

Learning Objectives

- Name, Origin and Insertion Of Muscles Of Posterior Compartment Of Forearm
- Course and relations of radial nerve and Blood vessels.
- Effects of paralysis of Muscles.
- Details of Snuff Box

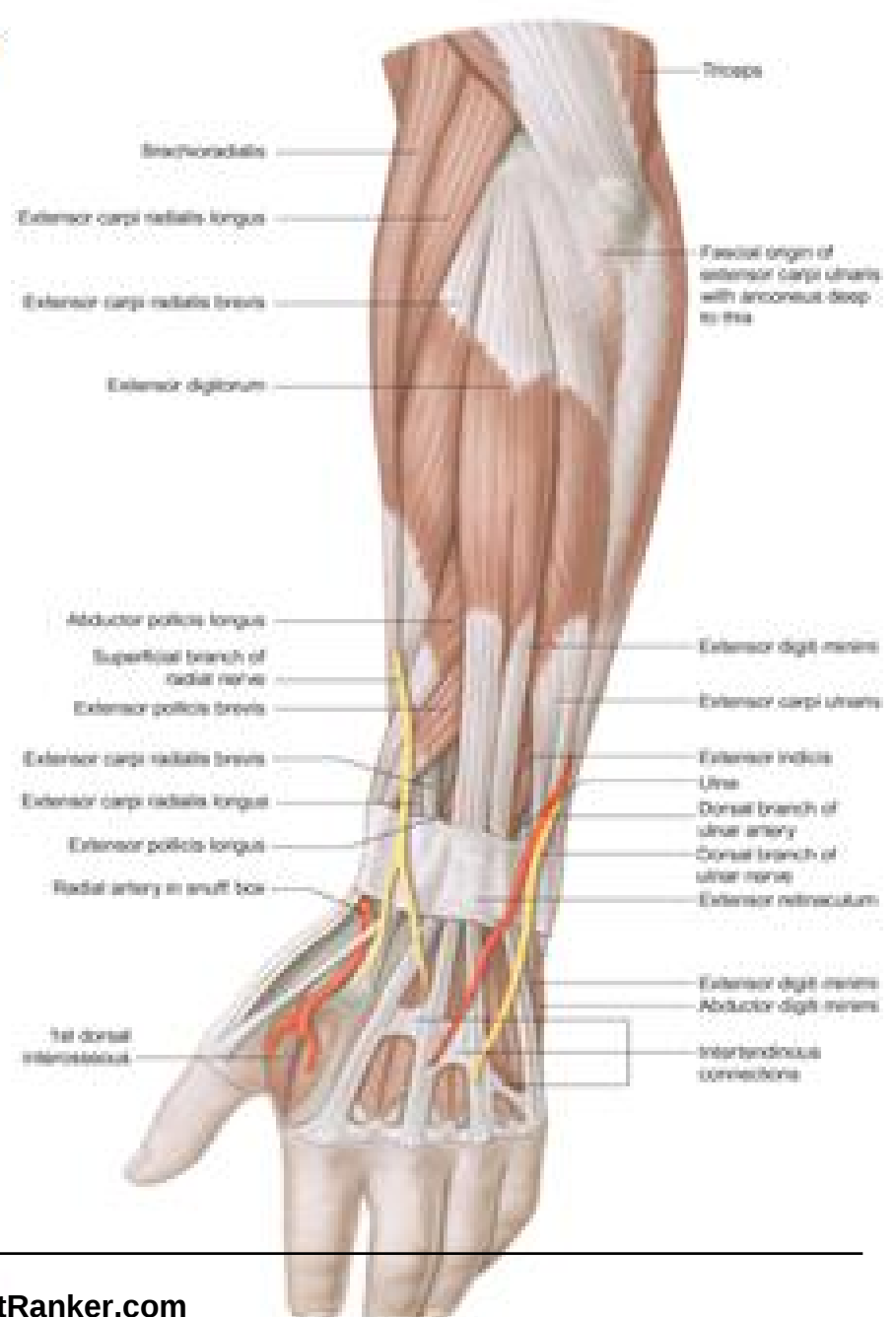
Posterior compartment of forearm

I- Superficial group:

Seven muscles (from lateral to medial)

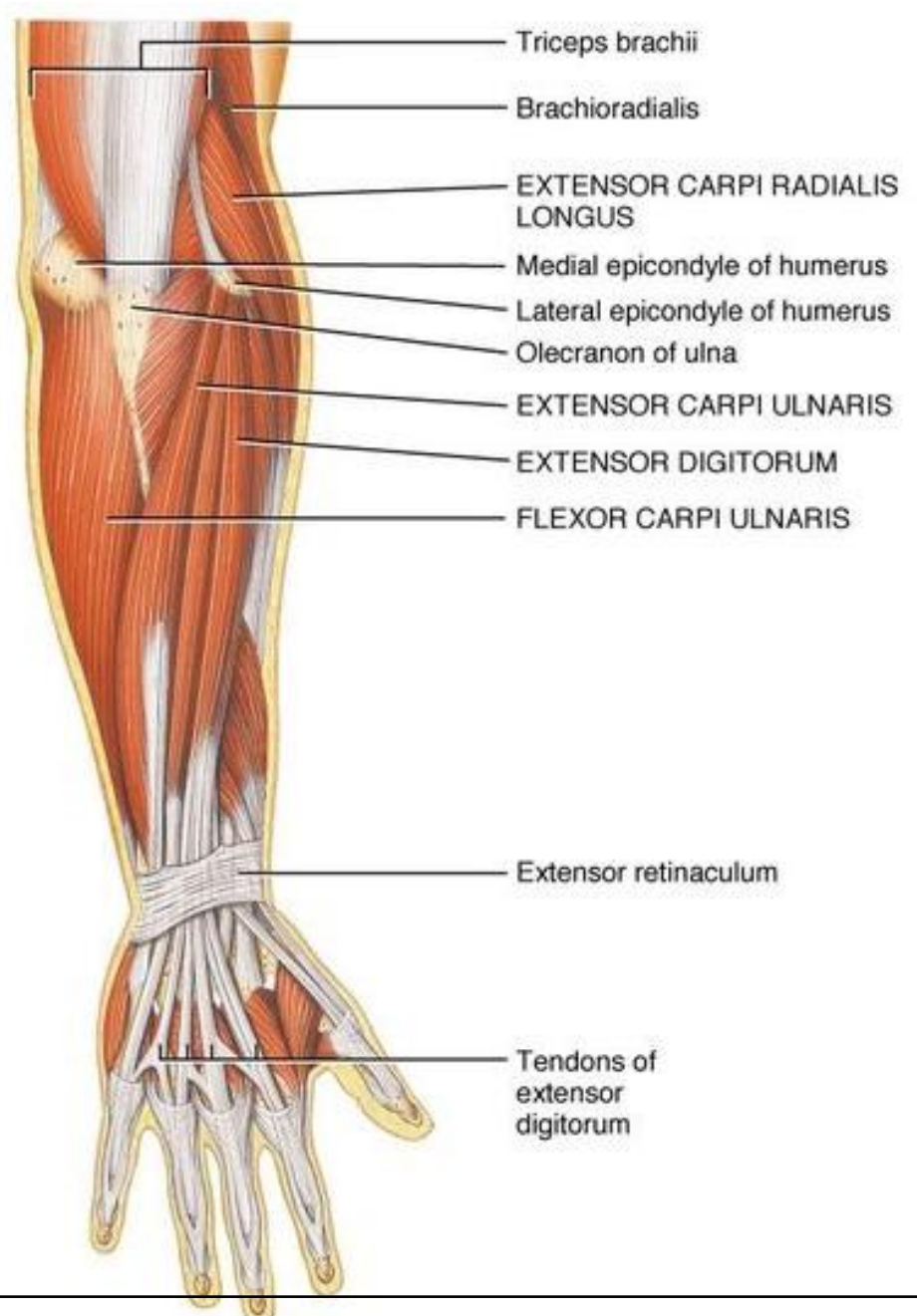
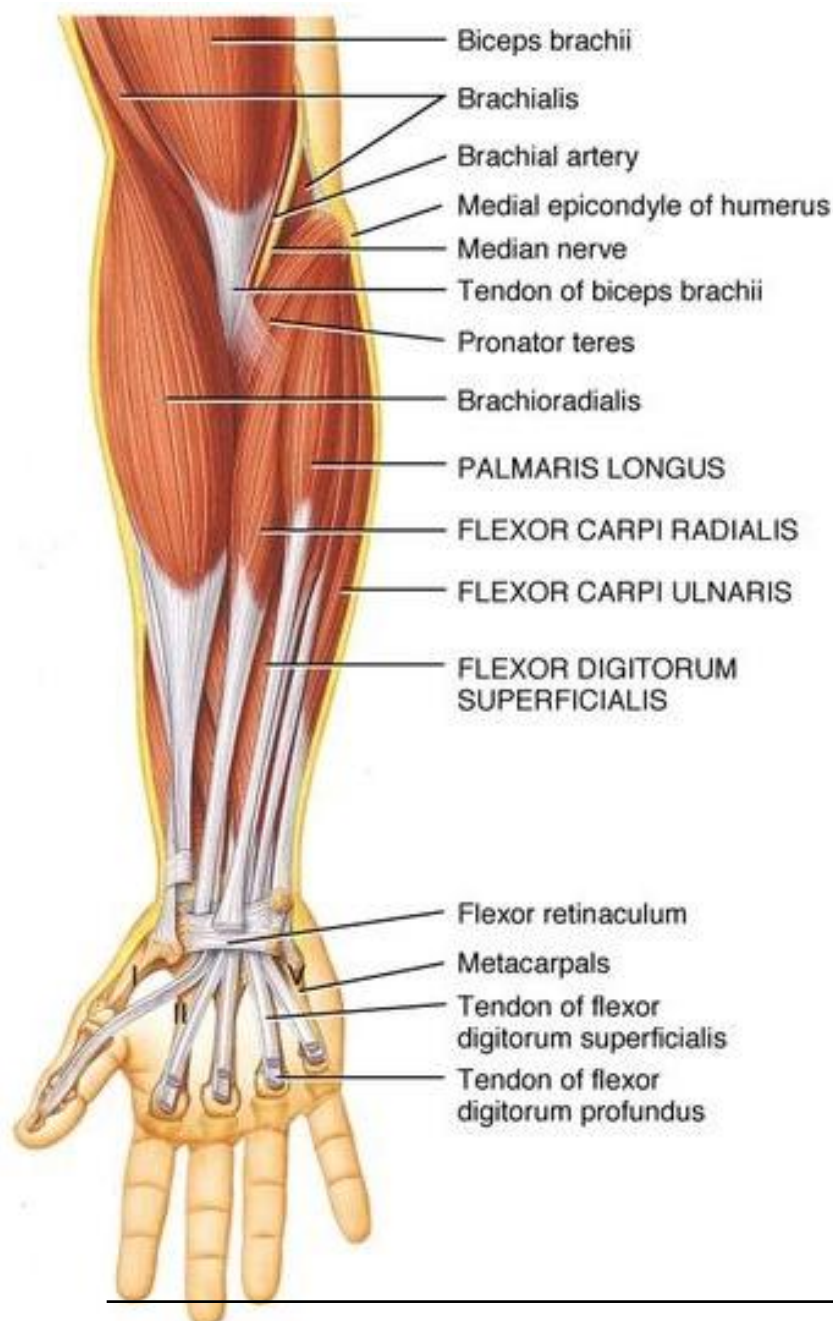
- 1.Brachioradialis, (BR).
2. Extensor carpi radialis longus, (ECRL).
3. Extensor carpi radialis brevis, (ECRB).
4. Extensor digitorum, (ED).
- 5.Extensor digiti minimi, (EDM).
6. Extensor carpi ulnaris, (ECU).
7. Anconeus. (An).

1-2 origin from supracondylar ridge
3-6 common extensor origin, Front of lateral epicondyle, 7- posterior of lateral epicondyle



Extensor compartment of forearm

- Muscles- Occur in two layers
- Superficial layer
- Deep layer
- Muscles are associated with movement of wrist, extension of fingers & thumb & supination

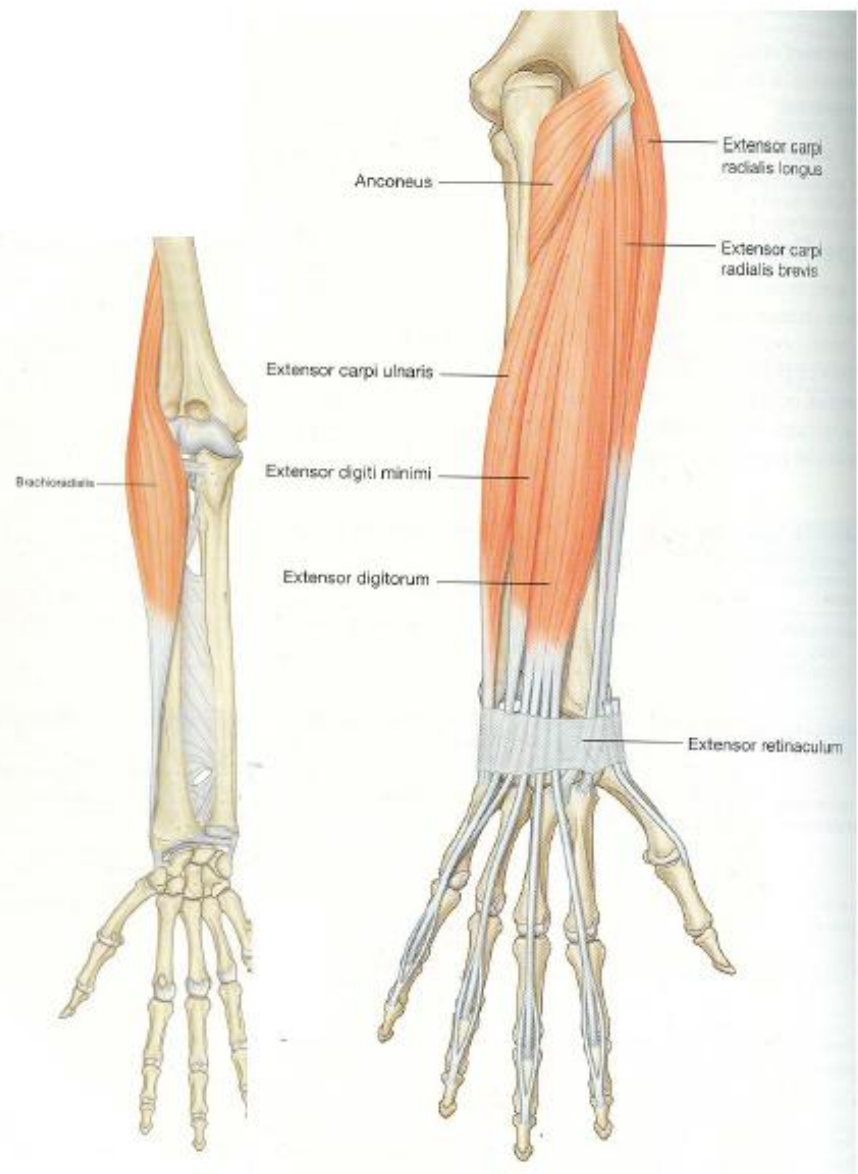


(a) Anterior superficial view

(b) Posterior superficial view

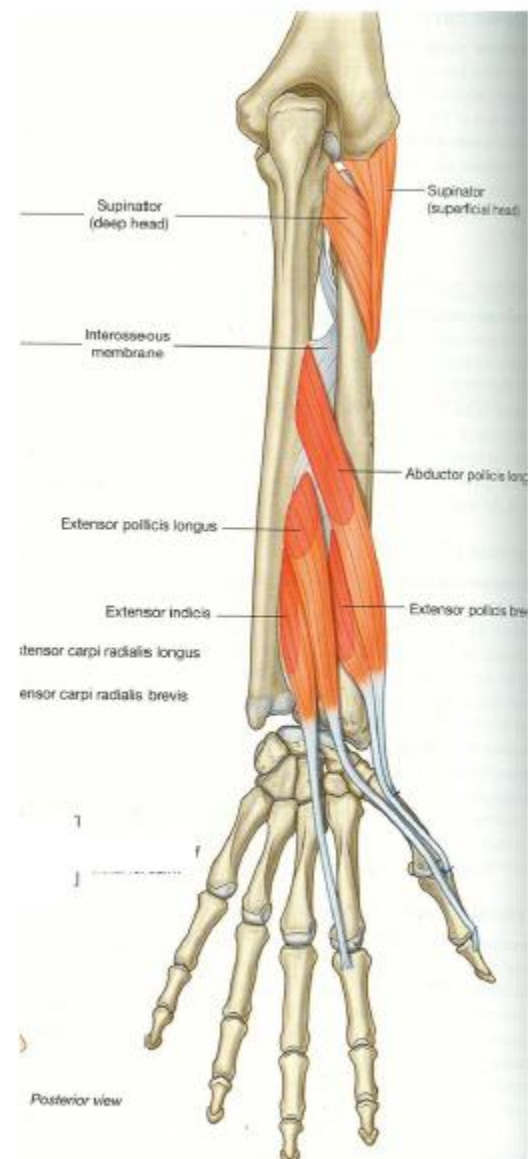
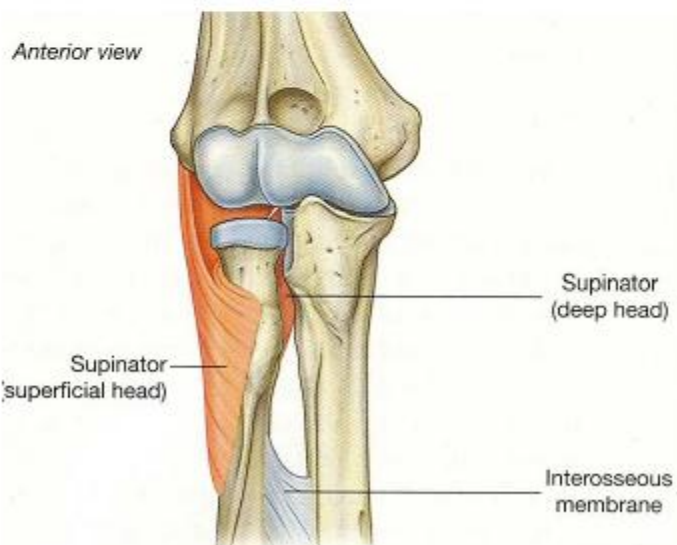
Superficial layer-

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

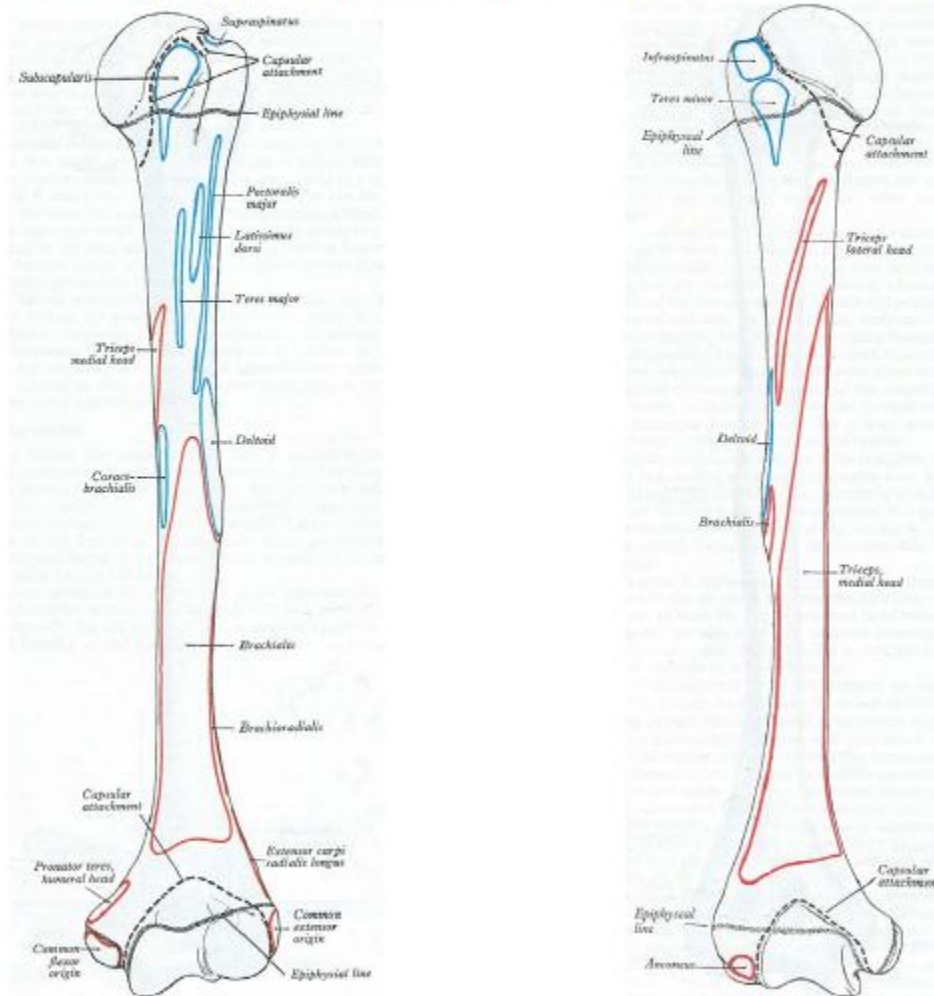


Deep layer-

- Supinator
- Abductor pollicis longus
- Extensor pollicis longus
- Extensor pollicis brevis
- Extensor indicis



Origin of superficial muscles of back of forearm



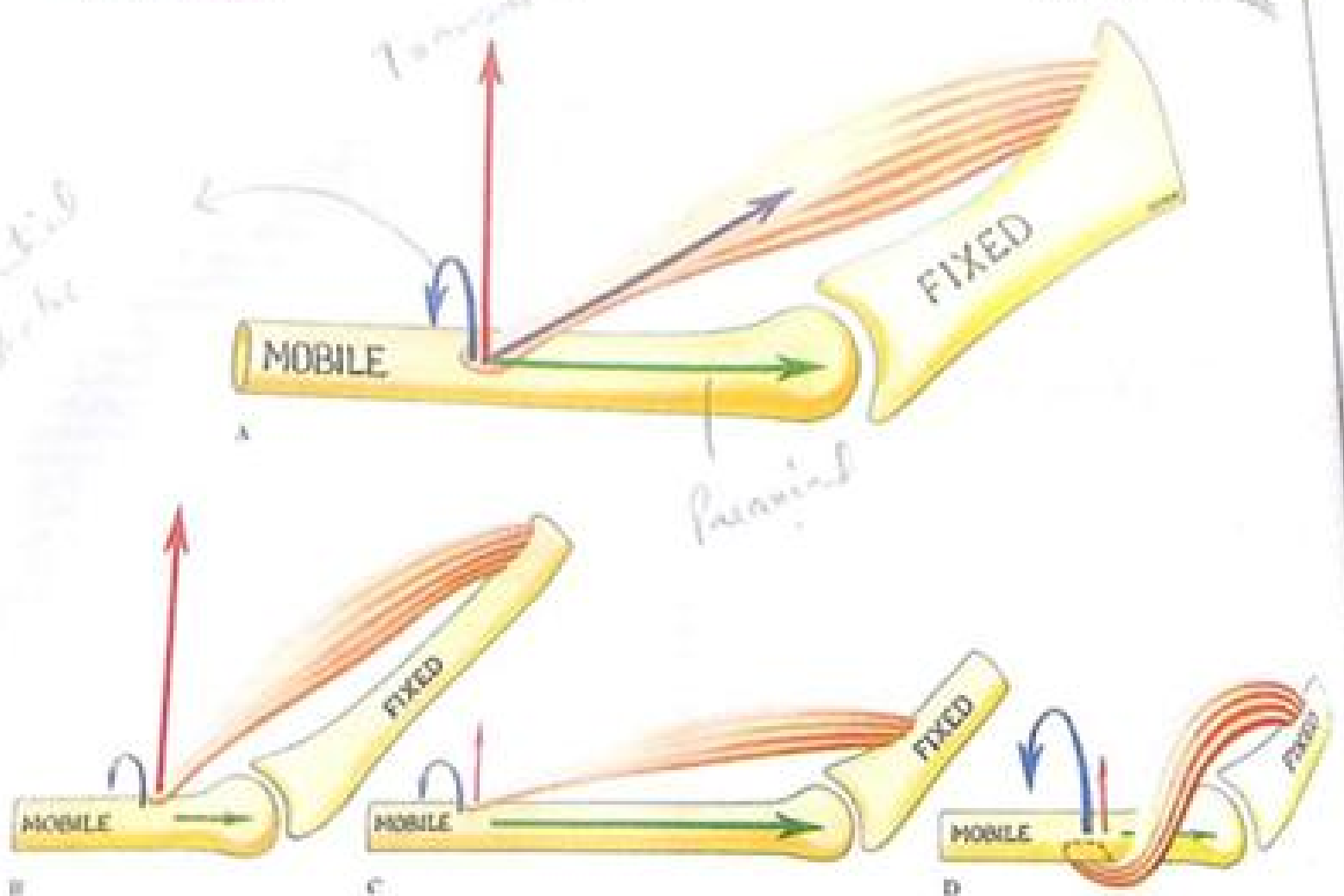
Brachioradialis-

- **Origin-** upper third of lateral supracondylar ridge of humerus & lateral intermuscular septum
- **Insertion-** Base of styloid process & lateral surface of radius
- **Action-** Flexes arm in midprone position
- Supinates the fully pronated forearm & pronates the fully supinated forearm
- **Nerve-** Radial nerve(C_{5,6})



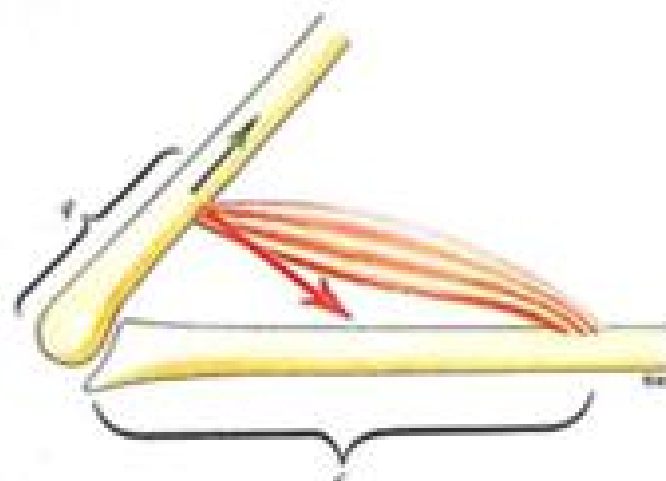
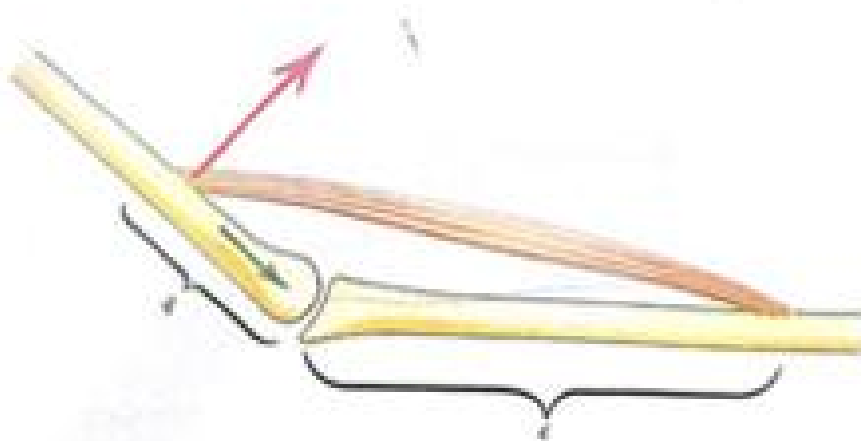
5 MYOLOGY

ACTIONS OF MUSCLE

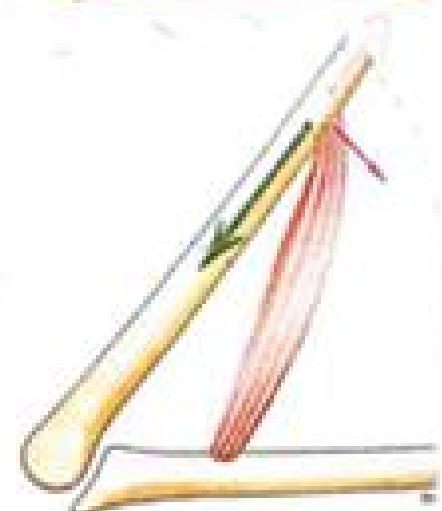
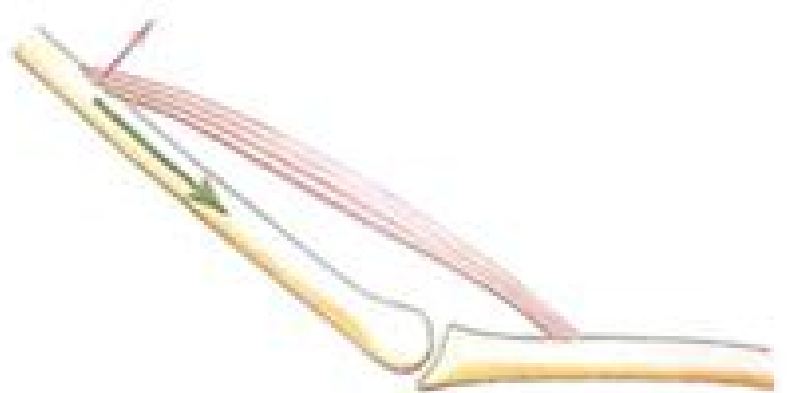


5.19A. Vectorial analysis of the force of contraction generated by a muscle which is attached to a fixed base, crosses a single multi-axial joint and is attached eccentrically to the shaft of a mobile bone. Colour code of arrows: purple = muscle force; red = transaxial 'wing' vector; green = parallel 'shunt' vector; blue = tangential 'spin' vector. Similar analyses relating to muscles which are predominantly (B) 'spin', (C) 'shunt' and (D) 'spin' in

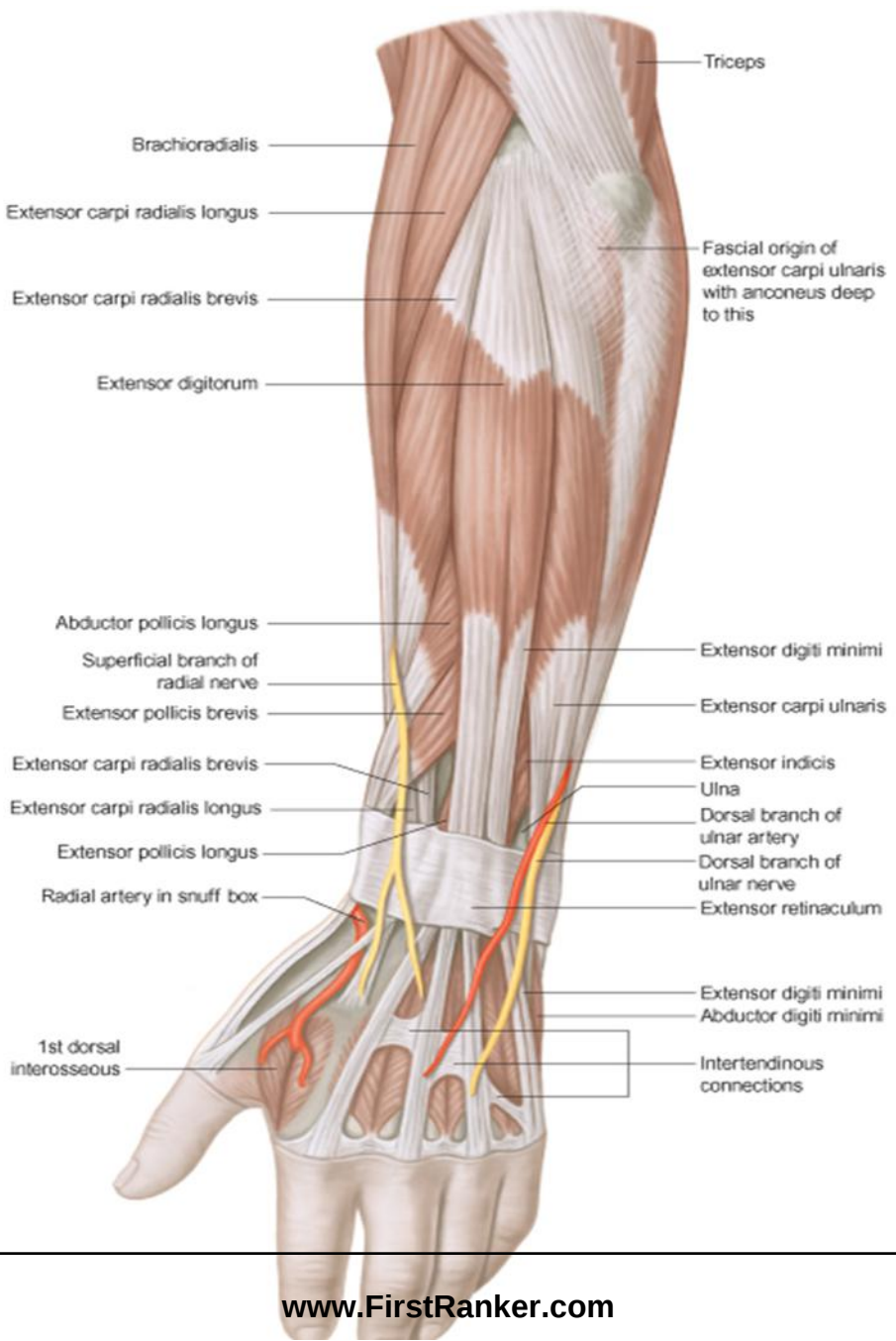
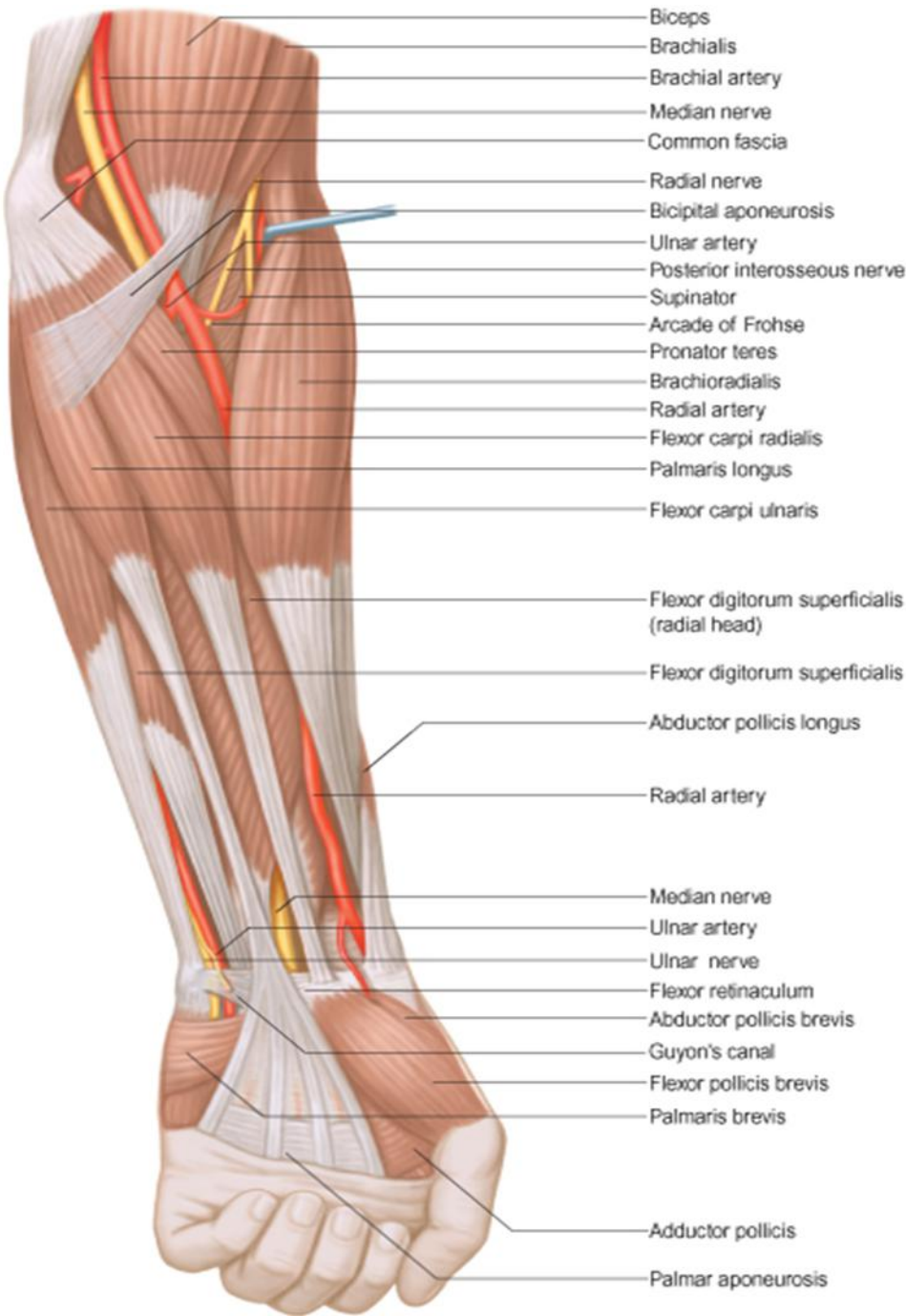
their actions. It should be appreciated that these diagrams have been constructed to illustrate certain principles discussed in the text, but do not represent any specific human bone or muscle. It is also clear that if the fixity and mobility of the two bones were interchanged, B would now operate as a 'shunt' muscle and C as a 'spin' muscle.



5.19A Some features of a 'spin' muscle. Note that it has a large 'wing' component of its force which acts to impart an angular acceleration to the mobile bone. Its small 'shunt' component acts towards the joint up to 90° of flexion and thereafter away from the joint. ℓ = cisarticular length; ℓ = transarticular length.



5.19B Some features of a 'shunt' muscle. The large shunt component of force acts towards the joint in all positions. In Fig. 5.19A and B no specific human muscle or bone is intended; in each case it is clear that the left bone is regarded as fixed whilst the right bone is mobile. Clearly the mobilities (and designations) could be interchanged.



EXTENSOR CARPI RADIALIS LONGUS

- Origin-** Lower third of supracondylar ridge of humerus, common extensor origin & lateral intermuscular septum
- Insertion-** Lateral side of dorsal surface of base of the second metacarpal bone
- Action-** Extends hand, synergist in abduction of hand with flexor carpi radialis
- Nerve-** Radial nerve (C_{6,7})



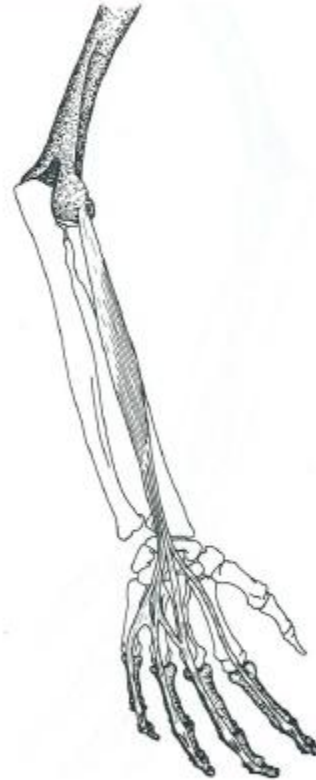
- Origin-** Lateral epicondyle of humerus, radial collateral ligament of elbow joint
- Insertion-** dorsal surface of second & third metacarpal bones
- Action-** Extends hand, synergistic in abduction of hand with flexor carpi radialis
- Nerve-** Radial nerve (C_{6,7})

EXTENSOR CARPI RADIALIS BREVIS



- **Origin**-Lateral epicondyle of humerus
- **Insertion**- Lateral & dorsal surface of all the phalanges of the four fingers
- , forms extensor expansion
- **Action**- Extends the fingers & wrist
- **Nerve**- Deep branch of radial nerve

EXTENSOR DIGITORUM COMMUNIS



- Origin-Common tendon attached to lateral epicondyle of humerus
- Insertion- Dorsal surface of base of first phalanx of fifth finger
- Action- Extends fifth finger
- Nerve- Deep branch of radial nerve (C_{5,6})

EXTENSOR DIGITI MINIMI



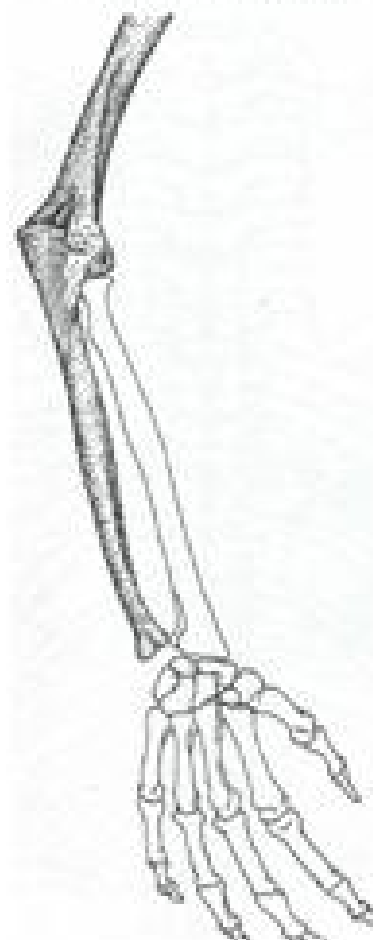
- **Origin-** Common tendon attached to lateral epicondyle of humerus
- Posterior border of ulna
- **Insertion-** Medial side of dorsal surface of base of fifth metacarpal bone
- **Action-** Extends hand, synergist in adduction of hand with flexor carpi ulnaris
- **Nerve-** Deep branch of radial nerve (C5,6)

EXTENSOR CARPI ULNARIS

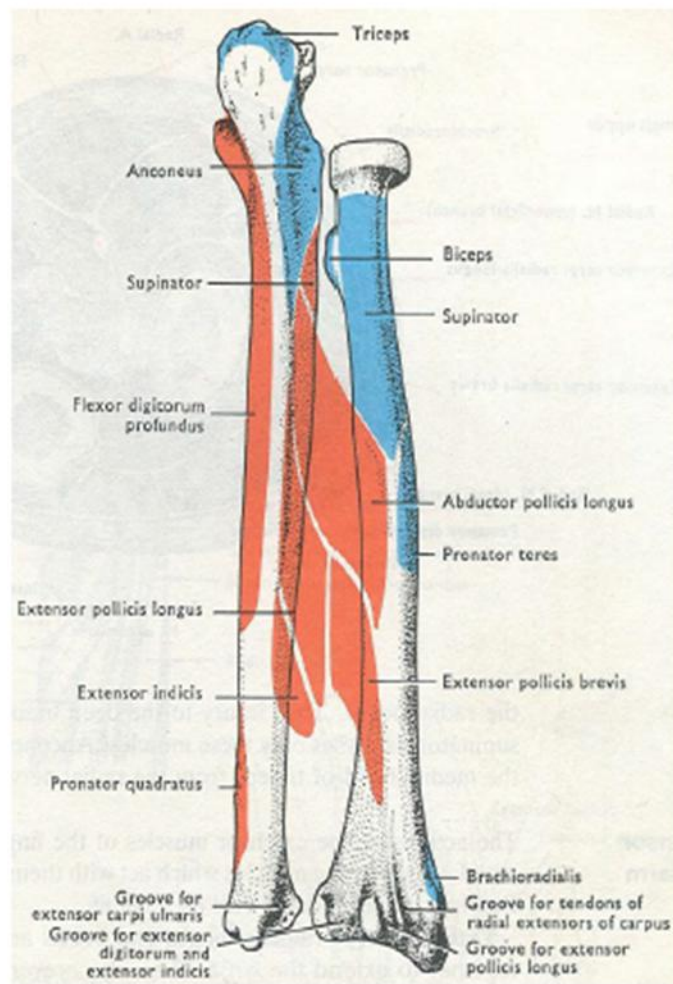


- **Origin-** Posterior part of lateral epicondyle of humerus
- **Insertion-** Lateral surface of the olecranon process & upper 1/4th of posterior surface of ulna
- **Action-** Weak Extensor of elbow, moves ulna laterally during pronation.
- **Nerve-** Radial nerve (C7,8) thru nerve to medial head of triceps

ANCONEUS

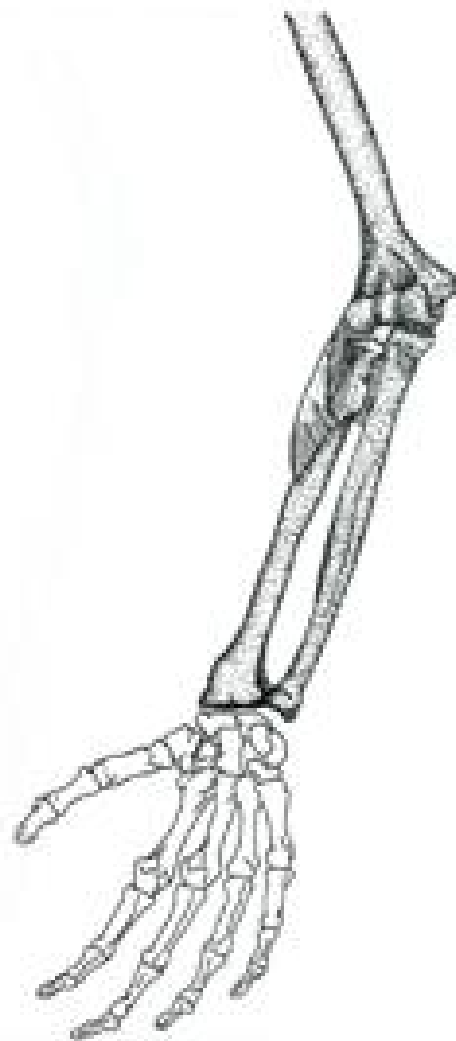


Origin of deep muscles of back of forearm



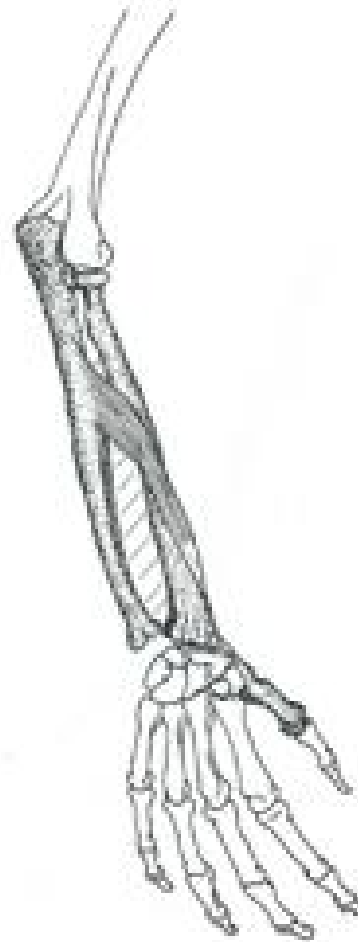
SUPINATOR

Origin	Lateral epicondyle of humerus, lateral ligament (radial collateral) of elbow, annular ligament of superior radioulnar joint, supinator crest of ulna
Insertion	Dorsal and lateral surfaces of upper third of radius
Action	Supinates forearm
Nerve	Radial nerve (C6)



ABDUCTOR POLLICIS LONGUS

- **Origin-** Posterior surface of shaft of radius, Lateral part of posterior surface of ulna & interosseous membrane
- **Insertion-** Dorsal surface of base of first metacarpal bone.
- **Action-** abducts, laterally rotates and extends thumb, abducts wrist
- **Nerve-** radial nerve (C_{6,7})



EXTENSOR POLLICIS BREVIS

- **Origin-** Dorsal surface of radius, adjacent part of interosseous membrane
- **Insertion-** Base of proximal phalanx of thumb
- **Action-** Extends thumb, abducts hand
- **Nerve-** Deep branch of radial nerve (C_{6,7})



- **Origin-** Middle third of dorsal surface of ulna & interosseous membrane
- **Insertion-** Base of distal phalanx of thumb
- **Action –** Extends thumb
- **Nerve-Deep branch of** radial nerve (C6-C8)

EXTENSOR POLLICIS LONGUS

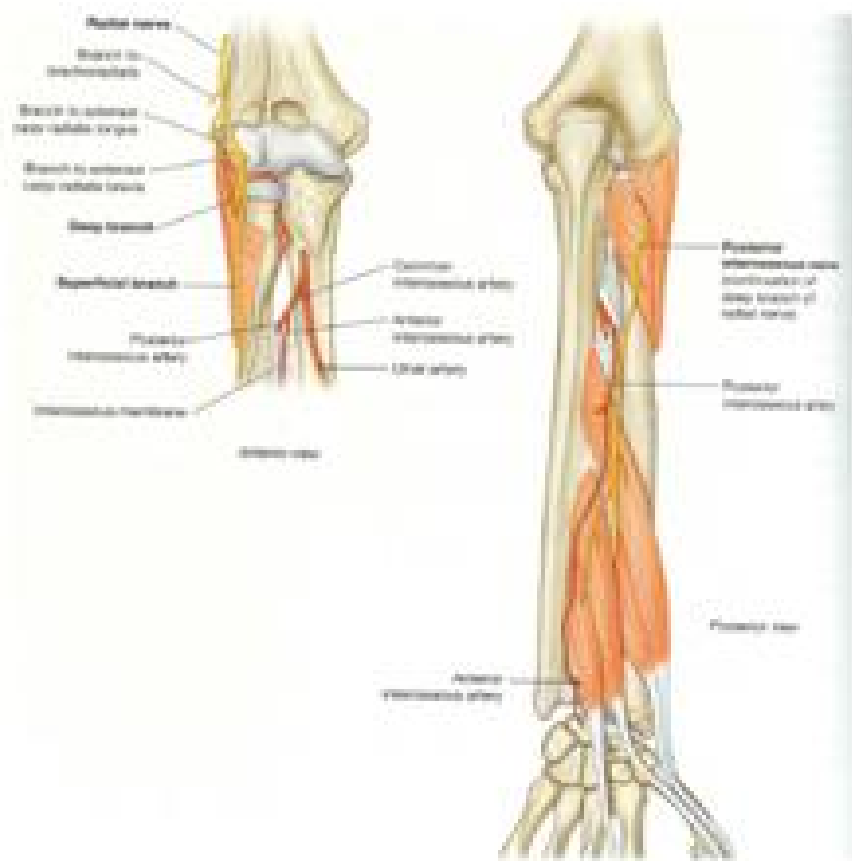


- **Origin-** Posterior surface of ulna & adjacent part of interosseous membrane
- **Insertion-** Extensor expansion on dorsal surface of proximal phalanx of index finger
- **Action-** Extends index finger
- **Nerve-Deep branch of** radial nerve (C_{5,6})

EXTENSOR INDICIS

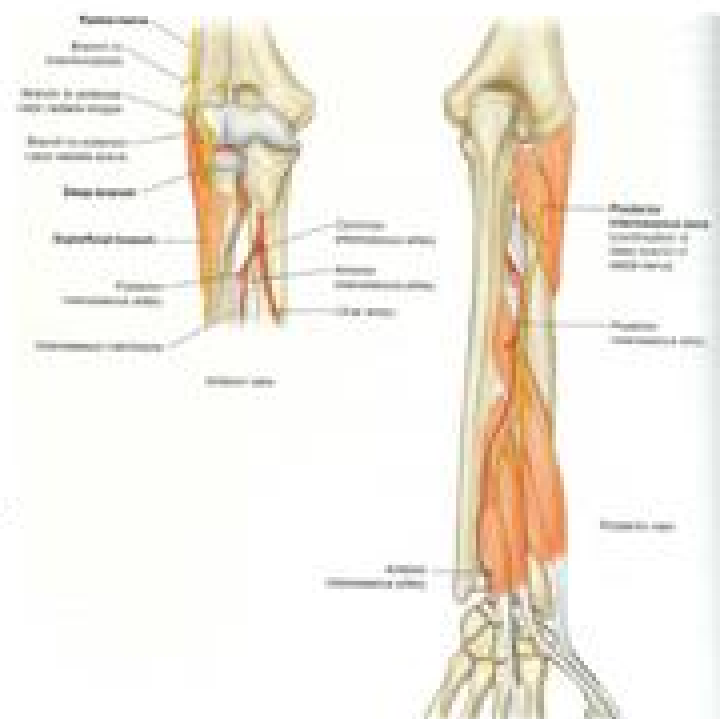


- Arteries & veins-
- Posterior interosseous artery
- Anterior interosseous artery
- Radial artery



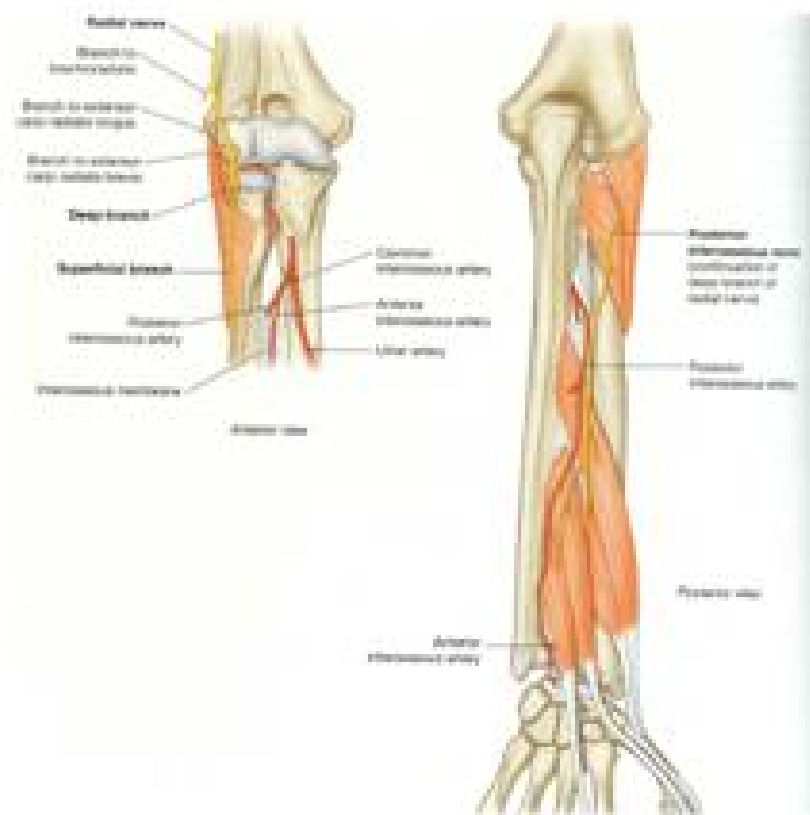
Posterior interosseous artery-

- Originate in anterior compartment from common interosseous artery
- Passes dorsally over the proximal margin of interosseous membrane into posterior compartment
- Gives out recurrent interosseous artery
- Terminates by joining the dorsal carpal arch of wrist



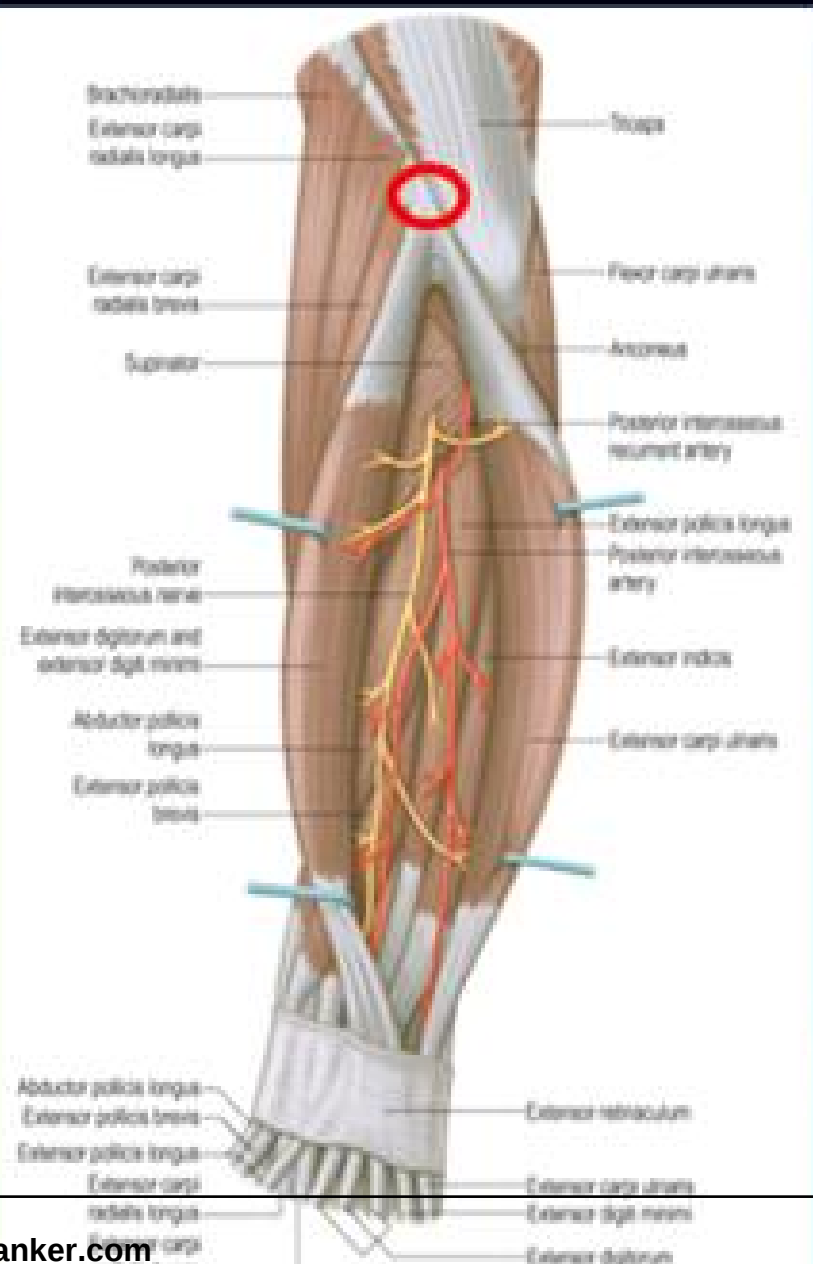
Radial nerve-

- Most of the muscles are supplied by deep branch of radial nerve (posterior interosseous nerve)
- Brachioradialis, anconeus & ECRL are supplied by radial nerve directly in arm

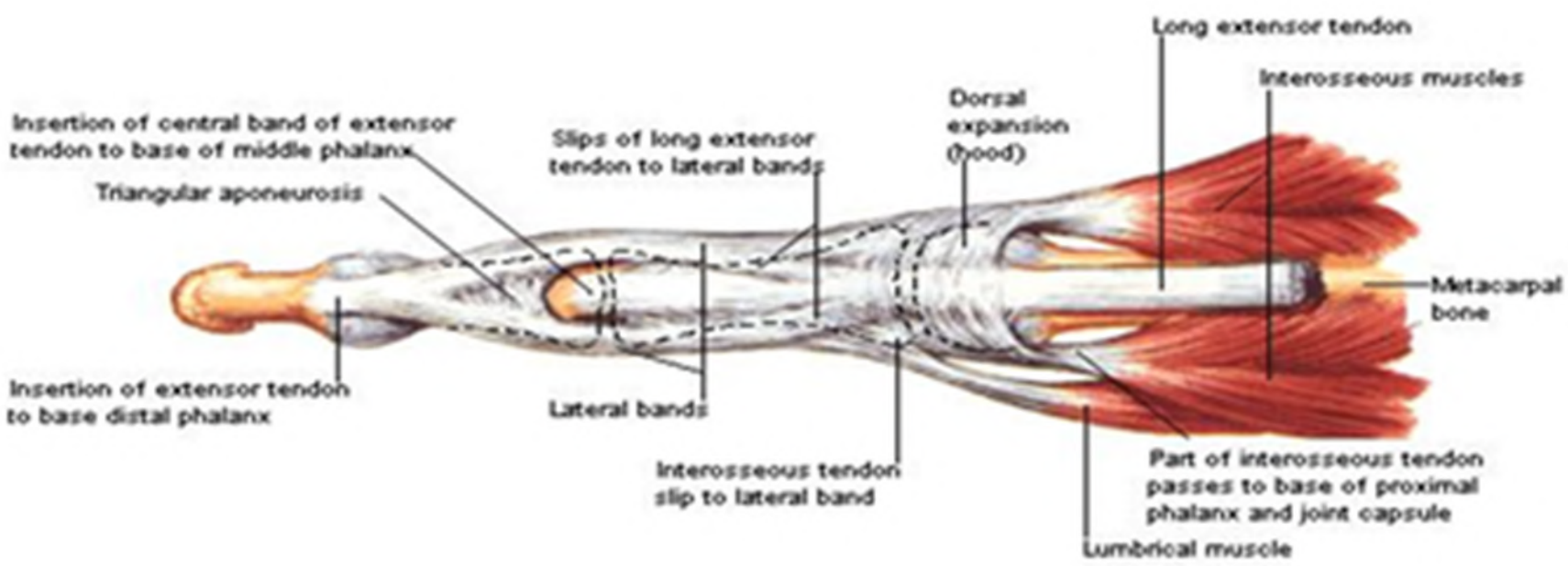
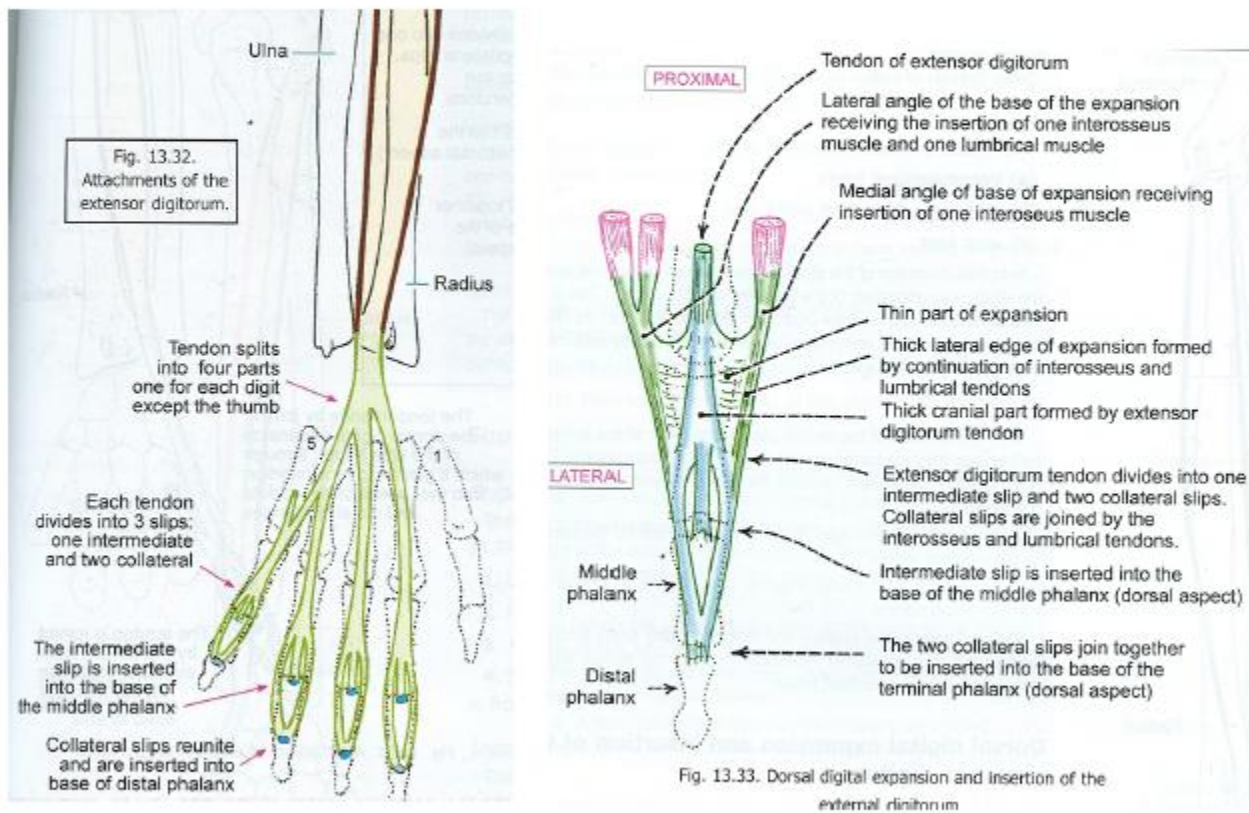


Superficial extensor

- All arises from the **common extensor origin**, (front of lateral epicondyle) of the humerus, **EXCEPT**, 2 (BR & EXRL).
- 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**



Extensor expansion



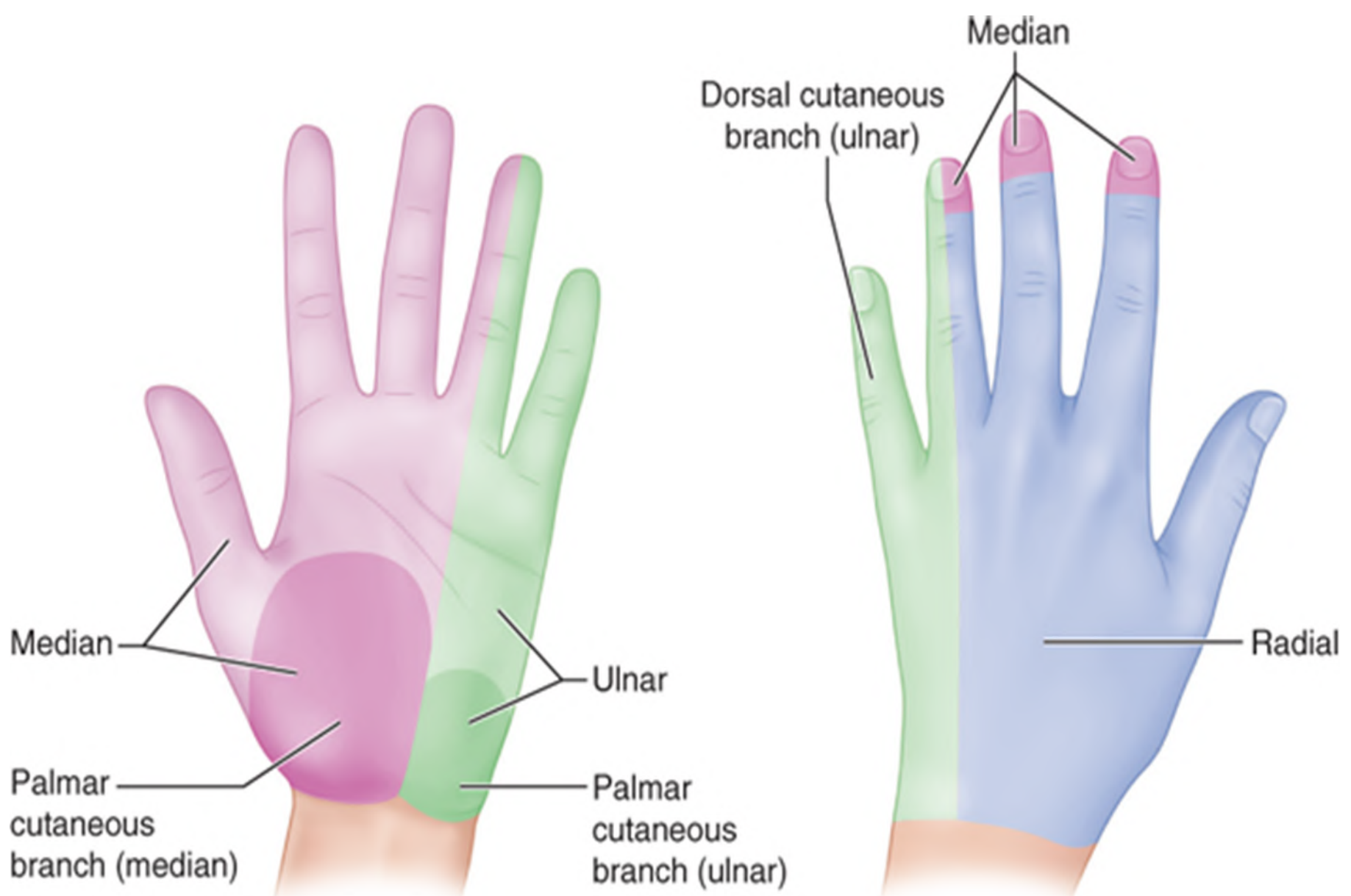
DORSAL DIGITAL EXPANSION

Formed by the union of the tendons of:

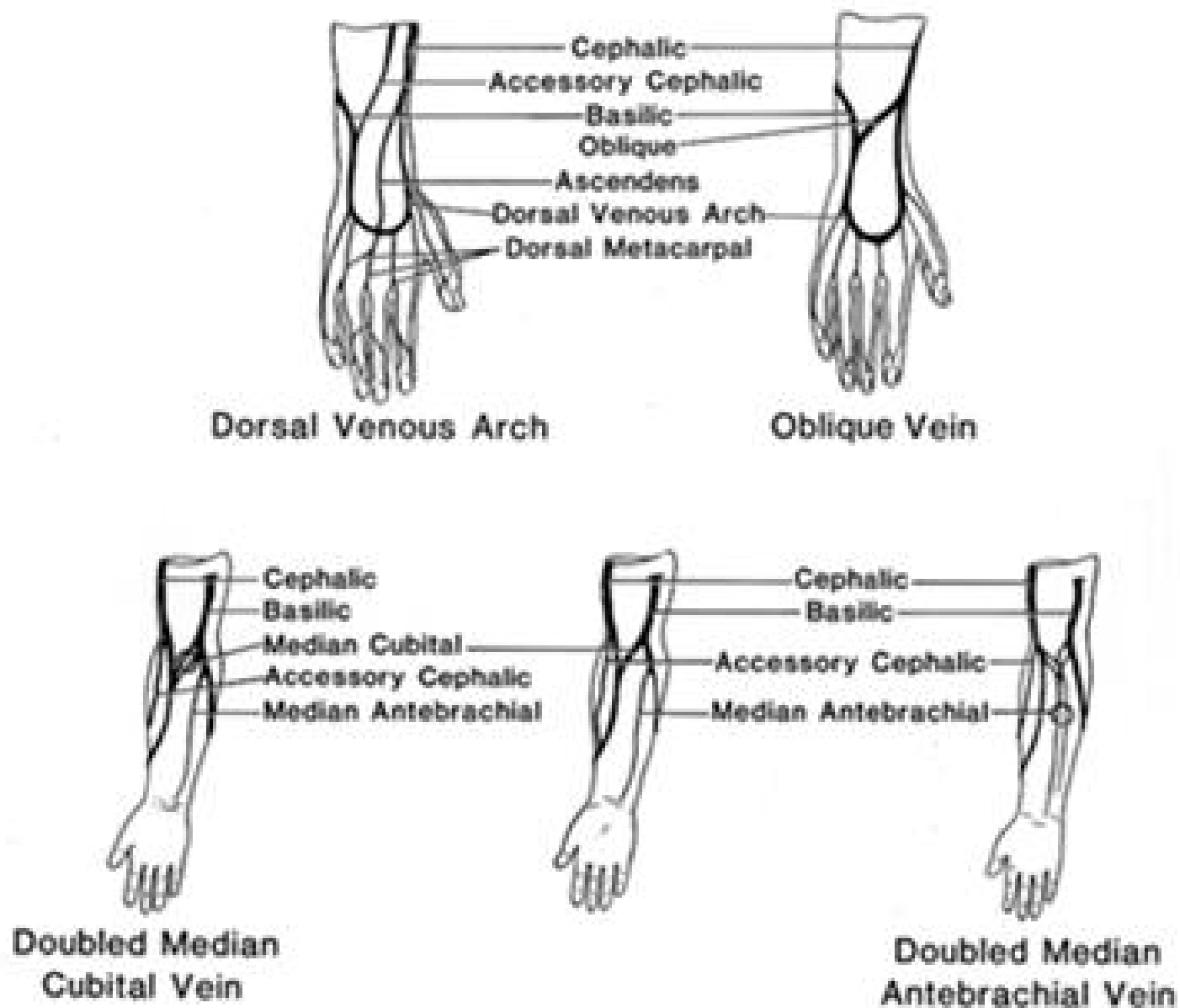
Extensor digitorum,
Extensor indicis,
Extensor digiti minimi,
Palmar & dorsal interossei and
Lumbrical muscles.

All these tendons unite to form one tendon which divides into 3 slips-

One median slip attached to middle phalanges
Two lateral slips attached to the terminal phalanges

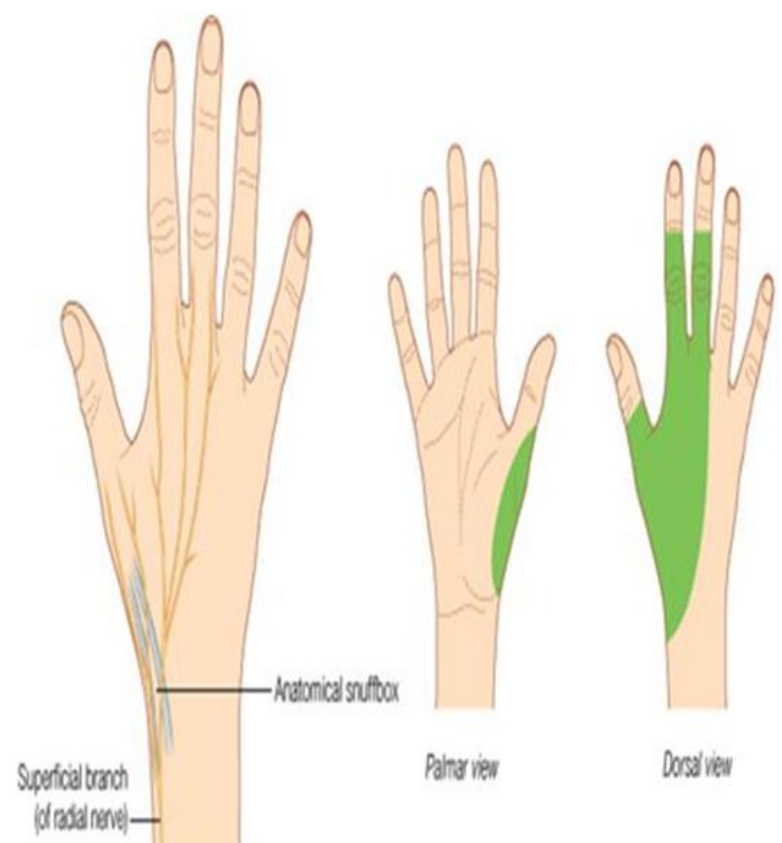


Veins of Arm, Forearm and Hand



The Dorsum of the Hand

- The skin on the dorsum of the hand is thin, hairy, and freely mobile on the underlying tendons and bones.
- The sensory nerve supply to the skin on the dorsum of the hand is derived from the superficial branch of the radial nerve and the posterior cutaneous branch of the ulnar nerve.
- The superficial branch of the radial nerve winds around the radius deep to the brachioradialis tendon, descends over the extensor retinaculum, and supplies the lateral two thirds of the dorsum of the hand
- divides into several dorsal digital nerves that supply the thumb, the index and middle fingers, and the lateral side of the ring finger
- The area of skin on the back of the hand and fingers supplied by the radial nerve is subject to variation
- Frequently, a dorsal digital nerve, a branch of the ulnar nerve, also supplies the lateral side of the ring finger

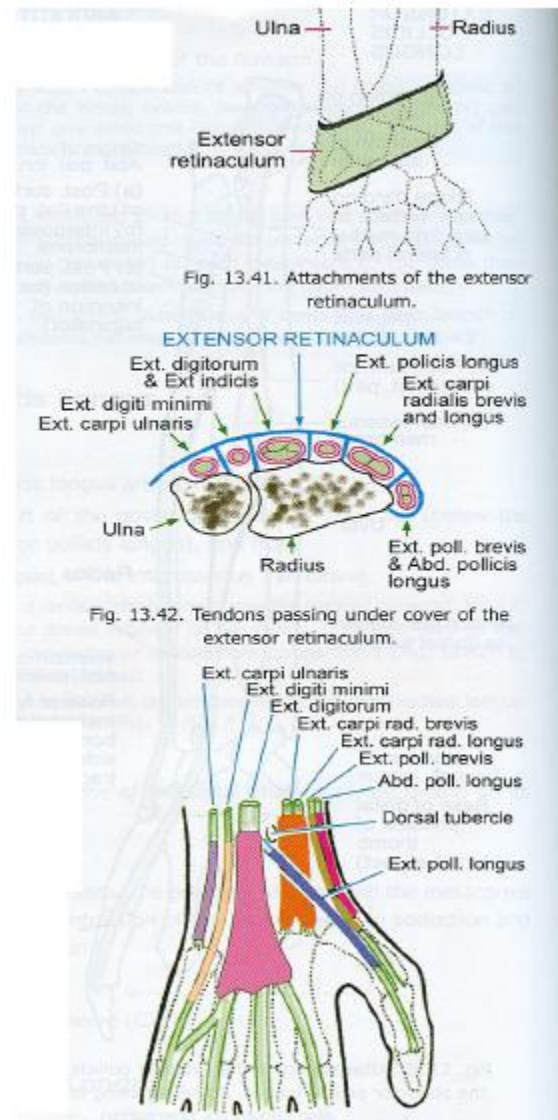


Extensor retinaculum

- Thickened band of fascia
- Runs across the back of wrist

Attachment-

- Laterally to lower part of anterior border of radius
- Medially it is attached to triquetral & pisiform

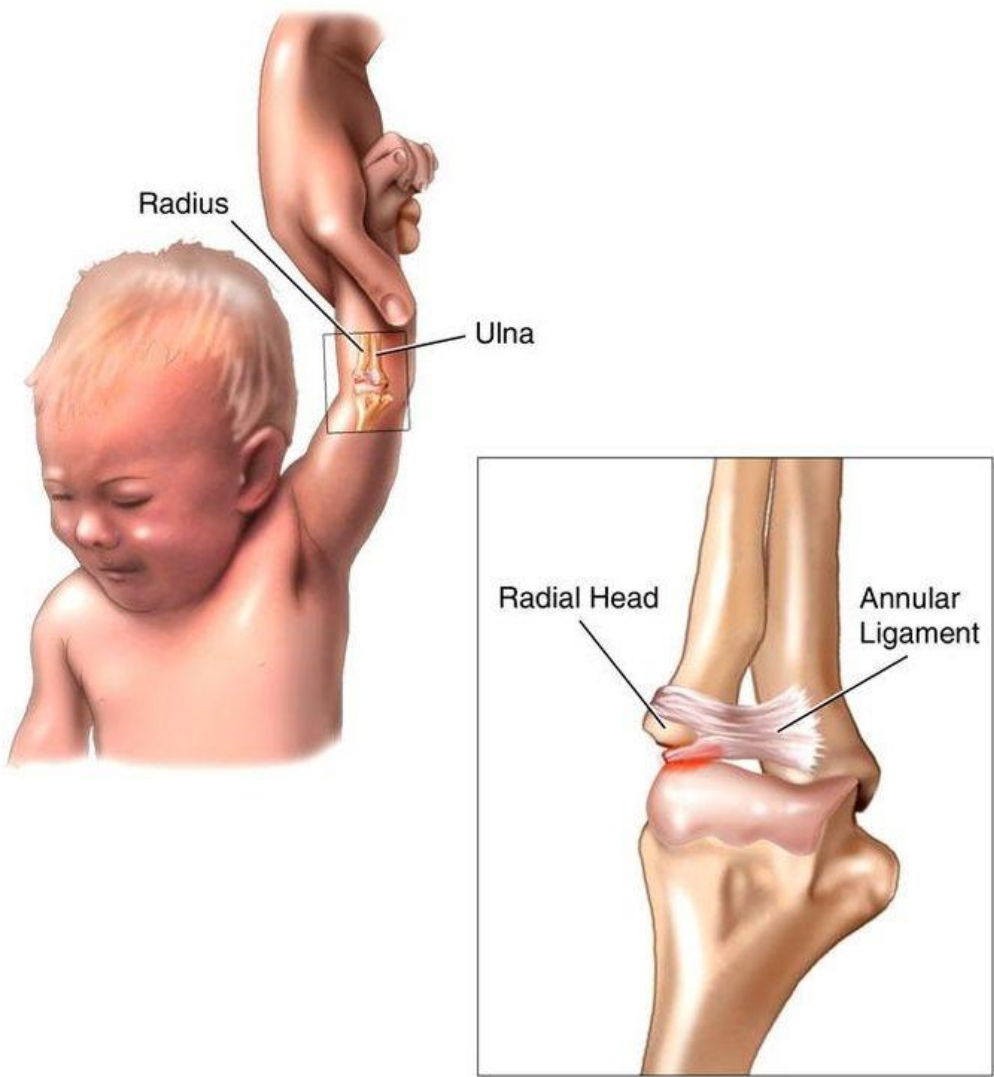


Applied anatomy

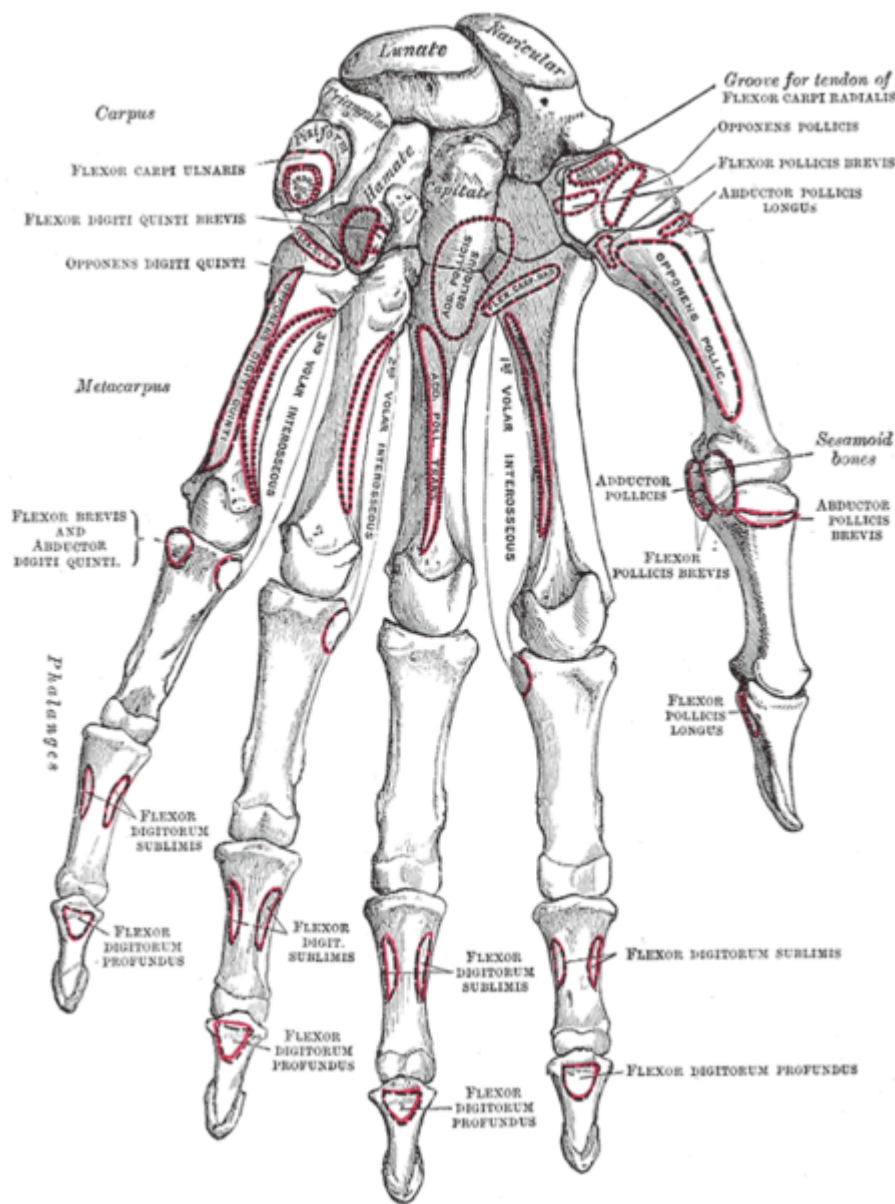
- Injury to radial nerve in forearm leads to wrist drop



Nursemaid’s Elbow

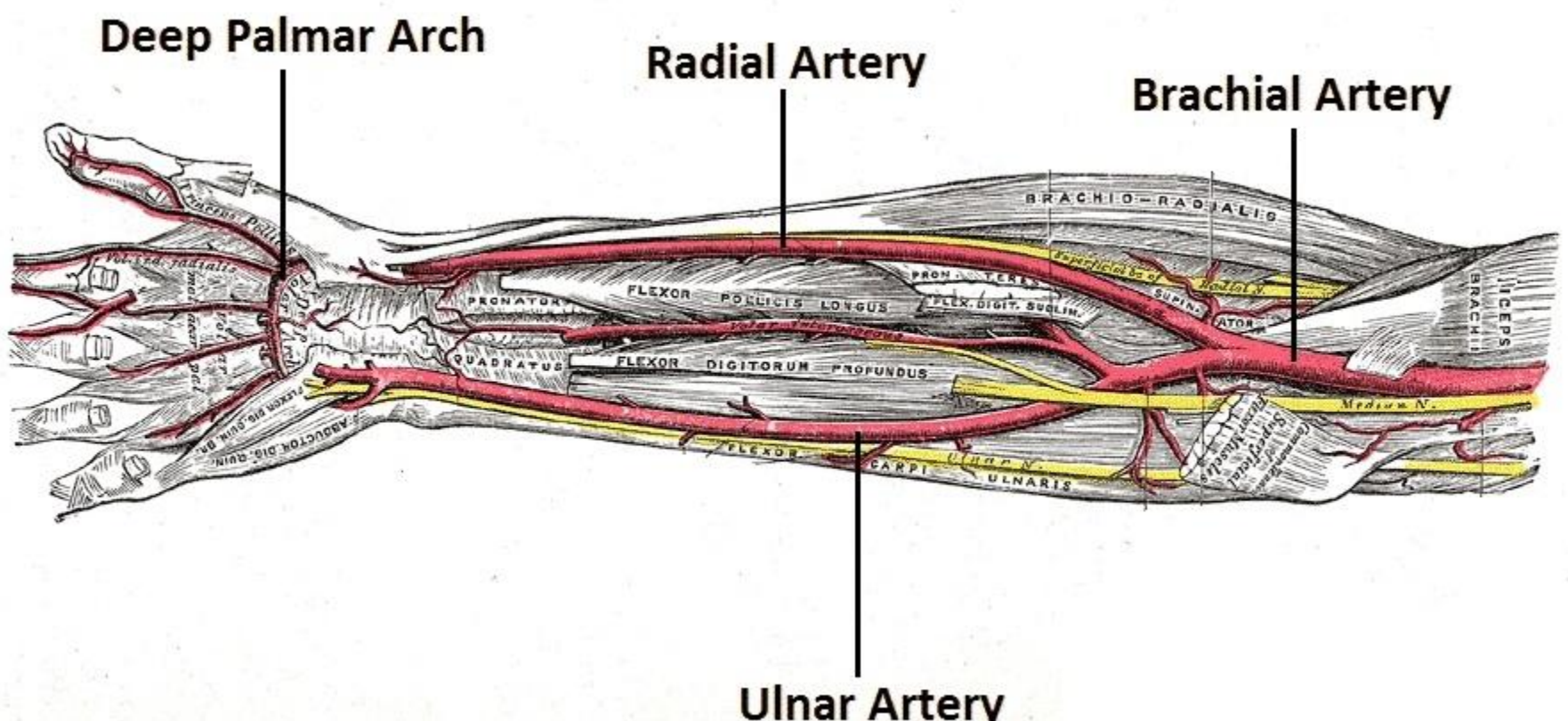


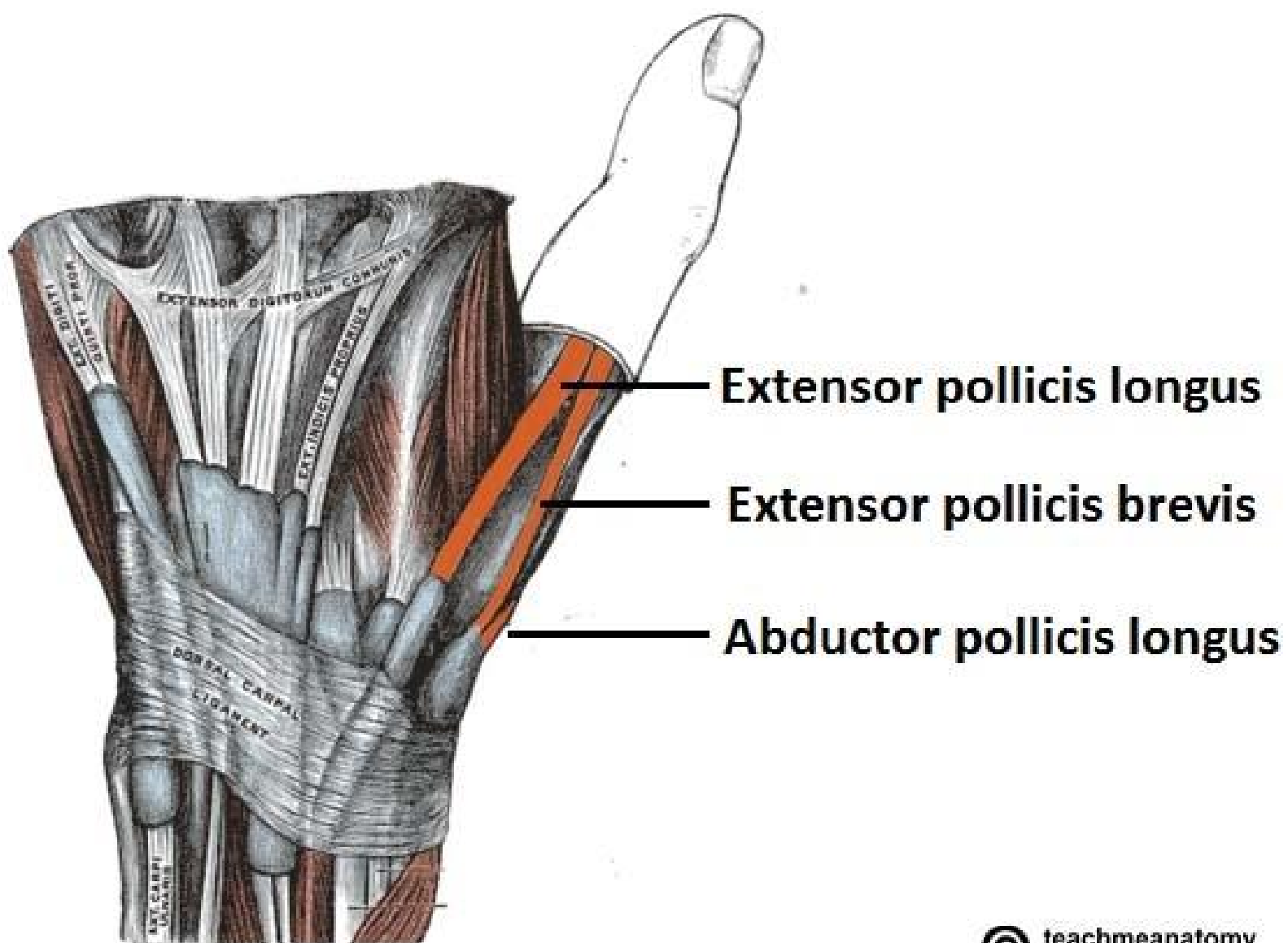
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MCQ

- 1 Dorsal extensor expansion receives the insertion of all of the following muscles except
- A Extensor indicis
- B Extensor digitorum
- C Dorsal interossei
- D Lumbricals
- E Palmar interossei
- Answer A



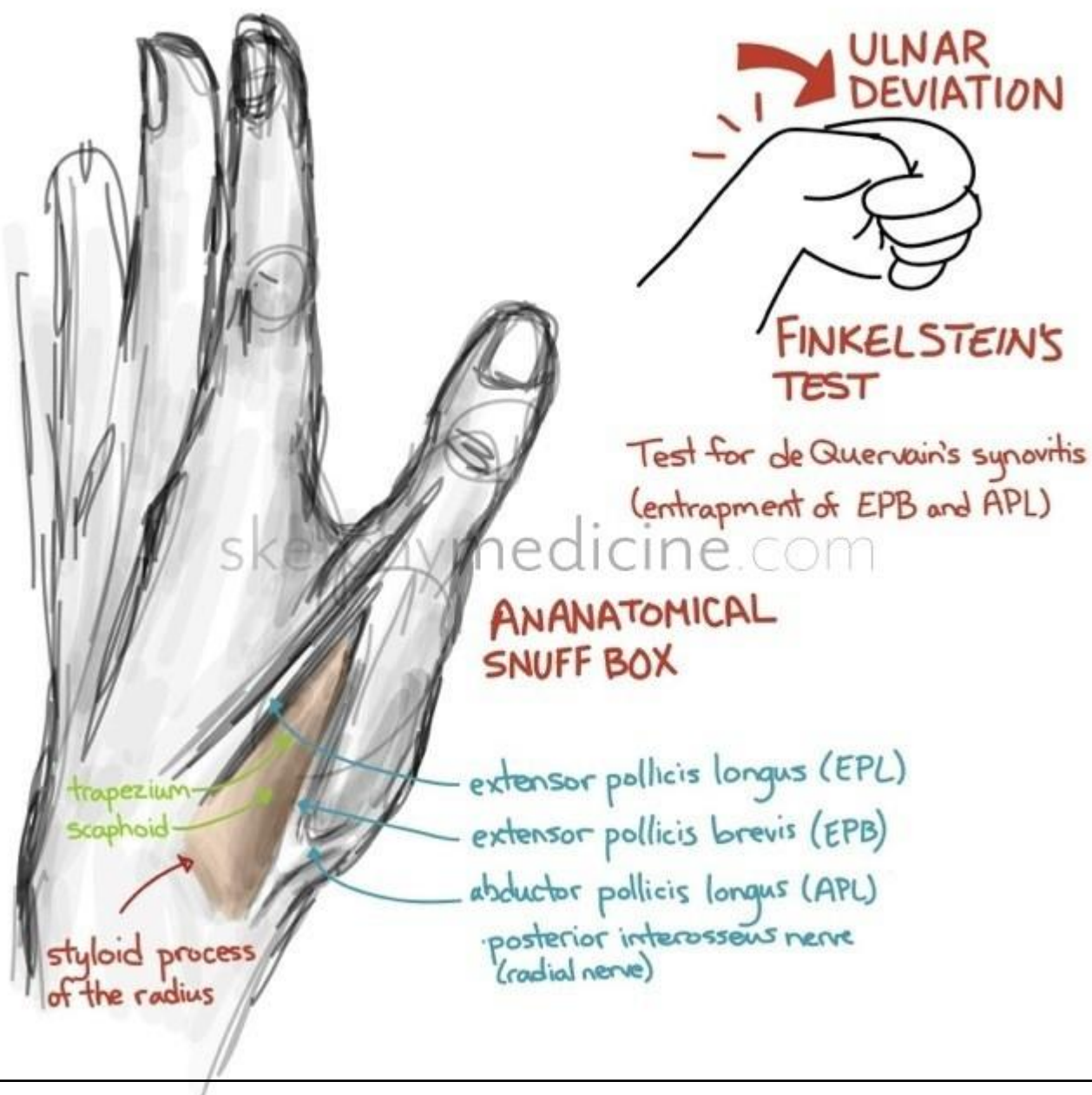
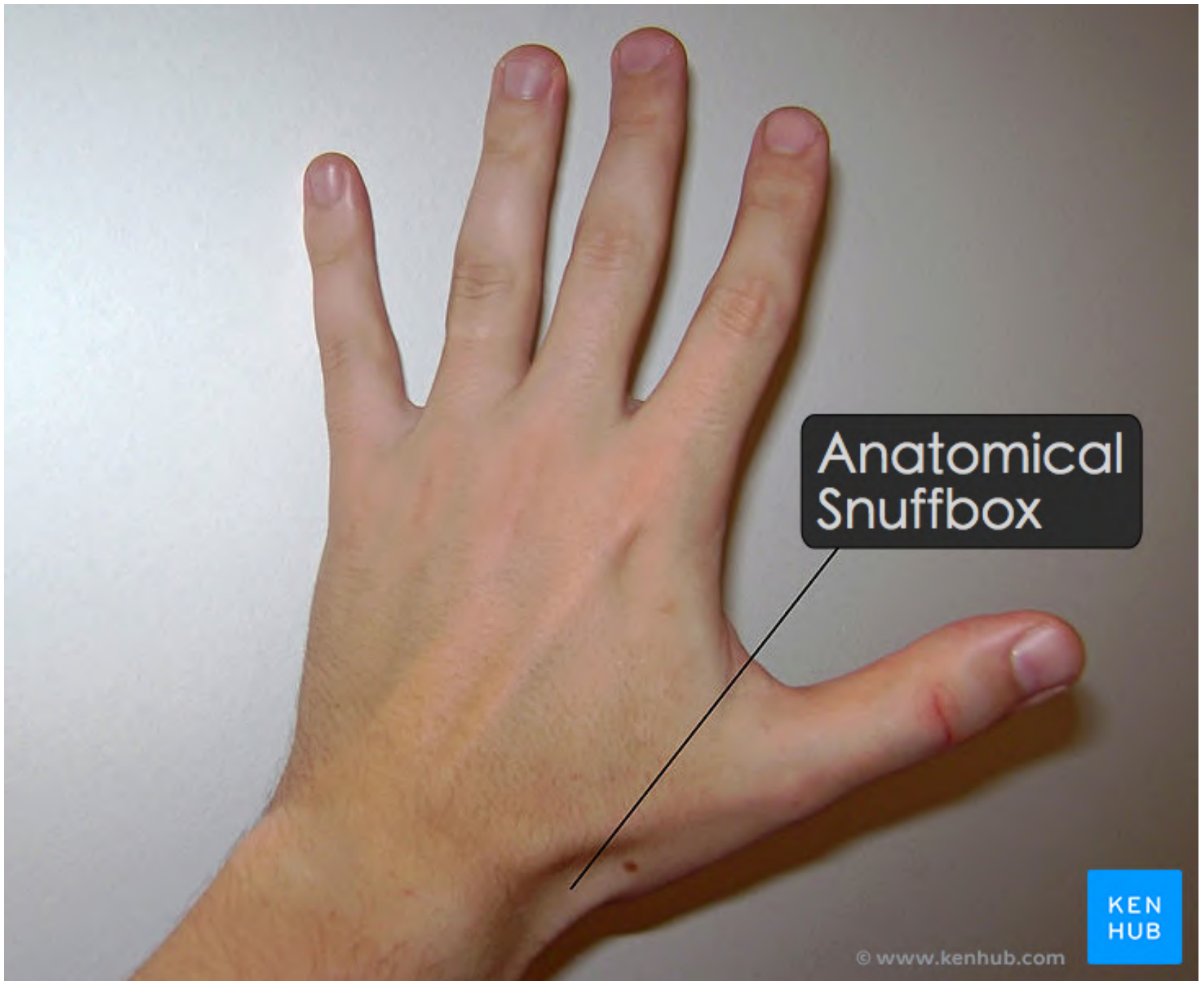


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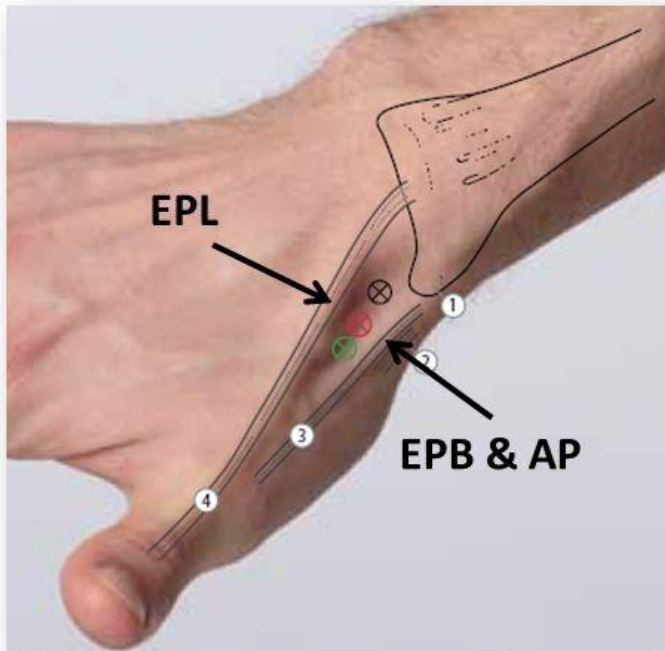
MCQ

The following movements are performed by the palmar and dorsal interossei except-

- A Abduction of digits
- B Adduction of digits
- C Flexion of IP and extension of MP joints
- D Flexion of MP and extension of IP joints
- Answer C



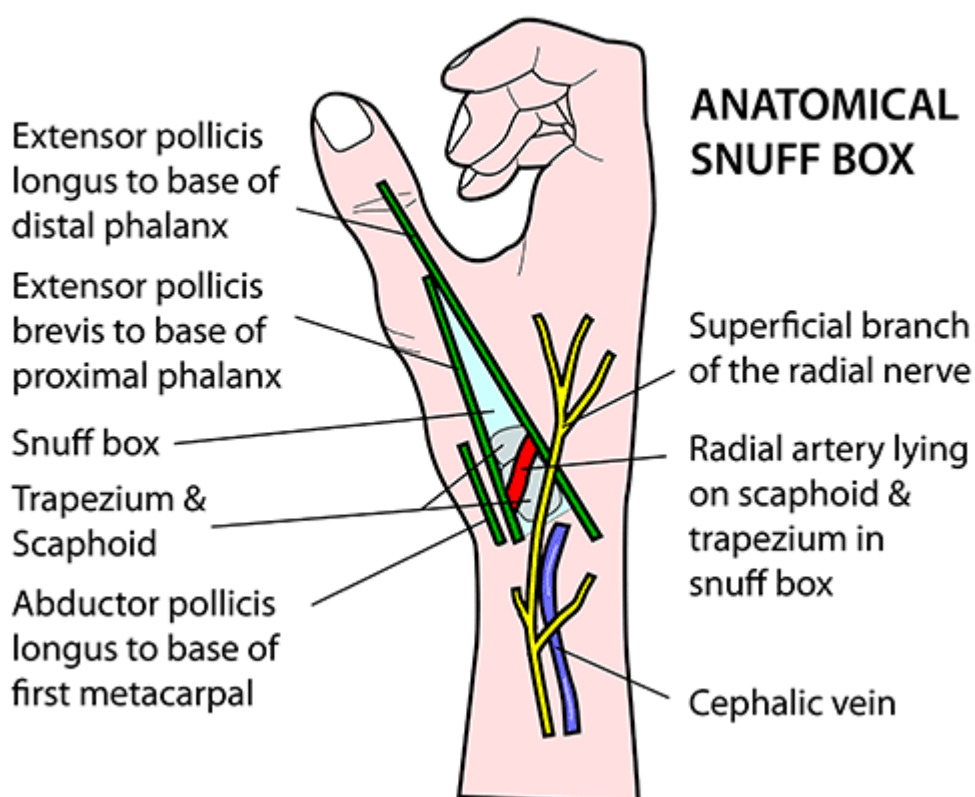
What are the boundaries of the anatomical snuffbox?

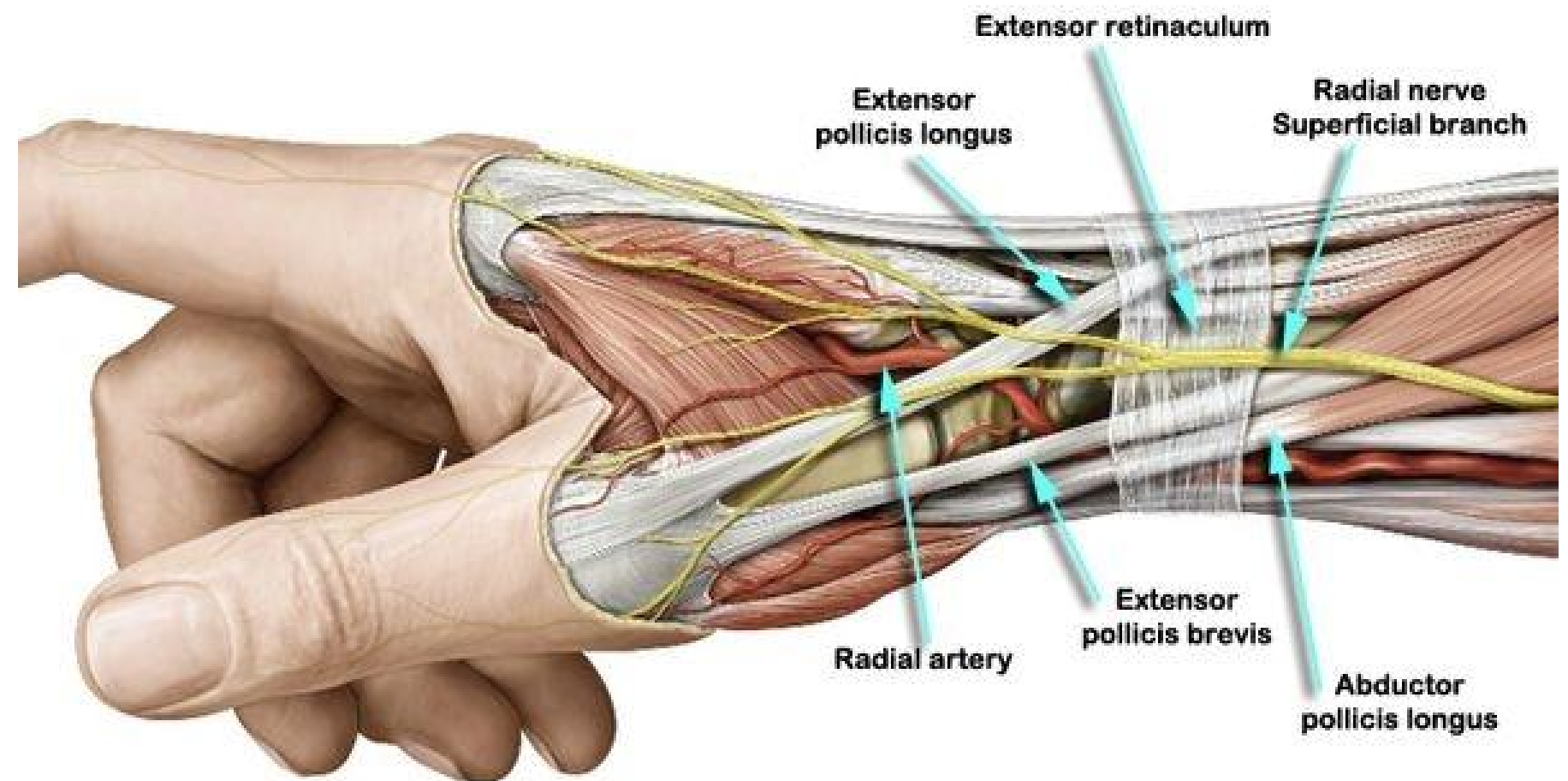


What can be palpated in the anatomical snuffbox?

- Radial artery
- Radial styloid process
- Scaphoid
- Trapezium
- Base of 1st metacarpal
- Cephalic vein passes over snuffbox

SURFACE ANATOMY





- All of the following are seen or felt at the anatomical snuff box except-
- A Scaphoid bone
- B Radial styloid process
- C Radial artery
- D Cephalic vein
- E Basilic vein
- Answer E



- All of the following are boundaries of anatomical snuff box except-
- A Abductor pollicis longus
- B Extensor pollicis brevis
- C Abductor pollicis brevis
- D Extensor pollicis longus
- E Styloid process of radius
- Answer C

