

وسهلا

أهلا



## الأستاذ الدكتور يوسف حسين

أستاذ التشريح وعلم الأجنة - كلية الطب - جامعة الزقازيق - مصر

رئيس قسم التشريح و الأنسجة و الأجنة - كلية الطب - جامعة مؤتة - الأردن

دكتورة من جامعة كولونيا المانيا

اليوتيوب Prof. Dr. Youssef Hussein Anatomy

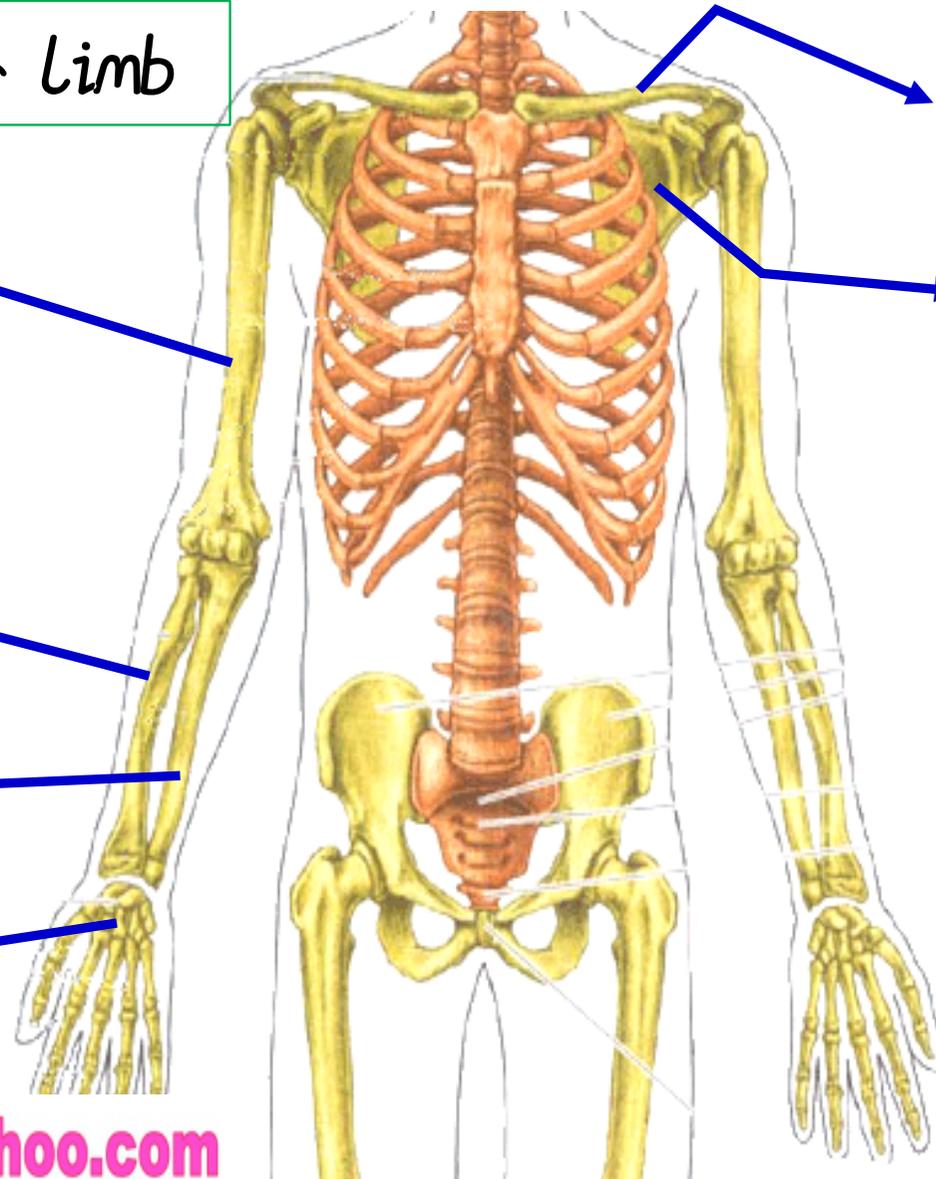
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## ❖ Bones of the upper limb



Clavicle

Scapula

Humerus

Radius

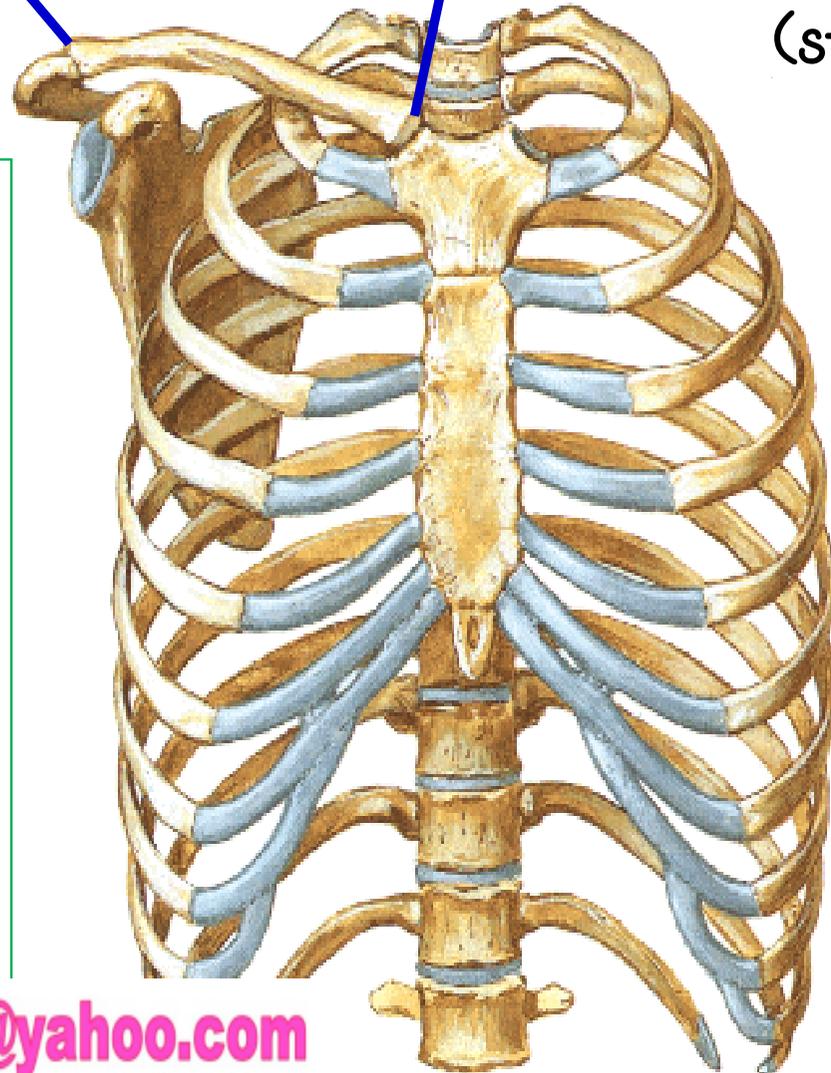
Ulna

Hand

Human skeleton is composed of 206 bones  
- 86 paired  
- 34 single.

Lateral end  
(acromial)

Medial end  
(sternal)



**\*\* How to identify the side of a clavicle**

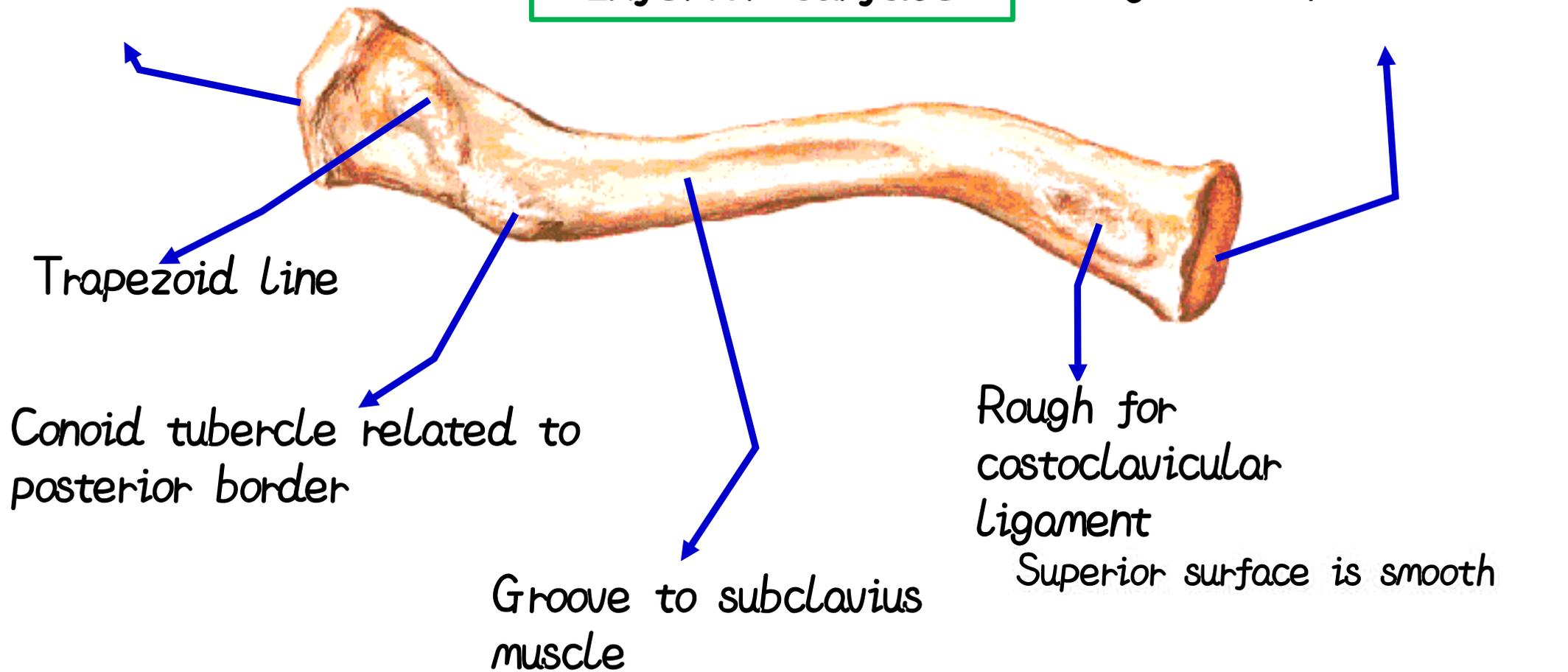
- The *medial end* is bulky and quadrilateral while the *lateral end* is flattened.
- The *medial 2/3* of the shaft is convex anteriorly.
- The Superior surface is smooth while the inferior surface shows a shallow groove in its middle third.

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Lateral end (acromial)  
flattened

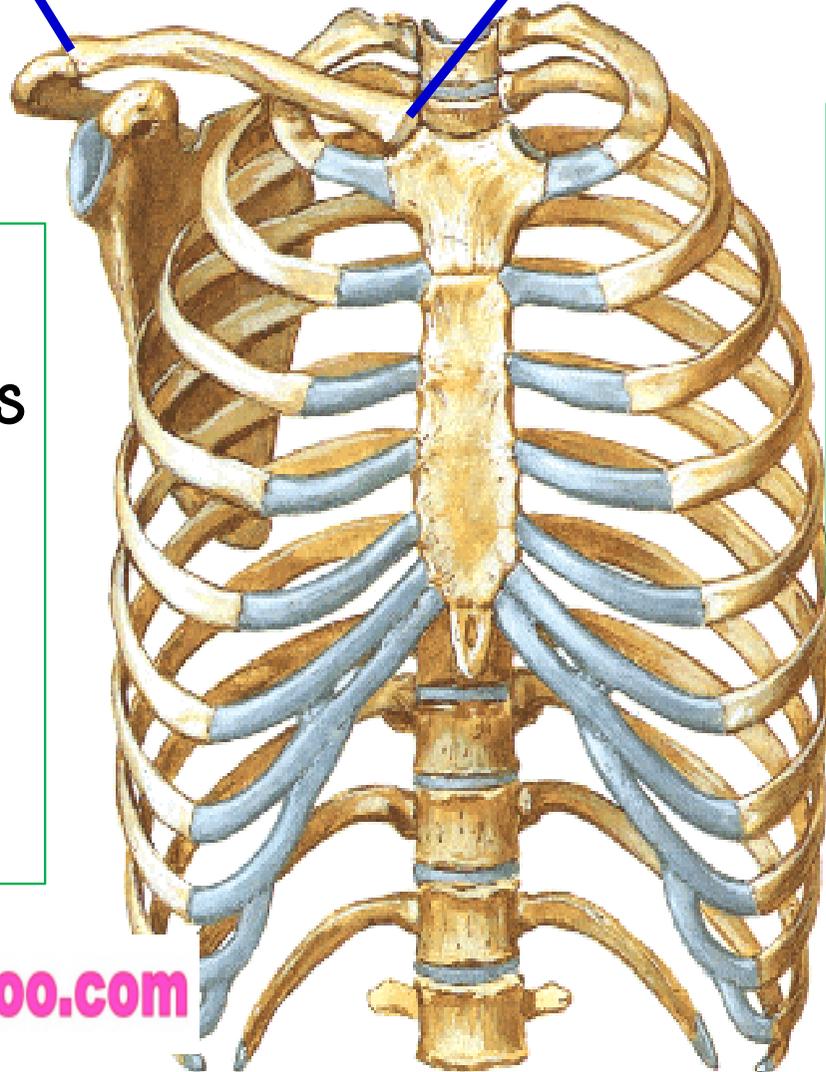
Inferior surface

Medial end (sternal)  
Large and quadrilateral



Lateral end  
(acromial)

Medial end  
(sternal)



It articulates with the acromion process of the scapula to form acromioclavicular joint.

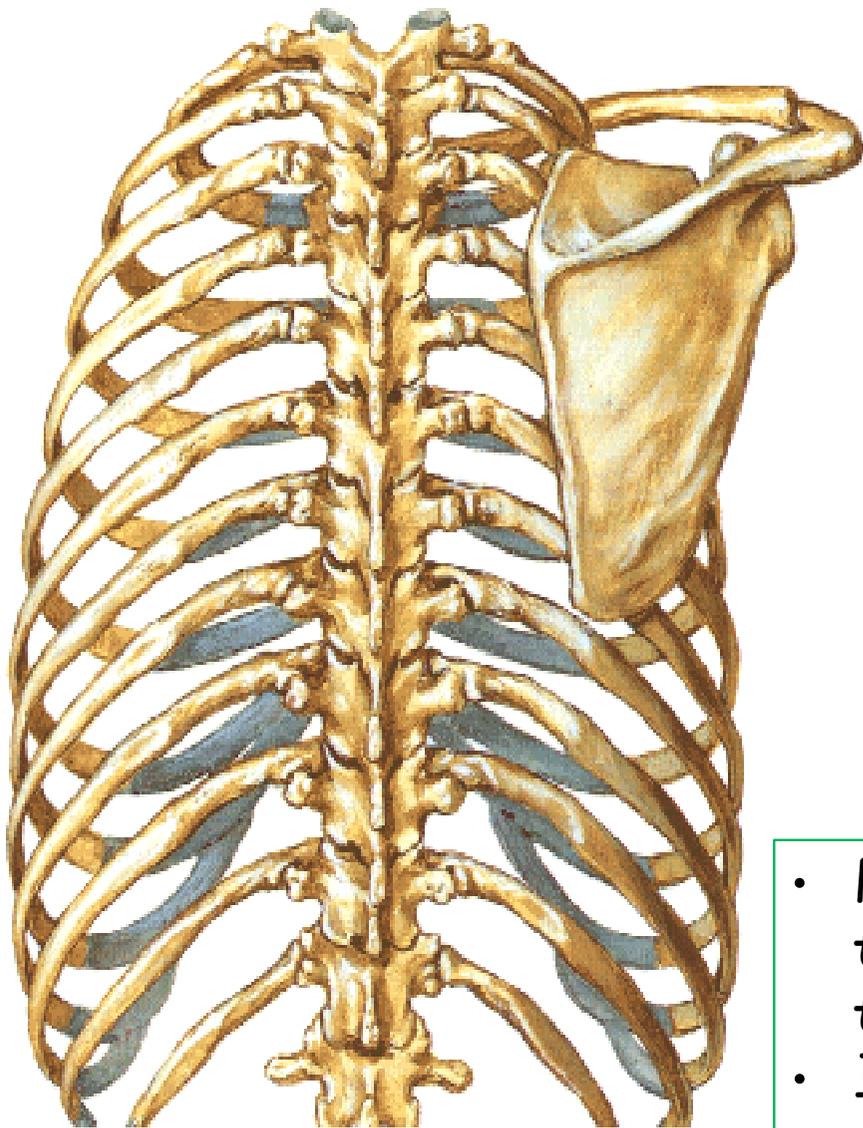
This end articulates with the clavicular notch of manubrium sterni and the first costal cartilage to form sternoclavicular joint.

- Medial (Sternal) end: large and quadrilateral.
- Lateral (Acromial) end: flattened
  - Shaft
    - It has 2 curvatures resembling the letter S between both ends.
    - The medial 2/3 are convex (محدب) anteriorly while the lateral 1/3 is convex posteriorly.
    - The medial 2/3 has 4 surfaces
      - 1) Anterior, 2) posterior, 3) superior and 4) Inferior.
    - The lateral 1/3 is flattened has
      - 2 surfaces: superior and inferior;
      - b- 2 borders: anterior and posterior.

- Although it is a long bone, it has unusual features:
- It lies horizontally.
- It has no medullary cavity.
- It ossifies in membrane not in cartilage
- It is the 1<sup>st</sup> bone to ossify intrauterine.
- It is the commonest bone to be fractured in the body

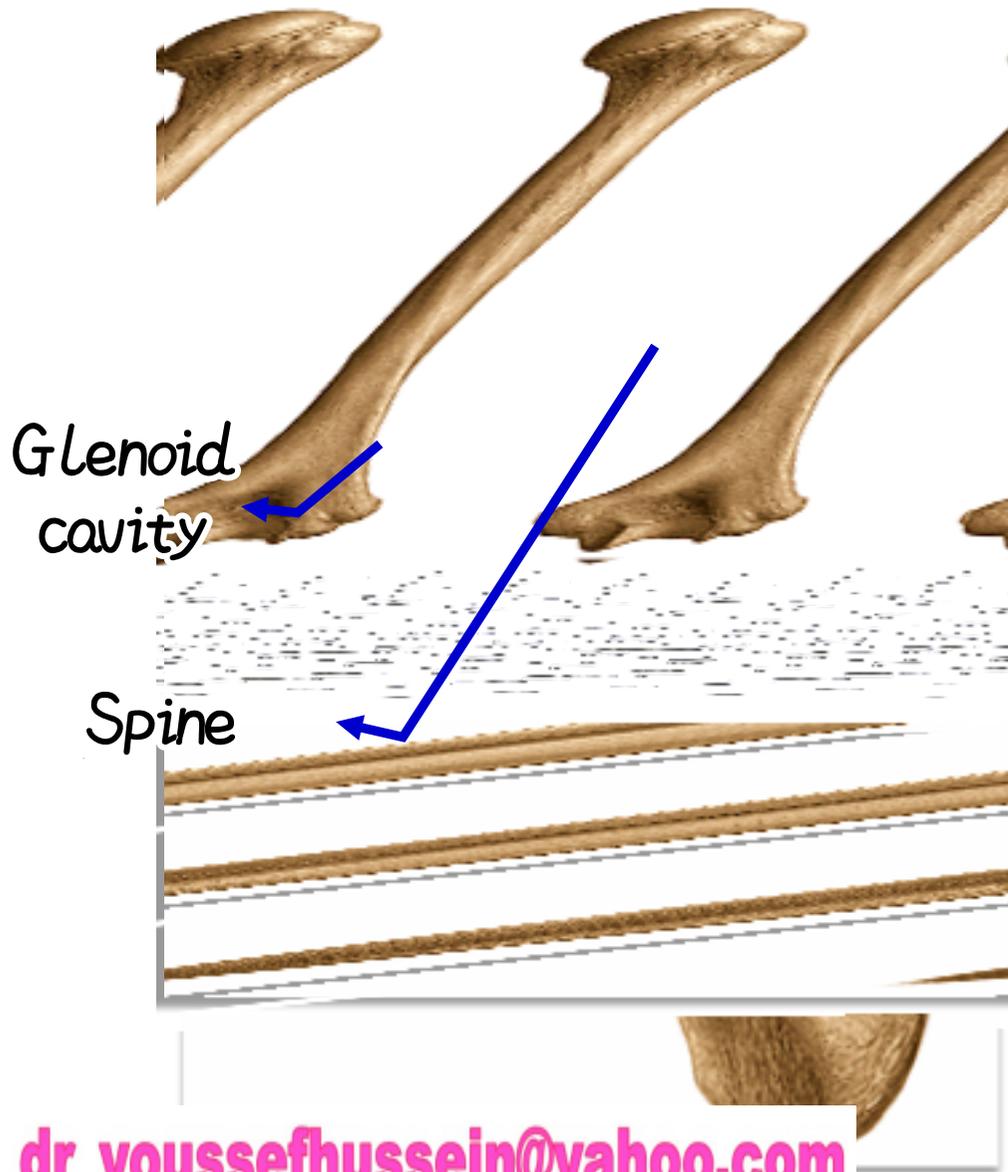
\*\* Functions of the clavicle:-

- 1) It transmits the weight of the upper limb to the axial skeleton.
- 2) It braces back the shoulder thus allowing the upper limb to be suspended free away from the trunk.



# Scapula

- Flat triangular bone which lies on the back of the upper part of the thoracic cage on each side.
- It extends from the 2nd- to 7th rib



**\*\* Identification of the side of the scapula;**  
-The *glenoid cavity* is directly *laterally and superior*.  
-The *spine* is attached to the *posterior surface*.

It has 2 surfaces, 3 angles, 3 borders and 3 processes.

Ventral

2 Surfaces

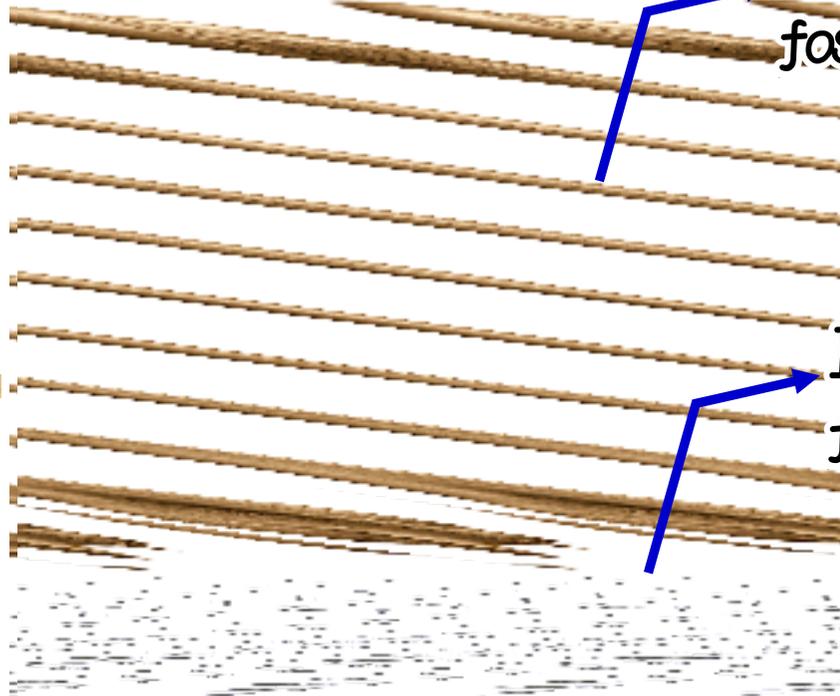
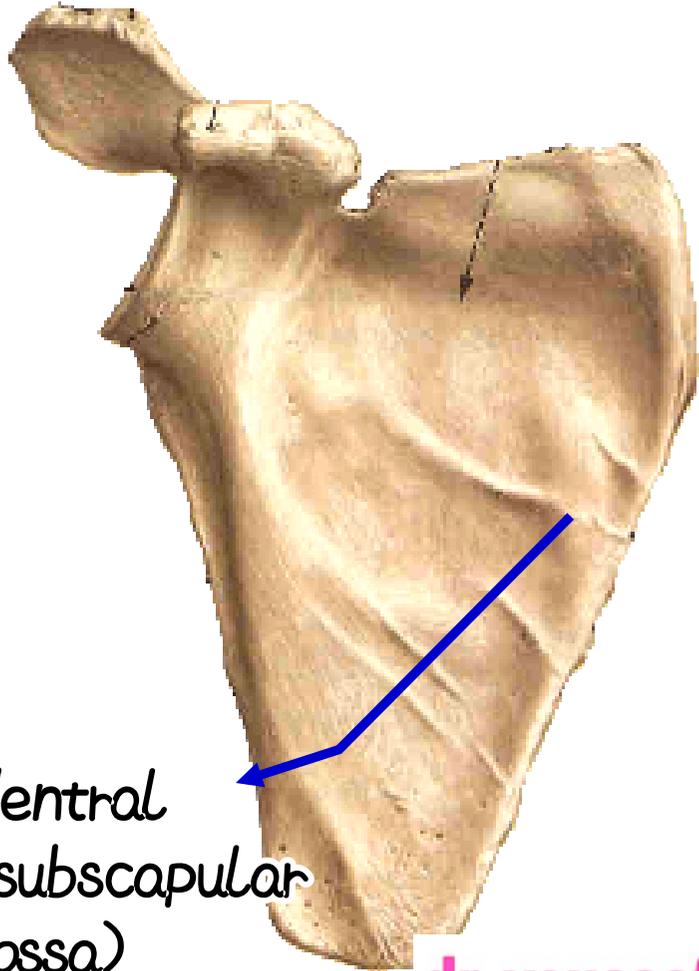
Dorsal

Supraspinous  
fossa

Infraspinous  
fossa

Ventral  
(subscapular  
fossa)

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# 3 Border & 3 Angle

Supraglenoid tubercle

Lateral angle (Glenoid cavity) articulates with the head of the humerus to form the shoulder joint.

Infraglenoid tubercle

Lateral border

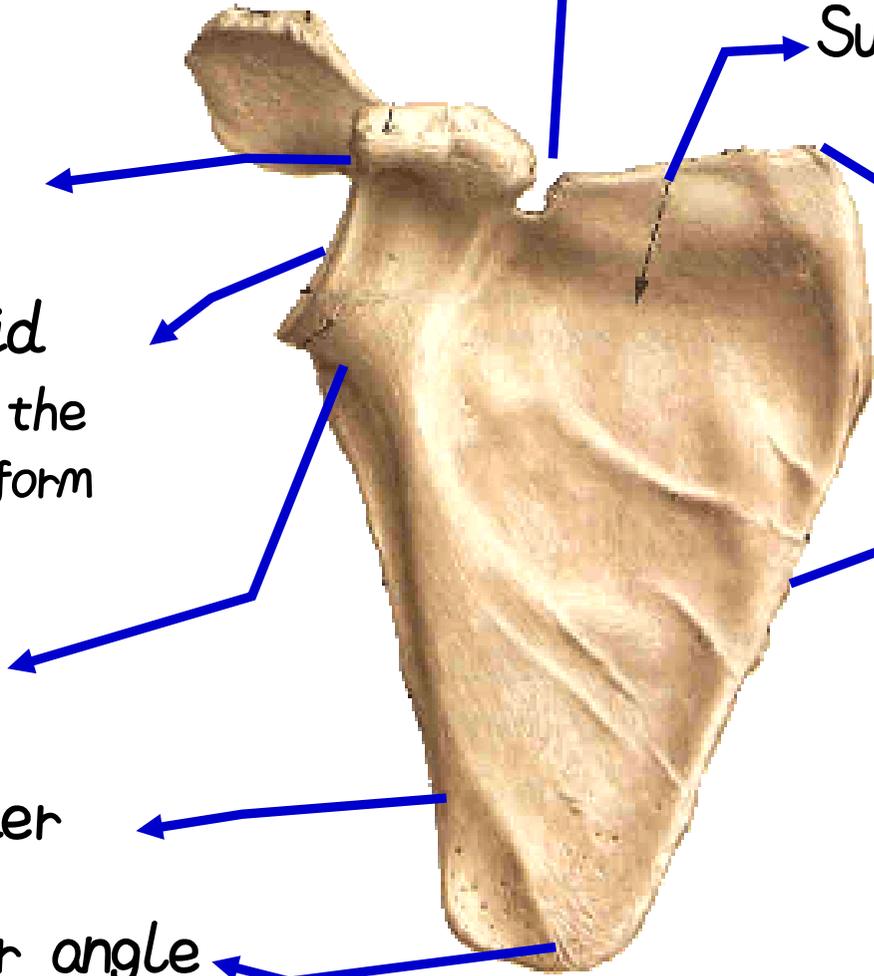
Inferior angle  
(7<sup>th</sup> rib)

Suprascapular notch

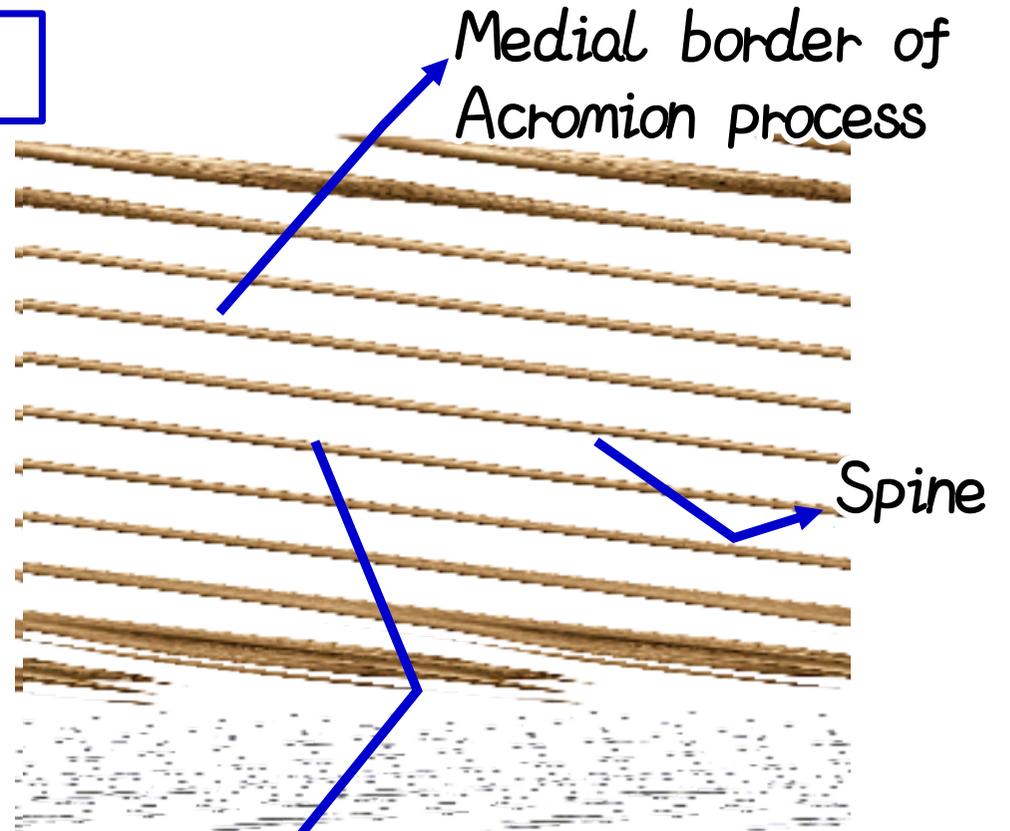
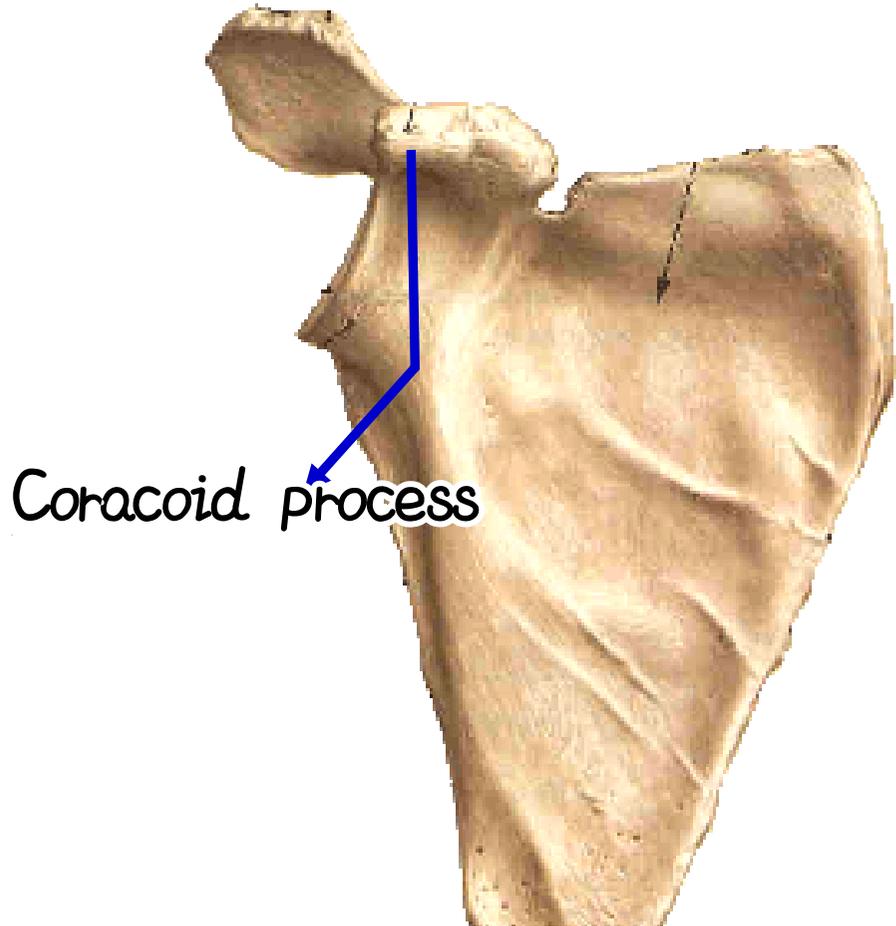
Superior border

Superior angle  
(2<sup>nd</sup> rib)

medial border



3 Processes



Spinoglenoid notch separated it from the glenoid cavity



## Processes

1- **Spine**: is a triangular process attached to the **dorsal** surface.

- **Posterior** or **free** border is broad and called the **crest of the spine**.

- It has 2 lips upper and lower lips and intermediate area in between showing a rough tubercle near its medial end.

- **Lateral** border separated from the glenoid cavity by **spinoglenoid notch**.

- This notch connects the supraspinous fossa with the infraspinous fossa.

- **Medial** end is the **root of the spine**.

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2 - **Acromion**: This process is continuous with the spine.

- It has 2 surfaces,

a) **Upper** subcutaneous surface.      b) **Lower** smooth slightly concave surface.

- It has 2 borders,

a) **Medial** border carries the **clavicular facet** which articulates with the acromial (lateral) end of the clavicle to form the **acromioclavicular joint**, - This border is continuous with the upper lip of spine.

b) **Lateral** border which is continuous with the lower lip of the crest of the spine.

3 - **Coracoid process**: attached to the superior aspect of the head.

- It is bent anteriorly so that, in the resting position, its tip points exactly forwards

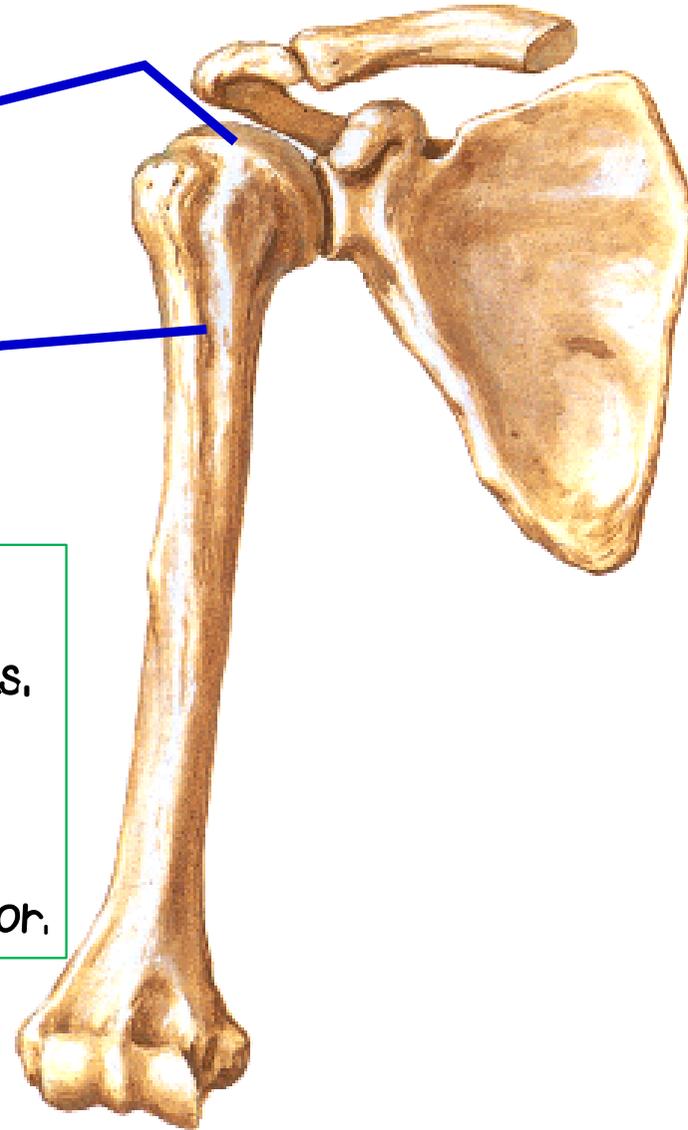
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Head of humerus

Bicipital groove



-This is the bone of the arm.

\*\* How to identify the side of the humerus.

1- The head is directed upwards and medially.

2- The bicipital groove is directed anterior.

Upper end

Head of humerus

Anatomical neck

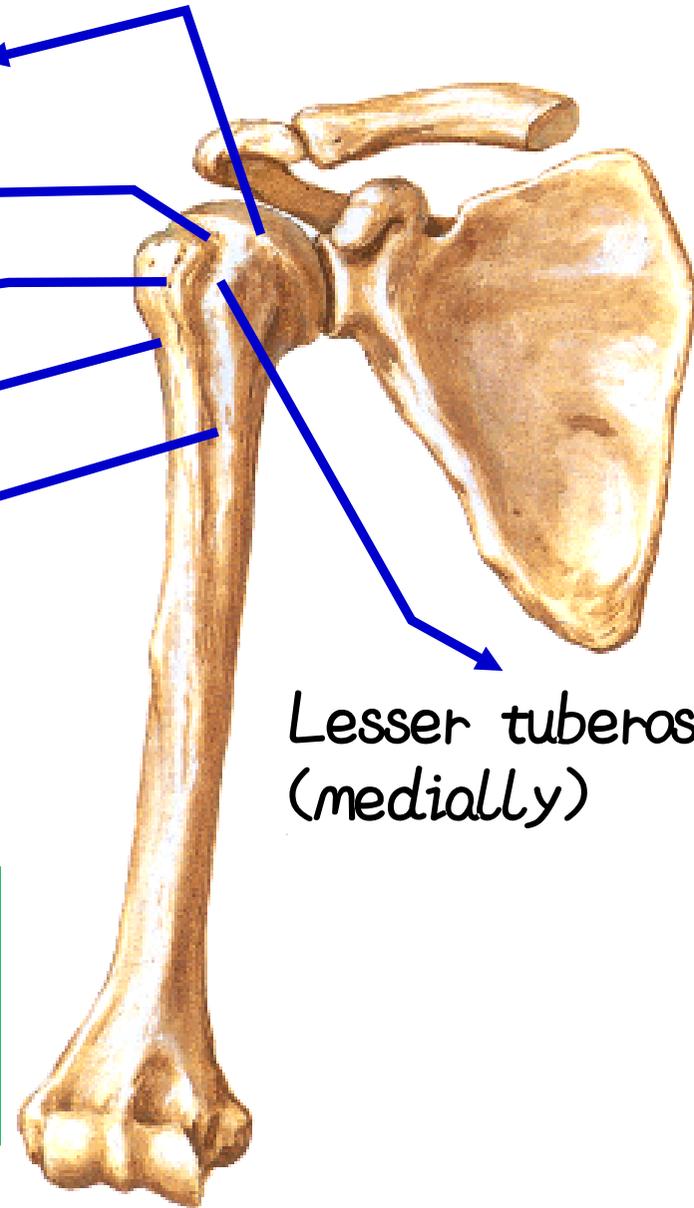
Greater tuberosity

Surgical neck

Bicipital groove  
(Intertubercular groove)

Lesser tuberosity  
(medially)

- Anatomical neck: constriction just beyond the head
- Surgical neck: constriction just below the head and two tuberosities

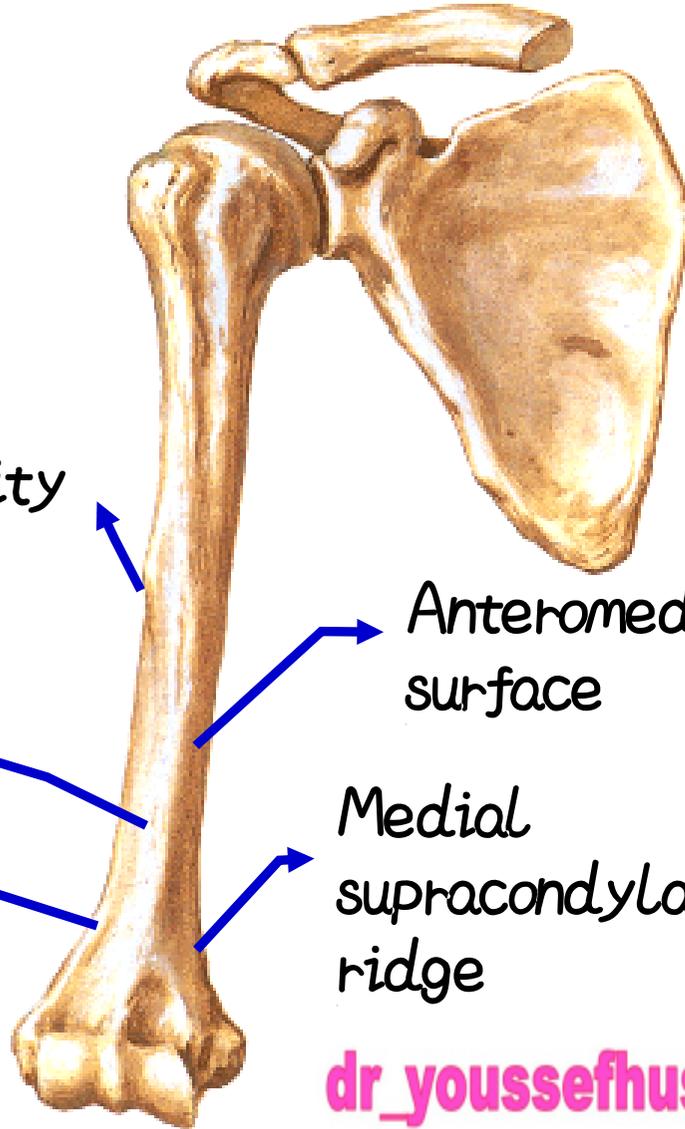


Anterior

Deltoid tuberosity

Anterolateral surface

Lateral supracondylar ridge



Anteromedial surface

Medial supracondylar ridge

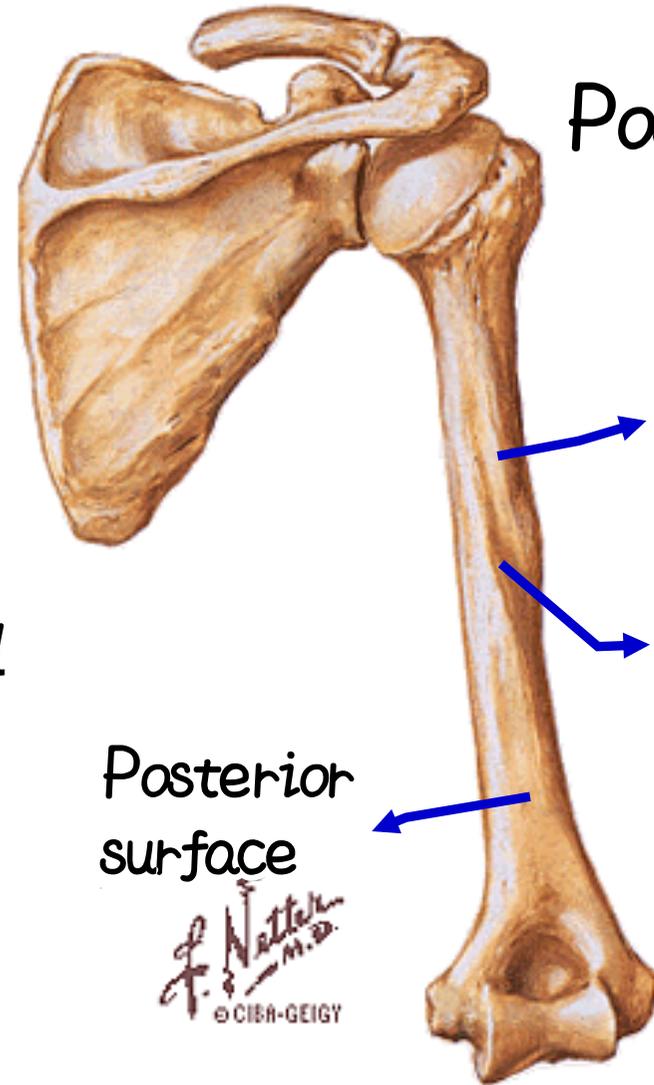
Posterior

Oblique ridge

Spiral groove

Posterior surface

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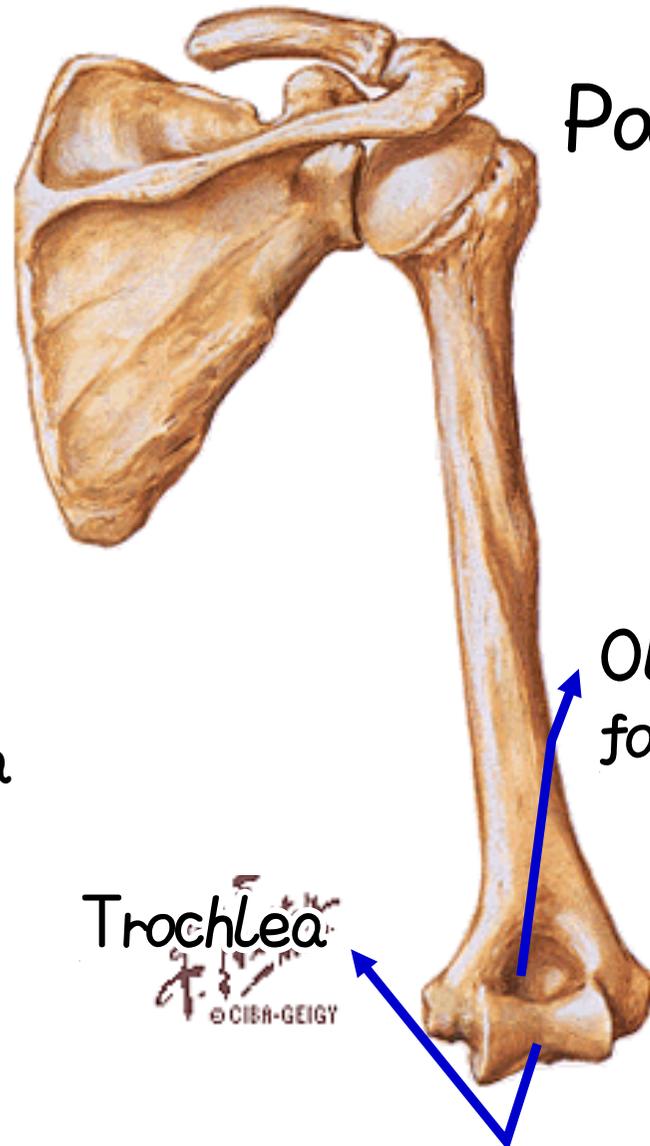
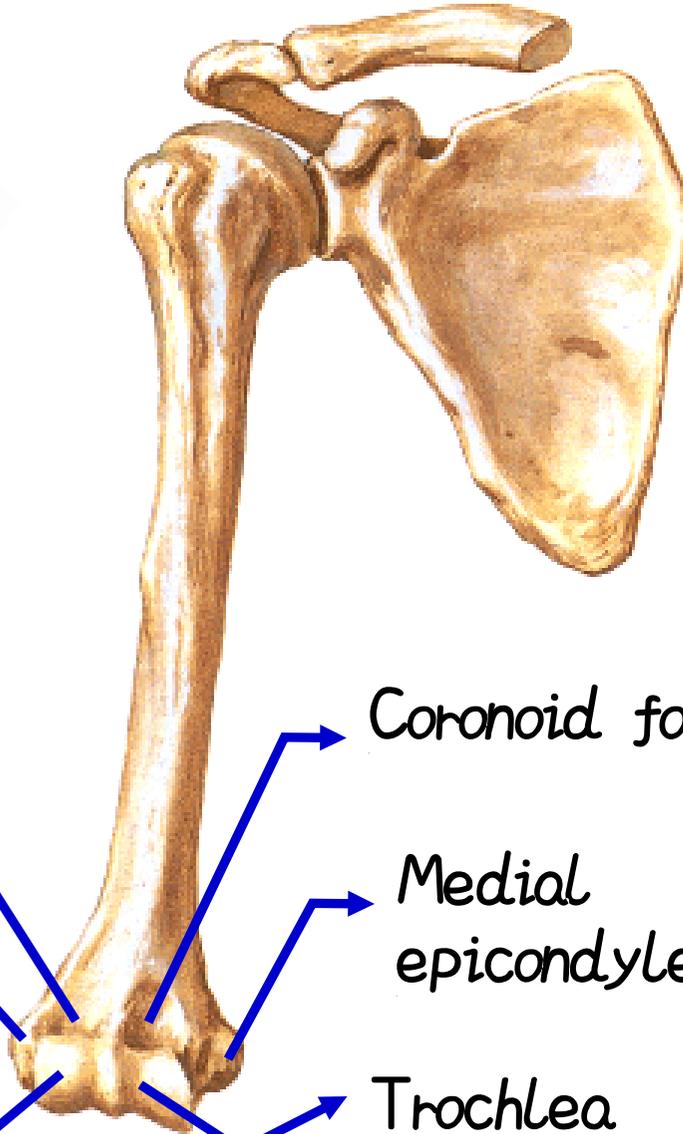


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Anterior

Posterior

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Radial fossa

Coronoid fossa

Olecranon fossa

Lateral epicondyle

Medial epicondyle

Trochlea

Capitulum

Trochlea

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## ❖ Shaft

– The shaft has 3 borders and 3 surfaces.

a) **Anterior border**; which is continuous above with the lateral lip of the bicipital groove.

b) **Medial border**: which is continuous above with the medial lip of the bicipital groove.

– Its lower part is sharp and forms the **medial supracondylar ridge**.

c) **Lateral border**: which is ill-defined superiorly.

– In the middle of the shaft it is cut by the spiral (radial) groove.

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– The lower part of this border is sharp and forms the **lateral supracondylar ridge**.

\*\* The surfaces are:

a) **Anteromedial surface**: Superiorly it becomes narrowed to form the floor of the bicipital groove.

b) **Anterolateral surface**, Just above the middle of the shaft, it carries **deltoid tuberosity**.

c) **Posterior surface**: The **spiral groove** begins slightly above its middle and extends obliquely downwards, laterally and forwards across the lateral border to the anterolateral surface.

– This surface may show an **oblique rough strip** above the spiral groove.

## ❖ Lower end

- It is formed of articular and non articular parts:

### A- Articular Parts:

1- Trochlea, is the *medial* position. It is a pulley **بكرة** shaped surface.

2- Capitulum is the *lateral* in position.

### B- Non-articular part:

1- Medial epicondyle, projects more than the lateral epicondyle.

2- Lateral epicondyle.

3- Coronid fossa, a small depression above the trochlea anterior.

4- Olecranon fossa, well defined depression above the trochlea posteriorly.

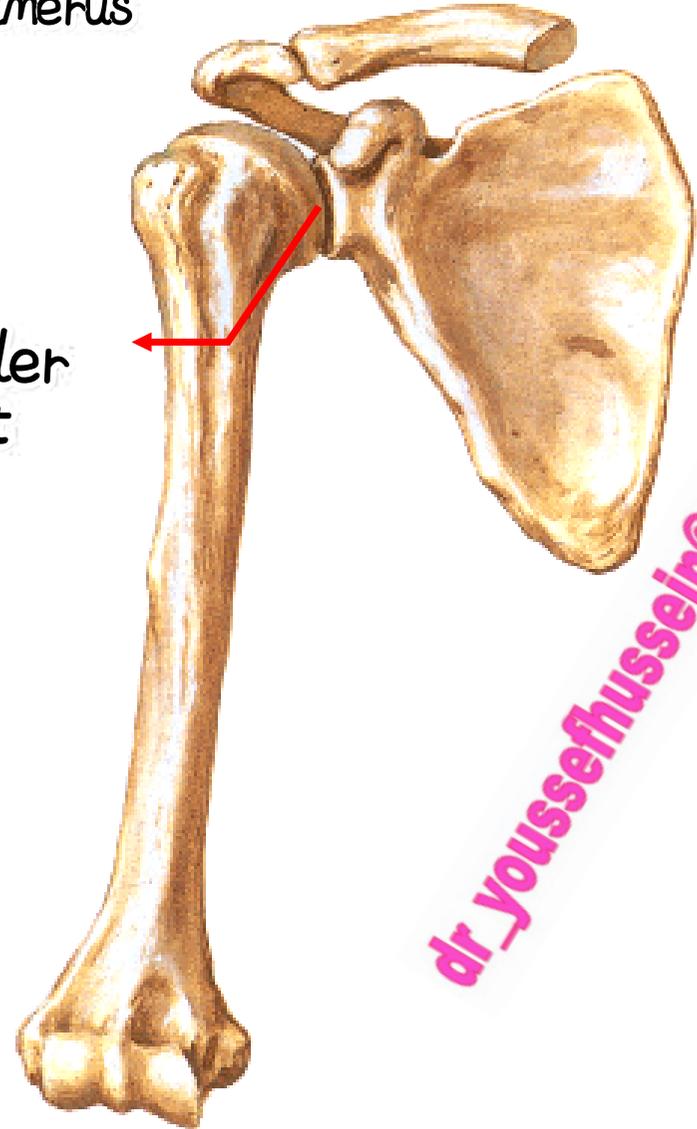
5- Radial fossa, a depression above the capitulum anteriorly.

# Joints related to Humerus

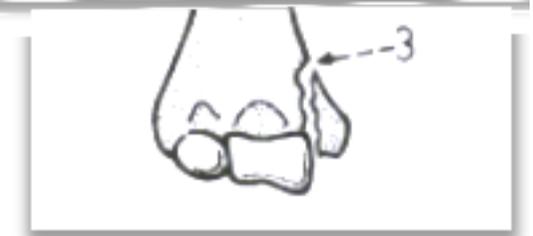
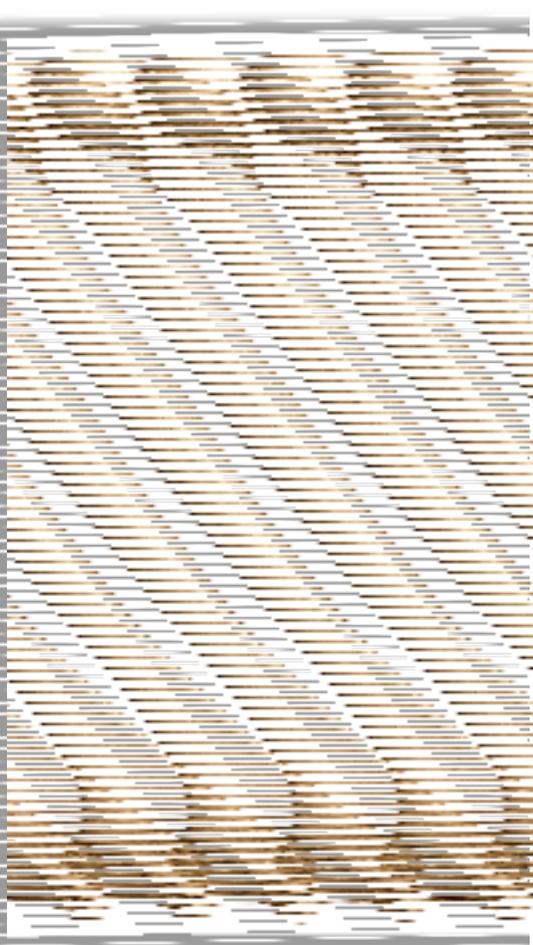


Shoulder joint

Elbow joint



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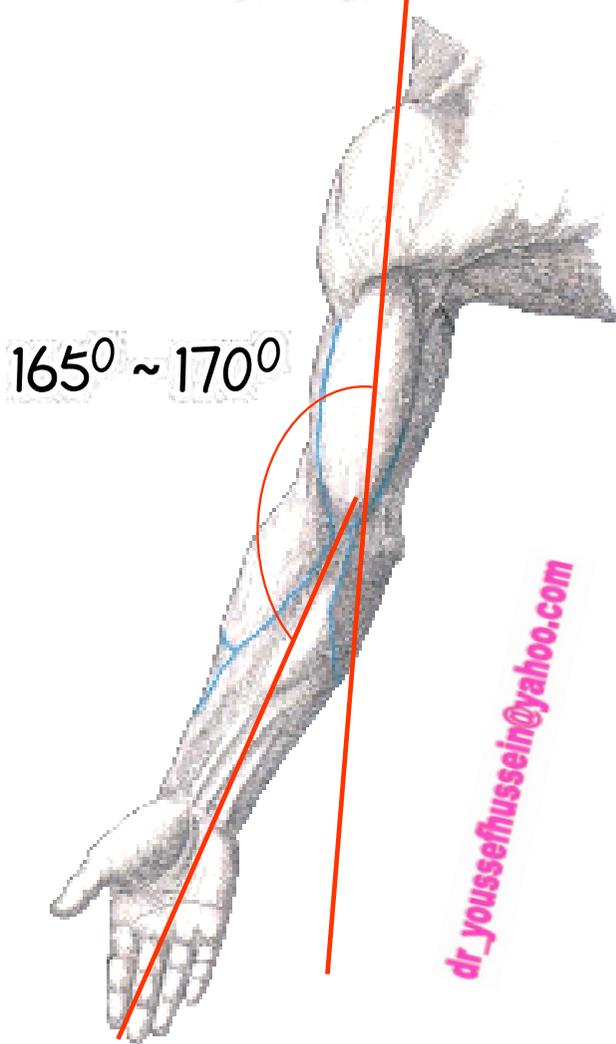


- Axillary nerve and posterior circumflex humeral vessels behind the surgical neck, anterior circumflex humeral vessels in front the surgical neck.
- Radial nerve accompanied by profunda brachii vessels in the spiral groove.
- Ulnar nerve, superior ulnar collateral behind the medial epicondyle.

Nerves and vessels related to Humerus

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## Carrying angle



## \*\* Carrying angle

- It is the angle between the long axis of arm and long axis of **extended supinated forearm**.
- It is opened **laterally** and measure about 165 - 170 degree.
- It is **more in female** than male.
- It **disappears in pronation** of the extended forearm.
- It is caused by
  - 1) Projection of the medial edge of the **trochlea** more than the lateral.
  - 2) Obliquely of the upper articular surface of the **coronoid** process of ulna



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