



Appendicular Skeleton

Introduction to Anatomy and Embryology

Lab 3

Bones of the forearm and hand

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Radius

Radius:

It is a **long bone** forming the **lateral bone of forearm**.

Articulates with
capitulum of
humerus

Articulates with
radial notch of
the ulna

Upper end consists of:

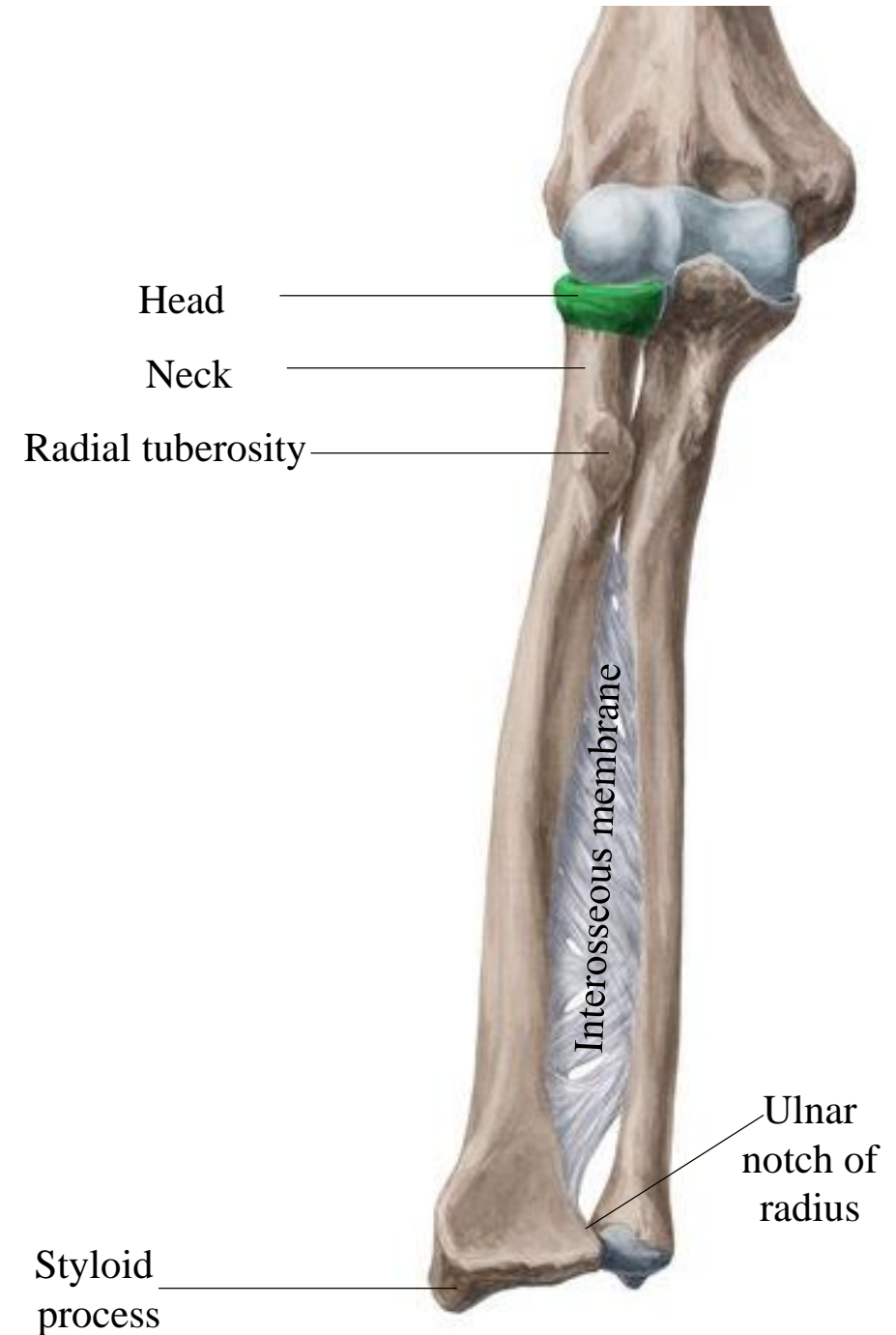
- A. Head: has 2 articular surfaces (upper surface & its circumference)
- B. Neck
- C. Radial tuberosity

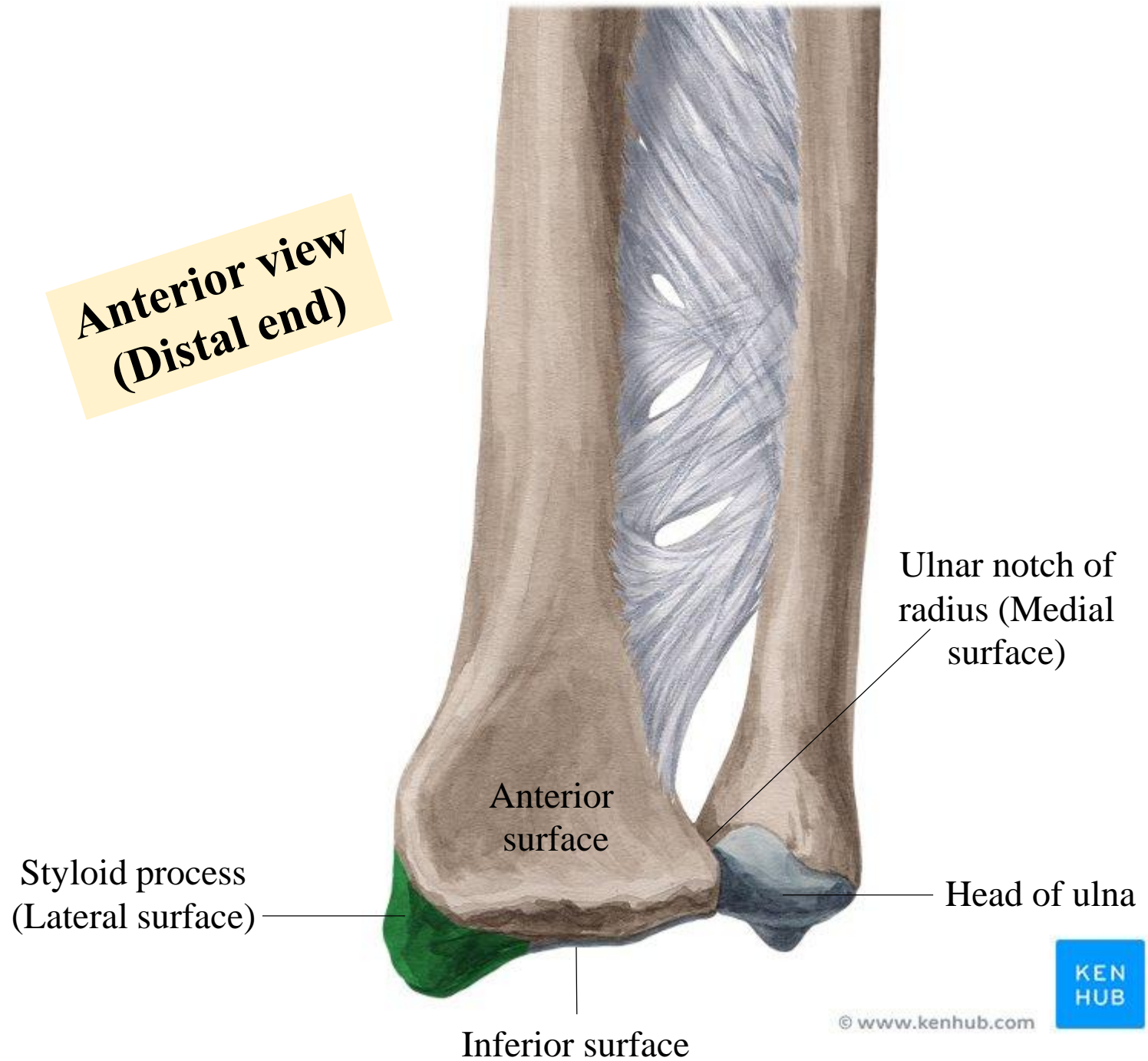
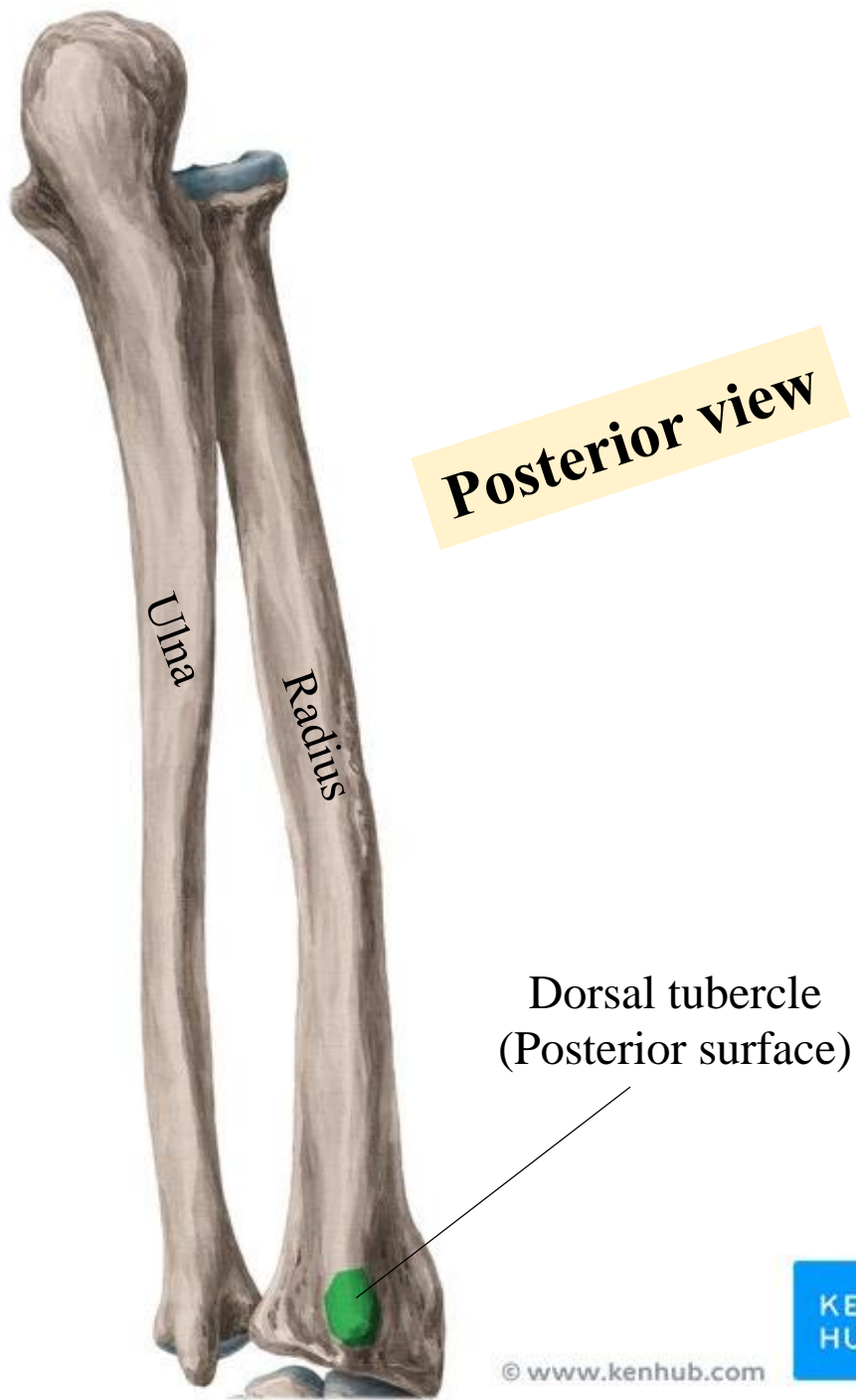
Shaft has:

- A. Three borders (anterior, posterior & medial (interosseous) borders)
- B. Three surfaces (anterior, posterior & lateral)

Lower end has 5 surfaces:

- A. Anterior surface
- B. Posterior surface: has a dorsal tubercle
- C. Lateral surface: shows styloid process
- D. Medial surface: has ulnar notch of radius that articulates with head of ulna
- E. Inferior surface: articulates with carpal bones (scaphoid and lunate)





Ulna

Ulna:

It is a **long bone** forming the **medial bone of forearm**.

Upper end consists of:

A. Two processes:

Olecranon process

Coronoid process

Large and posterior

Small and anterior

B. Two notches:

Trochlear notch

Radial notch

Articulates with the trochlea of the humerus (elbow joint)

Articulates with the head of radius (proximal radioulnar joint)

C. Ulnar tuberosity

Shaft has:

A. Three surfaces (anterior, posterior & medial surfaces)

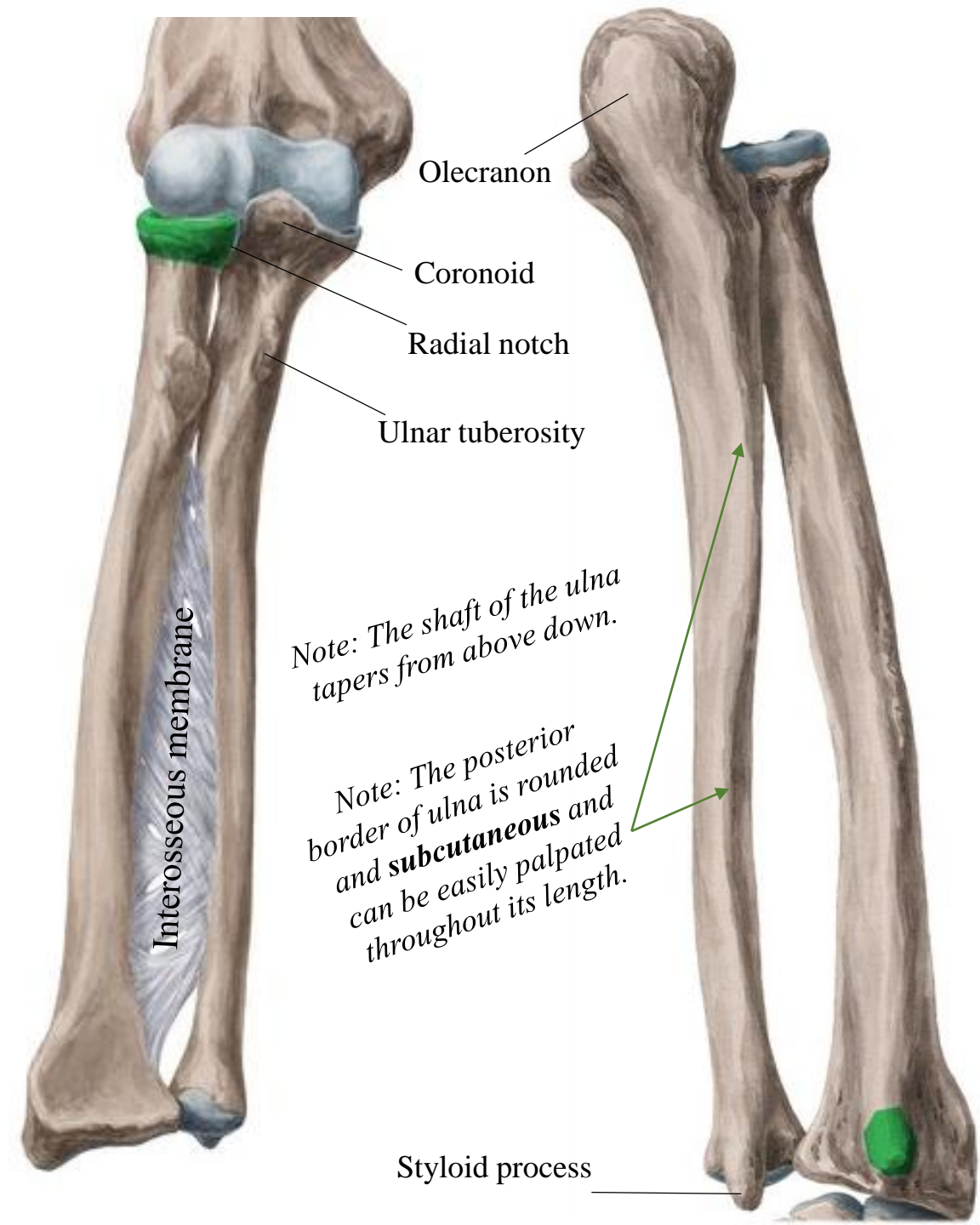
B. Three borders (anterior, posterior & lateral (interosseous) borders)

Lower end consists of:

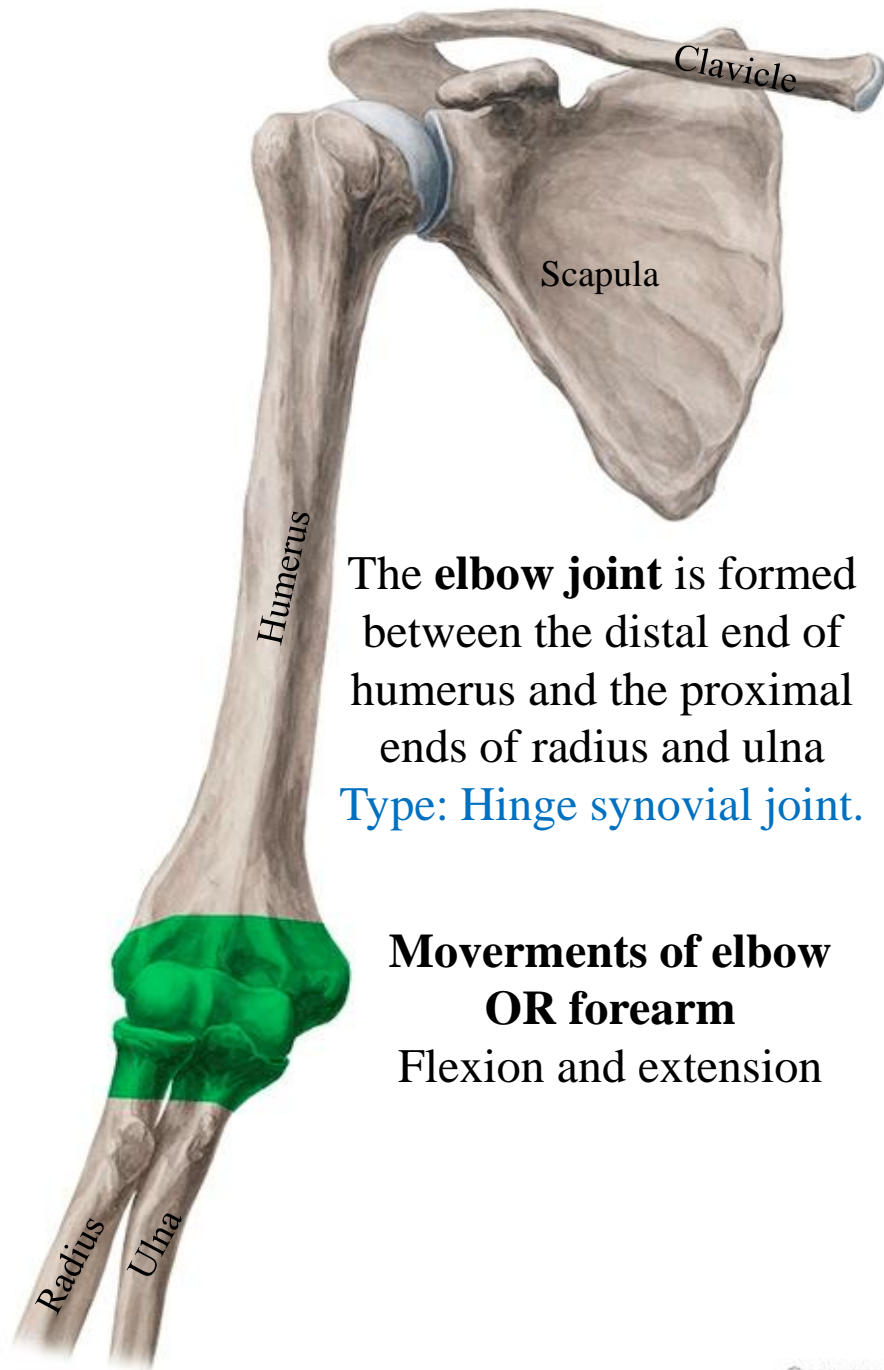
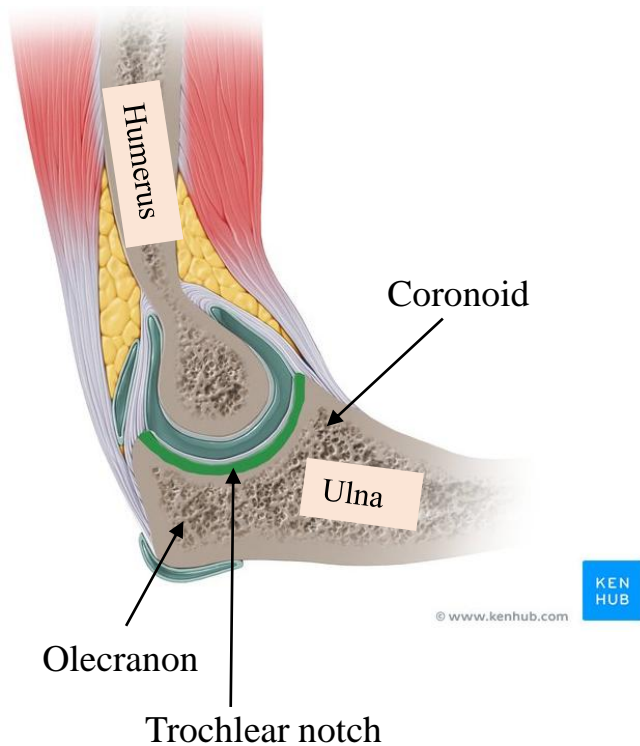
A. Head

Articulates with ulnar notch of radius (distal radioulnar joint)

B. Styloid process (which is shorter than styloid process of radius)



Articulation of Radius & Ulna



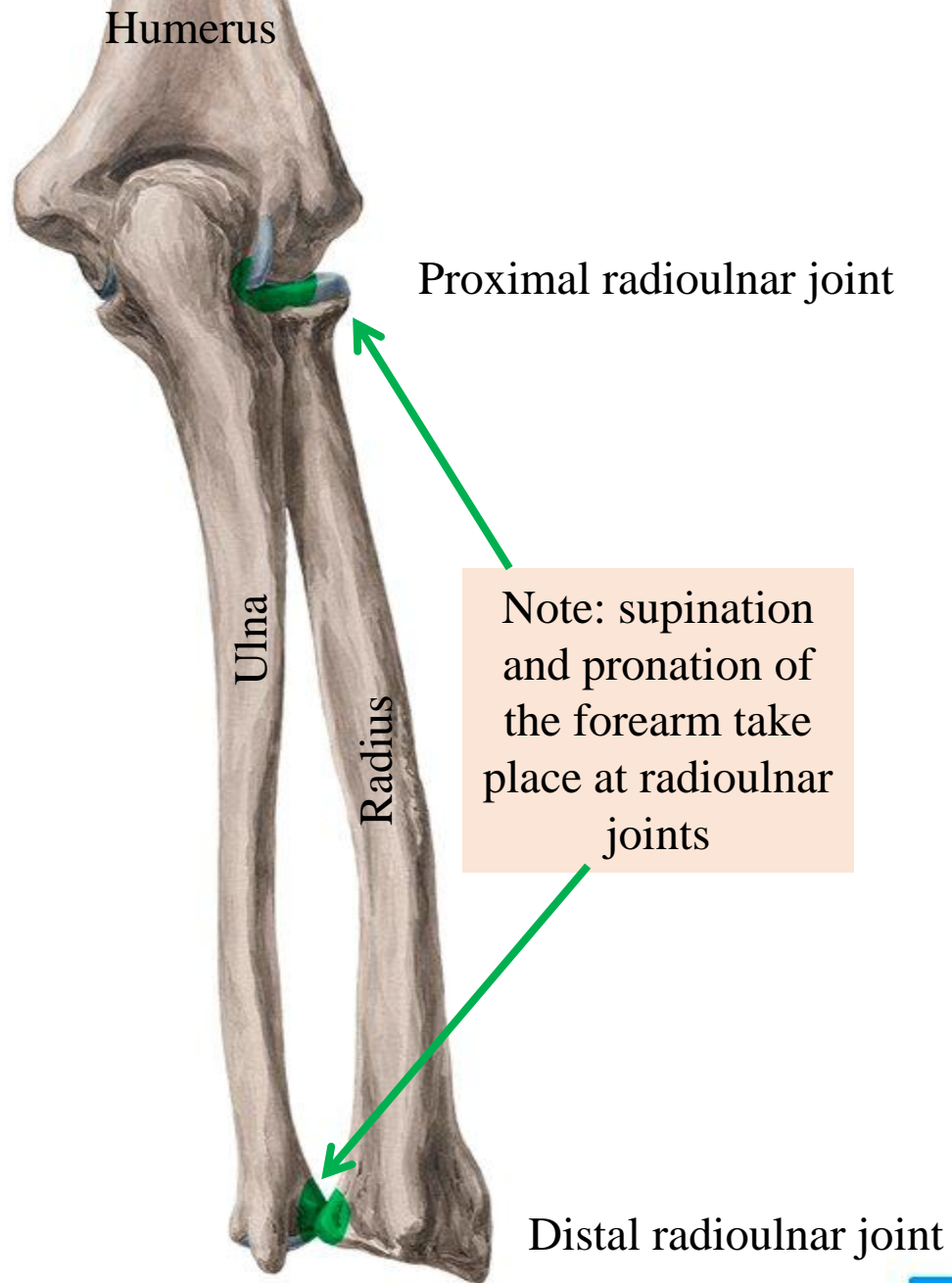
The **elbow joint** is formed between the distal end of humerus and the proximal ends of radius and ulna
Type: Hinge synovial joint.

Movements of elbow OR forearm
Flexion and extension

The **wrist joint** is formed between the distal end of radius and the carpal bones (scaphoid, lunate & triquetral) (Radiocarpal joint)
Type: Synovial Condyloid (ellipsoid).

Movements of wrist OR hand
Flexion, extension, abduction, adduction





The **proximal radioulnar joint** is formed between the proximal ends of the radius and ulna.

The **distal radioulnar joint** is formed between the distal ends of the radius and ulna.

Type: **Synovial pivot joints**

Moverments:

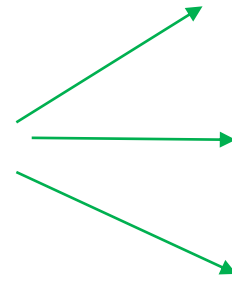
Supination & pronation

Bones of the hand

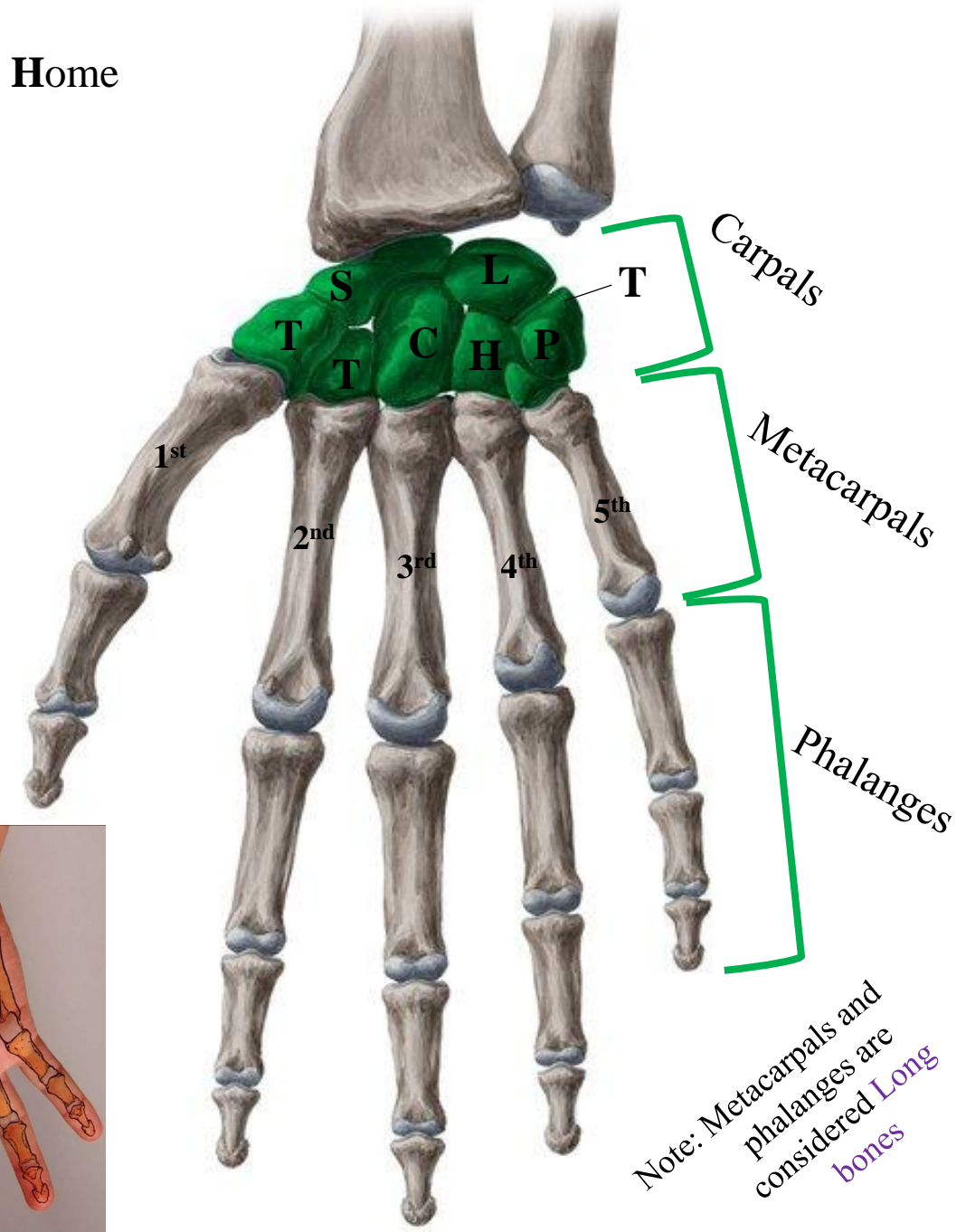
Bones of the Hand

Sally Left The Party To Take Cathy Home

It is very easy to remember the carpal bones from lateral to medial, and from proximal to distal rows if you use the following mnemonic!



- Scaphoid
- Lunate
- Triquetral
- Pisiform
- Trapezium
- Trapezoid
- Capitate
- Hamate

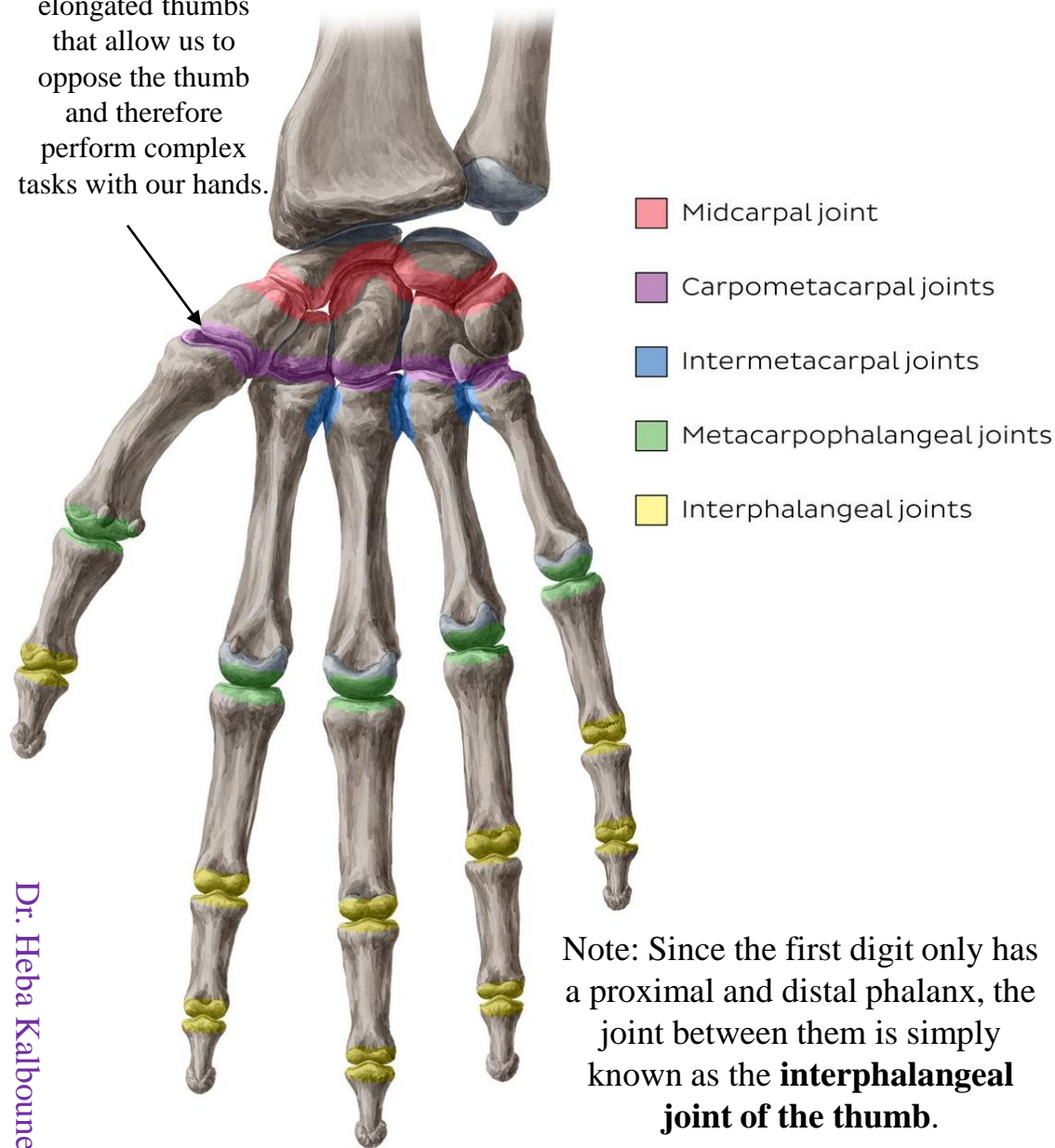


The Metacarpals and Phalanges

- 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. It does not lie in the same plane as the others but occupies a more anterior position.
- 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**.
- There are three phalanges for each of the fingers but only two for the thumb.



Note: It is the combination of this joint and our elongated thumbs that allow us to oppose the thumb and therefore perform complex tasks with our hands.



Note: Since the first digit only has a proximal and distal phalanx, the joint between them is simply known as the **interphalangeal joint of the thumb**.

The joints of the hand

The **midcarpal joint** is the articulation between the proximal row of carpal bones and the distal row of carpal bones. **Type: Synovial plane joint.**

The **carpometacarpal (CMC) joints** are articulations between the carpal bones and metacarpal bones of the hand. There are five CMC joints in total, out of which the carpometacarpal joint of thumb (trapeziometacarpal joint) is the most specialized and flexible.

Type:

CMC 1 (of thumb): Synovial saddle joint.

Movements of 1st carpometacarpal joint: Flexion and extension, abduction and adduction, and some circumduction.

CMC 2, 3, 4, 5: Synovial plane joint.

The **metacarpophalangeal (MCP) joints** connect the metacarpus, or palm of the hand, to the fingers. There are five separate metacarpophalangeal joints that connect each metacarpal bone to the corresponding proximal phalanx of each finger. **Type: Synovial condyloid joint.** Movements: Flexion, extension, adduction, abduction, and some circumduction (limited).

The **interphalangeal joints (IP)** of the hand are formed between the proximal, middle, and distal phalanges of the hand.

The **proximal interphalangeal joint** is located between the proximal and middle phalanges, while the **distal interphalangeal joint** is found between the middle and distal phalanges. **Type: Synovial hinge joint.** Movements: Flexion & extension.