

Academic year 2021- 2022
2nd year S3

Module: Musculoskeletal system (MSK)

Session No. 4

DR

Date: 9th November 2021

The Hand

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Moore : Clinically oriented anatomy

Snell : Clinical anatomy by regions

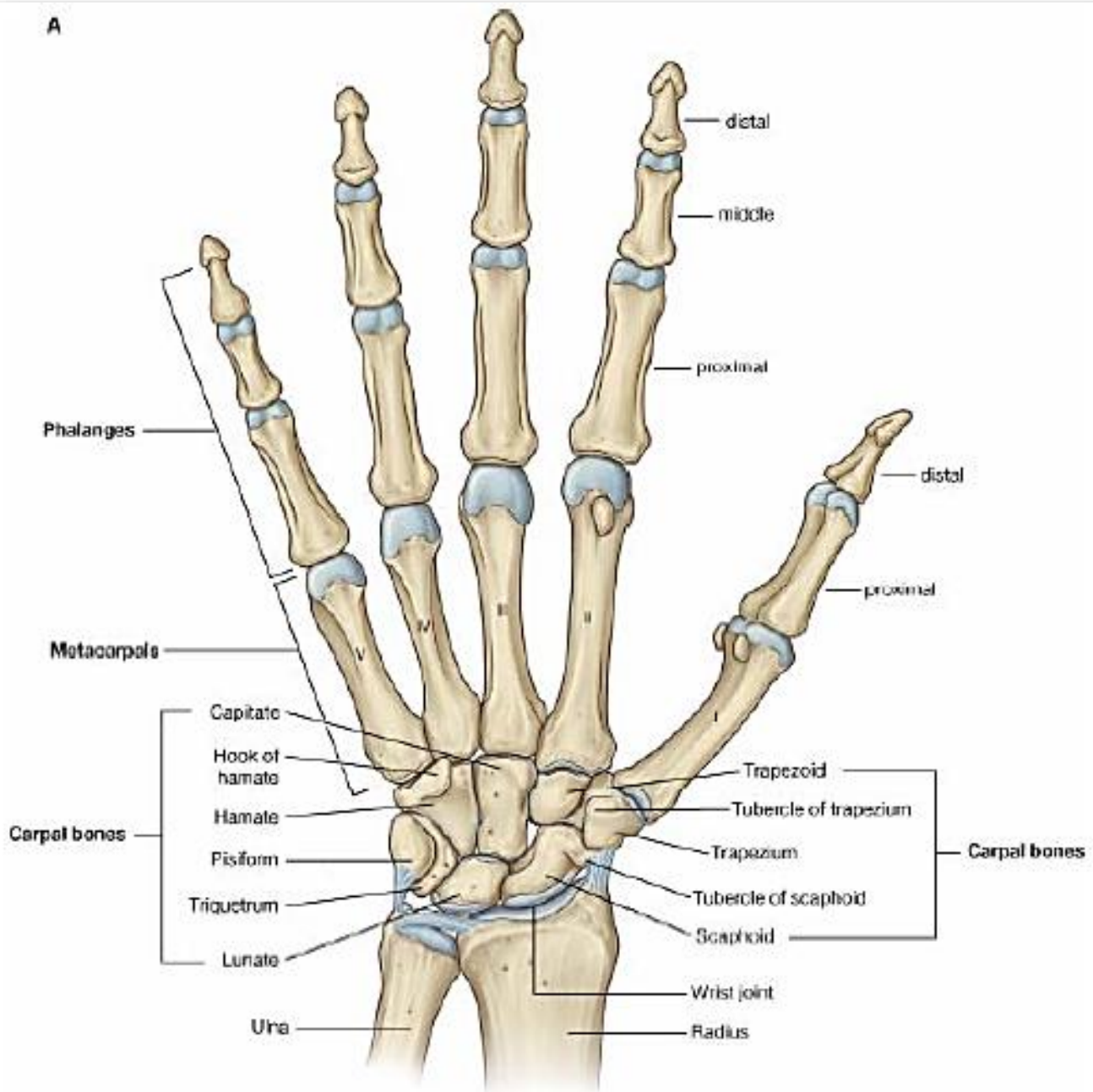


Objectives:

- To know, explain extrinsic and intrinsic muscles of the hand
- to describe and demonstrate the general arrangement and function of structures in the hand.



Bones



Carpal bones mnemonics

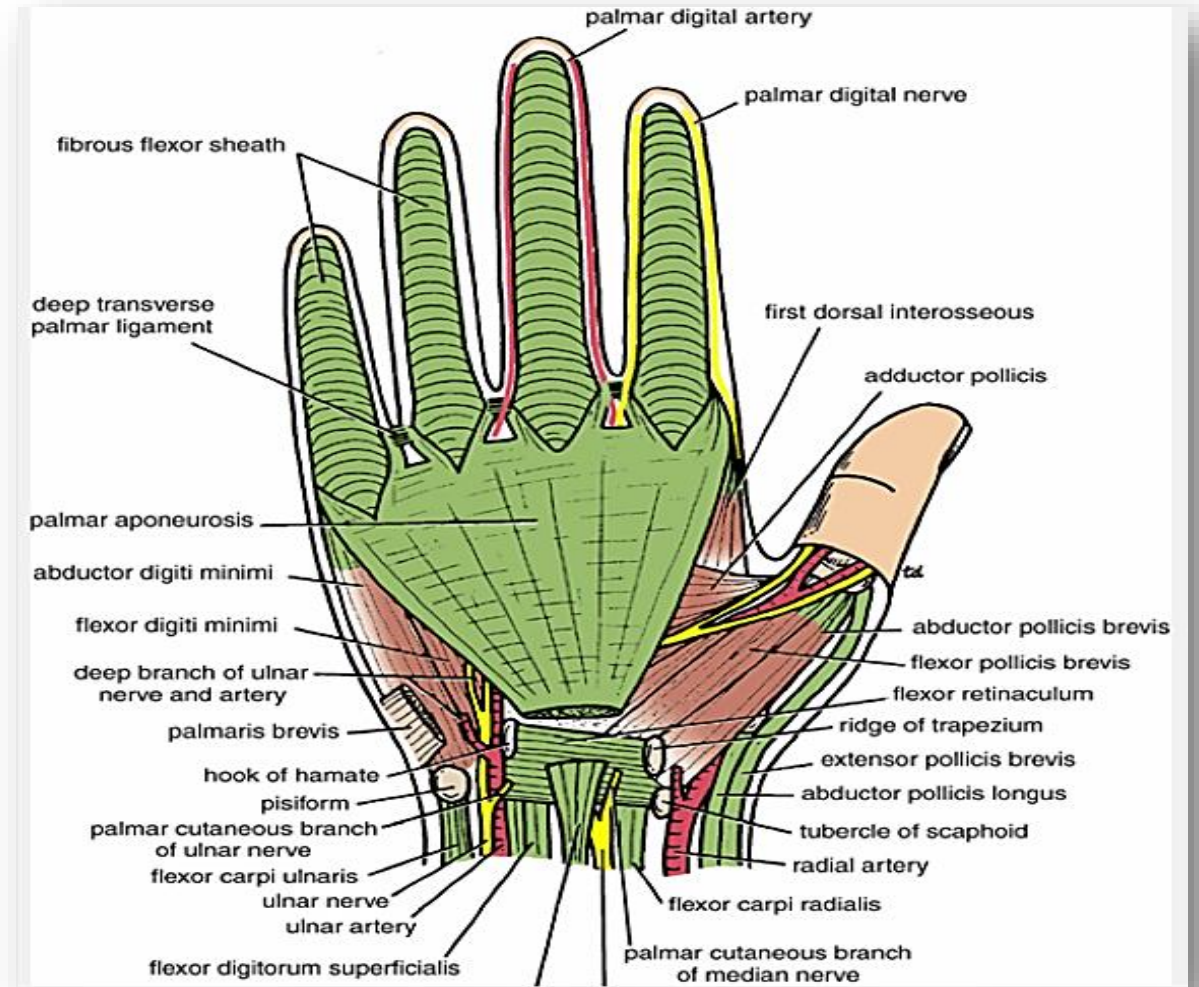
- Carpal bones (lateral to medial):

➤ Proximal row: **S**caploid, **L**unate, **T**riquetrum, **P**isiform

➤ Distal row: **T**rapezium, **T**rapezoid, **C**apitate, **H**amate

Flexor Retinaculum

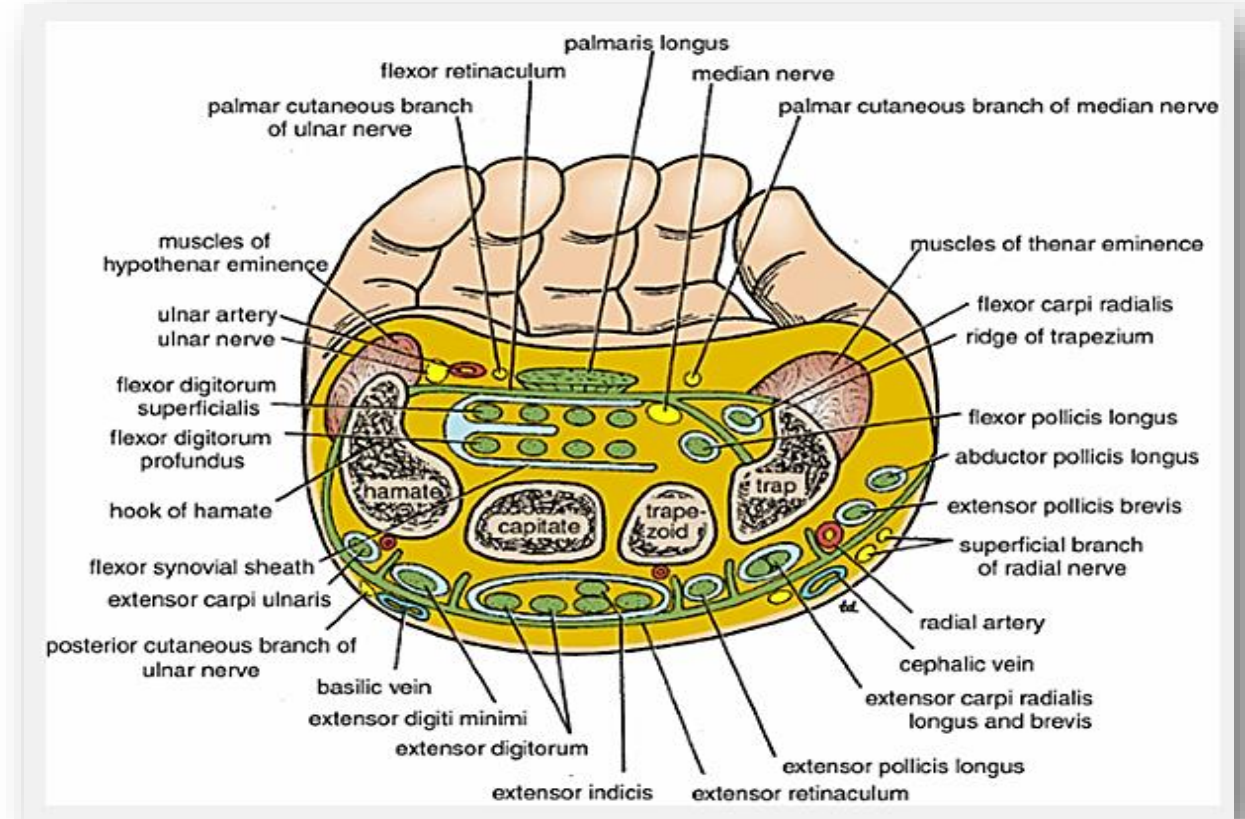
- It is a thickening of deep fascia that holds the long **flexor tendons** in position at the **wrist**.
- It is attached **medially** to the pisiform bone and the hook of the hamate and **laterally** to the tubercle of the scaphoid and the trapezium bones



Structures pass *deep* to Flexor Retinaculum

From medial to lateral:

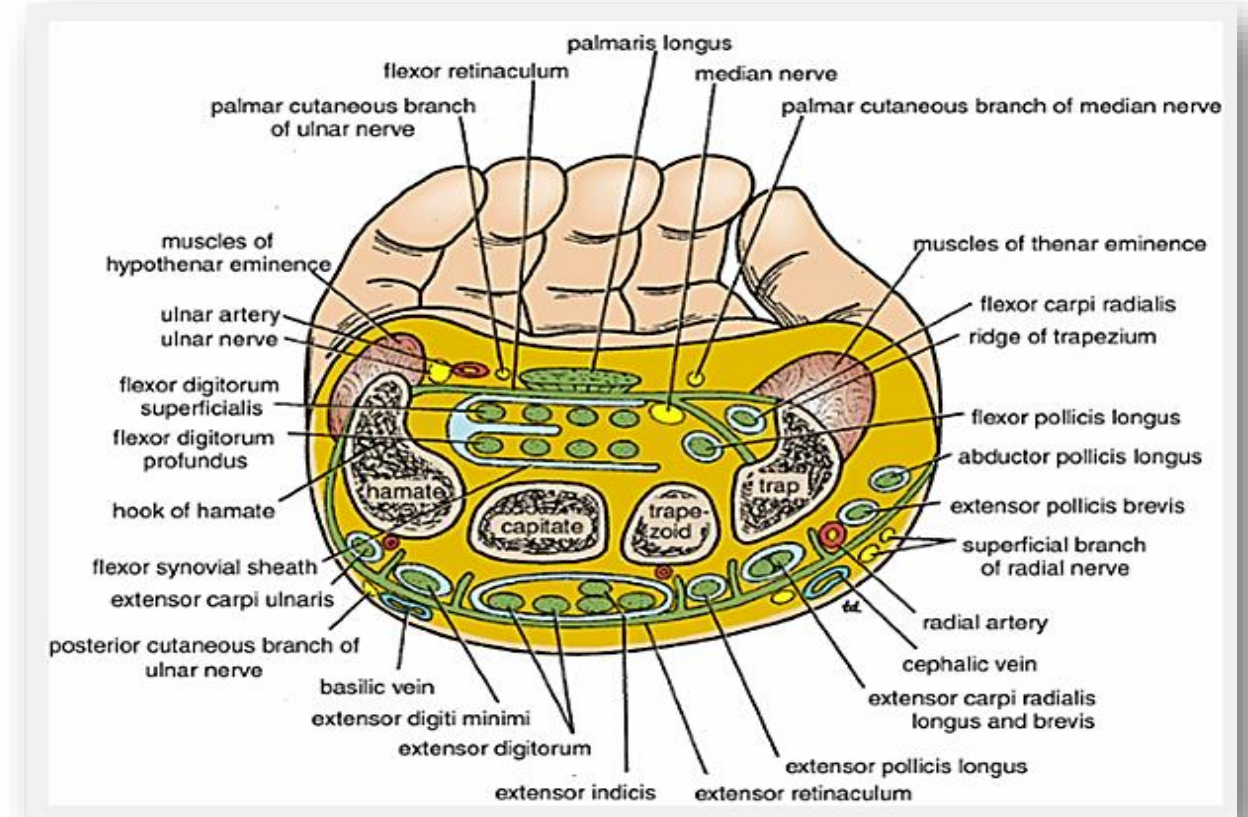
- 1) Flexor digitorum superficialis tendons
- 2) Median nerve
- 3) Flexor pollicis longus tendon
- 4) Flexor carpi radialis tendon



Structures pass *Superficial* to Flexor Retinaculum

From medial to lateral:

- 1) Flexor carpi ulnaris tendon
- 2) Ulnar nerve
- 3) Ulnar artery
- 4) Palmar cutaneous branch of the ulnar nerve
- 5) Palmaris longus tendon
- 6) Palmar cutaneous branch of the median nerve

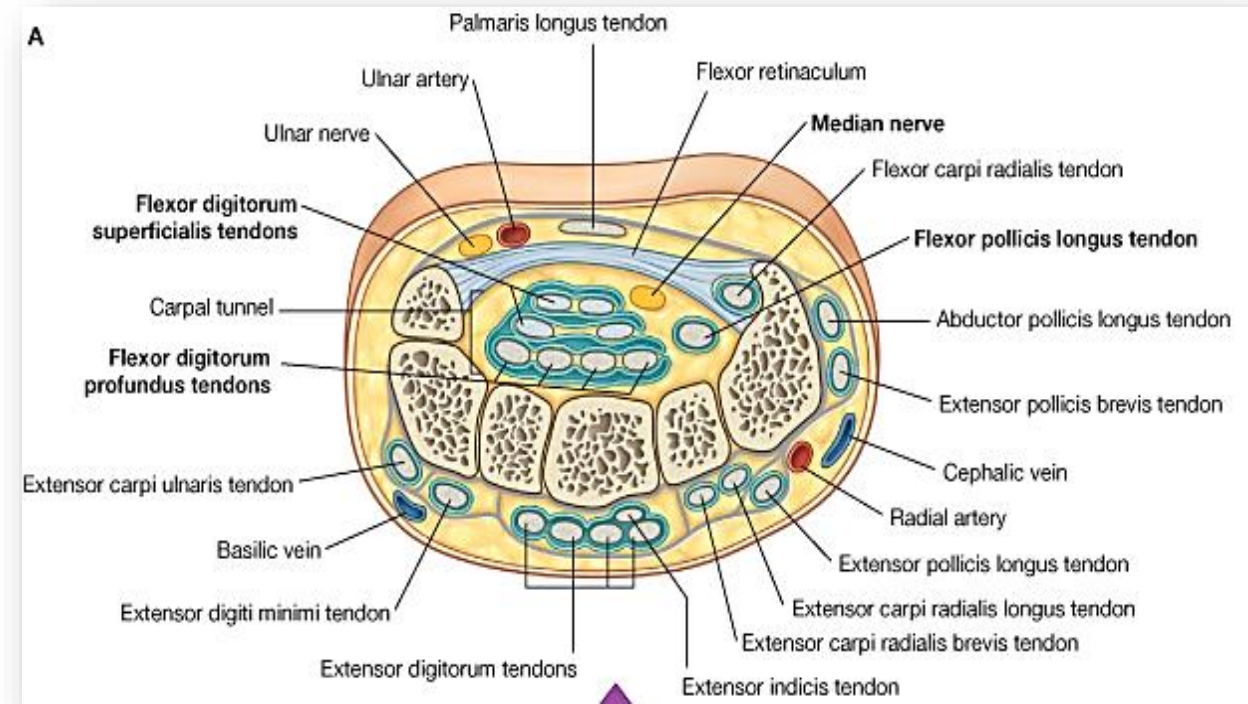


Carpal Tunnel

- It is a fibro-osseous canal formed anteriorly at the wrist by a deep arch formed by the **carpal bones and the flexor retinaculum**.

- **Contents** :

- 1) Tendons of FDS
- 2) Tendons of FDP
- 3) Tendon of FPL
- 4) Median nerve



Muscles of the Hand

- Hand muscles divided into two groups:

A. Extrinsic group: Muscles that **originate outside** the hand and inserted into the hand bones, e.g. FDS, FDP.

B. Intrinsic group: arranged in five parts

- 1) Thenar Eminence
- 2) Hypothenar Eminence
- 3) Adductor pollicis
- 4) Interosseous muscles
- 5) Lumbrical muscles

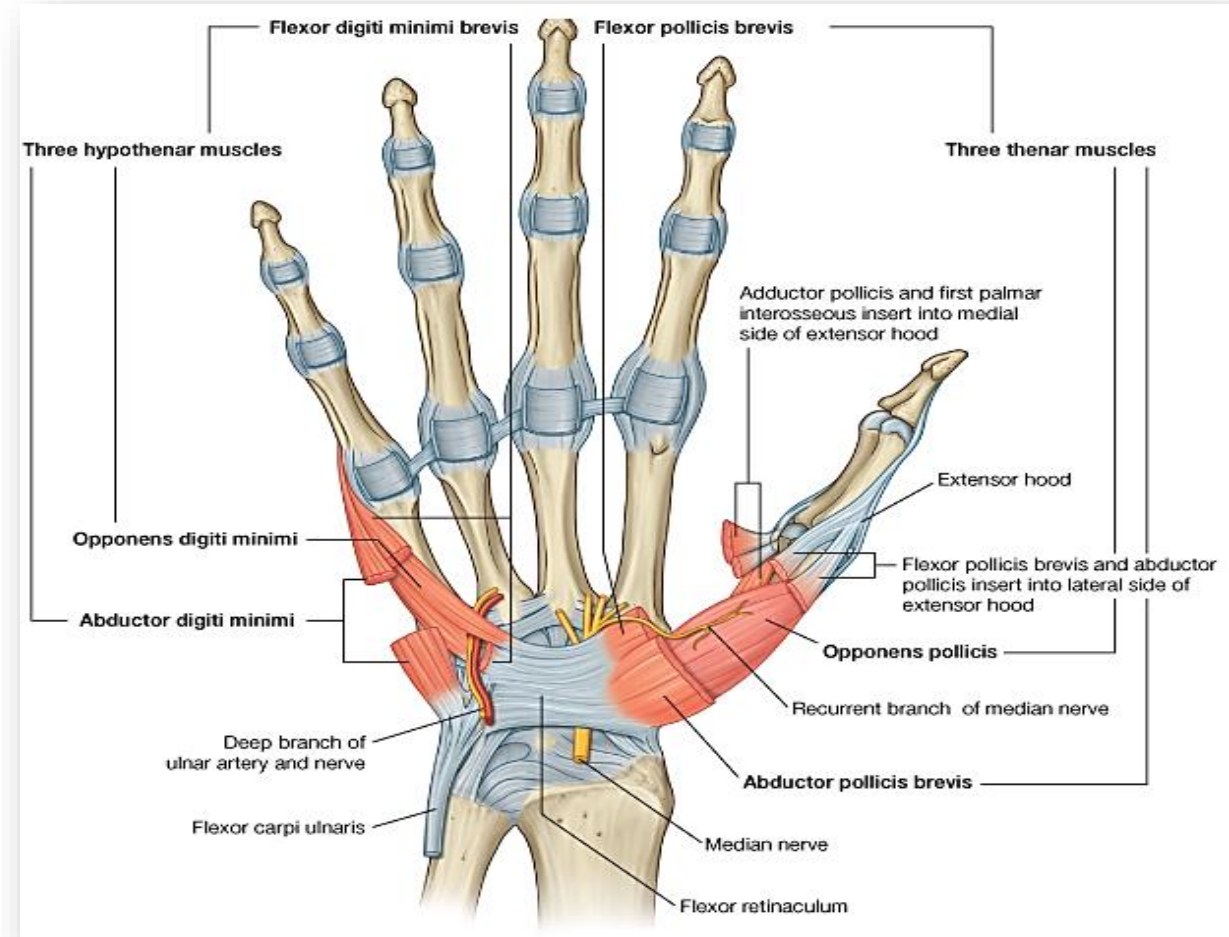


Thenar Eminence

- Three muscles responsible for the prominent swelling on the lateral side of the palm at the **base of the thumb**.

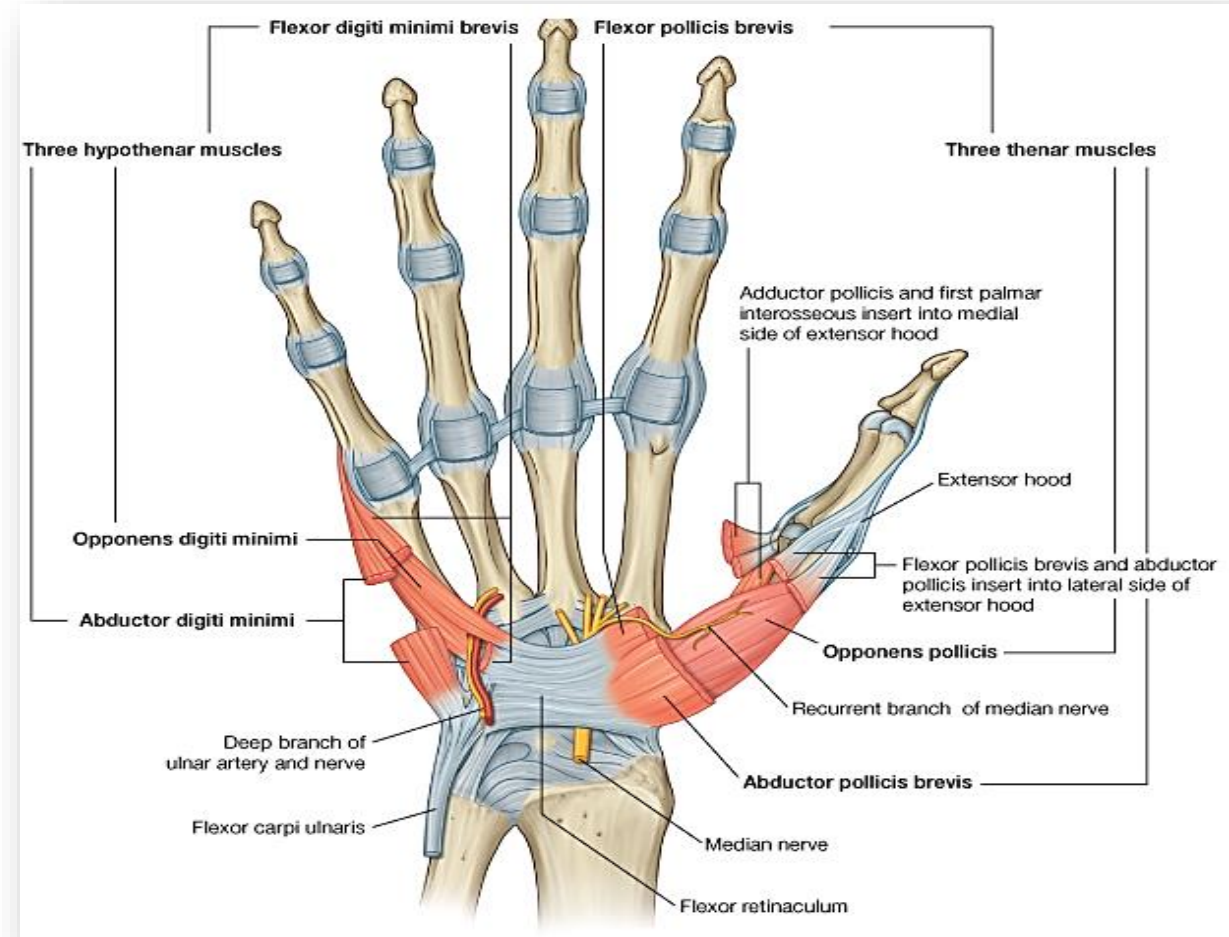
- 1) Opponens pollicis
- 2) Flexor pollicis brevis
- 3) Abductor pollicis brevis

- All are supplied by recurrent branch of **median** nerve



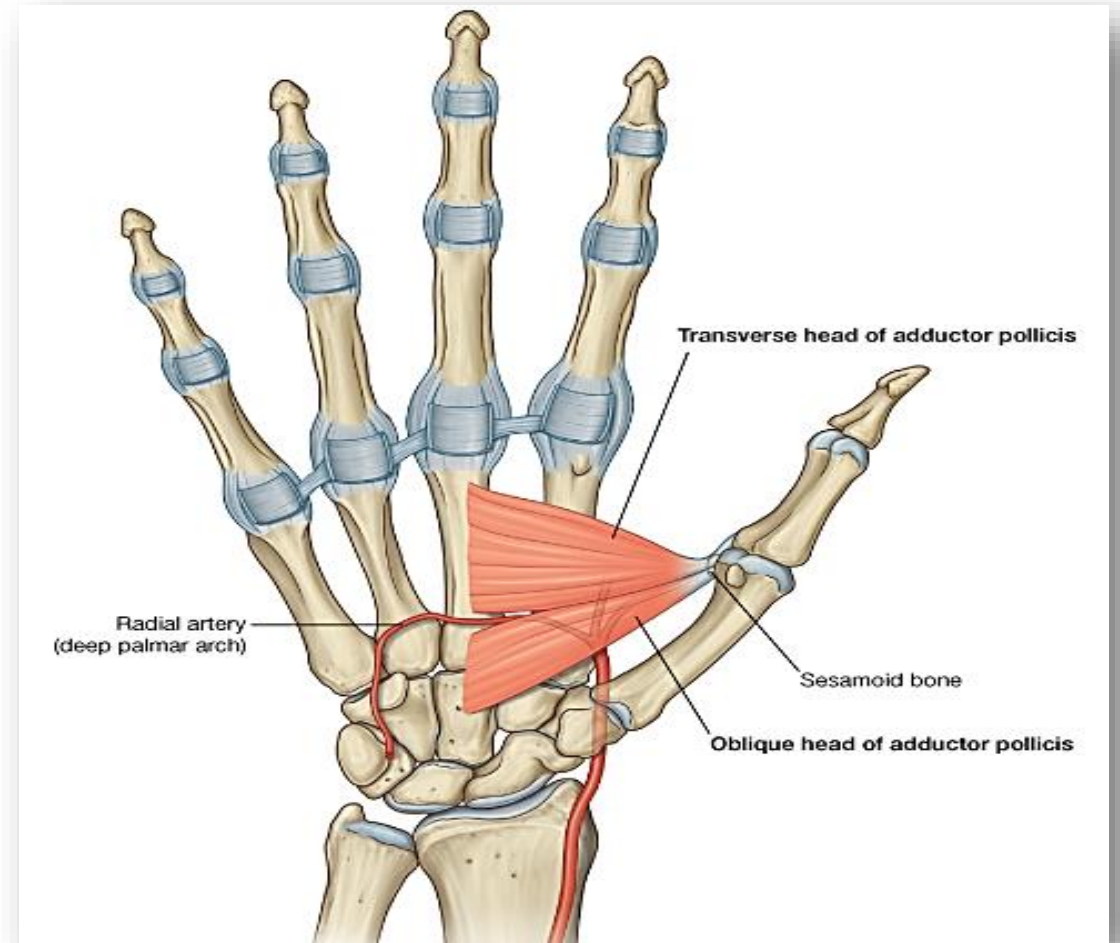
Hypothenar Eminence

- Three muscles responsible for the swelling at the **base of the little finger**.
 - 1) Opponens Digiti minimi
 - 2) Abductor Digiti minimi
 - 3) Flexor Digiti minimi brevis
- All supplied by deep branch of **Ulnar** nerve.



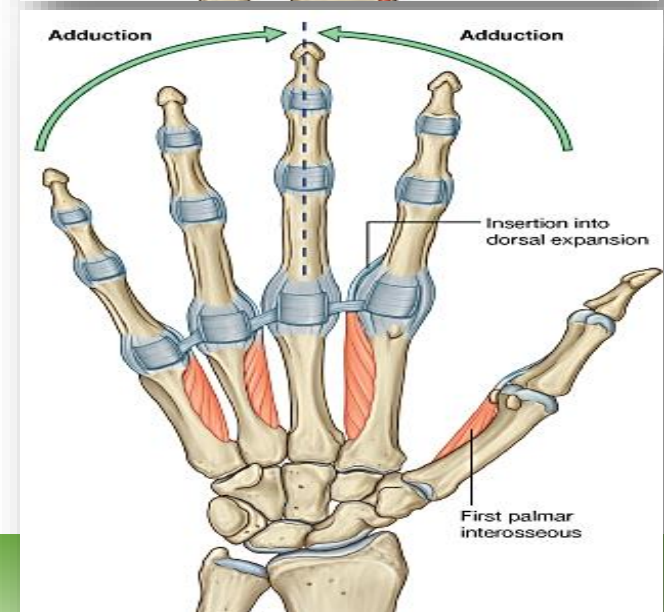
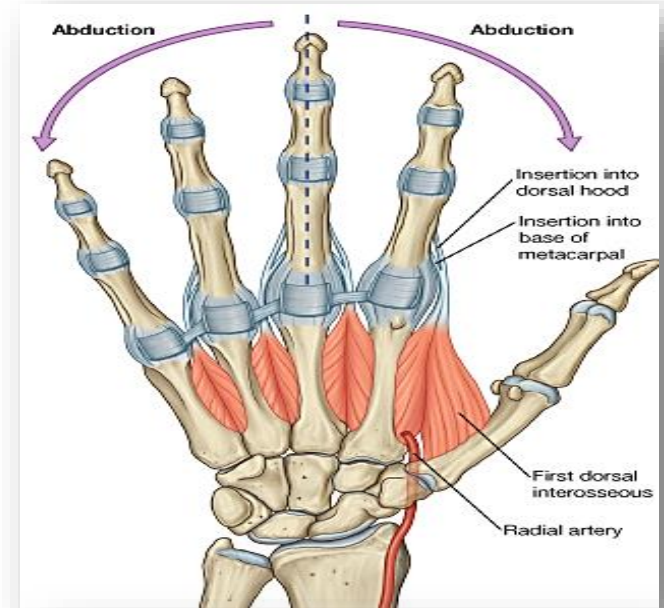
Adductor Pollicis

- It originates as two heads:
 - **transverse head** from the anterior aspect of the shaft of 3rd metacarpal
 - **oblique head**, from the capitate and adjacent bases of 2nd and 3rd metacarpals.
- inserts into the medial side of the base of the proximal phalanx.
- It supplied by Deep branch of ulnar nerve.
- Adduction



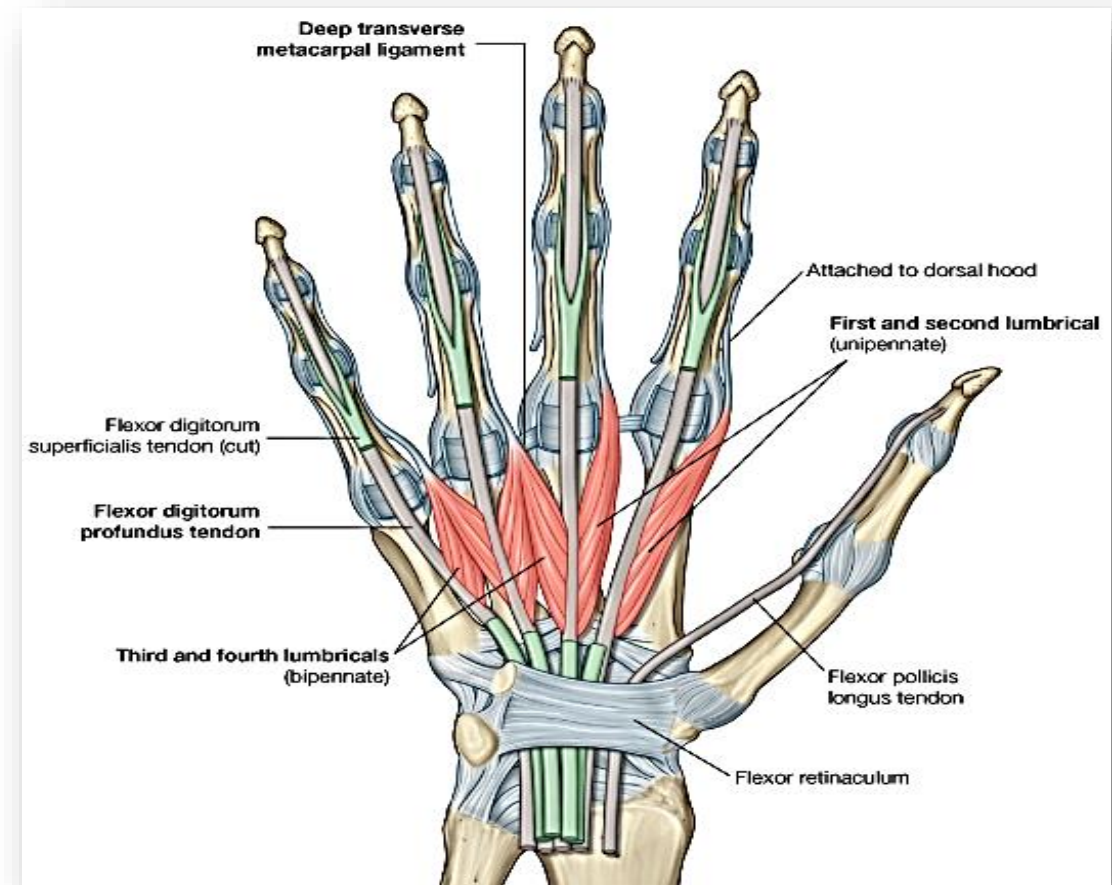
Interosseous Muscles

- The interossei are muscles between and attached to the **metacarpals**, inserted into the **proximal phalanx** of each digit.
- They are divided into two groups, the **dorsal** interossei and the **palmar** interossei.
- **All** are supplied by deep branch of **Ulnar** nerve.
- PAD , DAB.



Lumbrical Muscles

- They are four (worm-like) muscles, each of which is associated with one of the fingers. The muscles originate from the **tendons of FDP** in the **palm**.
- The medial two lumbricals are innervated by the deep branch of the **ulnar** nerve; the lateral two lumbricals are innervated by digital branches of the **median** nerve.
- Flex MPJ and extend IPJ.



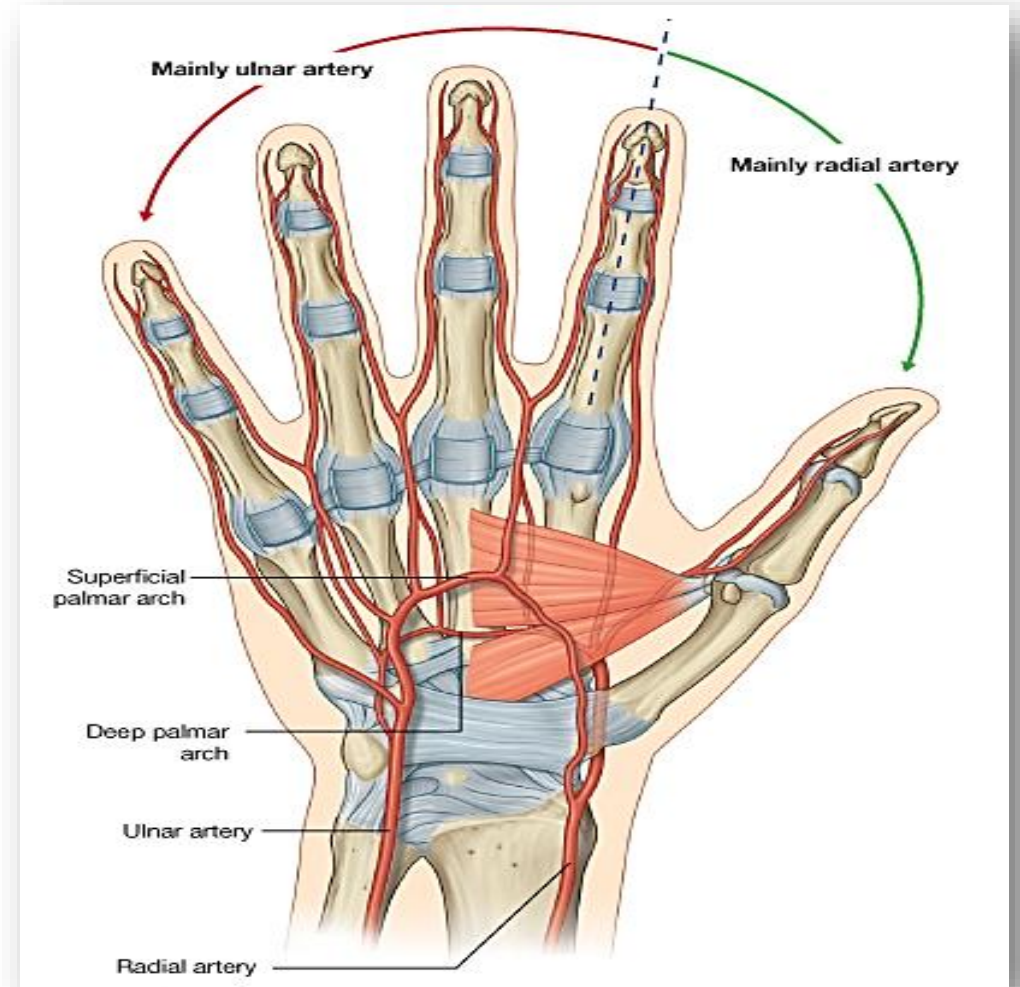
Blood vessels of the Hand

- Blood supply to the hand is by the **radial** and **ulnar** arteries.
- They form two interconnected vascular arches (**superficial** and **deep**) in the palm.
- The radial artery contributes substantially to the supply of the thumb and the lateral side of the index finger
- The remaining digits and the medial side of the index finger are supplied mainly by the ulnar artery.



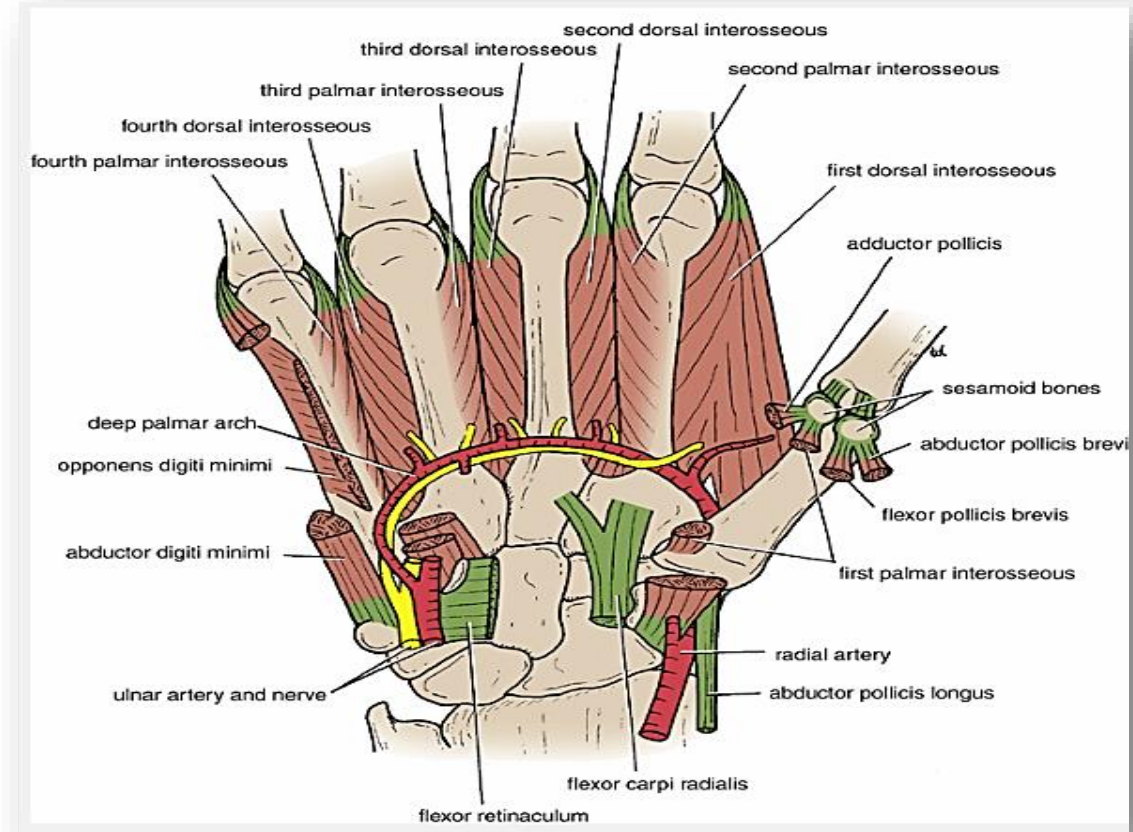
Superficial Palmar Arch

- It is formed by ulnar artery on the medial side of the palm, completed by palmar branch of radial artery.



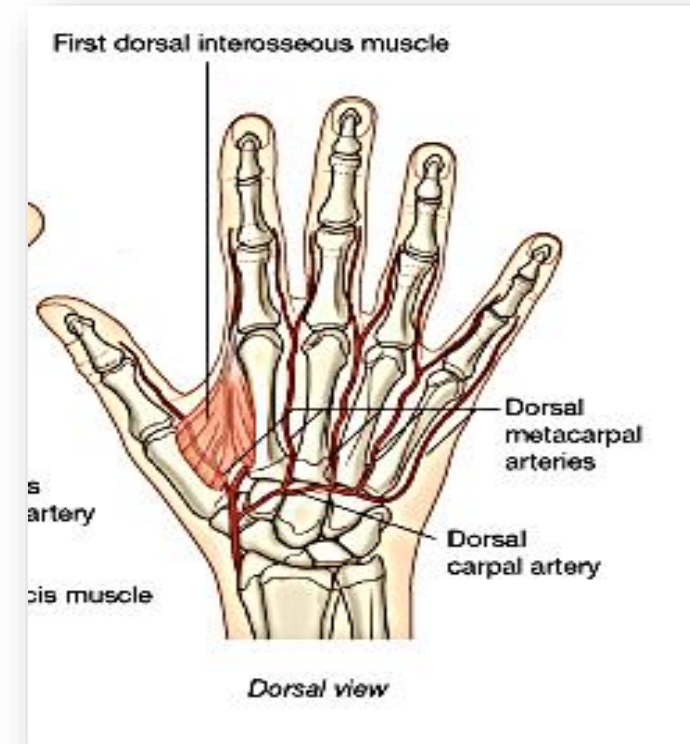
Deep Palmar Arch

- It is formed by radial artery on the lateral side of the palm and completed by deep branch of ulnar artery.
- This arch lies across the metacarpals just distal to their bases.



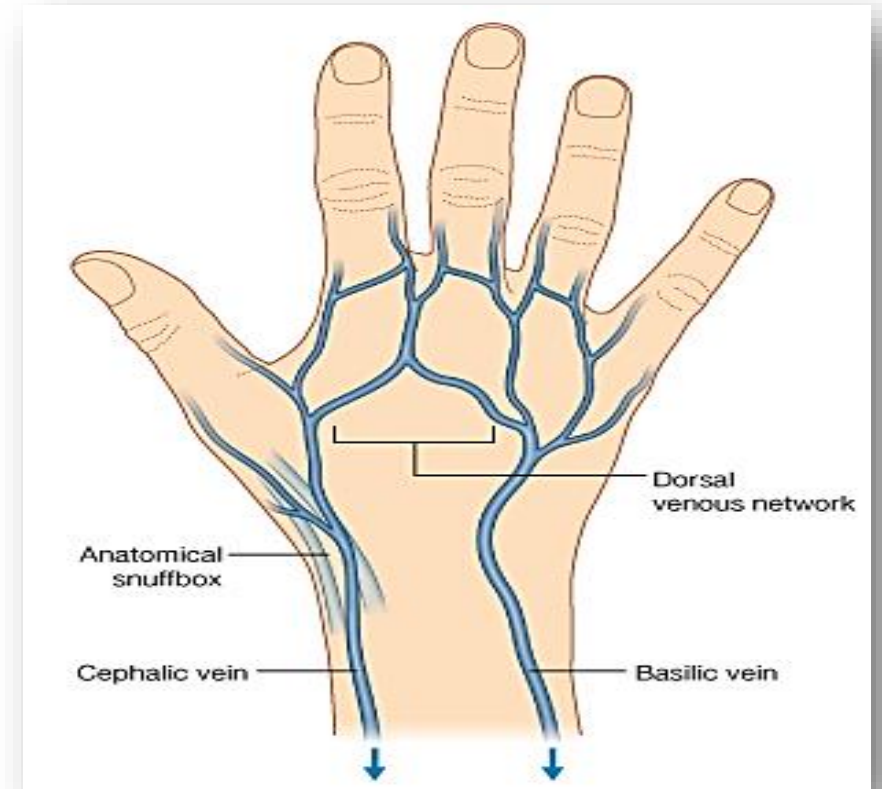
Dorsal Carpal Arch

- At the back of the hand, the radial artery form dorsal carpal arch



Veins of the Hand

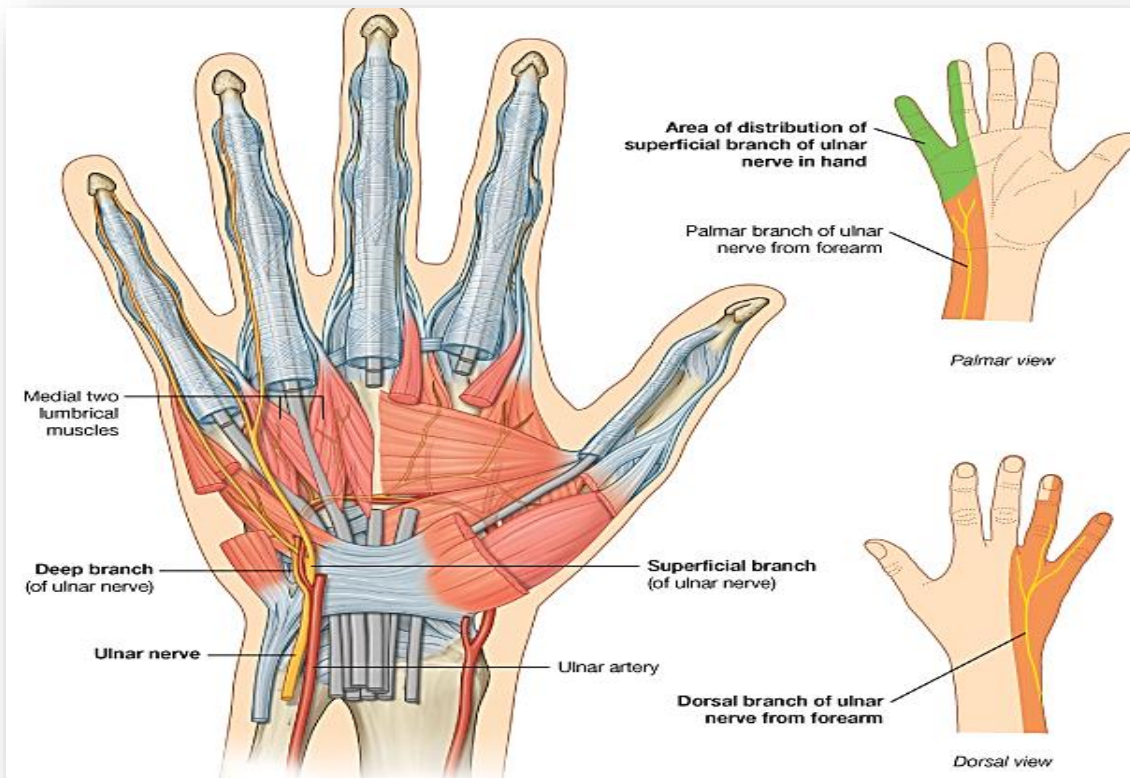
- **Deep** veins follow the arteries.
- **Superficial** veins drain into a dorsal venous network on the back of the hand over the metacarpal bones .
 1. The **Cephalic** vein originates from the lateral side of the dorsal venous network and passes over the anatomical snuffbox into the forearm.
 2. The **Basilic** vein originates from the medial side of the dorsal venous network and passes into the dorso-medial aspect of the forearm.



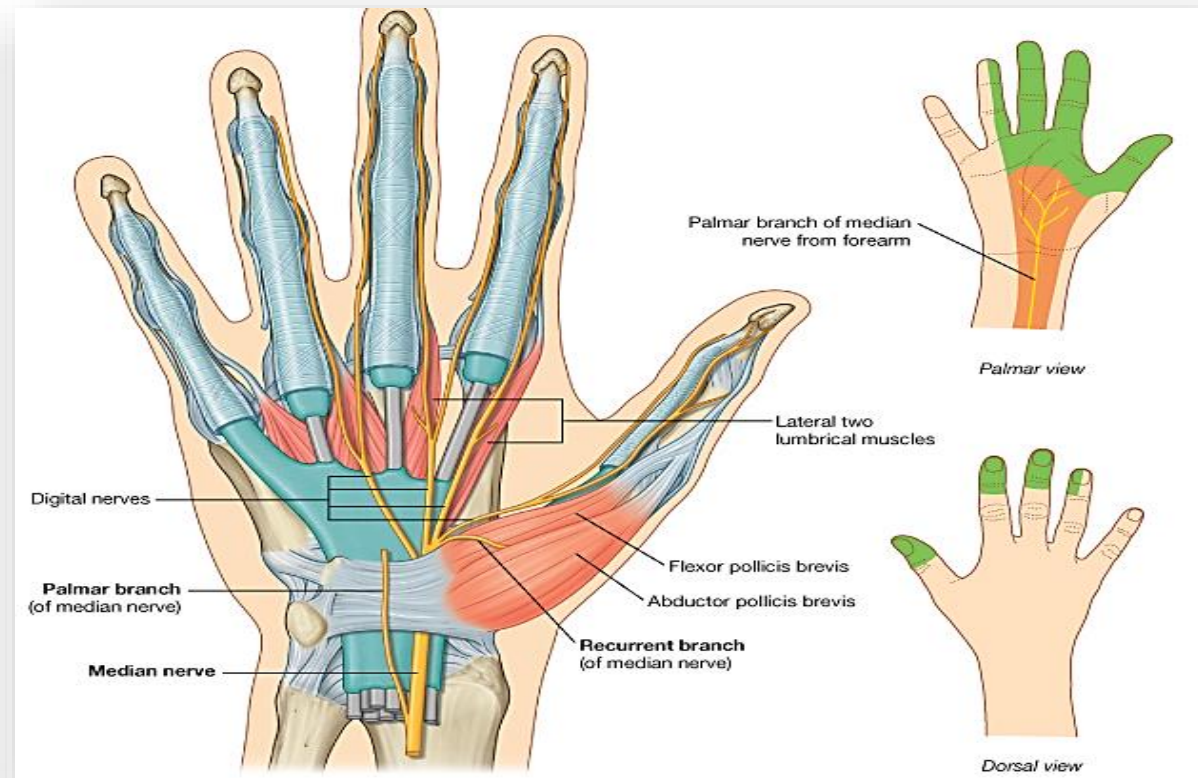
Nerves of the Hand

- The hand is supplied by the ulnar, median, and radial nerves
- The ulnar nerve innervates all intrinsic muscles of the hand except for the three thenar muscles and the two lateral lumbricals,
- which are innervated by the median nerve.
- The radial nerve only innervates skin on the dorsolateral side of the hand.



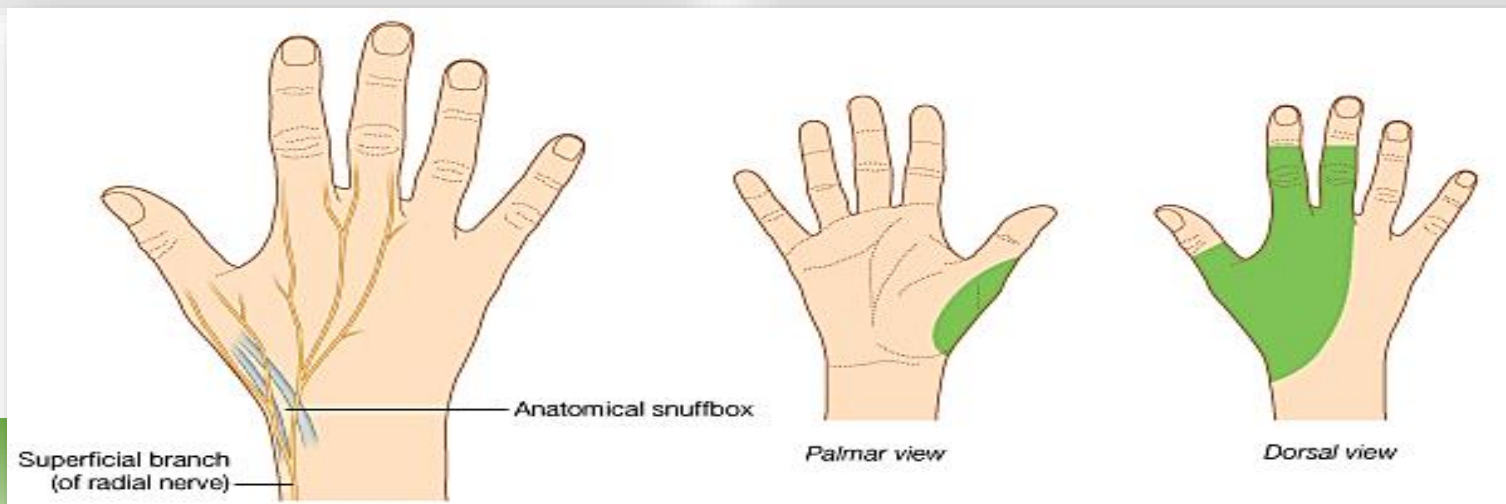


ULNAR



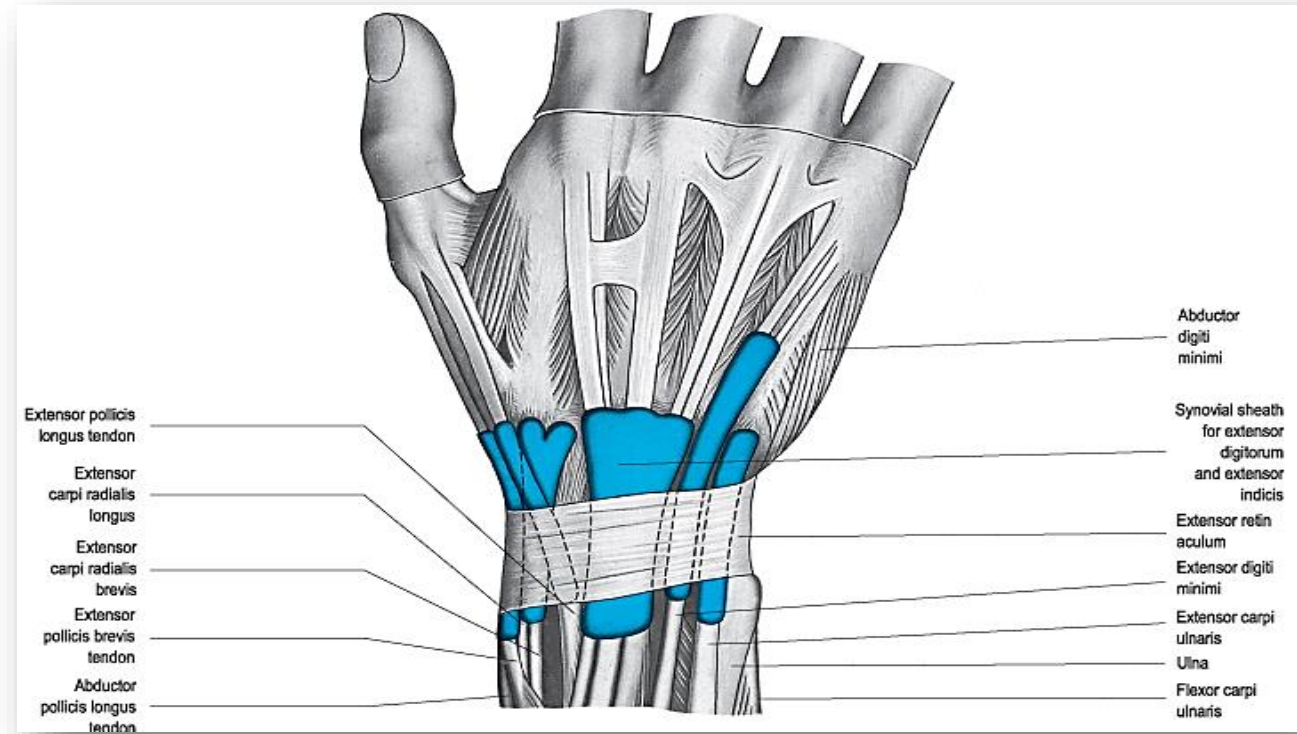
MEDIAN

RADIAL



Extensor Retinaculum

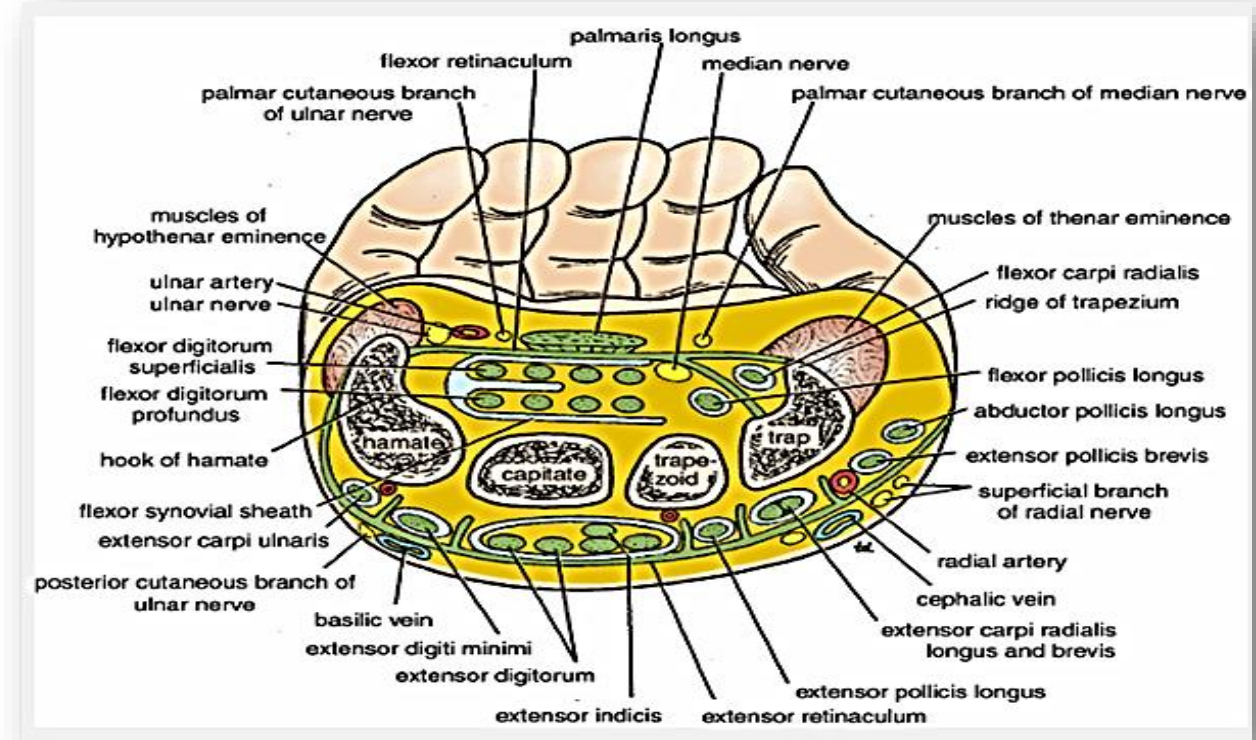
- It is a strong, fibrous band extends obliquely across the **back** of the wrist.
- It is attached **laterally** to the anterior border of the radius, **medially** to the triquetral and pisiform bones.



Extensor Retinaculum

• **Superficial** structures from medial to lateral:

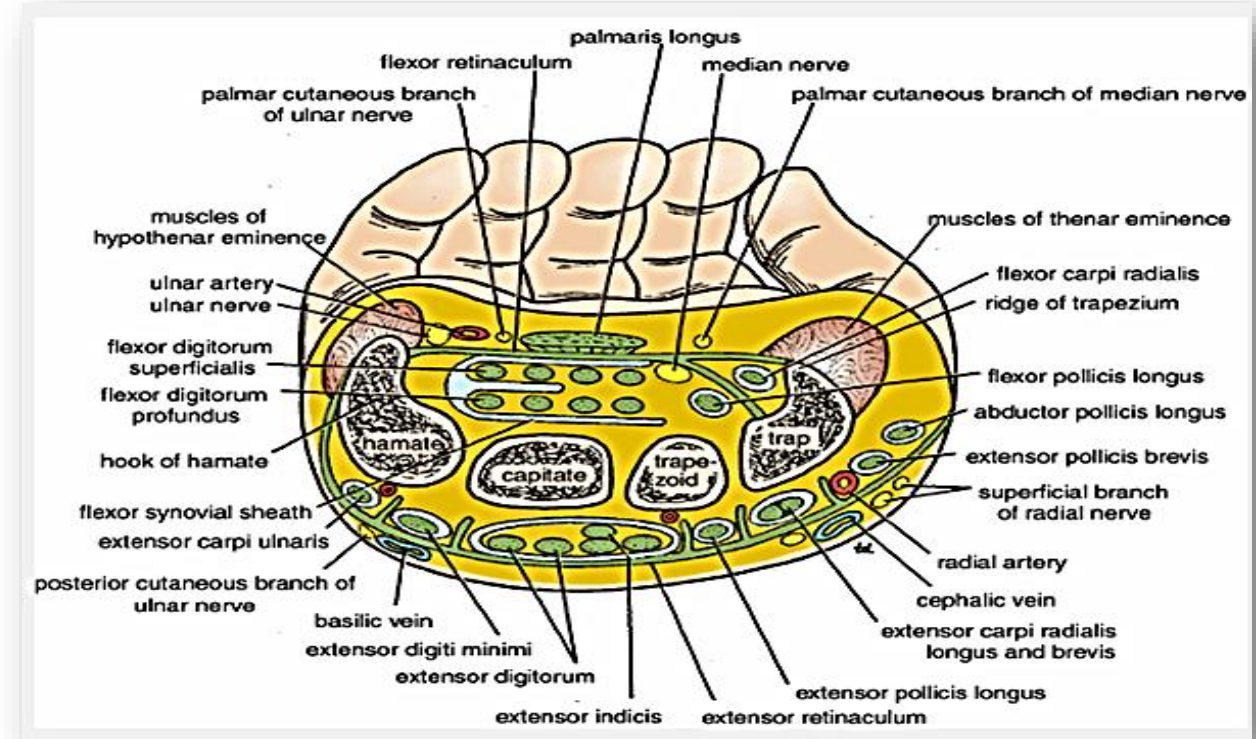
- 1) Dorsal (posterior) cutaneous branch of the ulnar nerve
- 2) Basilic vein
- 3) Cephalic vein
- 4) Superficial branch of the radial nerve



Extensor Retinaculum

• **Deep** structures from **medial to lateral**:

- 1) Extensor carpi ulnaris tendon
- 2) Extensor digiti minimi tendon
- 3) Extensor digitorum and extensor indicis tendons
- 4) Extensor pollicis longus tendon
- 5) Extensor carpi radialis longus and brevis tendons
- 6) Abductor pollicis longus and the extensor pollicis brevis tendons



Thank You

