

Al-Mustaqbal University

College of Engineering and Technologies

Biomedical Engineering Department



Anatomy I

Lecture: 2

Appendicular Skeleton

(Shoulder Girdles and Upper Extremities)

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Appendicular skeleton

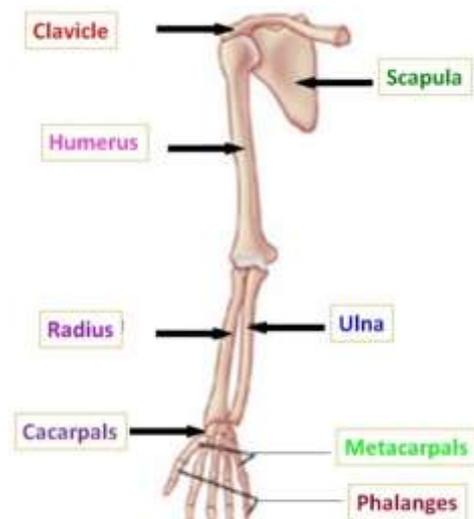
- ✚ Shoulder (Pectoral girdle) girdles
- ✚ Upper extremities
- ✚ Pelvic girdle
- ✚ Lower extremities

❖ **Shoulder (Pectoral girdle) girdles**

- Clavicle 2
- Scapula 2

❖ **Upper extremities**

- Humerus 2
- Radius 2
- Ulna 2
- Carpals 16
- Metacarpals 10
- Phalanges 28



❖ **Bones of the Shoulder (Pectoral girdle) girdles**

The shoulder girdle consists of the clavicle and the scapula, which articulate with one another at the **acromioclavicular joint**.

• **Clavicle**

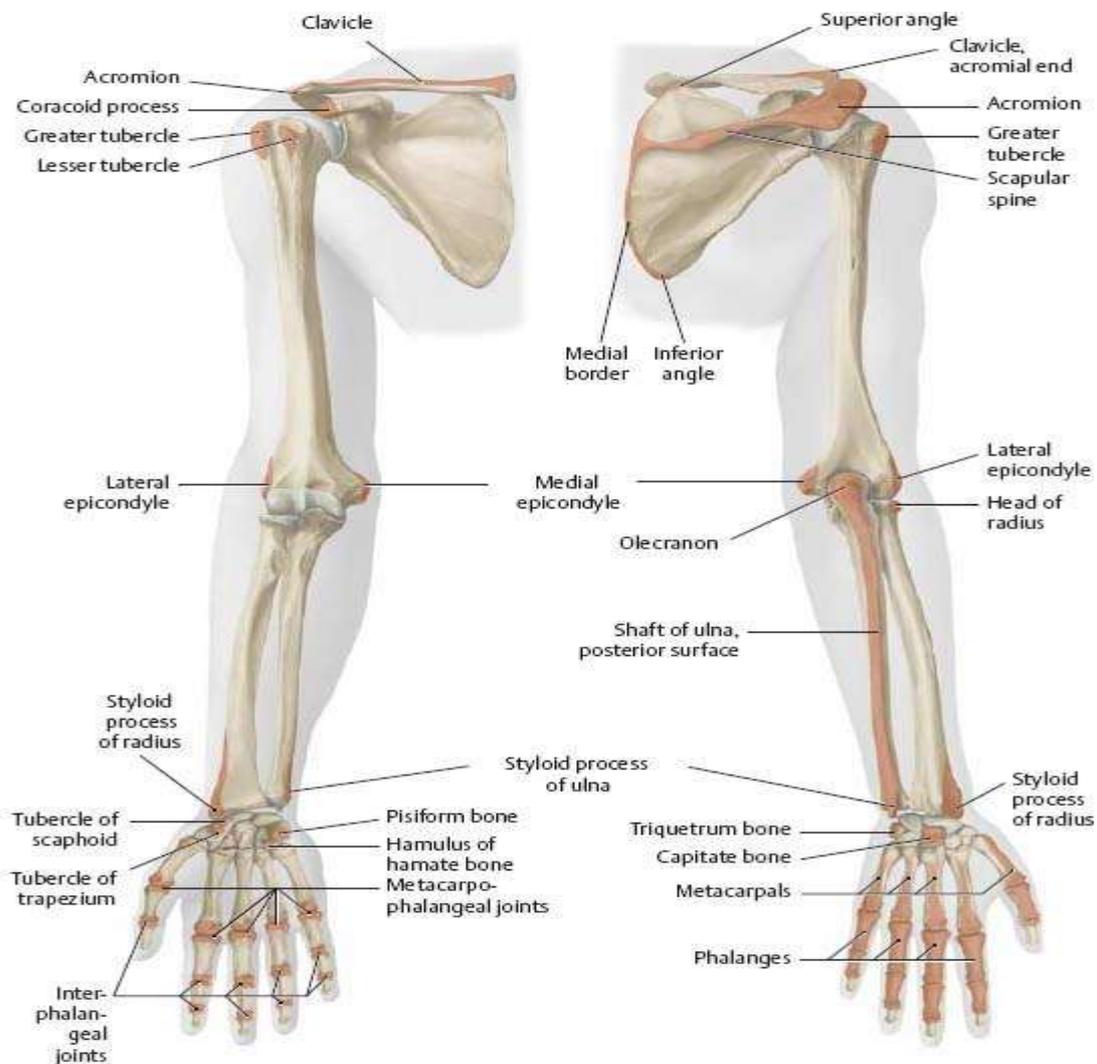
The clavicle is a long, slender bone that lies horizontally across the root of the neck just beneath the skin. It articulates with the sternum and 1st costal cartilage medially and with the acromion process of the scapula laterally.



- **Scapula**

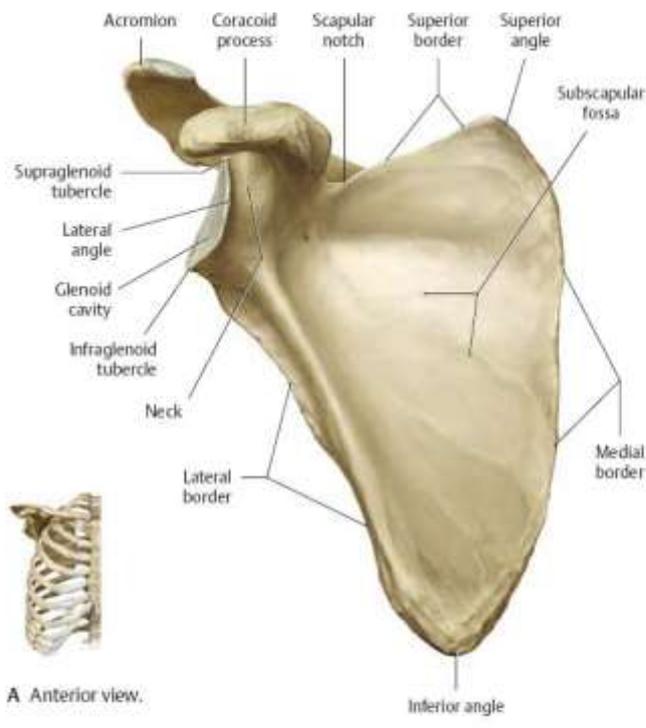
The scapula is a flat triangular bone that lies on the posterior chest wall. On its posterior surface, the **spine of the scapula** projects backward.

The lateral end of the spine is free and forms the **acromion**, which articulates with the clavicle. The superolateral angle of the scapula forms the pear-shaped **glenoid cavity**, or **fossa**, which articulates with the head of the humerus at the shoulder joint. The anterior surface of the scapula is concave and forms the shallow subscapular fossa. The posterior surface of the scapula is divided by the spine into the **supraspinous fossa** above and an **infraspinous fossa** below.

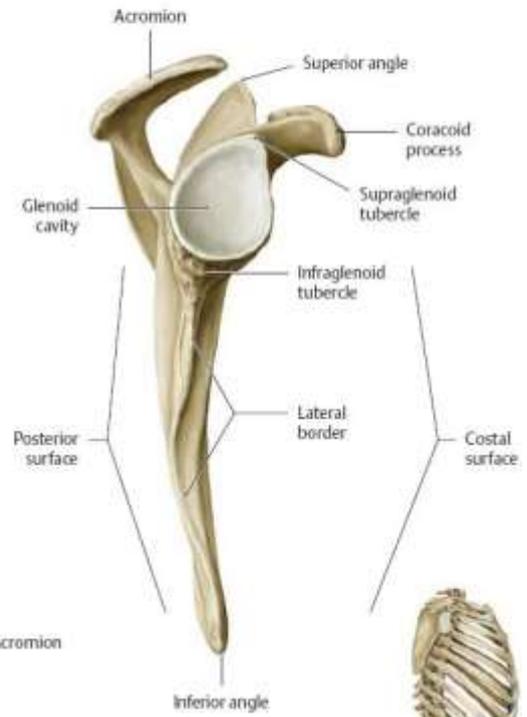


A Anterior view.

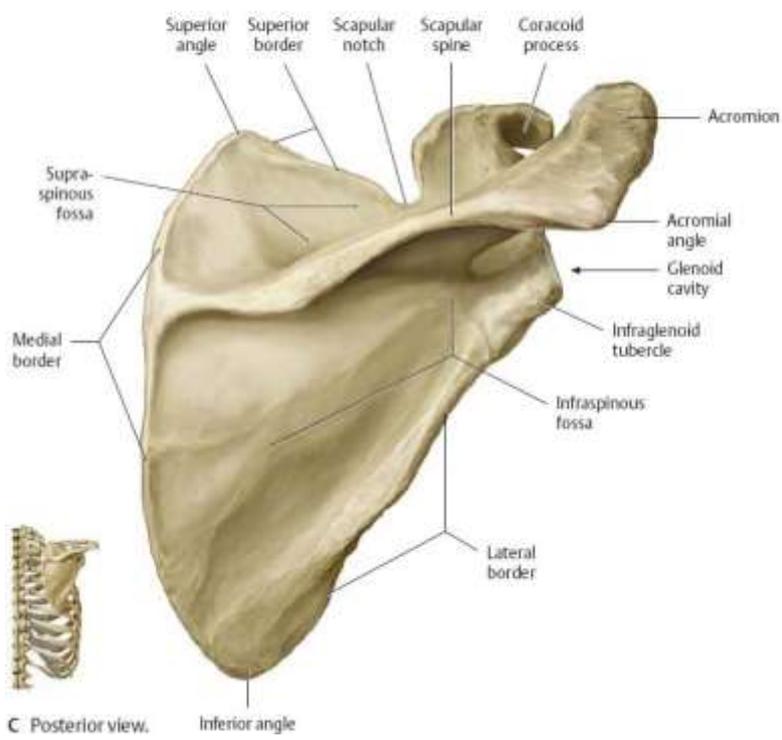
B Posterior view.



A Anterior view.



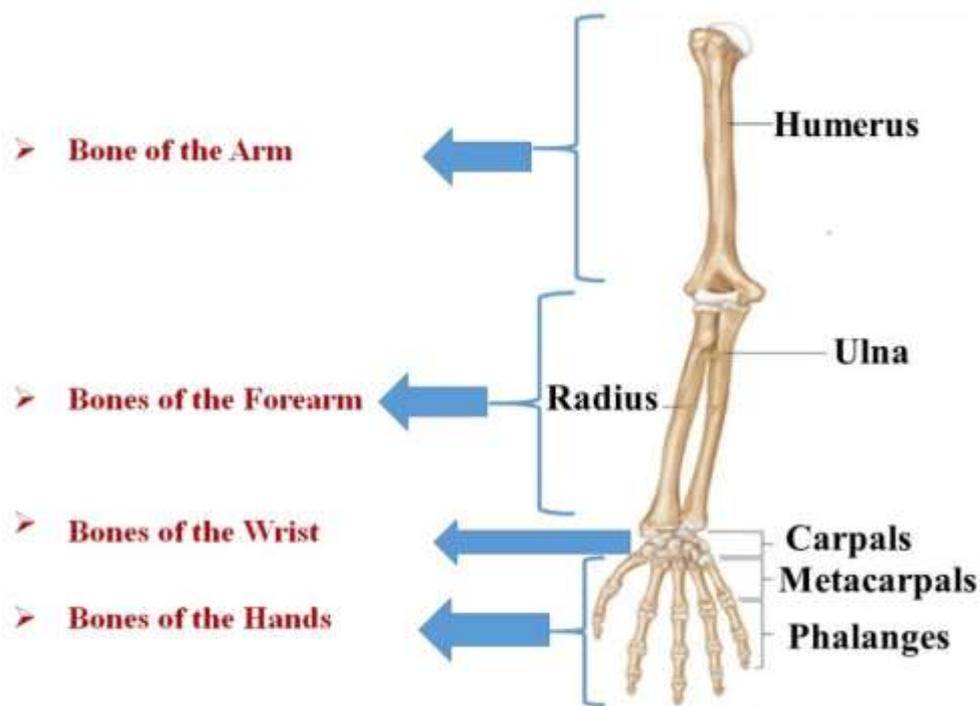
B Right lateral view.



C Posterior view.

Upper extremities

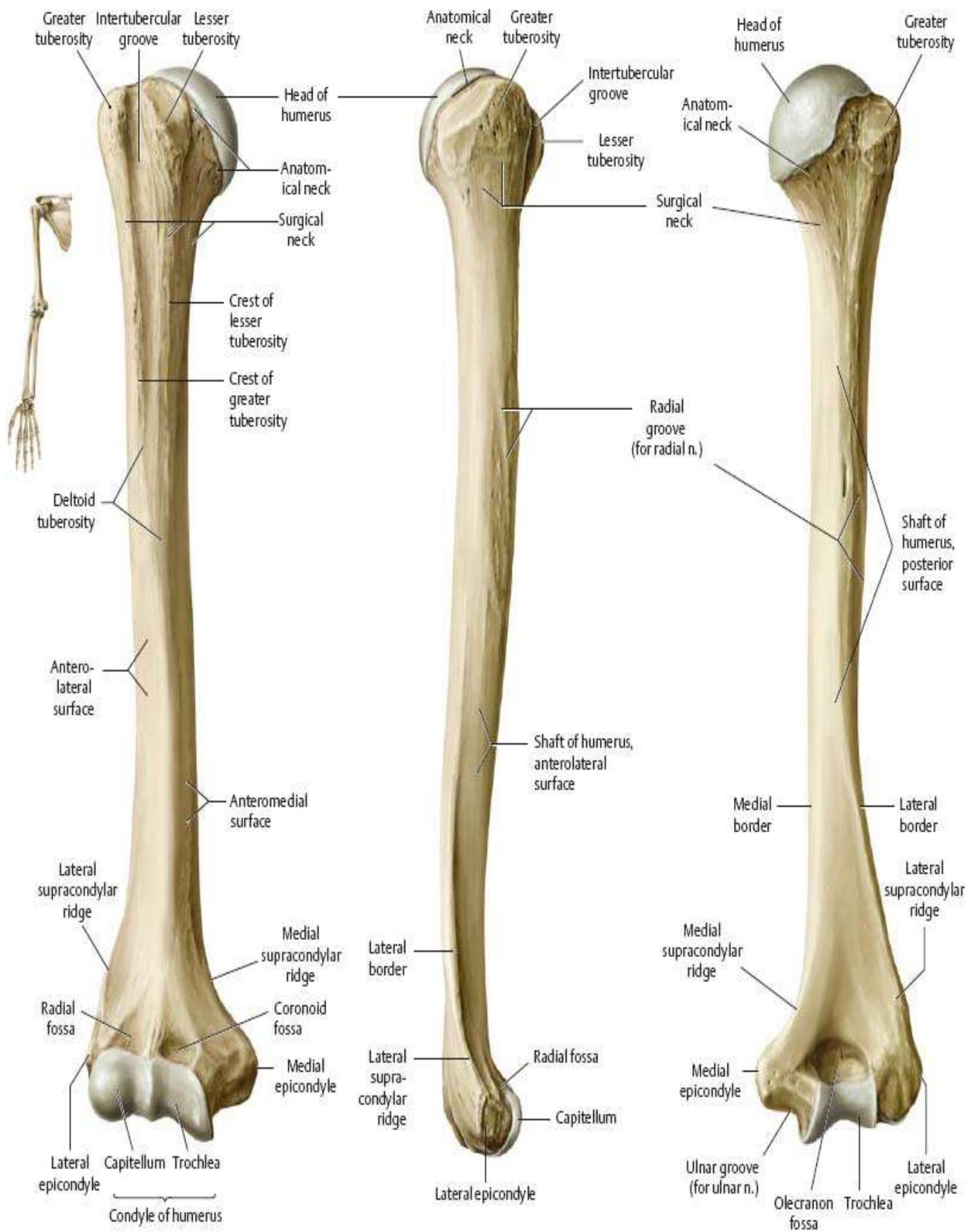
The bones of the upper extremities is divided into: bone of the arm, bones of forearm, bones of the wrist and bones of the hand.



•Humerus

The humerus articulates with the scapula at the **shoulder joint** and with the radius and ulna at the **elbow joint**. The upper end of the humerus has a **head** and articulates with the glenoid cavity of the scapula. Immediately below the head is the **anatomic neck**.

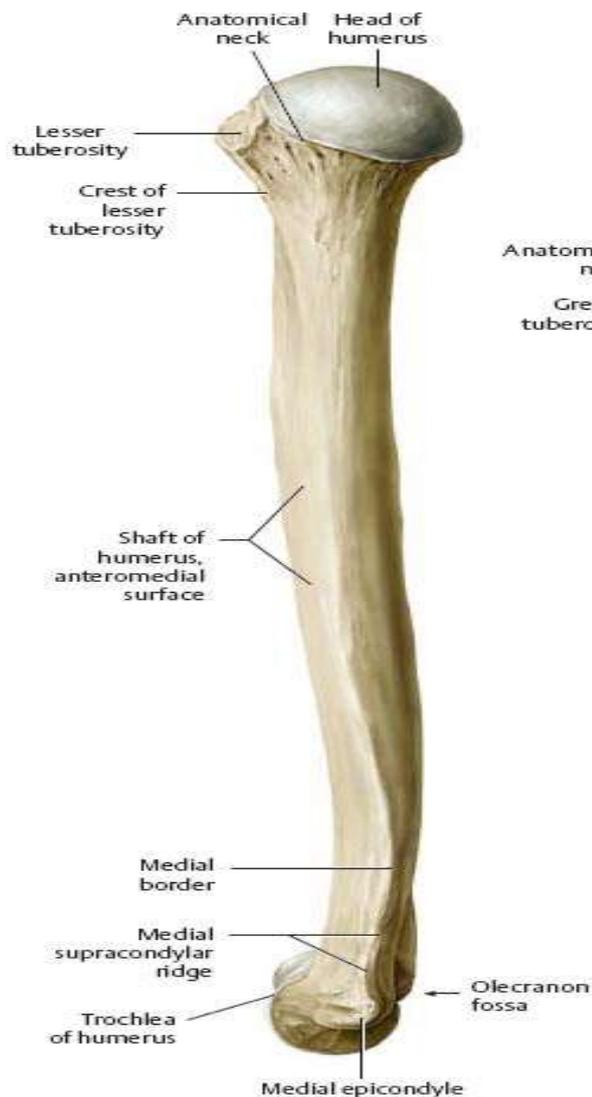
The lower end of the humerus possesses the rounded **capitulum** for articulation with the head of the radius, and the pulley-shaped **trochlea** for articulation with the trochlear notch of the ulna.



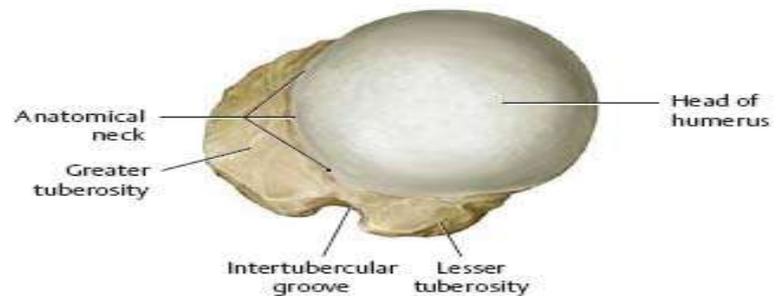
A Anterior view.

B Lateral view.

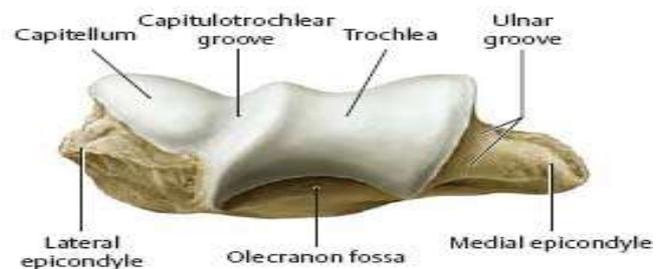
C Posterior view.



D Medial view.



E Proximal (superior) view.



F Distal (inferior) view.

- **Bones of the Forearm**

The forearm contains two bones: the **radius** and the **ulna**.

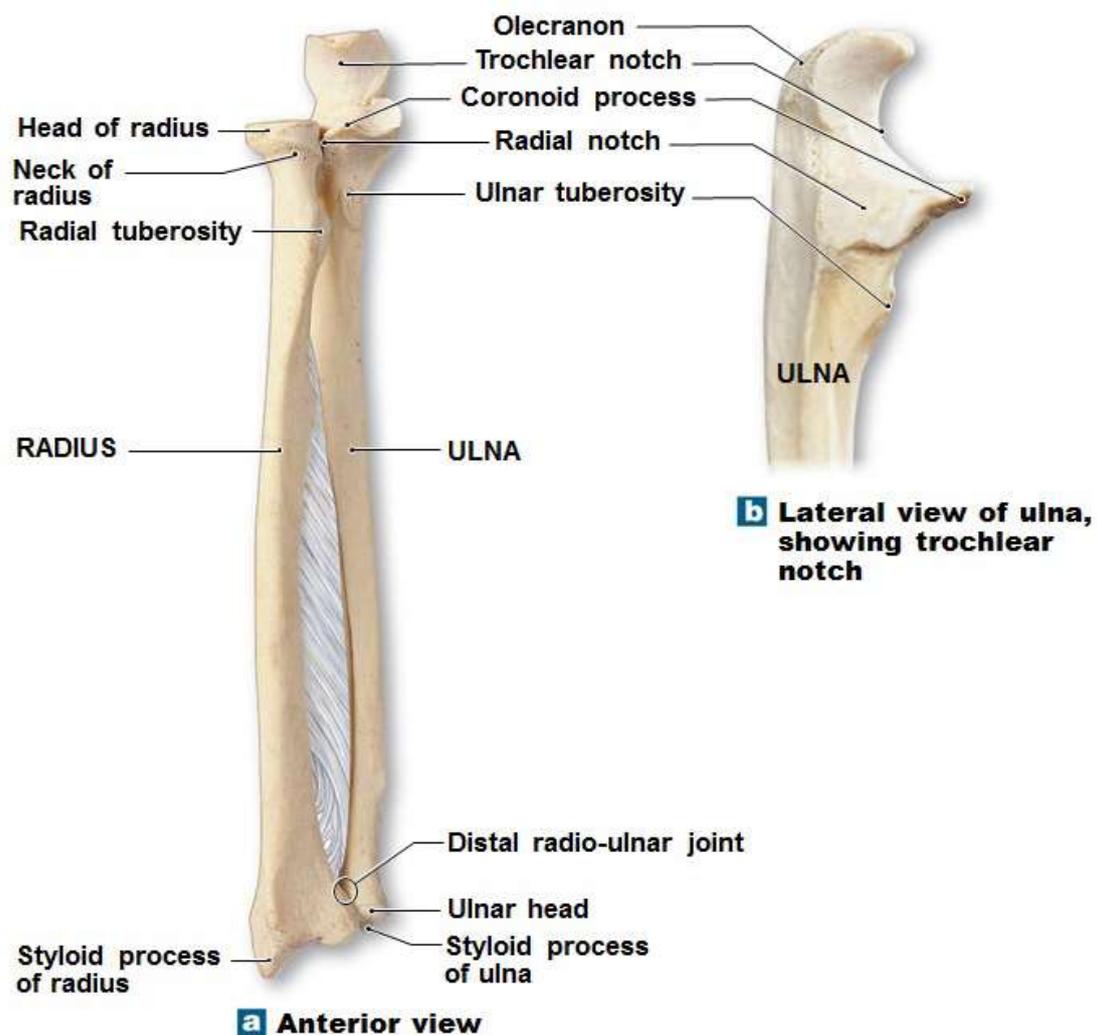
- **❖ Radius**

The radius is the *lateral bone* of the forearm.

Its proximal end articulates with the humerus at the elbow joint and with the ulna at the proximal radioulnar joint. Its distal end articulates with the scaphoid and lunate bones of the wrist at the wrist joint and with the ulna at the distal radioulnar joint.

At the proximal end of the radius is the small circular **head**. The upper surface of the head is concave and articulates with the convex capitulum of the humerus.

At the distal end of the radius is the styloid process; this projects distally from its lateral margin. On the medial surface is the ulnar notch, which articulates with the round head of the ulna.



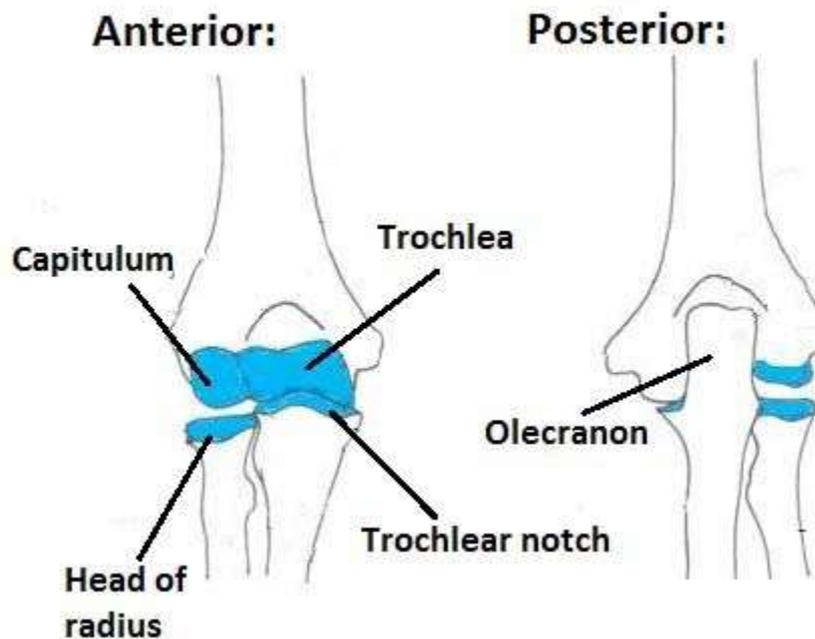
❖ Ulna

The ulna is the medial bone of the forearm. Its proximal end articulates with the humerus at the elbow joint and with the head of the radius at the

proximal radioulnar joint. Its distal end articulates with the radius at the distal radioulnar joint.

The proximal end of the ulna is large and is known as the **olecranon process**; this forms the prominence of the elbow. It has a notch on its anterior surface, the **trochlear notch**, which articulates with the trochlea of the humerus.

At the distal end of the ulna is the small rounded head, which has projecting from its medial aspect the styloid process.

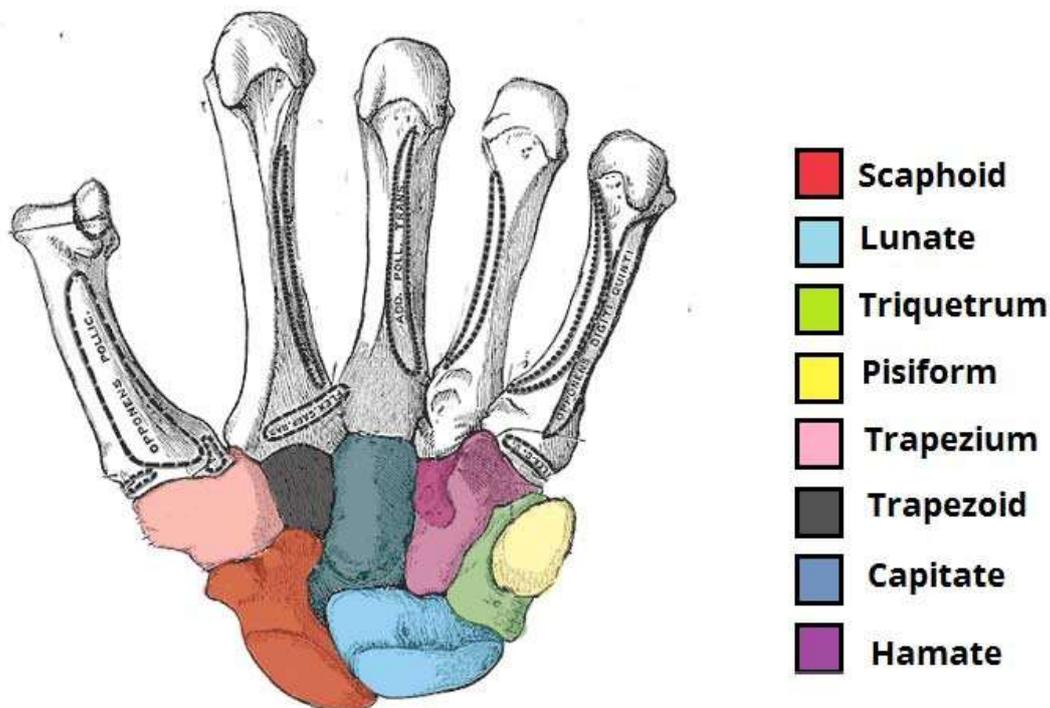


- **Bones of the Wrist**

The wrist connects the hand to the forearm and is composed of eight carpal bones aligned in a proximal and distal row (four carpals in each row).

The **proximal row** consists of (from lateral to medial) the **scaphoid**, **lunate**, **triquetral**, and **pisiform** bones.

The **distal row** consists of (from lateral to medial) the **trapezium**, **trapezoid**, **capitate**, and **hamate** bones.



- **Bones of the Hand**

The hand includes the metacarpus (the palm, with five **metacarpal bones**) and five digits with their **phalanges**.

- ❖ **The Metacarpals**

There are five metacarpal bones, each of which has a **base**, a **shaft**, and a **head**. The first metacarpal bone of the thumb is the shortest and most mobile .

The bases of the metacarpal bones articulate with the distal row of the carpal bones; the heads, which form the knuckles, articulate with the proximal phalanges.

❖ The Phalanges

There are three phalanges for each of the fingers but only two for the thumb. It's termed **proximal, middle, and distal phalanges** and possess **base, shaft, and head**.

