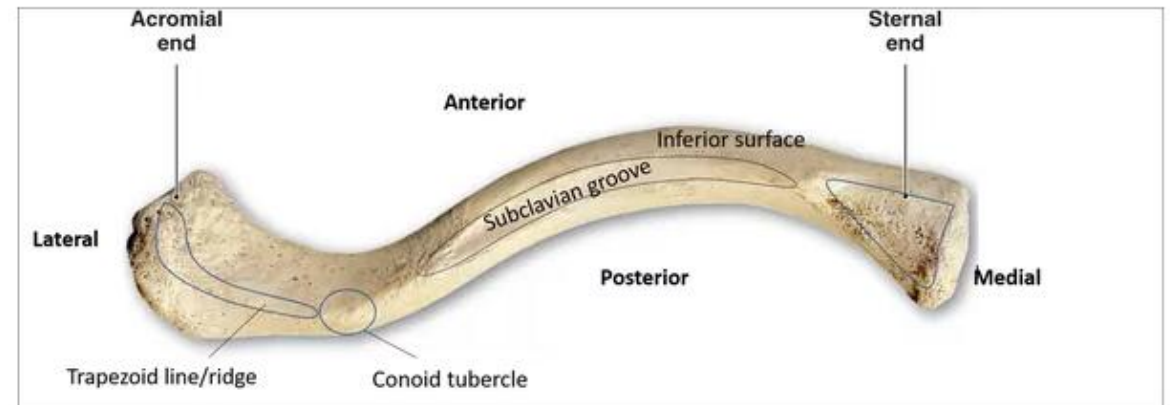
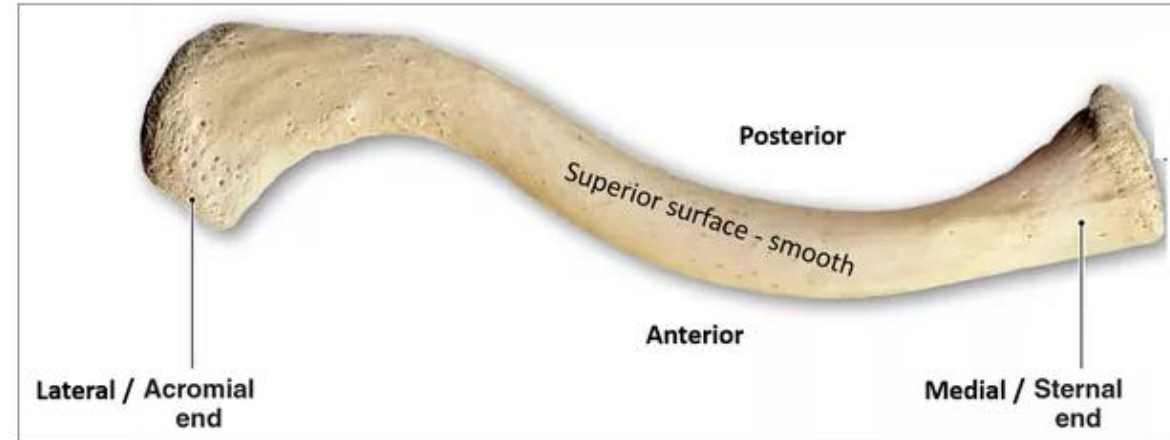
Clavicle

- The clavicle is the anterior bone of pectoral girdle.
- S-shaped bone
- **It has two ends:**
 1. The medial end: is called **the sternal end**, it is rounded and articulates with manubrium part of sternum to form **sterno-clavicular joint**.
 2. The lateral end: is called the **acromial end**, it is broad and flat and articulates with the acromion process of scapula to form **acromio-clavicular joint**.



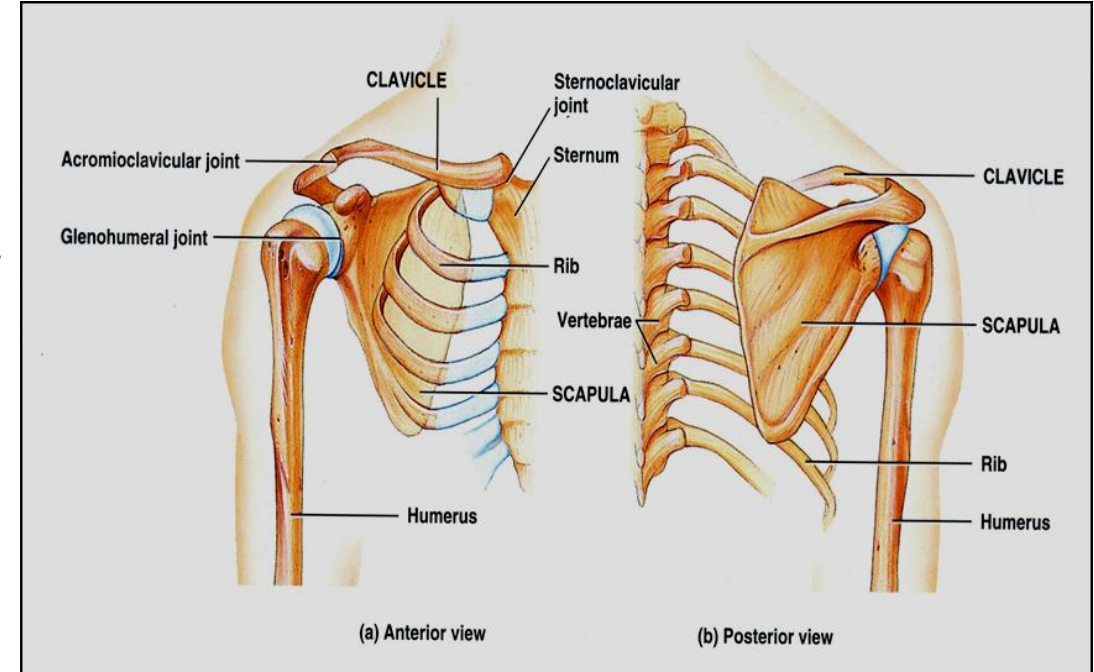
- The **medial two-thirds** of the clavicle is **convex anteriorly**, whereas the **lateral one-third** is **concave anteriorly**.

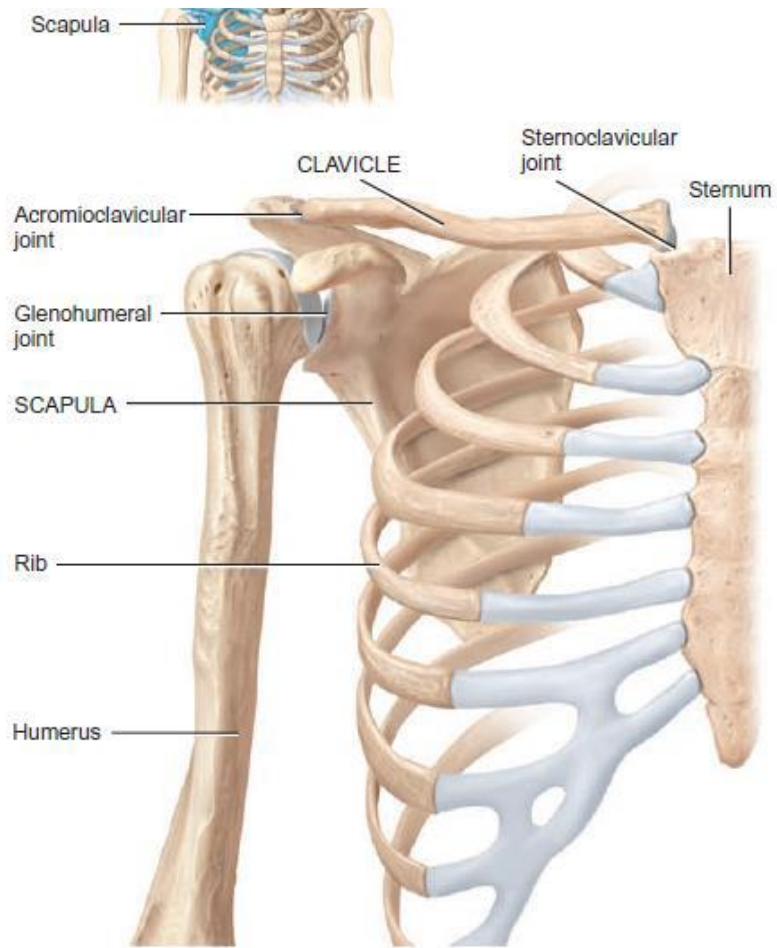
- The **superior surface** of the clavicle is **smooth**, whereas the **inferior surface** is **rough**.



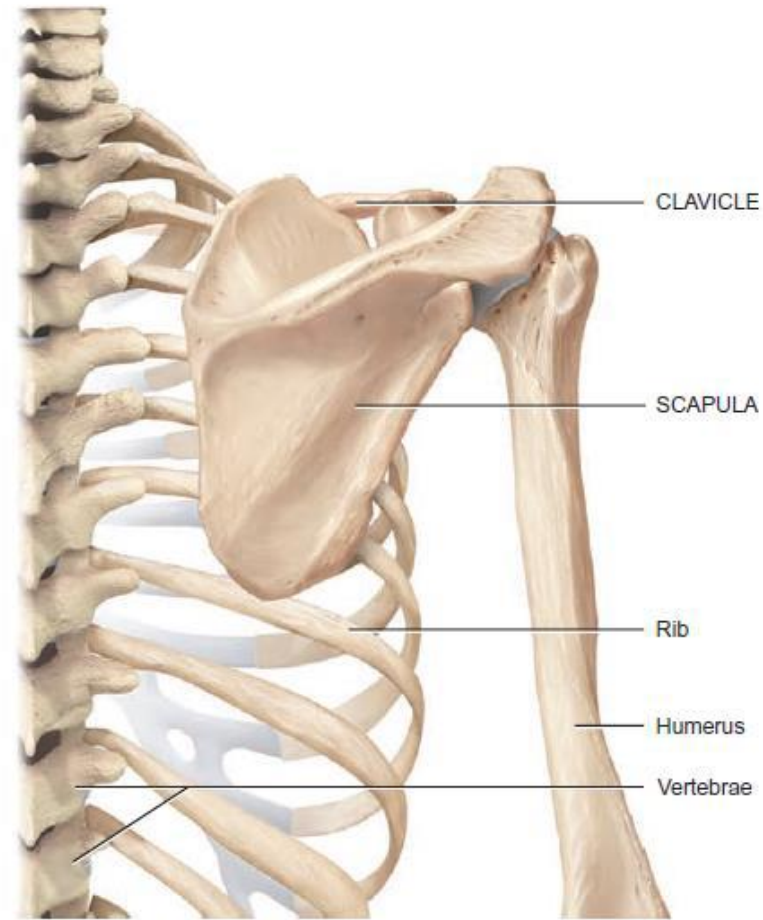
Scapula

- The scapula is the posterior bone of pectoral girdle.
- It is a large, flat, triangular bone.
- It lies on the posterior wall of thorax, overlapping the 2nd – 7th ribs.
- It has:
 - **Two surfaces:** anterior (costal) and posterior.
 - **Three borders:** superior, medial, and lateral.
 - **Three angles:** superior, inferior, and lateral
- Scapula also has **three processes:** spine, acromion process and coracoid process.





(a) Anterior view of pectoral girdle

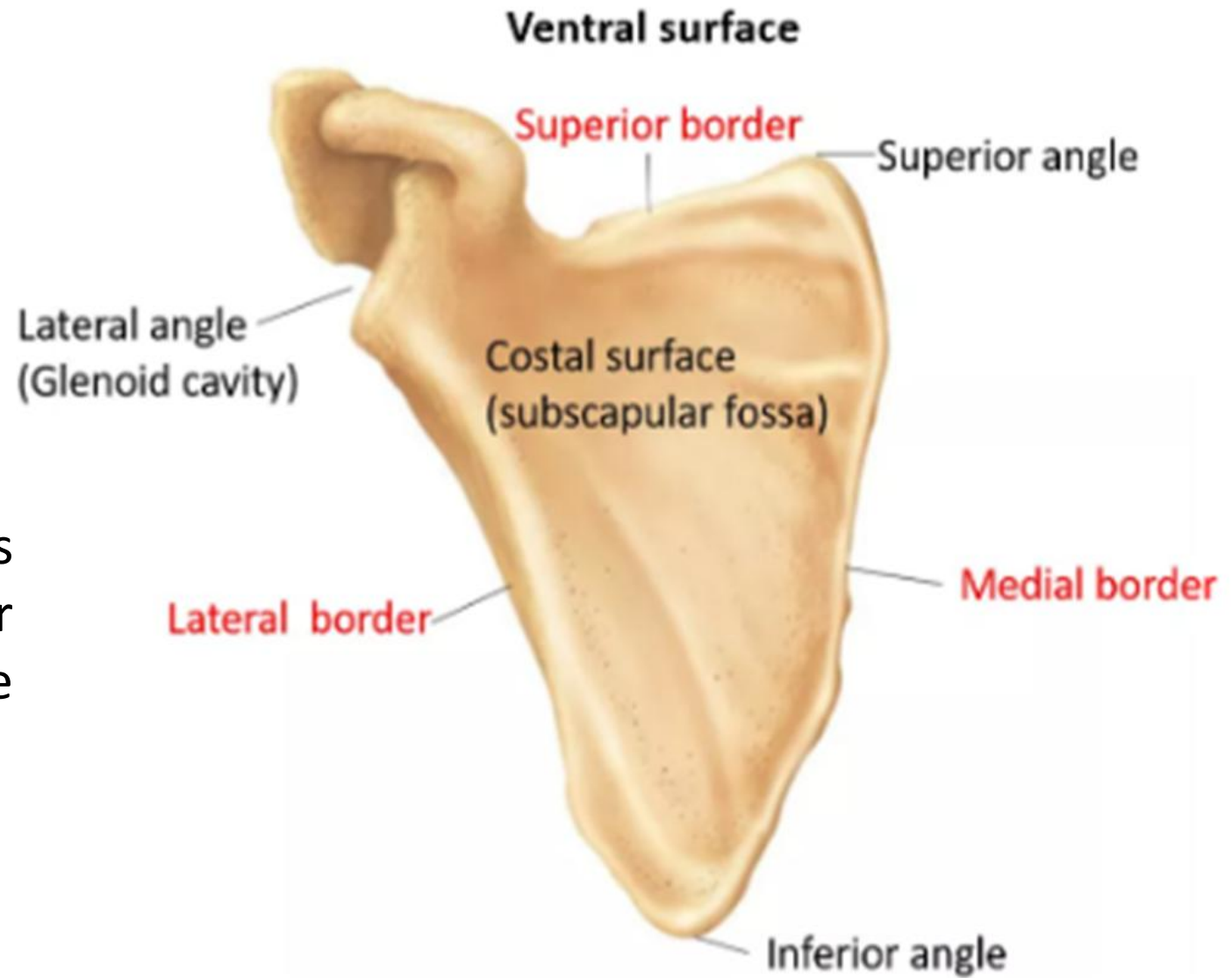


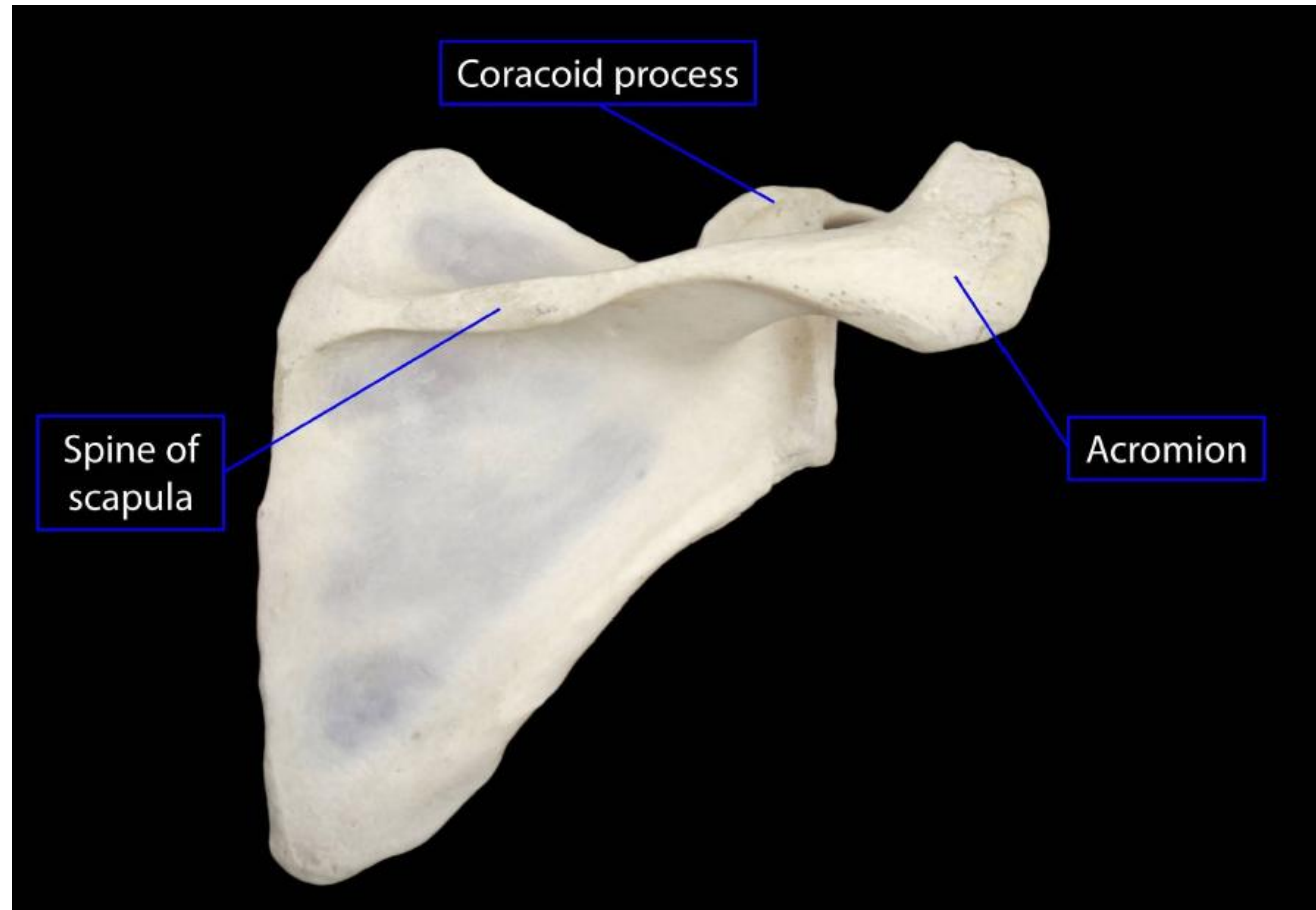
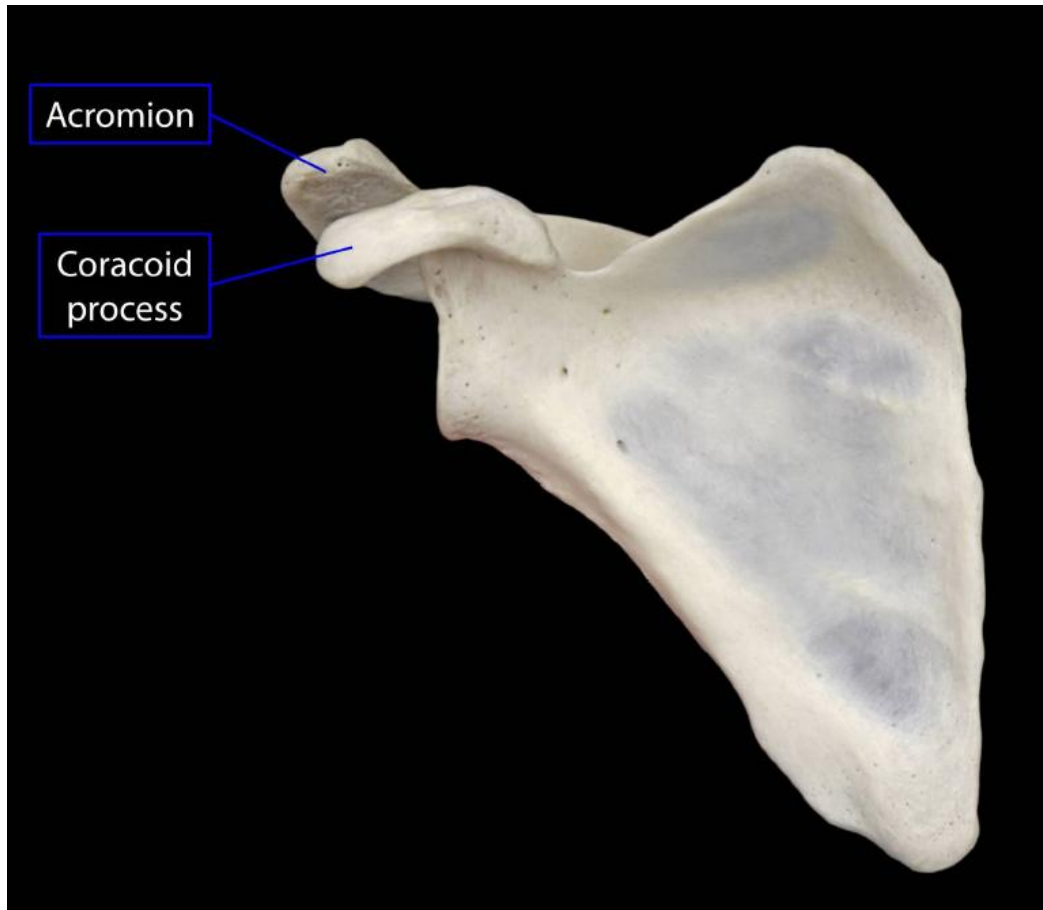
(b) Posterior view of pectoral girdle

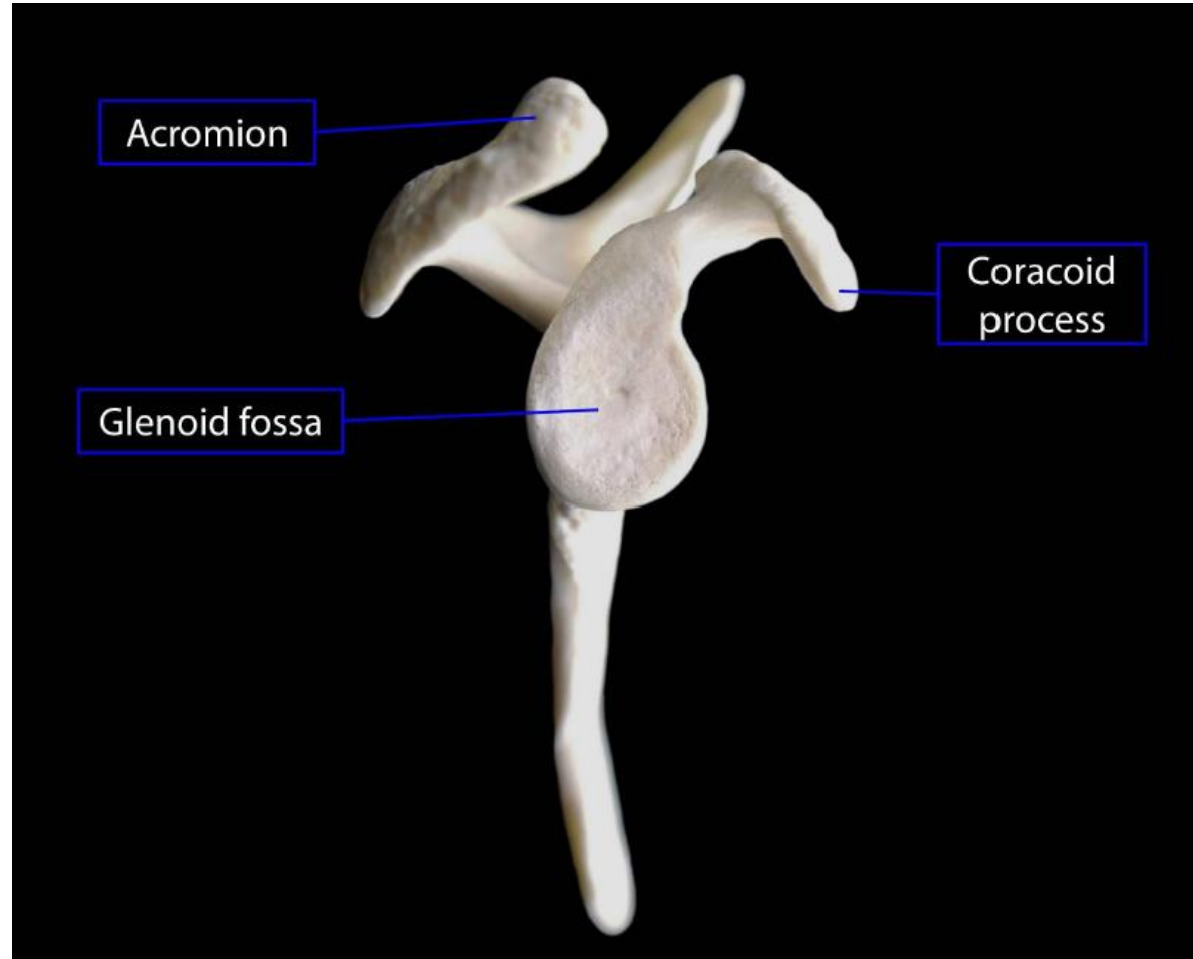
Scapula lies on the posterior wall of thorax, overlapping the 2nd – 7th ribs.

- **Two surfaces**
- **Three borders**
- **Three angles**

➤ The **lateral angle** of the scapula is occupied by the **glenoid cavity** for articulation with head of the humerus (in shoulder joint).

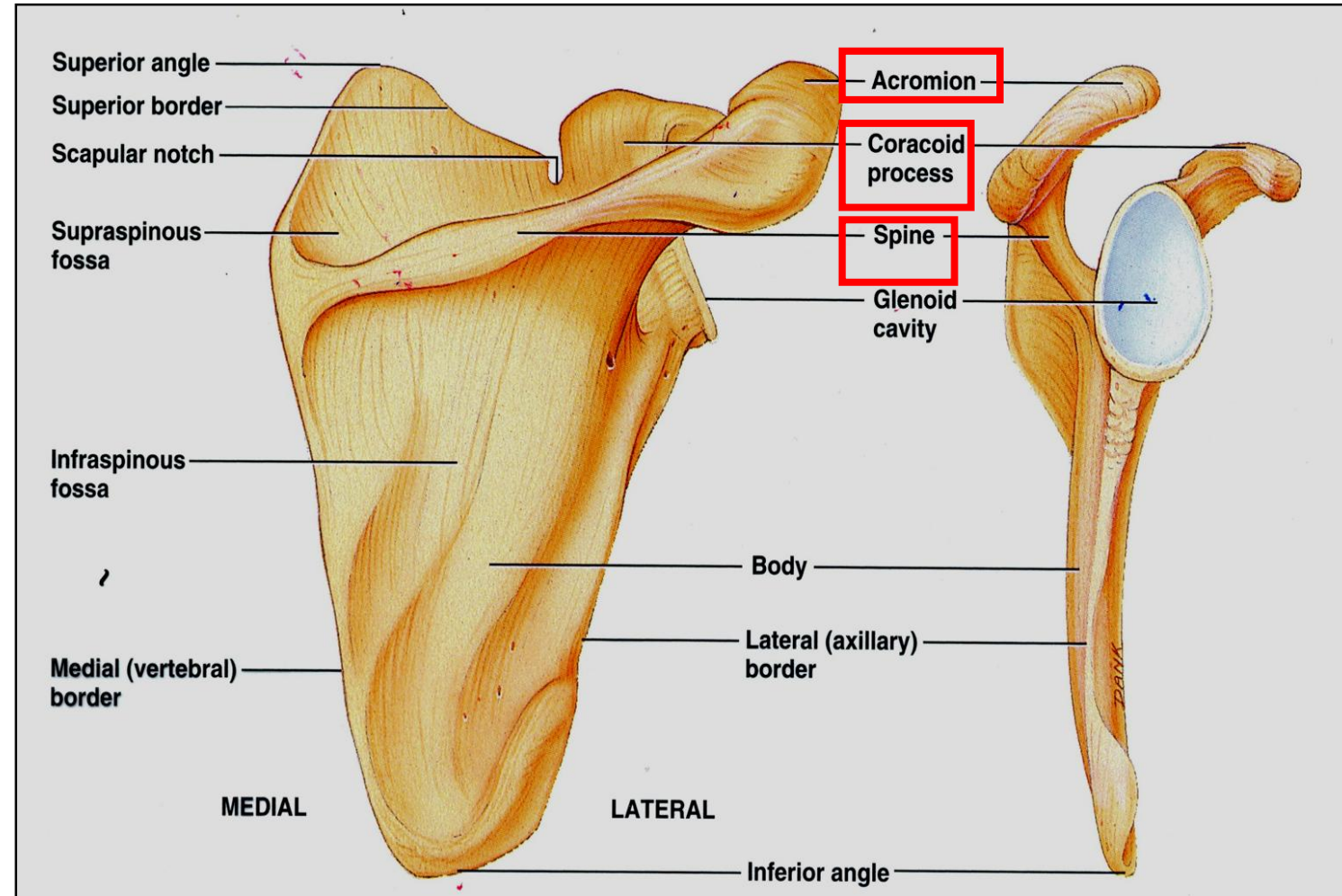




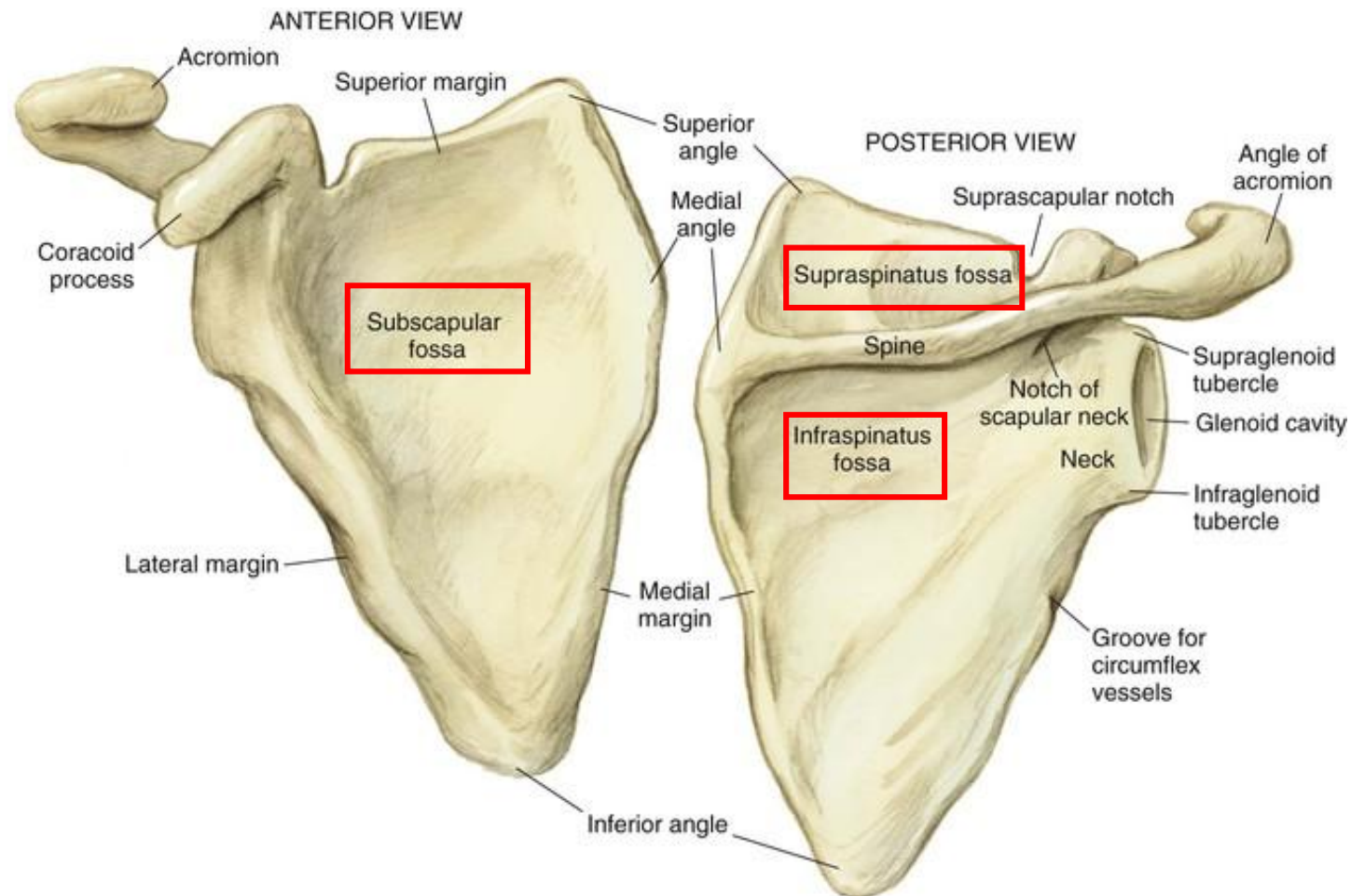


Three processes:

- **Spine:**
Shelf-like projection on the posterior surface.
- **Acromion process:**
An anterolateral projection of the spine.
- **Coracoid process**
Arises from lateral end of superior border.

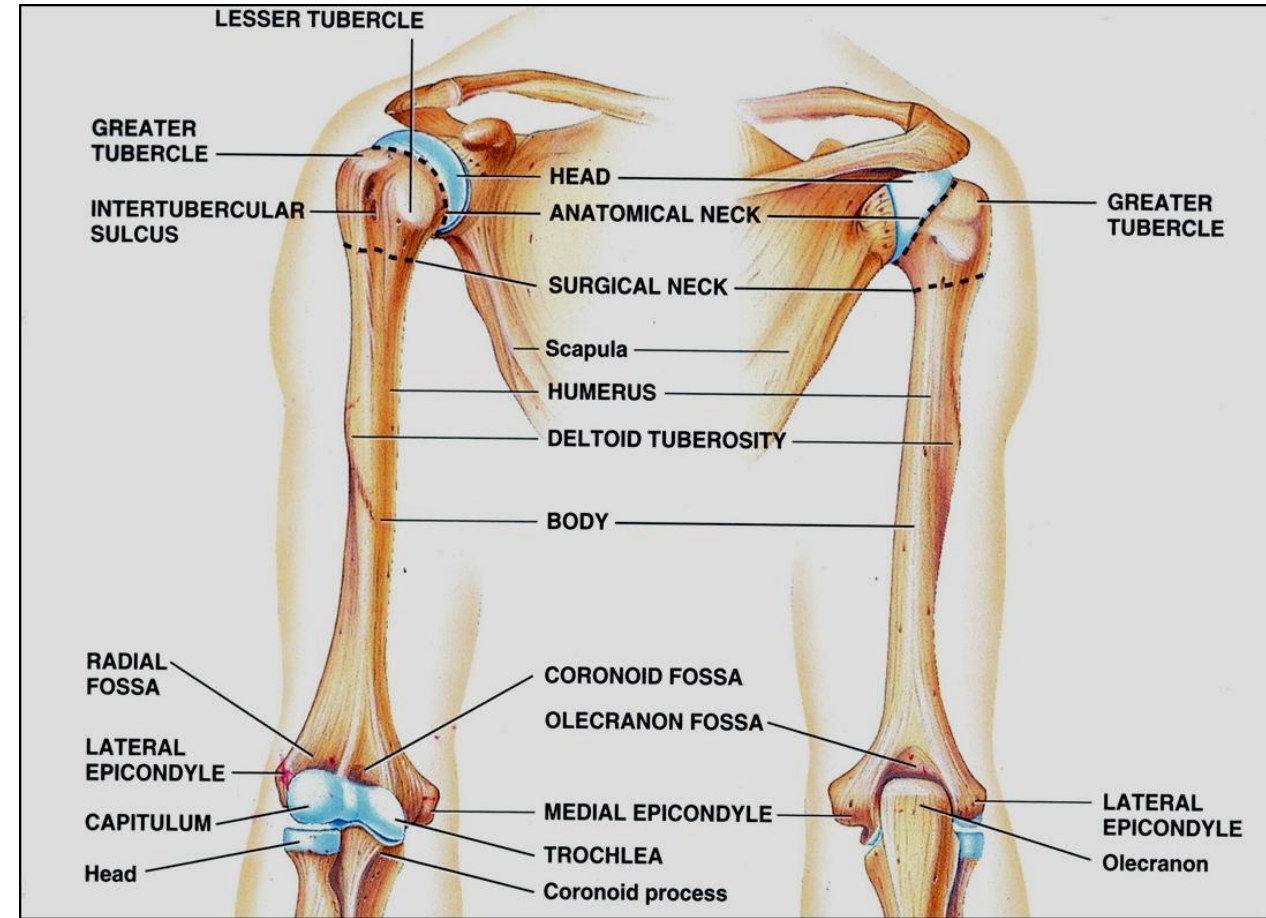


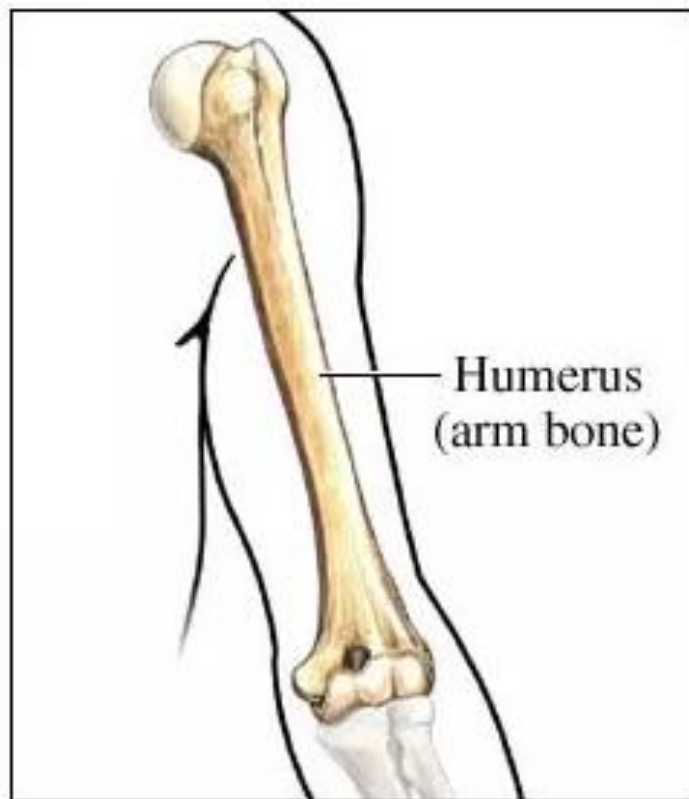
- The spine subdivides the **posterior surface** of the scapula into a small, **superior supraspinous fossa** and a much larger, **inferior infraspinous fossa**
- The **anterior (costal) surface** of the scapula is being characterized by a shallow concave **subscapular fossa** over much of its extent



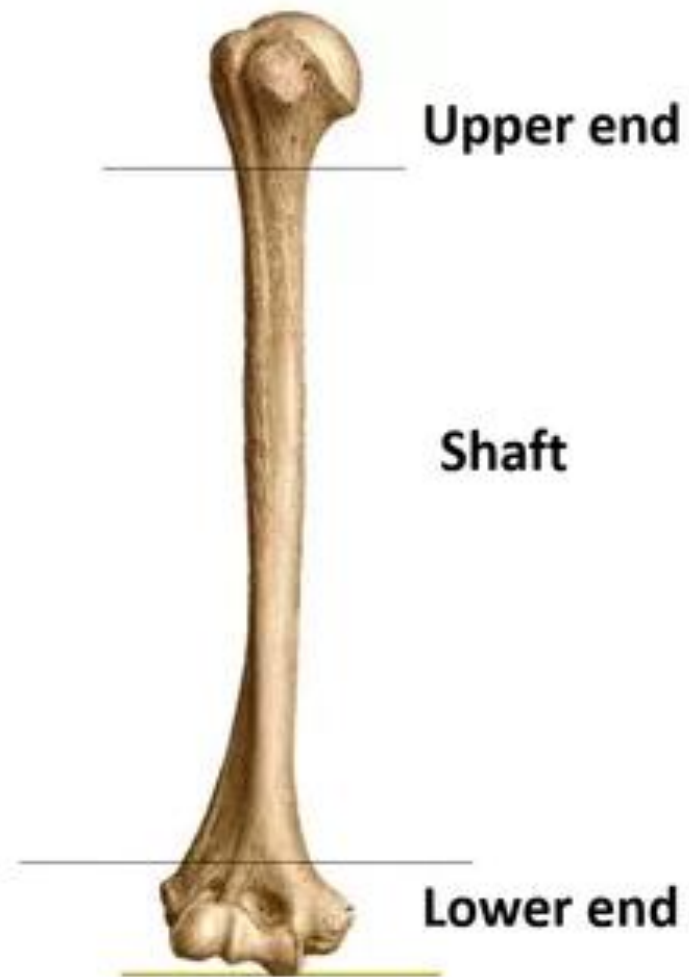
Humerus

- It is the bone of the arm.
- **Articulation:**
 - Proximally with **scapula** at **shoulder joint**.
 - Distally with **radius** and **ulna** at **elbow joint**.
- It has an **upper end**, a **shaft** and a **lower end**.





Location of Humerus



Parts of humerus

The upper end consists of :

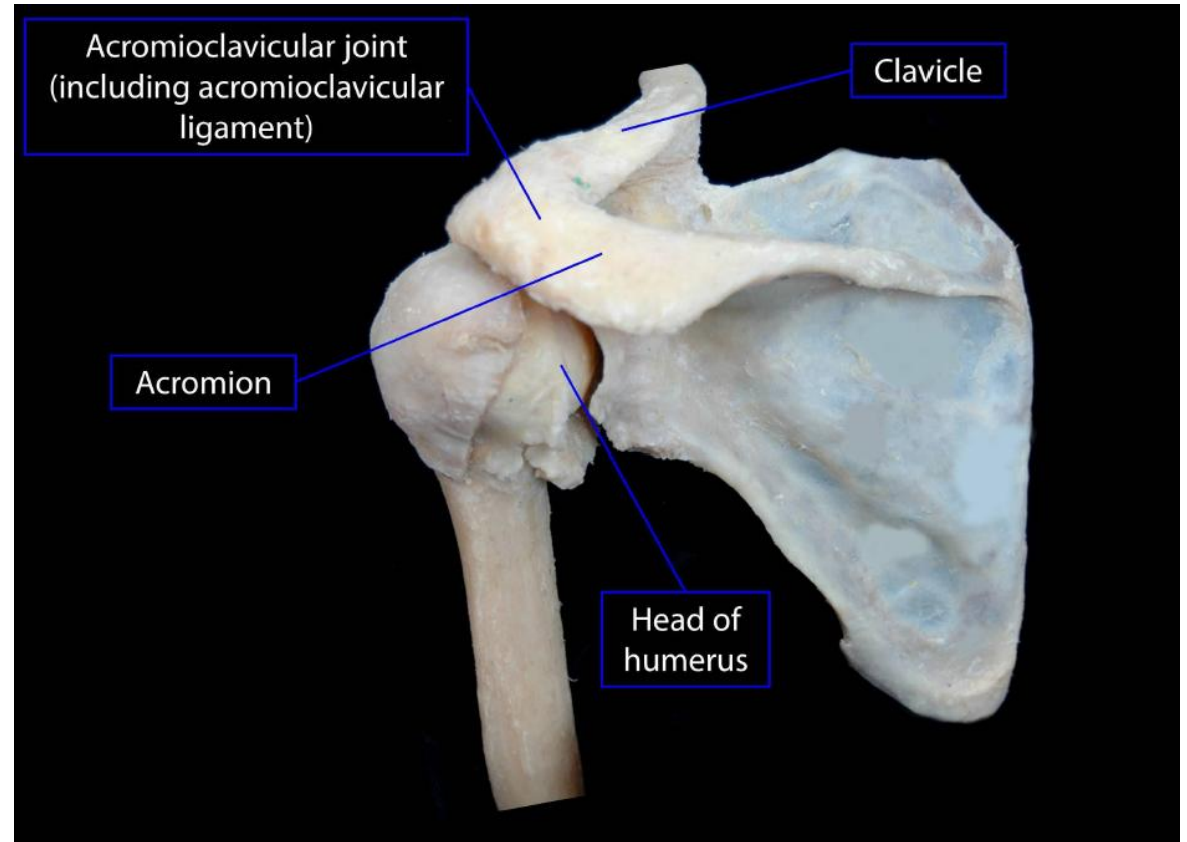
1. **The head:** which is less than half of a sphere. It articulates with the glenoid cavity of scapula to form shoulder (glenohumeral) joint.
2. **The greater tuberosity** (tubercle) which is a lateral projection.
3. **The lesser tuberosity** (tubercle) which is an anterior projection.
4. **The bicipital groove** (inter-tubercular sulcus) separates the 2 tuberosities.
5. **The anatomical neck** is the margin of the head that separates it from the tuberosities.
6. **The surgical neck** is the constriction that separates the upper end from the shaft.



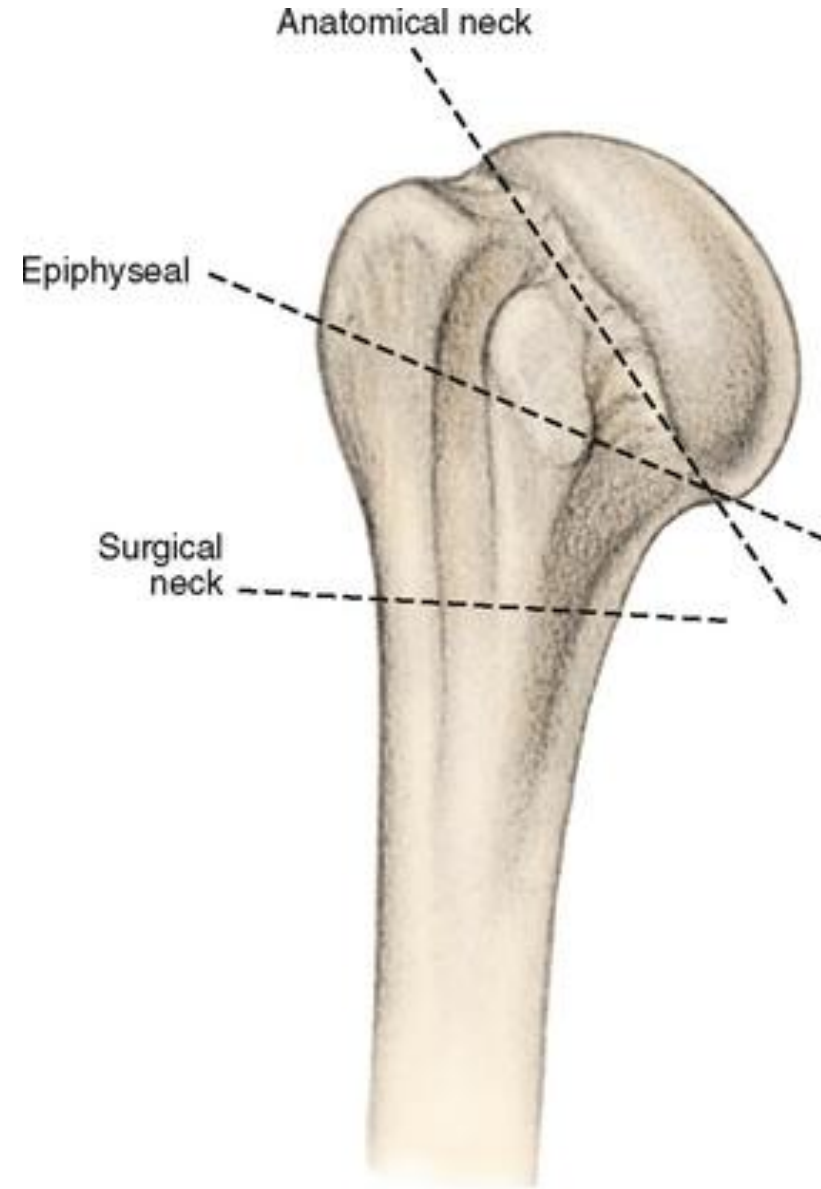
Upper End of Humerus



Articulatio humeri: Bony elements (Posterior view)

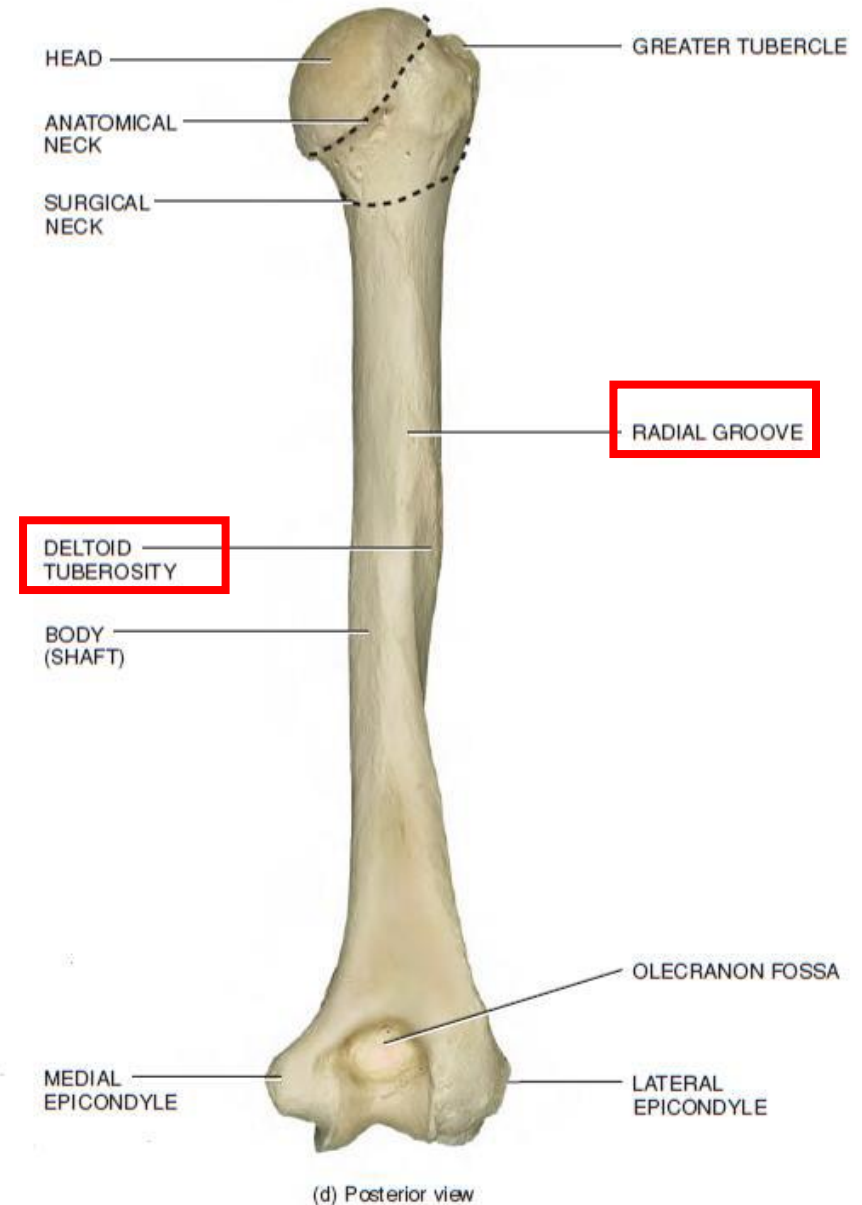
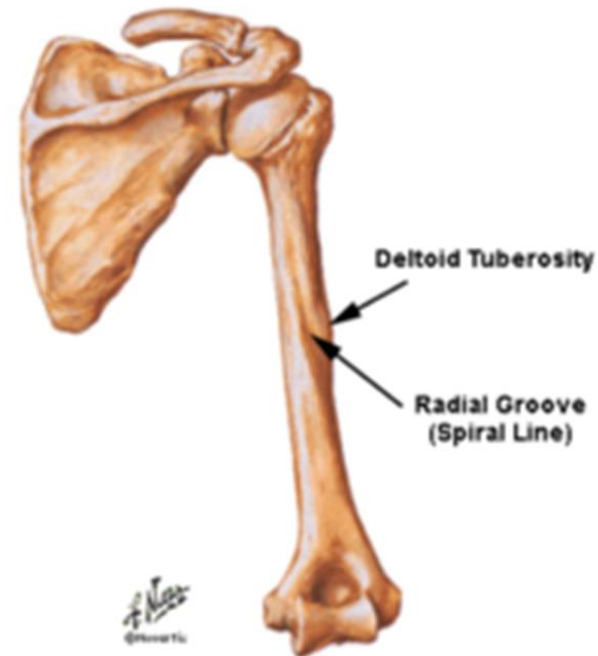


Because the surgical neck is weaker than more proximal regions of the bone, it is one of the sites where the humerus is commonly fractured. The associated nerve (axillary) and artery (posterior circumflex humeral) can be damaged by fractures in this region.



Shaft (body) presents:

- 1. Deltoid tuberosity:** roughened area on the lateral aspect of the middle portion of the shaft
- 2. Radial groove:** on posterior surface of the humerus.



(d) Posterior view
Posterior view

The lower end presents:

1- Two articular surfaces:

- A. The **capitulum**: a convex surface laterally. It articulates with the radius in humero-radial articulation.
 - B. The **trochlea**: a pulley-shaped surface medially. It articulates with the ulna in humero-ulnar articulation.
- Both the **humero-radial** & **humero-ulnar** articulations form the **elbow joint**.

2- Two non-articular side projections:

A. medial epicondyle.

B. lateral epicondyles.

- The medial epicondyle is more prominent and wider than the lateral, and is crossed on its posterior surface by **ulnar nerve**.

3- Three depressed fossae:

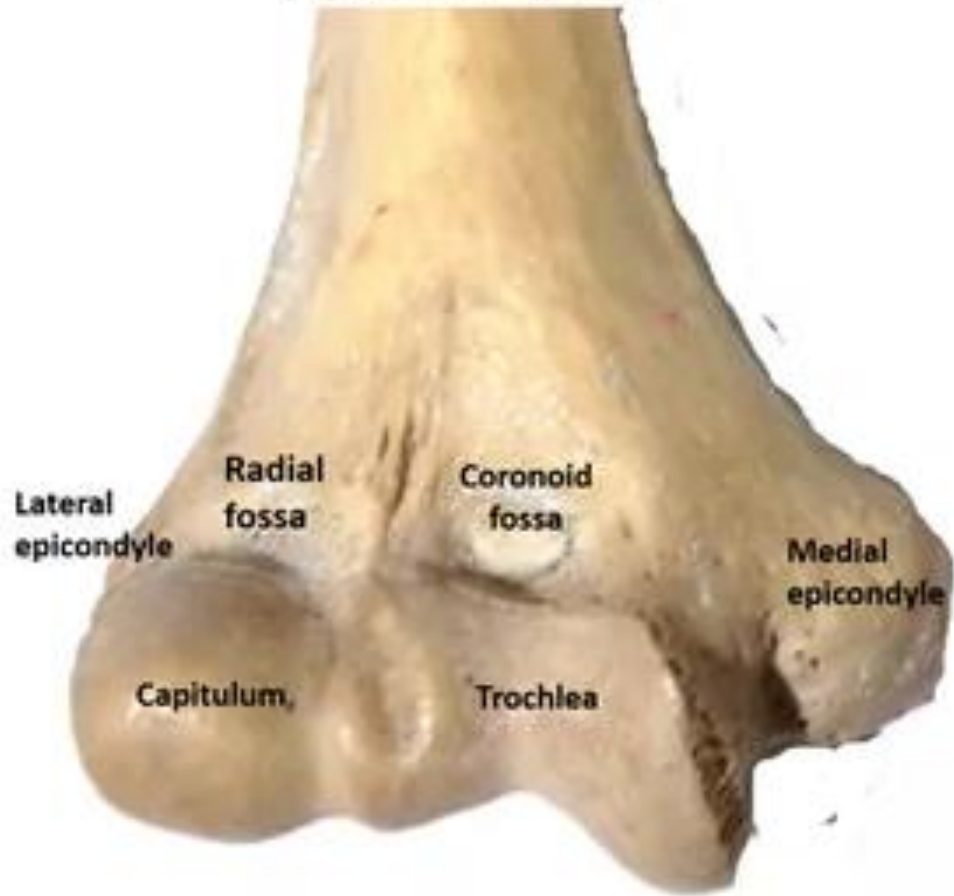
A. Radial fossa → above capitulum anteriorly.

B. Coronoid fossa → above trochlea anteriorly.

C. Olecranon fossa → above trochlea posteriorly.

The lower end of Humerus

Anterior view



Posterior view



Radius

- This is the lateral bone of the forearm.
- It has an **upper end**, a **shaft** & a **lower end**.

The upper end consists of :

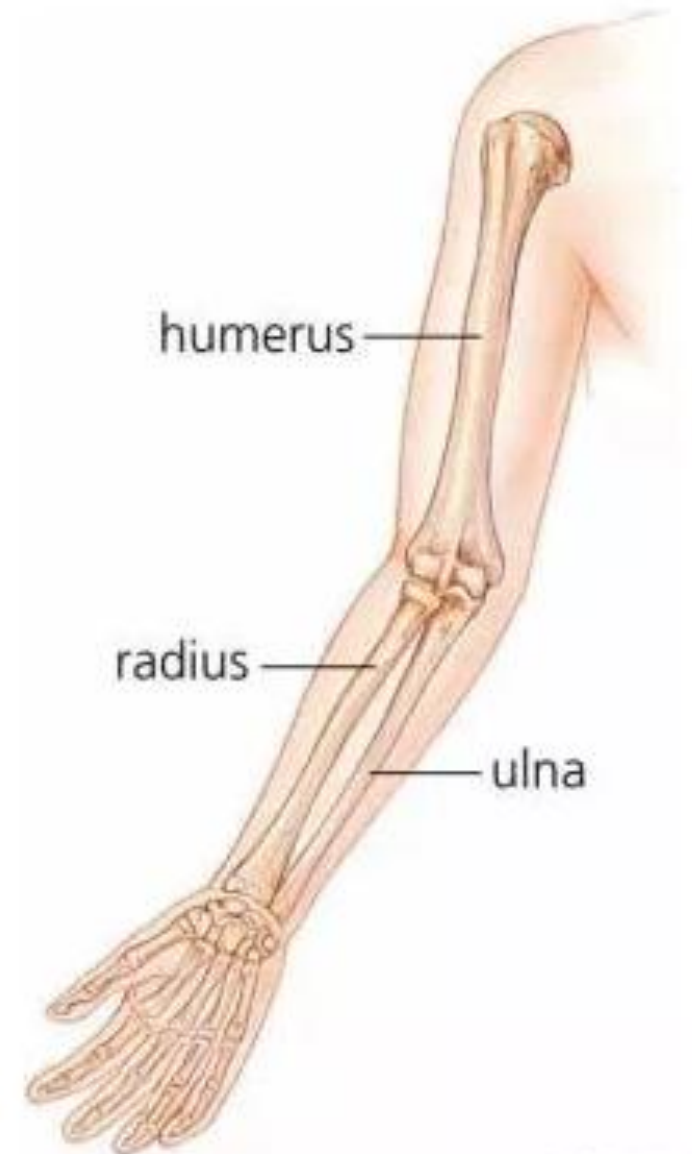
1. The head:

- Disc-shaped.
- It articulates superiorly with the capitulum of the humerus.

2. Neck.

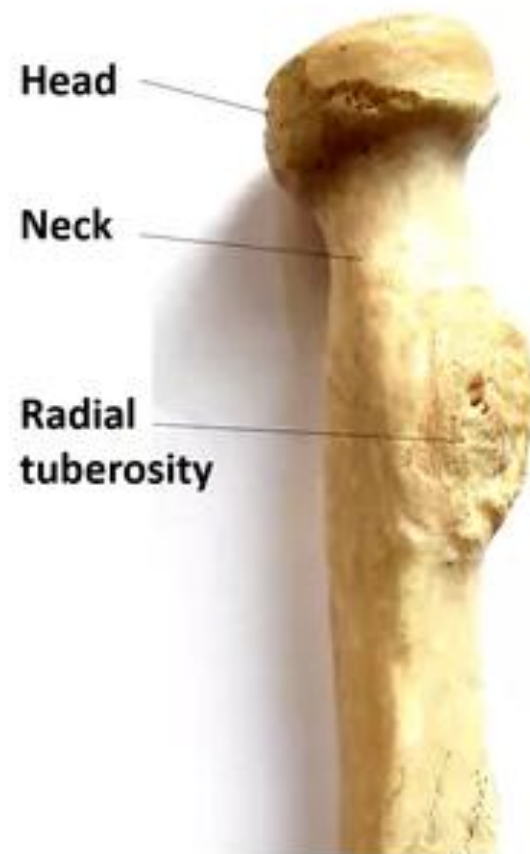
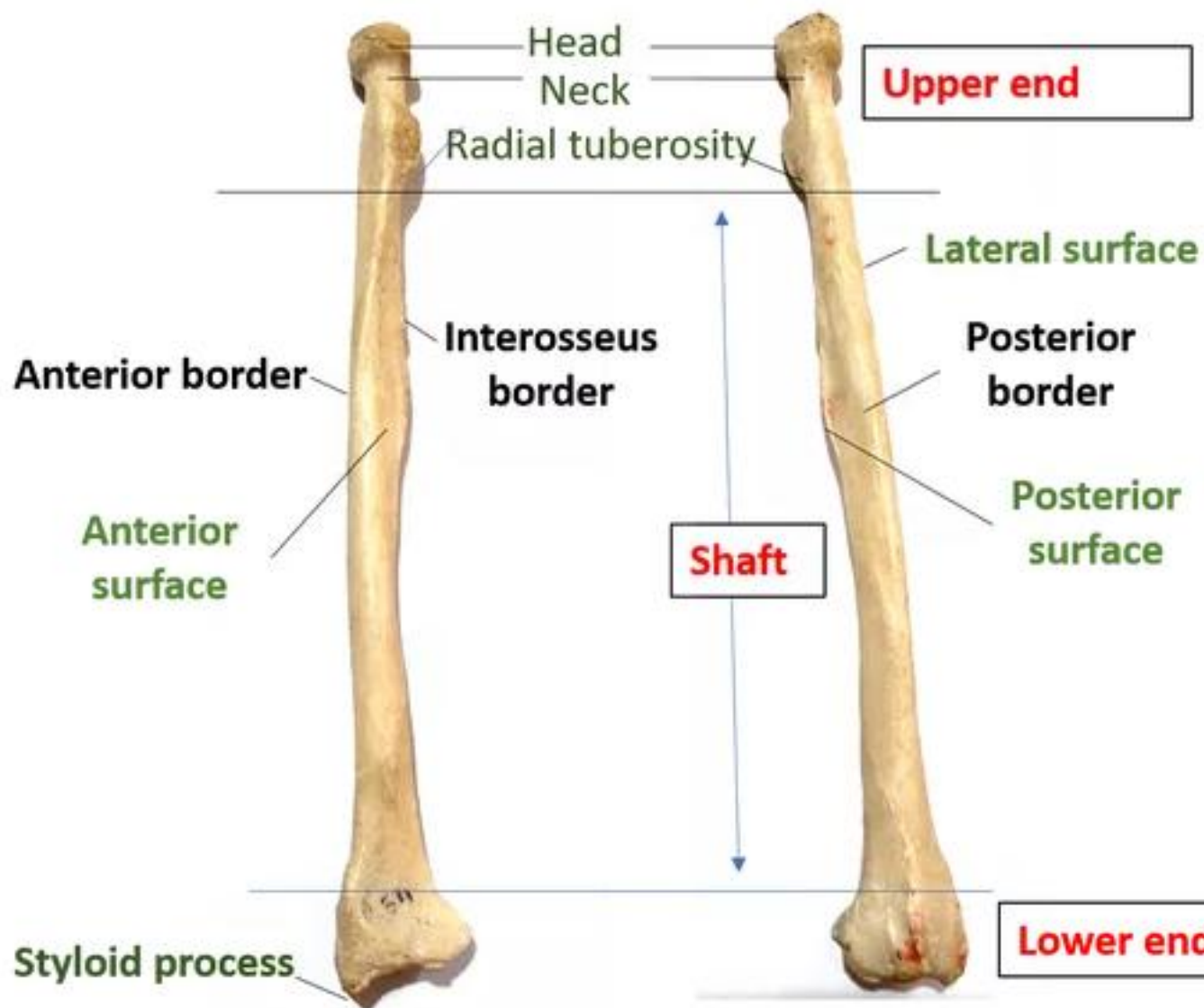
3. Radial tuberosity:

- a projection on ulnar side of shaft below the neck.



Anterior Aspect

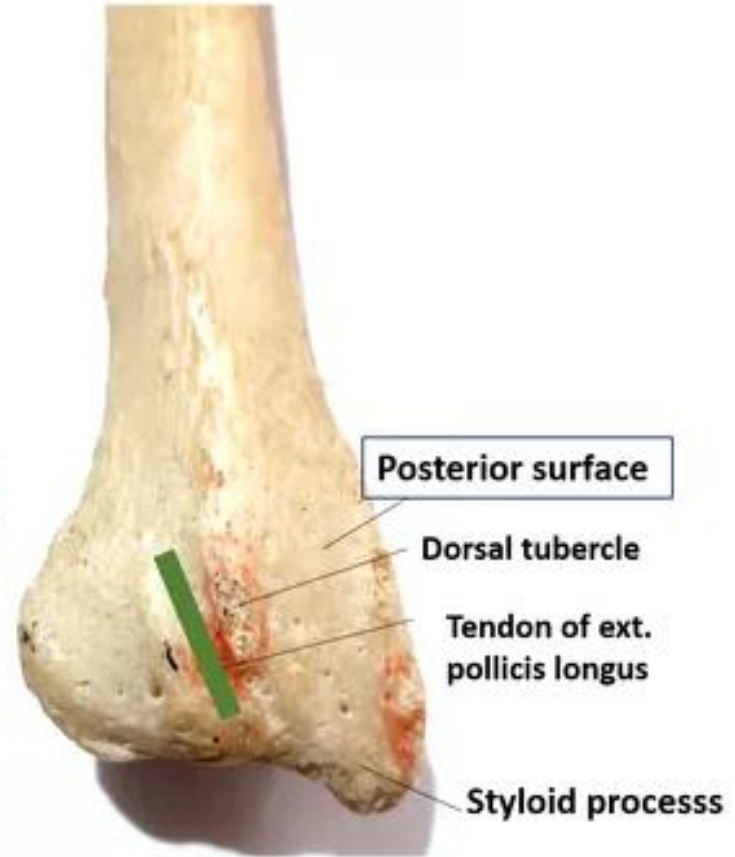
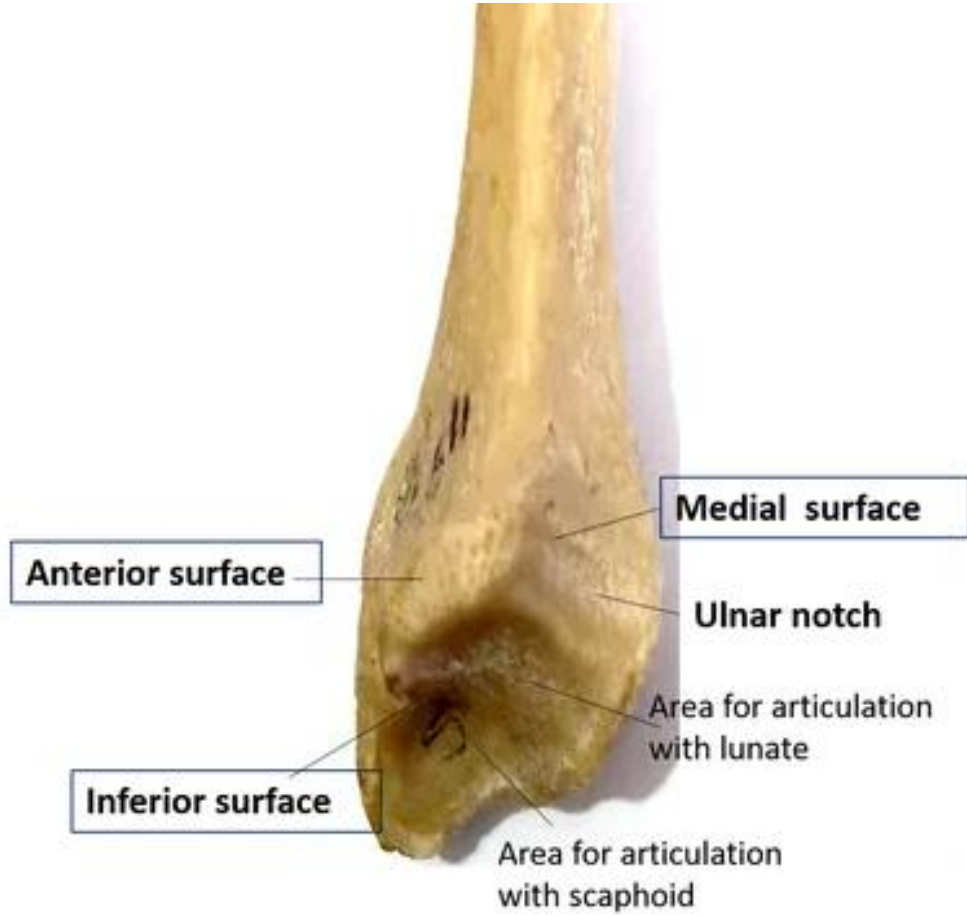
Posterior Aspect

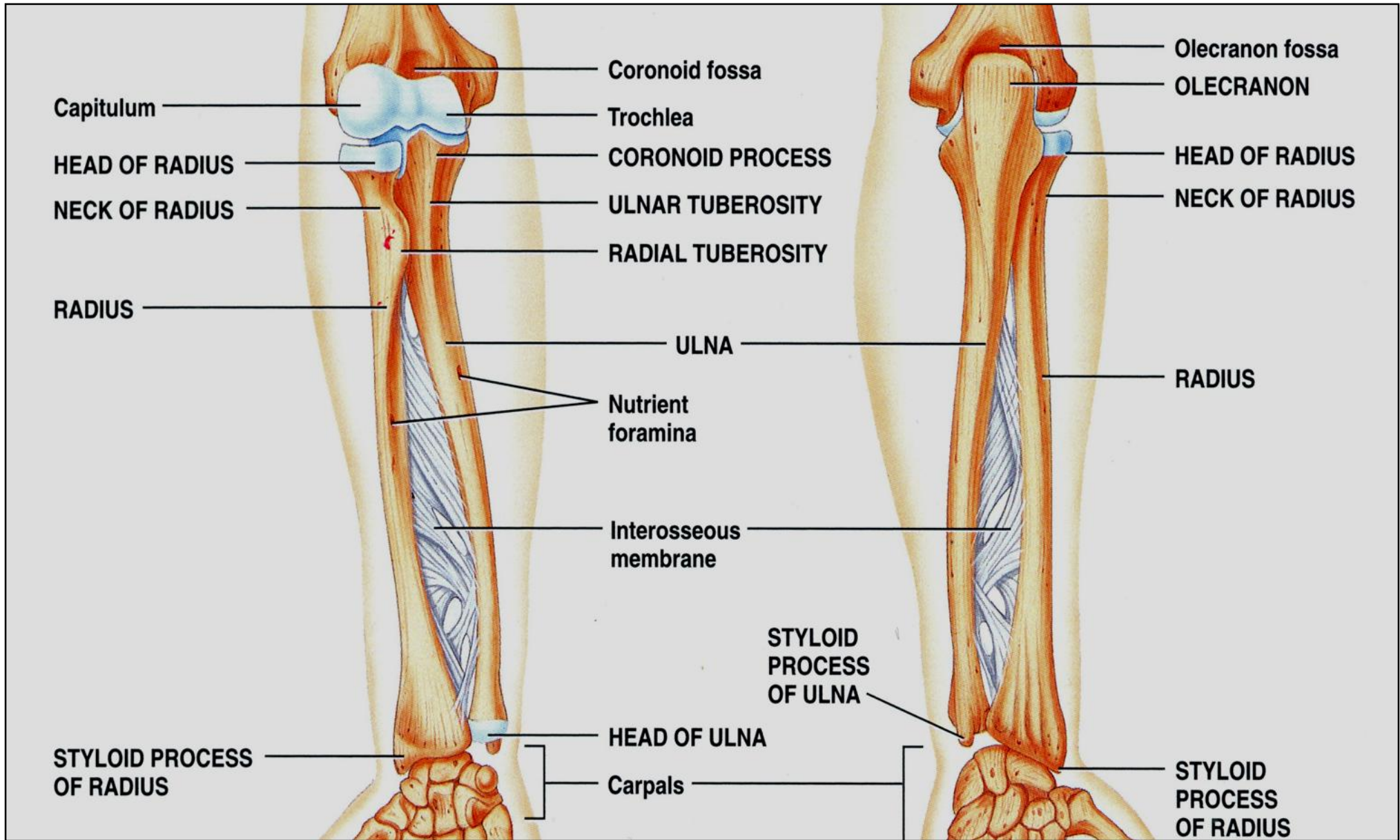


Upper End of Radius

Shaft (body):

- Has a sharp medial border, the **interosseous border**, to which the **interosseous membrane** is attached.
- **Lower end** presents:
 1. The medial surface of lower end presents the **ulnar notch**, for articulation with head of ulna to form inferior radio-ulnar joint.
 2. **Styloid process.**
 3. The inferior surface of the lower end articulates with scaphoid bone (laterally) and the lunate bone (medially).





Ulna

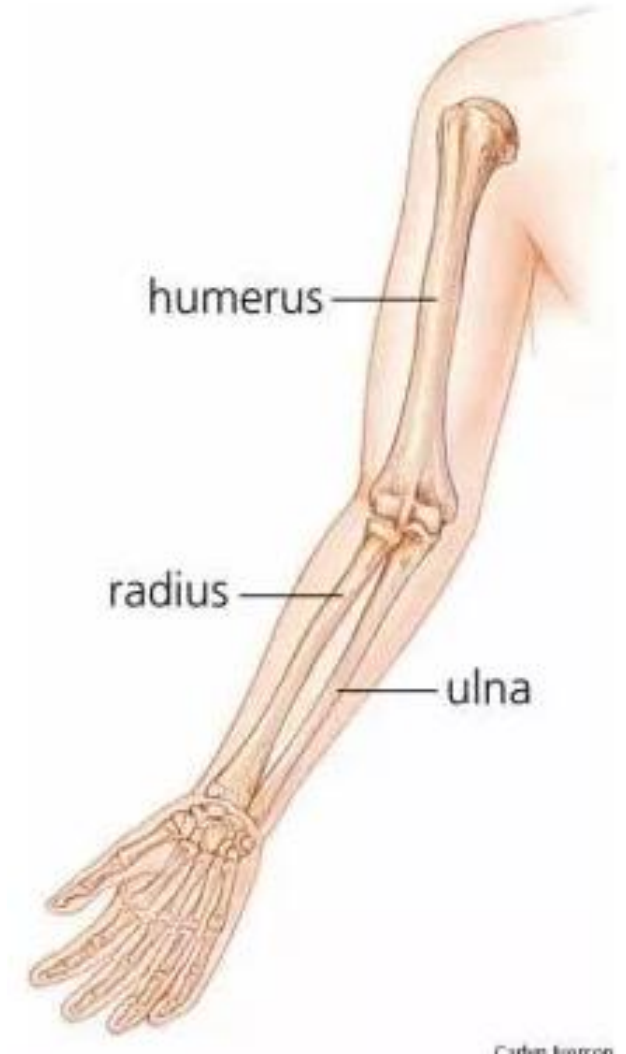
- This is the medial bone of the forearm.
- It has an **upper end**, a **shaft** & a **lower end**.

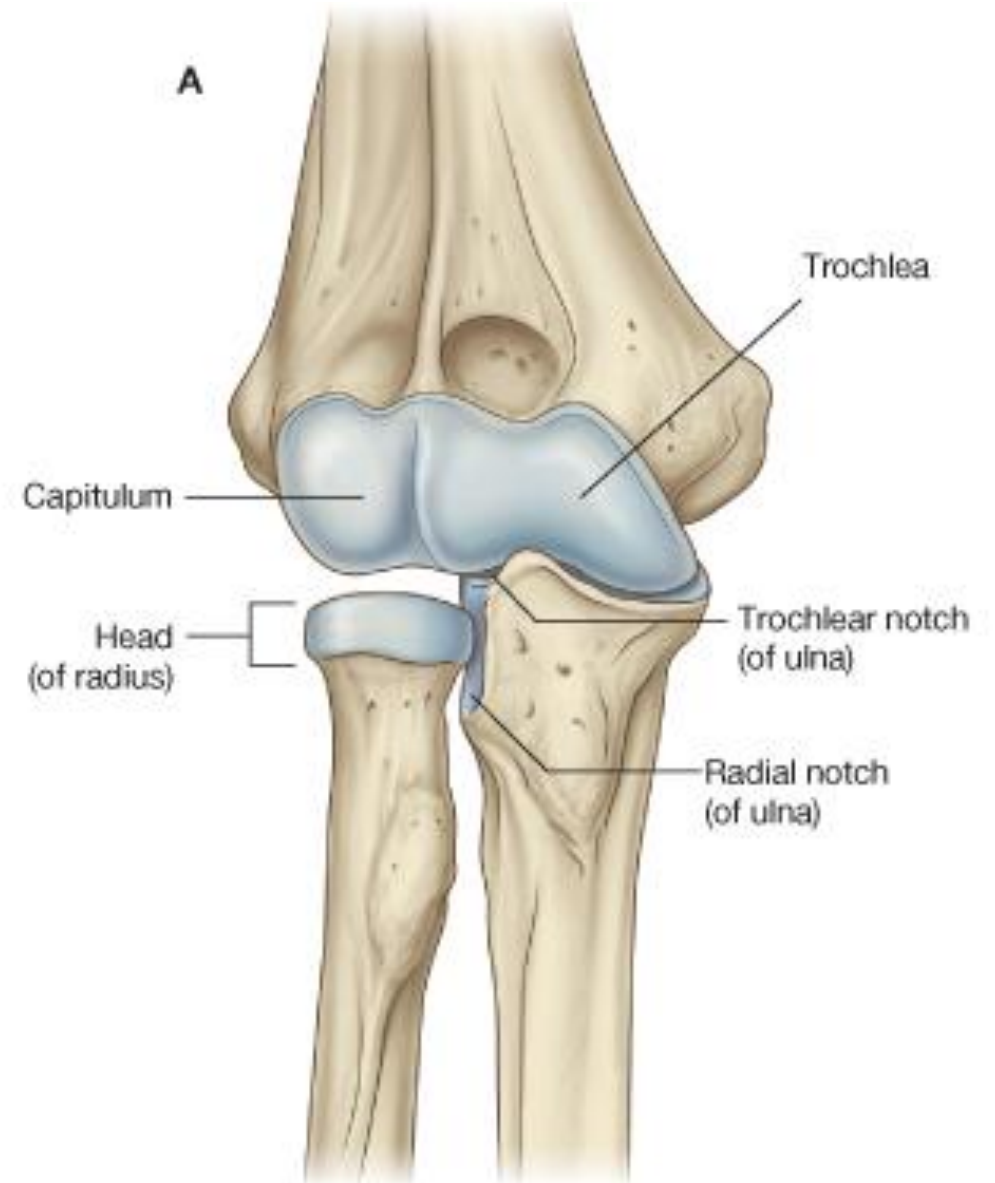
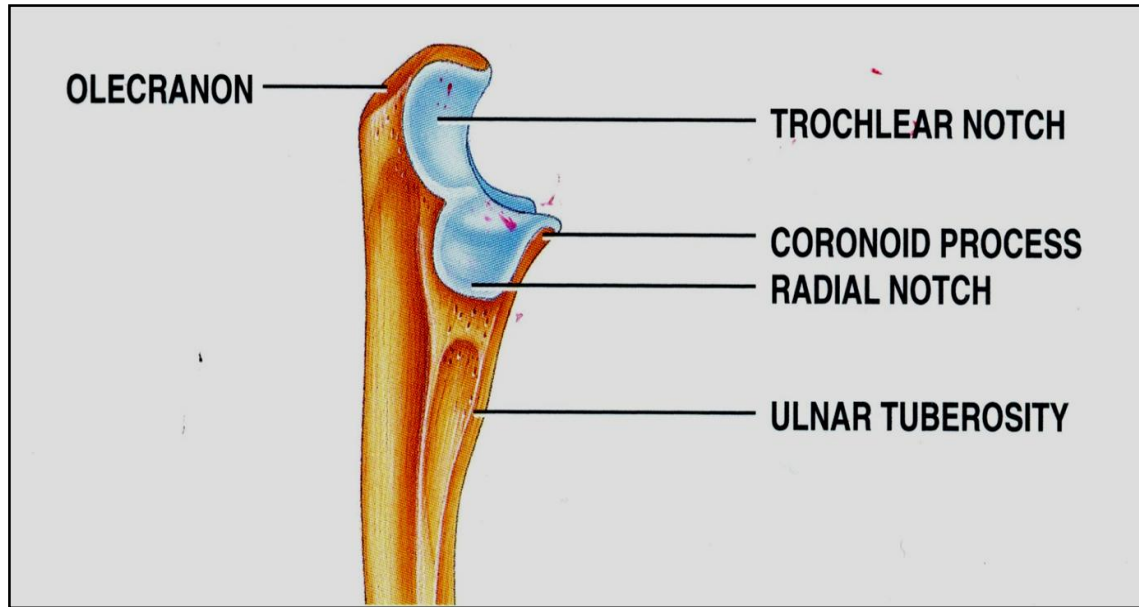
The upper end presents:

1- **The olecranon process** which forms the prominence of elbow.

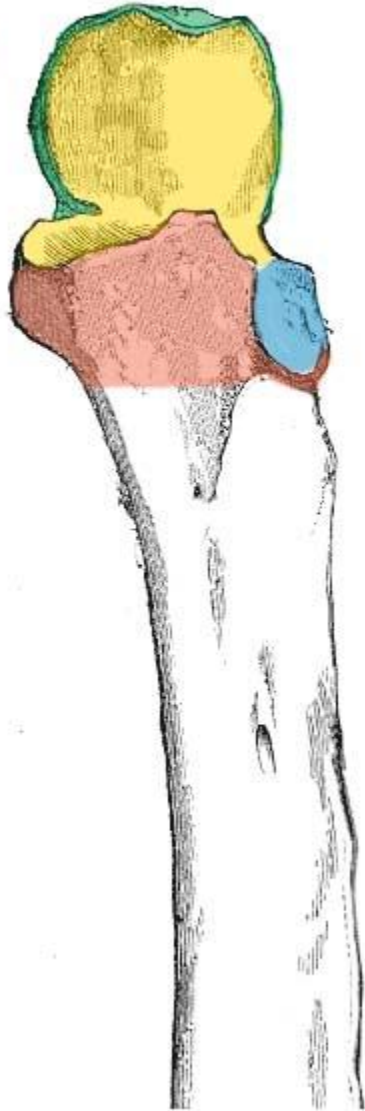
3- **The trochlear notch:** A semilunar concavity that lies in the anterior aspect of the upper end of the bone for articulation with the trochlea of the humerus.

2- **The coronoid process:** its lateral surface presents the shallow radial notch, for articulation with head of radius to form superior radio-ulnar joint





Anterior:



Lateral:



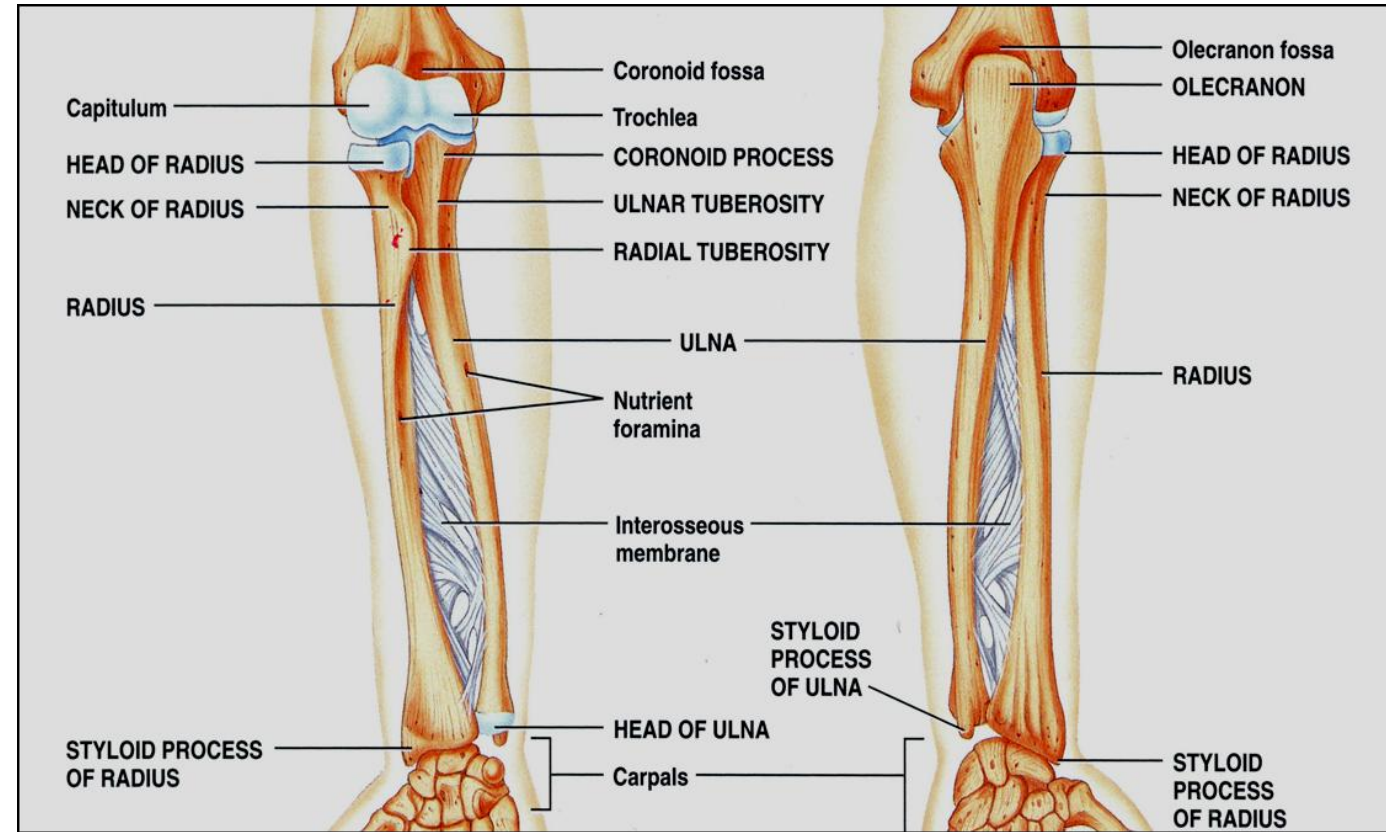
-  Olecranon
-  Coronoid Process
-  Trochlear Notch
-  Radial Notch

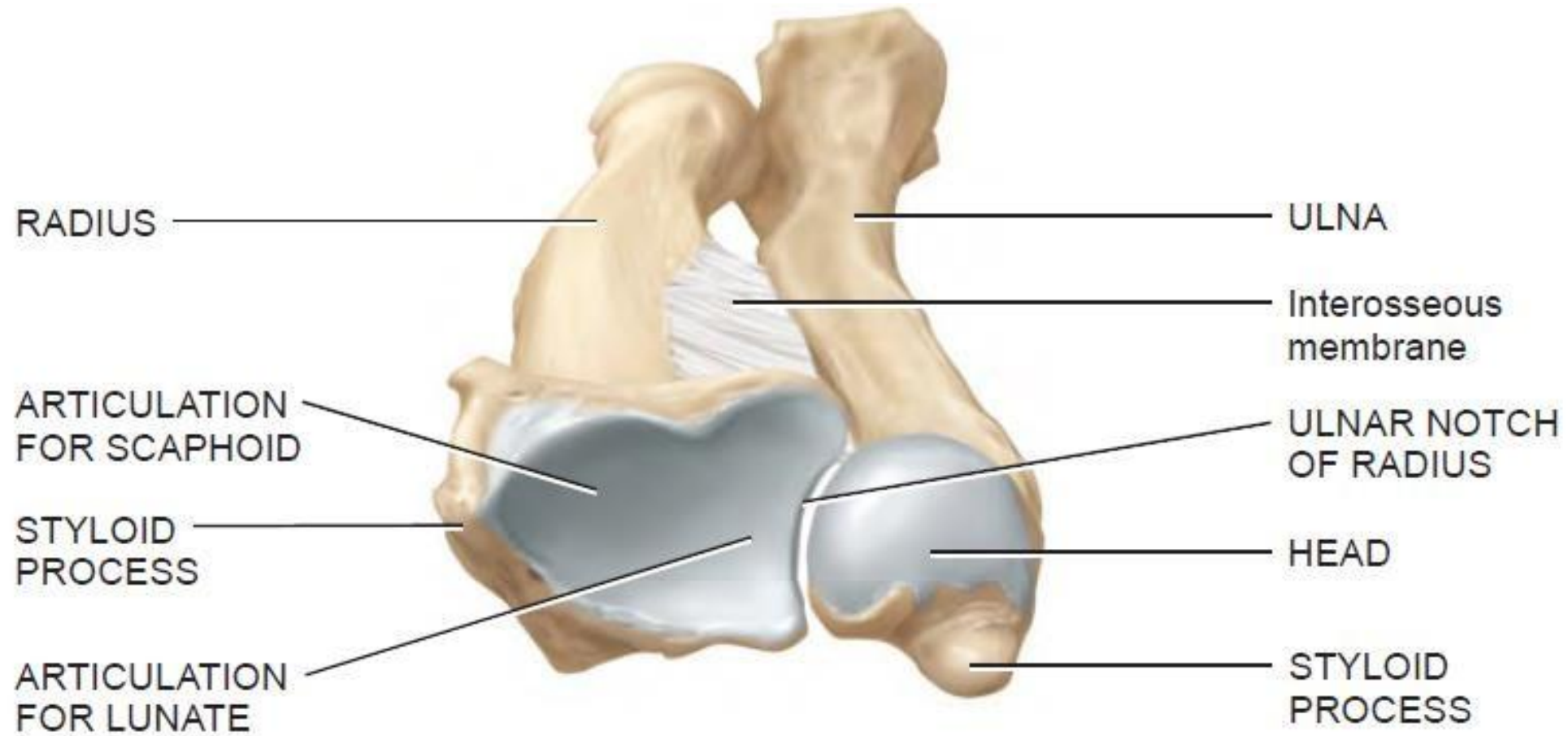
Shaft (body):

Has a sharp lateral border, the interosseous border, to which the interosseous membrane is attached.

Lower end consists of:

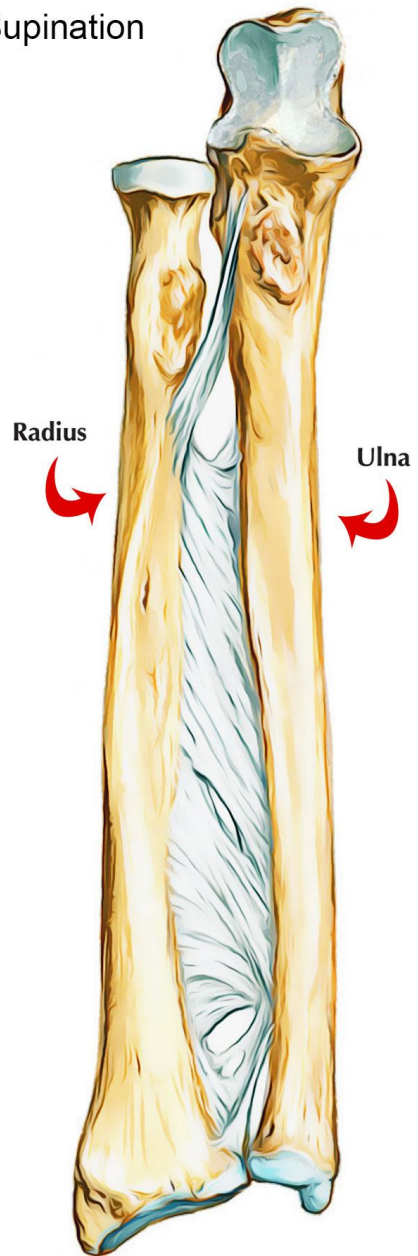
1. **Head:** separated from the wrist by a disc of fibrocartilage.
2. **Styloid process of ulna.**
Located posteromedial



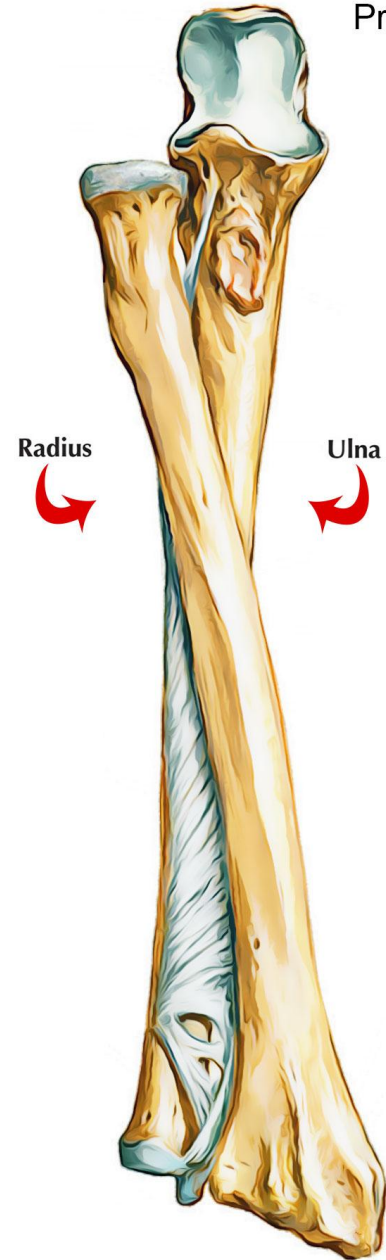


(h) Inferior view of distal ends of radius and ulna

Supination



Pronation



Bone of Hands

- There are three groups of bones in the hand:
 - A. The eight carpal bones** are the bones of the wrist.
 - B. The five metacarpals** (I to V) are the bones of the metacarpus.
 - C. The phalanges** are the bones of the digits-the thumb has only two, the rest of the digits have three.

The Carpal Bones (Carpus):

- The carpal bones are eight bones which are arranged in a proximal and a distal row, and are held firmly together by ligaments.

A. Proximal row:

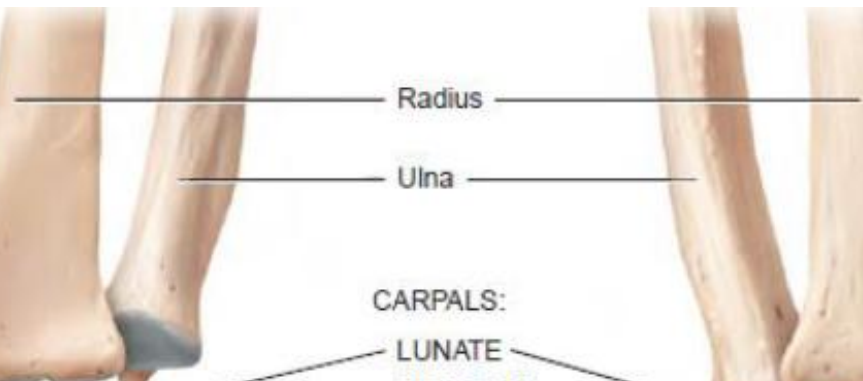
- From lateral to medial:
Scaphoid, Lunate, Triquetral, and Pisiform.

B. Distal row:

- From lateral to medial:
Trapezium, Trapezoid, Capitate, and Hamate



Carpals
 Metacarpals
 Phalanges



Radius
 Ulna

CARPALS:
 SCAPHOID
 TRAPEZIUM
 CAPITATE
 TRAPEZOID

CARPALS:
 LUNATE
 PISIFORM
 TRIQUETRUM
 HAMATE

CARPALS:
 SCAPHOID
 CAPITATE
 TRAPEZIUM
 TRAPEZOID

Sesamoid bones

Thumb (pollex)

Index finger

Middle finger

Ring finger

Little finger

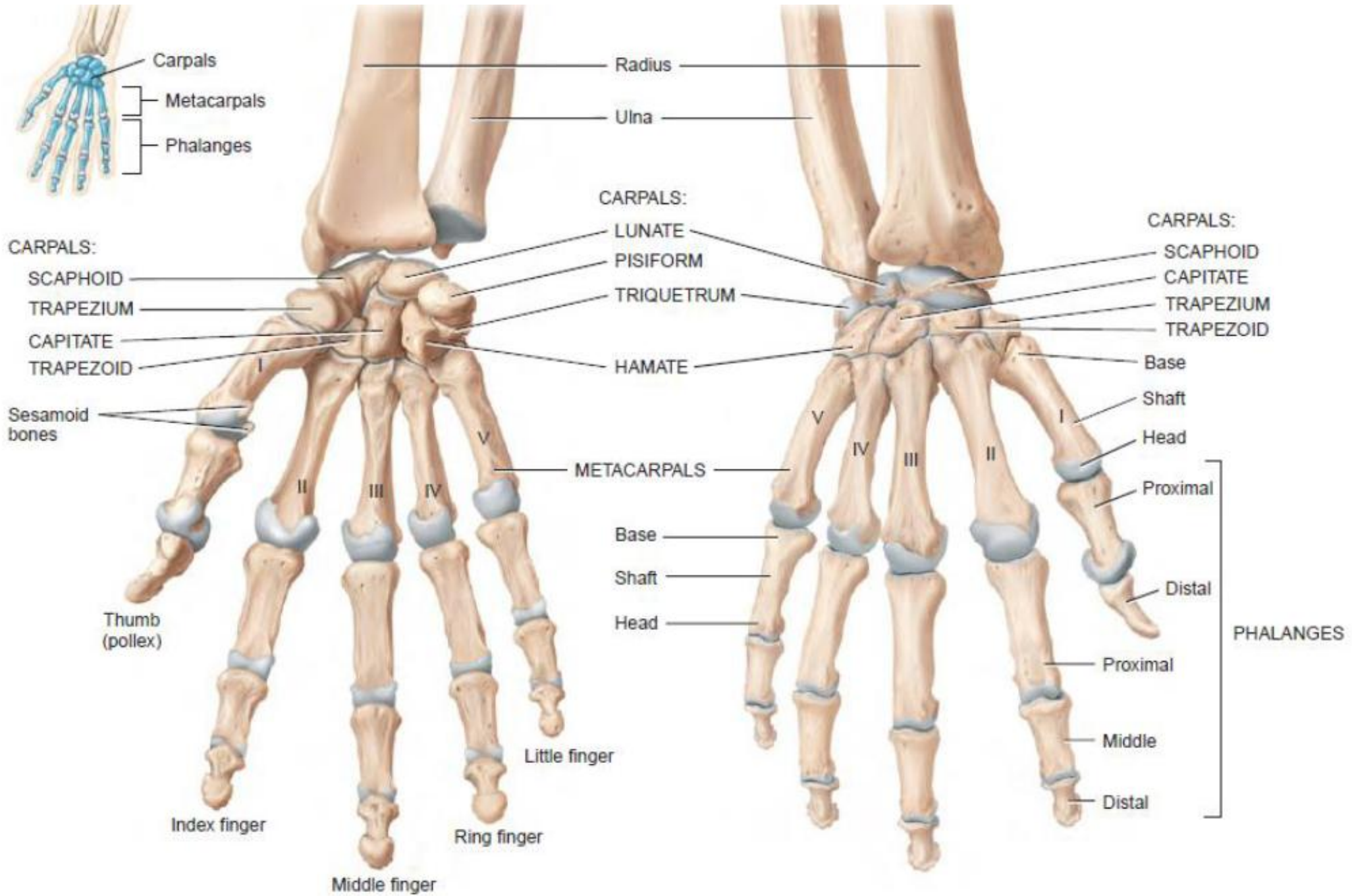
METACARPALS

Base
 Shaft
 Head

Base
 Shaft
 Head
 Proximal
 Distal

PHALANGES

Proximal
 Middle
 Distal



The Metacarpal Bones:

- There are **five metacarpal bones**; the 1st one is that of the thumb.
- Each metacarpal has: a proximal base, a body, and a distal head.

The Phalanges:

- There are two phalanges in the thumb and three in each of the medial four digits.
- Each phalanx has: a proximal base, a body, and a distal head.

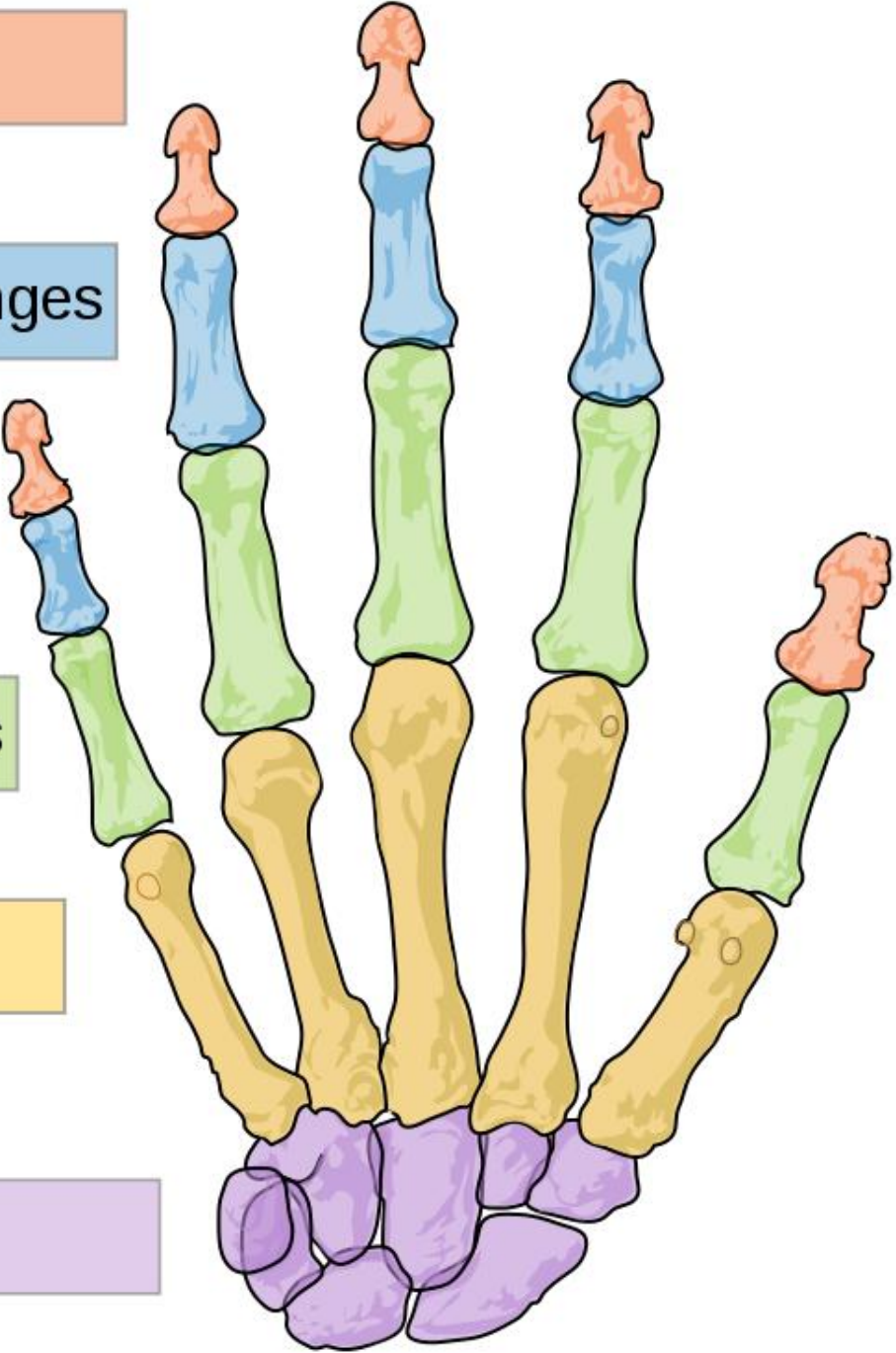
Distal phalanges

Intermediate phalanges

Proximal phalanges

Metacarpals

Carpals





Thank you

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