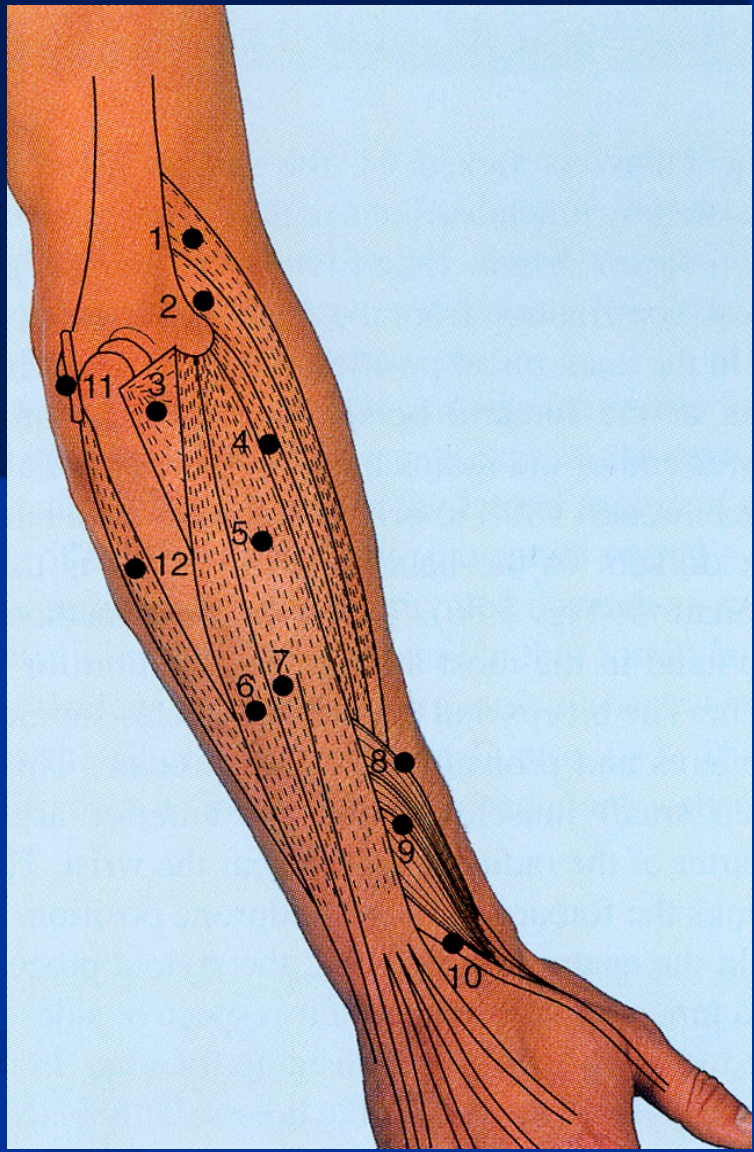
FOREARM

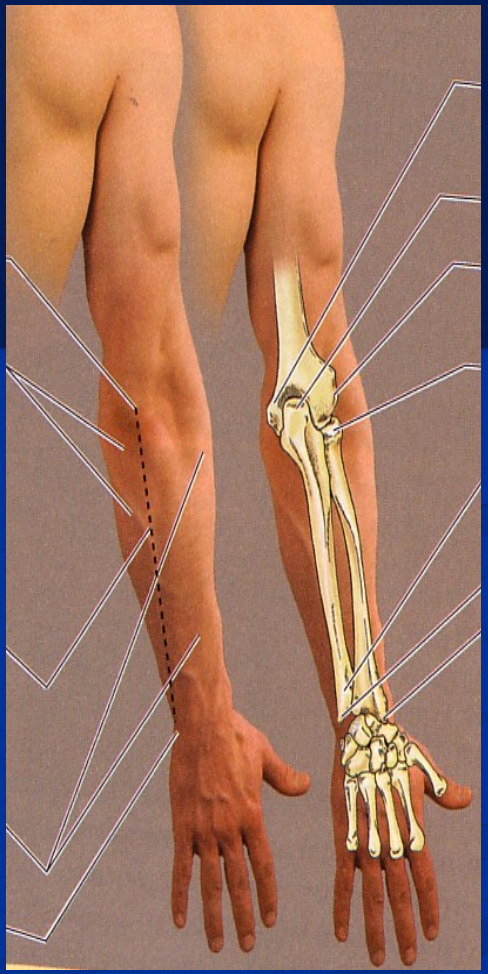


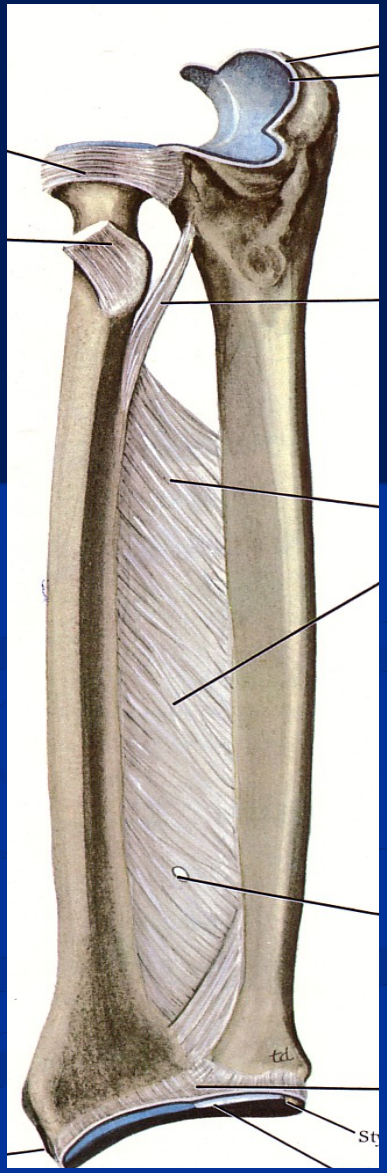
BY DR .SANAA ALSHAARAWY

OBJECTIVES

- At the end of this lecture, the student should 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 & poronation 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 musles and their innervation & movements.

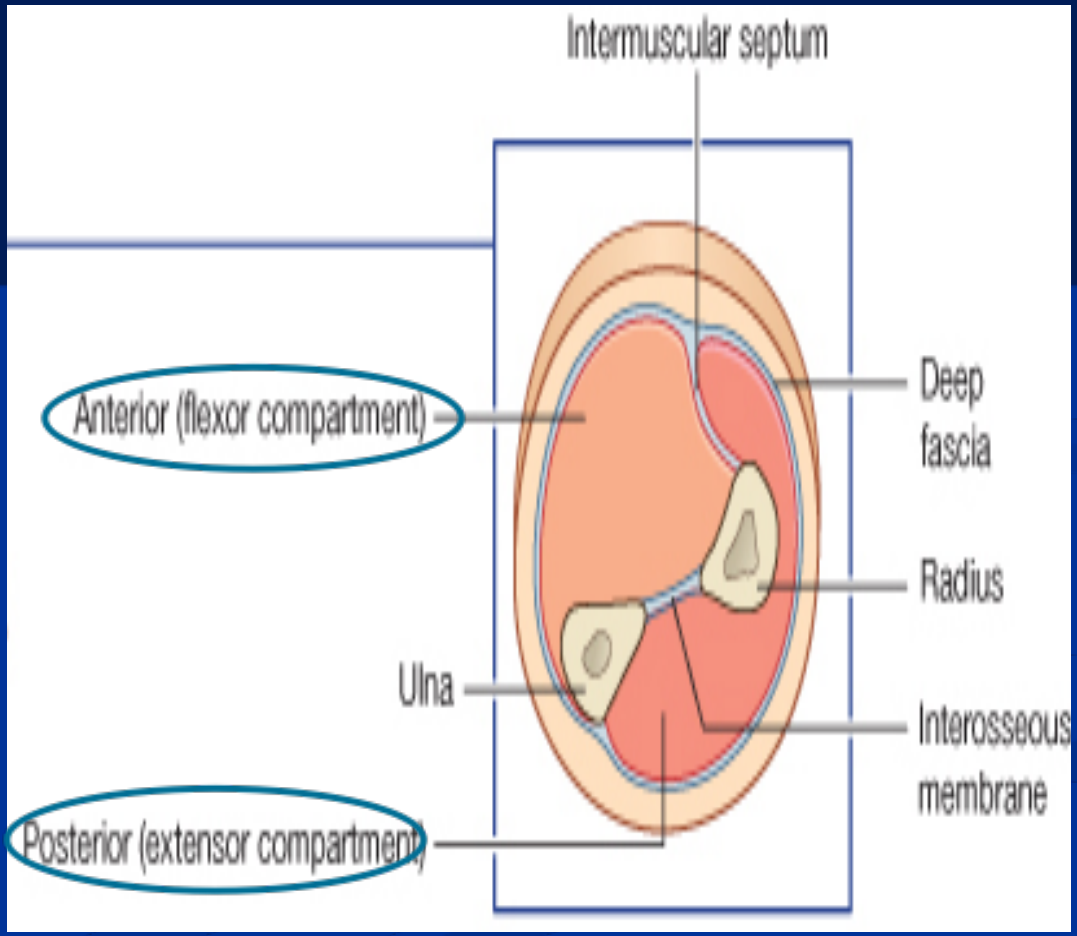
- **The forearm** extends from elbow to wrist.
- It posses two bones radius laterally & Ulna medially.
- The two bones are connected together by the interosseous membrane.
- This membrane allows movement of **Pronation** and **Supination** while the two bones are connected together.
- Also it gives origin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

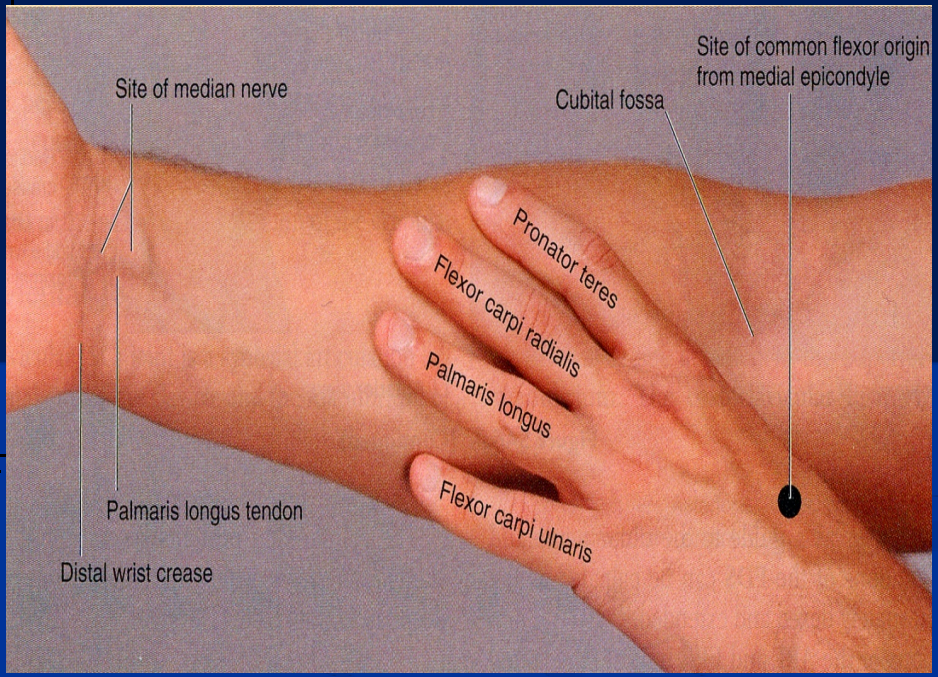


FLEXOR GROUP

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**

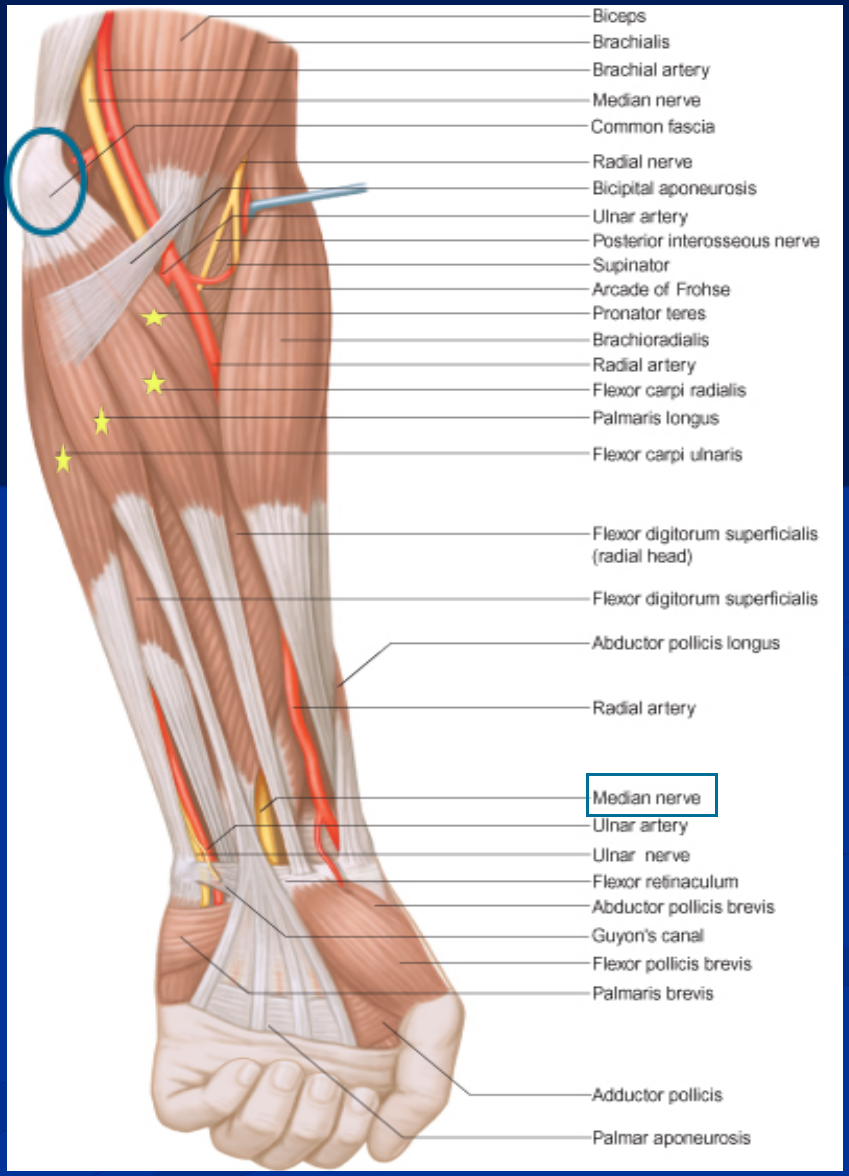
II-Intermediate: 1

- **Flexor digitorum superficialis**

III- Deep: 3

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

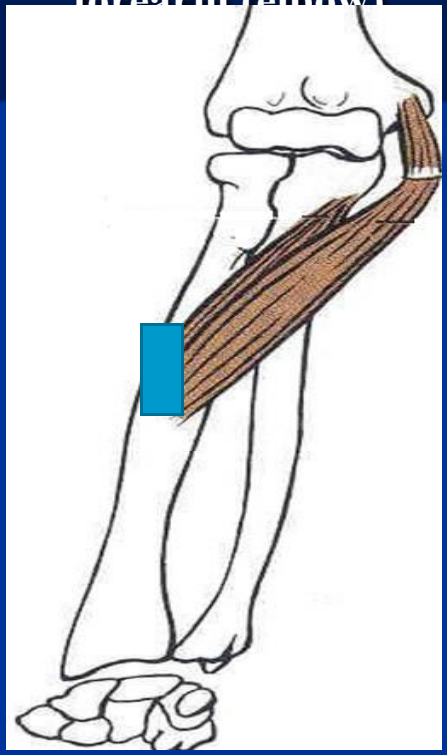
- **Superficial Flexors:**
- They arise - more or less- from the common flexor origin (front of medial epicondyle).
- All are supplied by median nerve except one, flexor carpi ulnaris, FCU (ulnar).
- All cross the wrist joint except one, pronator teres, (PT).



Pronator teres

Insertion: middle of lateral surface of radius

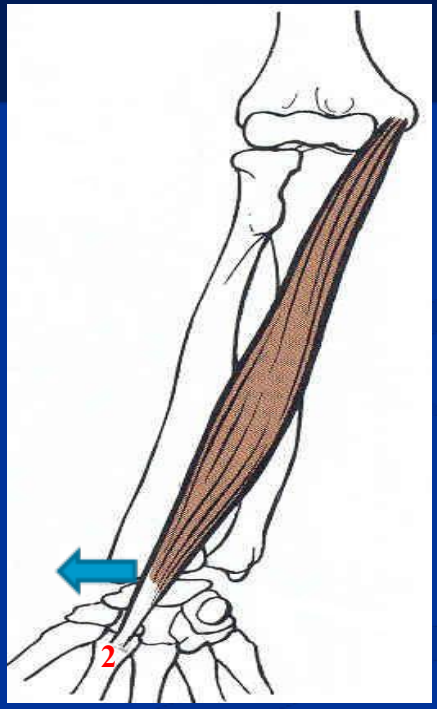
Action: pronation & flexion of forearm (elbow)



Flexor Carpi Radialis

Insertion: Base of 2nd metacarpal bone

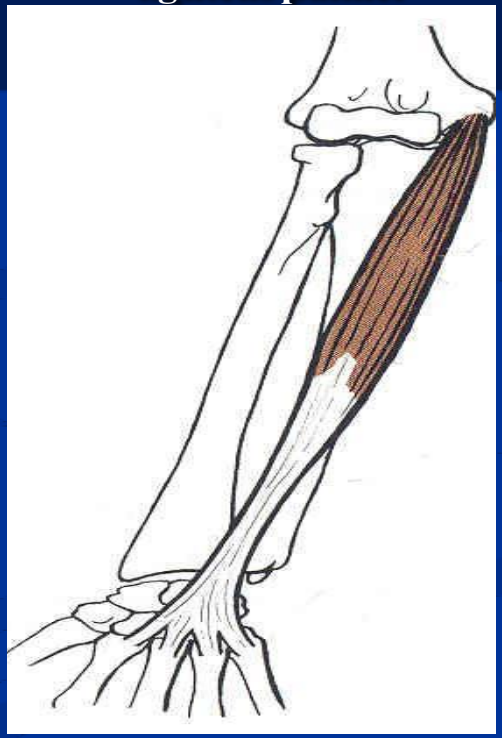
Action: Flexion & abduction of the hand



Palmaris Longus

Insertion: into the flexor retinaculum & palmar aponeurosis.

Action: Flexes hand & tightens palmer



Flexor Carpi Ulnaris

Insertion:

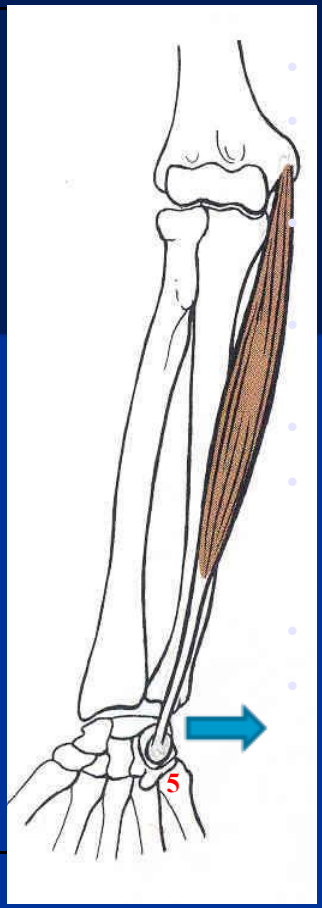
Pisiform,

hook of hamate

5th metacarpal bone

Action:

Flexion and adduction of the hand.



Flexor Digitorum Superficialis

Origin:

Common flexor origin,

Coronoid process of ulna;

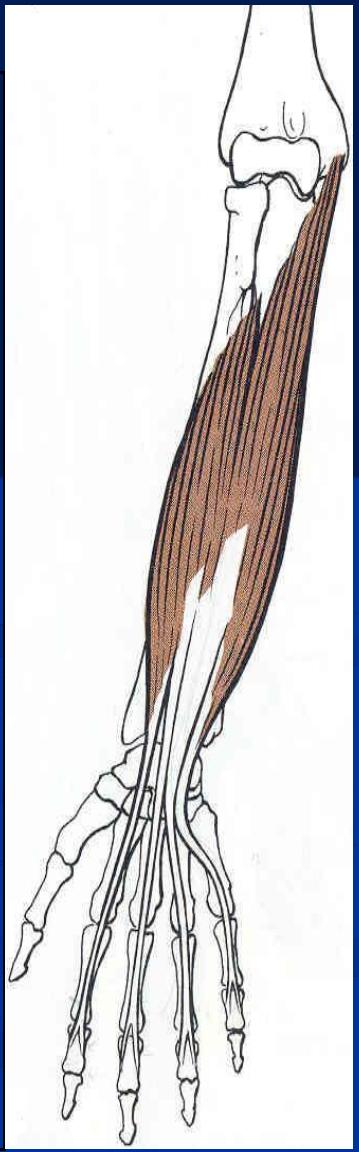
Anterior surface of radius

Insertion:

base of middle phalanges of medial 4 fingers.

Action:

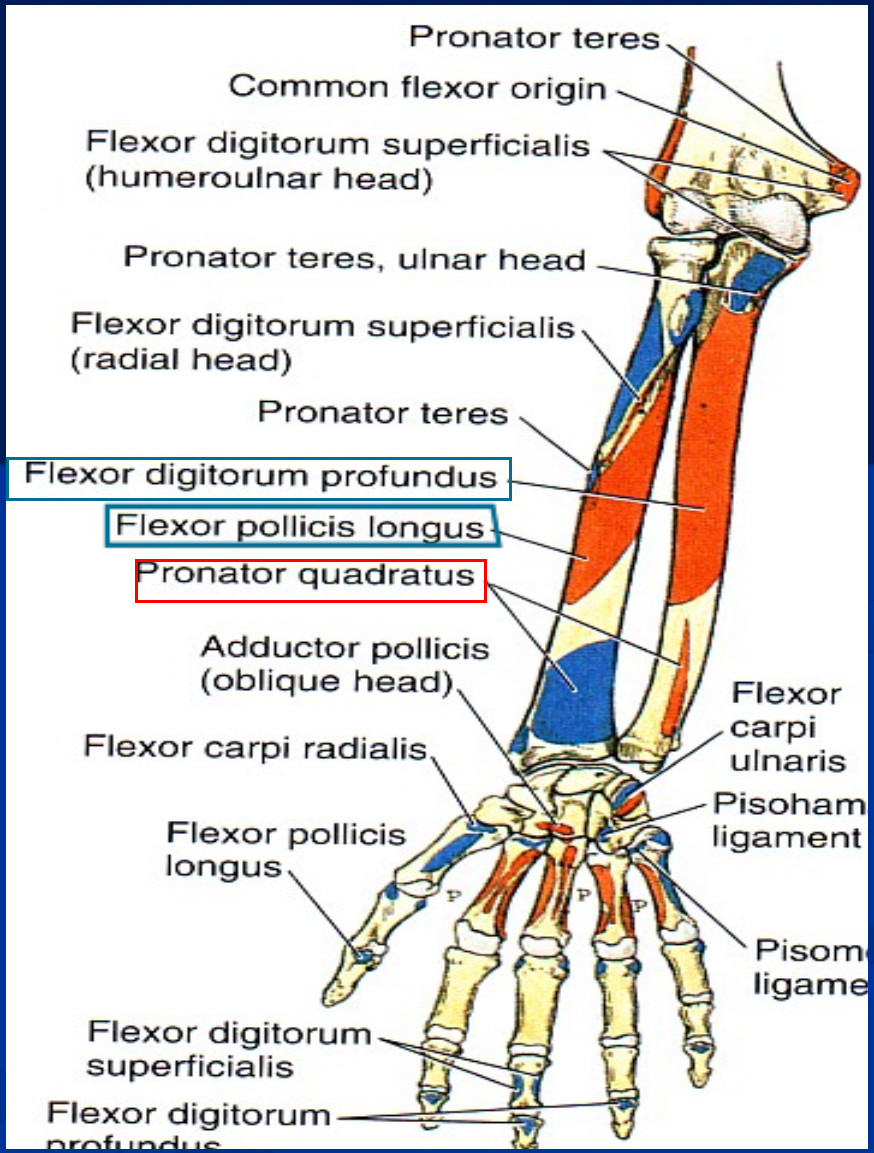
Flexes middle and proximal phalanges of medial 4 fingers, and the hand



Deep Flexors

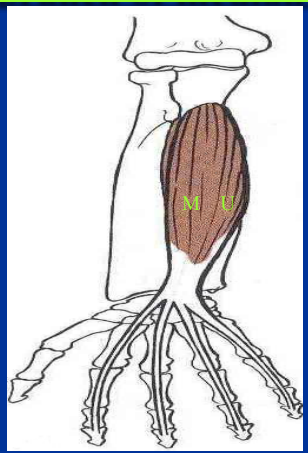
- **One above ulna**: Flexor Digitorum profundus
- **One above radius**: Flexor pollicis longus
- **One above the 2 bones:**

Pronator Quadratus.



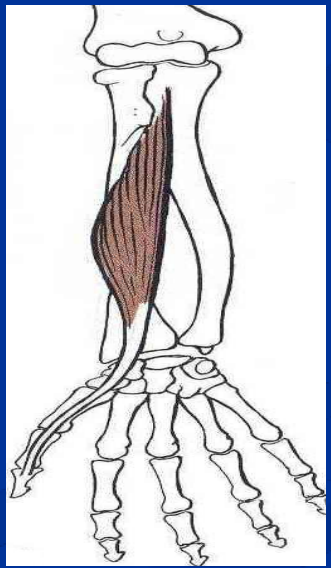
Flexor Digitorum Profundus

- **Insertion:** bases of distal phalanges of medial 4 digits
- **Action:** Flexes distal phalanges of medial 4 digits.
- **N.Supply :**
  Medial ½ : by ulnar N.
  Lateral ½ : by anterior interosseous nerve (branch of median N.)



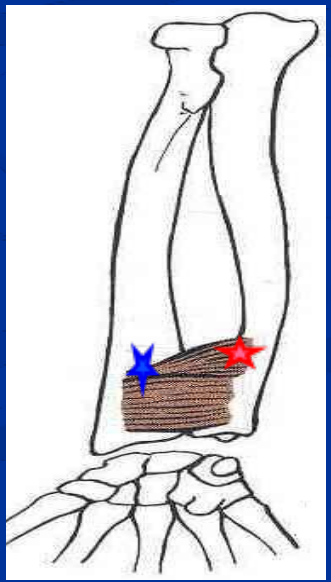
Flexor Pollicis Longus

- **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;

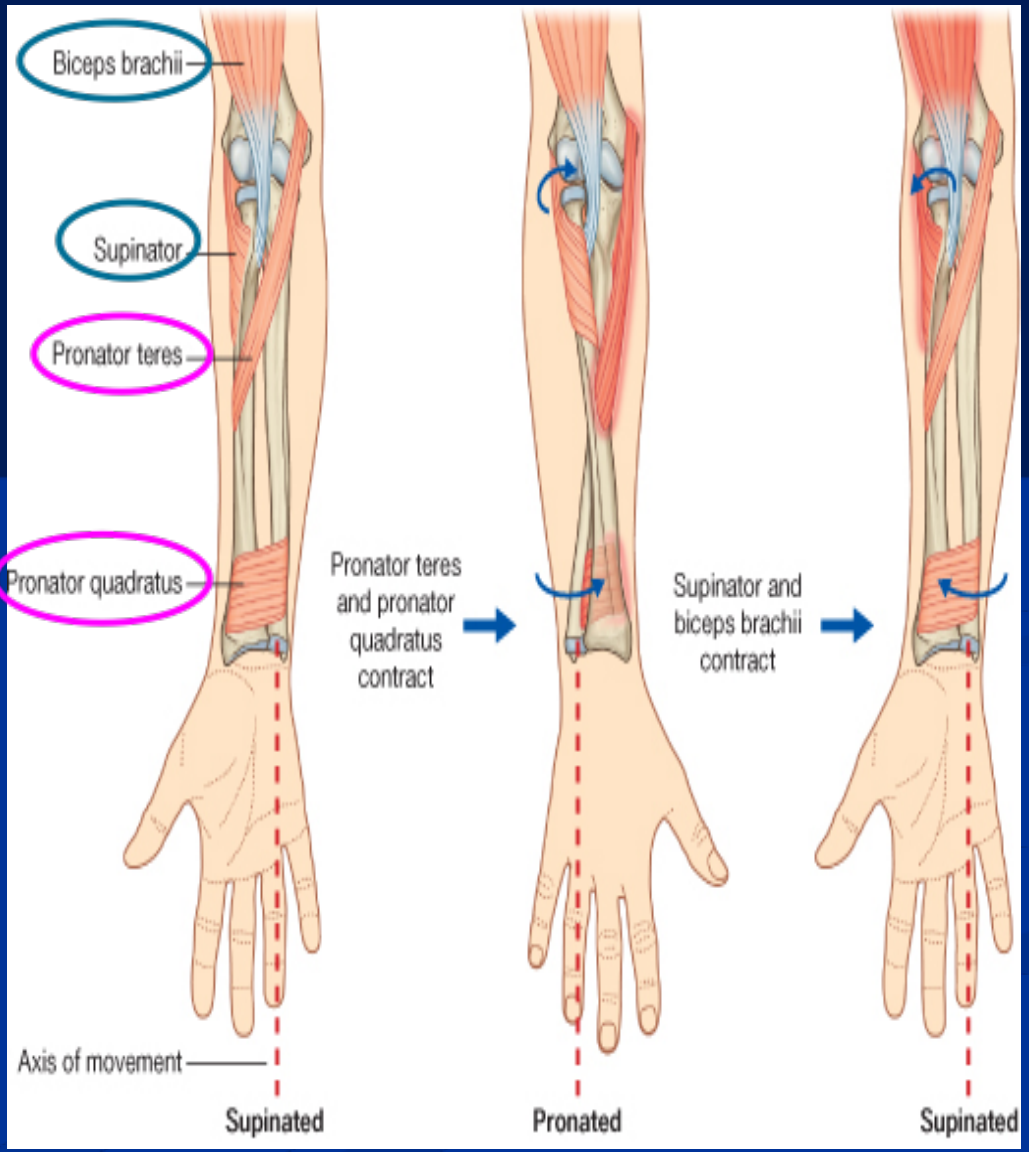
Muscles produce supination

- 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).

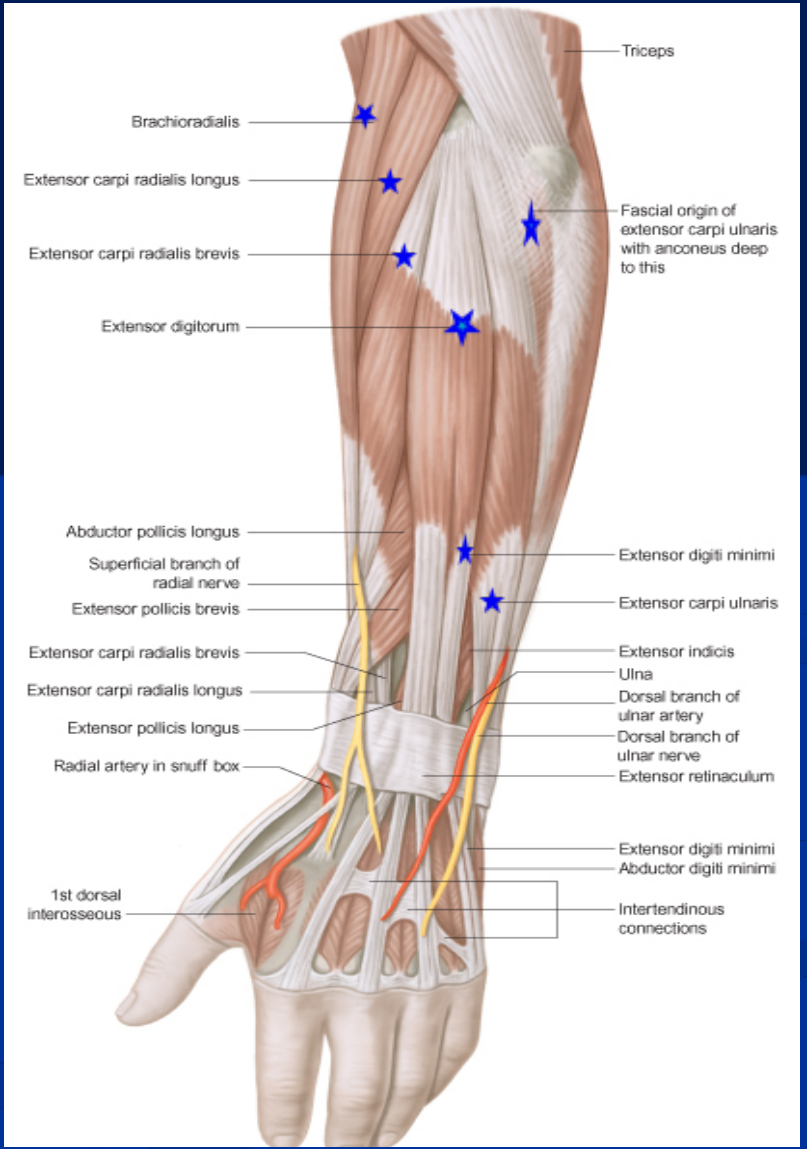
Superficial group (5)

- 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.

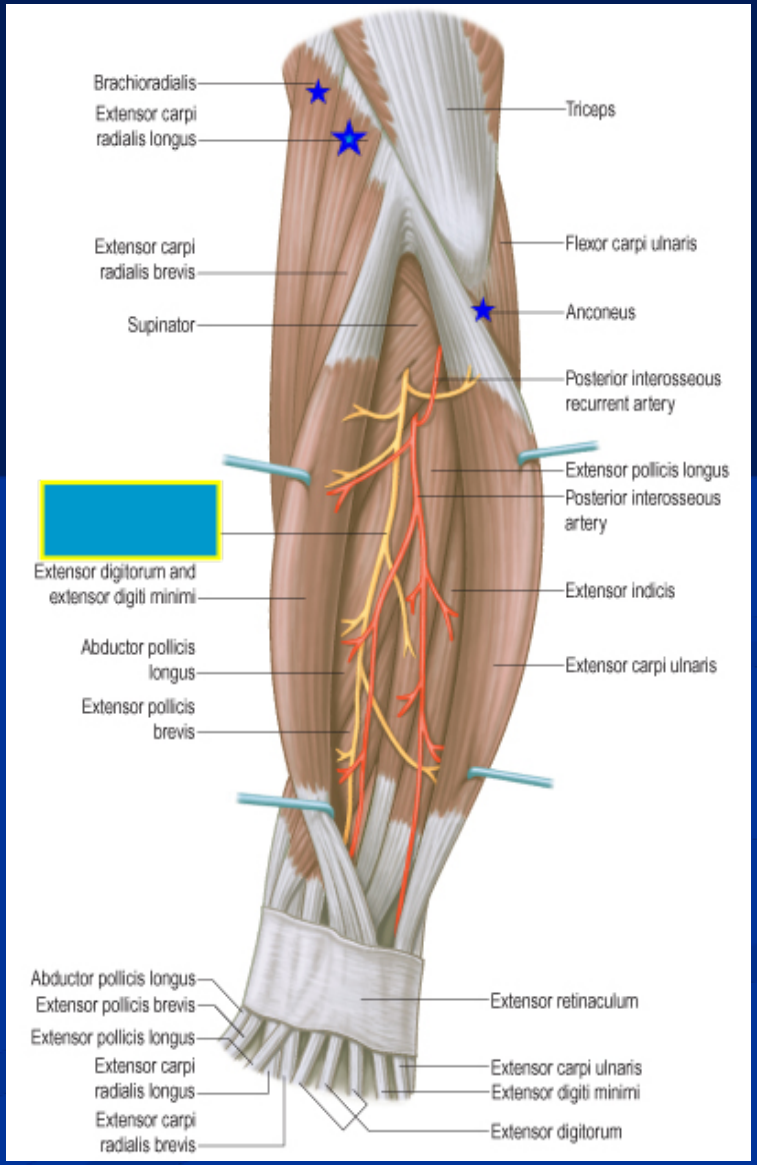
All supplied by deep branch of radial nerve, EXCEPT ABE

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

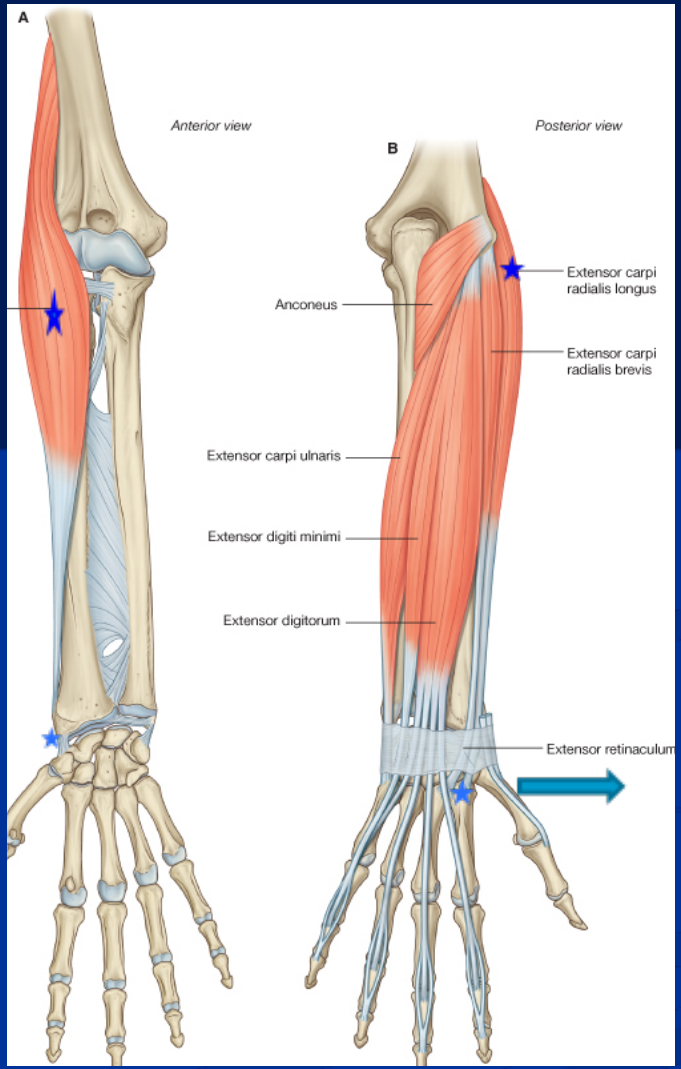
Insertion:

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

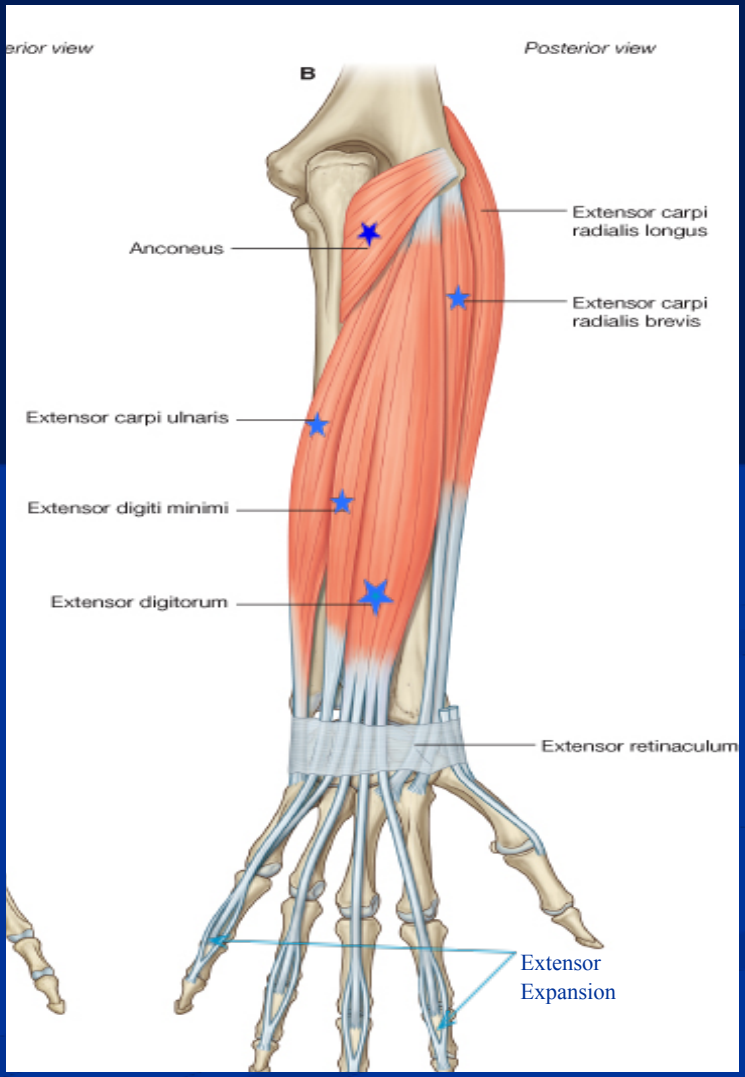
Extensor carpi radialis brevis: base of 3rd metacarpal bone.

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).

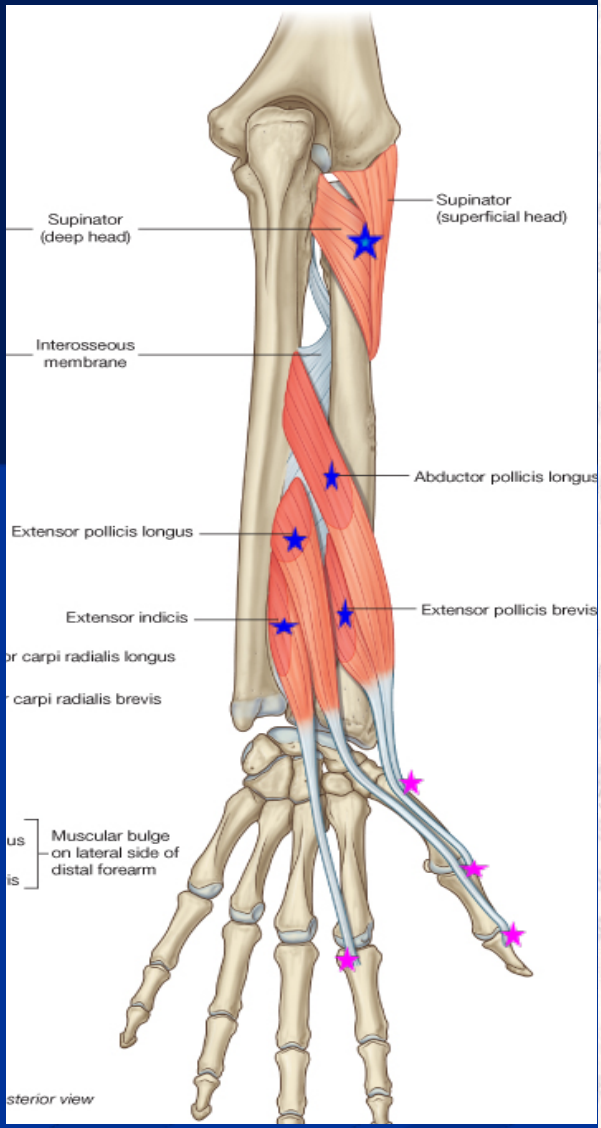
2- Extensor pollicis brevis, (EPB).

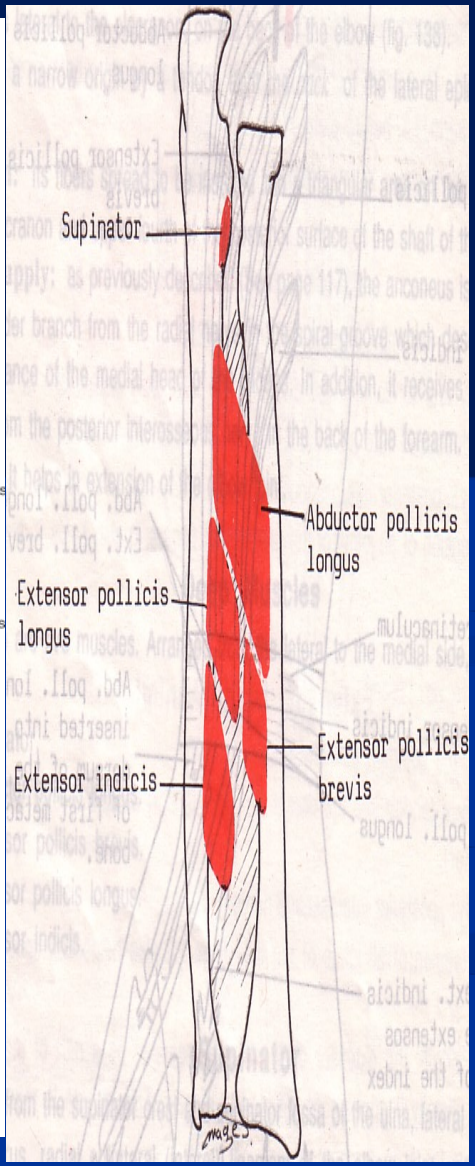
3- Extensor pollicis longus, (EPL).

4- Extensor indicis (EI).

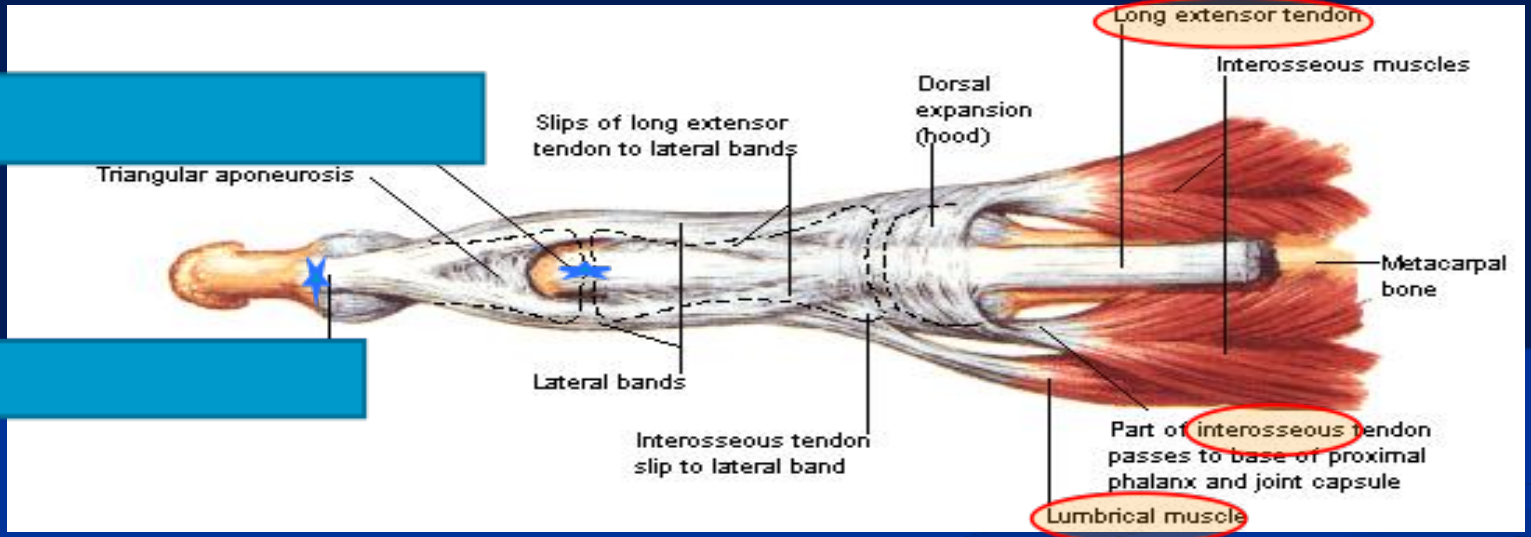
5- Supinator.

- **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 long extensor tendons : Extensor digitorum, Extensor digiti minimi, Extensor indicis with palmar &dorsal interossei &lumbricals muscles.

- **All these tendons unite to form one tendon (dorsal Extensor 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..

1. **Which muscle is supplied by median nerve ?**

b. Anconeus.
c. Brachioradialis.
d. Extensor carpi radialis longus.
e. Flexor digitorum superficialis.

6. **Which muscle is related to common flexor origin ?**

g. Flexor digitorum profundus.
h. Flexor pollicis longus.
i. Pronator quadratus.
j. Pronator teres.