

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

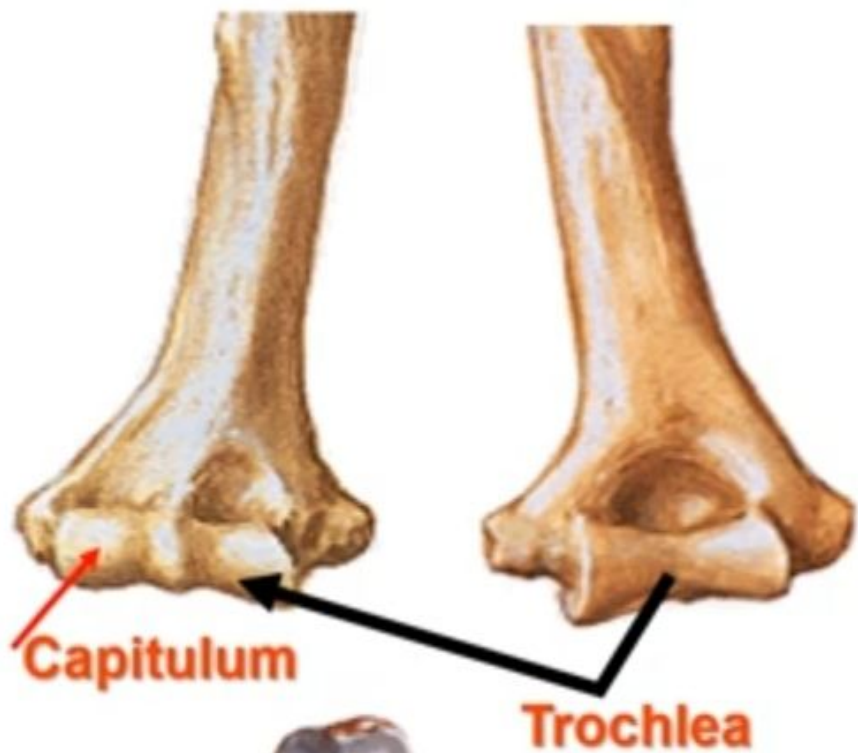
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دكتورة من جامعة كولونيا المانيا

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❖ **Types: Synovial hinge joint (uniaxial)**

❖ **Articular surfaces of elbow joint;**

a- Proximal; trochlea and capitulum of the humerus.

b- Distal; Trochlear notch of ulna.

- Superior surface of head of radius.

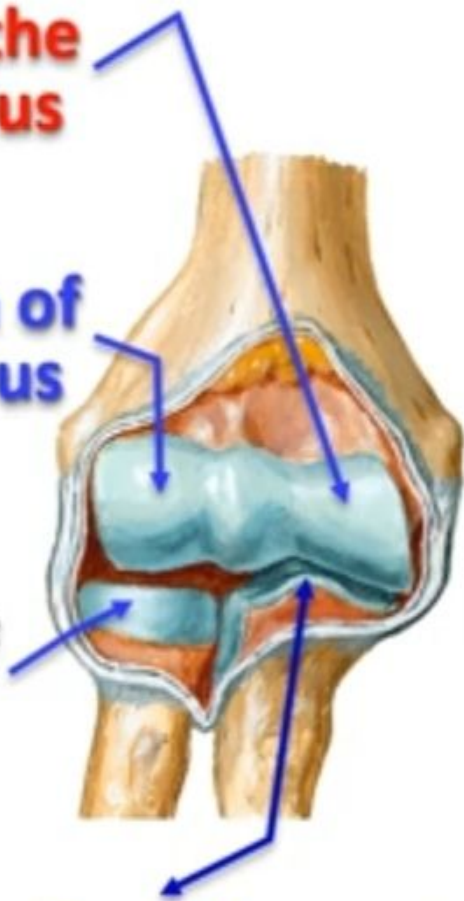


Trochlea of the humerus

Capitulum of the humerus

Head of radius

Trochlear notch of the ulna

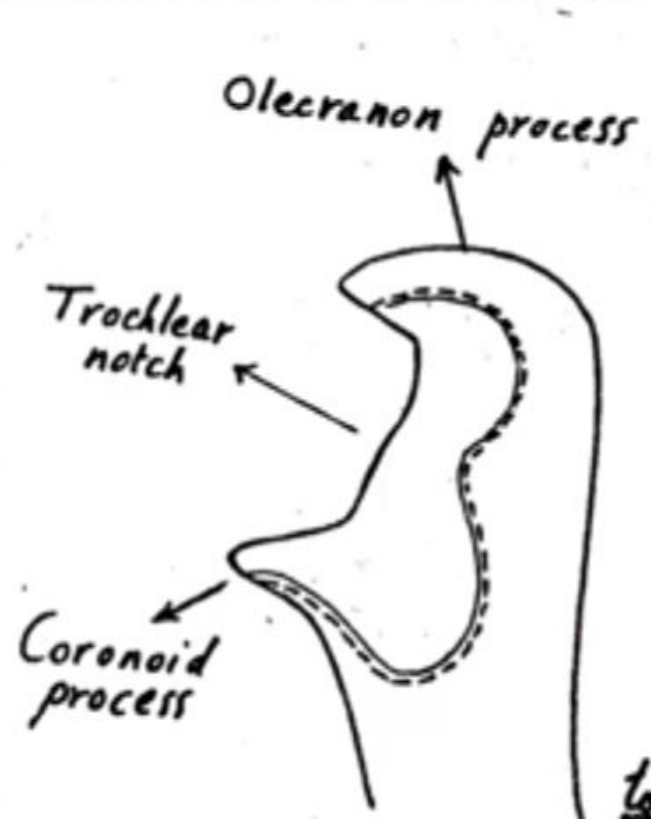


❖ It actually includes two articulations

(a) Humeroulnar articulation, between trochlea of humerus and trochlear notch of ulna

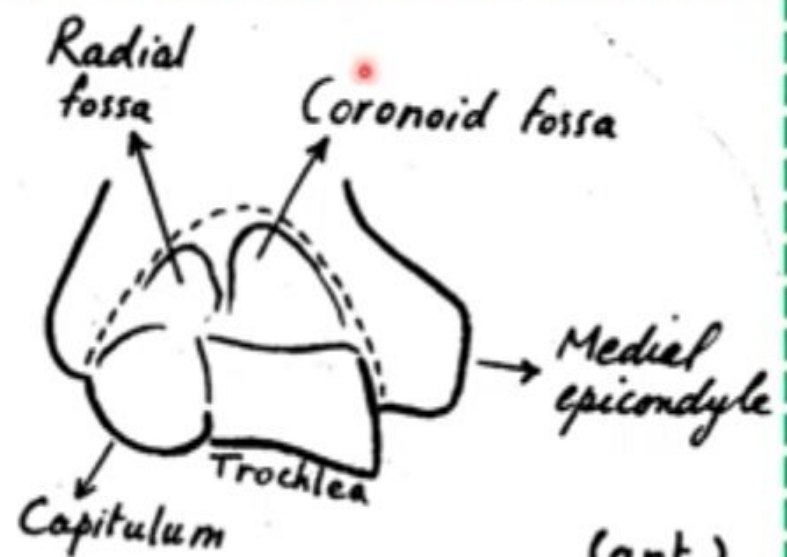
(b) Humeroradial articulation, between capitulum of humerus and Superior surface of head of radius



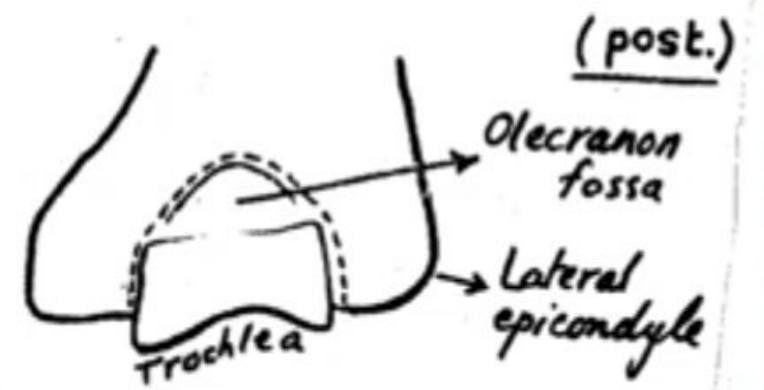


Annular ligament around head of radius

❖ Capsule of the elbow joint



Attachment of Capsule to Humerus (ant.)



(post.)



❖ Attachment of the capsule

a- Superiorly: it is attached to

- **Anteriorly**; to the margin of the coronoid and radial fossae.
- **Posteriorly**; to the margin of the olecranon fossa.
- **Medially**, to the margin of the trochlea.
- **Laterally**, to the margin of the capitulum.

b- Inferiorly: It is attached to;

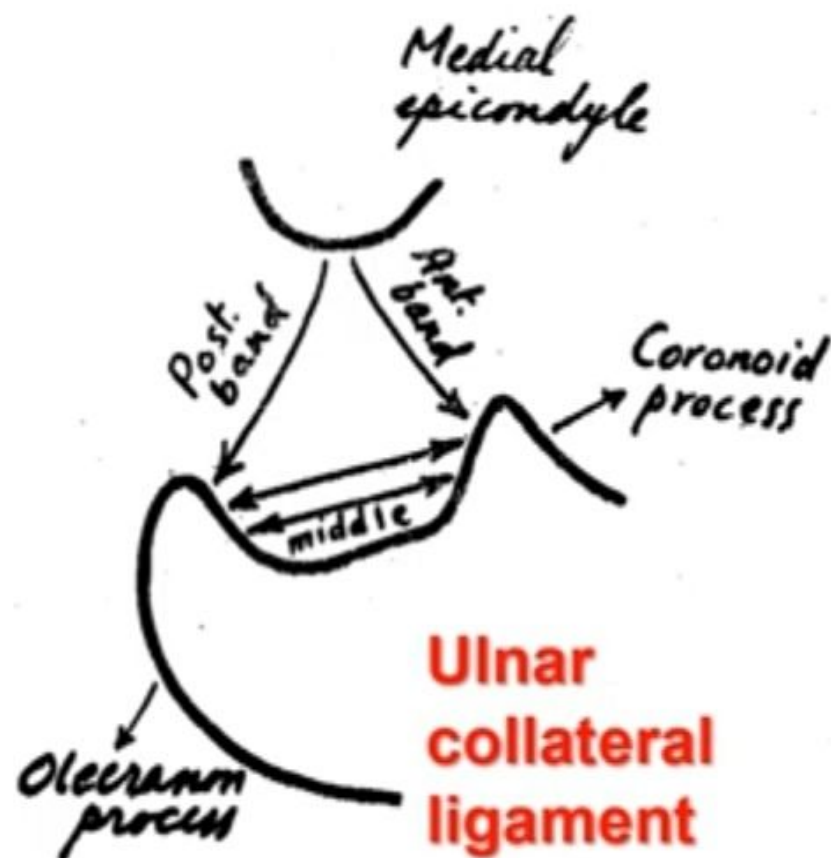
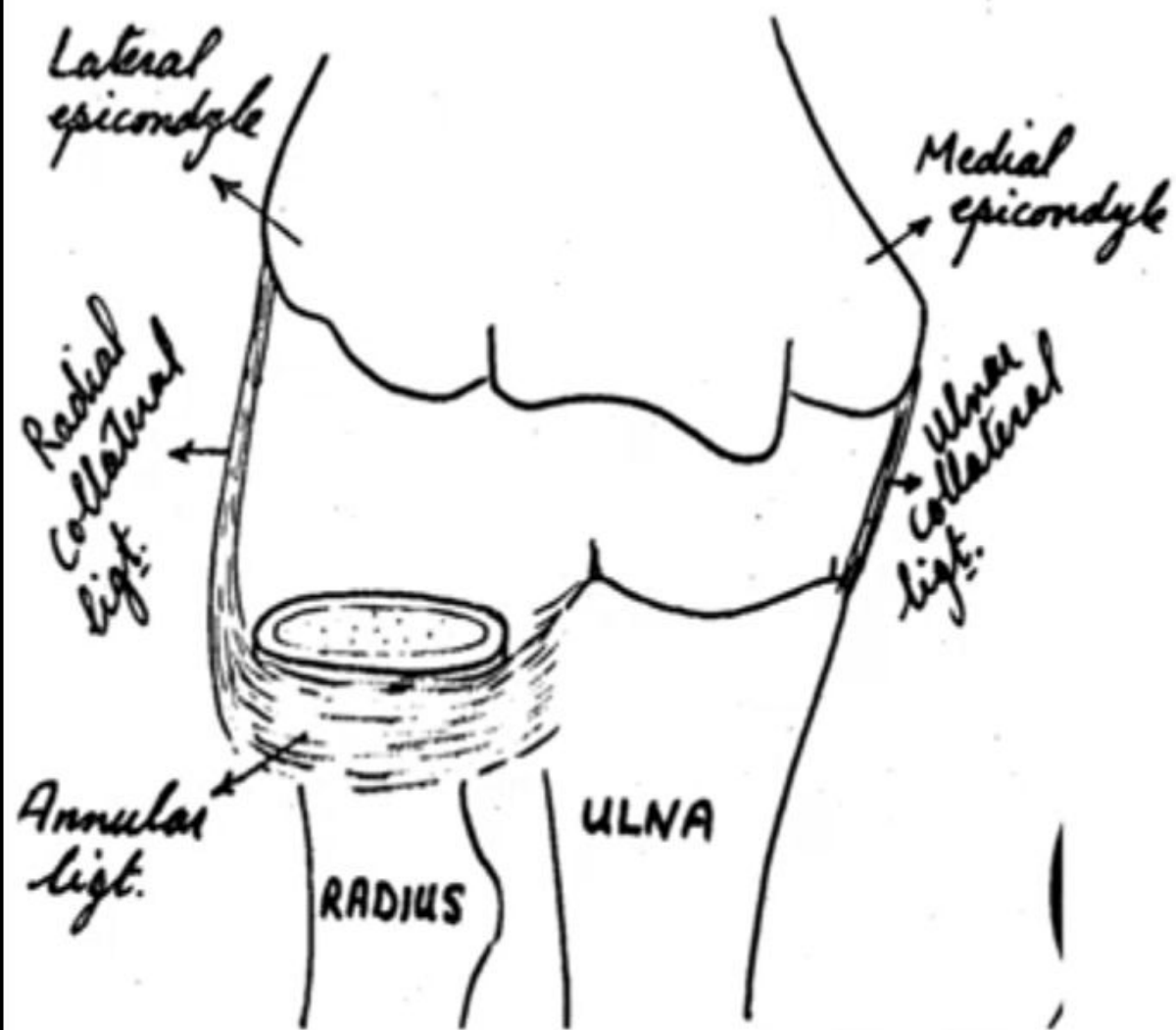
- **Anteriorly**, to the margins of the coronoid process and annular ligament.
- **Posteriorly**, to the margins of the olecranon process.

** **Synovial membrane**: lines **inner surface** of the capsule and **non-articular** parts.

- **Inferiorly**, it is Continuous with the synovial membrane of the **superior** joint.



Ligaments of Elbow joint



❖ Ligaments of the elbow

1) **Radial collateral (lateral) ligament:** a strong band between the lateral epicondyle of the humerus and upper border of the annular ligament.

2) **Ulnar collateral (Medial) ligament:** a thick triangular ligament and formed of 3 bands

a- **Anterior band:** between the medial epicondyle and medial border of the **coronoid** process.

b- **Posterior band:** between the medial epicondyle and the medial border of the **olecranon** process.

c- **Middle band:** **between** the medial borders of the coronoid and olecranon processes.

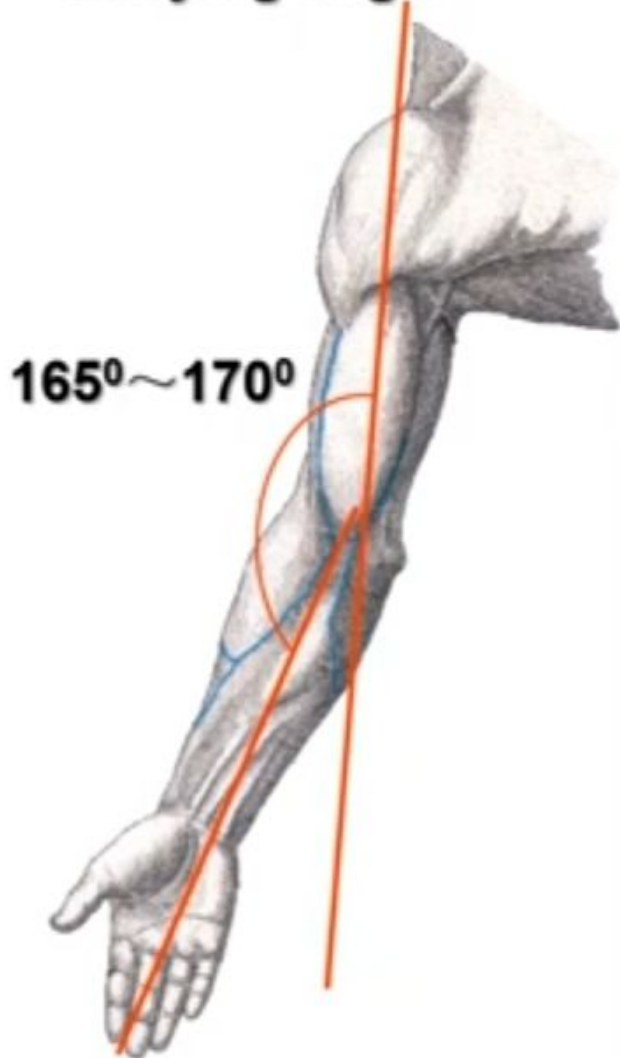


❖ Movements

- 1) Flexion:** by brachialis (mainly), biceps brachii
 - Flexion at the mid prone position by brachioradialis .
 - **Normal elbow flexion** is 20° to 30° .
 - Full **flexion** places the proximal forearm against the distal biceps brachii
- 2) Extension:** by triceps and anconeus.



Carrying angle

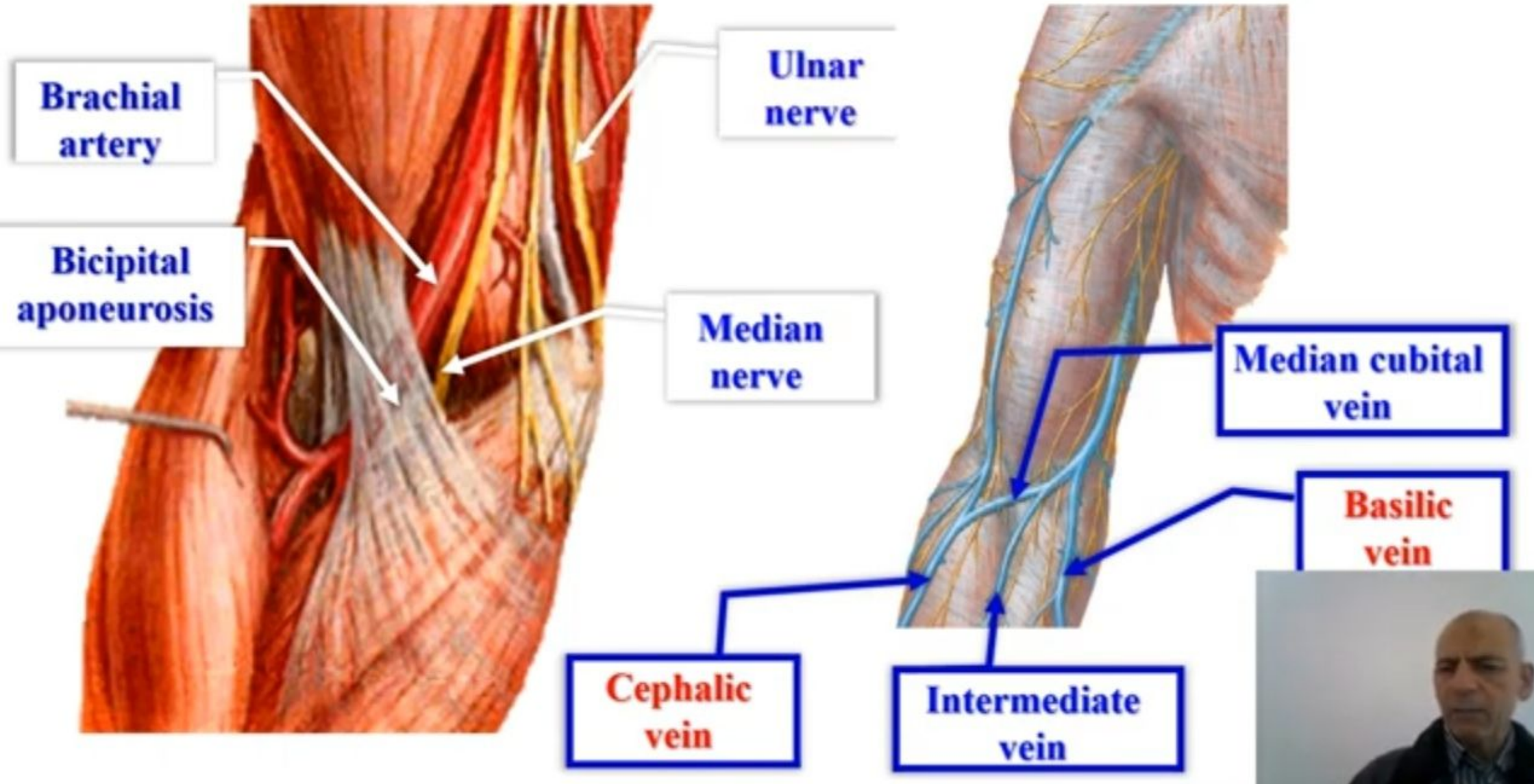


** Carrying angle

- 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



Relations of elbow joint

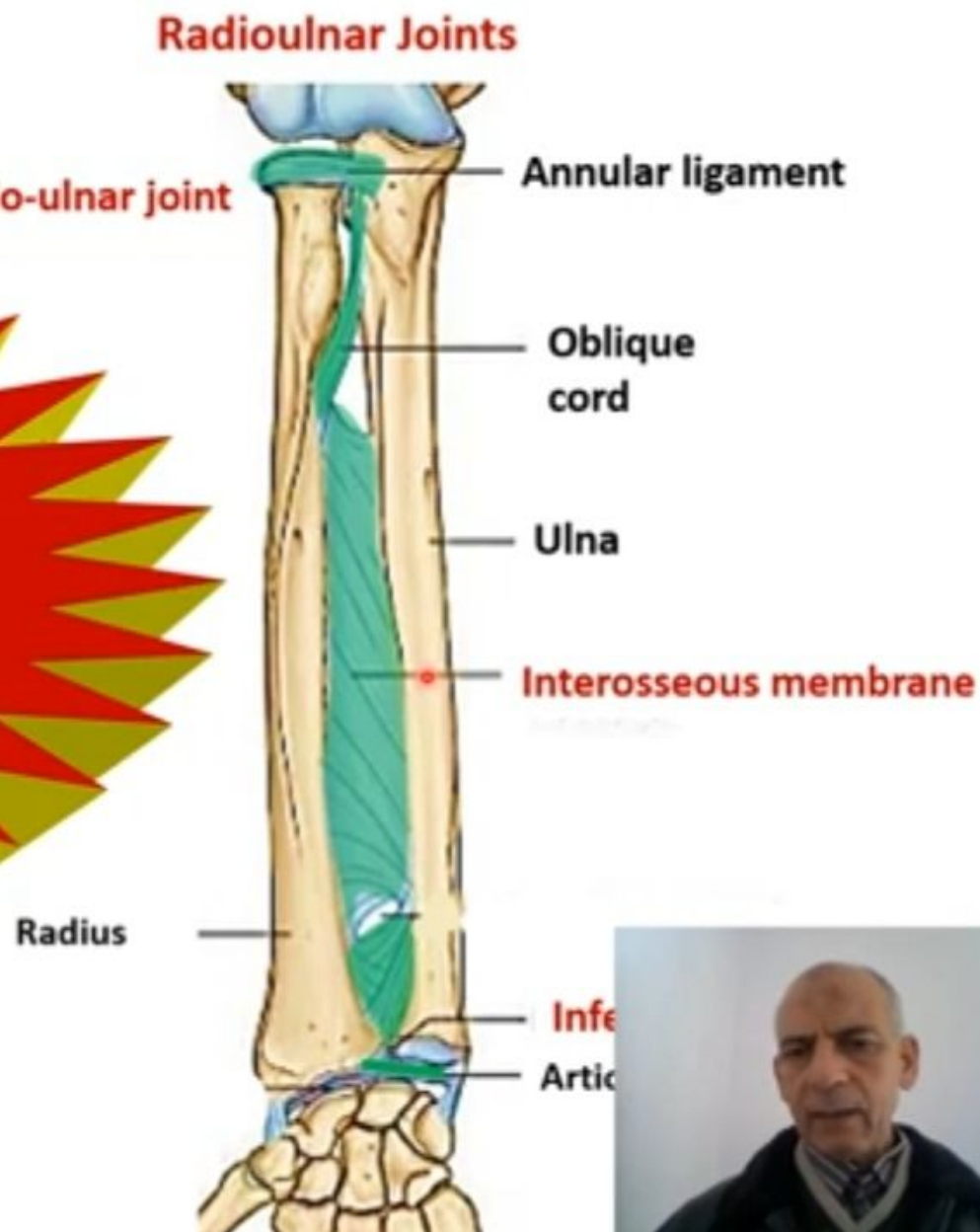


❖ Relations of the elbow joint

- 1- **Cephalic vein** (anterolaterally) الوريد الرأسي
- 2- **Basilic vein** (anteromedially) الوريد الملکی
- 3- **Median cubital vein (Infront)** directs upward from cephalic vein to the basilic vein
- 4- **Intermediate vein (Infront)** ends in the median cubital vein. But, commonly it divides into **lateral** branch to the cephalic vein and **medial** branch to the basilic vein.
- 5- Brachialis muscle and **Bicipital aponeurosis (Infront)** separates median cubital vein from brachial artery and median nerve
- 6- **Brachial artery (Infront)** passes from medial side of brachialis muscle to the cubital fossa
- 7- **Median nerve (Infront)** passes deep to bicipital aponeurosis.
- 8- **Ulnar nerve** descends to the **back of the medial epicondyle** of the humerus (**dangerous position**).
- 9- **Posteriorly:** triceps and anconeus.



Radioulnar Joints



- **Superior Radioulnar Joint**

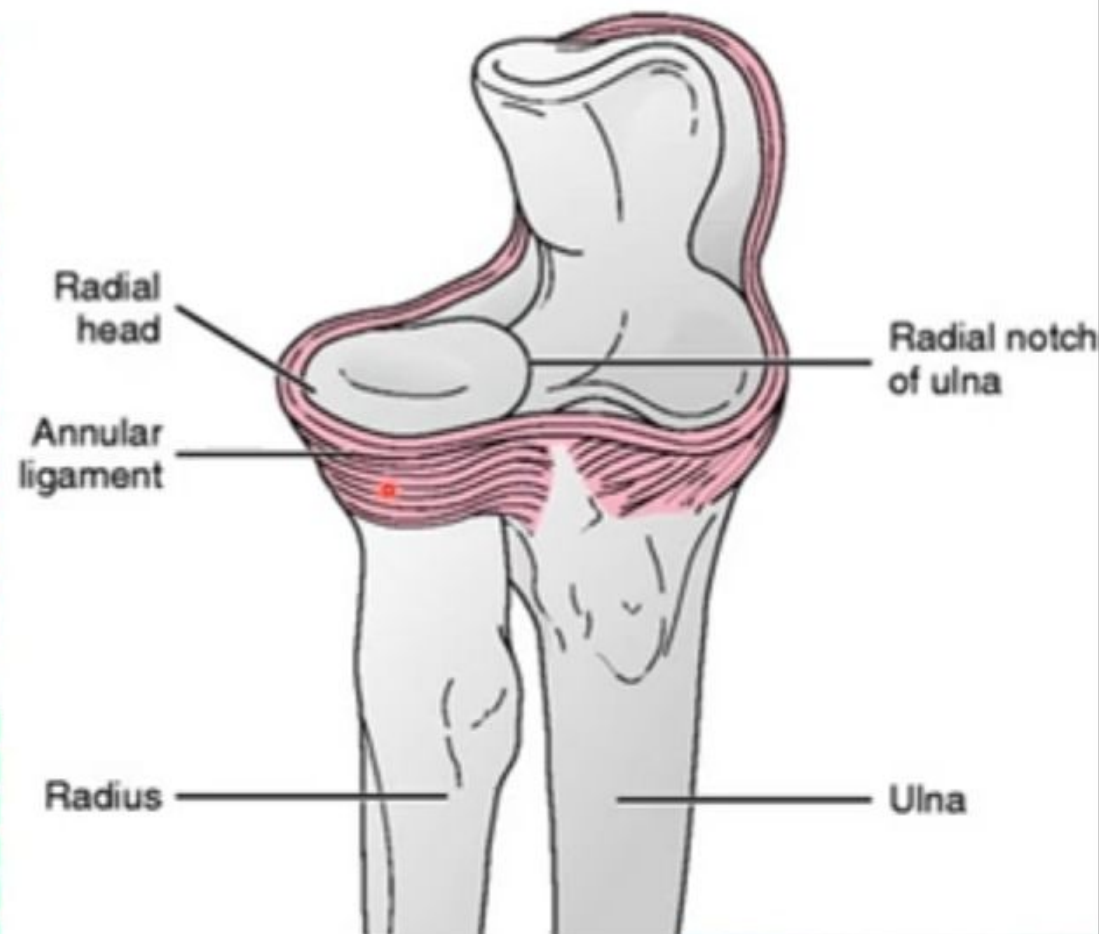
- ** **Type;** a pivot (uniaxial) synovial joint.

- ** **Articular surfaces:**

- 1- Articular circumference of the head of the radius.
- 2- Radial notch of the ulna and annular ligament.

- **Annular ligament:**

- It is a strong fibrous band surrounding the head of the radius.
- It is attached to the margins of radial notch of the ulna.



Synovial membrane: lines capsule and Continuous membrane of elbow joint.



• Inferior Radioulnar Joint

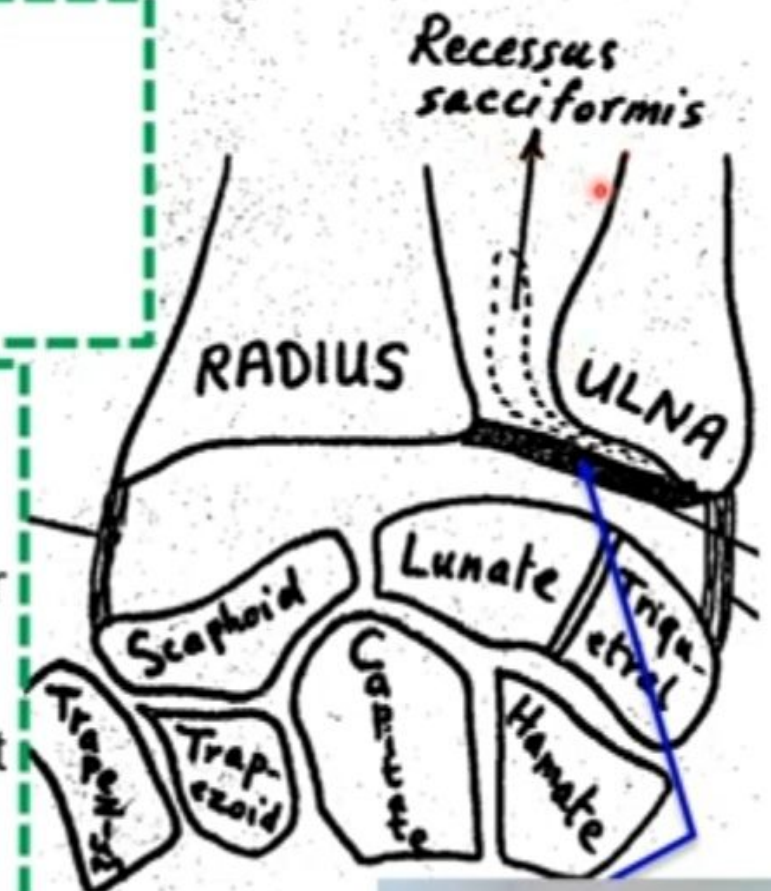
** **Type**; a pivot (uniaxial) synovial joint.

** **Articular surfaces**; head of ulna
- Ulnar notch of radius.

** **Articular disc**; is a triangular fibrocartilage.

- Its **apex** attached to base of styloid process of ulna.
- The **base** is attached the inferior margin of the ulnar notch of the radius.
- The disc separates the inferior radioulnar joint above from wrist joint below.

** **Synovial membrane**, projects upwards forming recessus sacciformis in front the interosseus membrane.



Artic



- **Movements of superior and inferior radioulnar joints**

Palm anterior

Palm posterior

- **Pronation and Supination**

- **Definition:**

- **Pronation:** **medial** rotation of the forearm and the palm of the hand faces **posteriorly**.

- **Supination:** **lateral** rotation of the forearm and the palm of the hand faces **anteriorly**.

- **Joints:** superior and inferior radioulnar joints.

Supination

Pronation



- **Pronation**

a- It is initiated by **brachioradialis**.

b- It is completed by:

- **Pronator teres** and **Pronator quadratus**.

Brachioradialis



Pronation



X shape



Pronator Teres

Pronator quadratus



- **Supination**

a- It is initiated by brachioradialis.

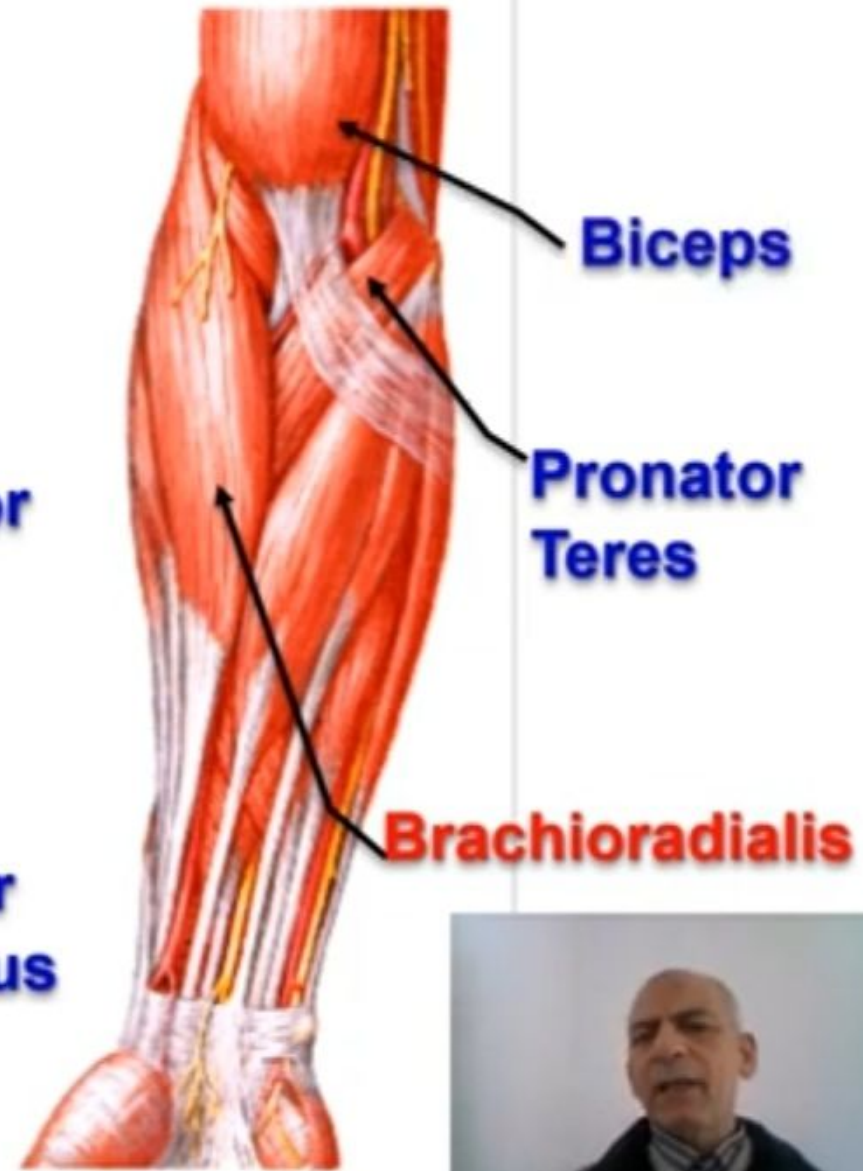
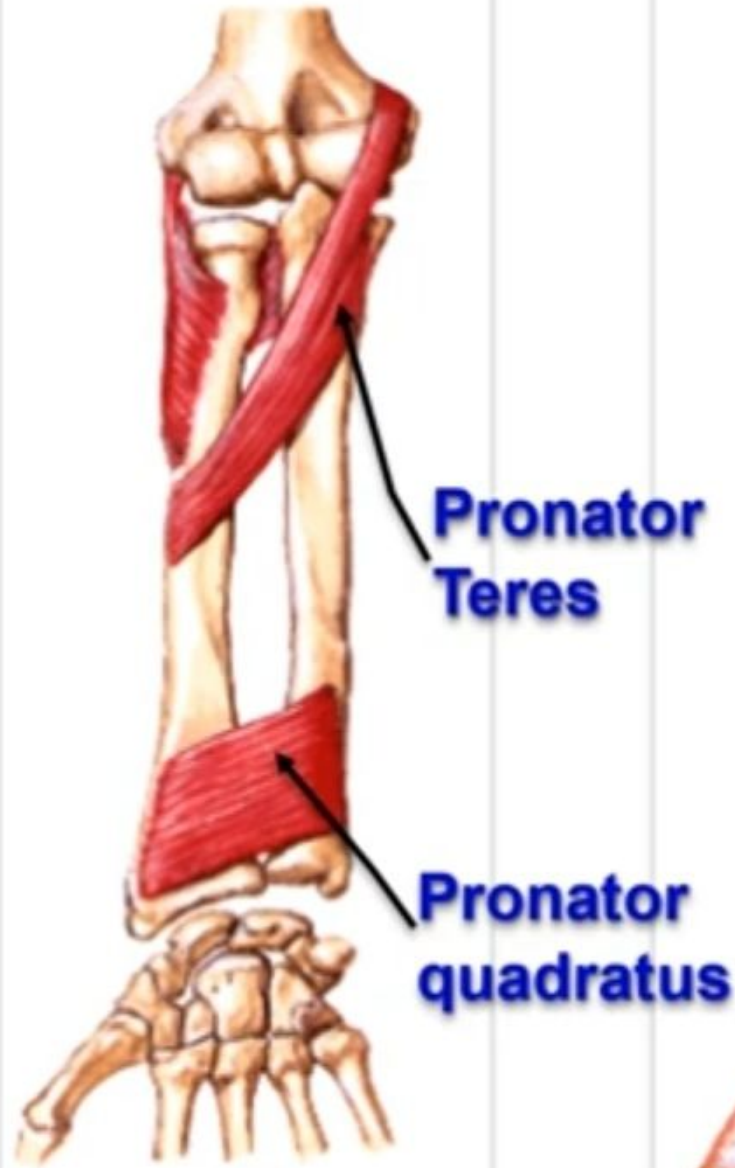
b- It is completed by

- **Supinator** during **extension** of elbow joint.
- **Biceps brachii** during **flexion** of elbow joint.
- Radius is parallel to ulna

- **N.B Supination** is more **powerful** than pronation. Because, in usual working position with elbow flexed (e.g. Turning screwdriver).
- In a semiflexed elbow: palm is turned upwards in supination and downward in pronation (**king pronates and beggar supinates**)

Supination





Radioulnar Joints

• Middle Radioulnar Joint

** Type; fibrous joint (No movements). It is formed by

1- **Oblique cord**: is a fibrous band extending from ulnar tuberosity to shaft of radius below the radial tuberosity.

2- **Interosseous membrane**: thin sheet of fibrous tissue between interosseous borders of the radius and ulna.

- **Directions of fibres**, obliquely downwards and medially from the radius to the ulna.

- **Functions of interosseous membrane**:

1- It binds radius and ulna.

2- Breaks the shock transmitted from hand to radius.

3- It gives origin for the deep muscles of the forearm.

• **Openings**,

1- **Anterior interosseous artery** perforates membrane to the back of the forearm above the upper border of pronator quadratus.

2- **Posterior interosseous artery** passes in gap between the oblique cord and interosseous membrane to the back of the forearm.

