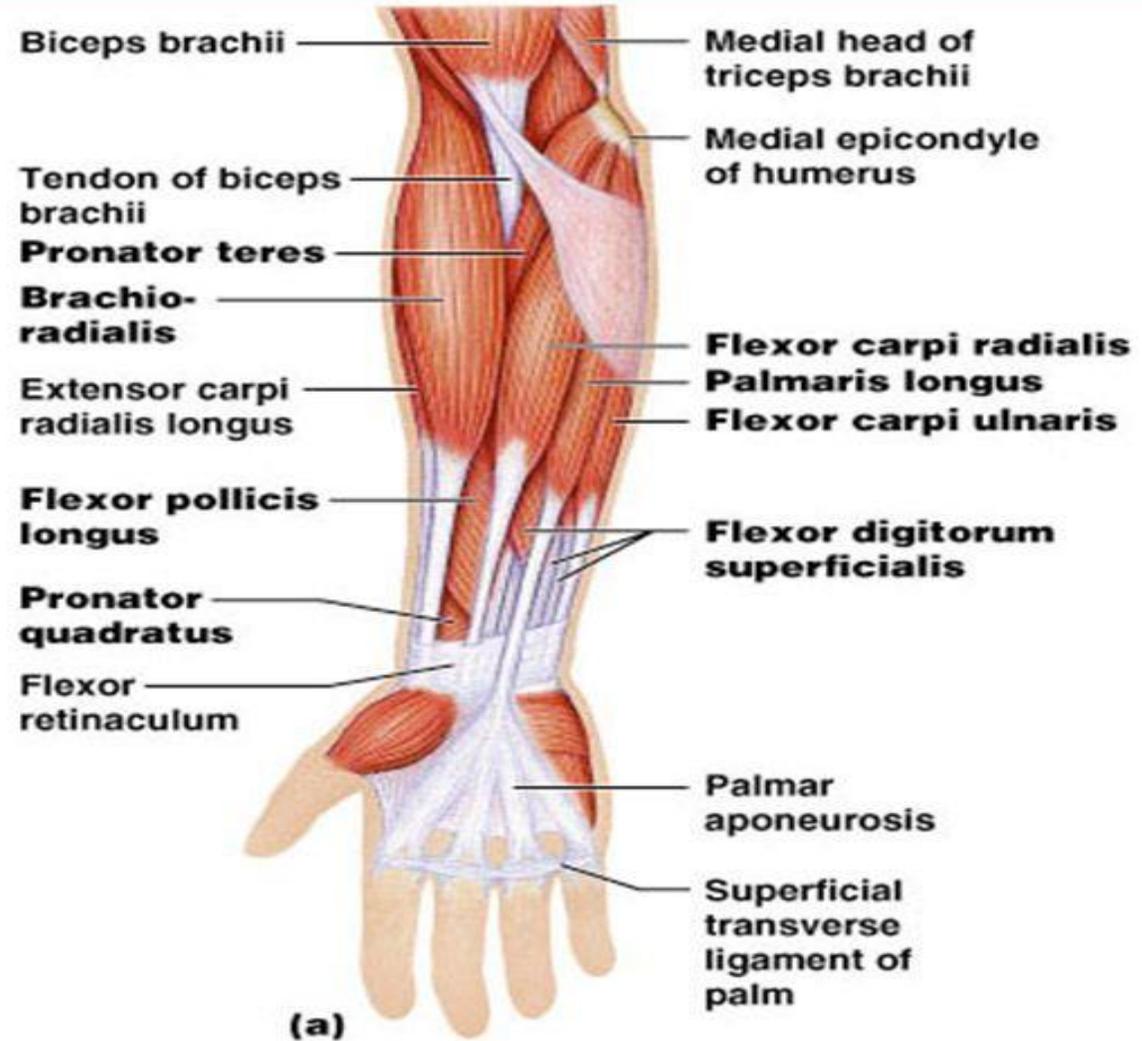


FRONT OF THE FOREARM

BY DR. DALIA M BIRAM

Muscles of the Forearm: Anterior Compartment

- These muscles are primarily flexors of the wrist and fingers

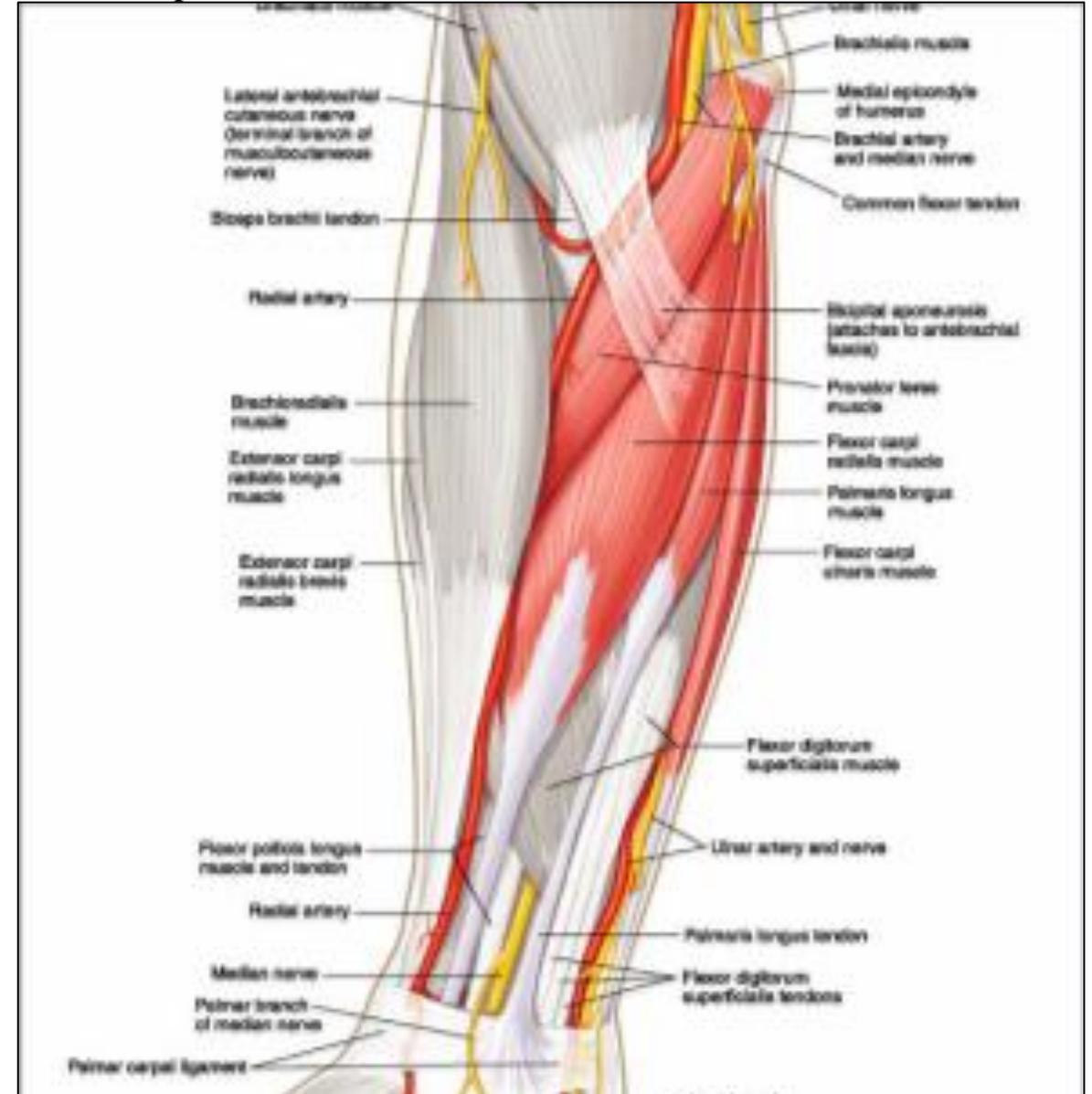


FLEXORS OF THE FOREARM

The muscles of the forearm are arranged into 2 groups; superficial and deep

I- Superficial group of flexors of forearm:

- They are 5 in numbers arranged from lateral to medial are:
 - **Pronator teres.**
 - **Flexor carpi radialis.**
 - **Palmaris longus.**
 - **Flexor carpi ulnaris.**
 - **Flexor digitorum superficialis**



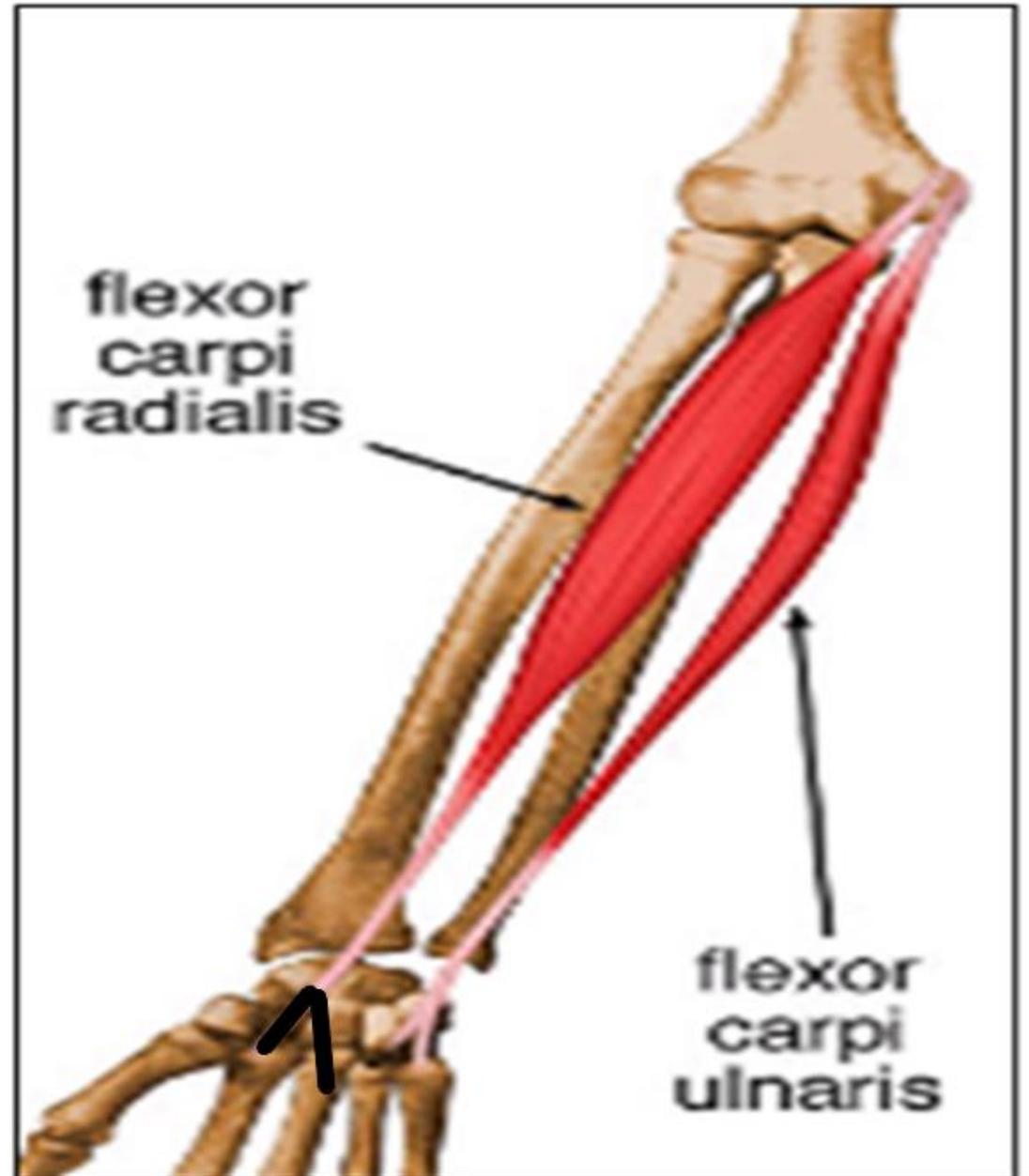
1- Pronator teres:

- **Origin:**
- **Superficial (humeral) head: common flexor origin (the front of medial epicondyle).**
- **Deep (ulnar) head: Medial border of coronoid process of ulna.**
- **Insertion:**
- **Into an impression on the middle of the lateral surface of shaft of radius.**
- **Nerve supply: Median nerve.**
- **Pronation of the forearm.**
- **Helps in flexion of the elbow.**



2- Flexor Carpi Radialis:

- **Origin:**
- **Common flexor origin.**
- **Insertion:**
- **Bases of palmar aspect of 2nd and 3rd metacarpal bones.**
- **Nerve supply:** Median nerve.
- **Actions:**
- **Flexion and abduction of the wrist.**
- **Flexion of forearm.**



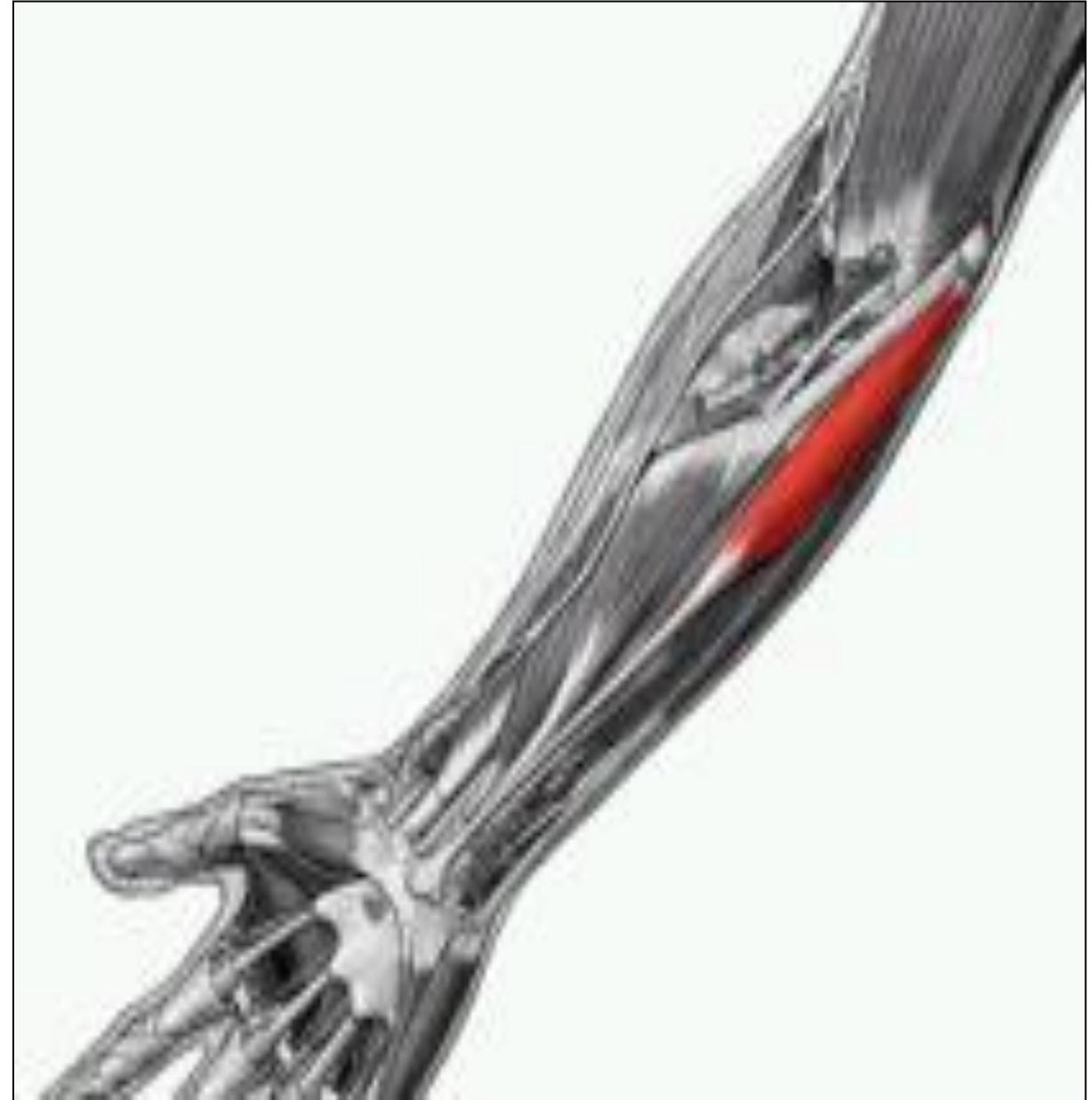
3- Palmaris longus (This muscle may be absent):

- **Origin:**
- **Common flexor origin.**
- **Insertion:**
- **Apex of palmar aponeurosis** which is a triangular thickening of deep fascia of the palm.
- **Nerve supply:** Median nerve.

Action:

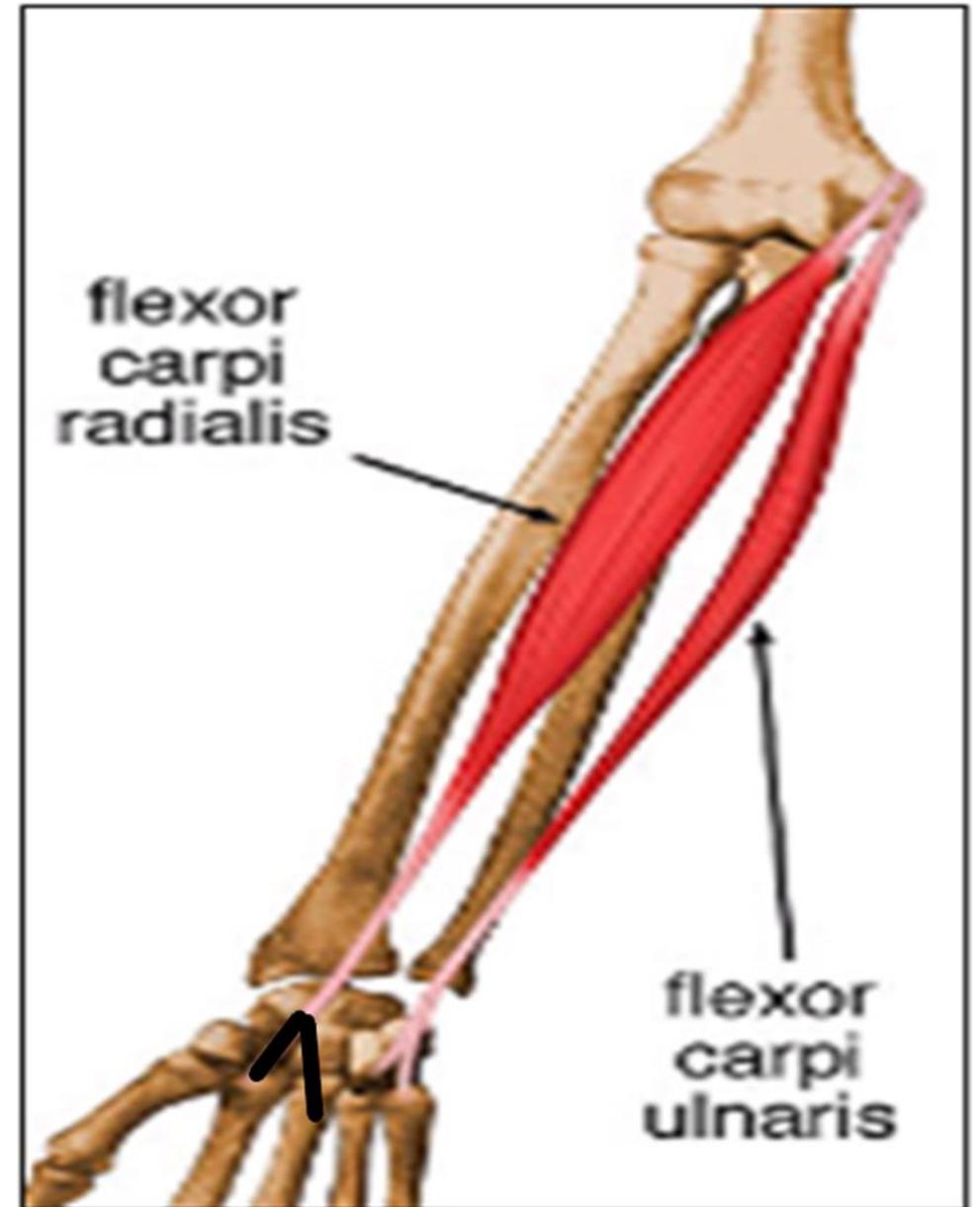
Flexion of wrist.

Tension of the palmar aponeurosis.



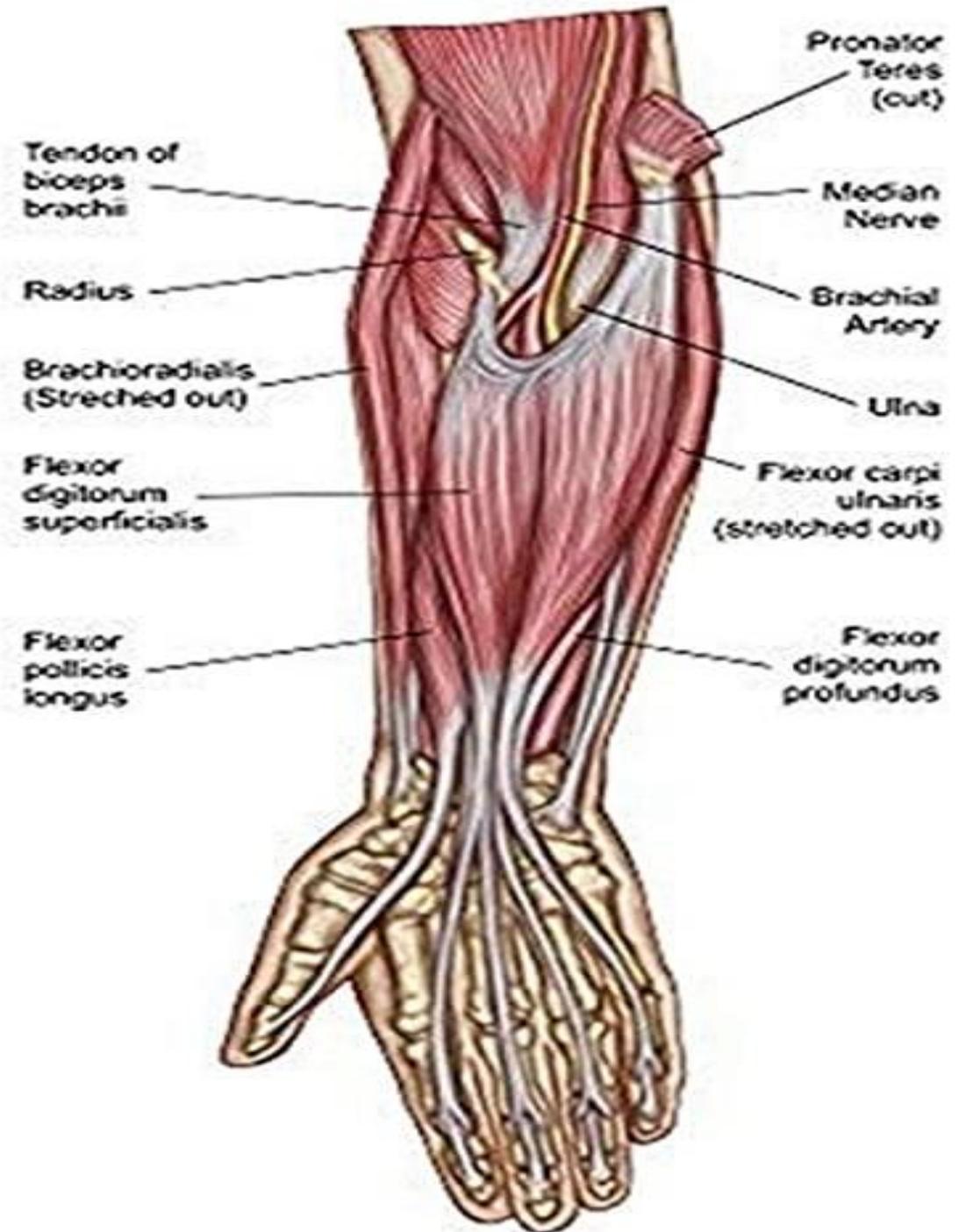
5- Flexor Carpi Ulnaris

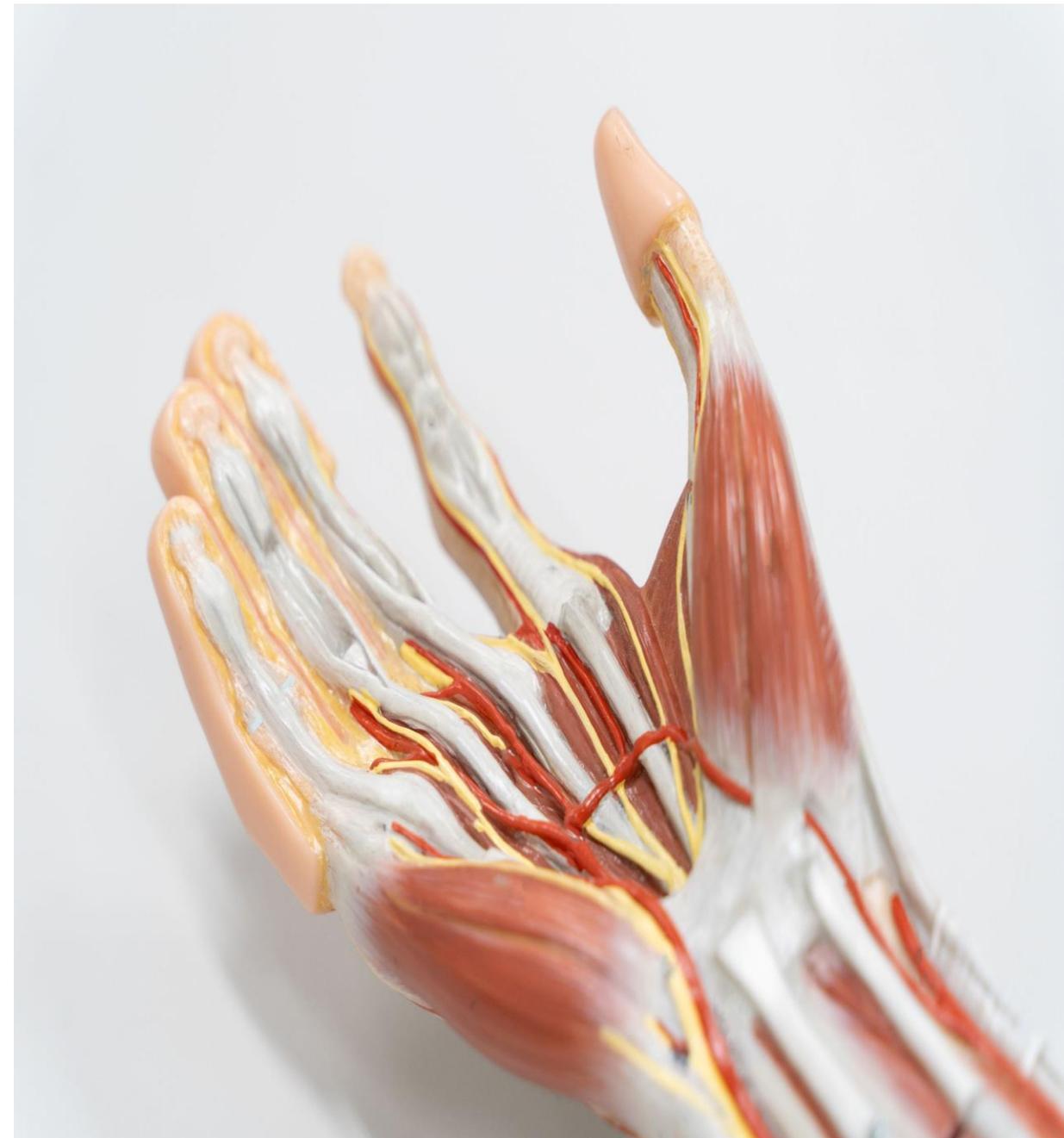
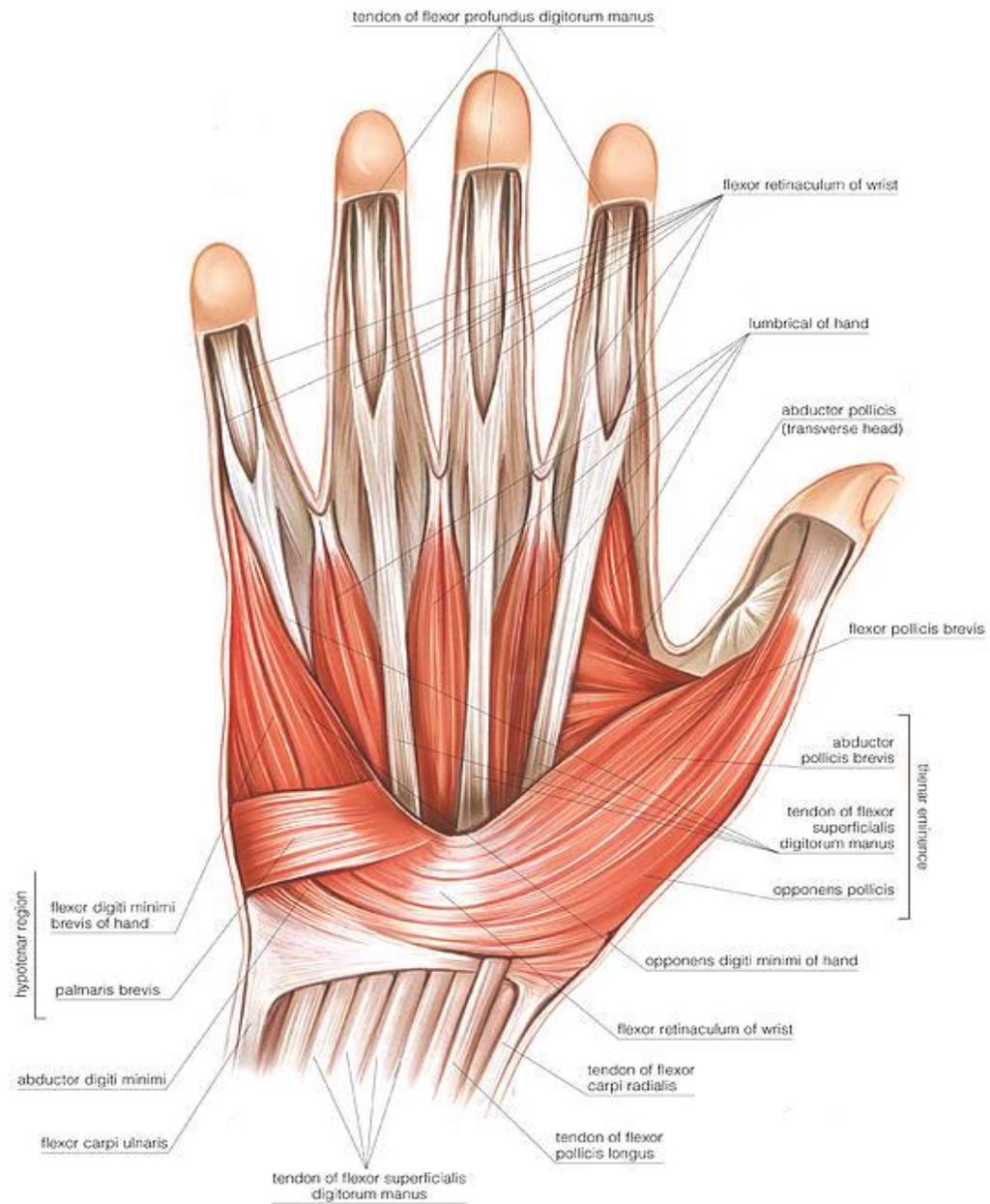
- **Origin:**
- Humeral head: from common flexor origin.
- Ulnar head: from medial border of olecranon process and posterior border of ulna.
- **Insertion:**
- Pisiform bone, pisohamate ligament (to hook of hamate), and pisometacarpal ligament (to base of 5th metacarpal bone).
- **Nerve supply:** Ulnar nerve.
- **Actions:**
- Flexion and adduction of wrist joint + Flexion of forearm



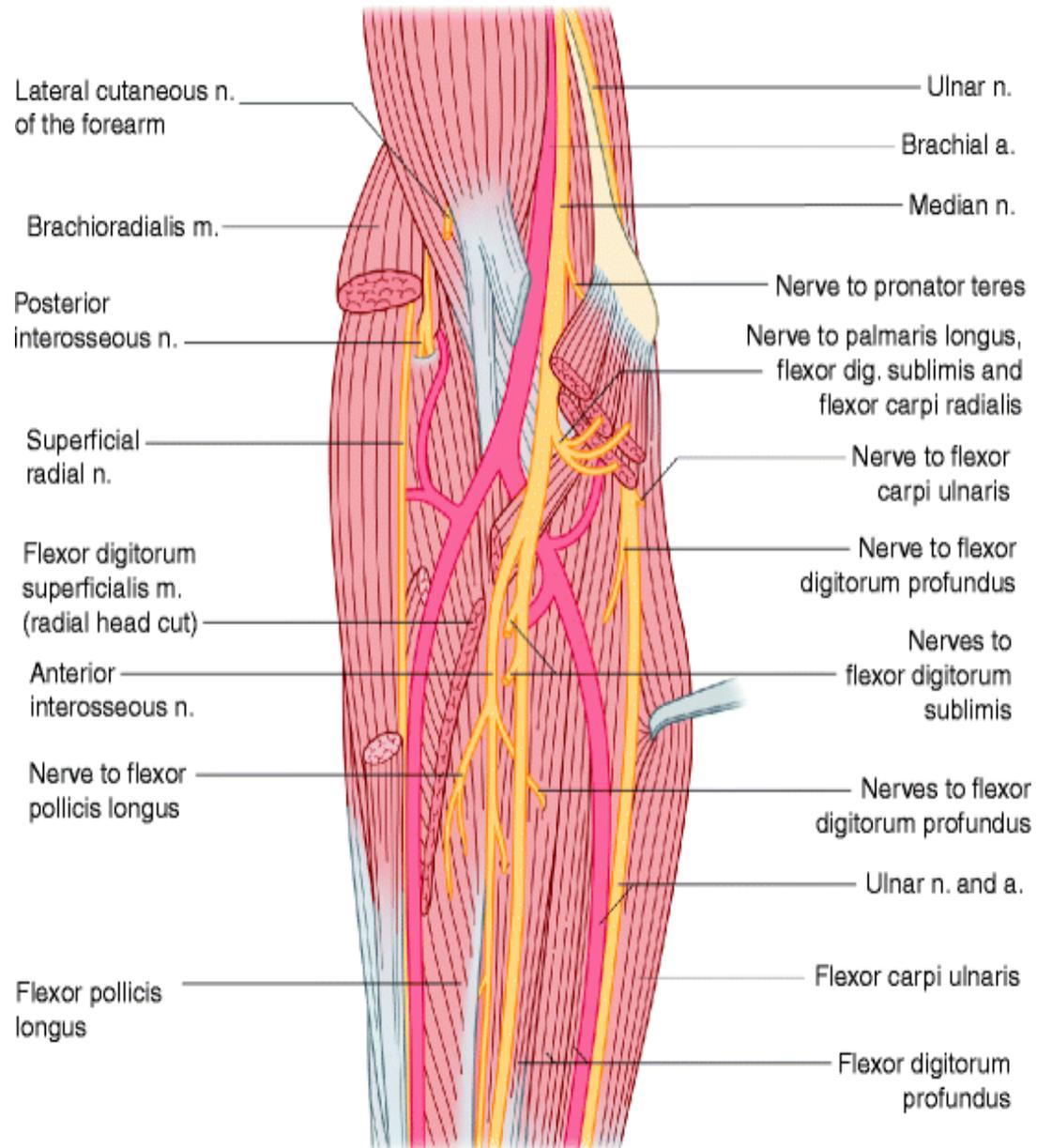
4- Flexor Digitorum Superficialis

- **Origin:**
- **Humeroulnar head: common flexor origin and medial border of coronoid process of ulna.**
- **Radial head: from the oblique line on front of shaft of radius.**
- **Insertion:**
- **By 4 tendons into the middle phalanges of the medial 4 fingers. On reaching the proximal phalanges, each tendon divides into two slips, and finally inserted into the sides of the middle phalanges. It gives passage for the flexor digitorum profundus tendon**
- **Nerve supply: Median nerve.**
- **Actions:**
- **Flexion of proximal interphalangeal and metacarpophalangeal joints of the medial 4 fingers + Flexion of the hand + Flexion of forearm**



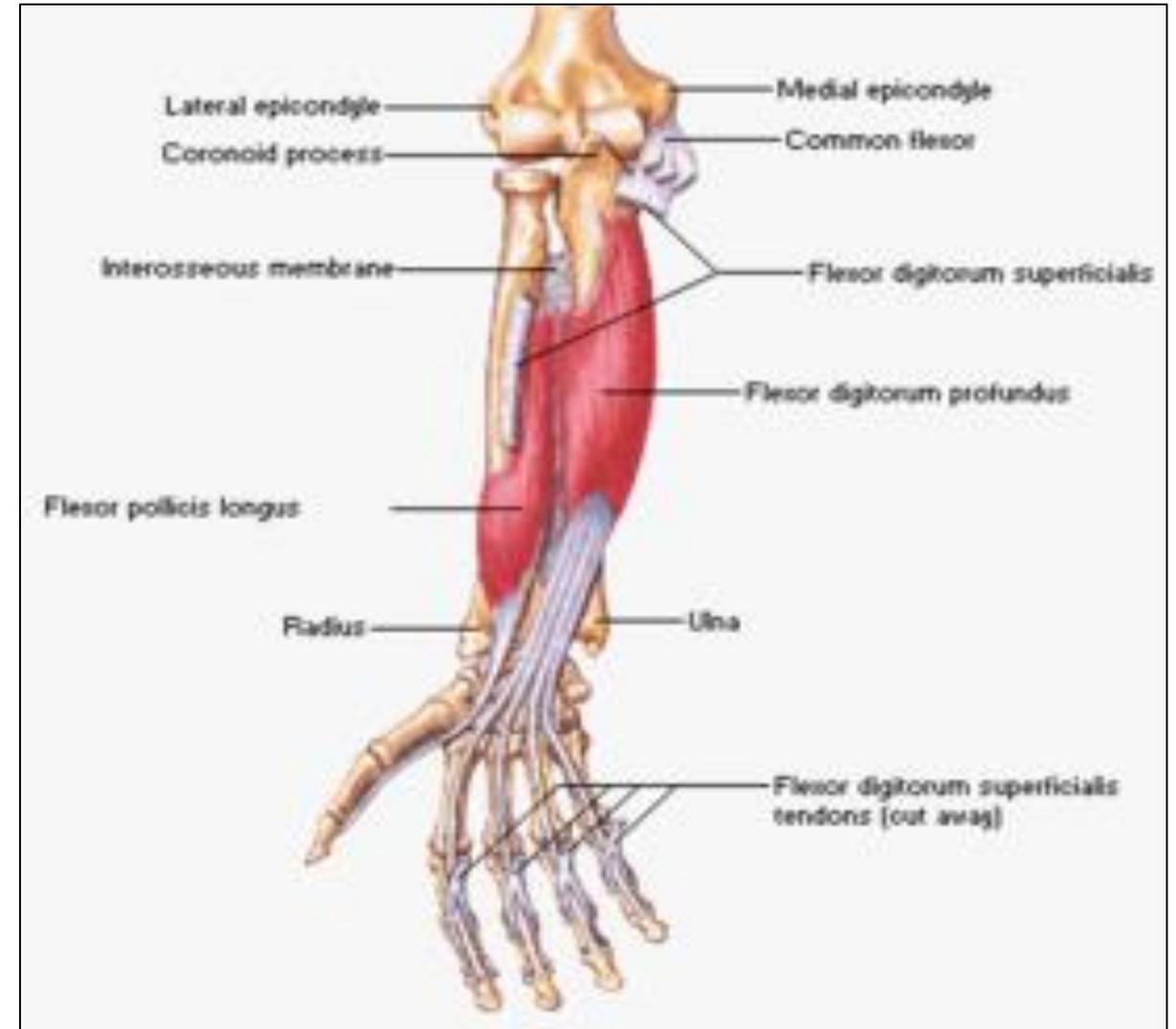


- The superficial group of forearm flexor muscles mainly arises from the common flexor origin (the front of medial epicondyle).
- All the superficial flexors have their nerve supply from the median nerve EXCEPT flexor carpi ulnaris that take its supply from ulnar nerve.



II- Deep group of flexors of forearm

- **They are:**
- **Flexor pollicis longus.**
- **Flexor digitorum profundus.**
- **Pronator quadratus**



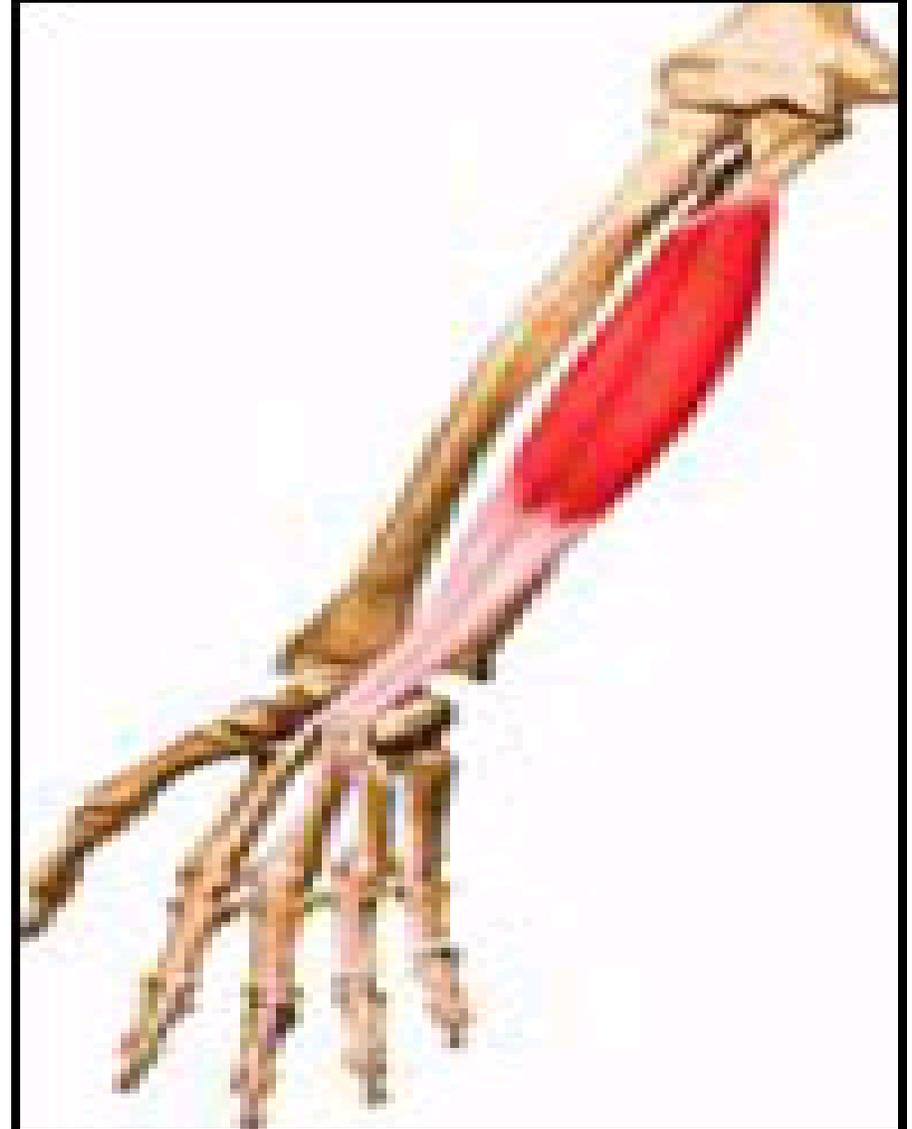
1-Flexor pollicis longus

- **Origin:**
- **Upper $\frac{3}{4}$ of anterior surface of shaft of radius.**
- **Interosseous membrane.**
- **Insertion:**
- **Base of terminal phalanx of the thumb.**
- **Nerve supply:**
- **Anterior interosseous nerve.**
- **Actions:**
- **Flexion of all joints of the thumb.**
- **Helps in flexion of wrist.**



2- Flexor digitorum profundus:

- **Origin:**
 - **1. Upper $\frac{3}{4}$ of anterior and medial surfaces of shaft of ulna.**
 - **2. Interosseous membrane.**
- **Insertion:**
 - **Bases of terminal phalanges of the medial 4 fingers.**
- **Nerve supply:**
 - **Medial $\frac{1}{2}$ by ulnar nerve.**
 - **Lateral $\frac{1}{2}$ by anterior interosseous nerve.**
- **Actions:**
 - **Flexion of all joints of the medial 4 fingers.**
 - **Helps in flexion of wrist joint.**



3- Pronator quadratus:

Origin:

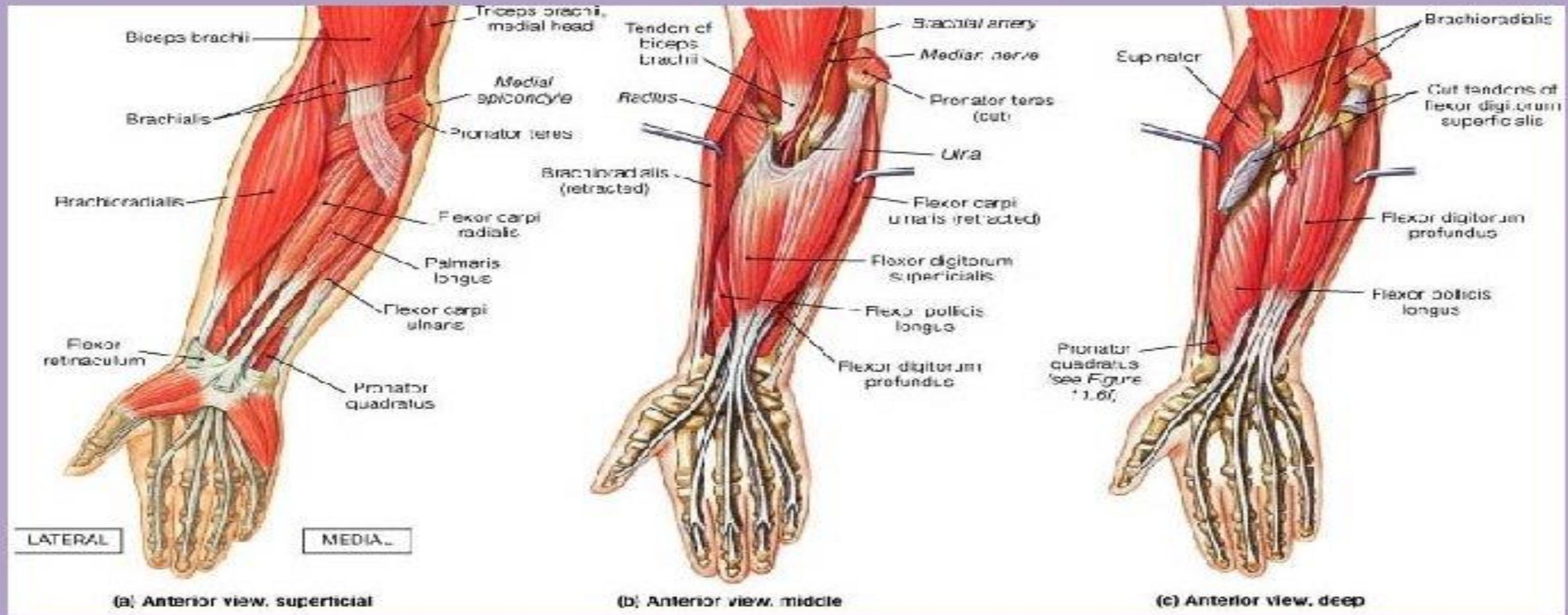
Lower 1/4 of anterior surface of shaft of ulna.

Insertion:

- **Lower 1/4 of anterior surface shaft of radius.**
- **Nerve supply:**
- **Anterior interosseous nerve.**
- **Action:**
- **Pronation of forearm.**



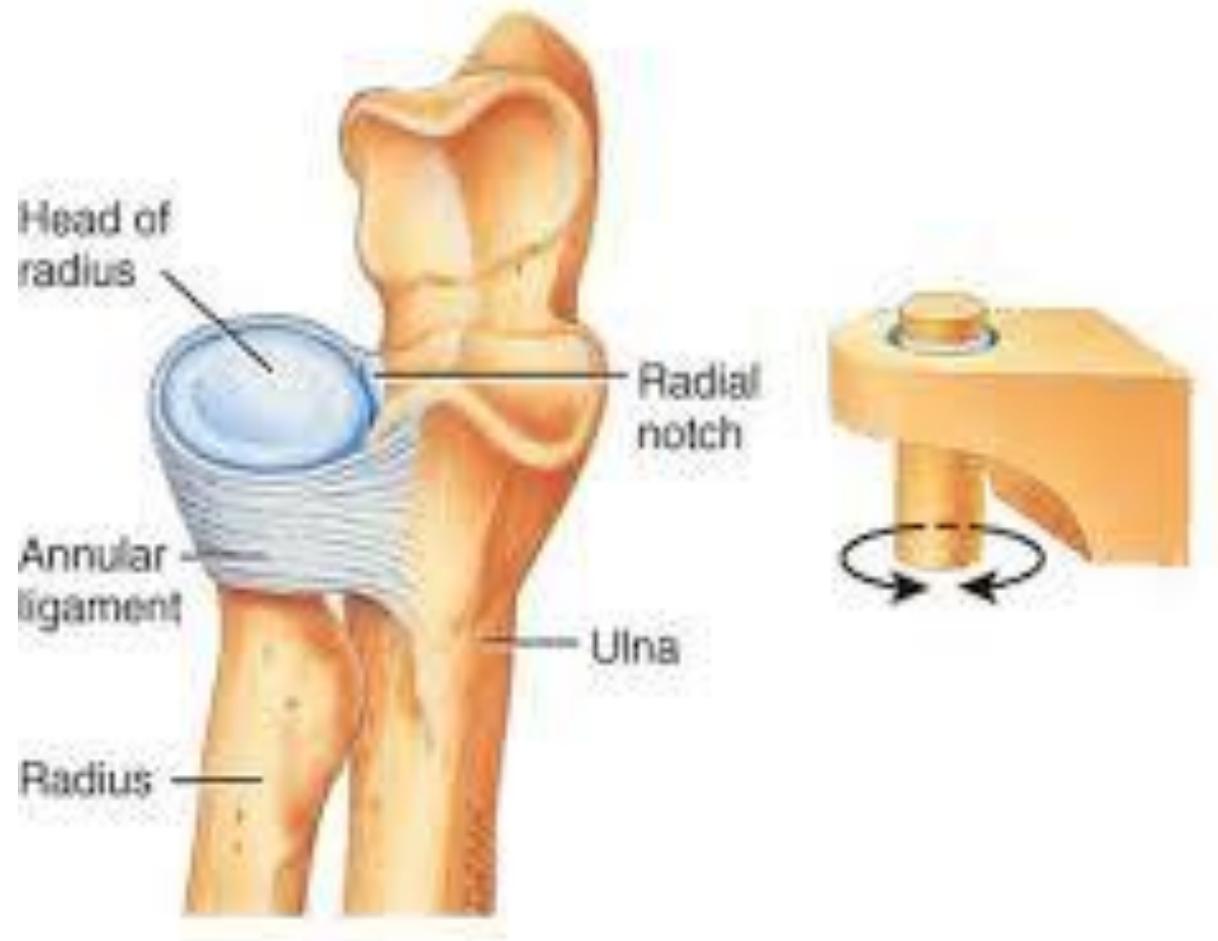
One last look at the muscles of the Hand, Wrist and Forearm



Radioulnar Joints

1- Superior radioulnar joint

- **Type of joint:**
 - **Synovial, Uniaxial, Pivot.**
 - **Articular surfaces**
 - **Radial notch of ulna & Annular ligament.**
 - **Circumference of the head of the radius**
 - **Each of the articular surfaces is covered by hyaline cartilage.**
- The inner surface of the annular ligament is also lined with hyaline cartilage.**



(c) Pivot joint between head of radius and radial notch of ulna

- **CAPSULE**

- The capsule is attached to the margins of the articular parts

- **Synovial membrane**

- It lines all the structures inside the joint EXCEPT the articular surfaces.

- Superiorly, it is continuous with the synovial membrane of elbow joint.

- **Ligaments related to superior radioulnar joint:**

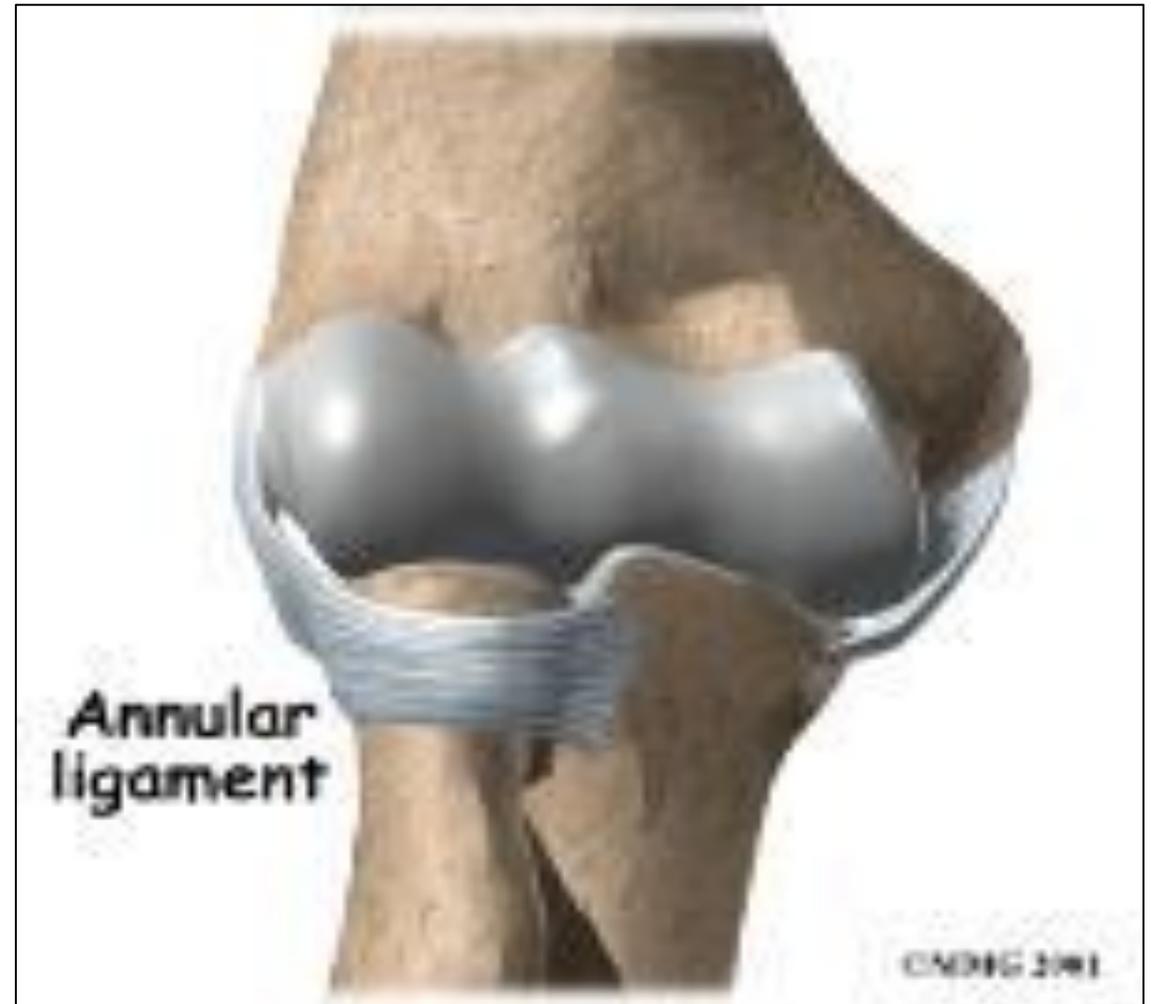
- **Annular ligament:**

- It is a strong fibrous band that is attached the margins of the radial notch of ulna and surrounds the circumference of head of radius

- The upper border is continuous with the capsule of elbow joint while the lower border is free surrounding the neck of radius.

- **Quadrante ligament:**

- It is a thin fibrous band that extends between the neck of radius and below the radial notch of ulna.



- **2- Middle radioulnar joint**

- **1- The interosseous membrane**

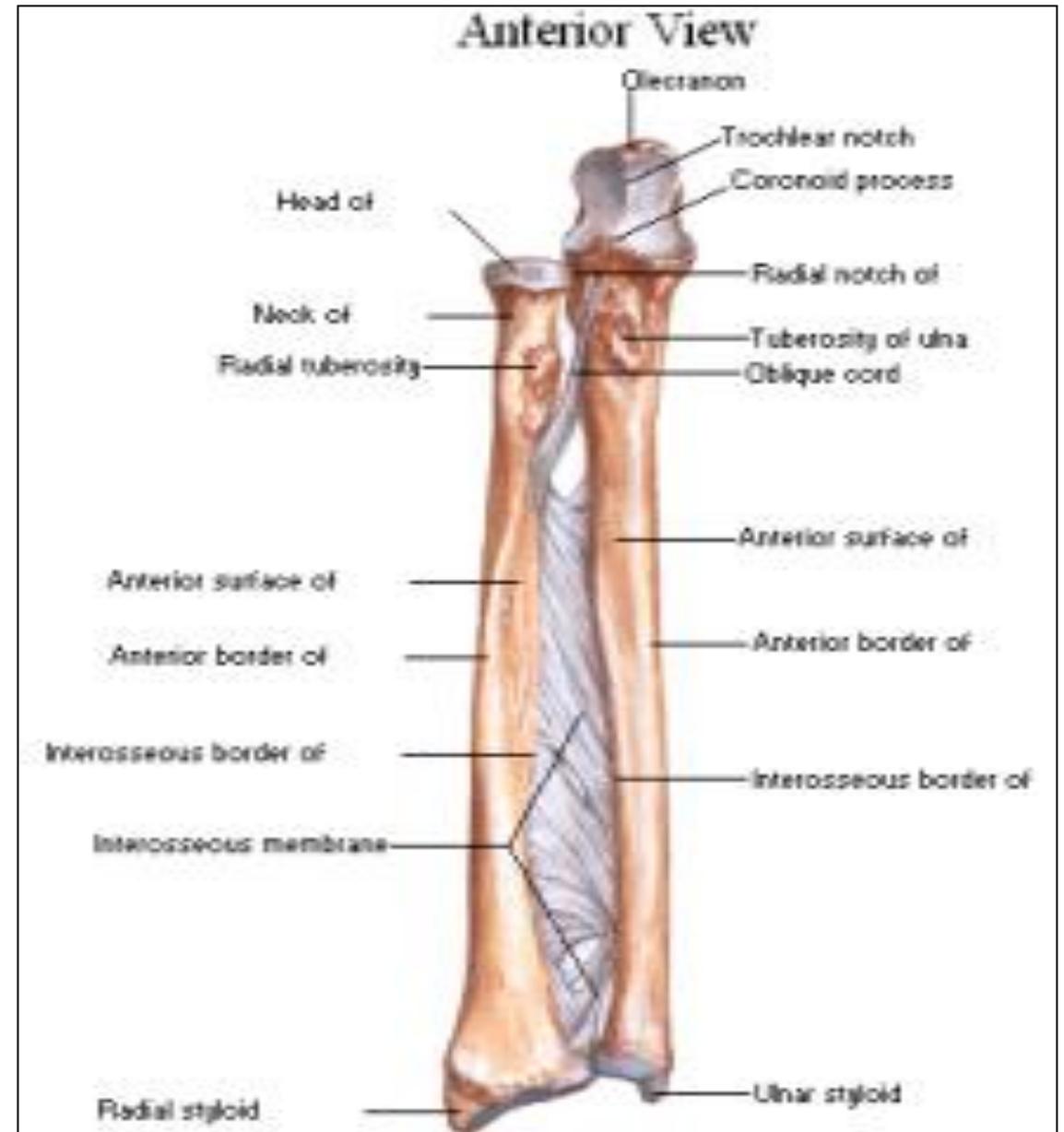
It is a fibrous joint between the radius and ulna.

- **The direction of its fibers is oblique downwards and medially from radius to ulna.**

- **Its function is to absorb the shock transmitted from the hand through the wrist joint, from radius to ulna, then partly transmits it to elbow.**

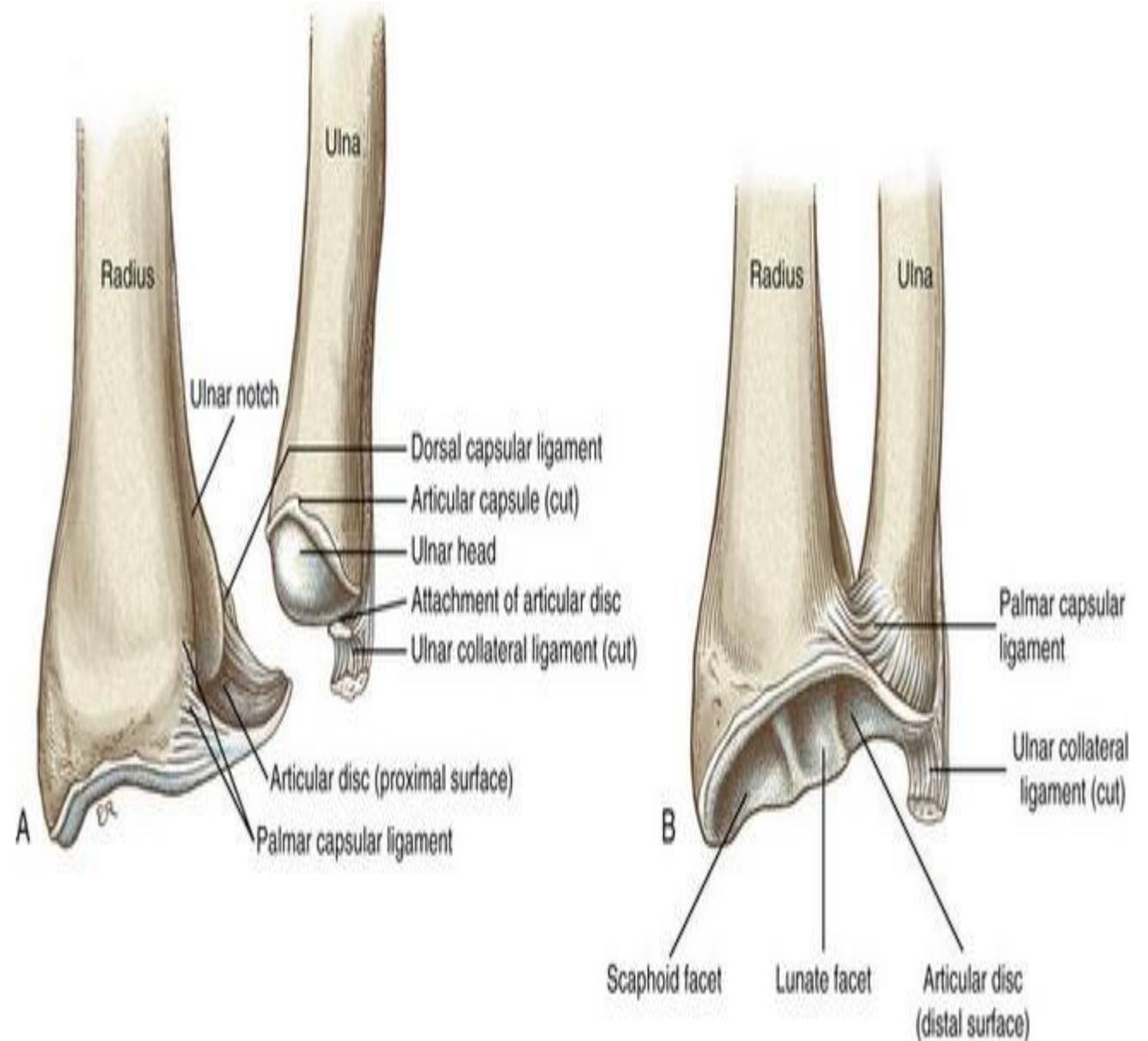
- **2- Oblique cord:**

- **It is a fibrous band extends between the ulnar tuberosity and the shaft of radius below the radial tuberosity.**



- **3- Inferior radioulnar joint**

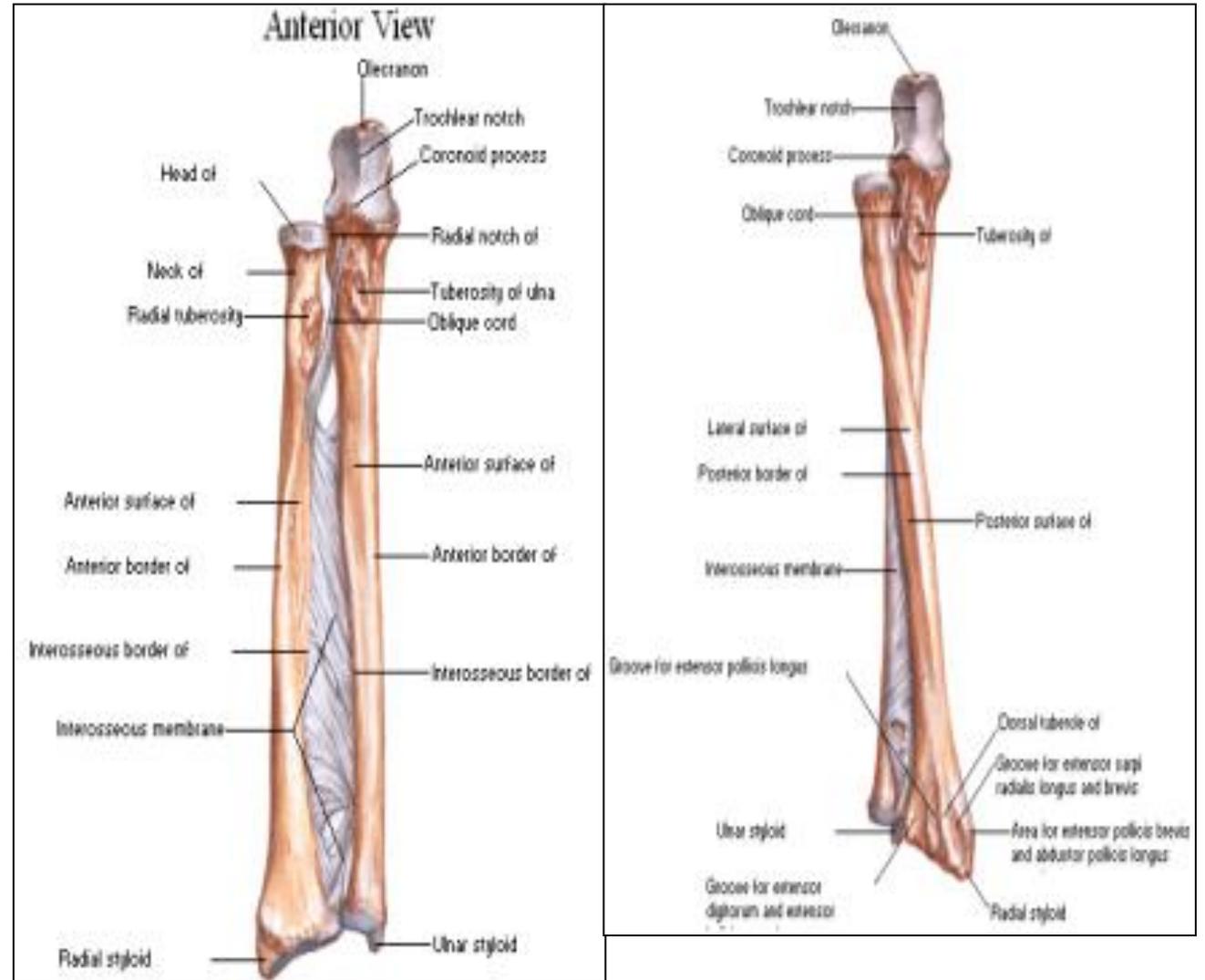
- It is a uniaxial, pivot synovial joint
- between the head of ulna and ulnar notch of radius.
- It has the same movements of the superior radioulnar joint.

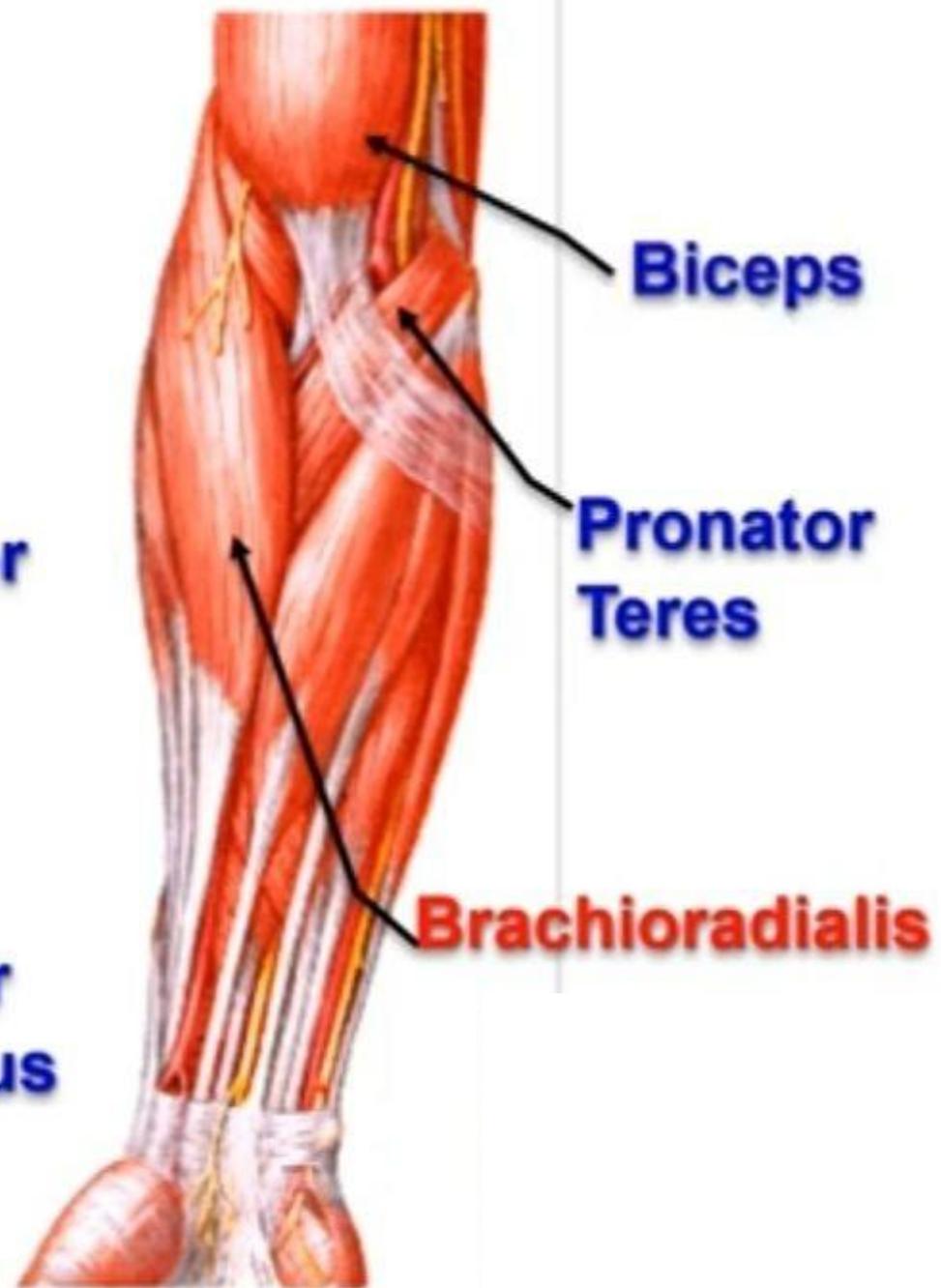
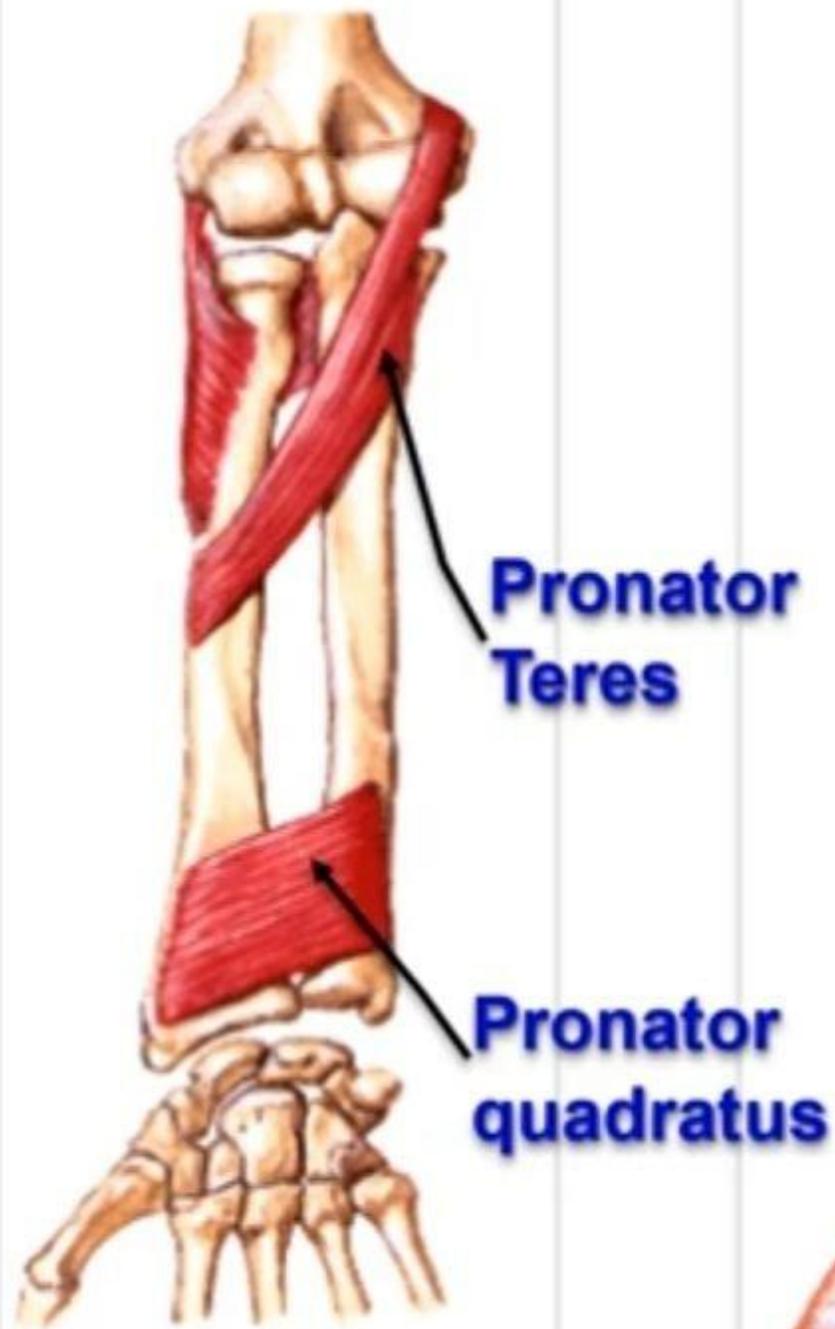


- **Movements of the superior and inferior radioulnar joints:**

- **Supination:** this movement is produced by the biceps brachii and the supinator muscles.

- **Pronation:** this movement is produced by the pronator teres and the pronator quadratus muscles







Anterior View