Skeletal System

Anatomy First Stage

Lec....4 and Lec....5

Dr Hawraa kareem

Appendicular skeleton (Bones of upper limbs)

- The appendicular skeleton refers to those structures that are appended to the axial skeleton.
- The pectoral girdle and the upper limbs form the upper appendage.
- The pelvic girdle and the lower limbs form the lower appendage

The Skeletal System

The upper limb consists of the:

- Shoulder / Pectoral Girdle
- Arm
- Forearm
- Hand

λ Each upper limb contains 32 bones.

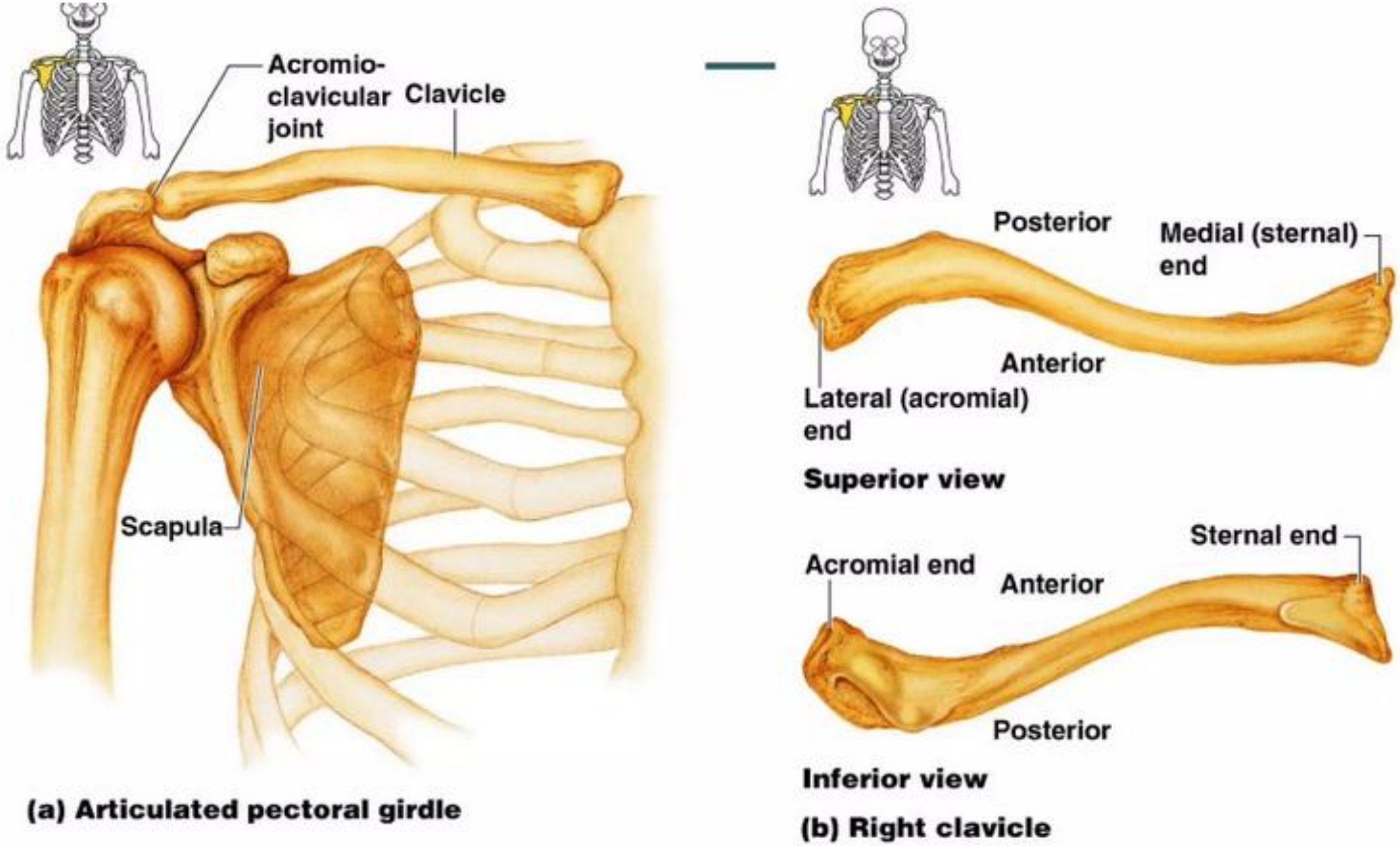
The Shoulder Girdle

Composed of two bones

- Clavicle – collarbone
- Scapula – shoulder blade

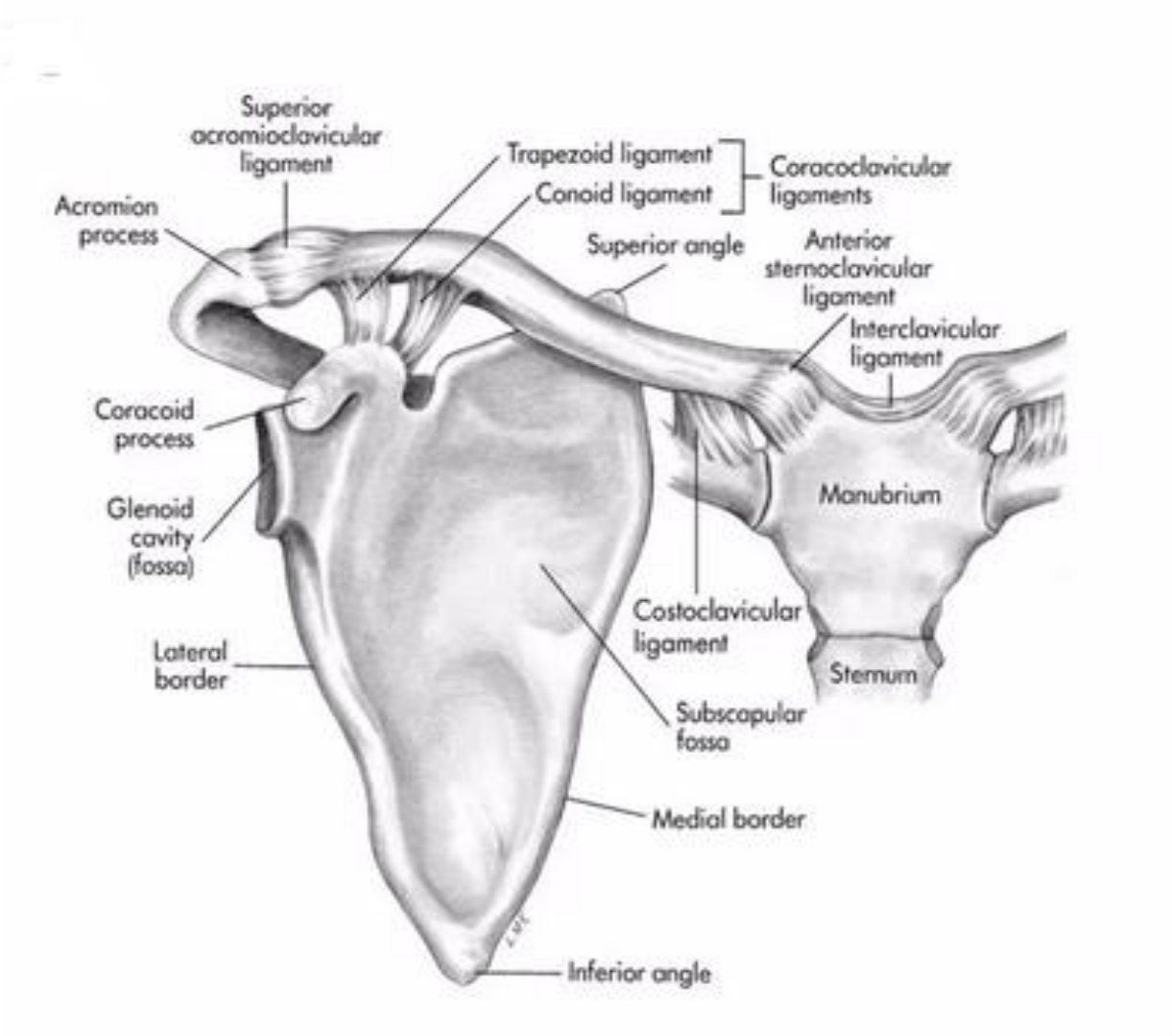
λ Only the clavicle actually attaches to the thorax.

λScapulae do not join each other or the axial skeleton but “float” on the back of the ribs.


Acromio-
clavicular
joint
Clavicle
Scapula
(a) Articulated pectoral girdle
Posterior
Medial (sternal)
end
Anterior
Lateral (acromial)
end
Superior view
Sternal end
Acromial end
Anterior
Posterior
Inferior view
(b) Right clavicle

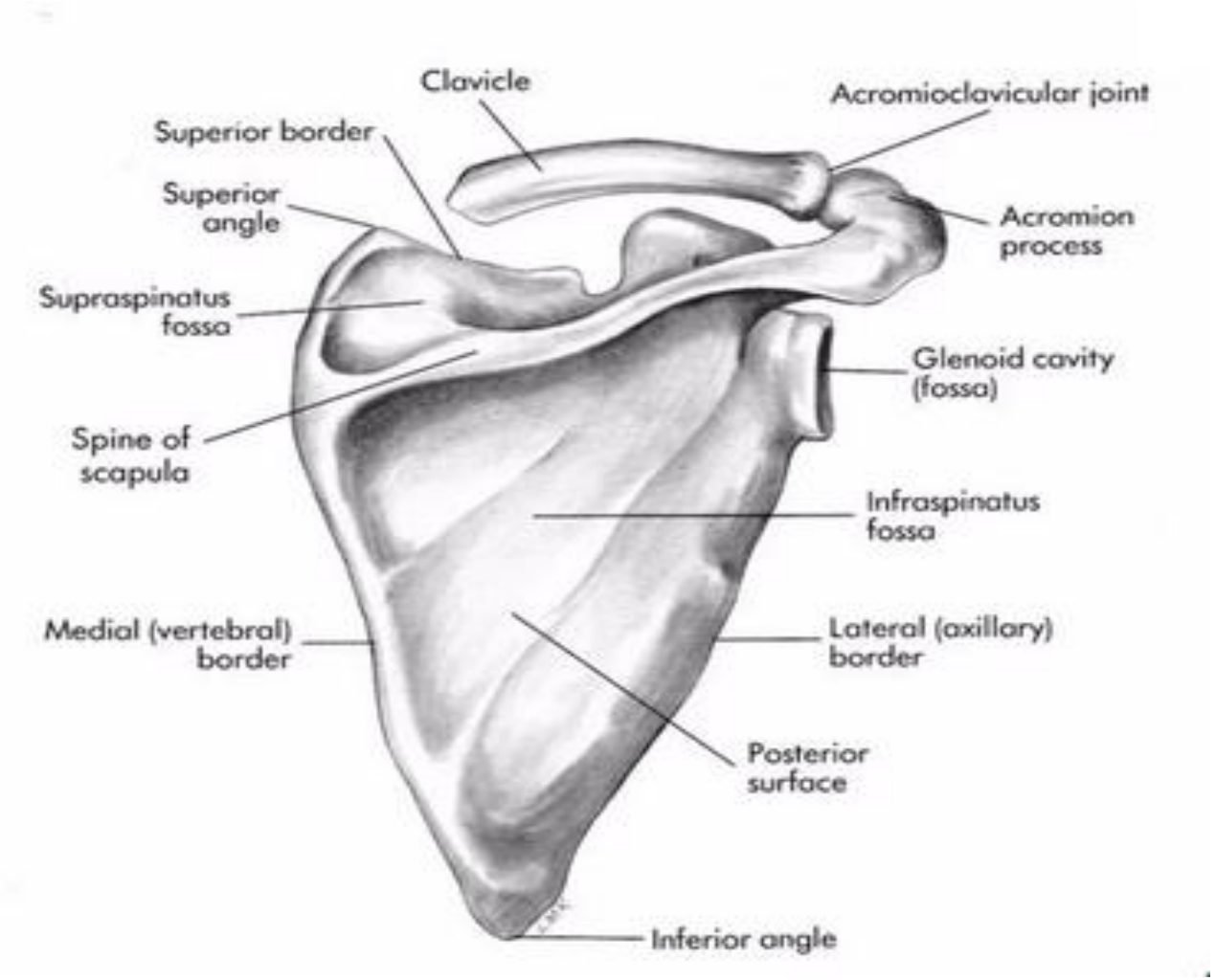
Bones of the Shoulder Girdle (Anterior View)

- Manubrium
- Clavicle
- Coracoid process
- Acromion process
- Glenoid fossa
- Lateral border
- Inferior angle
- Medial border



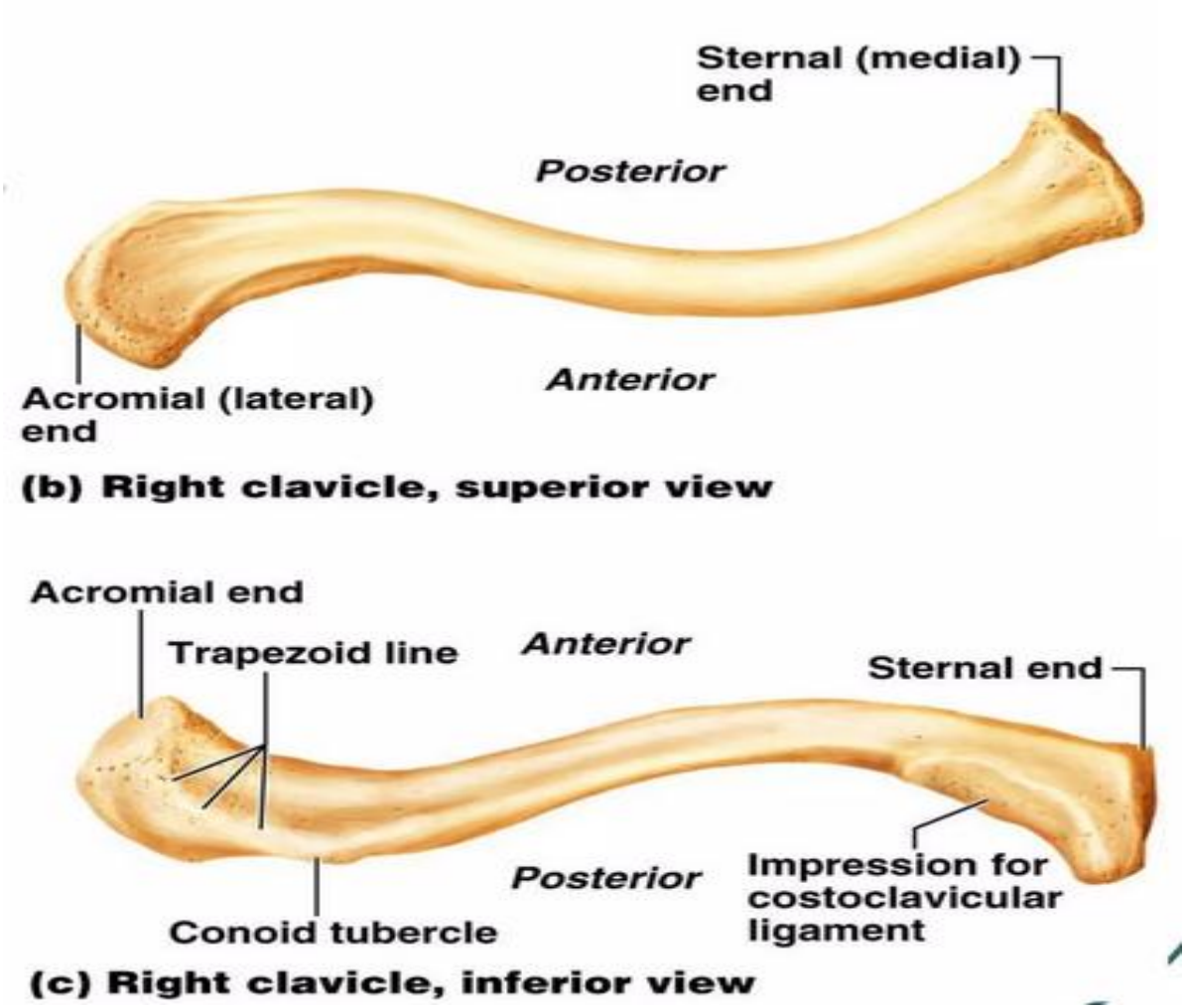
Bones of the Shoulder Girdle (Posterior View)

- Acromion process
- Glenoid fossa
- Lateral border
- Inferior angle
- Medial border
- Superior angle
- Spine of the scapula



Clavicles

- Extend horizontally across the superior thorax
- Sternal end articulates with the manubrium
- Acromial end articulates with scapula
- Provide attachment for muscles
- Hold the scapulae and arms laterally

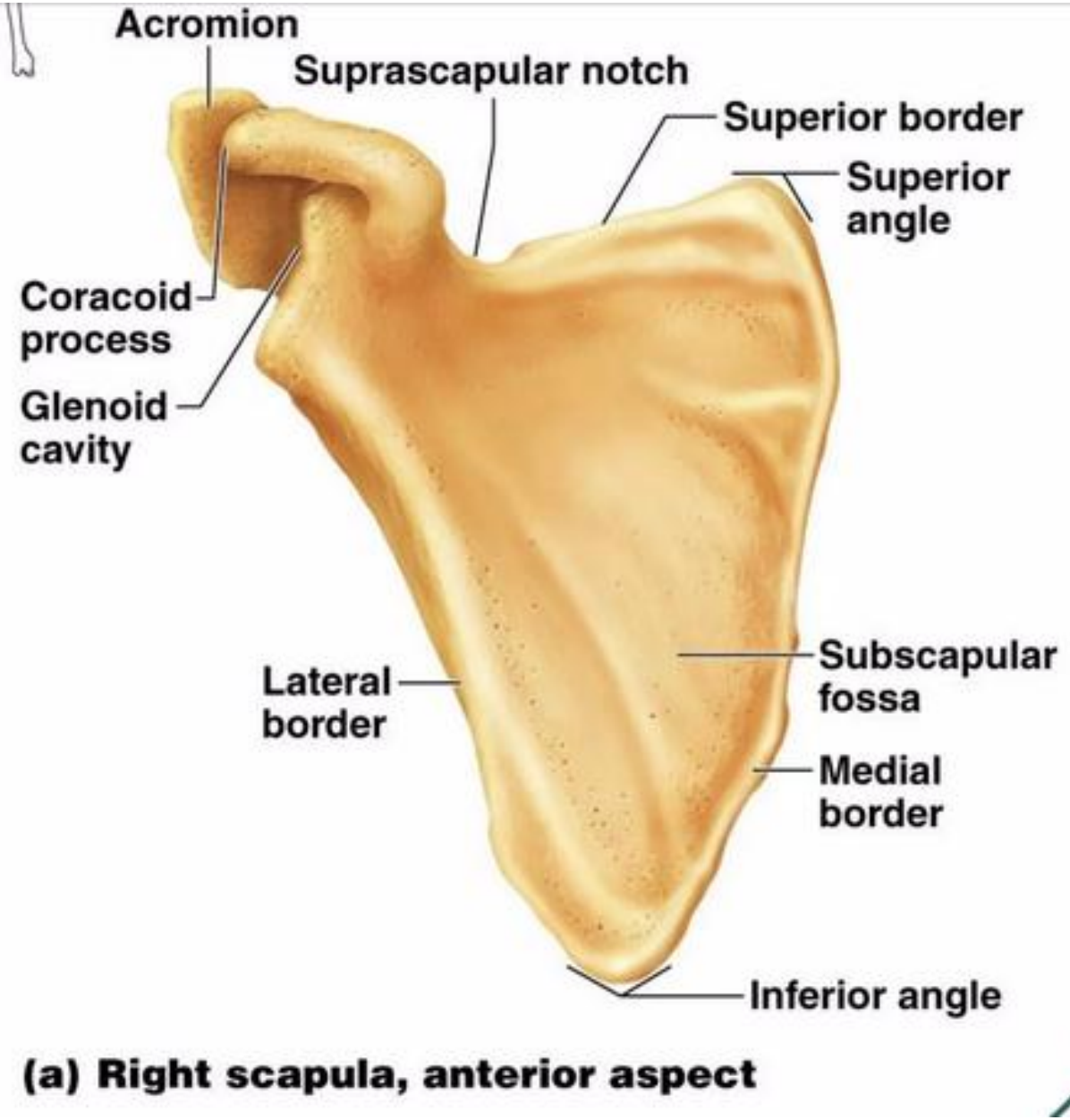


Scapulae

- Lie on the dorsal surface of the rib cage
- Located between ribs 2 – 7
- Have three borders
  - Superior
  - Medial (vertebral)
  - Lateral (axillary)
- Have three angles
  - Lateral, superior, and inferior

Structures of the Scapula

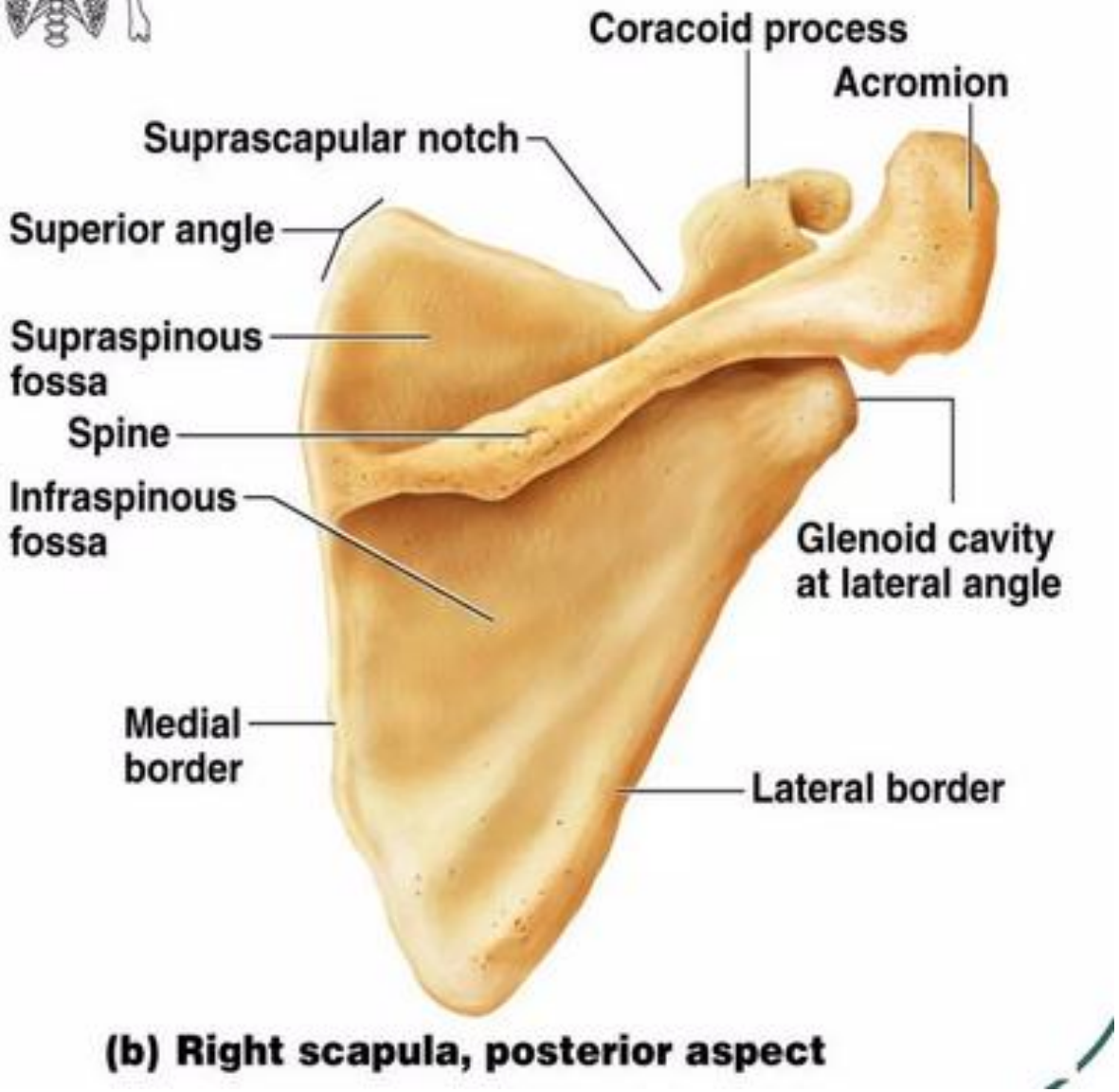




(a) Right scapula, anterior aspect

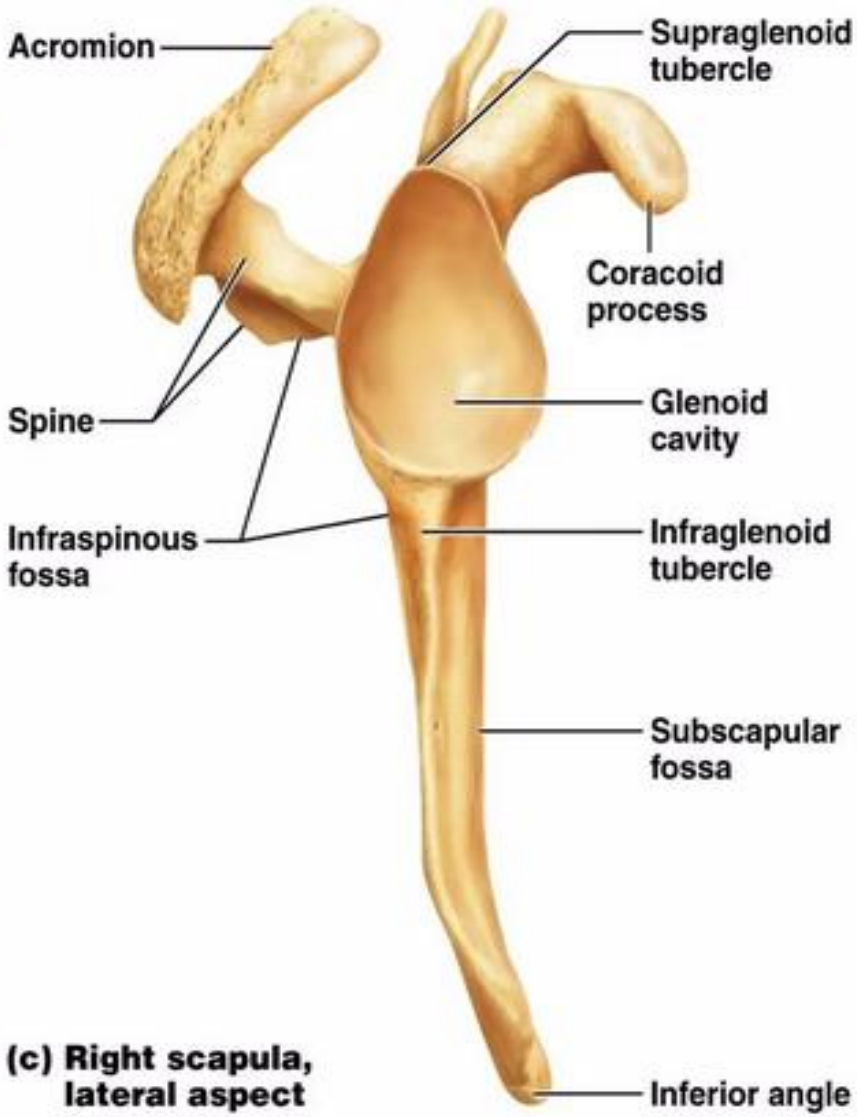
Structures of the Scapula



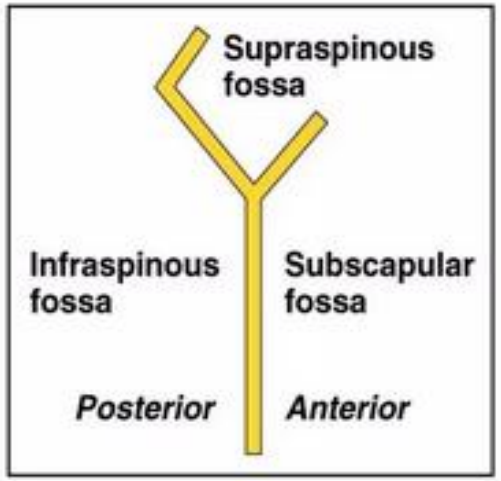


(b) Right scapula, posterior aspect

Structures of the Scapula



(c) Right scapula, lateral aspect



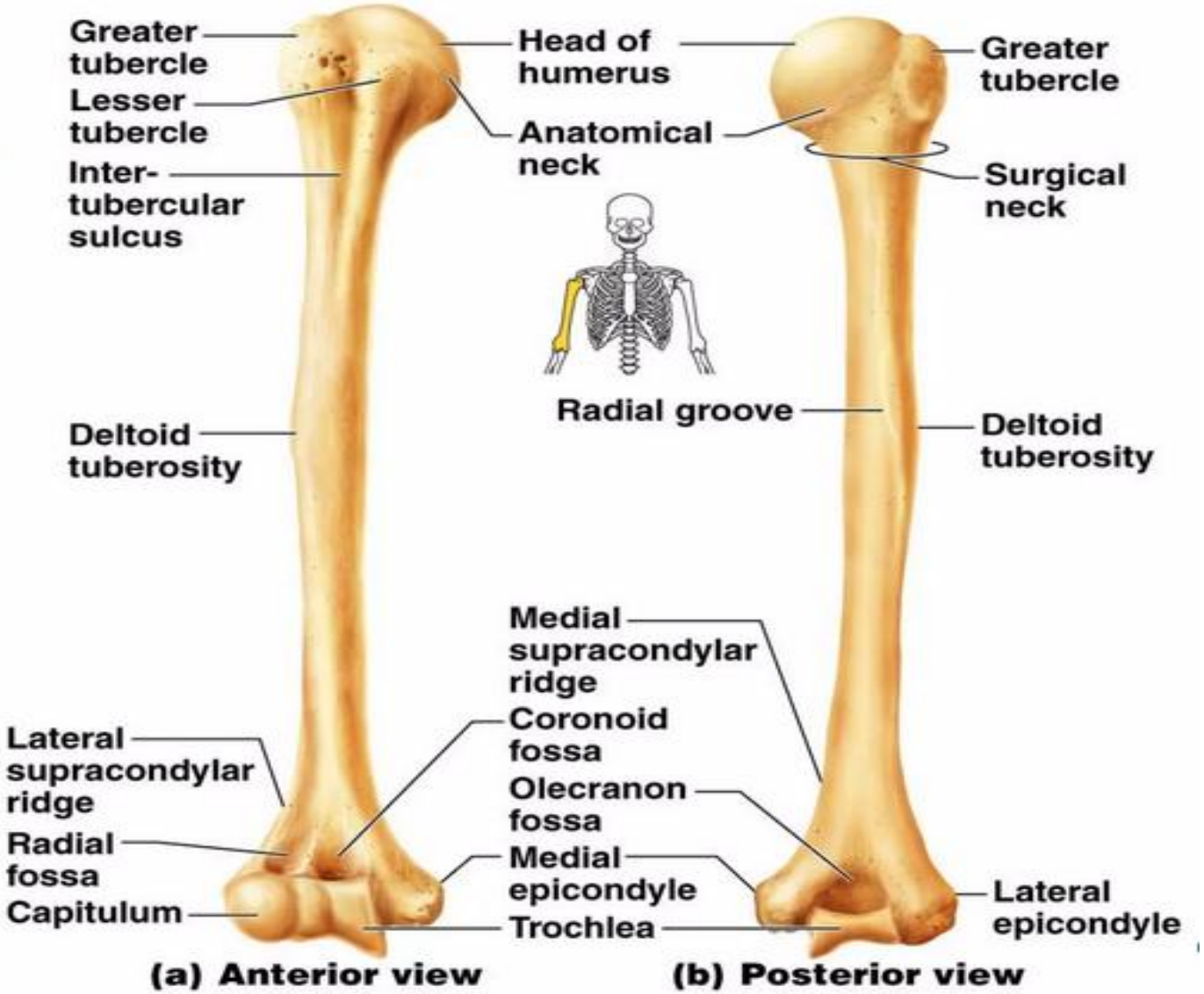
Arm

Region of the upper limb between the shoulder and elbow

λ Humerus

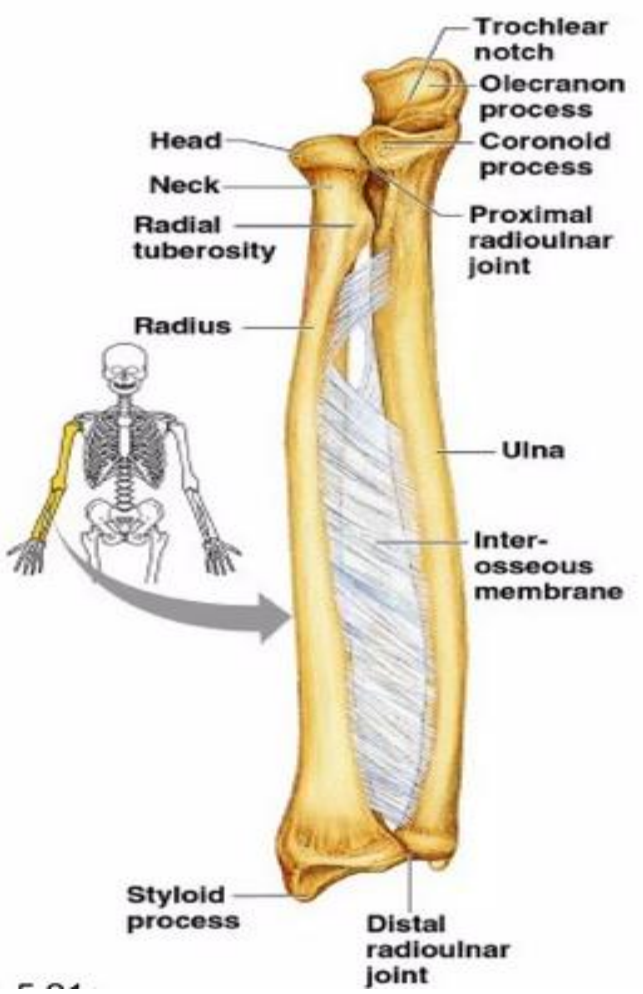
- The only bone of the arm
- Longest and strongest bone of the upper limb
- Articulates with the scapula at the shoulder
- Articulates with the radius and ulna at the elbow
- Many structures of the humerus provide sites for muscle attachment
- Other structures of the humerus provide articulation sites for other bones

Structures of the Right Humerus



Bones of the Fore Arm

- The forearm has two bones
  - •Ulna
  - •Radius
- Proximal ends articulate with the humerus
- Distal ends articulate with carpals
- Radius and ulna articulate with each other
  - At the proximal and distal radioulnar joints



Bones of the Fore Arm

- The interosseous membrane
    - Interconnects radius and ulna
- In anatomical position
    - The radius is lateral and the ulna is medial

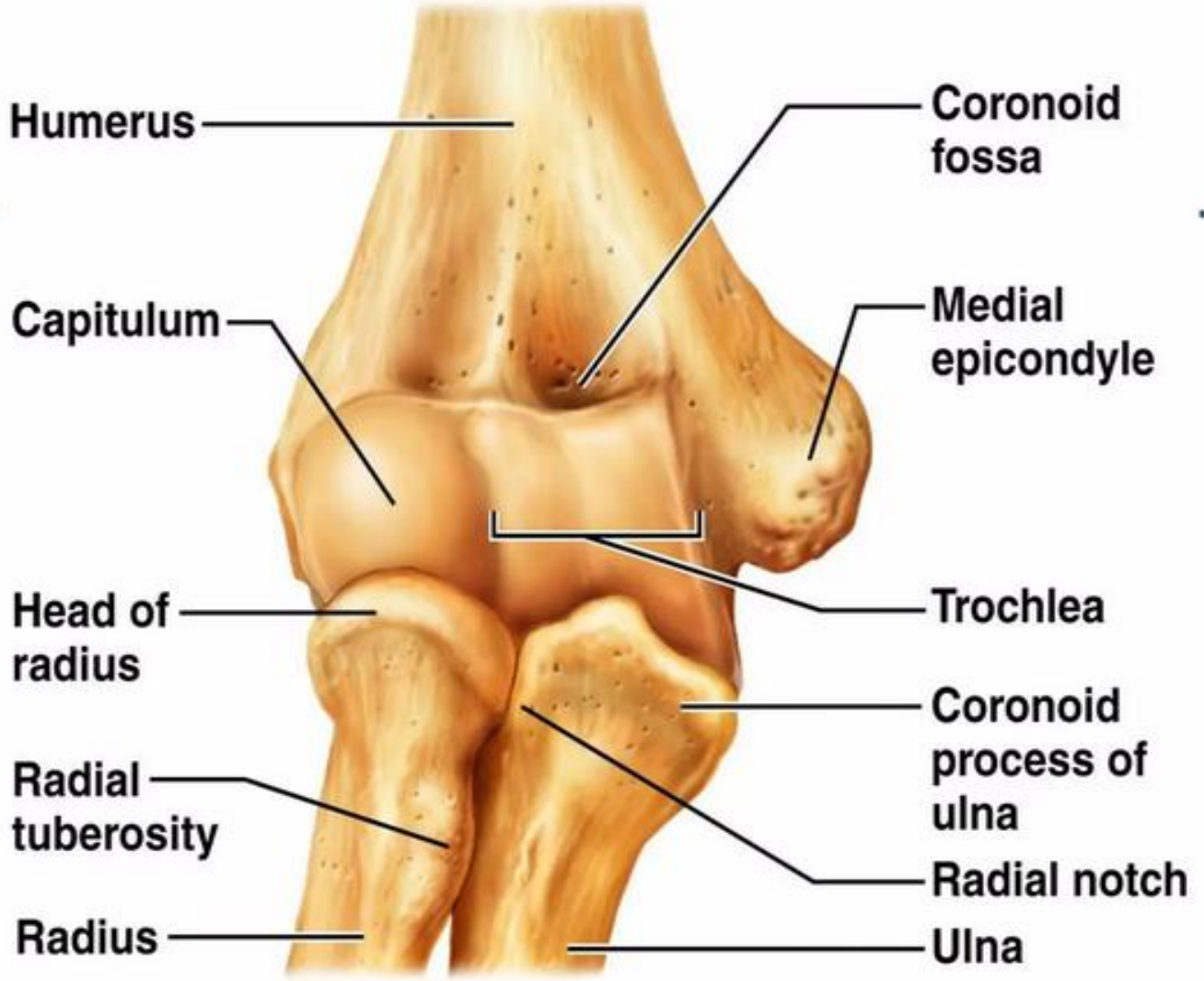
Ulna

- Main bone responsible for forming the elbow joint with the humerus
- Hinge joint, allows forearm to bend on arm
- Distal end is separated from carpals by fibrocartilage
- Plays little to no role in hand movement

Radius

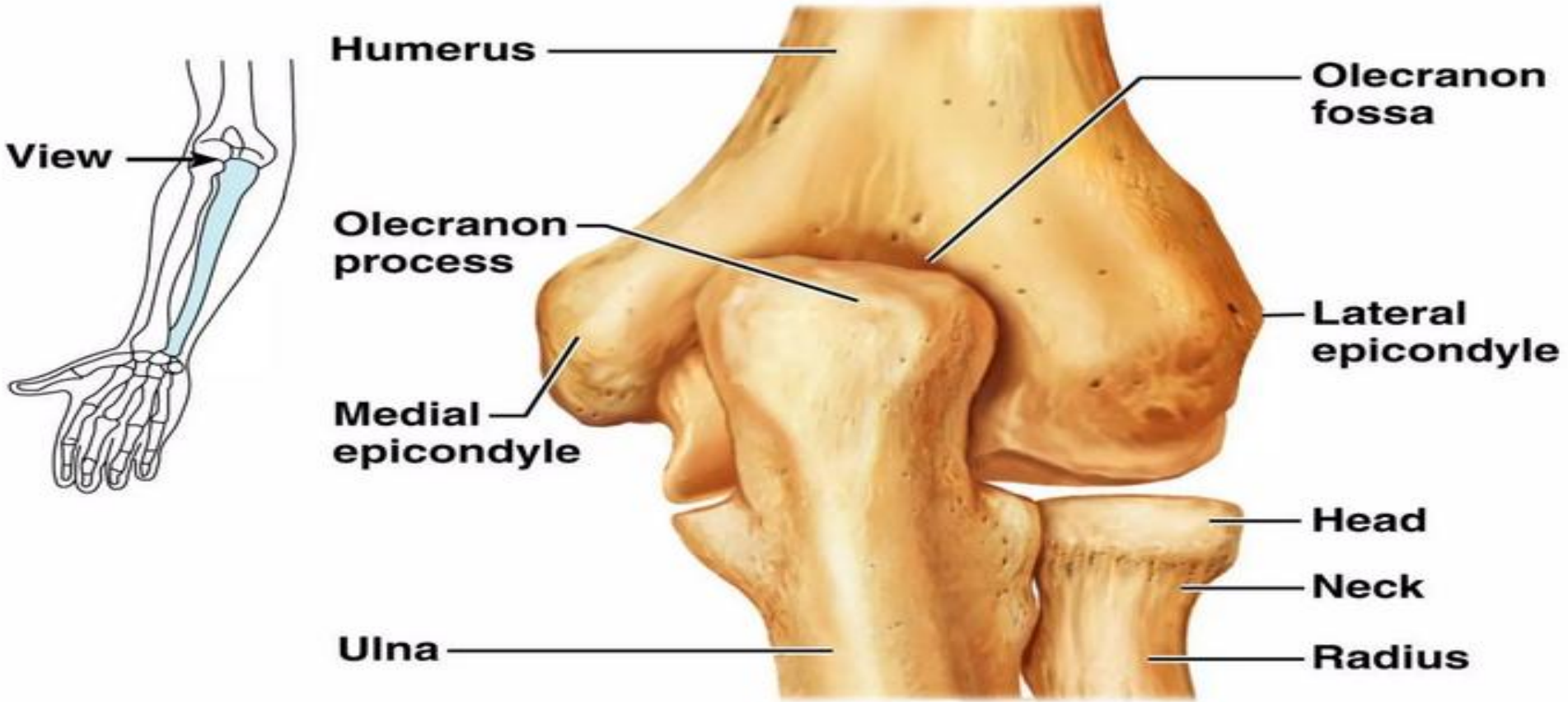
- λ Superior surface of the head of the radius articulates with the capitulum
- λ Medially – the head of the radius articulates with the radial notch of the ulna
- λ Contributes heavily to the wrist joint
    - Distal radius articulates with carpal bones
    - When radius moves, the hand moves with it

Details of Elbow Joint

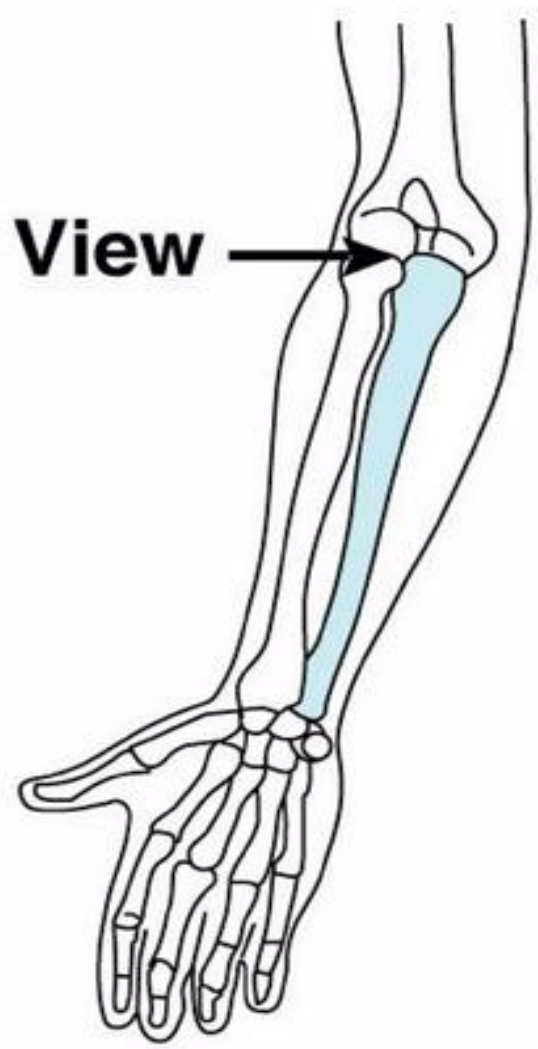


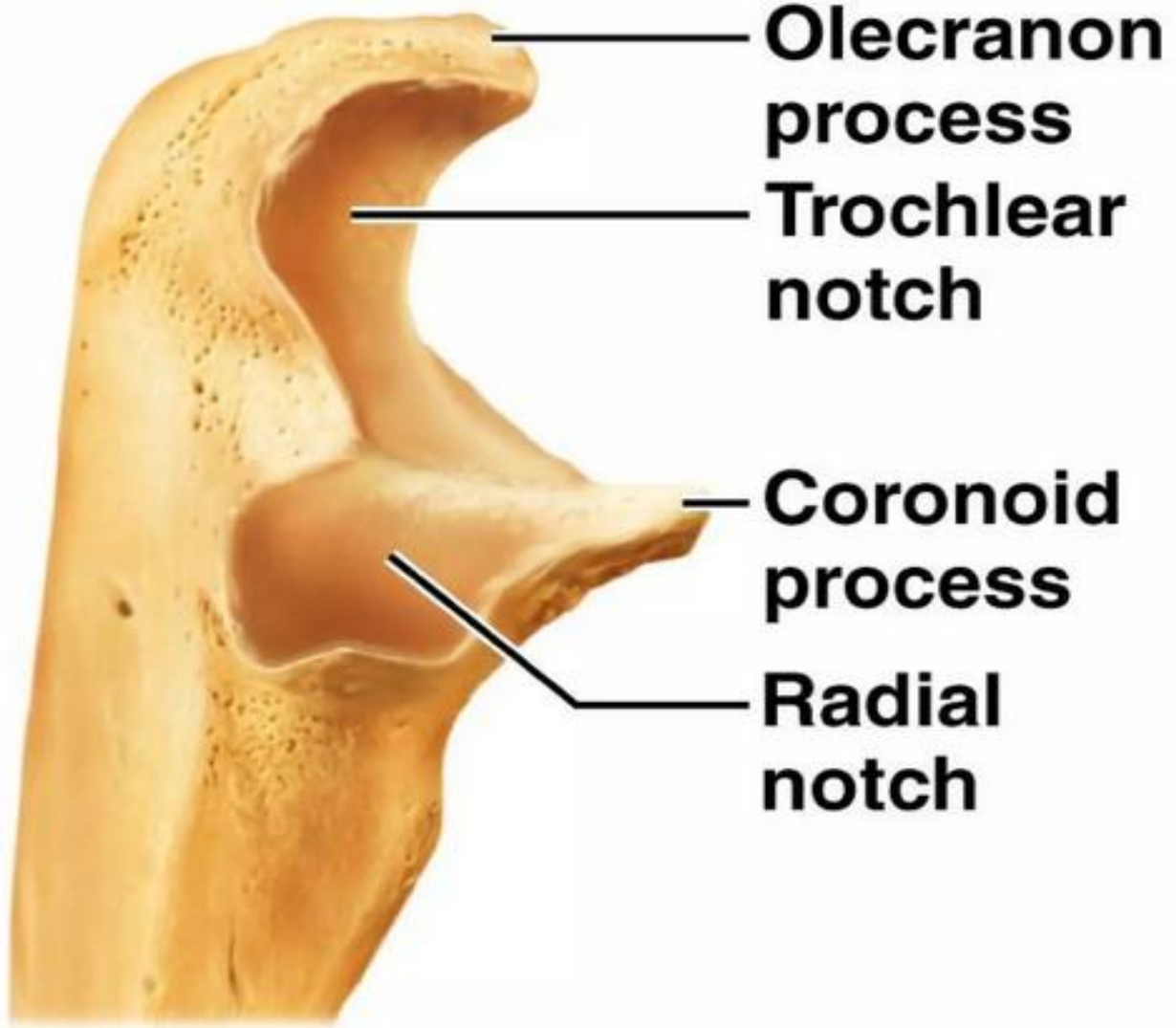
(a) Anterior view

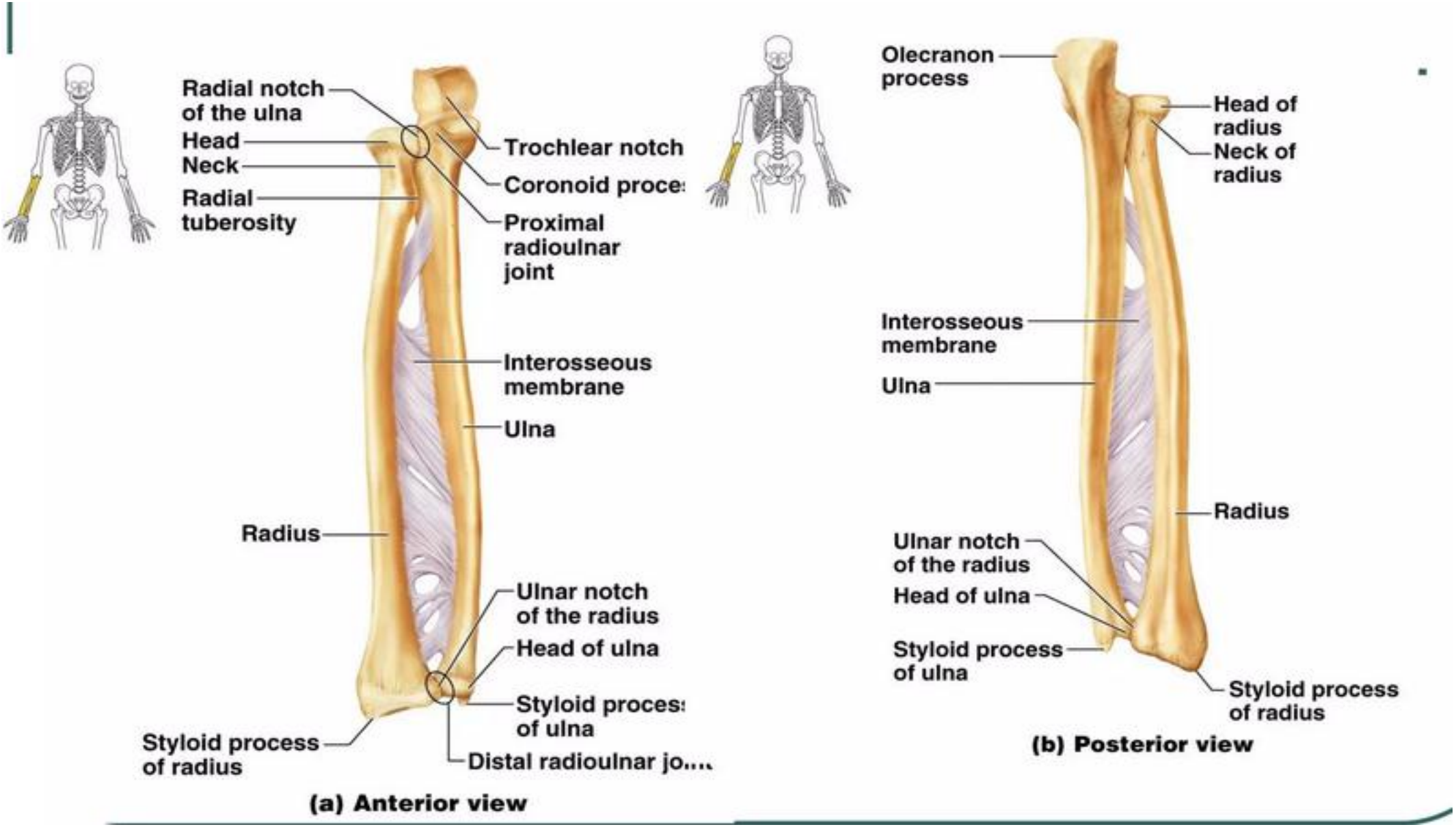
Proximal Ends of Radius and Ulna



(c) Posterior view

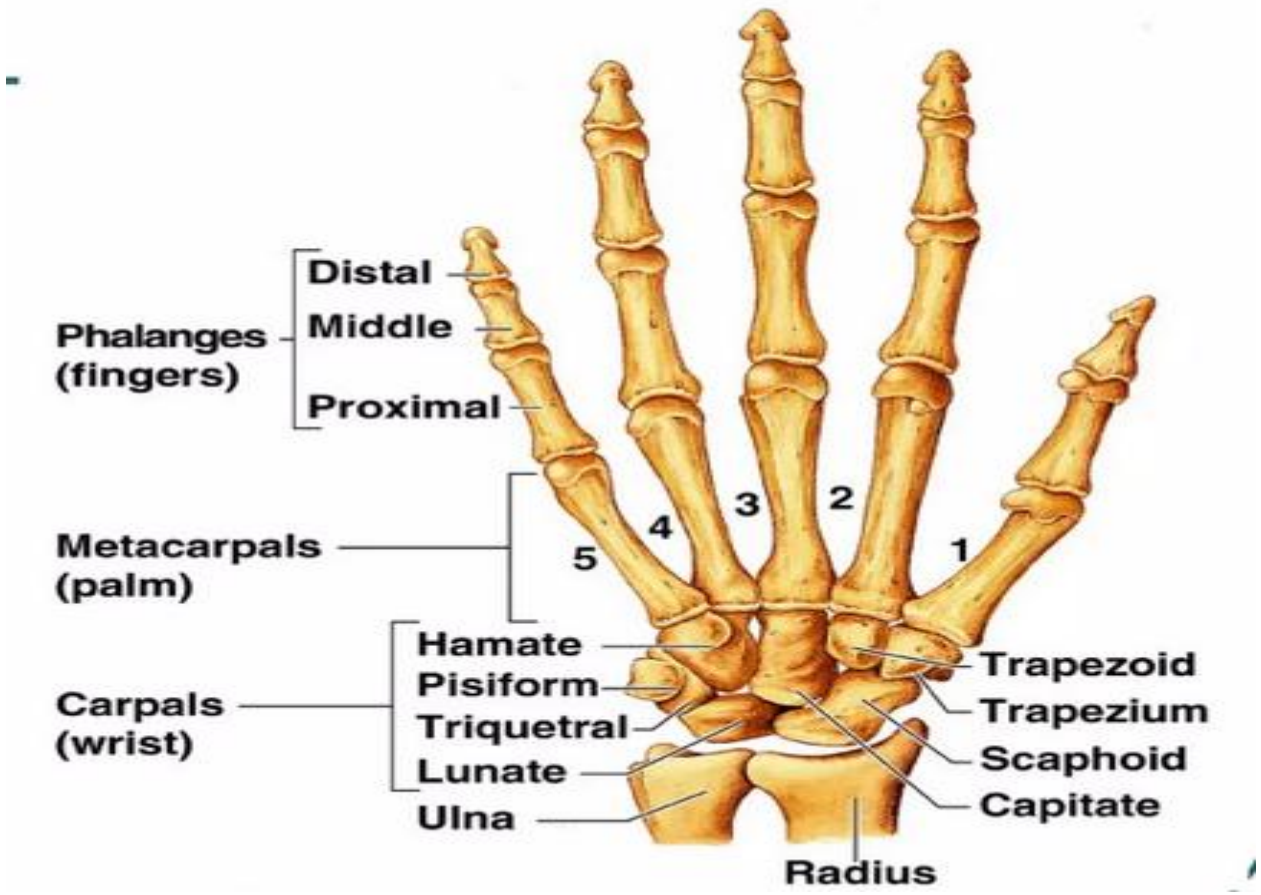

View


Olecranon process
Trochlear notch
Coronoid process
Radial notch


Radial notch of the ulna
Head
Neck
Radial tuberosity
Trochlear notch
Coronoid proce
Proximal radioulnar joint
Interosseous membrane
Ulna
Radius
Ulnar notch of the radius
Head of ulna
Styloid proces of ulna
Styloid process of radius
Distal radioulnar jo....
(a) Anterior view
Olecranon process
Head of radius
Neck of radius
Interosseous membrane
Ulna
Radius
Ulnar notch of the radius
Head of ulna
Styloid process of ulna
Styloid process of radius
(b) Posterior view

The hand

- Includes the following bones
  - •Carpals – wrist
  - •Metacarpals – palm
  - •Phalanges – fingers



Carpus

λ Forms the true wrist – the proximal region of the hand

λ Gliding movements occur between carpals

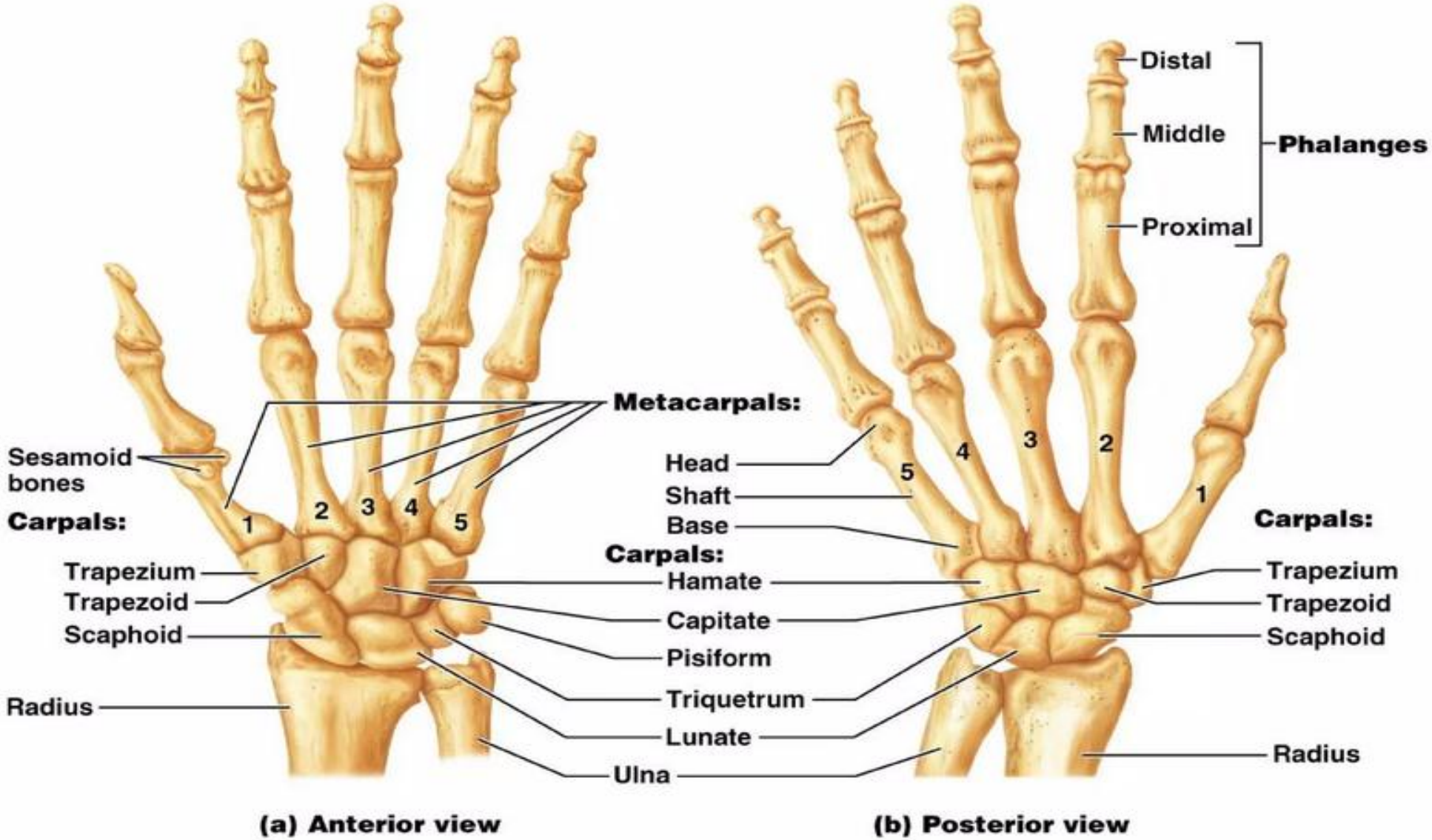
λ Composed of eight marble-sized bones

λ Carpal bones

- Are arranged in two irregular rows
- Proximal row from lateral to medial
    - Scaphoid, lunate, triquetral, and pisiform

- Distal row from lateral to medial
    - Trapezium, trapezoid, capitate, and hamate
- A mnemonic to help remember carpals

    “Sally left the party to take Carmen home”


Sesamoid bones
Carpals:
Trapezium
Trapezoid
Scaphoid
Radius
Metacarpals:
1
2
3
4
5
Ulna
Lunate
Triquetrum
Pisiform
Capitate
Hamate
Carpals:
Base
Shaft
Head
(a) Anterior view
Distal
Middle
Proximal
Phalanges
Carpals:
Trapezium
Trapezoid
Scaphoid
Radius
(b) Posterior view

Metacarpus

λ Five metacarpals radiate distally from the wrist

λ Metacarpals form the palm

- Numbered 1–5, beginning with the pollex (thumb)
- Articulate proximally with the distal row of carpals
- Articulate distally with the proximal phalanges

Phalanges

λ Numbered 1–5, beginning with the pollex (thumb)

λ Except for the thumb, each finger has three phalanges

• Proximal, middle, and distal