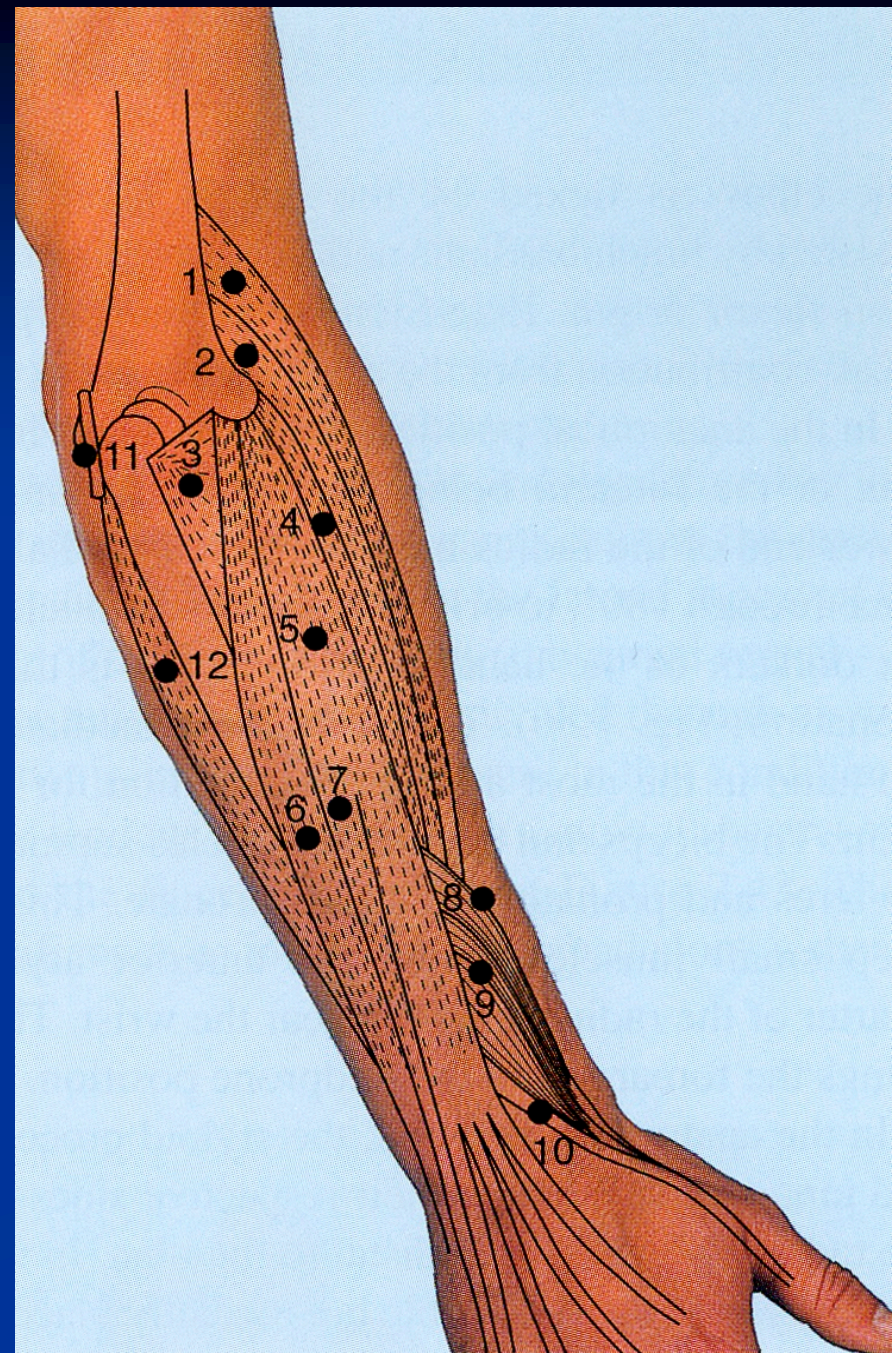


FOREARM

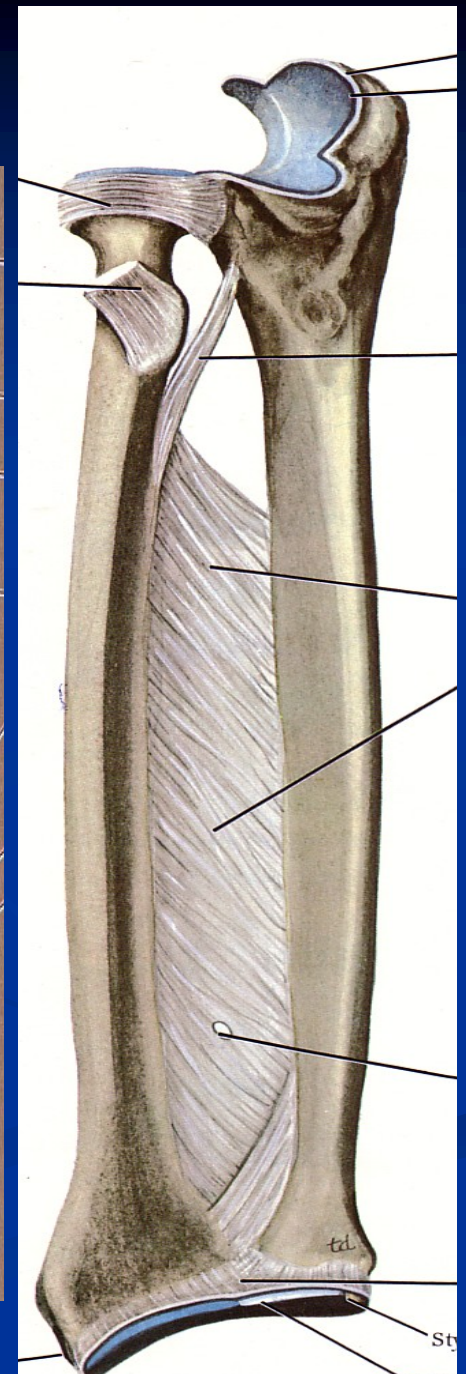
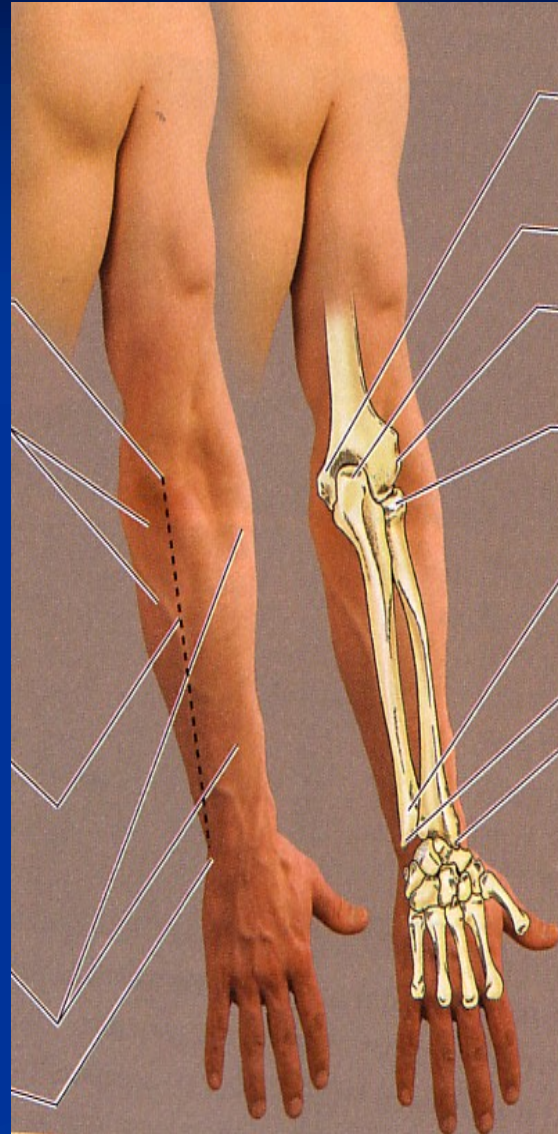


BY DR .SANAA ALSHAARAWY

OBJECTIVES

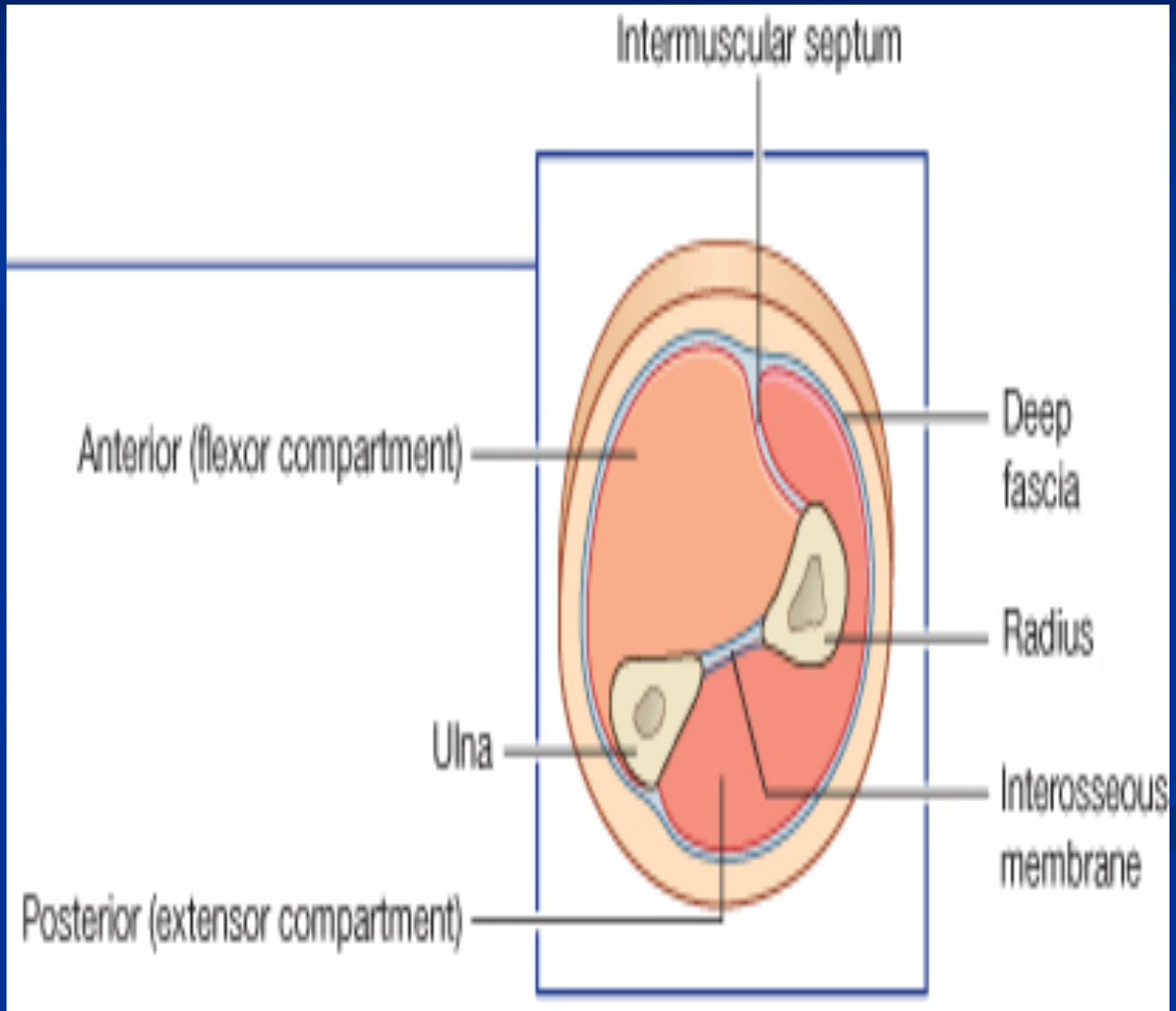
- At the end of this lecture, the student should be able to :
- List the **names of the Flexors Group** of Forearm (superficial & deep muscles).
- Identify the **common flexor origin** of flexor muscles and their **innervation & movements**.
- Identify **supination & pronation** and list the **muscles** produced these 2 movements.
- List the **names of the Extensor Group** of Forearm (superficial & deep muscles).
- Identify the **common extensor origin** of extensor muscles and their **innervation & movements**.

- **The forearm** extends from elbow to wrist.
- It posses two bones **radius** laterally & **Ulna** medially.
- The two bones are connected together by the **interosseous membrane**.
- This membrane allows movement of **Pronation** and **Supination** while the two bones are connected together.
- Also it gives origin for the deep muscles.



Fascial Compartments of the Forearm

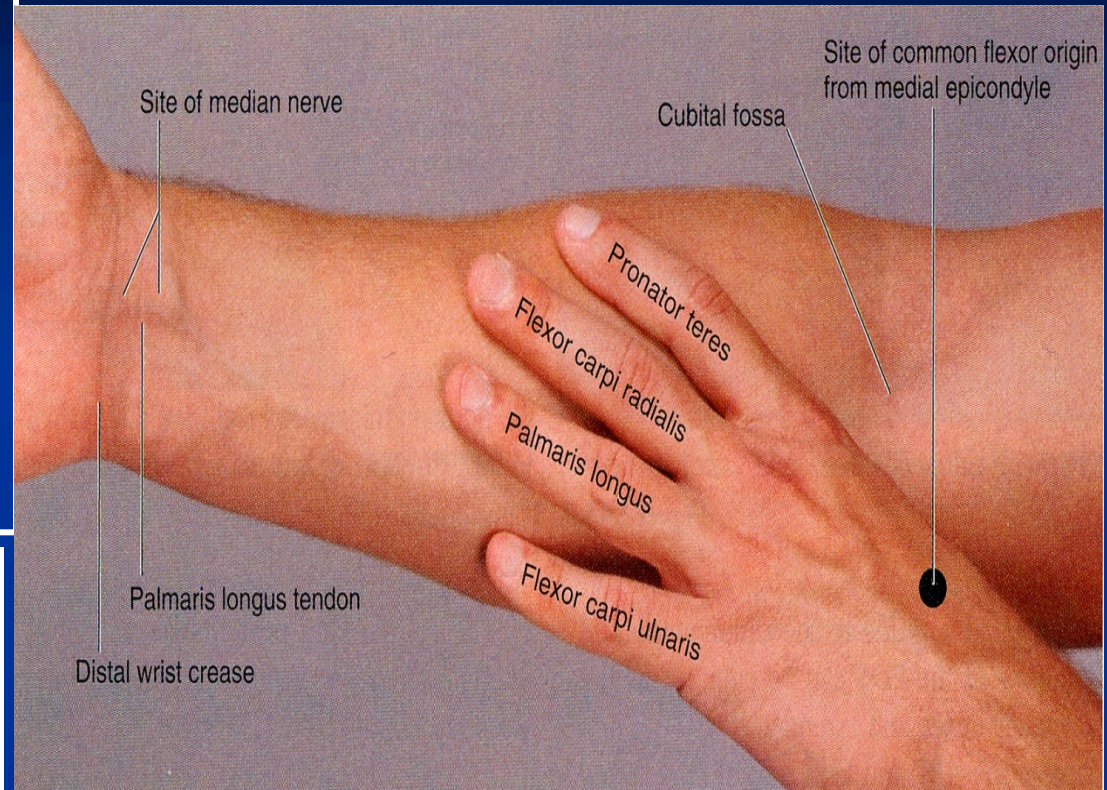
- **The forearm** is enclosed in a **sheath of deep fascia**, which is attached to the posterior border of the ulna.
- This **fascial sheath**, together with the **interosseous membrane & fibrous intermuscular septa**, divides the forearm into compartments, each having its own muscles, nerves, and blood supply.



FLEXOR GROUP

These muscles: 8

- Act on the elbow & wrist joints and those of the fingers.
- Form **fleshy masses** in the proximal part and become **tendinous** in the distal part of the forearm.
- Arranged in three groups:



I-Superficial: 4

- **Pronator teres**
- **Flexor carpi radialis**
- **Palmaris longus**
- **Flexor carpi ulnaris**

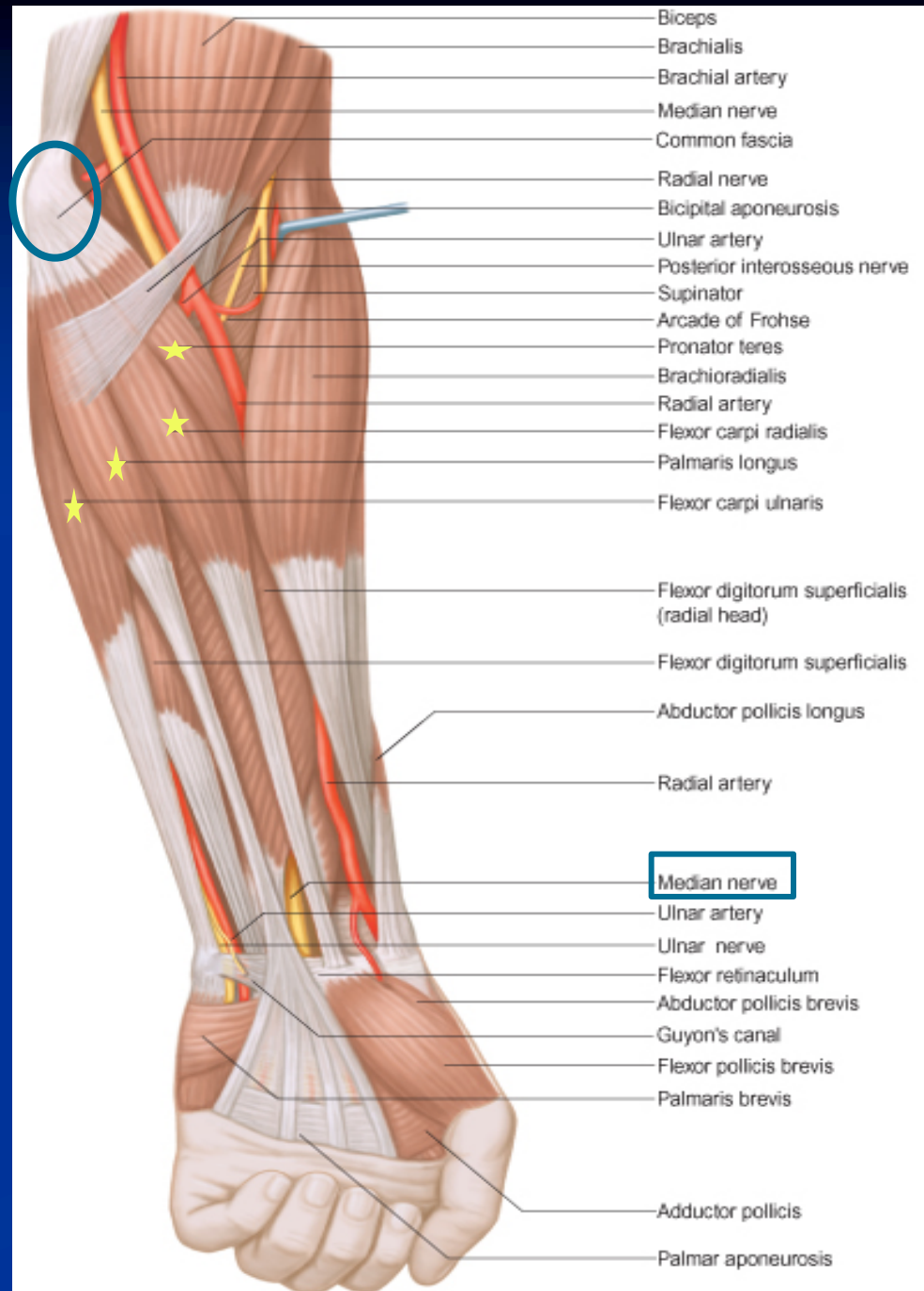
II-Intermediate: 1

- **Flexor digitorum superficialis**

III- Deep: 3

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

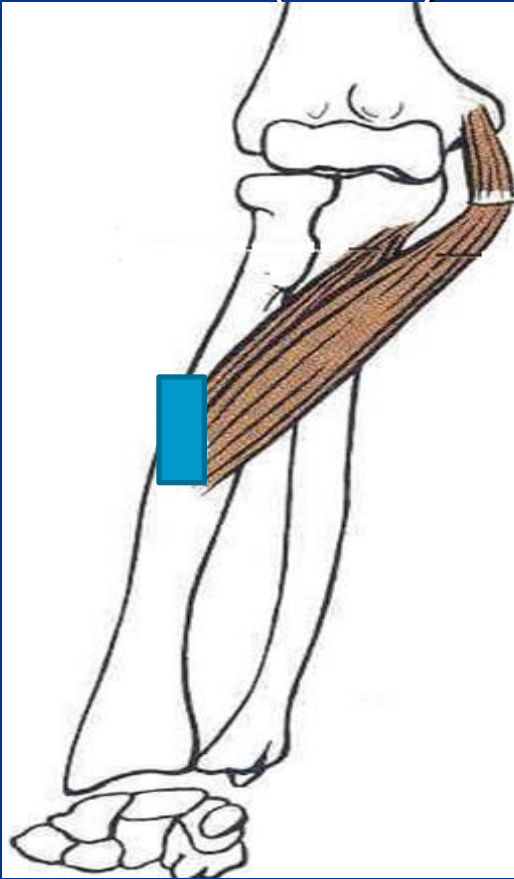
- **Superficial Flexors:**
- **They arise - more or less- from the common flexor origin (front of medial epicondyle).**
- **All are supplied by median nerve except one, **flexor carpi ulnaris, FCU (ulnar).****
- **All cross the wrist joint except one, **pronator teres, (PT).****



■ **Pronator teres**

Insertion: middle of lateral surface of radius

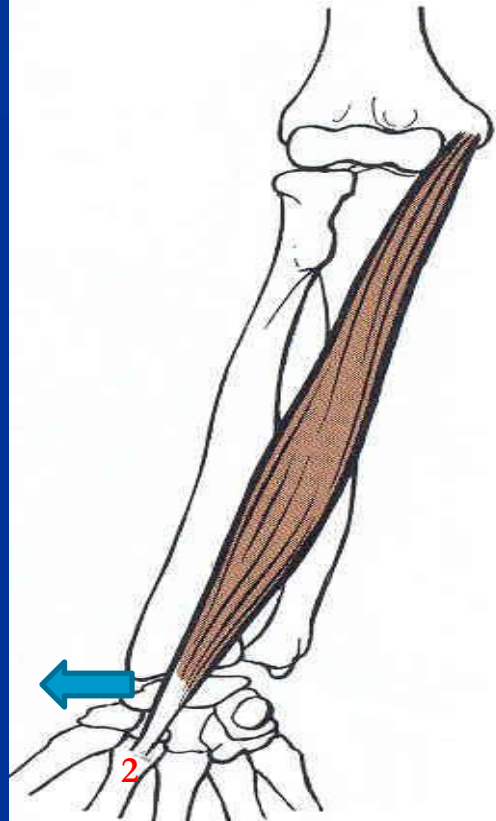
- **Action:** pronation & flexion of forearm (elbow) .



■ **Flexor Carpi Radialis**

- **Insertion:** Base of 2nd metacarpal bone

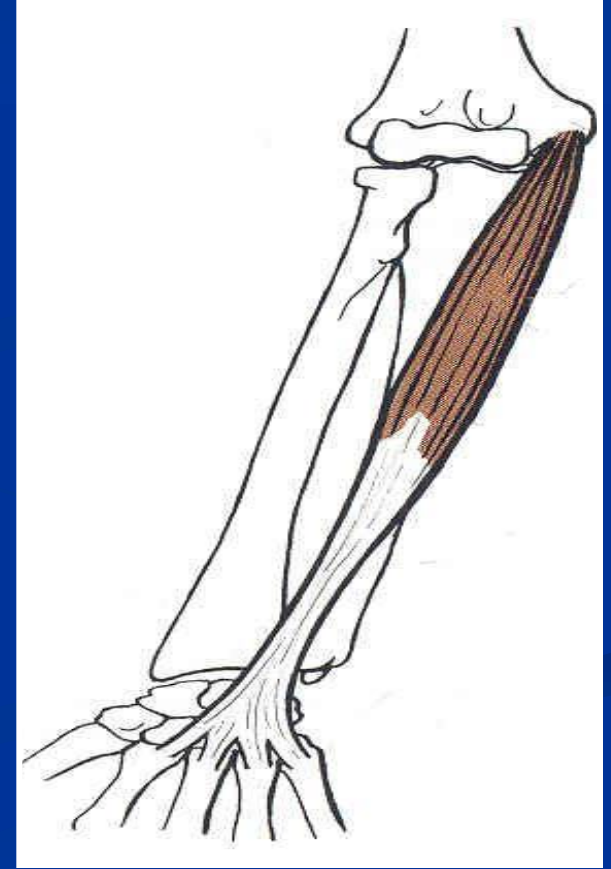
- **Action:** Flexion & abduction of the hand



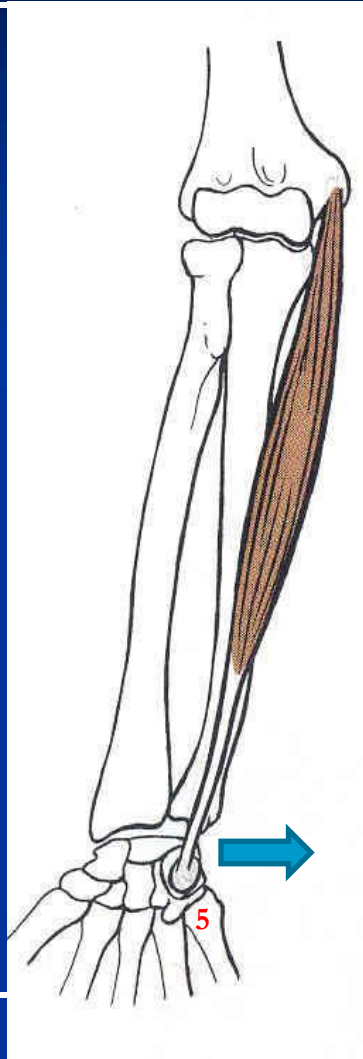
■ **Palmaris Longus**

Insertion: into the flexor retinaculum & palmar aponeurosis.

Action: Flexes hand & tightens palmar aponeurosis

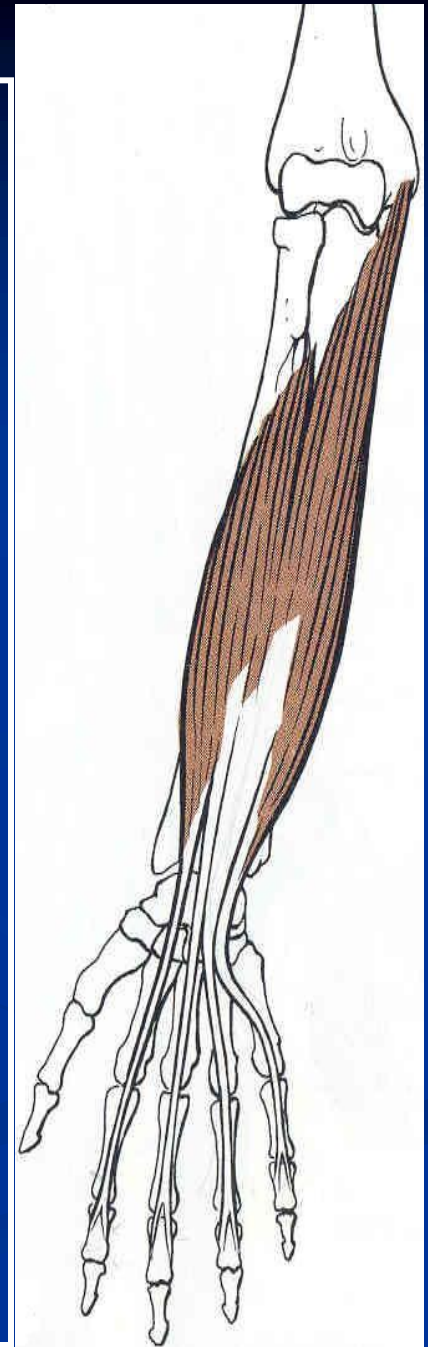


- **Flexor Carpi Ulnaris**
- **Insertion:**
- Pisiform,
- hook of hamate
- 5th metacarpal bone
- **Action:**
- Flexion and adduction of the hand.



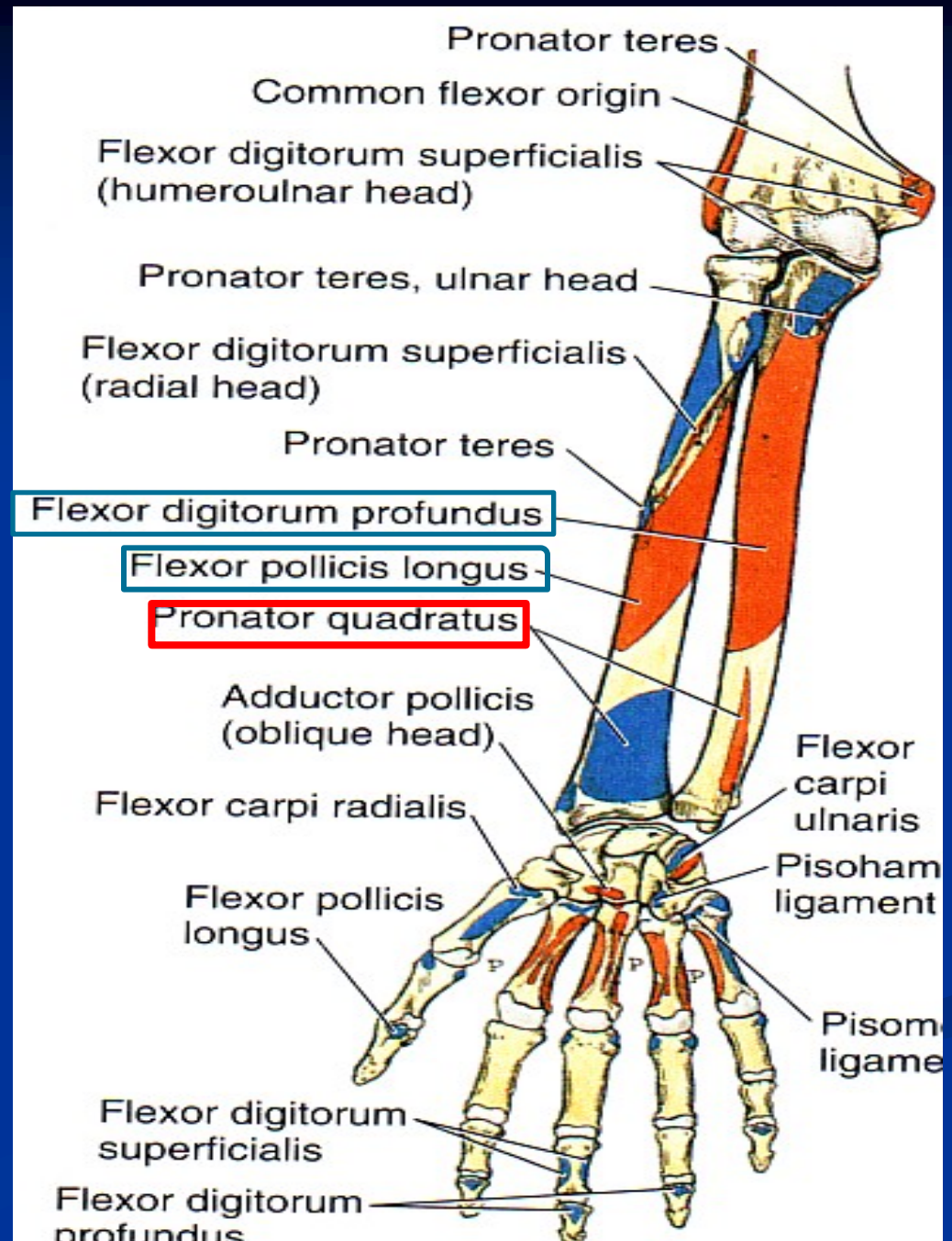
■ **Flexor Digitorum Superficialis**

- **Origin:**
- Common flexor origin,
- Coronoid process of ulna;
- Anterior surface of radius
- **Insertion:**
- base of middle phalanges of medial 4 fingers.
- **Action:**
- Flexes middle and proximal phalanges of medial 4 fingers, and the hand

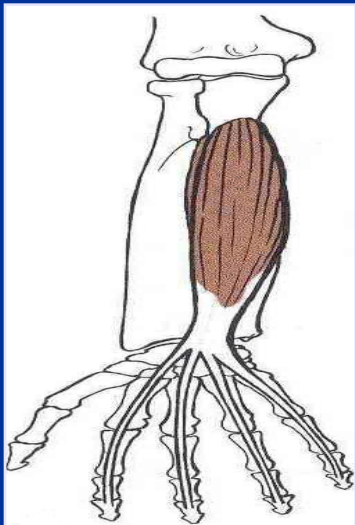


Deep Flexors

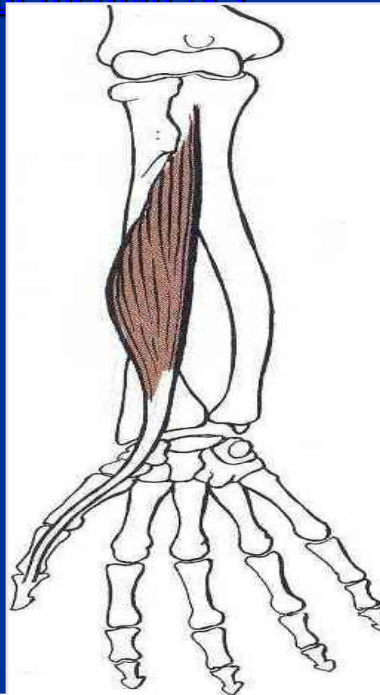
- One above ulna:
Flexor Digitorum profundus
- One above radius:
Flexor pollicis longus
- One above the 2 bones:
Pronator Quadratus.



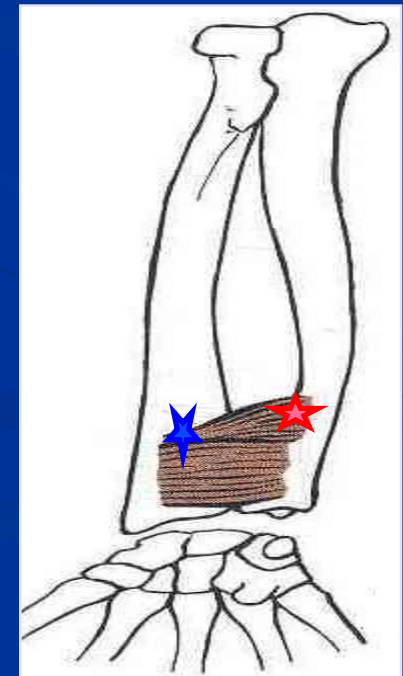
- **Flexor Digitorum Profundus**
- **Insertion:** bases of distal phalanges of medial 4 digits
- **Action:** Flexes **distal phalanges** of medial 4 digits.
- **N.Supply :**
Medial 1/2 : by ulnar N.
- Lateral 1/2 : by anterior interosseous nerve (branch of median N.)



- **Flexor Pollicis Longus**
- **Insertion:** Base of **distal phalanx** of thumb
- **Action:** flexes **interphalangeal, metacarpophalangeal & carpometacarpal joints** of thumb.
- **N.supply :** anterior interosseous nerve (branch of median N.)



- **Pronator Quadratus**
 - **Insertion:** distal fourth of ant. surface of radius
 - **Action:** pronates forearm (prime mover), helps to hold the bones together.
 - **N.supply :** anterior interosseous nerve (branch of median N.)



Supination and pronation

It occurs in the superior
and inferior radioulnar
joints;

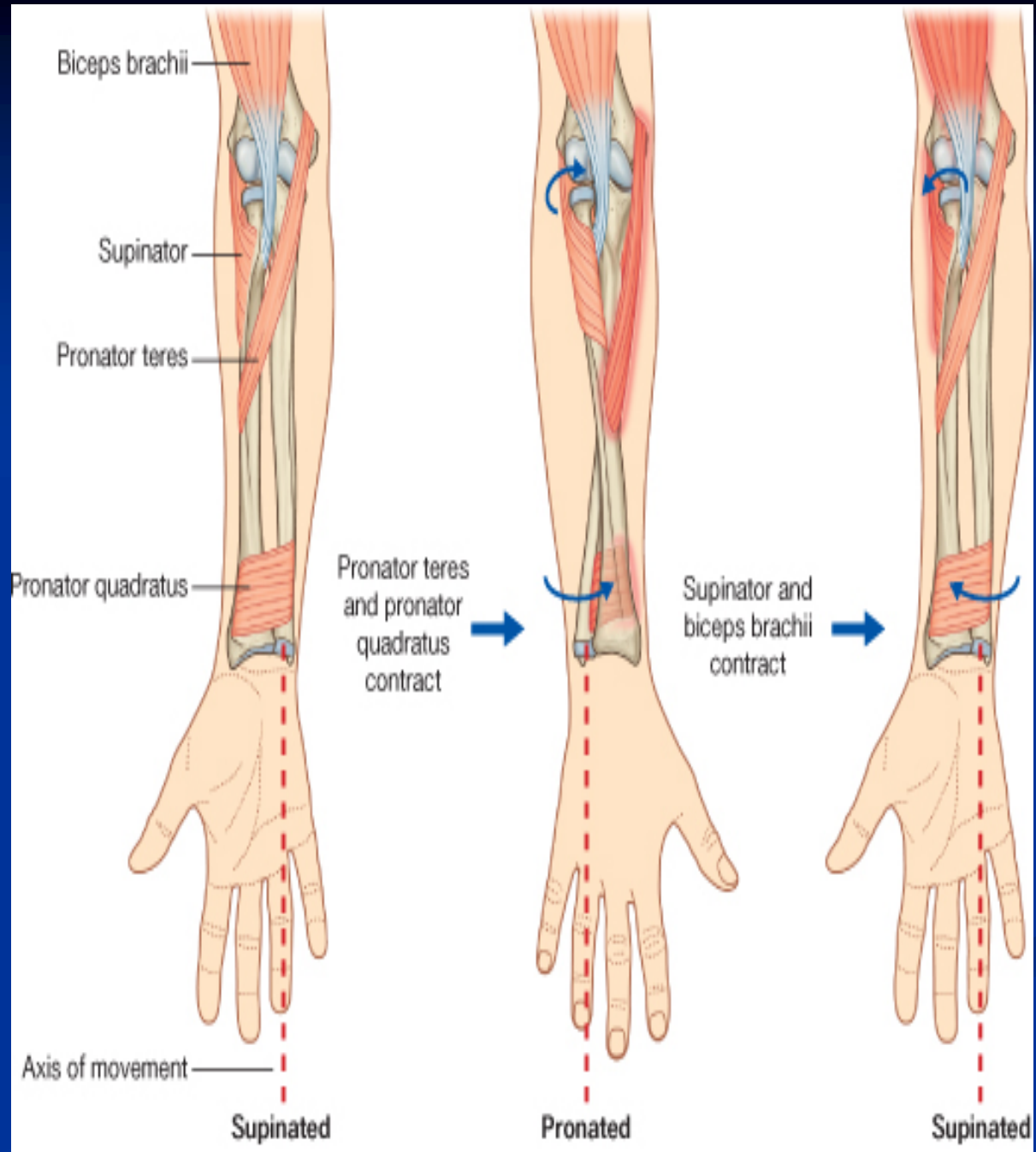
Muscles produce supination

- Biceps brachii.
- Supinator.

Muscles produce pronation

- Pronator teres.
- Pronator quadratus.

NB. **Brachioradialis** put
the forearm in **midprone-**
position.



Posterior compartment: 3 groups

Superficial Lateral group (2)

- ❖ Brachioradialis
- ❖ Extensor carpi radialis longus

Common Extensor
Origin .
(front of lateral
epicondyle).

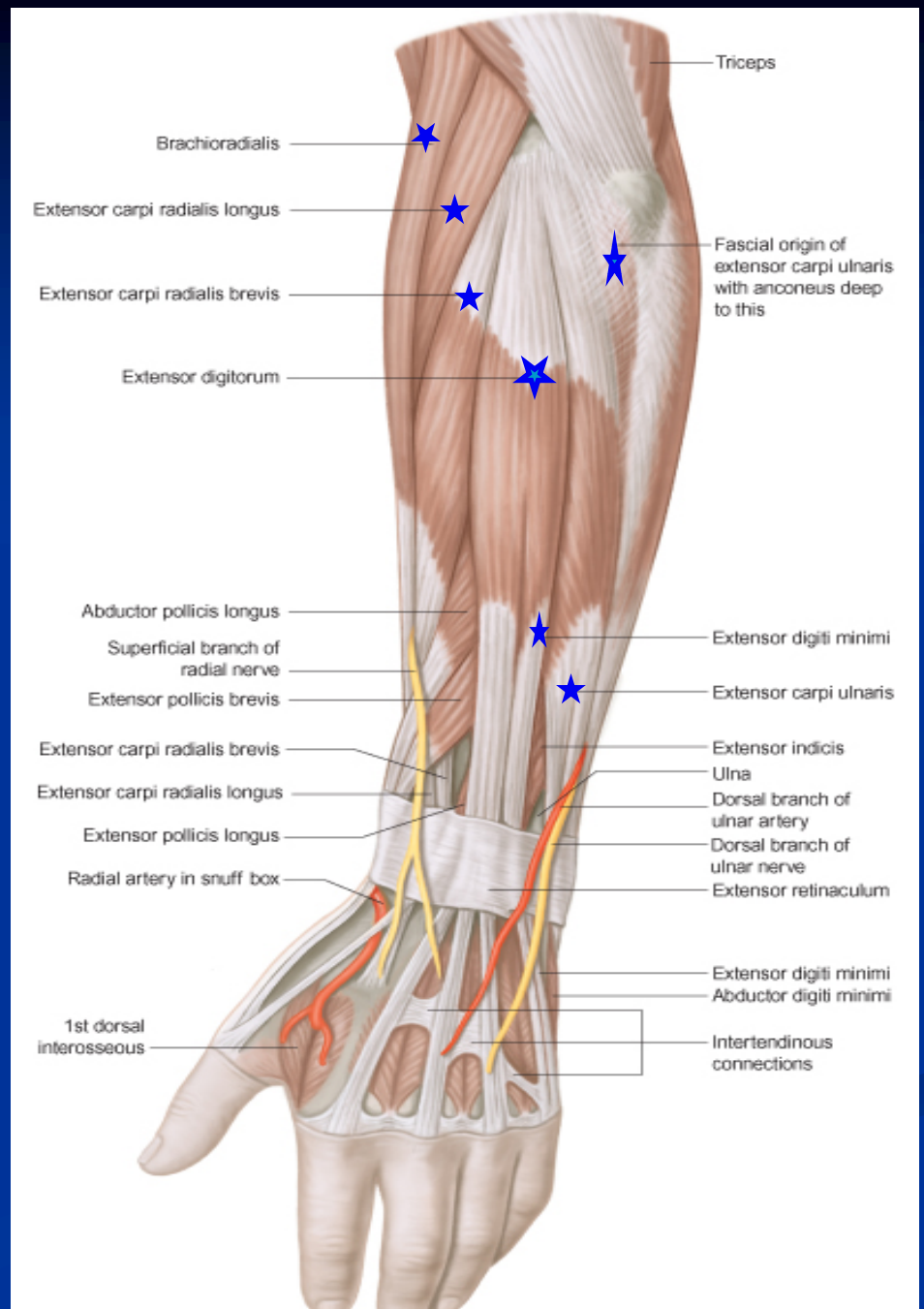
Superficial group (5)

- Extensor carpi radialis brevis
- Extensor digitorum
- Extensor digiti minimi
- Extensor carpi ulnaris
- Anconeus

Deep group (5)

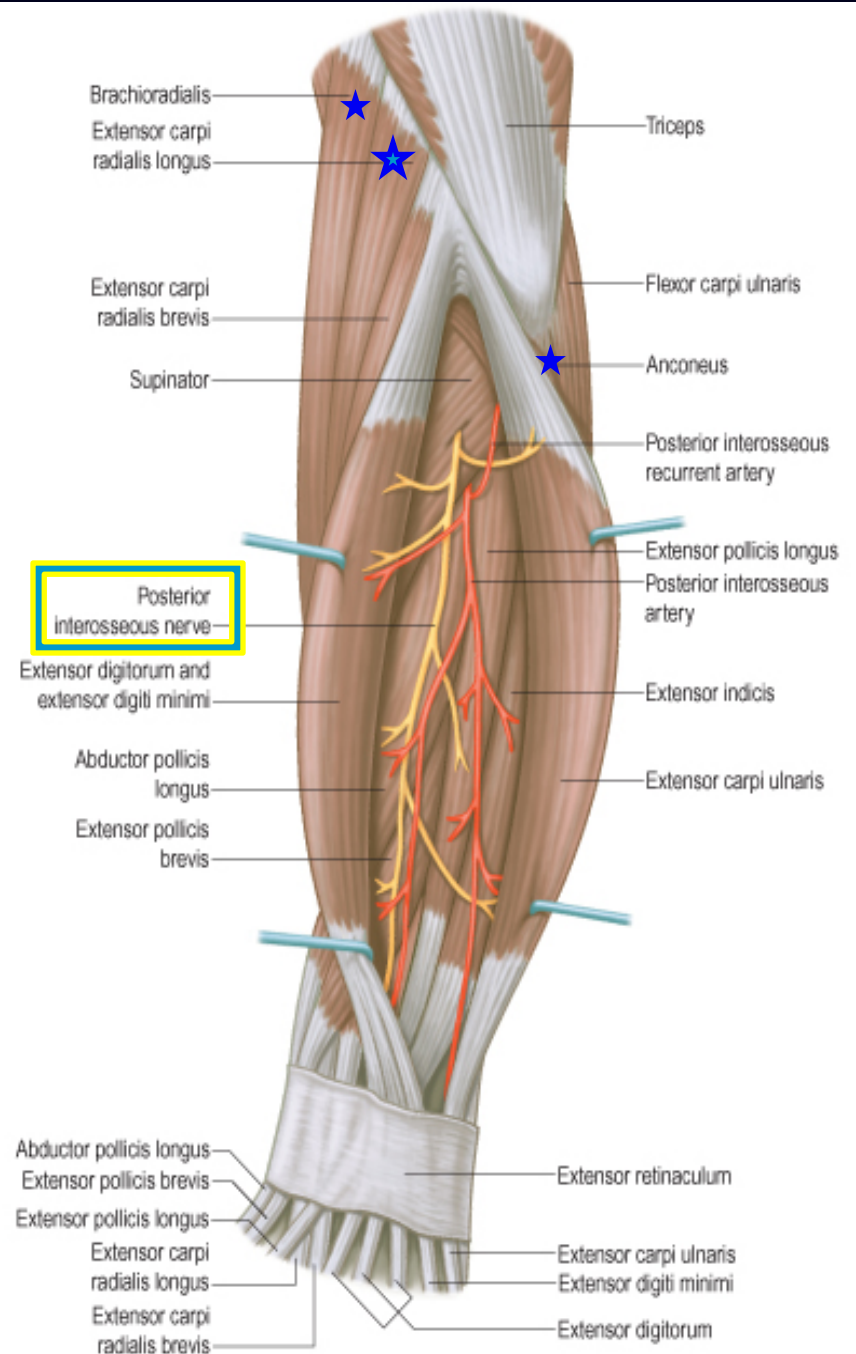
- (3 to thumb + 1 to index + supinator).
- Supinator.
 - Abductor pollicis longus.
 - Extensor pollicis brevis.
 - Extensor pollicis longus.
 - Extensor indices.

- **Posterior compartment:**
- **Superficial group:**
- **7 muscles** (from lateral to medial) :
- Brachioradialis, (BR).
- Extensor carpi radialis longus, (ECRL).
- Extensor carpi radialis brevis, (ECRB).
- Extensor digitorum, (ED).
- Extensor digiti minimi, (EDM).
- Extensor carpi ulnaris, (ECU).
- Anconeus. (An).



Superficial extensors

- All arises from the **common extensor origin**, (front of lateral epicondyle of the humerus), **EXCEPT 2 (BR & ECRL)**.
- All cross the wrist **EXCEPT**, one, **brachioradialis**.
- All supplied by deep branch of radial nerve, **EXCEPT ABE**
- **A, anconeus**
- **B, Brachioradialis**
- **E, Extensor carpi radialis longus**
- **These 3 muscles are supplied by the radial nerve itself**



■ **Brachioradialis**

■ **Origin:**

■ Lateral supracondylar ridge of humerus

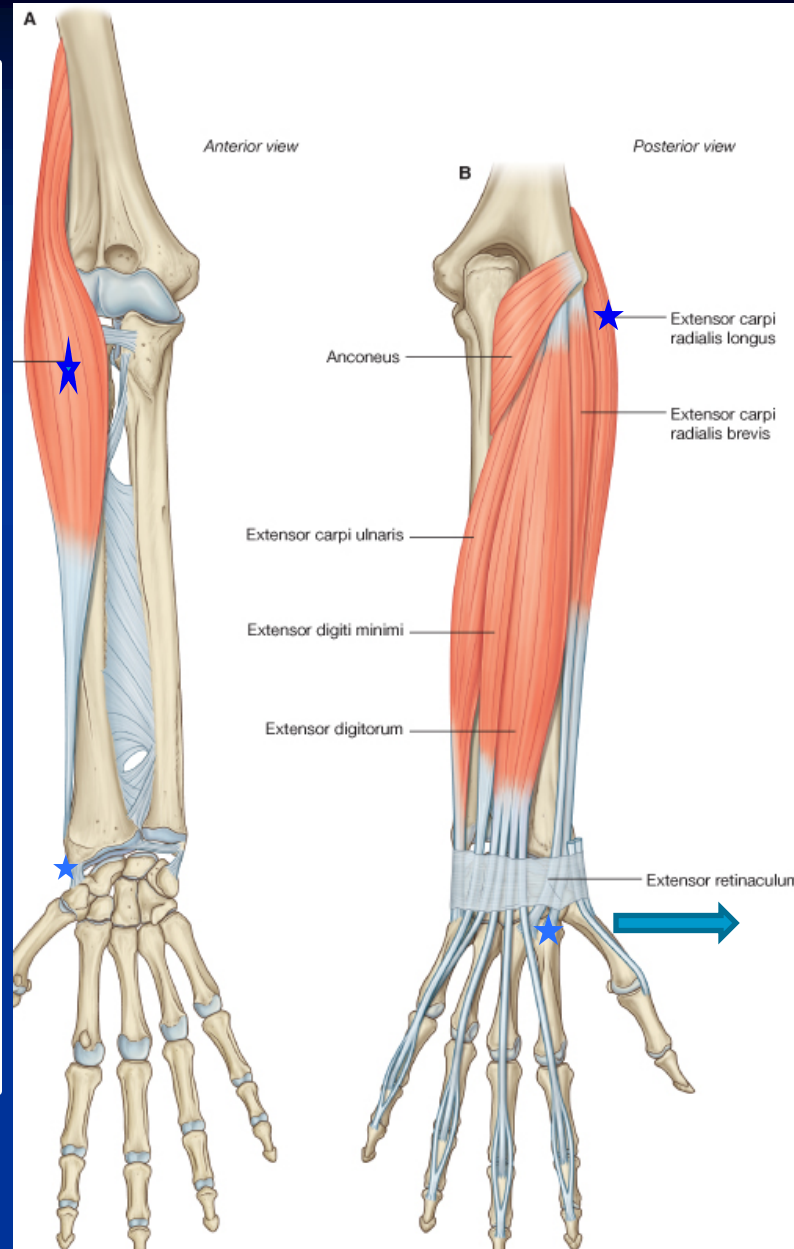
■ **Insertion:**

■ Base of styloid process of radius

■ **Action:**

■ Flexes forearm; (elbow).

■ Rotates forearm to the **midprone position**



■ **Extensor Carpi radialis longus**

■ **Origin:**

■ Lateral supracondylar ridge of humerus

■ **Insertion:**

■ Posterior surface of base of 2nd metacarpal bone

■ **Action:**

■ **Extends** and **abducts hand** at wrist joint

INSERTION

Extensor carpi radialis brevis:

base of 3rd metacarpal bone.

Extensor digitorum:

Extensor expansion of the medial 4 fingers.

Extensor digiti minimi:

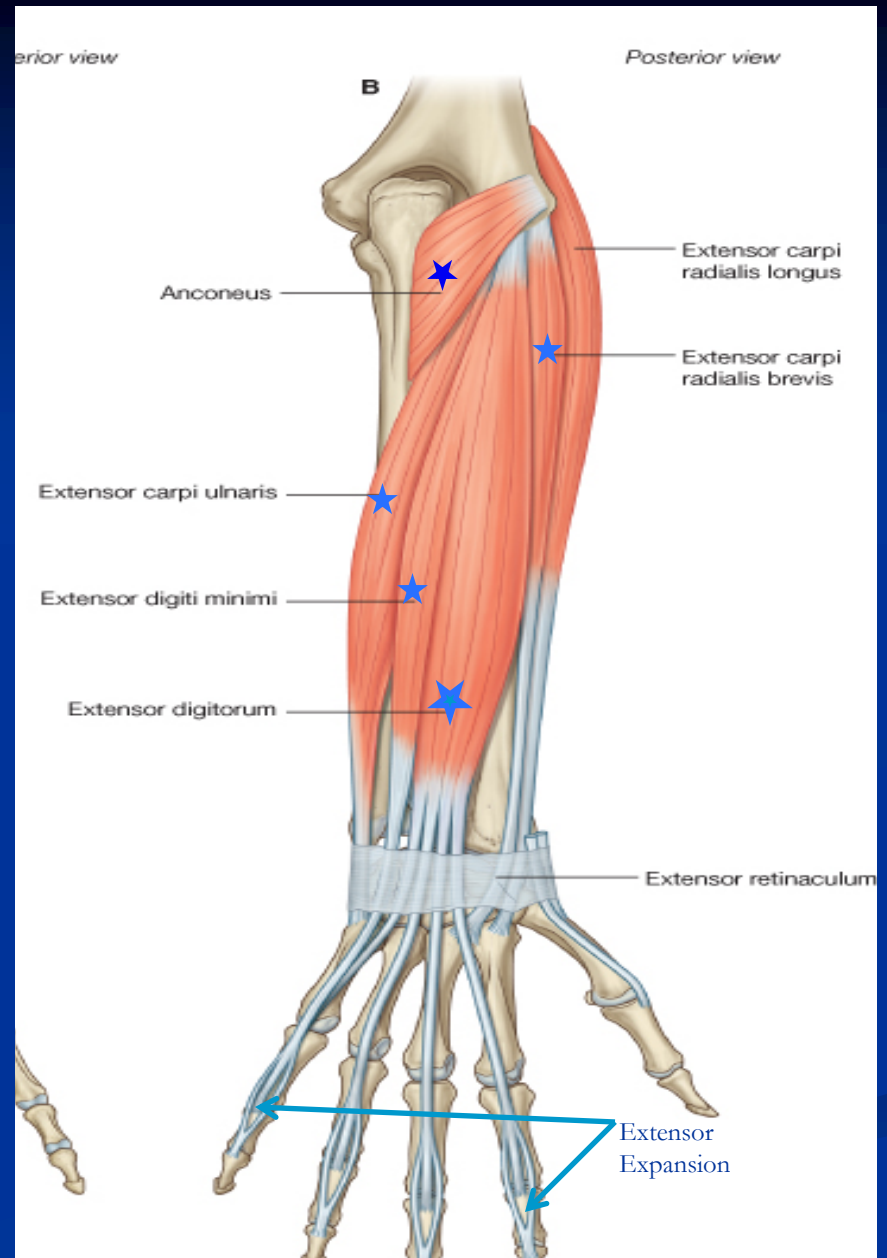
Extensor expansion of the little finger.

Extensor carpi ulnaris:

Base of the 5th metacarpal bone.

Anconeus :

Upper back of shaft of ulna.

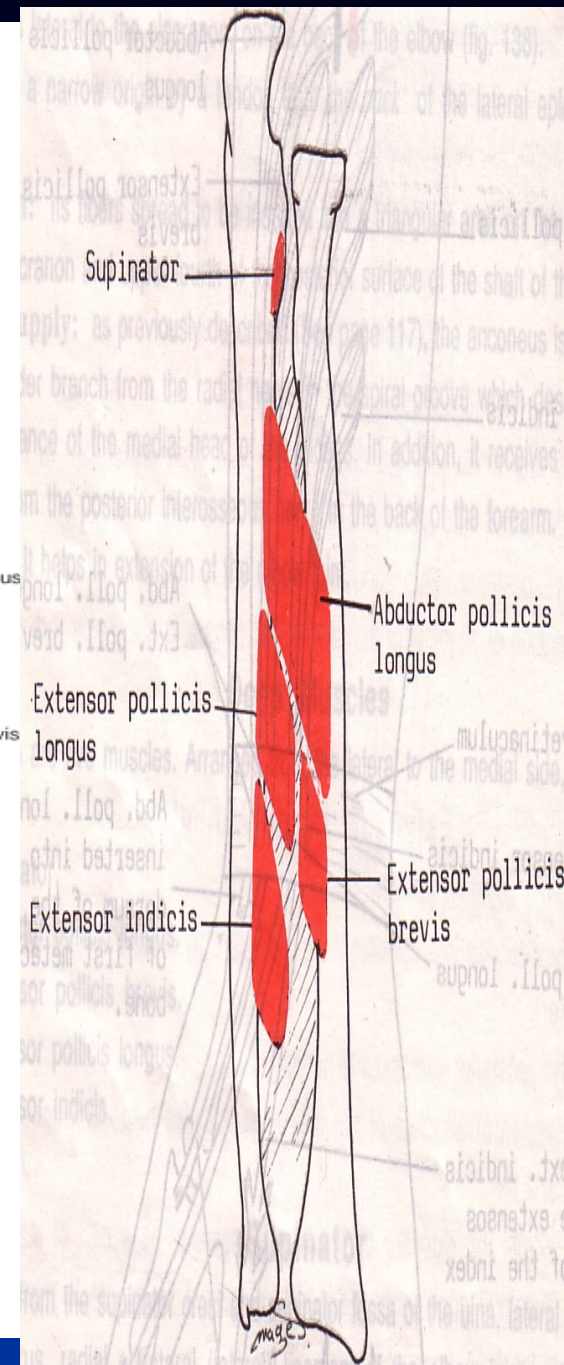
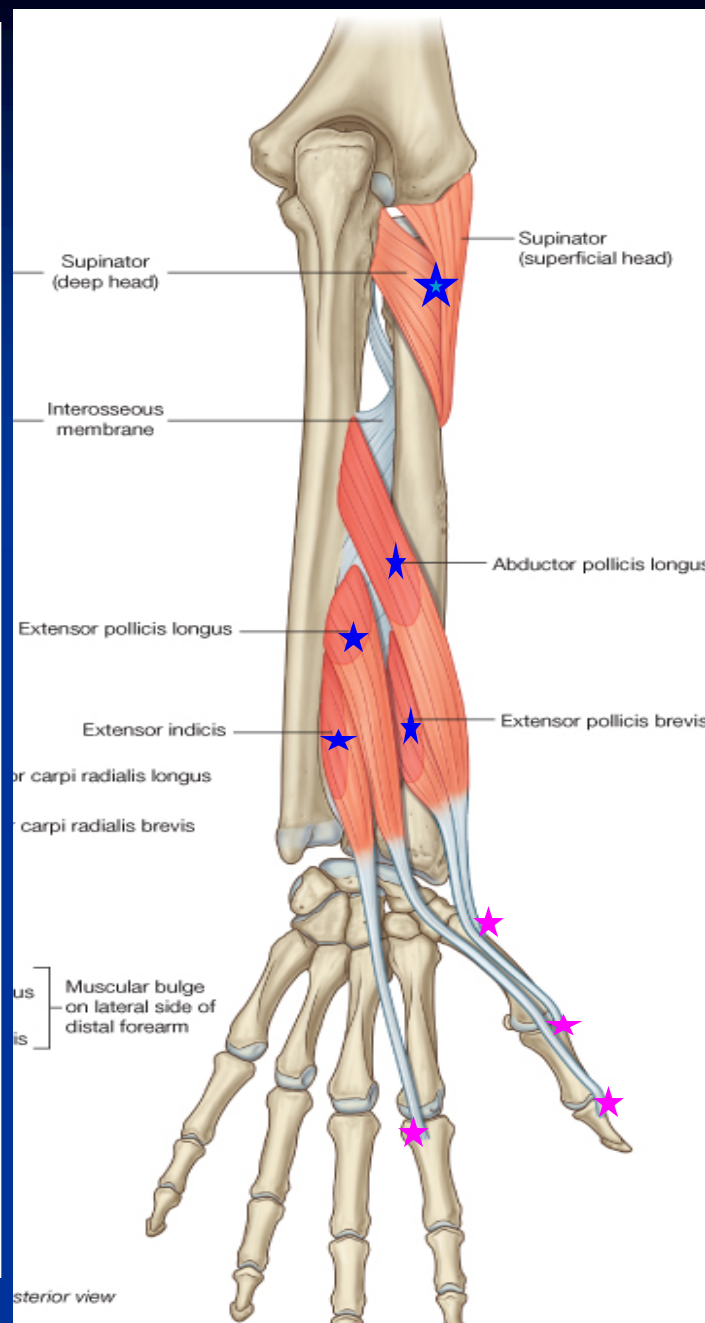


II- Deep group:

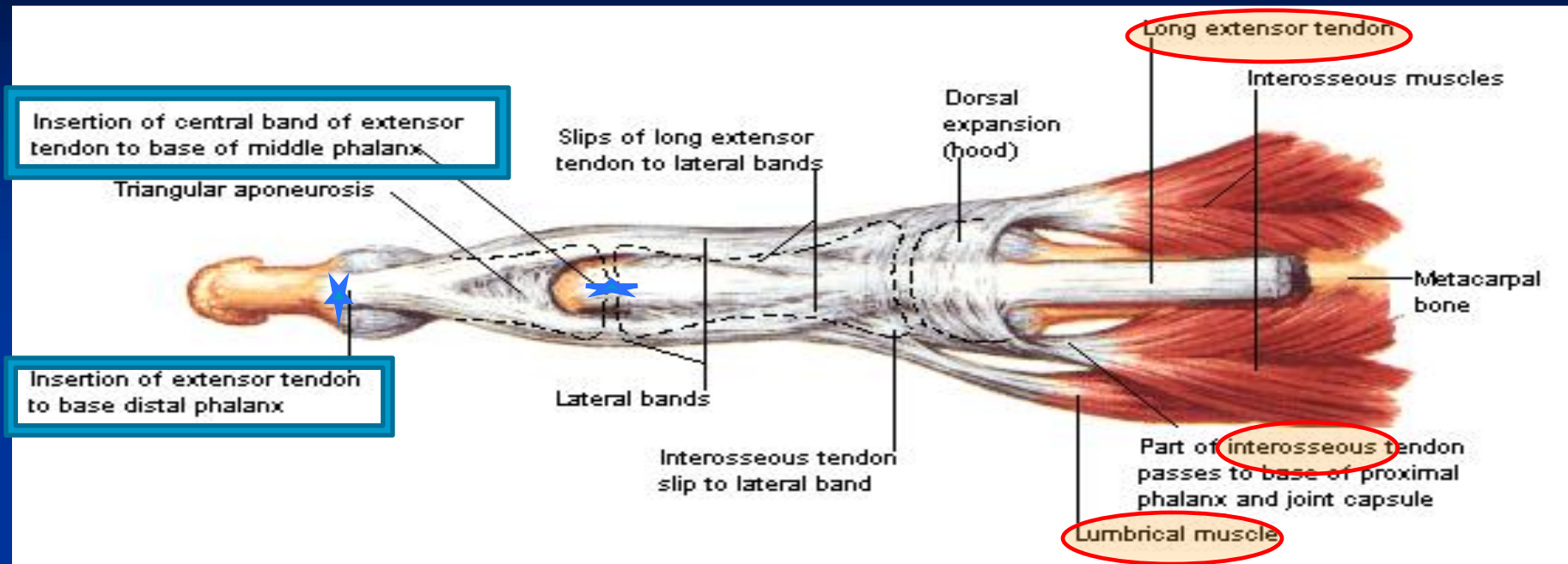
5 muscles

- 1- Abductor pollicis longus, (APL).
- 2- Extensor pollicis brevis, (EPB).
- 3- Extensor pollicis longus, (EPL).
- 4- Extensor indicis (EI).
- 5- Supinator.

• All back muscles of forearm are supplied by posterior interosseous nerve except, ABE by Radial nerve.



Dorsal Extensor Expansion



- It is formed on the dorsum of medial 4 fingers by : the union of the tendons of : **Extensor digitorum, Extensor digiti minimi, Extensor indicis**, palmar and dorsal **interossei** and **lumbricals** muscles.
- All these tendons unite to form one tendon which divides into 3 slips, a median one attached to middle phalanges and 2 lateral attached to the terminal phalanges.

THANK YOU

1. Which one of the following muscles contributes as powerful supinator of forearm?

- a. Palmaris longus.
- b. Pronator teres.
- c. Biceps brachii. ←
- d. Supinator..

2. Which muscle is supplied by median nerve ?

- a. Anconeus.
- b. Brachioradialis.
- c. Extensor carpi radialis longus.
- d. Flexor digitorum superficialis. ←

3. Which muscle is related to common flexor origin ?

- a. Flexor digitorum profundus.
- b. Flexor pollicis longus.
- c. Pronator quadratus.
- d. Pronator teres. ←