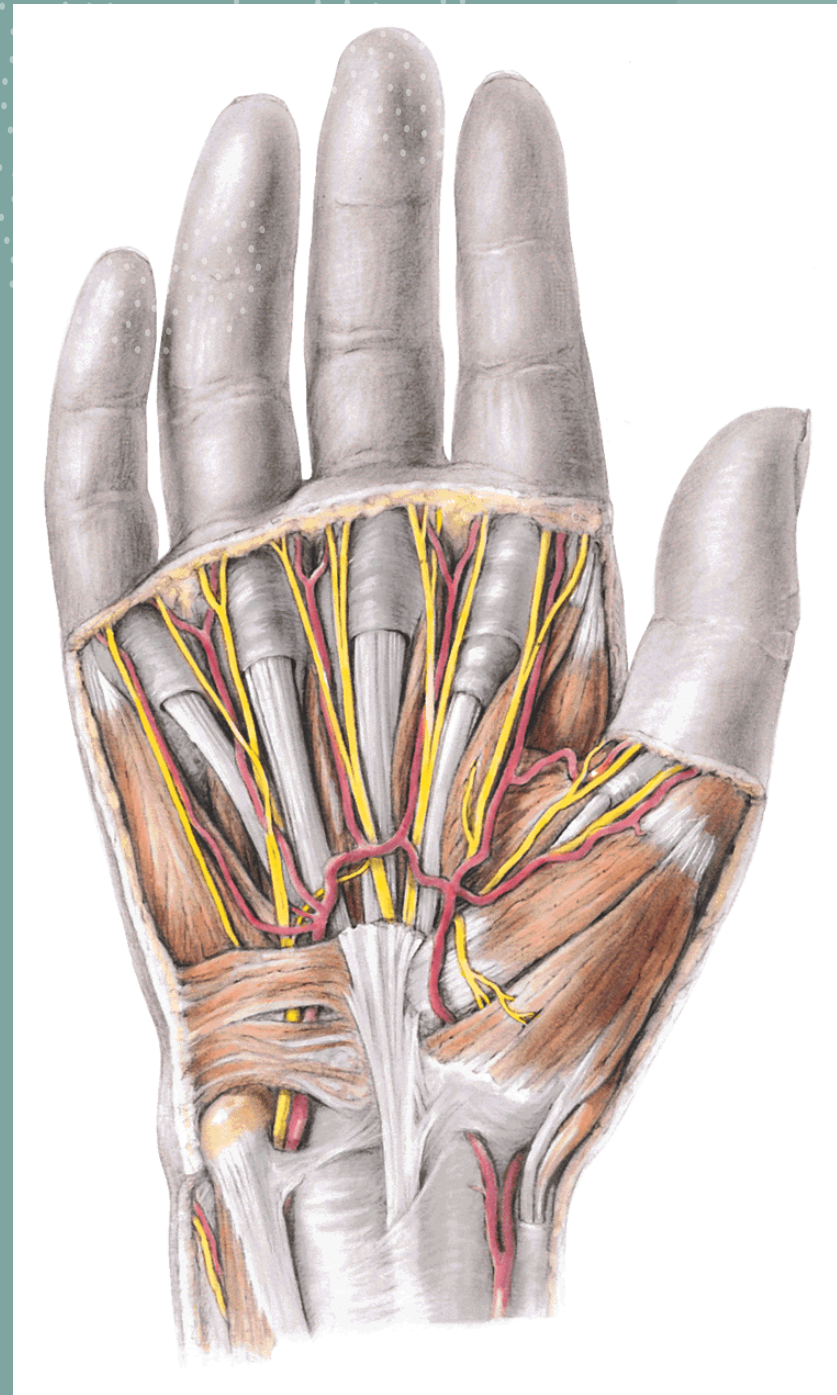


The hand II
The Muscles,
Blood supply
and Nerves
Prof. Oluwadiya KS
www.oluwadiya.com



Intrinsic muscles of the hand

A. Muscles of the thumb (thenar Muscles)

- All these muscles except the adductor pollicis originate from either the tubercle of the trapezium or /and the tubercle of the scaphoid
- All are innervated by the recurrent branch of the median nerve
- All are inserted into the base of the proximal phalanx except the opponens pollicis



Intrinsic muscles of the hand

A. Muscles of the thumb

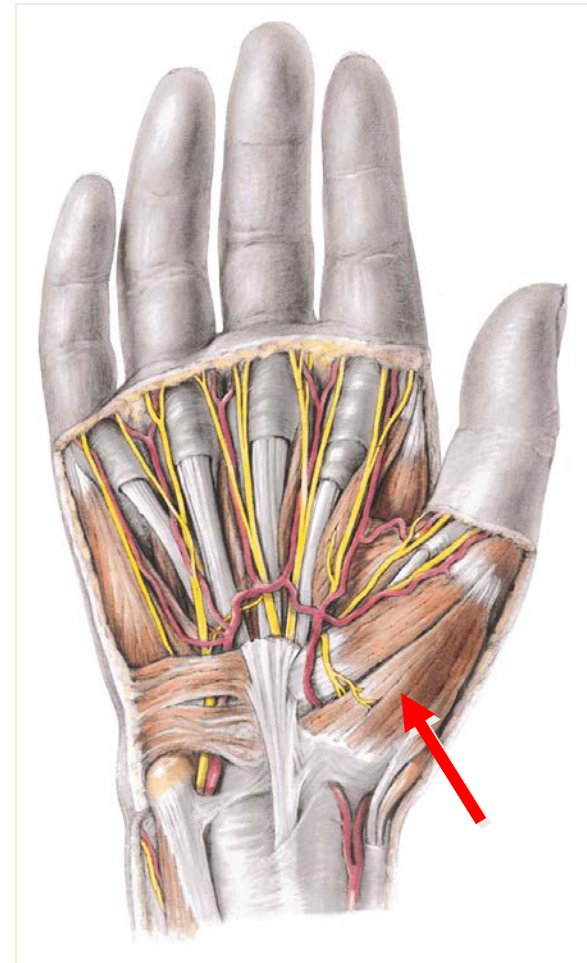
1. *Abductor pollicis brevis*

O: Tubercles of scaphoid and trapezium and adjacent flexor reticulum

I: Proximal phalanx and extensor hood of thumb

A: Abducts thumb at metacarpophalangeal joint

N: Recurrent branch of median nerve



Intrinsic muscles of the hand

A. Muscles of the thumb

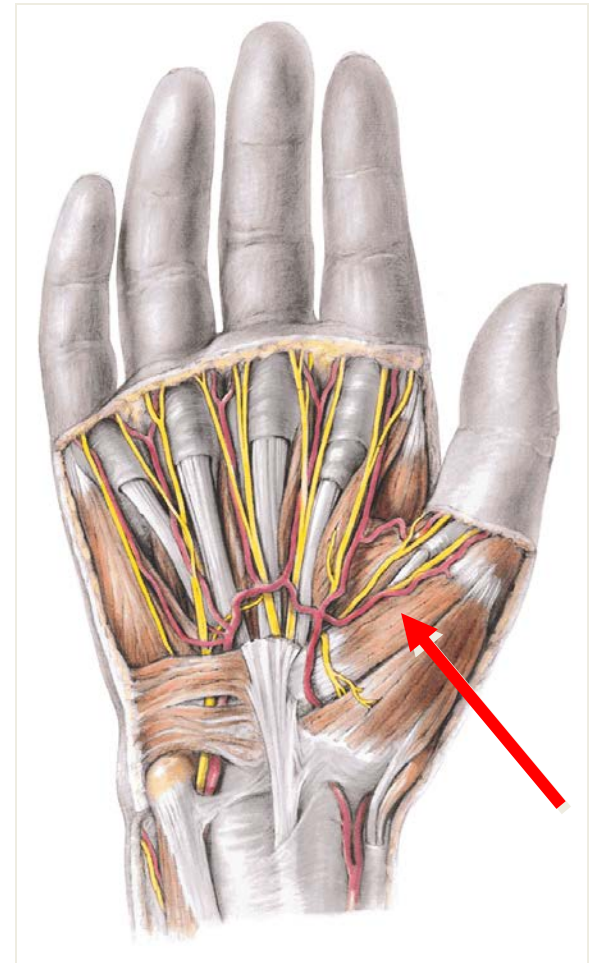
2. *Flexor pollicis brevis*

O: Tubercle of the trapezium and flexor retinaculum

I: Proximal phalanx of the thumb

A: flexes the metacarpophalangeal joint

N: Recurrent branch of median nerve



Intrinsic muscles of the hand (contd)

A. Muscles of the thumb

3. *Opponens pollicis*

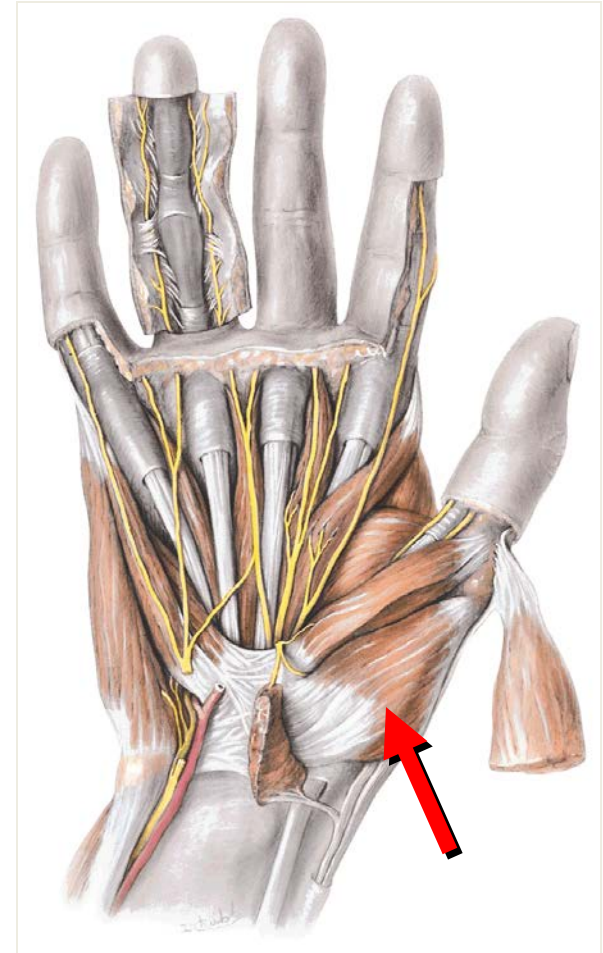
Deep to the abductor pollicis brevis

O: Tubercle of trapezium and flexor retinaculum

I: Lateral margin and adjacent palmar surface of metacarpal I

A: Medially rotates thumb and opposes the thumb

N: Recurrent branch of median nerve



Intrinsic muscles of the hand

A. Muscles of the thumb

4. *Adductor pollicis*

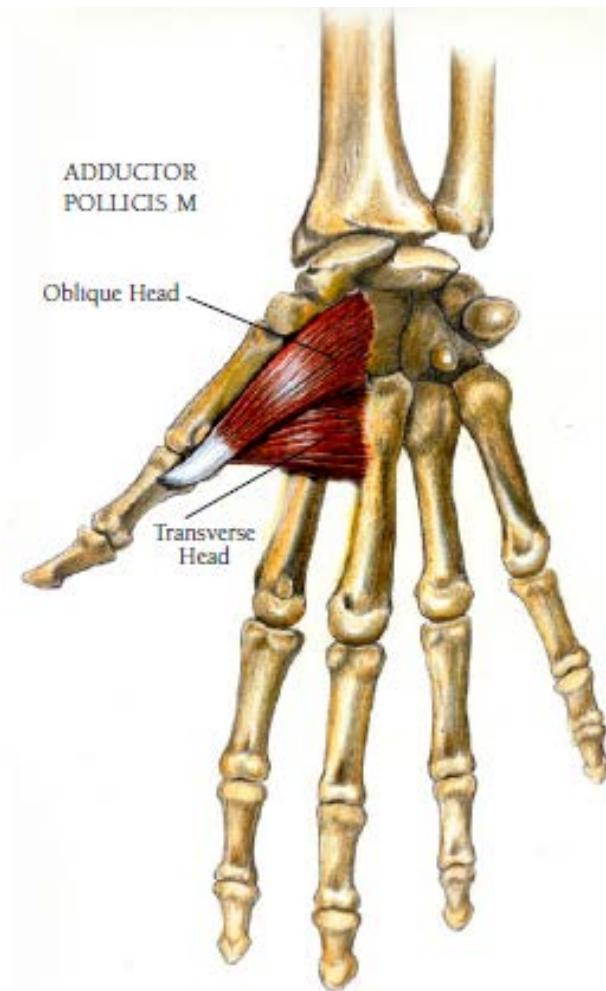
The only intrinsic muscle acting on the thumb that is not in the thenar eminence. Has 2 heads:

O: **Transverse head**- metacarpal III
oblique head-capitate and bases of metacarpals II and III

I: Base of proximal phalanx and extensor hood of thumb palmar surface of metacarpal I

A: Adducts thumb

N: Deep branch of the ulna nerve



Intrinsic muscles of the hand

B. Hypothenar muscles

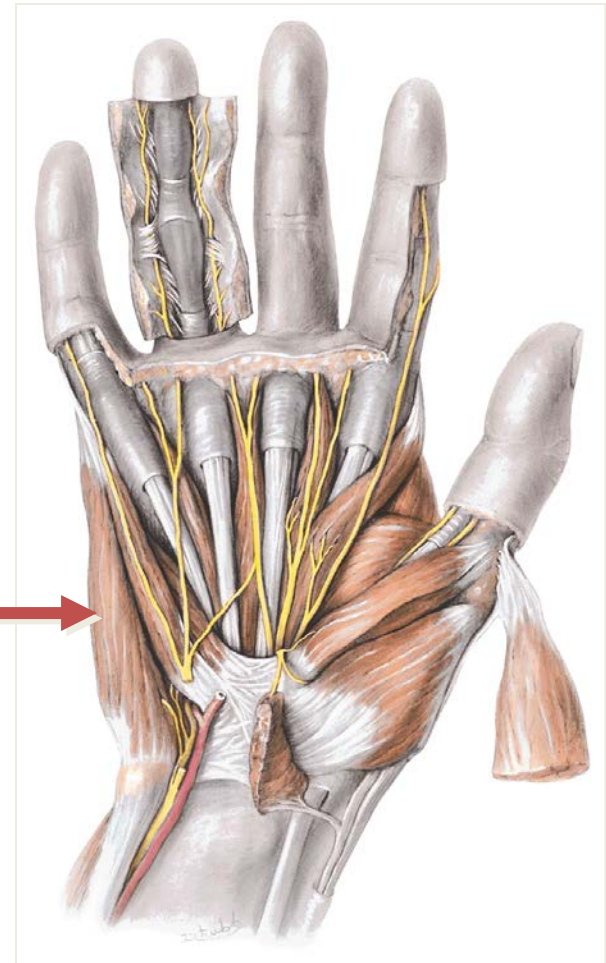
1. *Abductor digiti minimi*

O: Pisiform, the pisohamate ligament, and tendon of flexor carpi ulnaris

I: Proximal phalanx of little finger

A: Abducts little finger at metacarpophalangeal joint

N: Deep branch of ulnar nerve



Intrinsic muscles of the hand

B. Hypothenar muscles

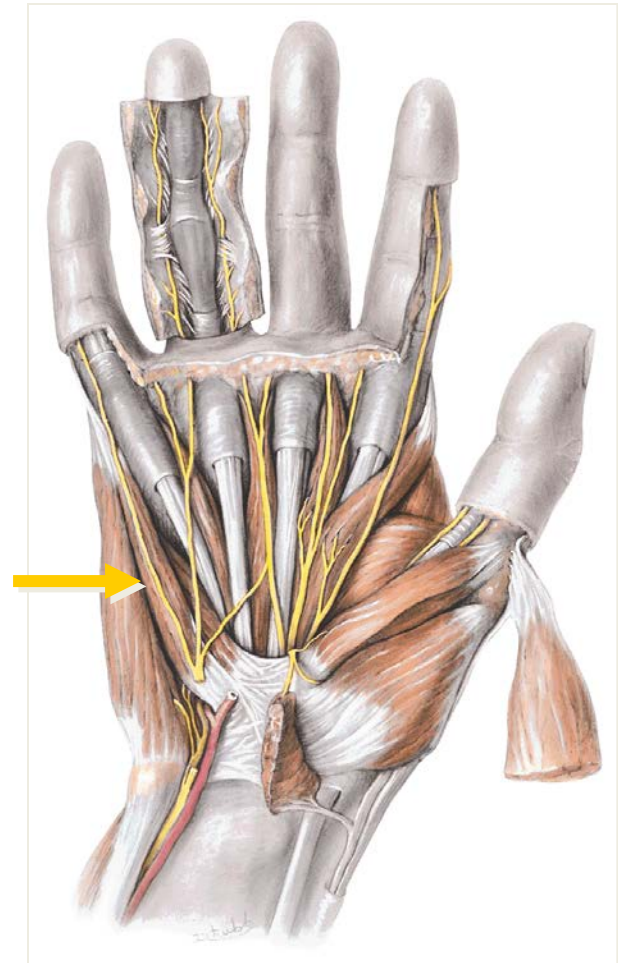
2. *Flexor digiti minimi brevis*

O: Hook of the hamate and flexor retinaculum

I: Proximal phalanx of little finger

A: Flexes little finger at metacarpophalangeal joint

N: Deep branch of ulnar nerve



Intrinsic muscles of the hand

B. Hypothenar muscles

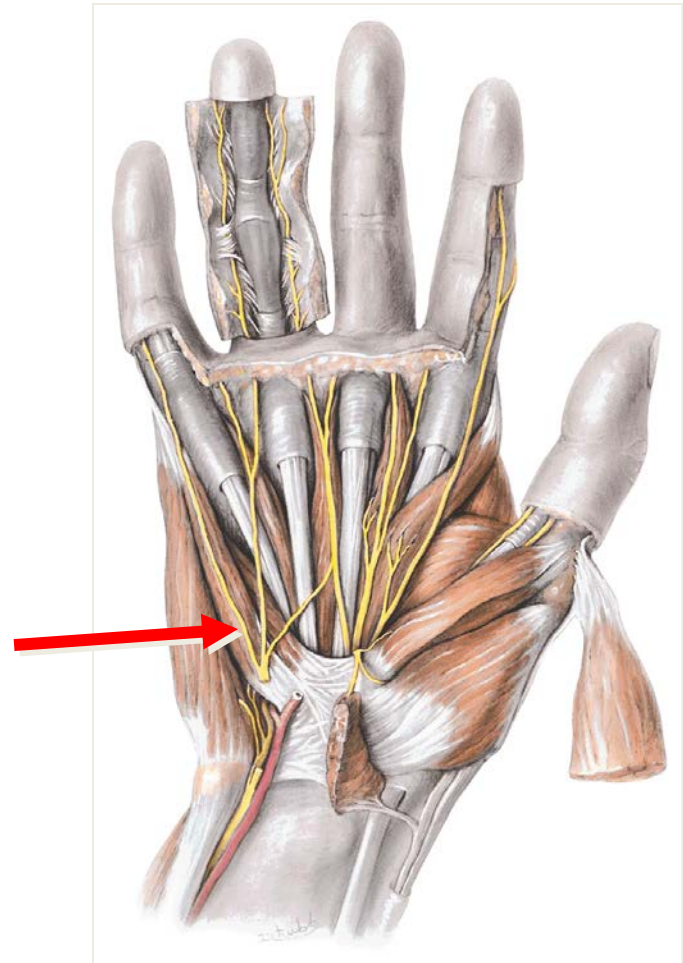
3. *Opponens digiti minimi*

O: Hook of hamate and flexor retinaculum

I: Medial aspect of metacarpal V

A: Laterally rotates metacarpal V leading to opposition

N: Deep branch of ulnar nerve



Memory aid:

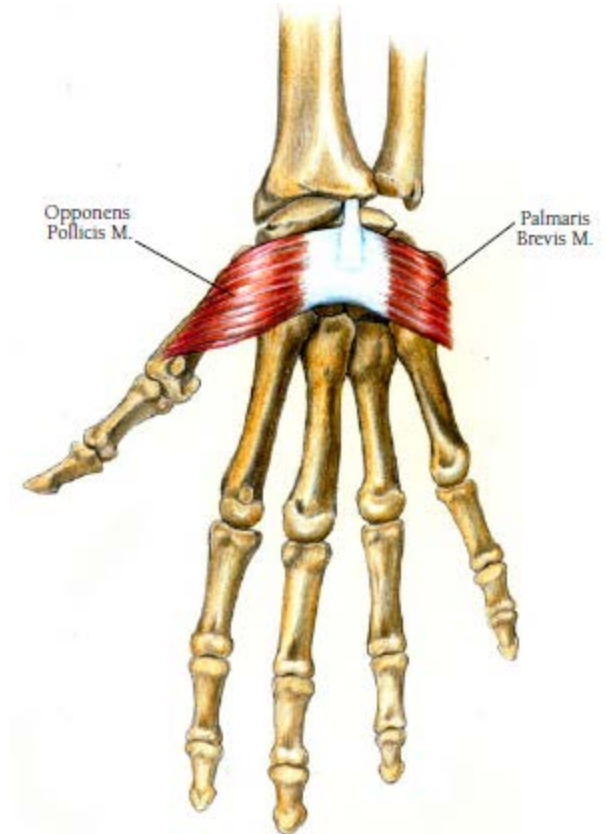
- Muscles arising partially or wholly from the transverse carpal ligaments are four:
 - The flexor pollicis brevis and the opponens pollicis on the medial side
 - The flexor digiti minimi and the opponens digiti minimi on the lateral side

Intrinsic muscles of the hand

C. Other Intrinsic hand muscles

1. *Palmaris brevis*

- Covers the hypothenar compartment
- Arises from the flexor retinaculum
- Inserts into the skin on the 5th finger
- Innervated by the Ulna
- Helps in cupping the hand



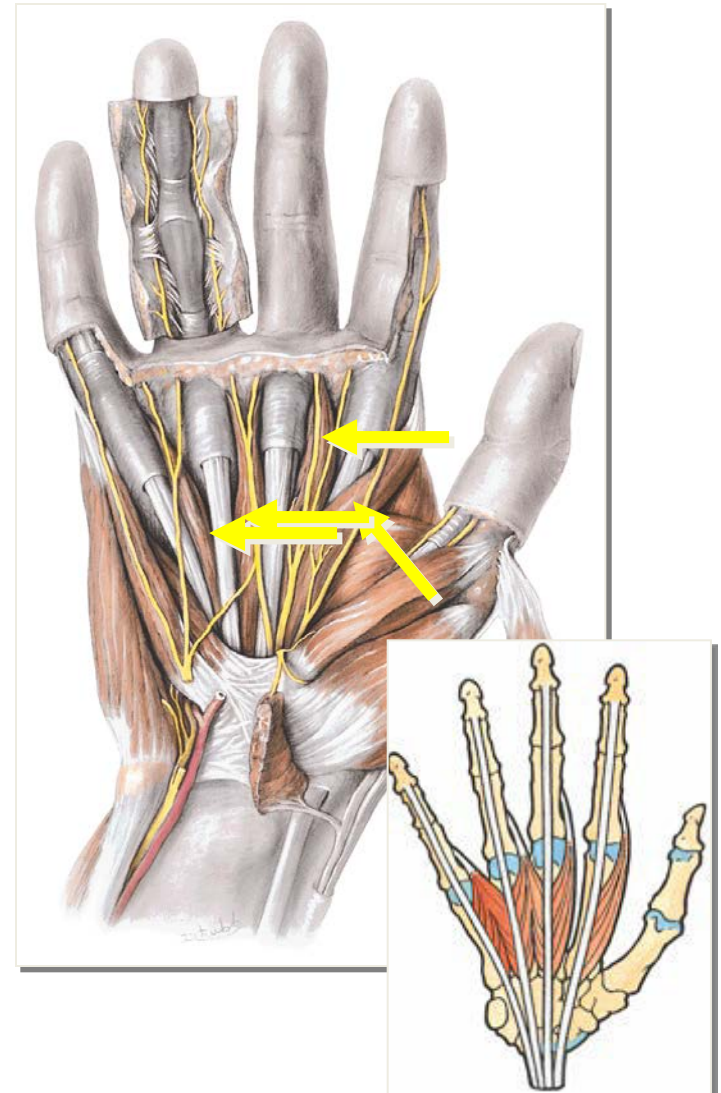
Intrinsic muscles of the hand

C. Other Intrinsic hand muscles

1. Lumbricals (earthworm)

- The medial two lumbricals are bipennate and originate from the flexor digitorum profundus tendons of the middle and ring fingers and the ring and little fingers

- The lateral two lumbricals are unipennate muscles, originating from the flexor digitorum profundus tendons associated with index and middle fingers, respectively



Intrinsic muscles of the hand

C. Other Intrinsic hand muscles

2. Interosseous muscles

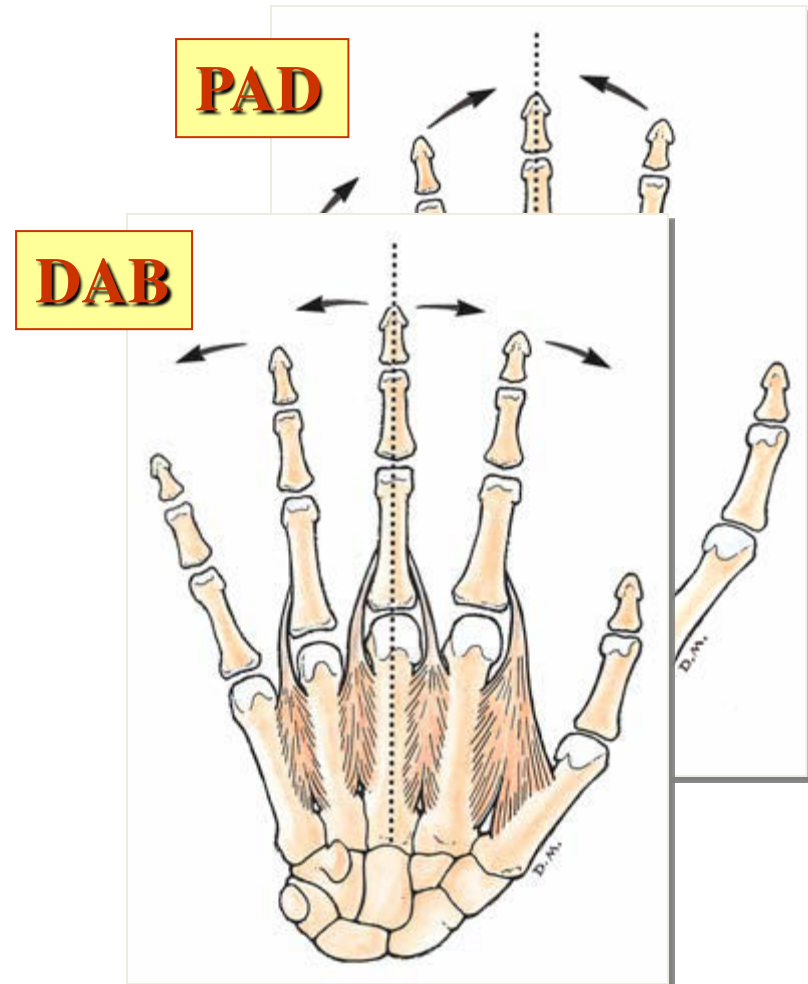
a. palmar interossei:

located on side of digits facing middle finger, and bring fingers toward middle finger i.e. Adducts

b. dorsal interossei

located on side away from middle finger (middle finger has one on either side)
Abducts the fingers

Note: no matter how you move the middle finger, it is always an abduction



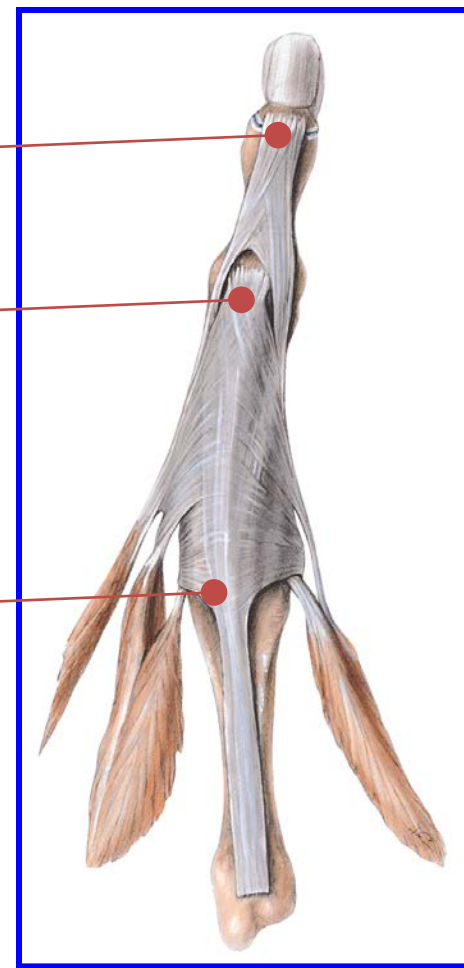
Extensor hood (1)

- Formed by the expansion of the tendons of the extensor digitorum (fingers) and extensor pollicis longus (thumb) muscles on the dorsal aspect of the proximal phalanges of the digits



Extensor hood (2)

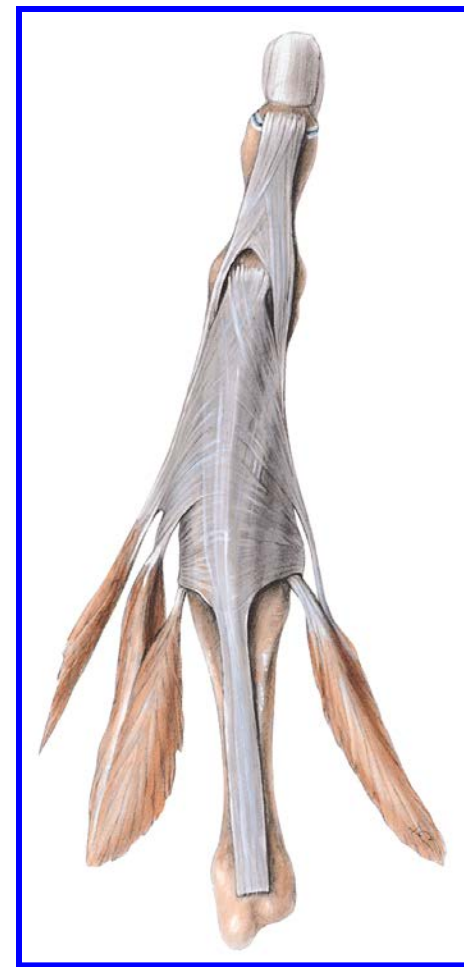
- Each extensor hood is triangular in shape
 - The apex is attached to the distal phalanx
 - The central region attaches to the middle phalanx (fingers) or proximal phalanx (thumb)
 - Each corner of the base wrapped around the sides of the metacarpophalangeal joint-in the fingers to attach mainly to the deep transverse metacarpal ligaments. In the thumb, the hood is attached on each side to muscles.



Extensor hood (3)

Other muscles contributing to the hood:

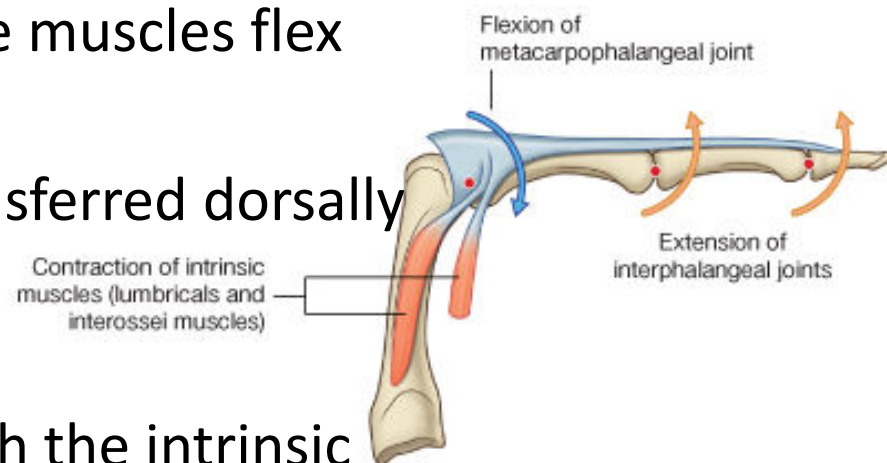
- In the fingers:
 - i. Extensor digiti minimi
 - ii. Extensor indicis
 - iii. The lumbricals
 - iv. The interossei
 - v. Abductor digiti minimi muscles
- In the thumb:
 - i. Extensor pollicis brevis
 - ii. Adductor pollicis and
 - iii. Abductor pollicis brevis



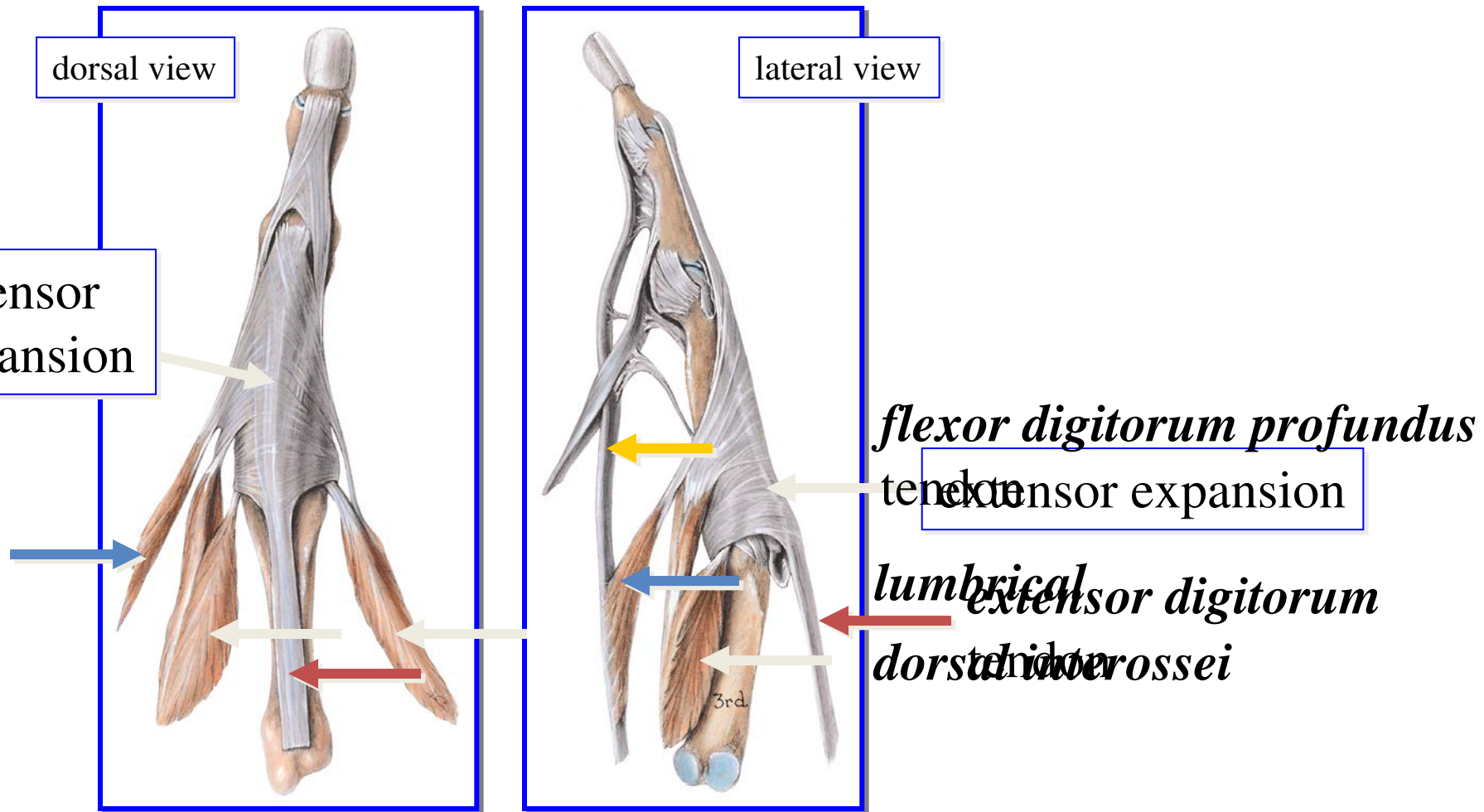
Extensor hood (3)

Understanding the function of the extensor hood

- Because force from the small intrinsic muscles of the hand is applied to the extensor hood distal to the fulcrum of the metacarpophalangeal joints, the muscles flex these joints .
- Simultaneously, the force is transferred dorsally through the hood to extend the interphalangeal joints.
- Thus the extensor hood (through the intrinsic muscles) helps to flex the metacarpophalangeal joints, while at the same time extending the interphalangeal joints



Extensor hood (4)

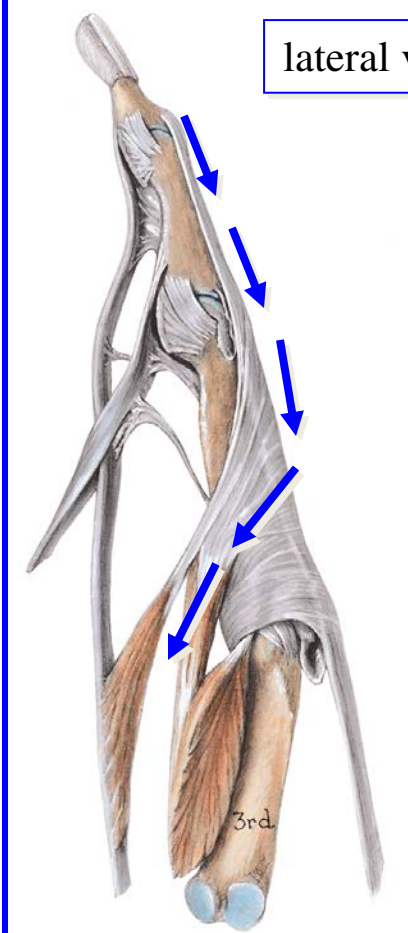


Extensor hood (5)

dorsal view

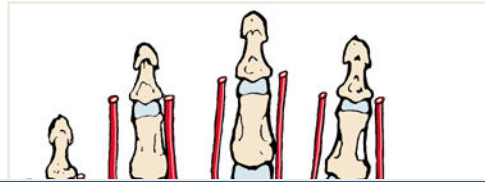


lateral view



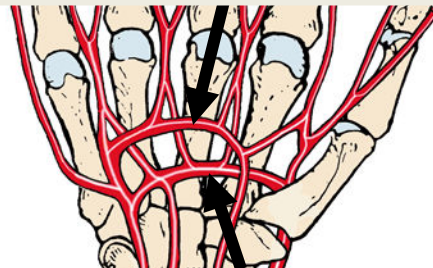
Action of lumbricals
and interossei

Blood supply to the hand



superficial palmar arterial arch...

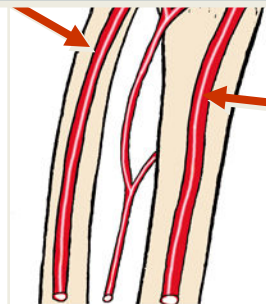
...comes primarily from the ulnar artery



deep palmar arterial arch...

...comes primarily from the radial artery

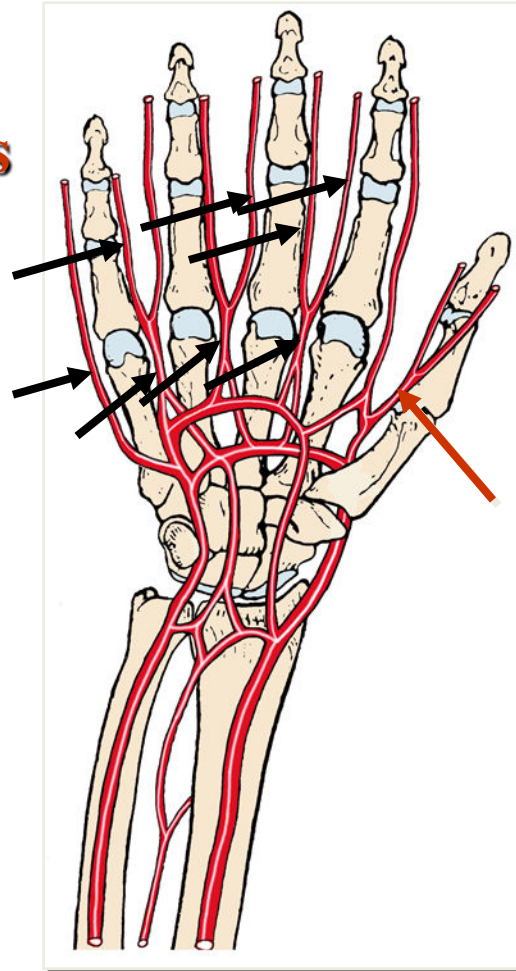
ulnar artery



radial artery

Blood supply to the hand

common digital arteries
proper digital arteries

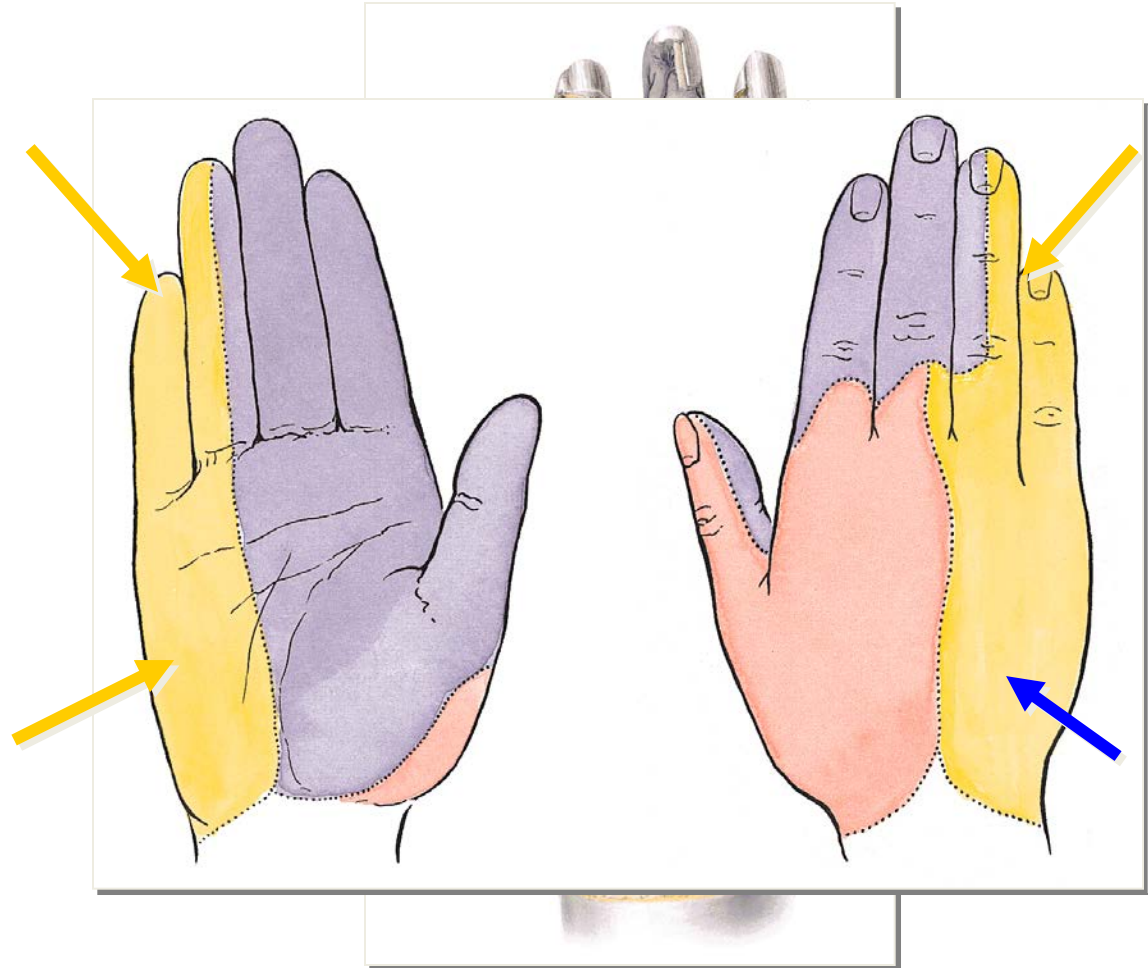


princeps pollicis artery

Nerves of the hand

A. *Ulnar nerve*

1. Cutaneous branches
 - a. dorsal branch
 - b. digital branches
 - c. palmar branch

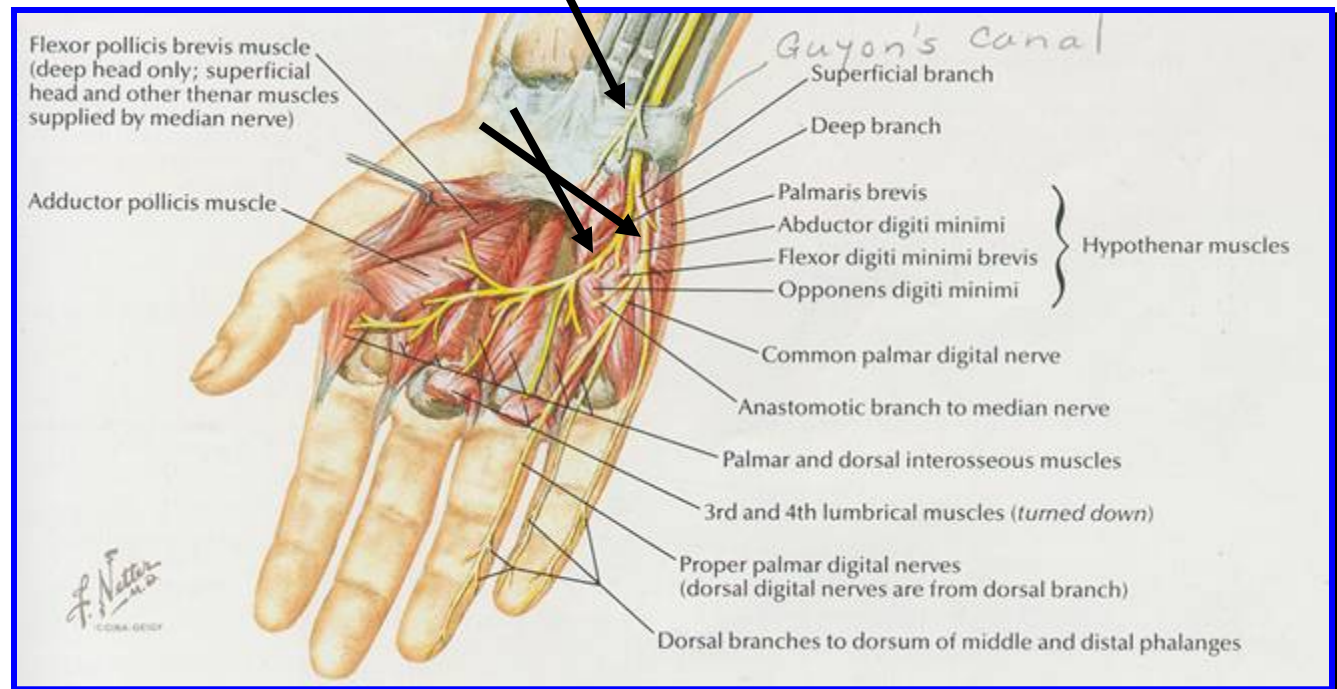


Nerves of the hand

A. Ulnar nerve

- superficial branch
- deep branch

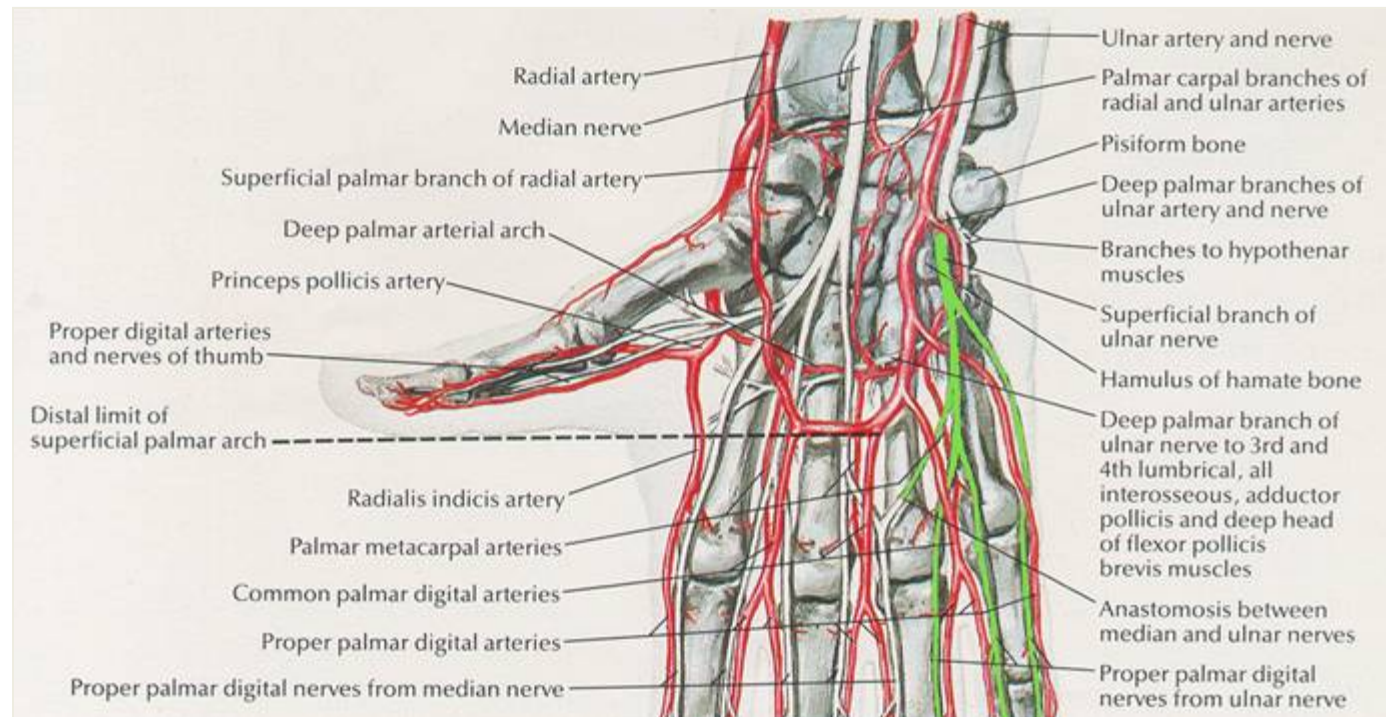
palmar cutaneous branch



Nerves of the hand

A. Ulnar nerve

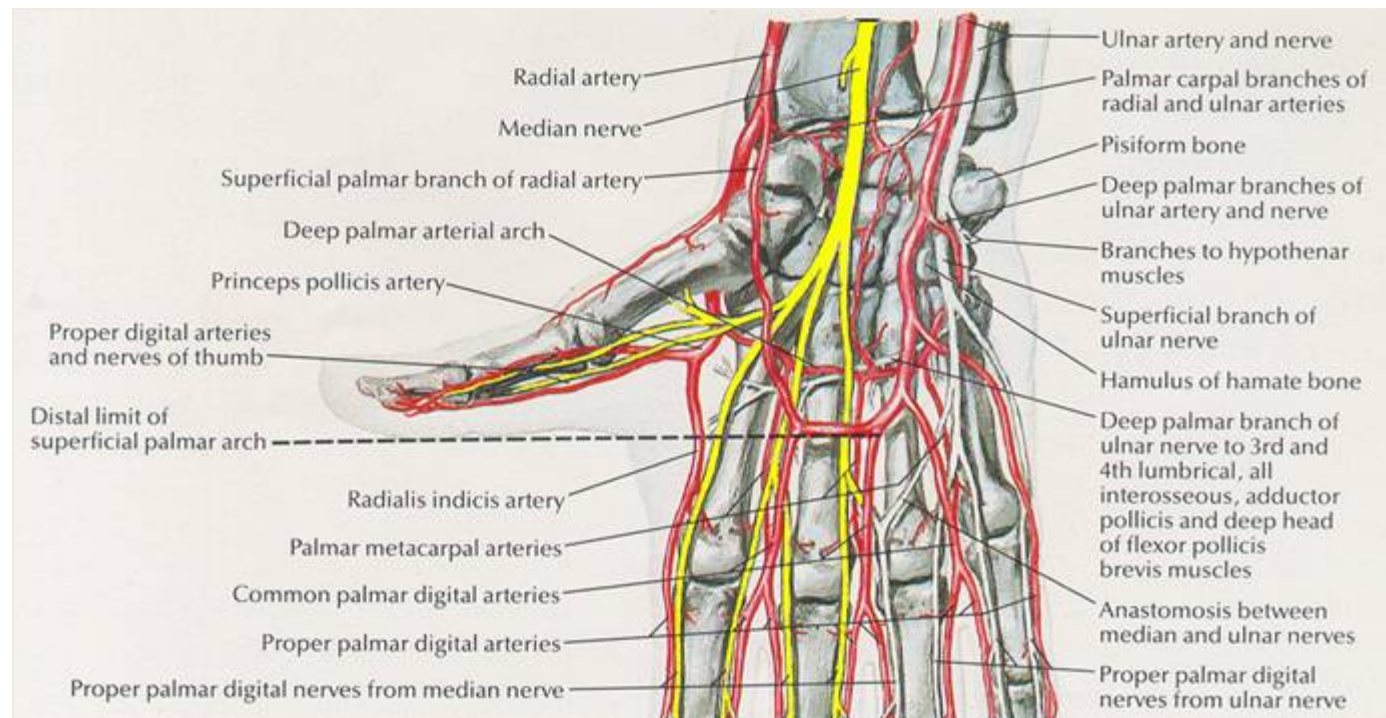
- superficial branch
- deep branch



Nerves of the hand

B. Median nerve

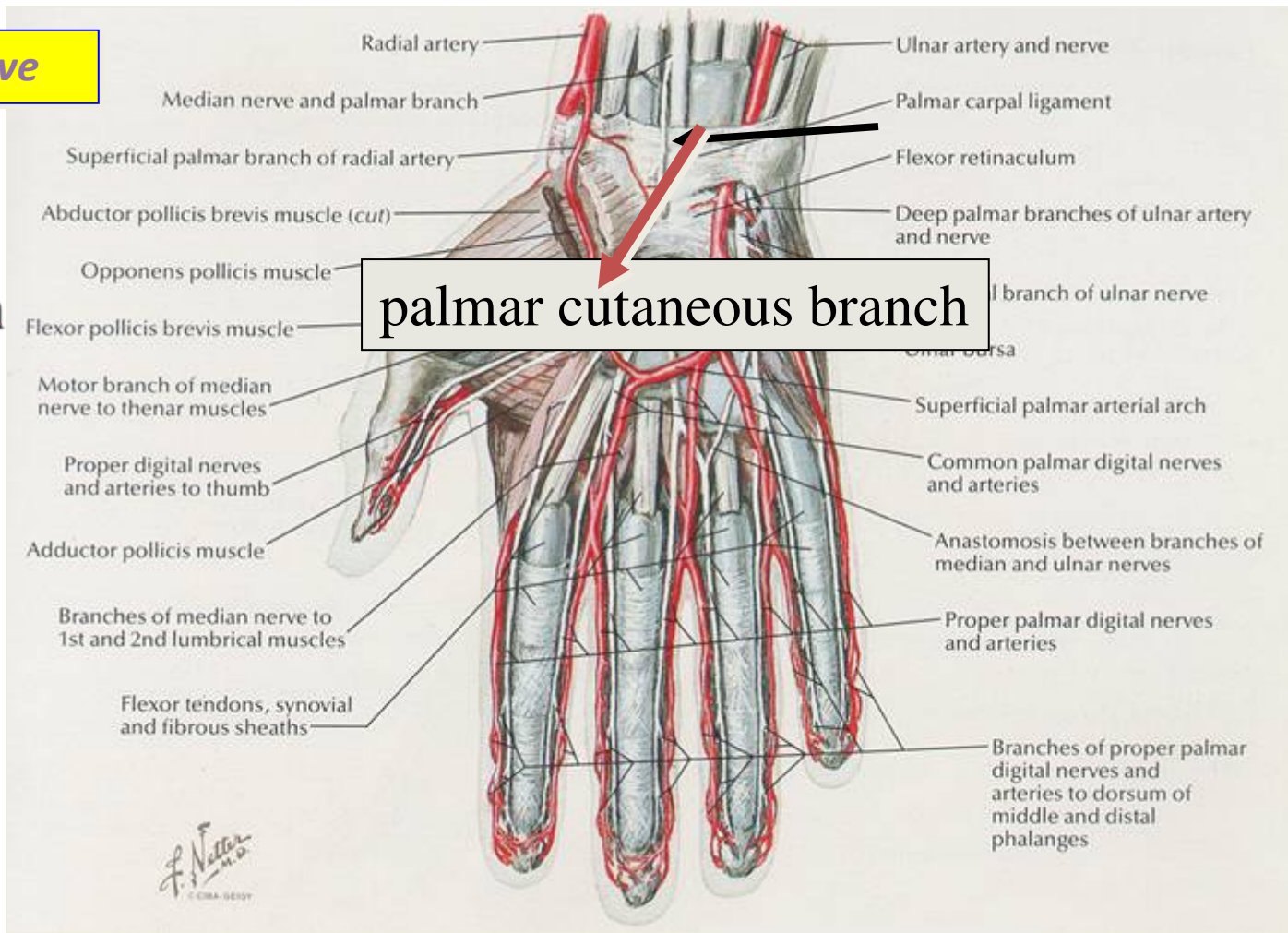
digital branches



Nerves of the hand

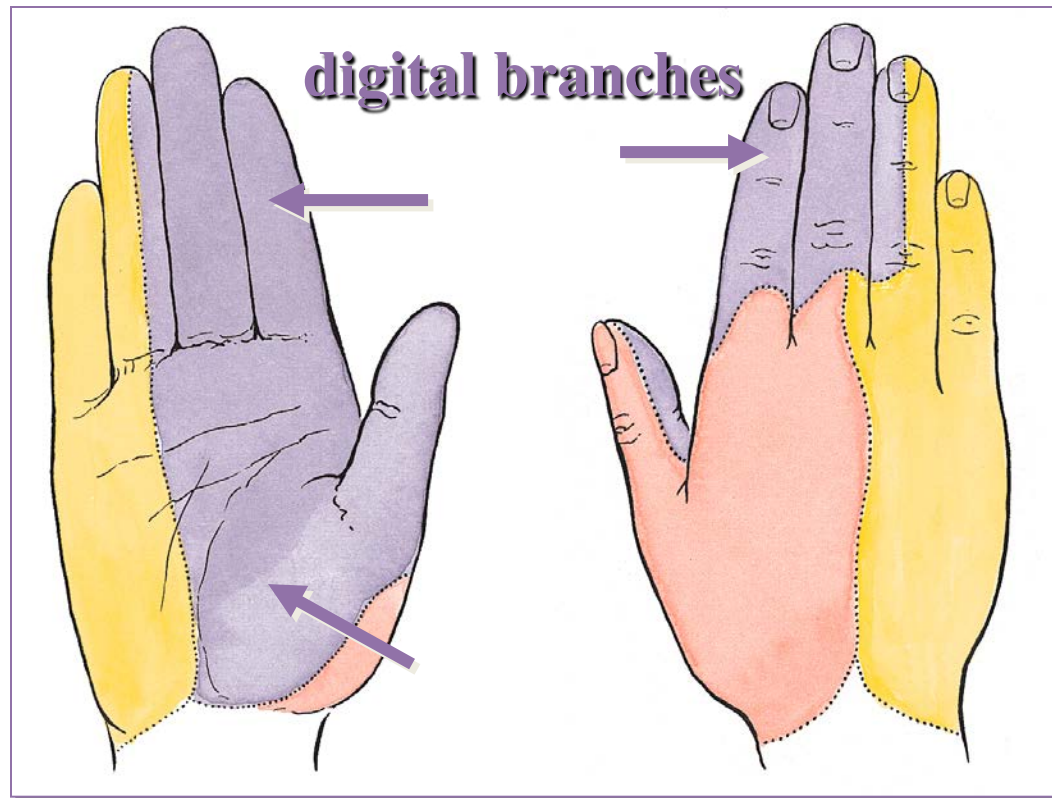
B. Median nerve

recurrent branch



Nerves of the hand

B. Median nerve

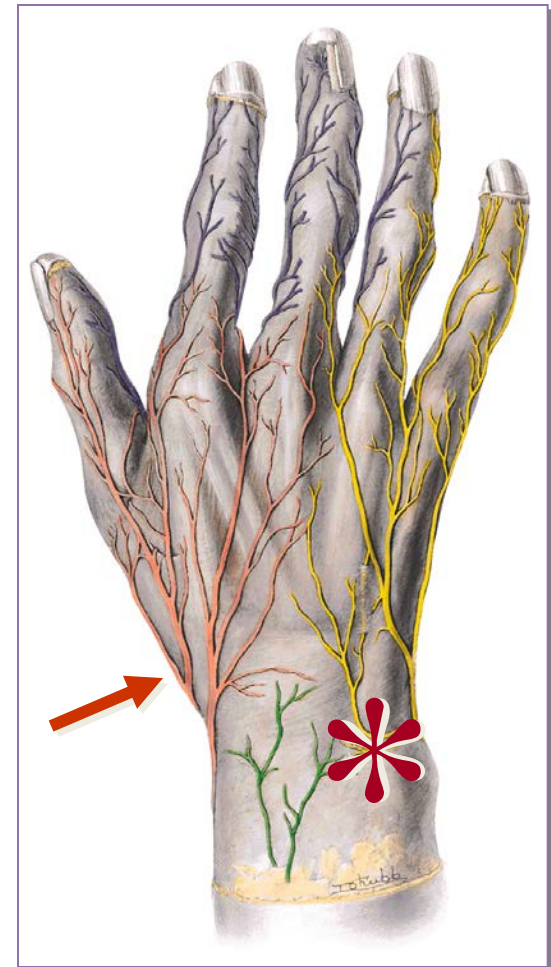
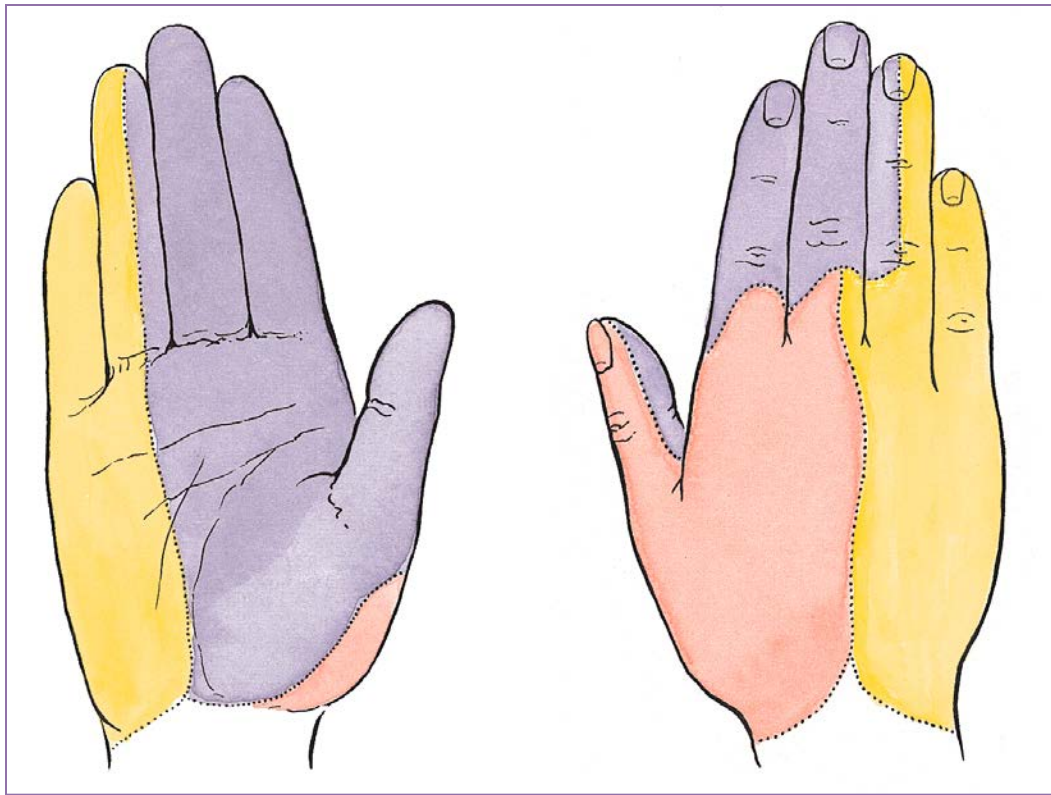


palmar cutaneous branch

Nerves of the hand

C. Radial nerve

- superficial radial nerve





THE END

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