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

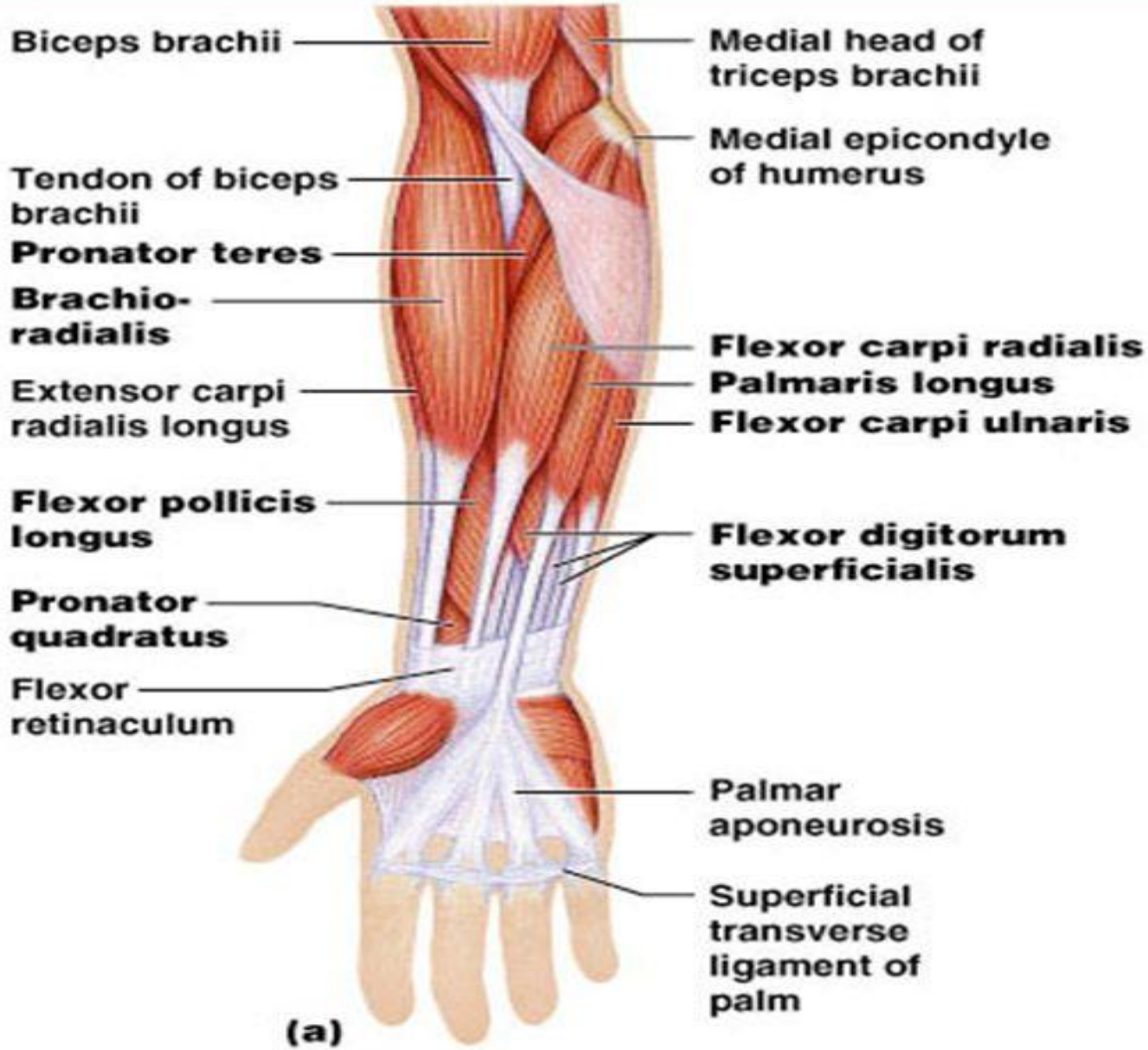
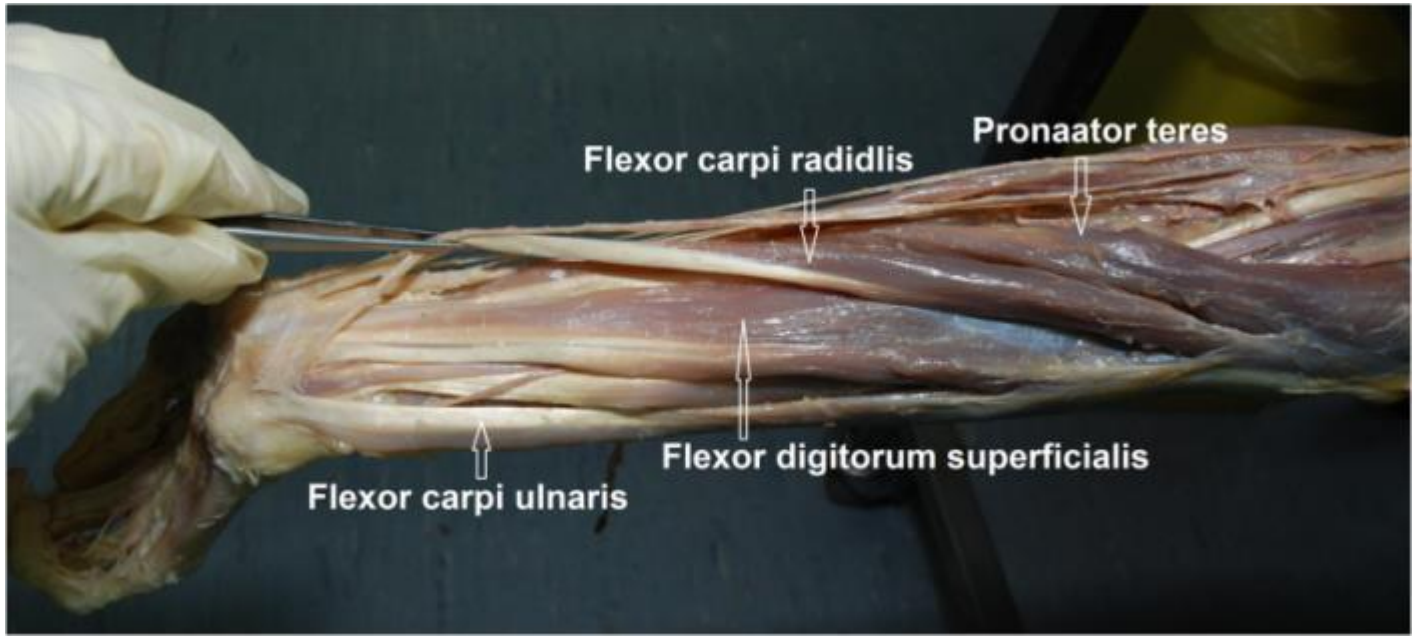


Figure 10.15a

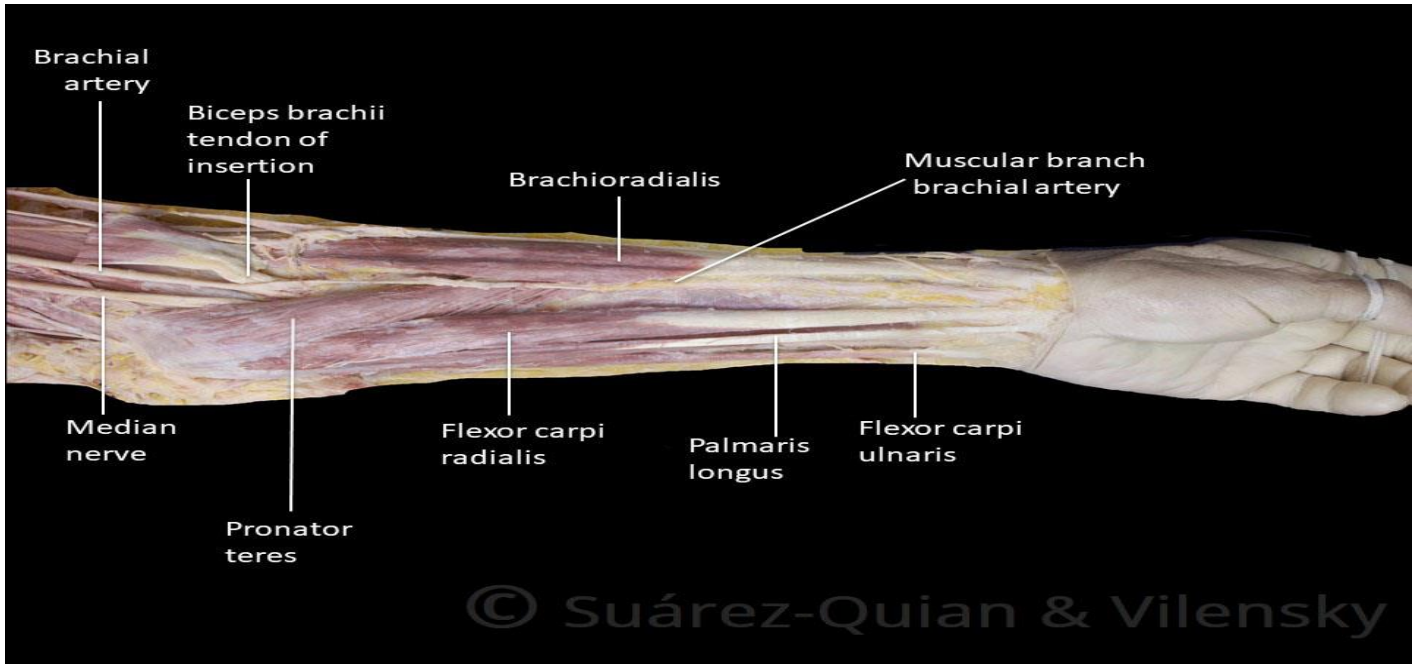
FLEXORS OF THE FOREARM

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.

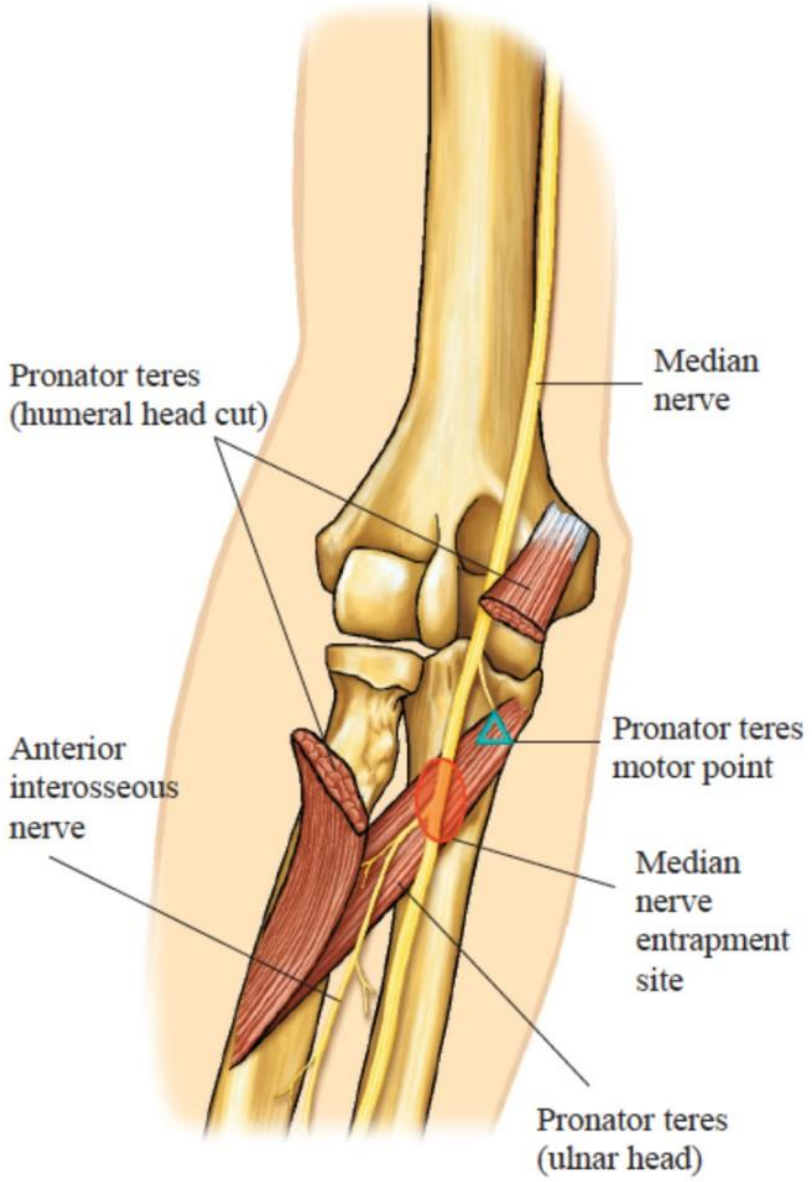
Nerve supply: Median nerve.

(enter the forearm between its two heads)

Action

Pronation of the forearm.

Helps in flexion of the elbow.



2- Flexor Carpi Radialis

Origin:

Common flexor origin.

Insertion:

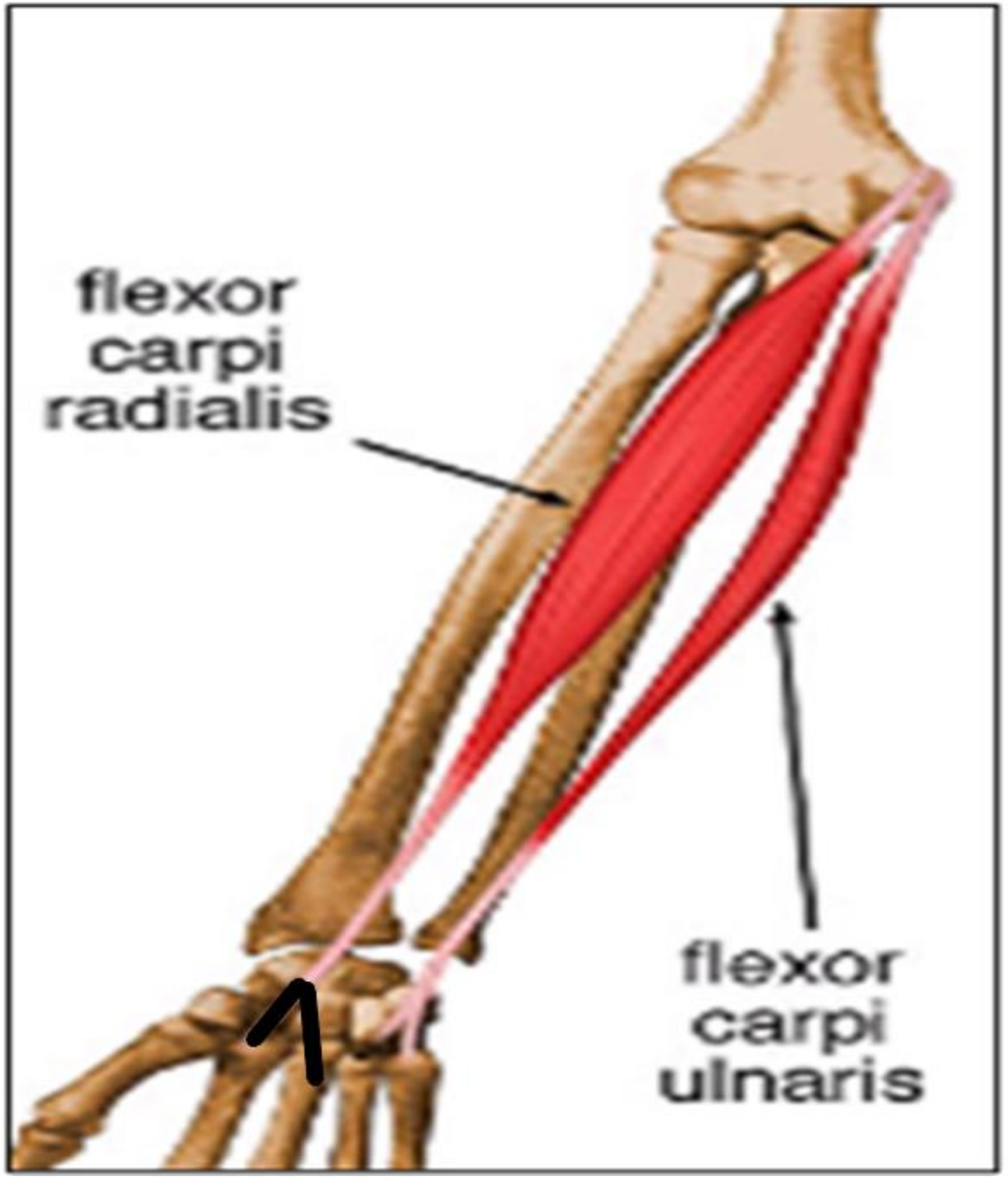
Bases of palmar aspect of 2nd and 3rd metacarpal bones.

Nerve supply: Median nerve.

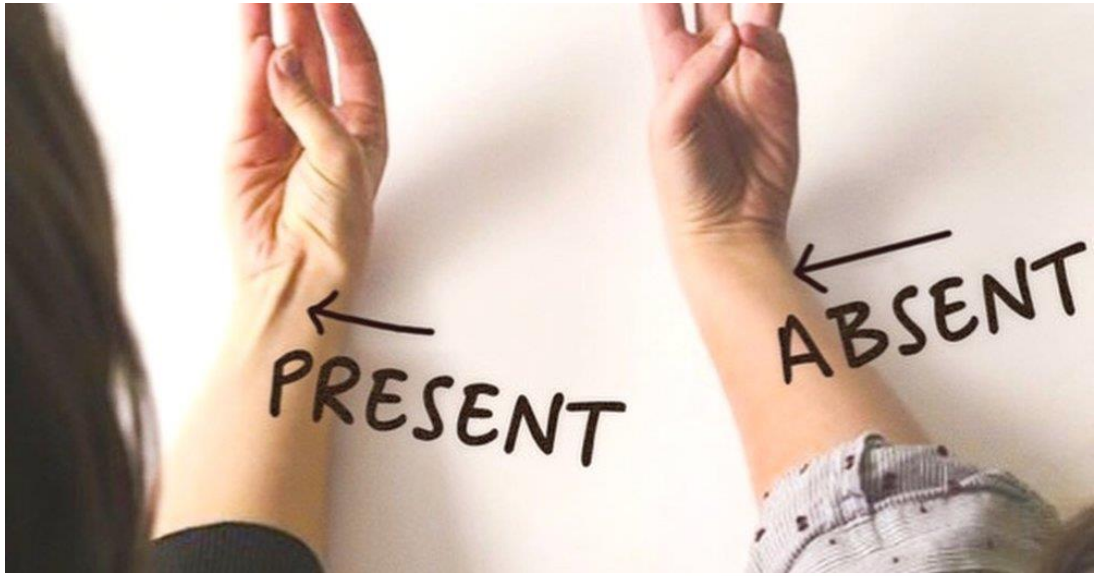
Actions:

Flexion and abduction of the wrist.

Flexion of forearm.



3- Palmaris longus



(This muscle may be absent):

Origin:

Common flexor origin.

Insertion:

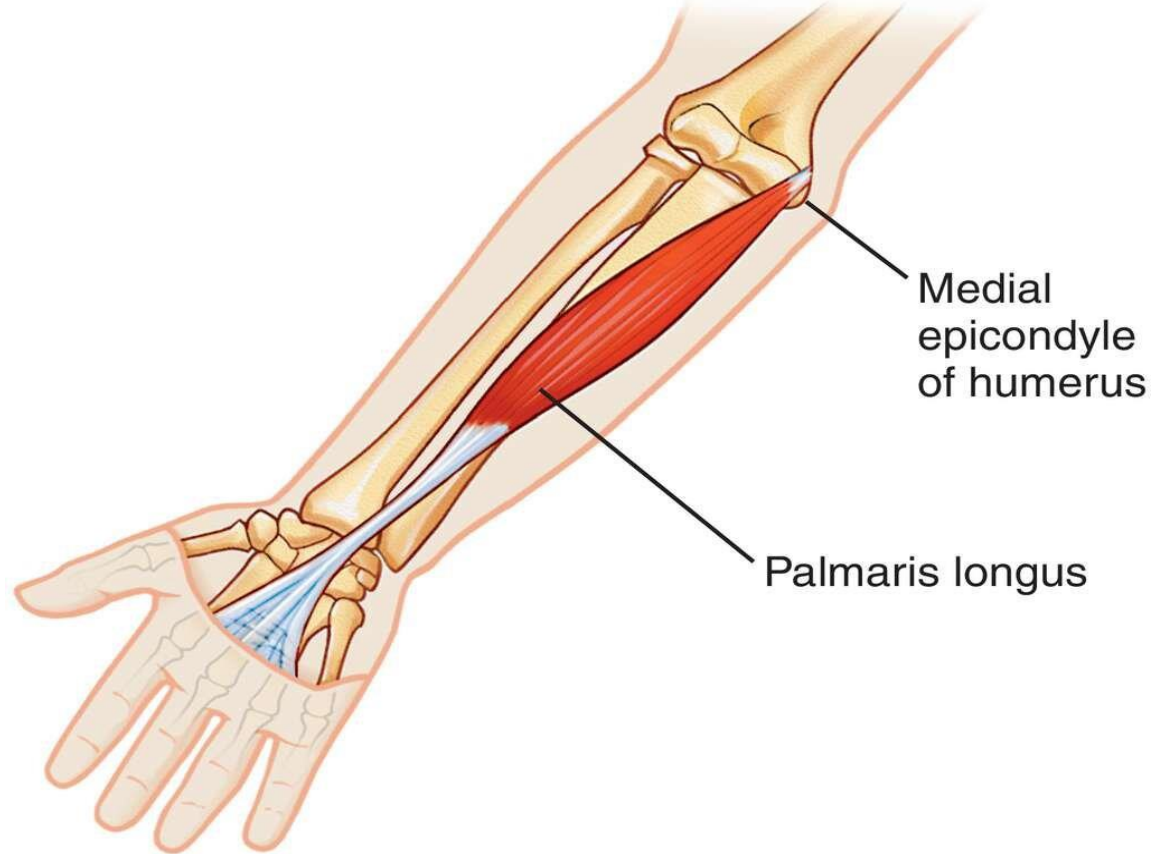
Apex of palmar aponeurosis which is a triangular thickening of deep fascia of the palm.

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:

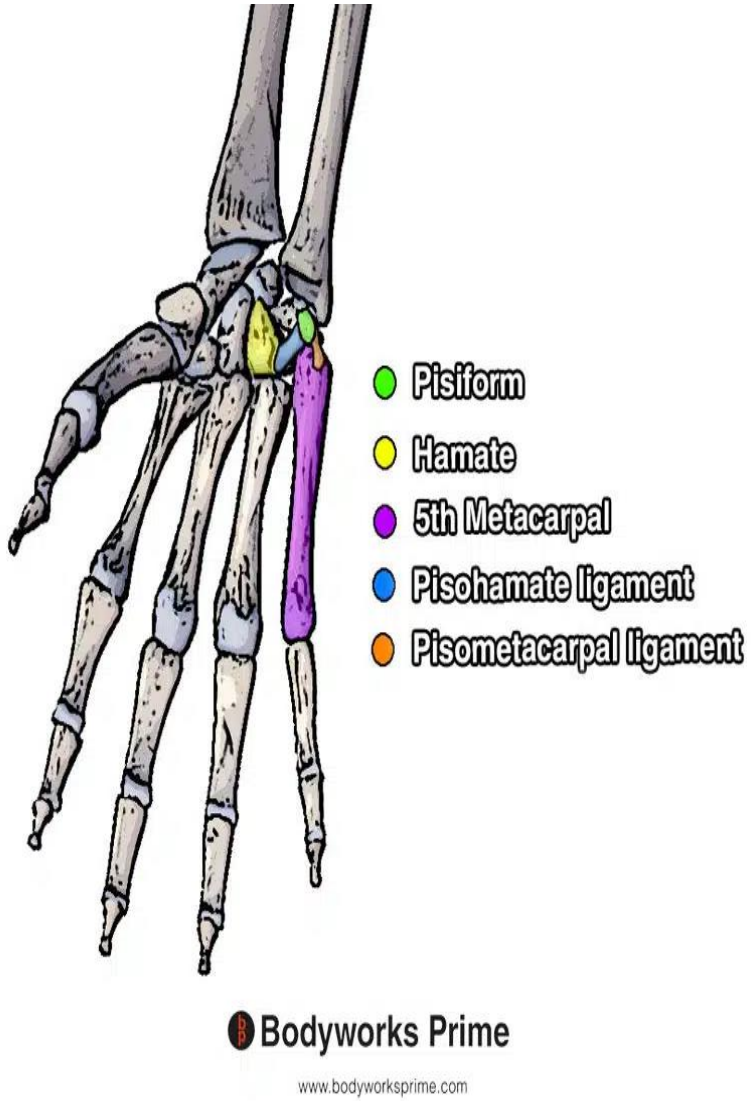
Pisiform bone, pisohamate ligament (to hook of hamate), and pisometacarpal ligament (to base of 5th metacarpal bone).and base of 5th metacarpal bone

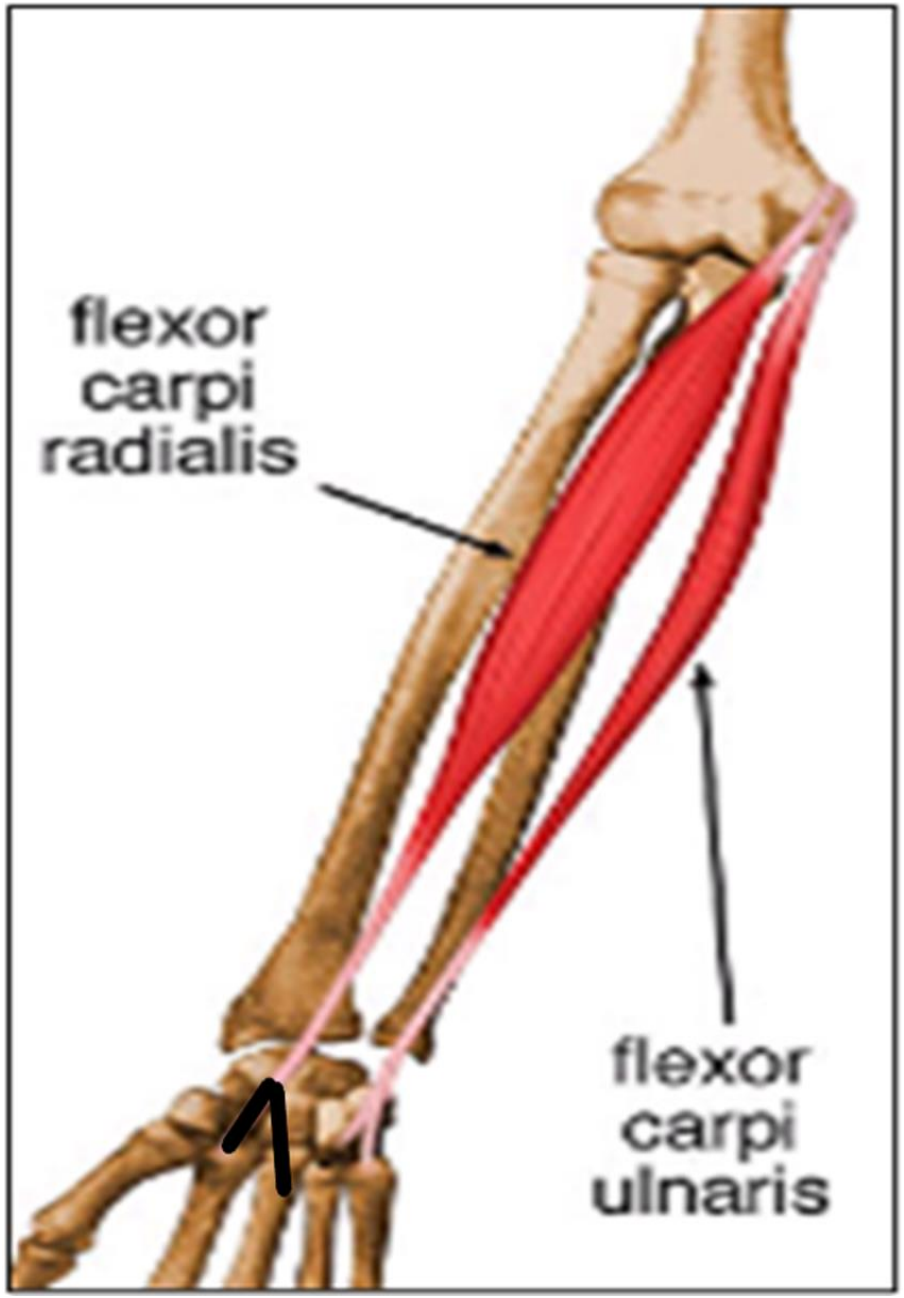
Nerve supply: Ulnar nerve.

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

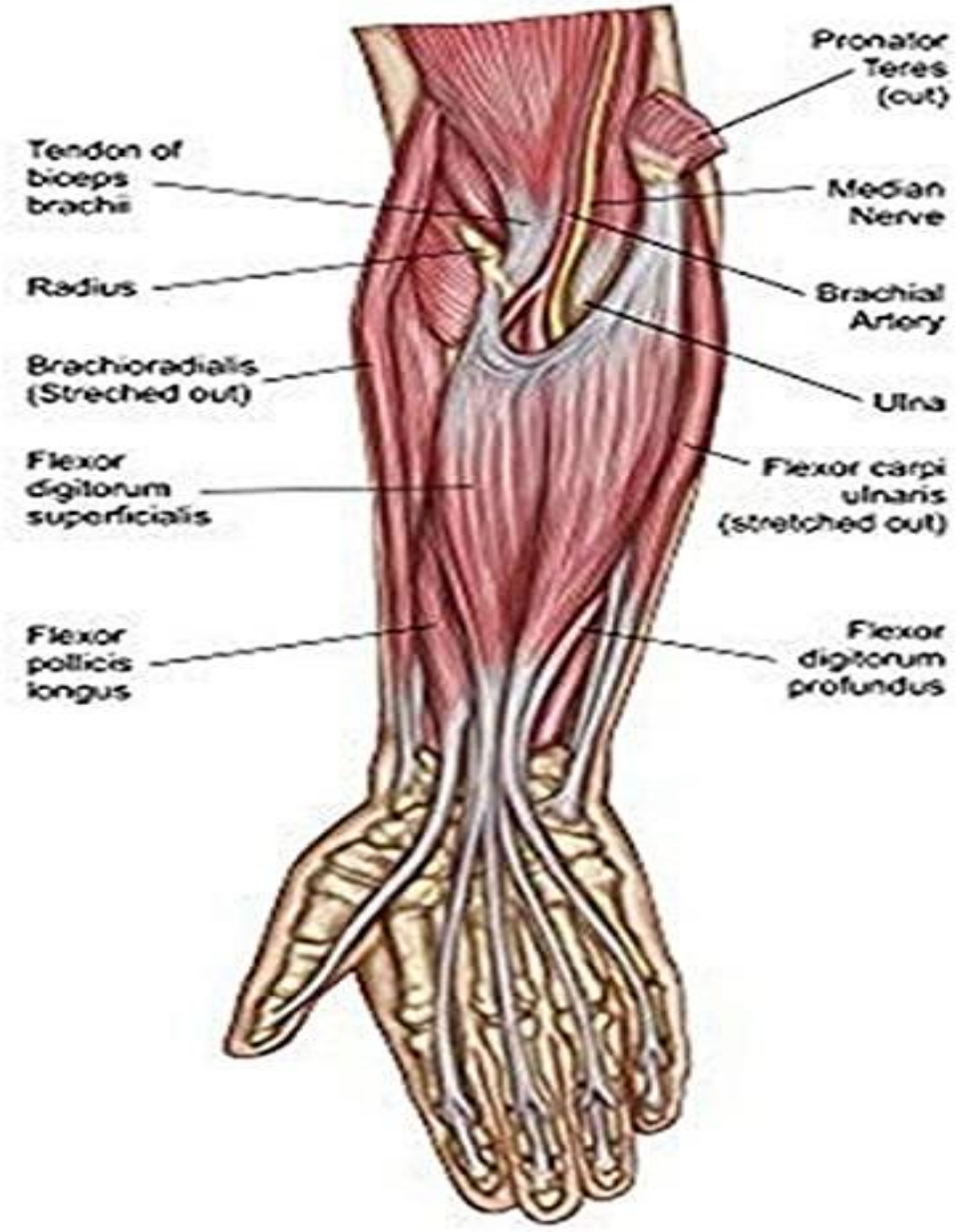
Nerve supply: Median nerve.

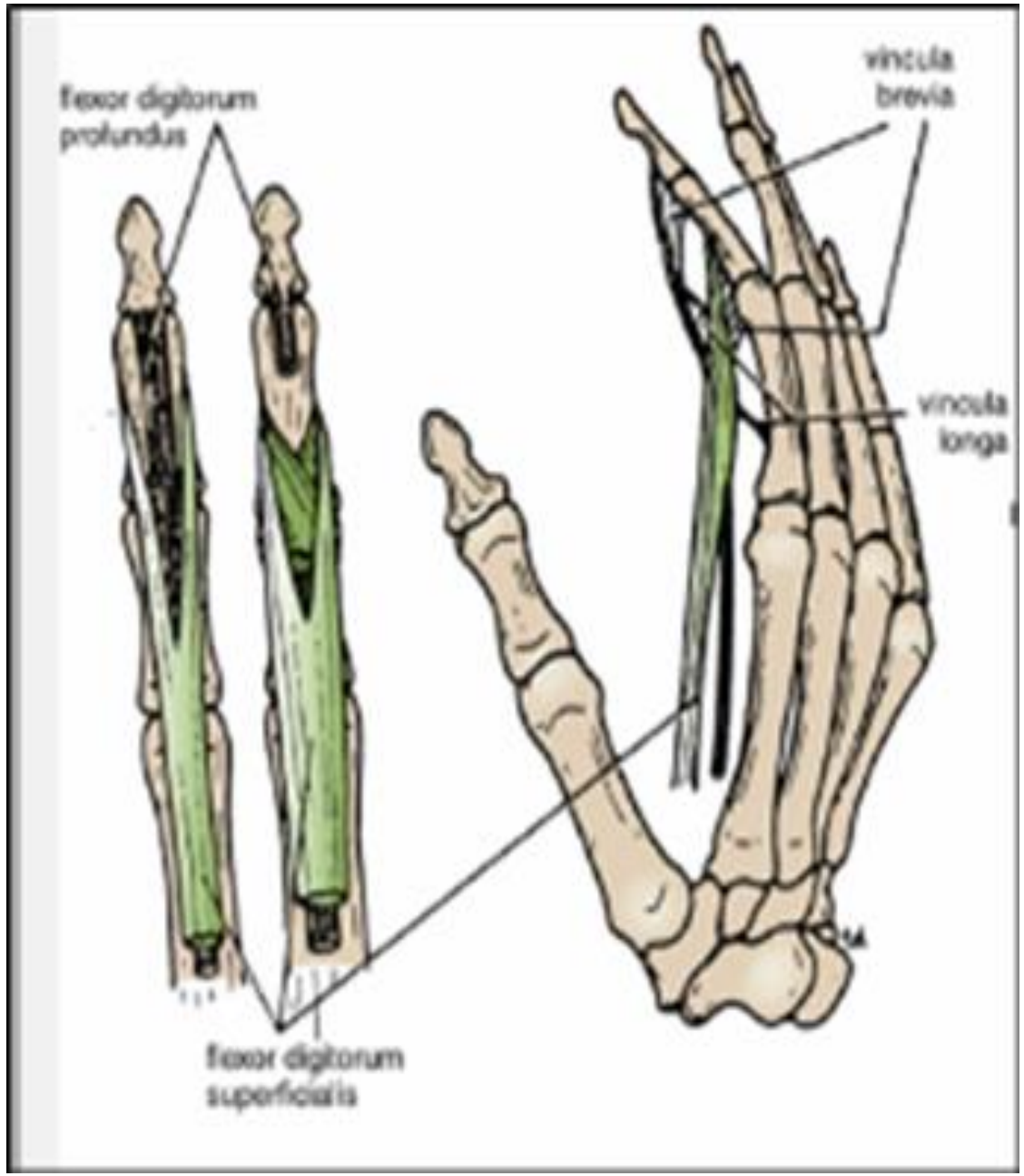
Actions:

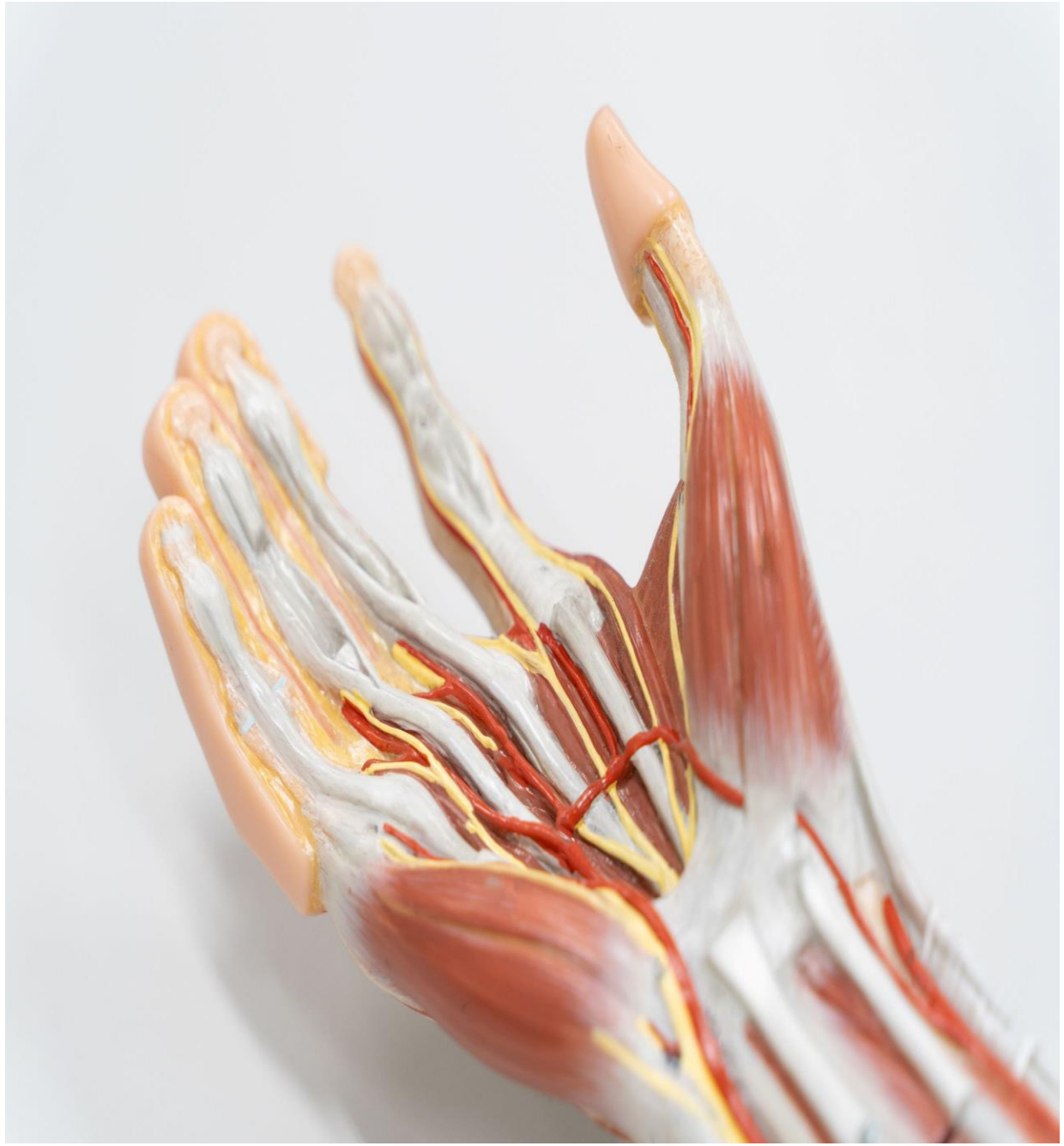
Flexion of proximal interphalangeal and metacarpophalangeal joints of the medial 4 fingers

Flexion of the wrist

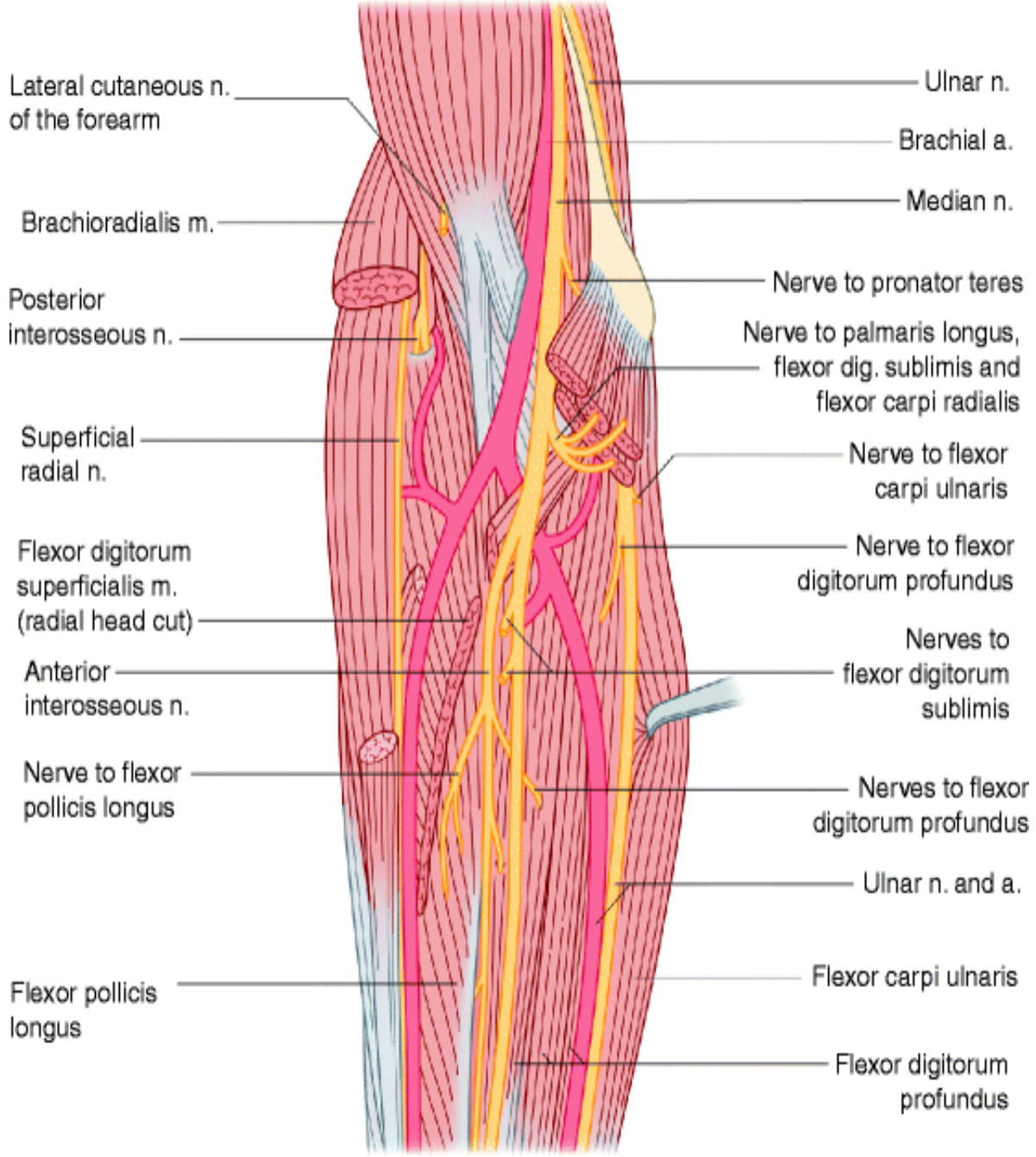
helps in Flexion of forearm




flexor digitorum
profundus
vincula
brevia
vincula
longa
flexor digitorum
superficialis



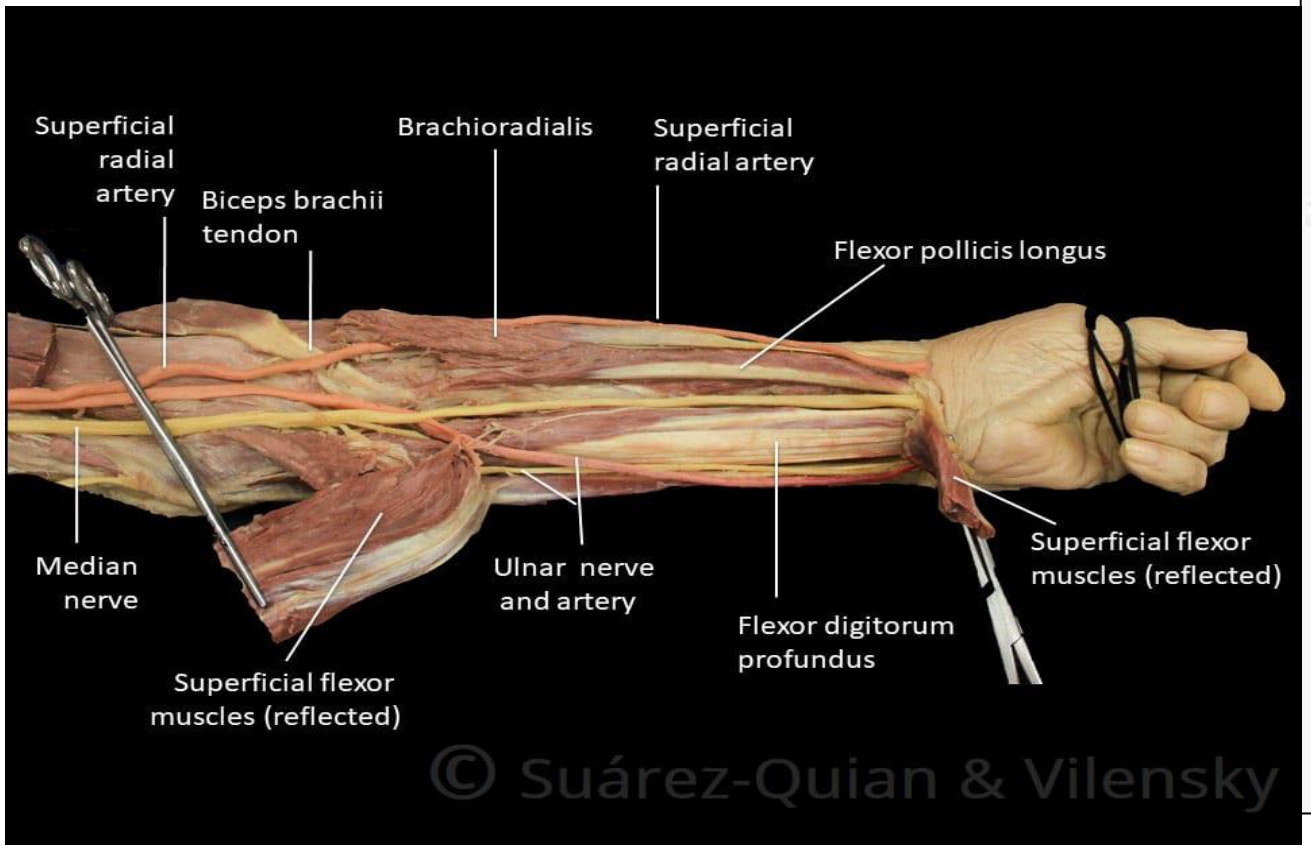
- **The superficial group of forearm (flexor muscles) mainly arises from the common flexor origin (the front of medial epicondyle).**
- **All the superficial flexors have their nerve supply from the median nerve EXCEPT flexor carpi ulnaris that take its supply from ulnar nerve.**

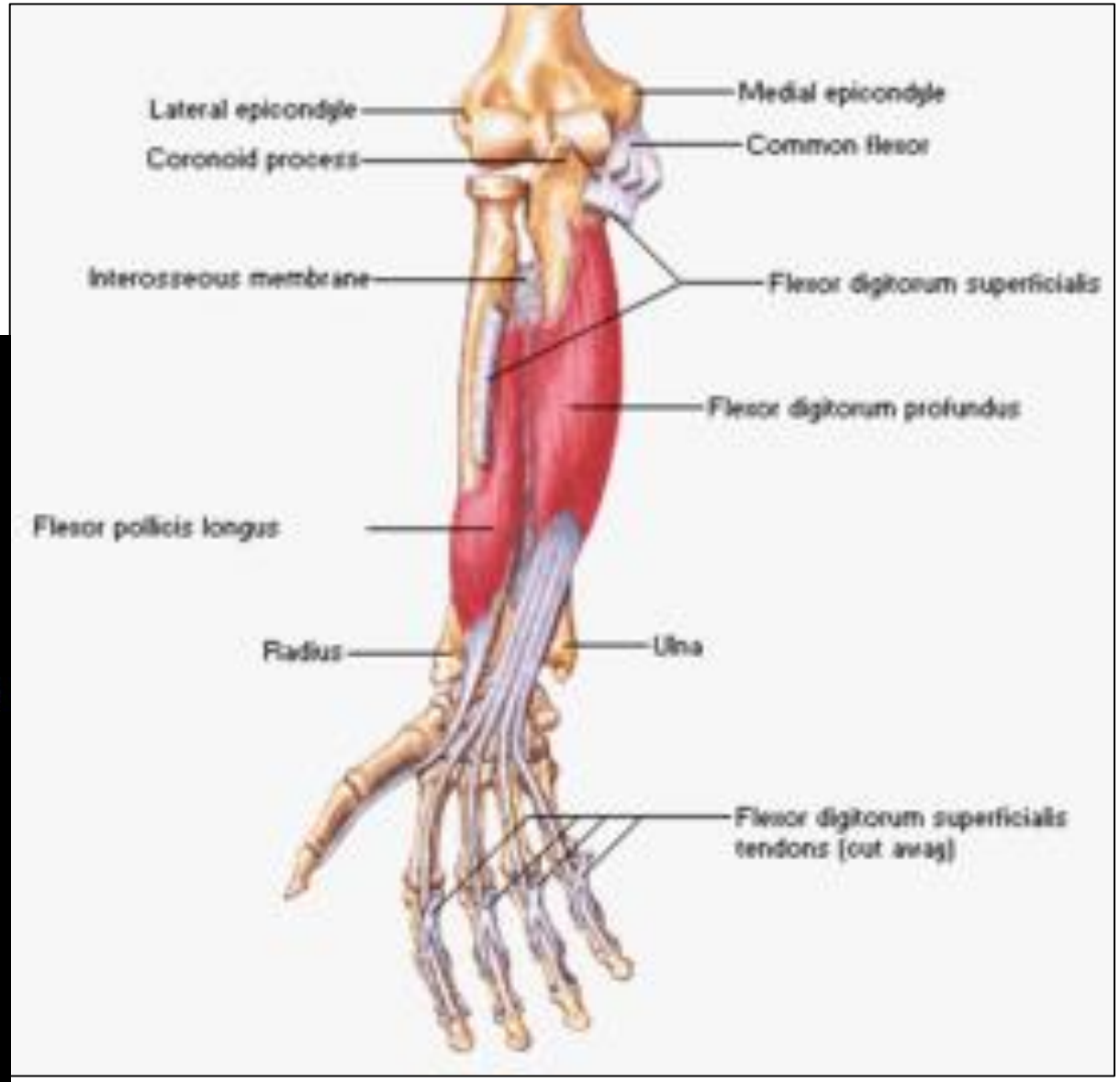


II- Deep group of flexors of forearm

They are:

- **Flexor pollicis longus.**
- **Flexor digitorum profundus.**
- **Pronator quadratus**





1-Flexor pollicis longus

Origin:

Upper ¾ 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 ¾ 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 1/2 by ulnar nerve.

Lateral 1/2 by anterior interosseous nerve.

Actions:

Flexion of all joints of the medial 4 fingers.

Helps in flexion of wrist joint.

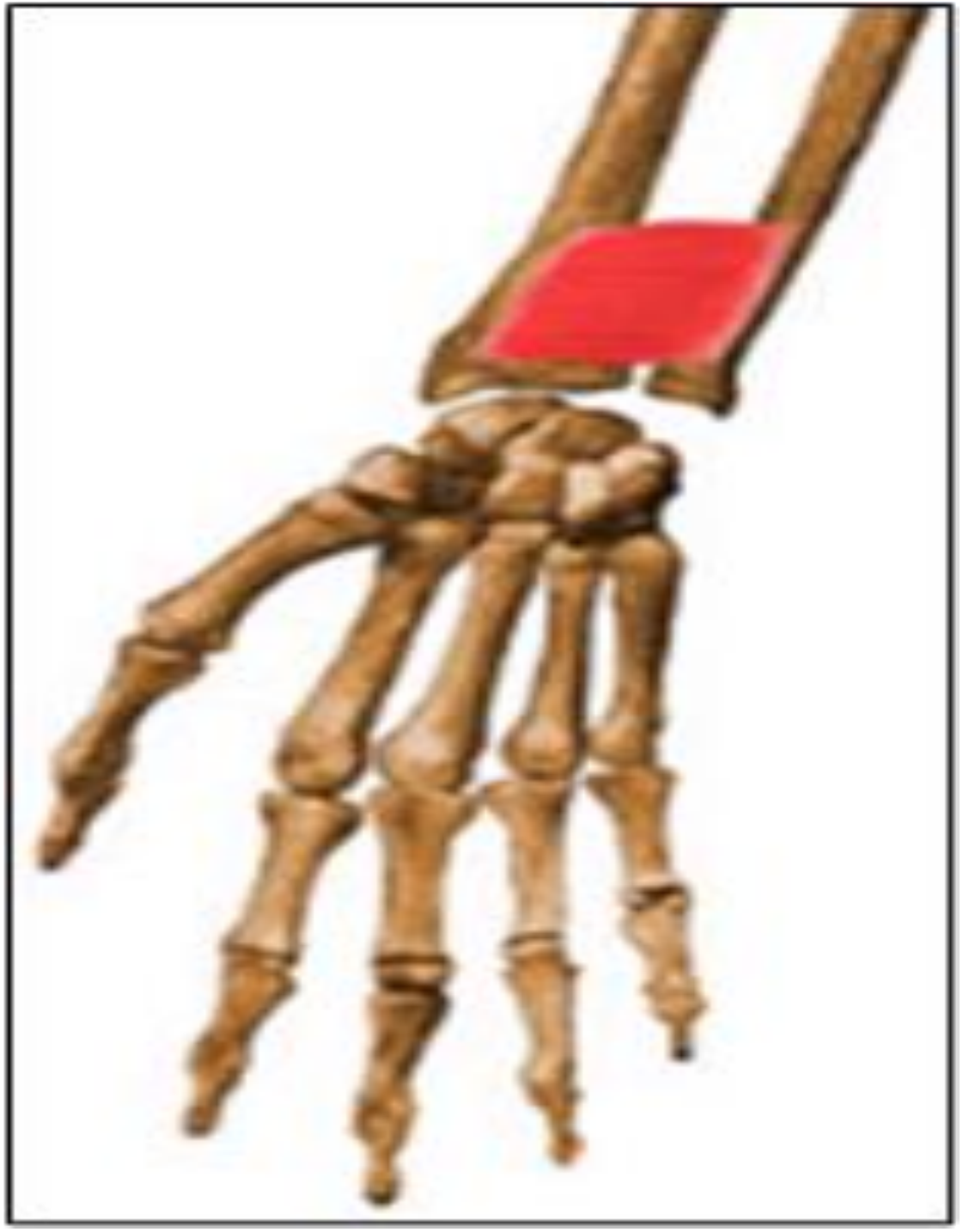
3- Pronator quadratus:

Origin:

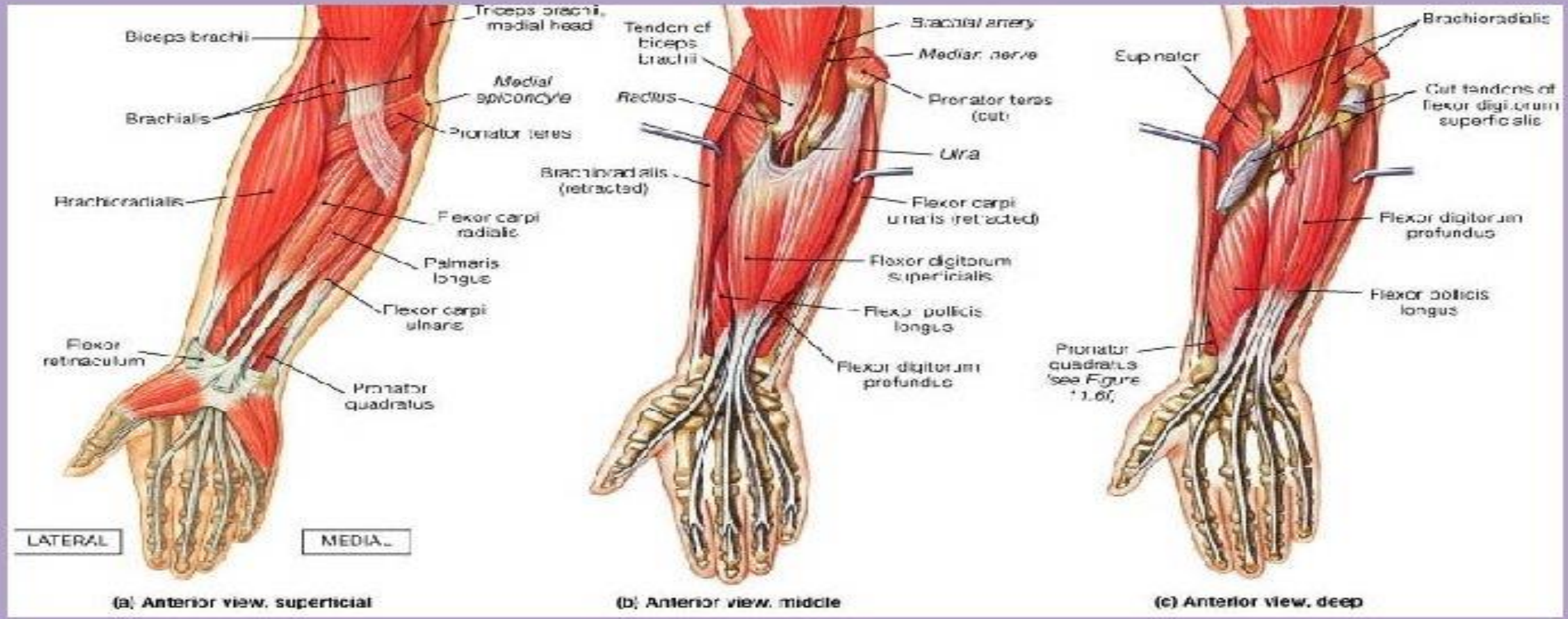
Lower 1/4 of anterior surface of shaft of ulna.

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:

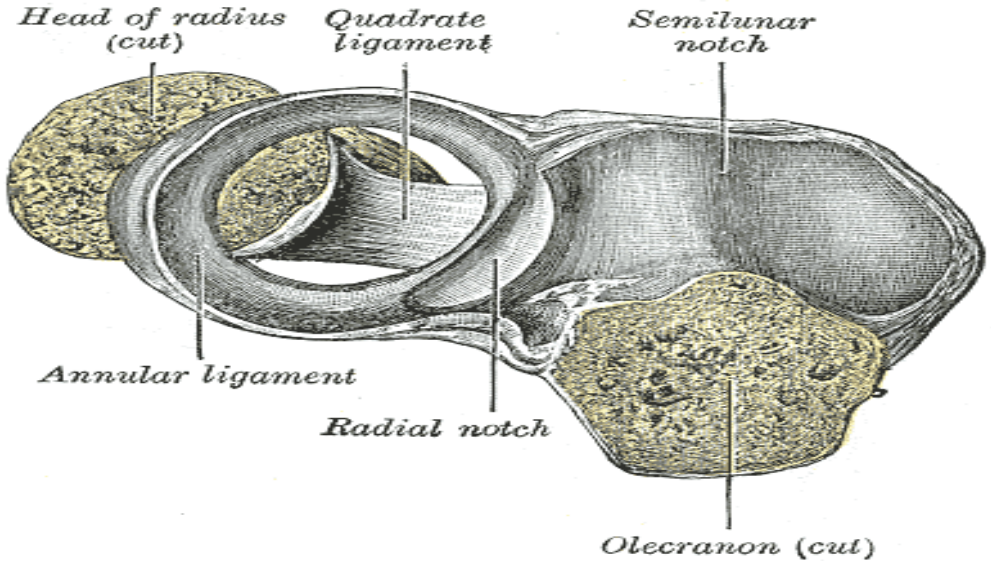
Annular ligament:

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.

Quadrate ligament:

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



2- Middle radioulnar joint

1- The interosseous membrane

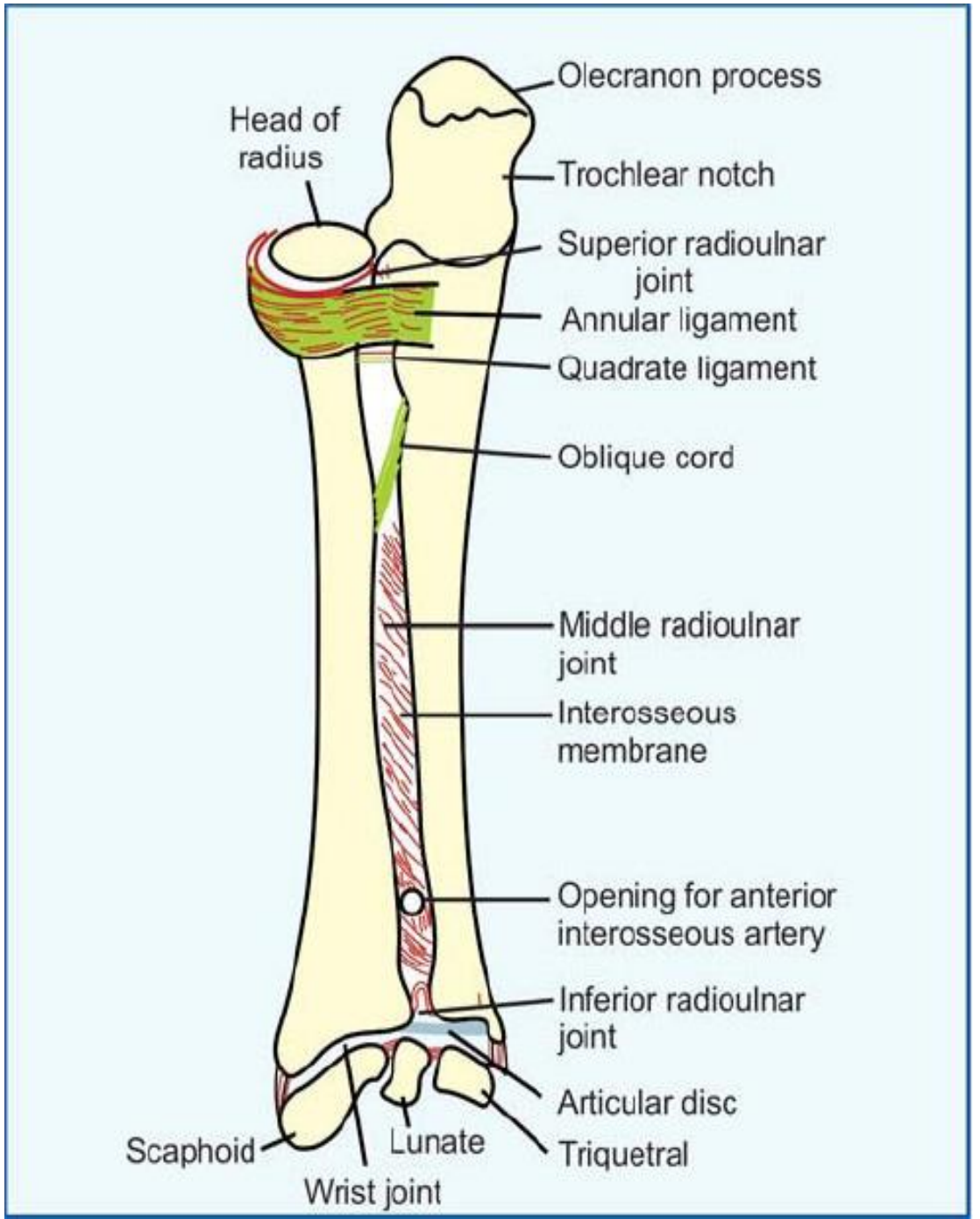
It is a fibrous joint between the radius and ulna.

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.

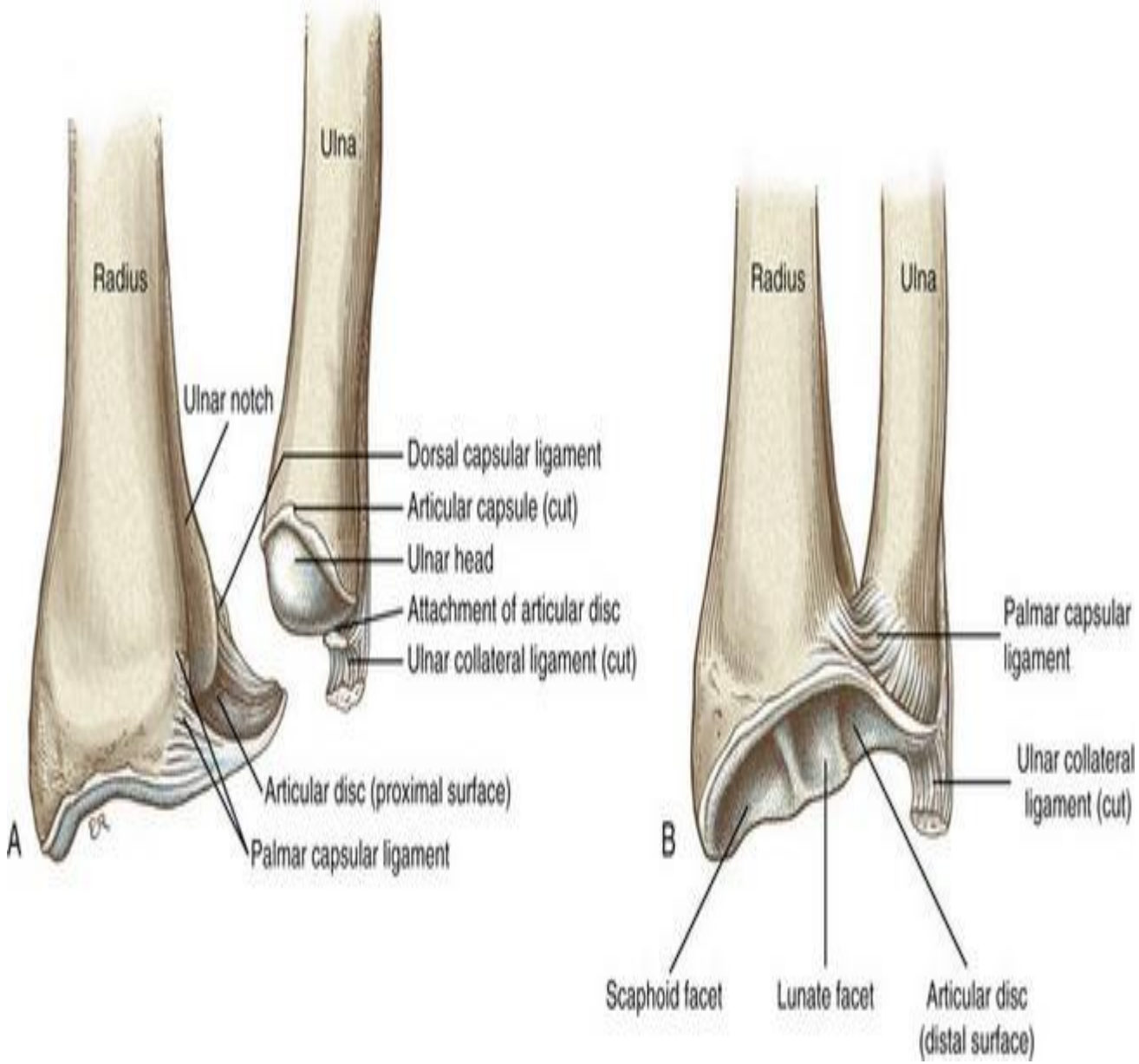
2- Oblique cord:

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



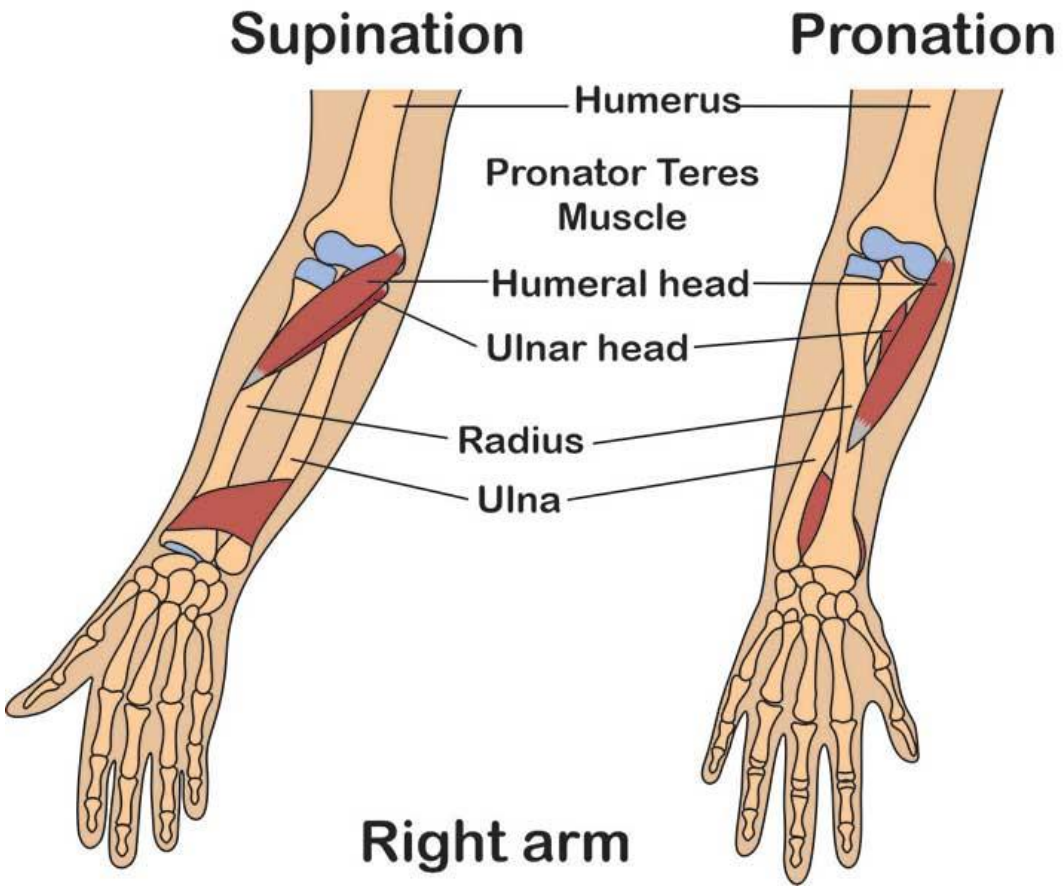
3- Inferior radioulnar joint

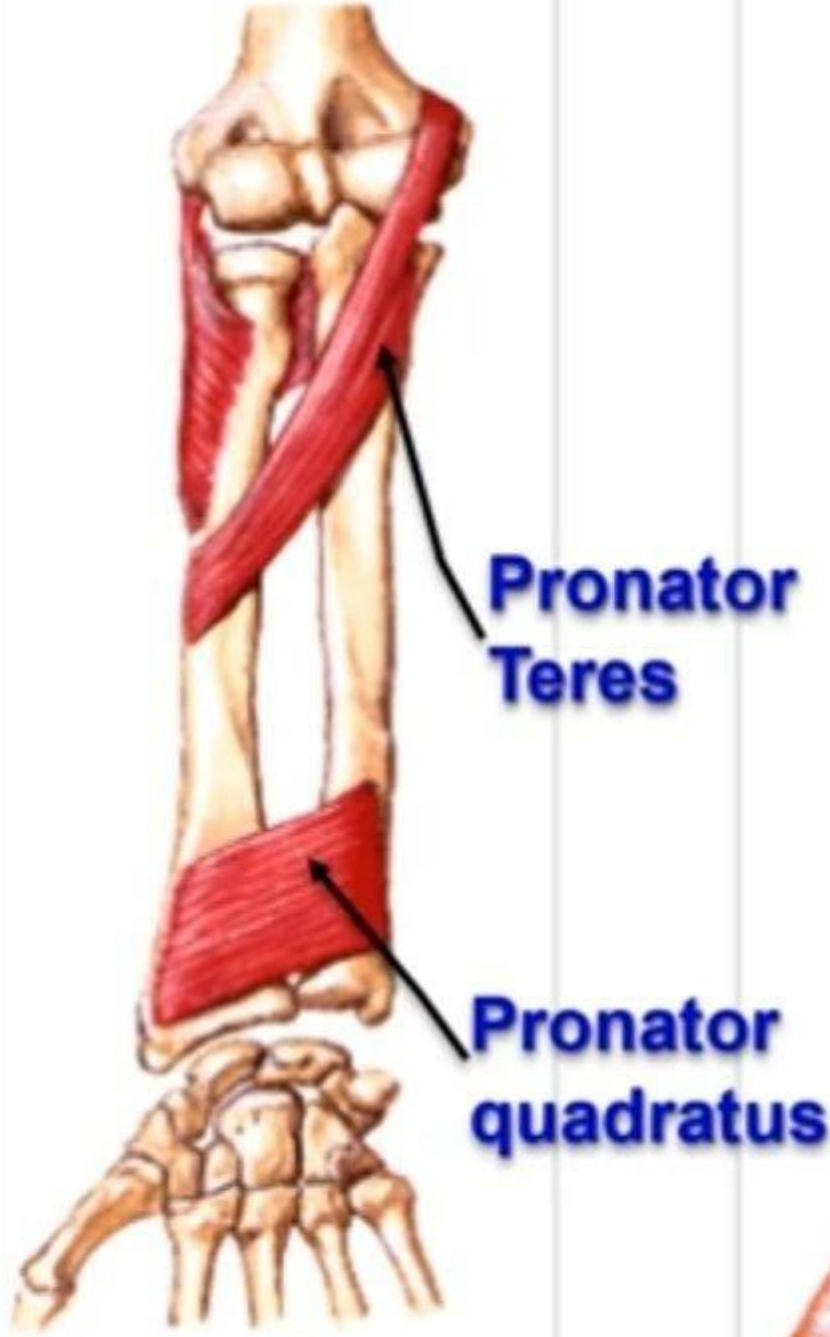
- **It is a uniaxial, pivot synovial joint**
- **between the head of ulna and ulnar notch of radius.**
- **It has the same movements of the superior radioulnar joint.**



Movements of the superior and inferior radioulnar joints:

- **Supination:** this movement is produced By biceps brachii and supinator muscles.
- **Pronation**: this movement is produced by the pronator teres and the pronator quadrates muscles




Pronator
Teres
Pronator
quadratus


Biceps
Pronator
Teres
Brachioradialis