



Muscles of the upper limb II.

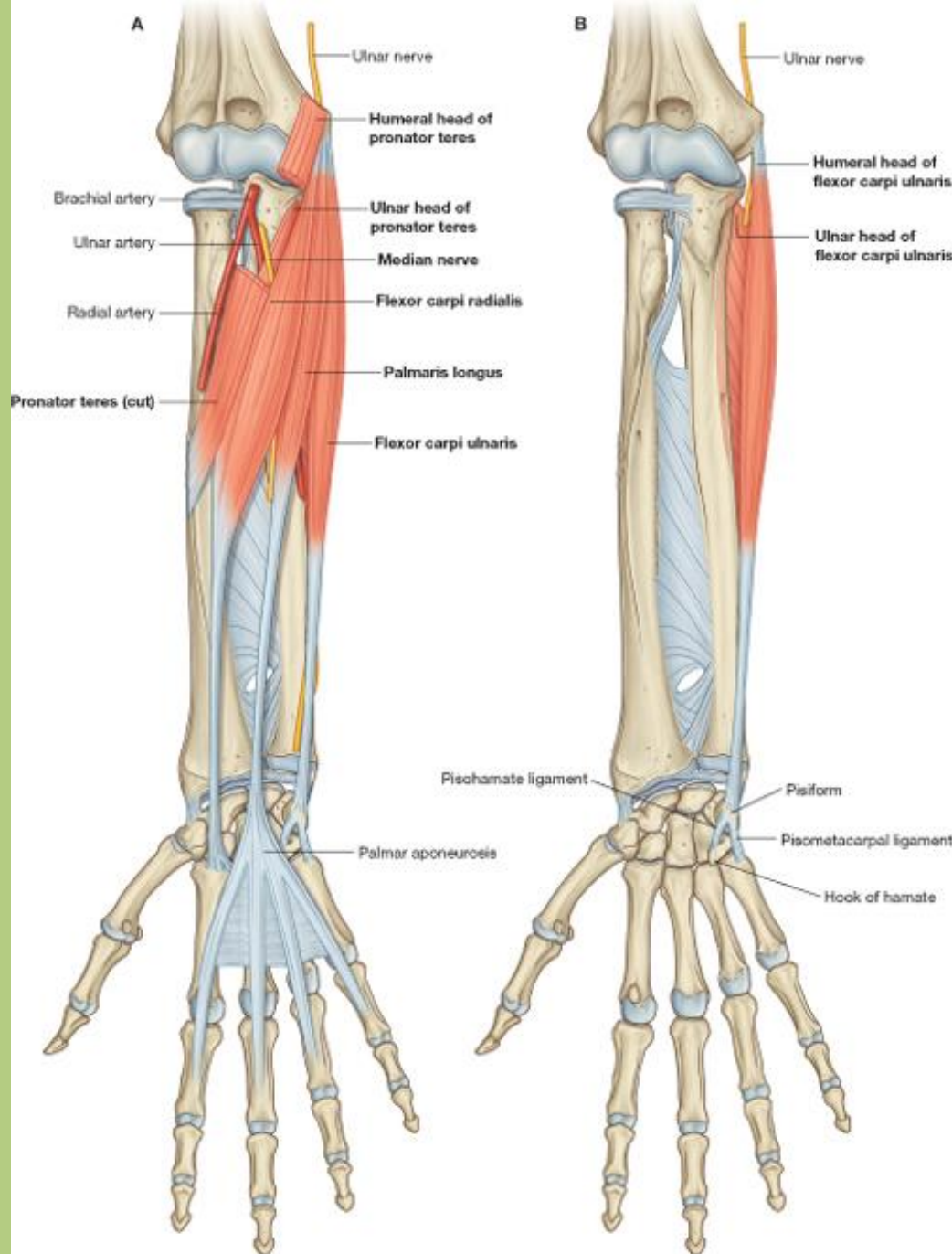
Sándor Katz M.D., Ph.D.

Flexor muscles of the forearm

(almost all arise from the *medial epicondyle* and are innervated by the *median nerve*)

Pronator teres

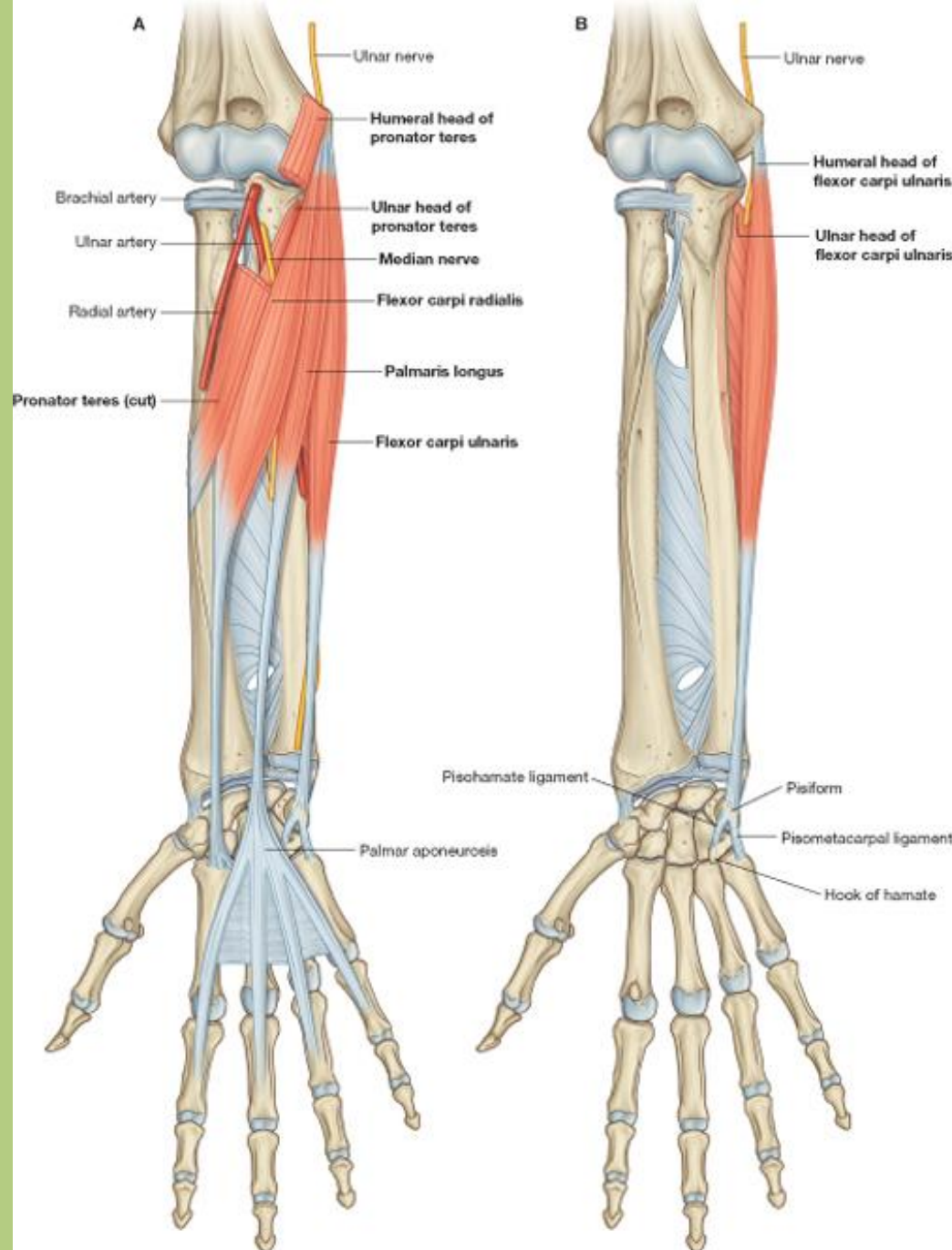
- **Origin:** medial epicondyle and coronoid process
- **Insertion:** lateral surface of radius
- **Action:** pronation
- **Innervation:** median nerve



Palmaris longus

- **Origin:** medial epicondyle
- **Insertion:** palmar aponeurosis
- **Action:** it tenses the palmar aponeurosis
- **Innervation:** median nerve

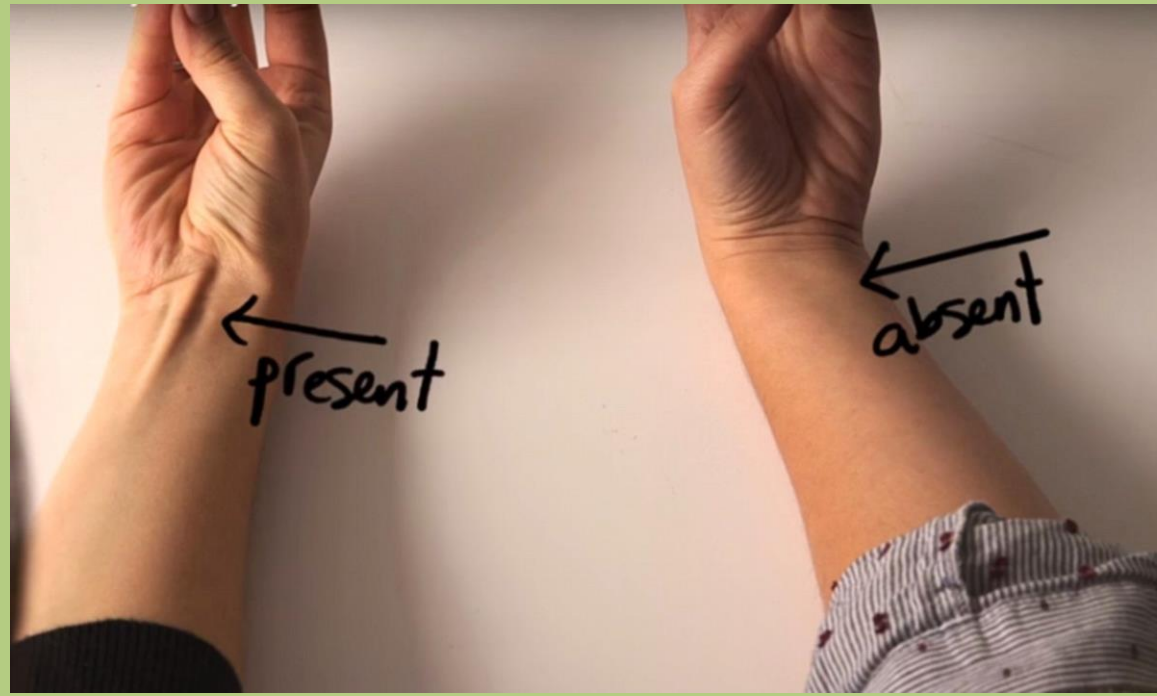
It is absent in 15% of the population.



Bunched finger test

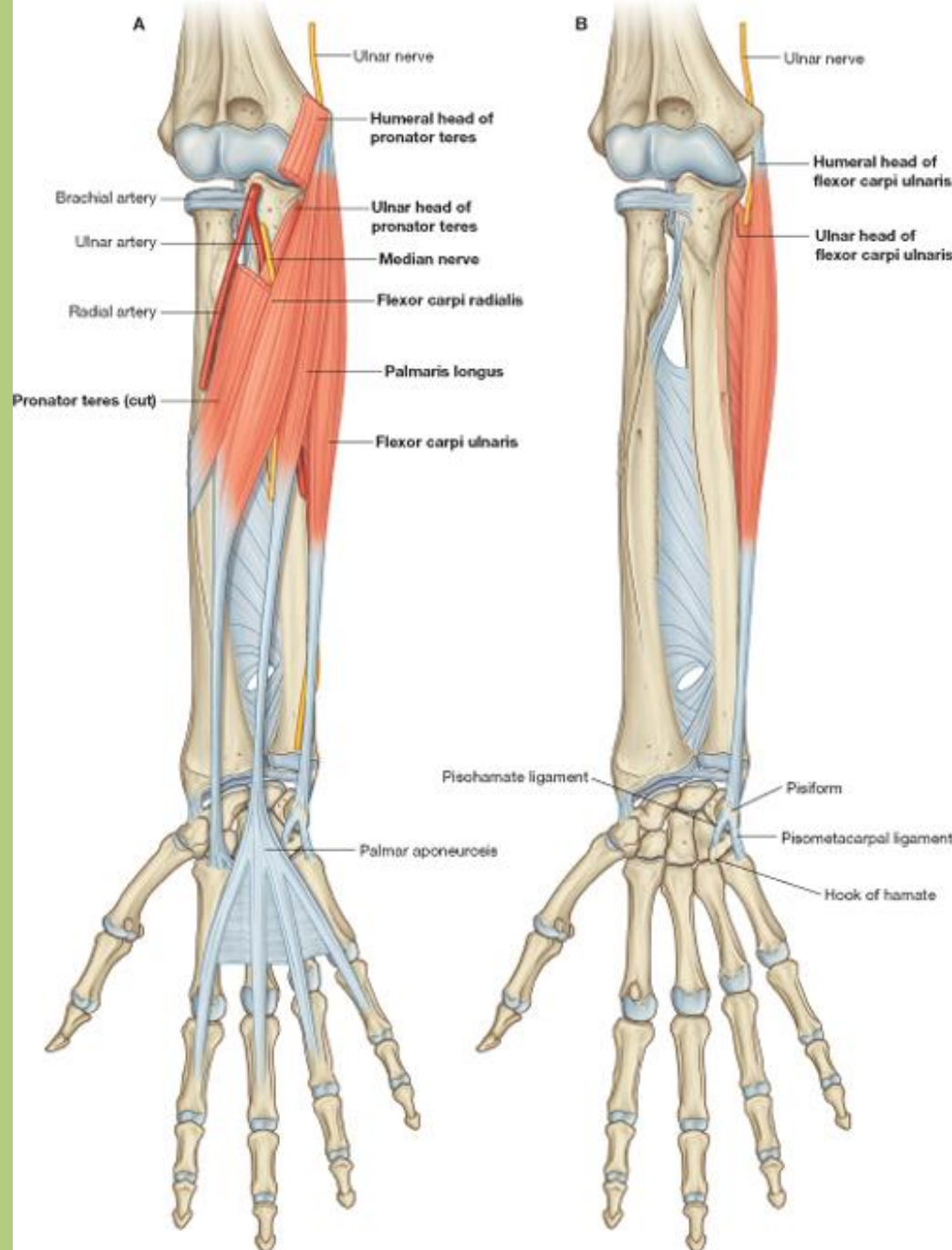
Palmaris longus is absent in 15% of the population.

- when fingers are bunched
- the wrist is flexed
- forearm is slightly pronated



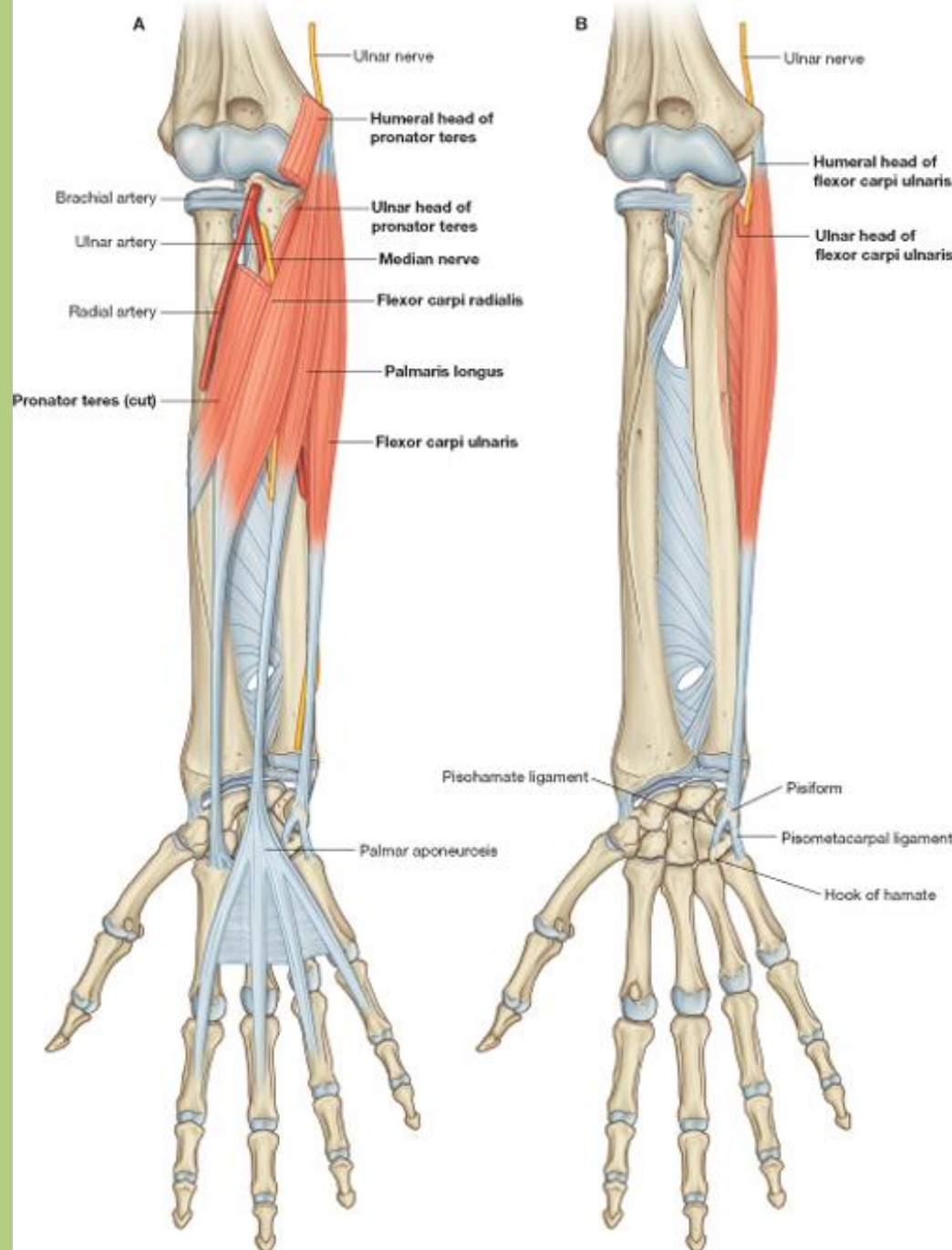
Flexor carpi radialis

- **Origin:** medial epicondyle
- **Insertion:** base of the II. metacarpal
- **Action:** palmar flexion and radial abduction
- **Innervation:** median nerve



Flexor carpi ulnaris

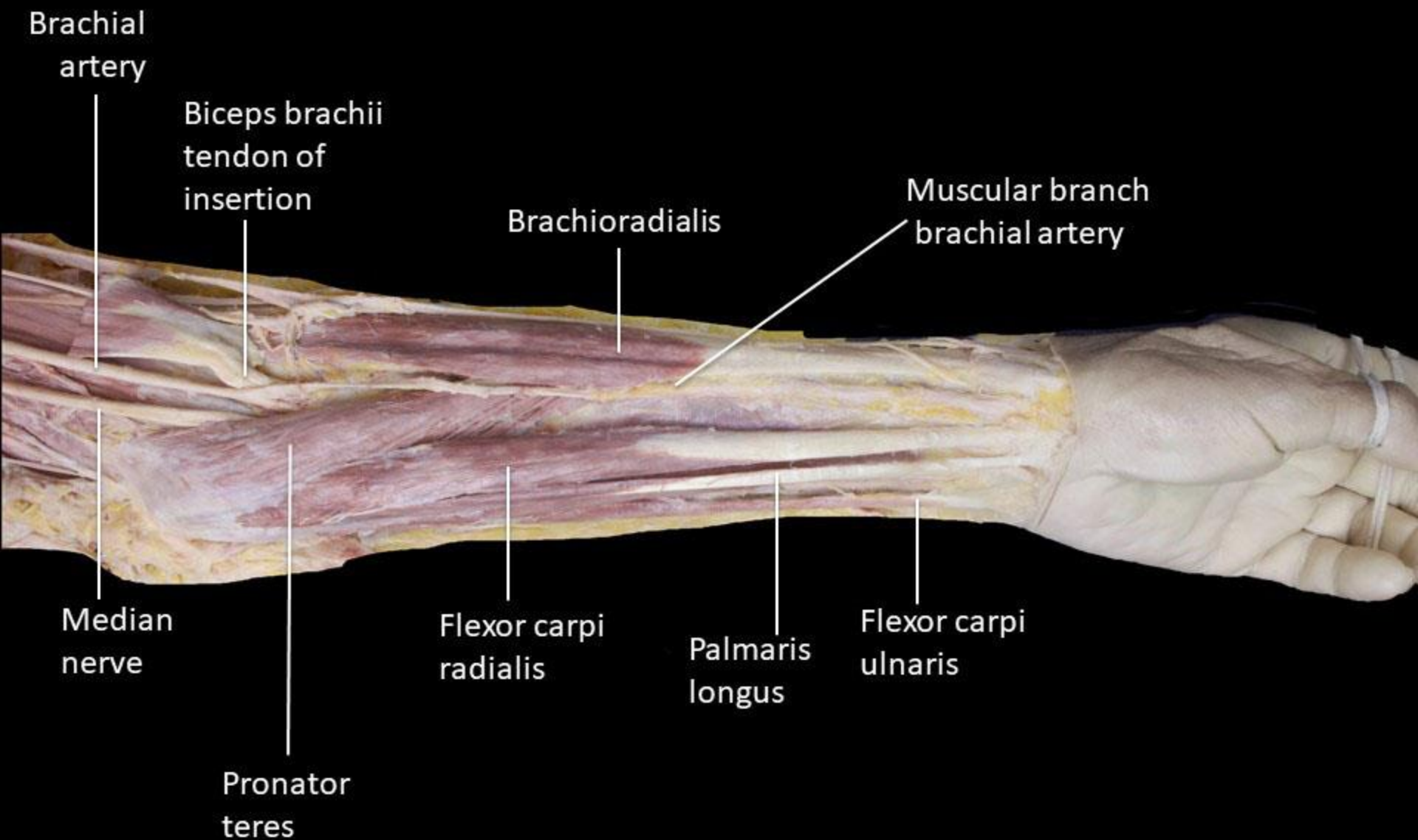
- **Origin:** medial epicondyle and olecranon
- **Insertion:** base of the V. metacarpal, pisiform
- **Action:** palmar flexion and ulnar abduction
- **Innervation:** ulnar nerve



Flexor digitorum superficialis

- **Origin:** medial epicondyle, anterior border of radius
- **Insertion:** middle phalanges of the II-V. fingers
- **Action:** flexion of II-V. fingers and wrist
- **Innervation:** median nerve





Brachial artery

Biceps brachii tendon of insertion

Brachioradialis

Muscular branch brachial artery

Median nerve

Pronator teres

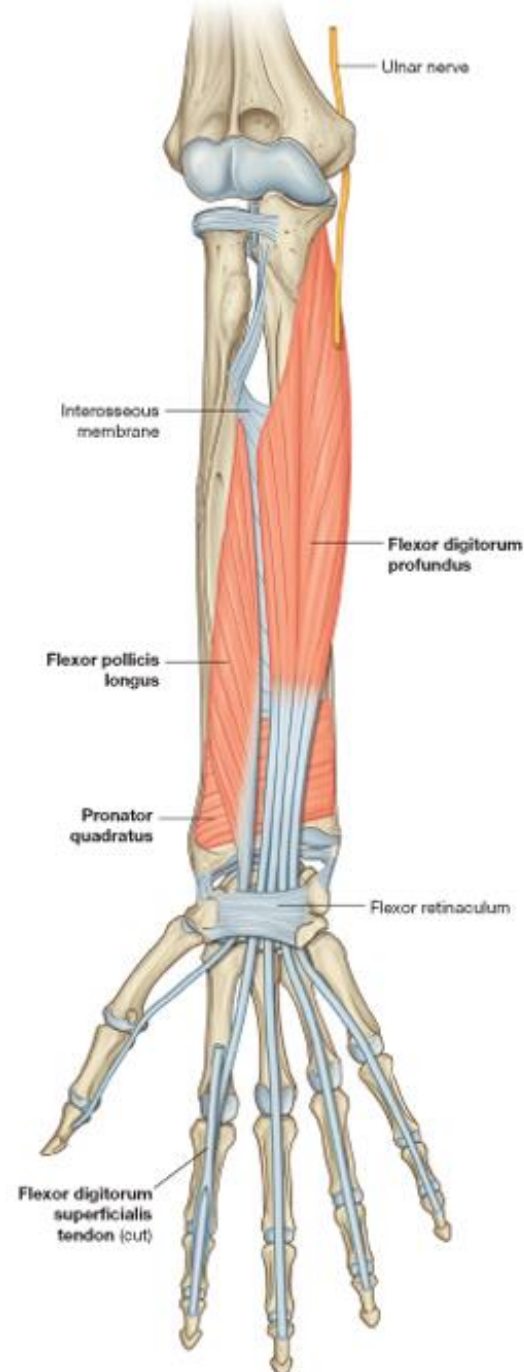
Flexor carpi radialis

Palmaris longus

Flexor carpi ulnaris

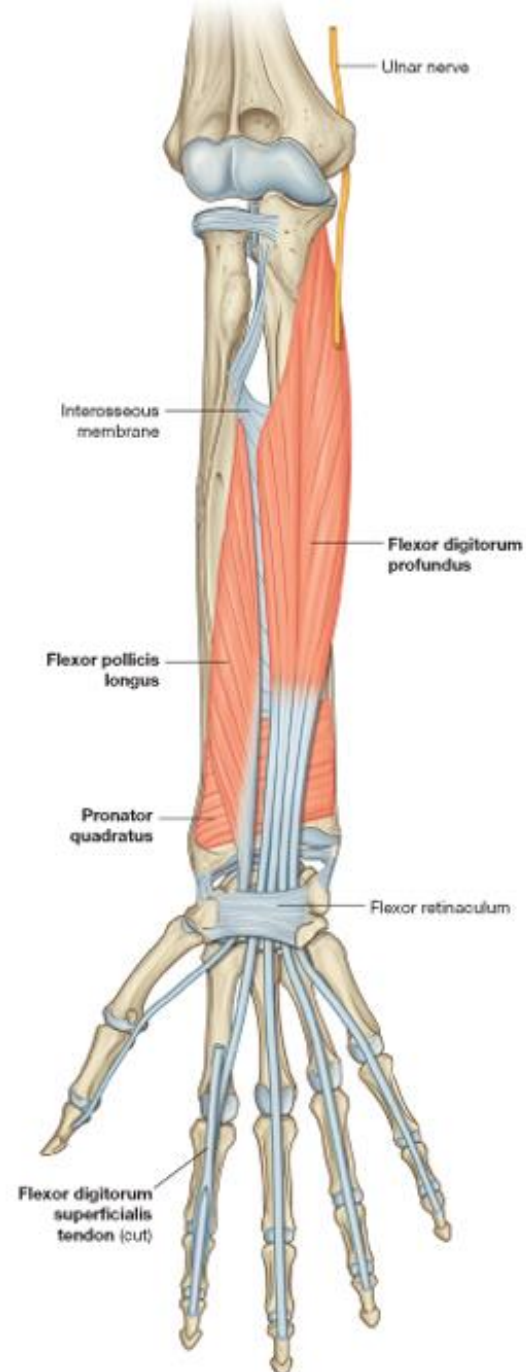
Flexor digitorum profundus

- **Origin:** ulna and interosseous membrane
- **Insertion:** distal phalanges of the II-V. fingers
- **Action:** flexion of II-V. fingers and wrist
- **Innervation:** median and ulnar nerves



Flexor pollicis longus

- **Origin:** radius
- **Insertion:** distal phalanx of the I. finger
- **Action:** flexion, adduction and opposition of the I. finger
- **Innervation:** median nerve



Pronator quadratus

- **Origin:** distal portion of the ulna
- **Insertion:** distal portion of the radius
- **Action:** pronation
- **Innervation:** median nerve

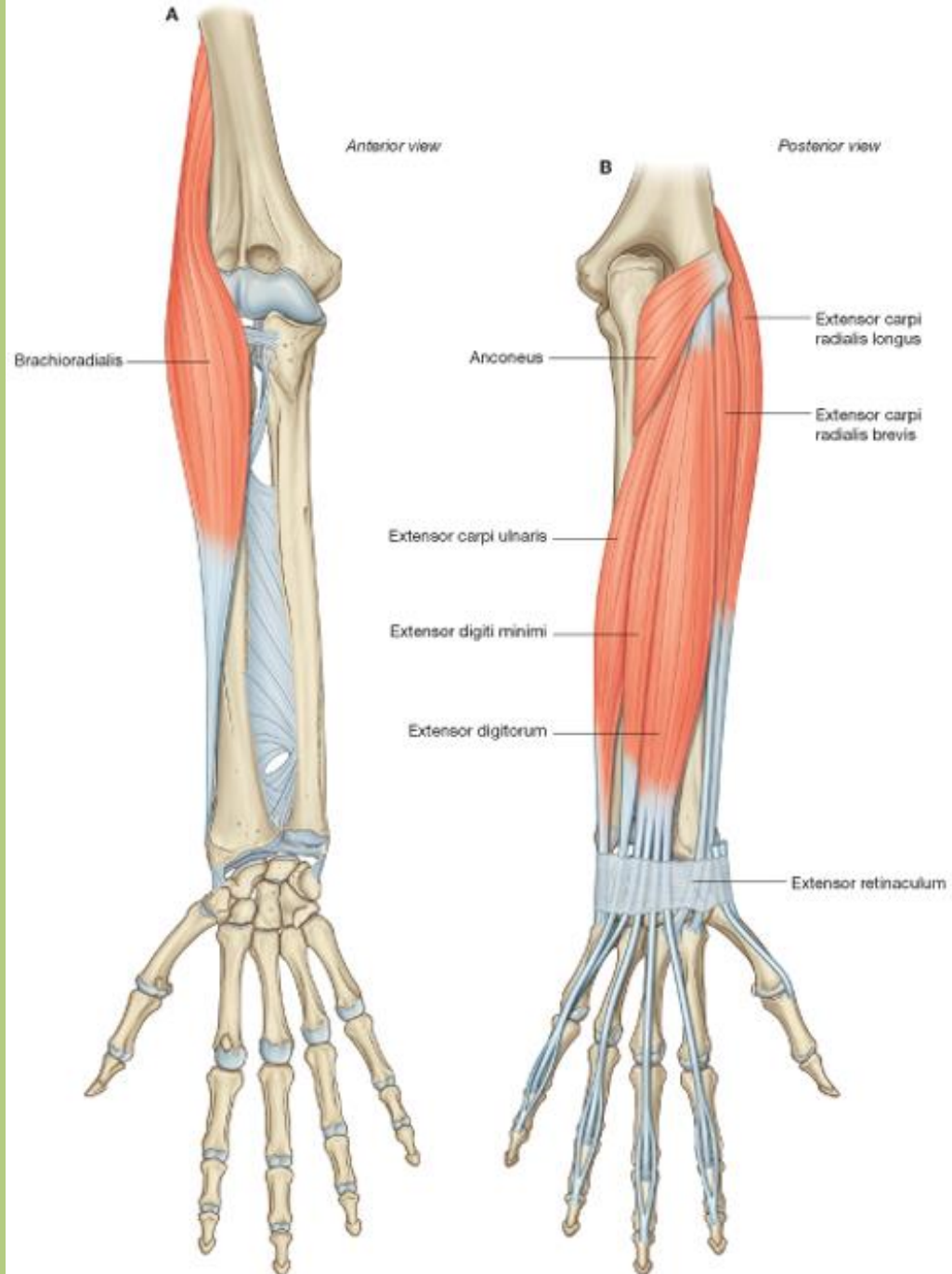


Extensor muscles of the forearm

(almost all arise from the *lateral epicondyle* and are innervated by the *radial nerve*)

Brachioradialis

- **Origin:** above the lateral epicondyle
- **Insertion:** styloid process of radius
- **Action:** flexion and supination of the elbow
- **Innervation:** radial nerve

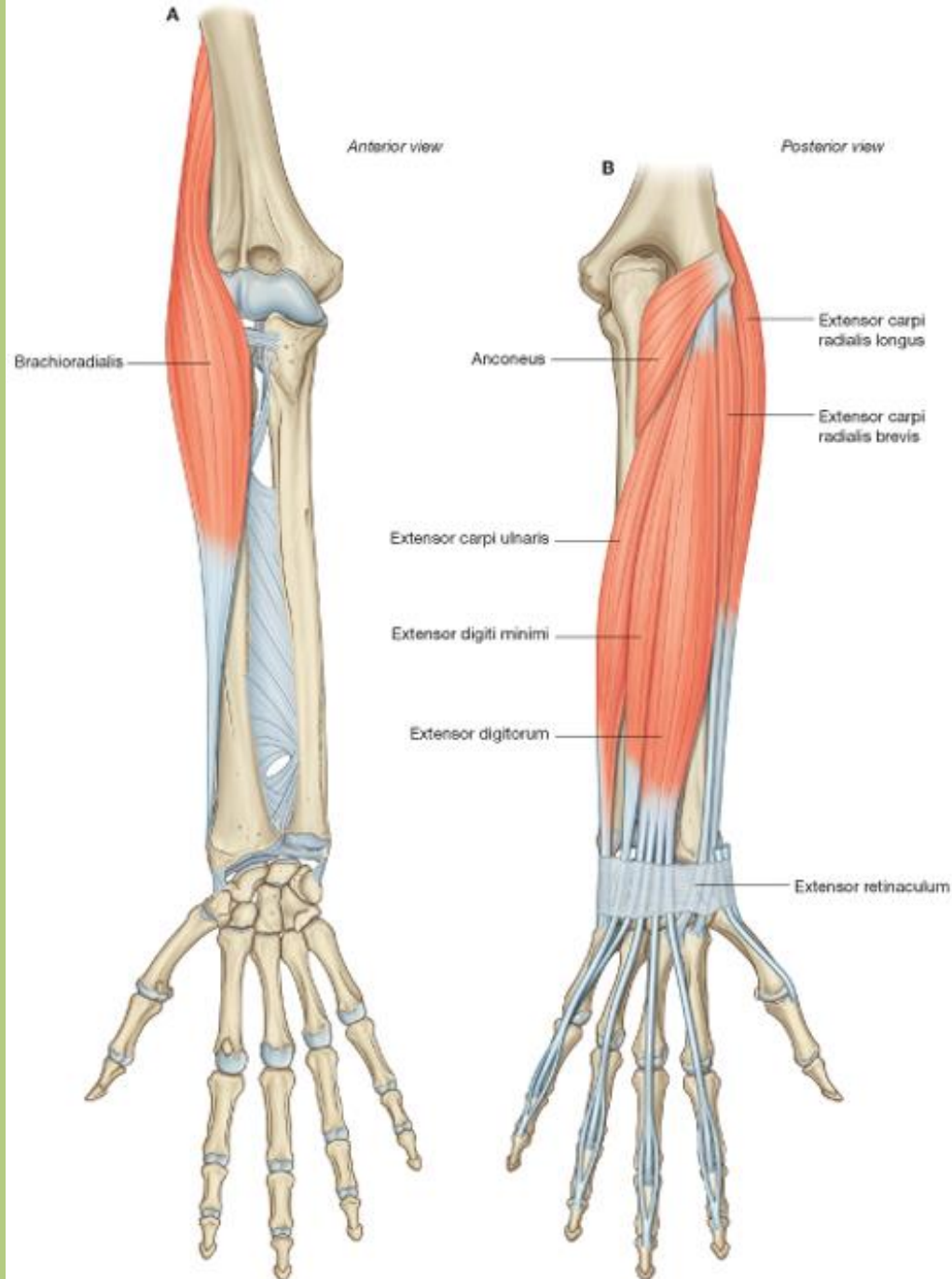


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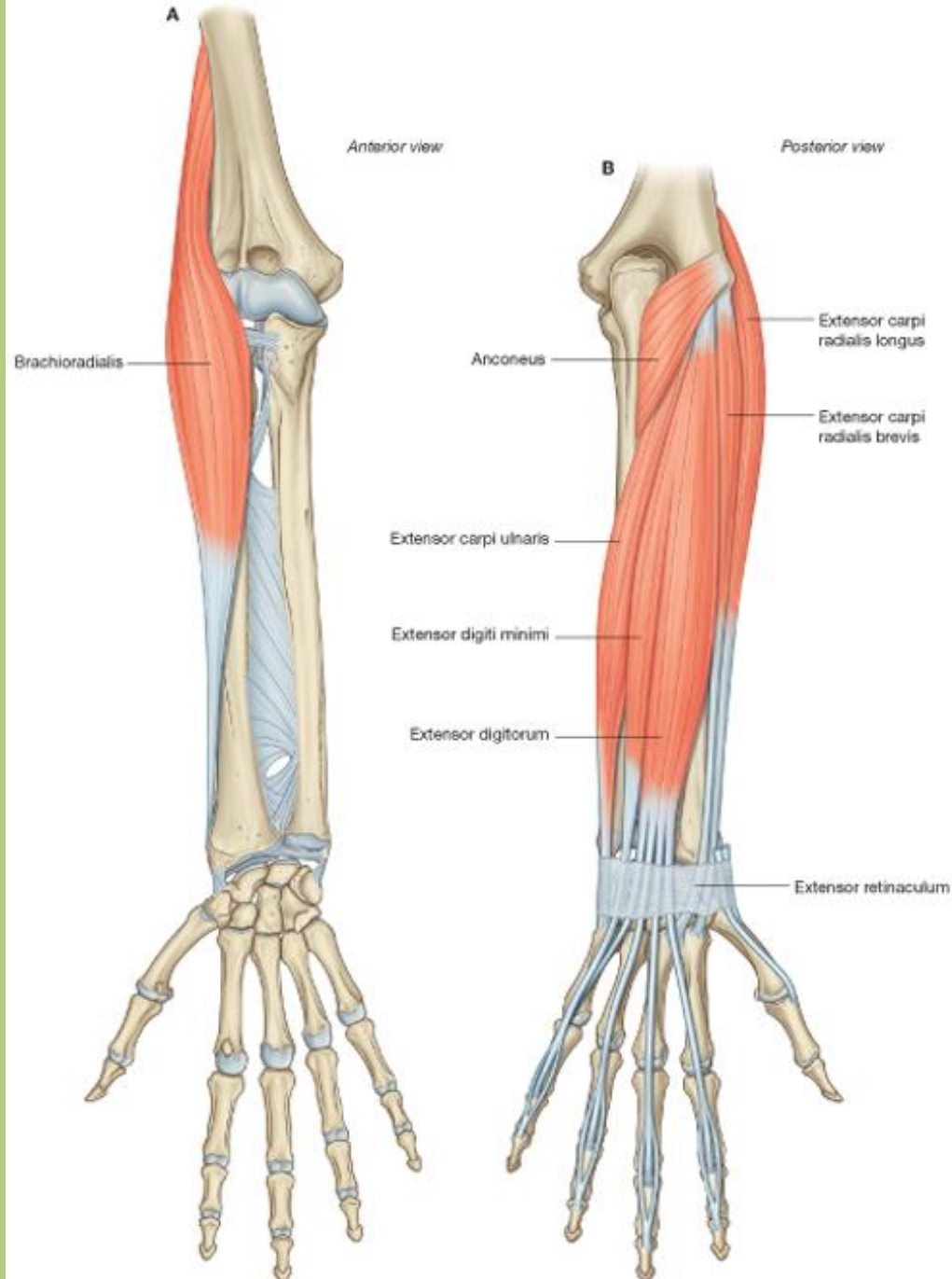
Extensor carpi radialis longus and brevis

- **Origin:** lateral epicondyle
- **Insertion:** *longus*: base of the II. metacarpal, *brevis*: base of the III. metacarpal
- **Action:** dorsiflexion and radial abduction
- **Innervation:** radial nerve



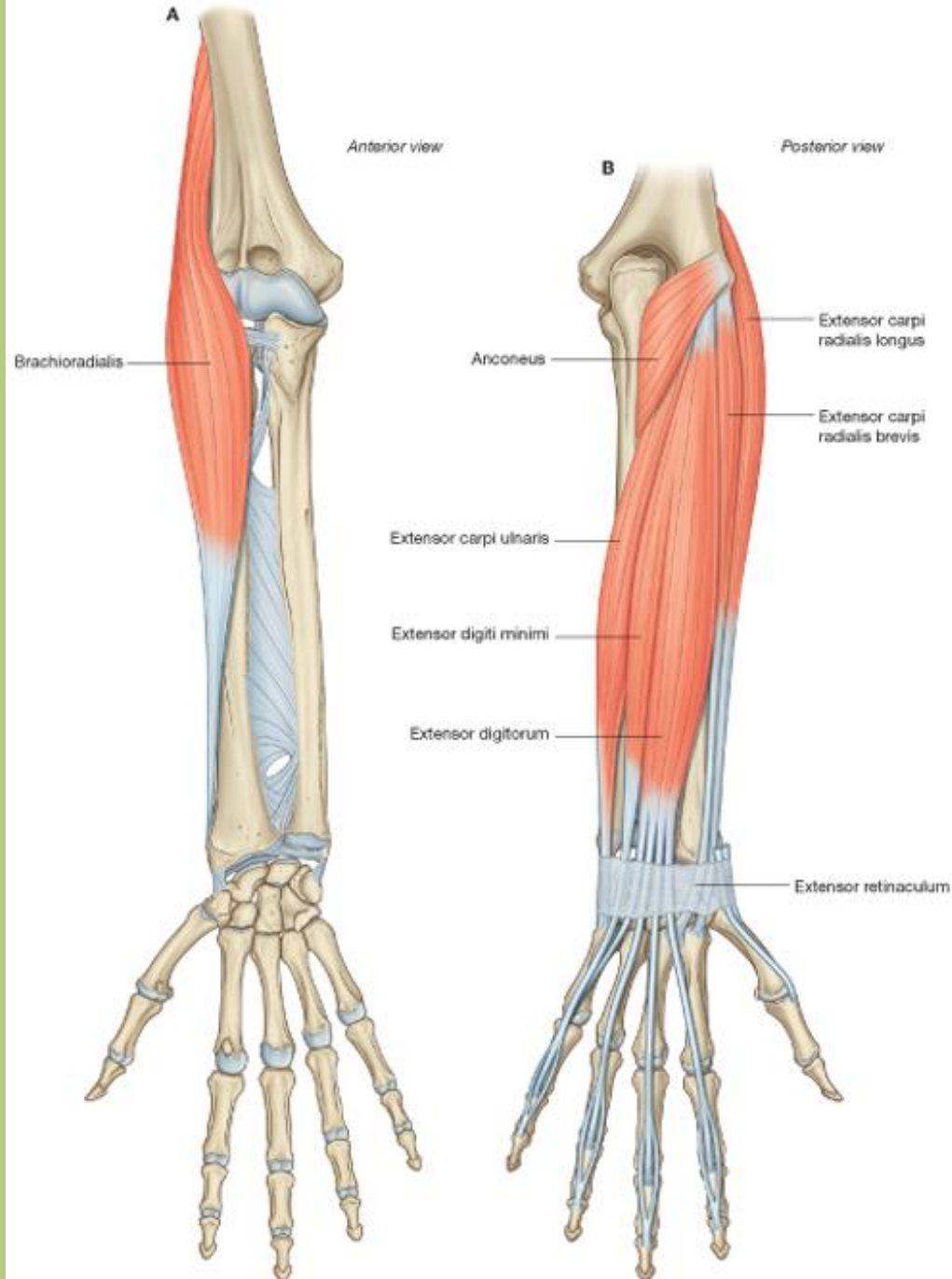
Extensor carpi ulnaris

- **Origin:** lateral epicondyle and olecranon
- **Insertion:** base of the V. metacarpal
- **Action:** dorsiflexion and ulnar abduction
- **Innervation:** radial nerve



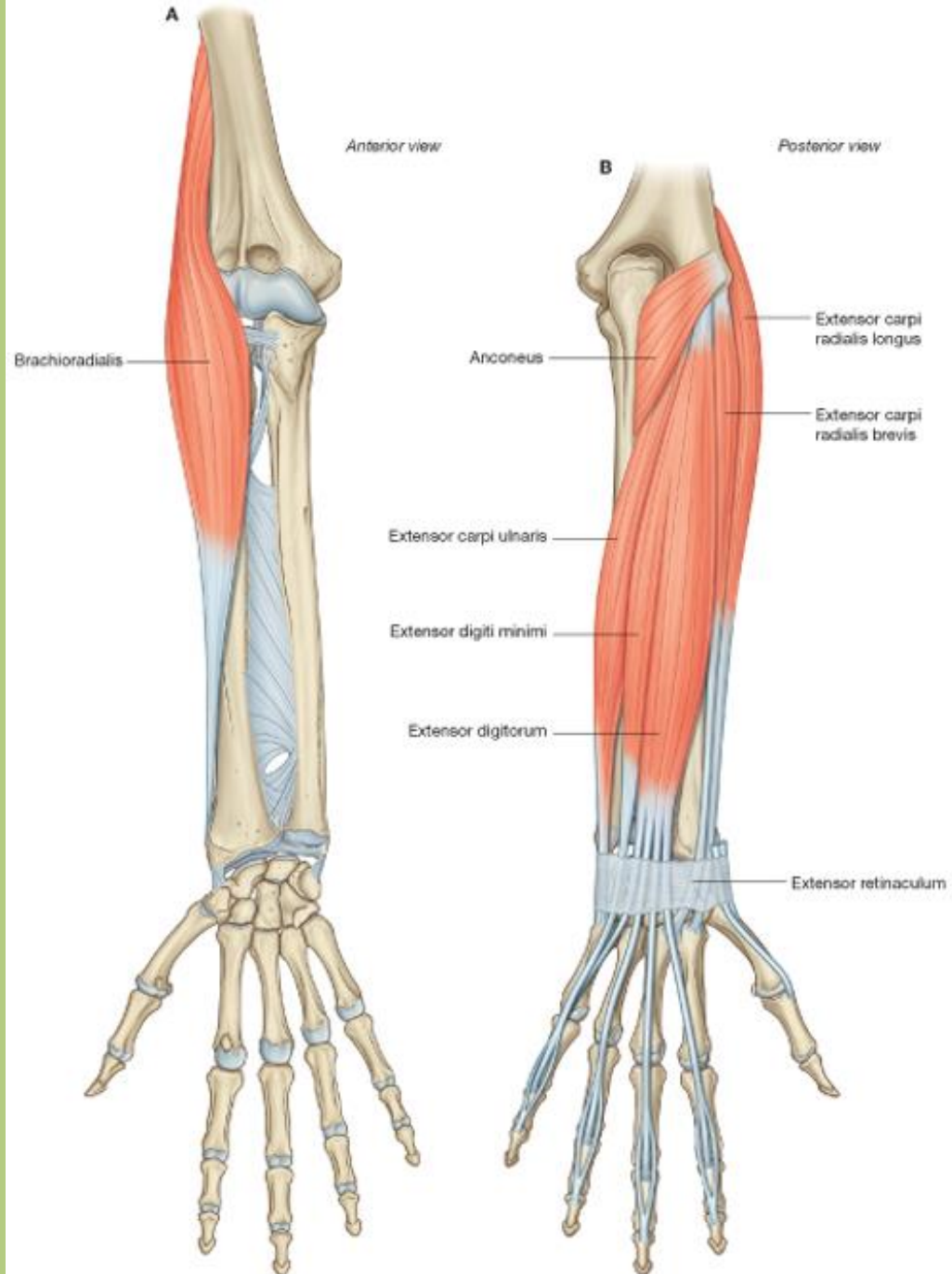
Extensor digitorum

- **Origin:** lateral epicondyle
- **Insertion:** distal and middle phalanges of the II-V. fingers, forming the *dorsal aponeurosis*
- **Action:** extension of the II-V. fingers, dorsiflexion
- **Innervation:** radial nerve



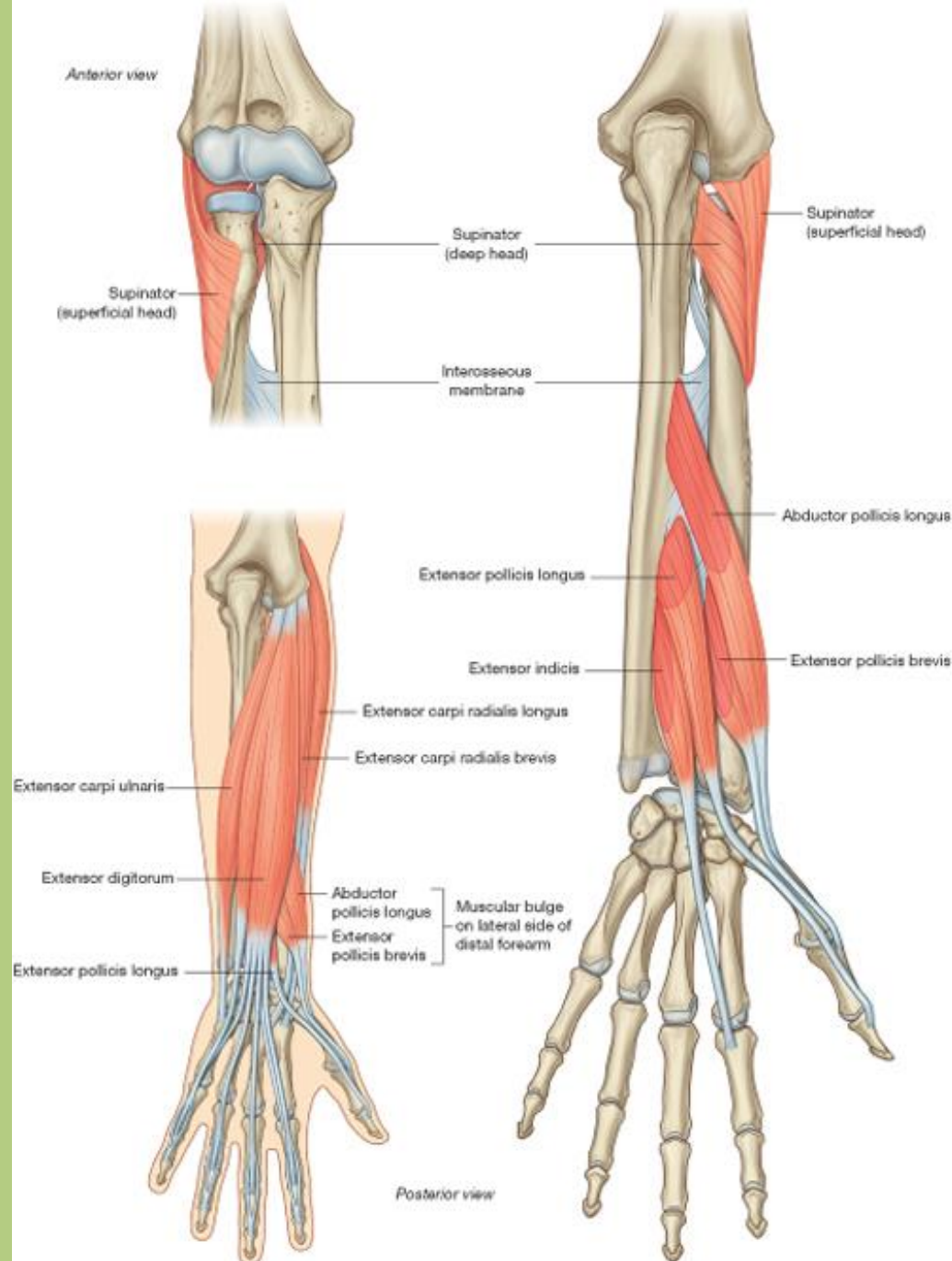
Extensor digiti minimi

- **Origin:** lateral epicondyle
- **Insertion:** dorsal aponeurosis of the V. finger
- **Action:** extension of the V. finger
- **Innervation:** radial nerve



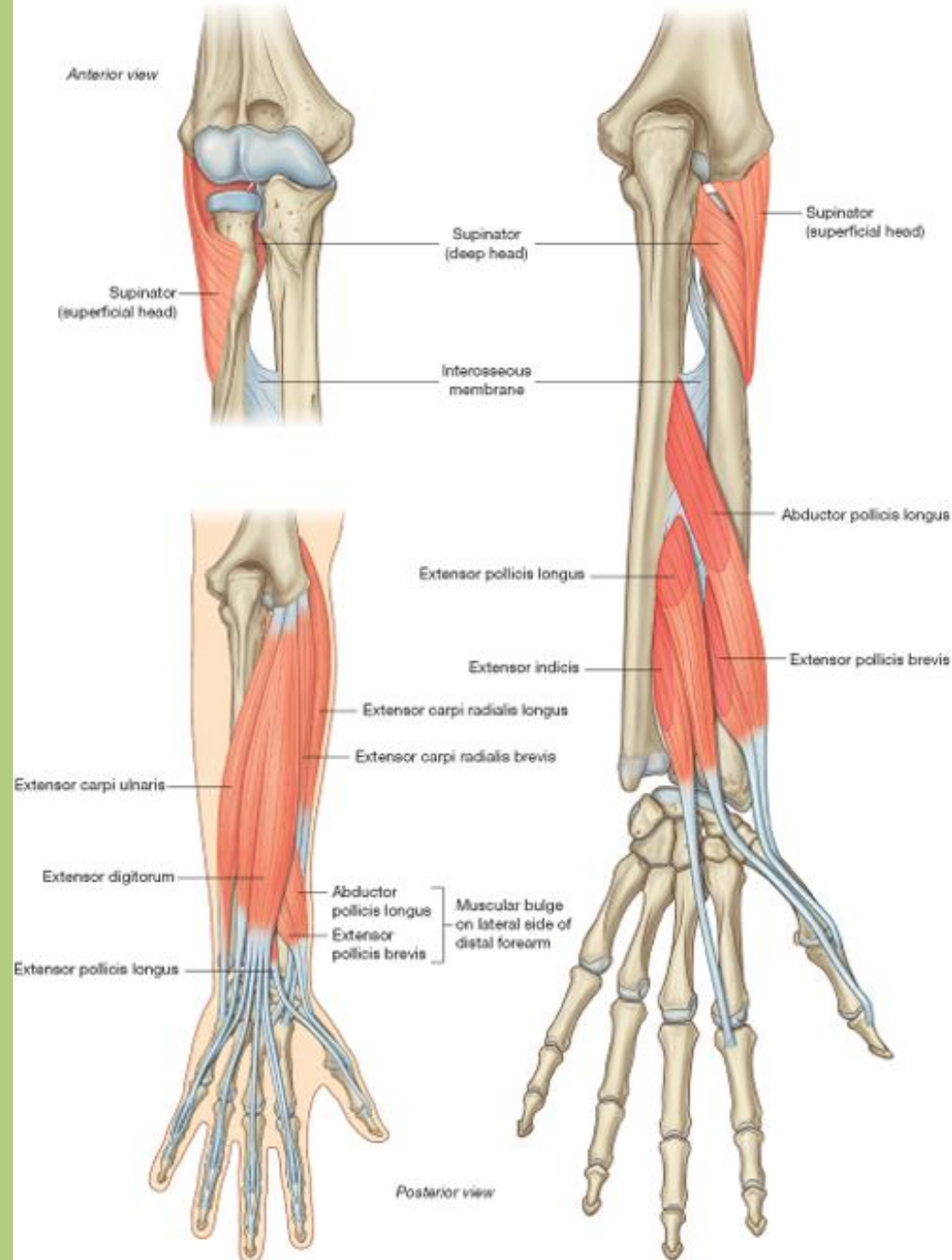
Extensor indicis

- **Origin:** interosseous membrane and ulna
- **Insertion:** dorsal aponeurosis of the II. finger
- **Action:** extension of the II. finger
- **Innervation:** radial nerve



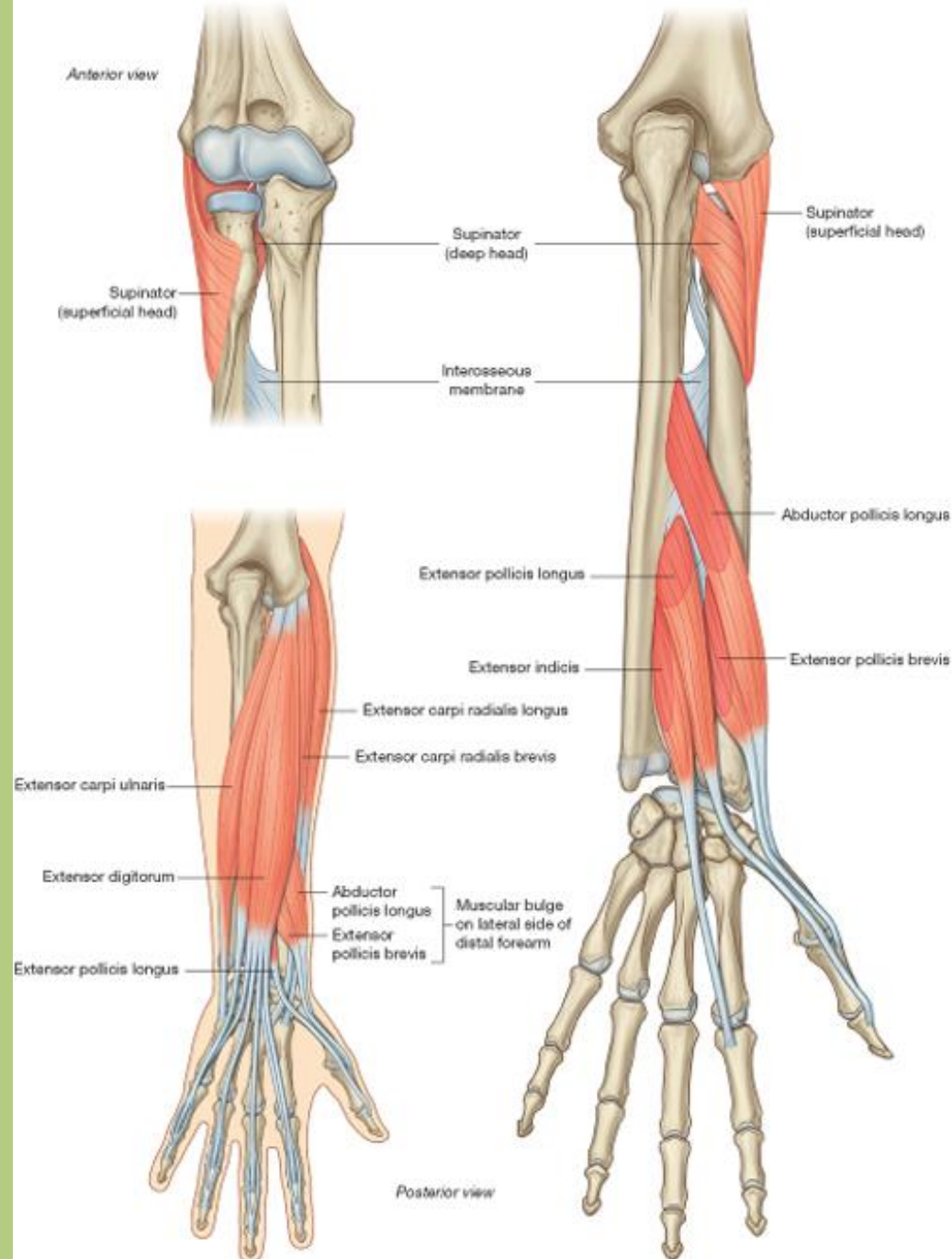
Supinator

- **Origin:** lateral epicondyle and supinator crest
- **Insertion:** anterior surface of radius
- **Action:** supination
- **Innervation:** radial nerve



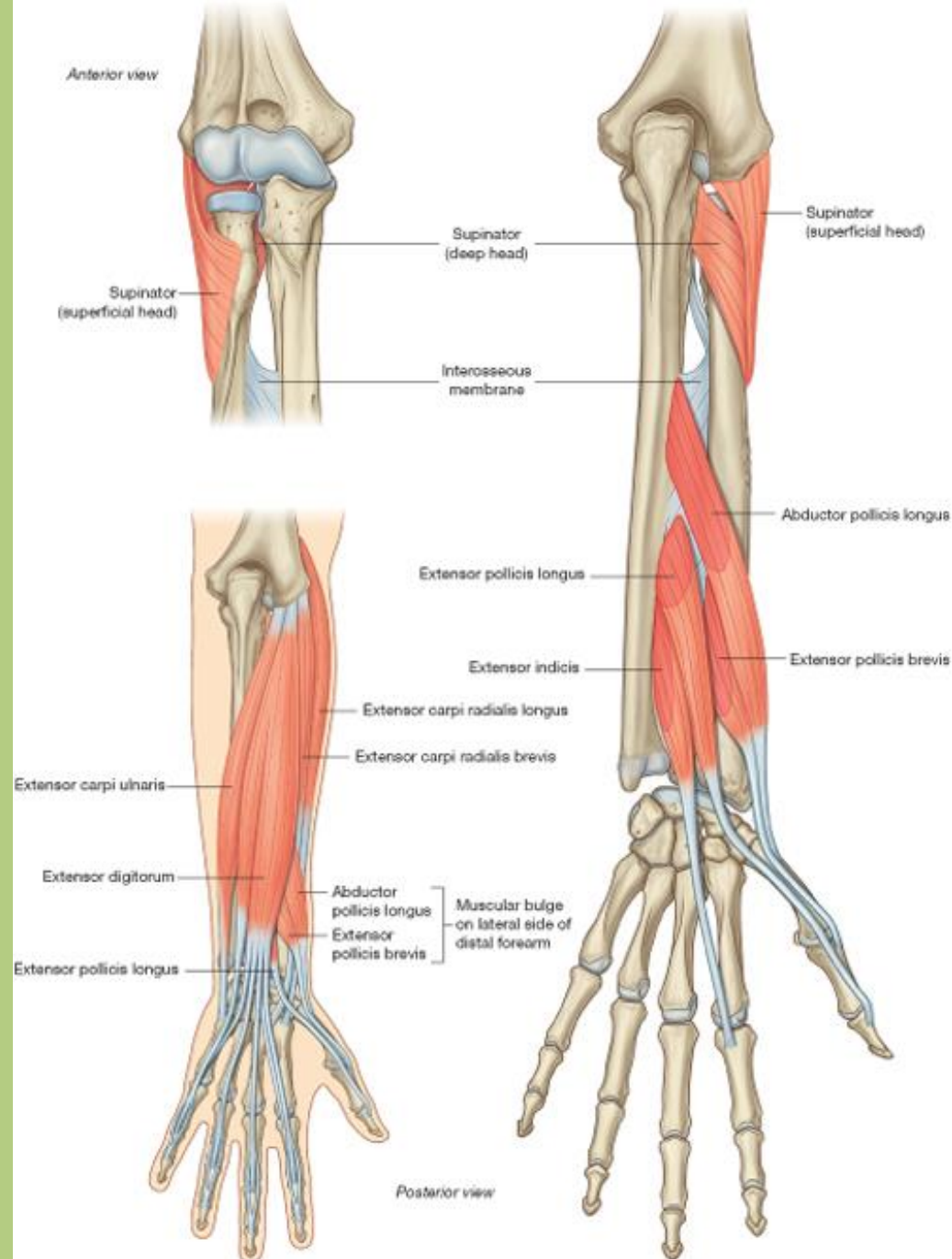
Abductor pollicis longus

- **Origin:** interosseous membrane and posterior surfaces of the ulna and radius
- **Insertion:** base of the I. metacarpal
- **Action:** abduction
- **Innervation:** radial nerve



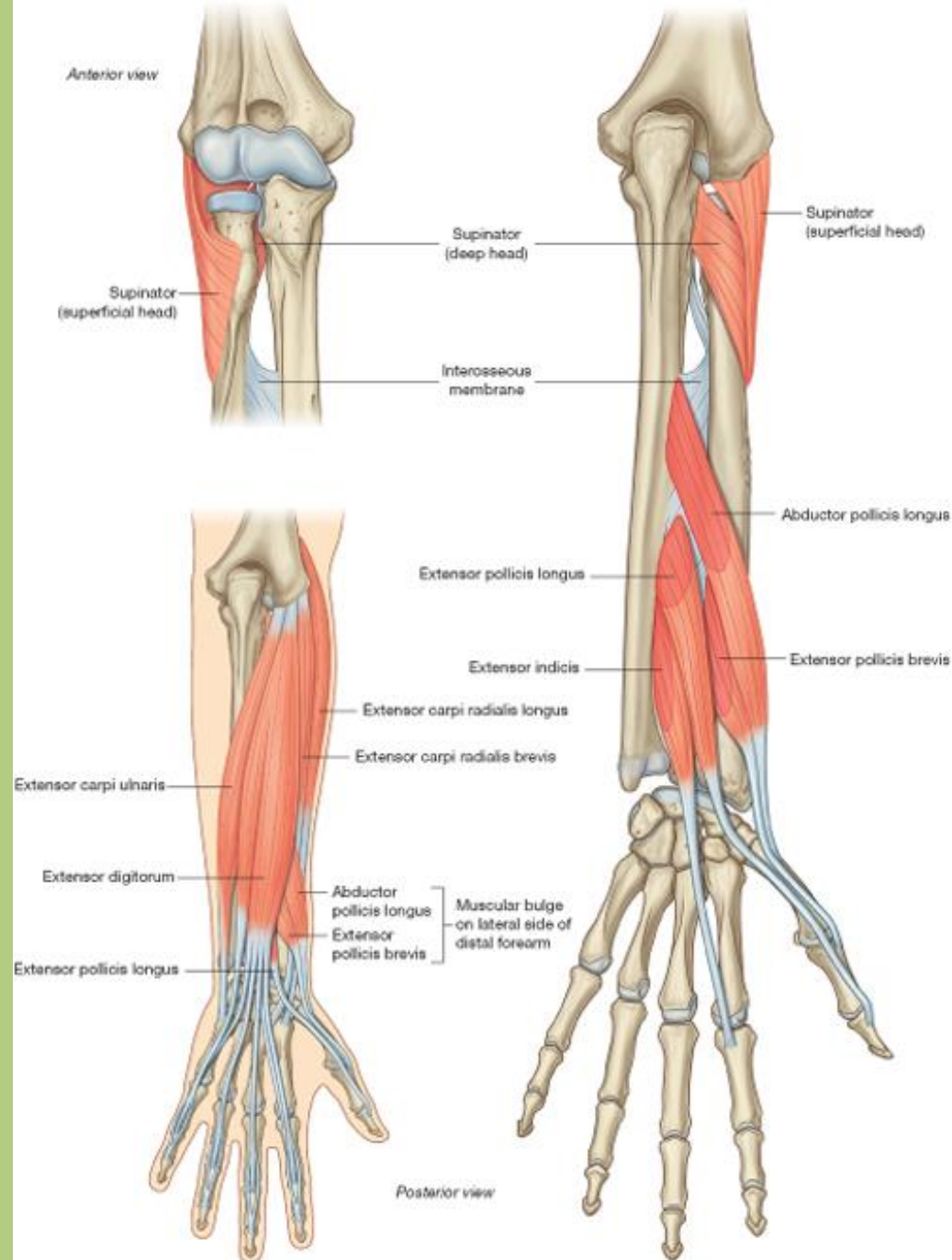
Extensor pollicis brevis

- **Origin:** interosseous membrane and posterior surface of the radius
- **Insertion:** base of the proximal phalanx of the I. finger
- **Action:** extension
- **Innervation:** radial nerve



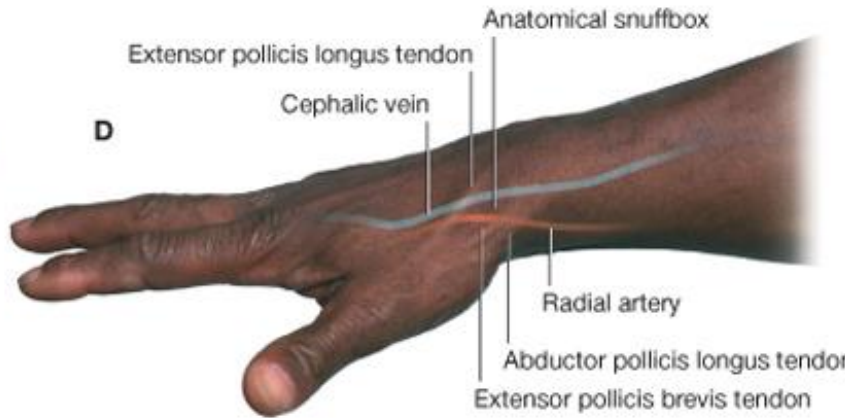
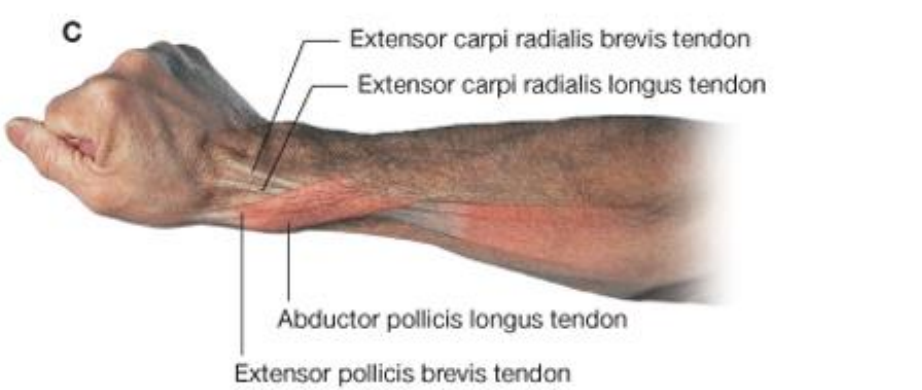
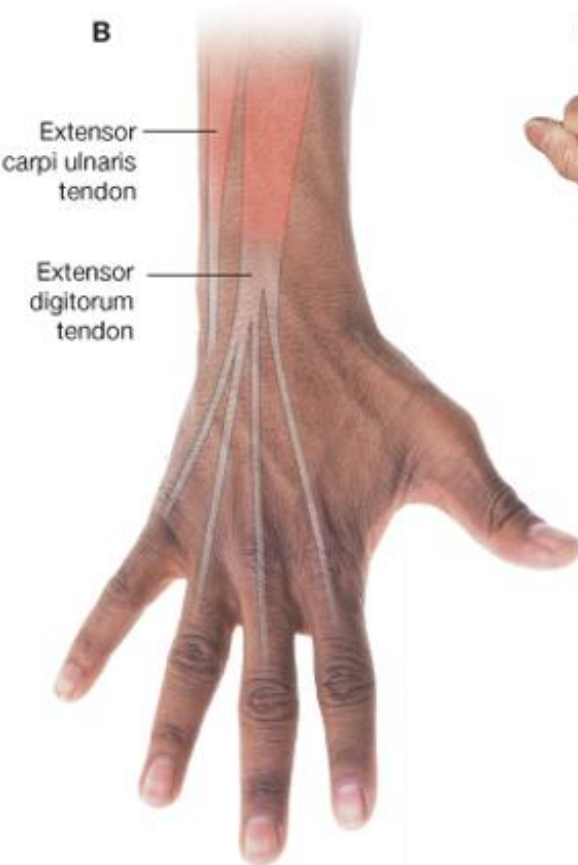
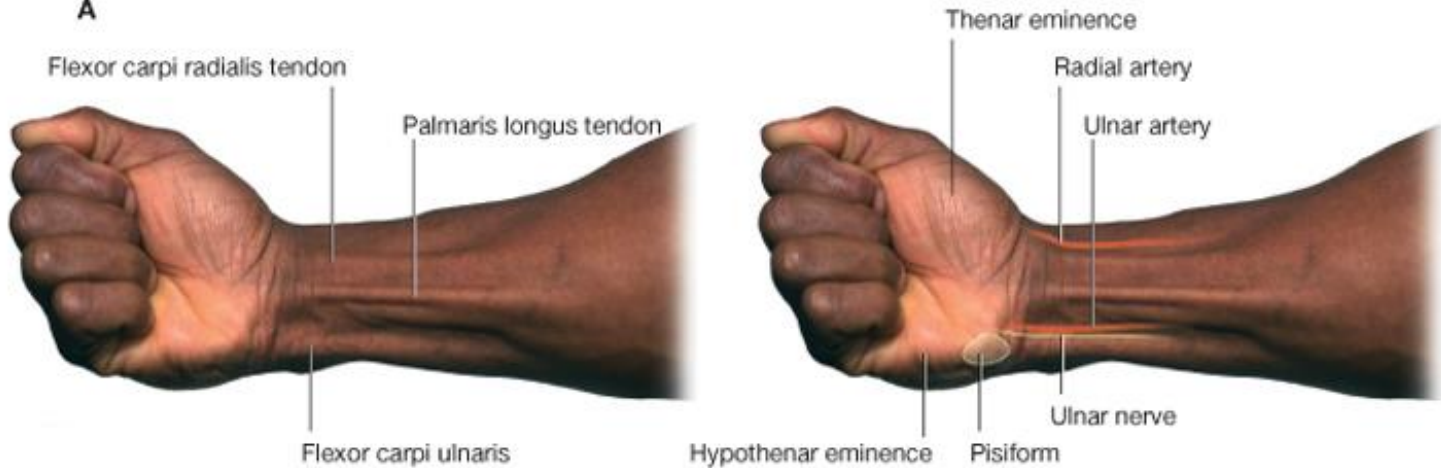
Extensor pollicis longus

- **Origin:** interosseous membrane and posterior surface of the ulna
- **Insertion:** distal phalanx of the I. finger
- **Action:** abduction and extension
- **Innervation:** radial nerve



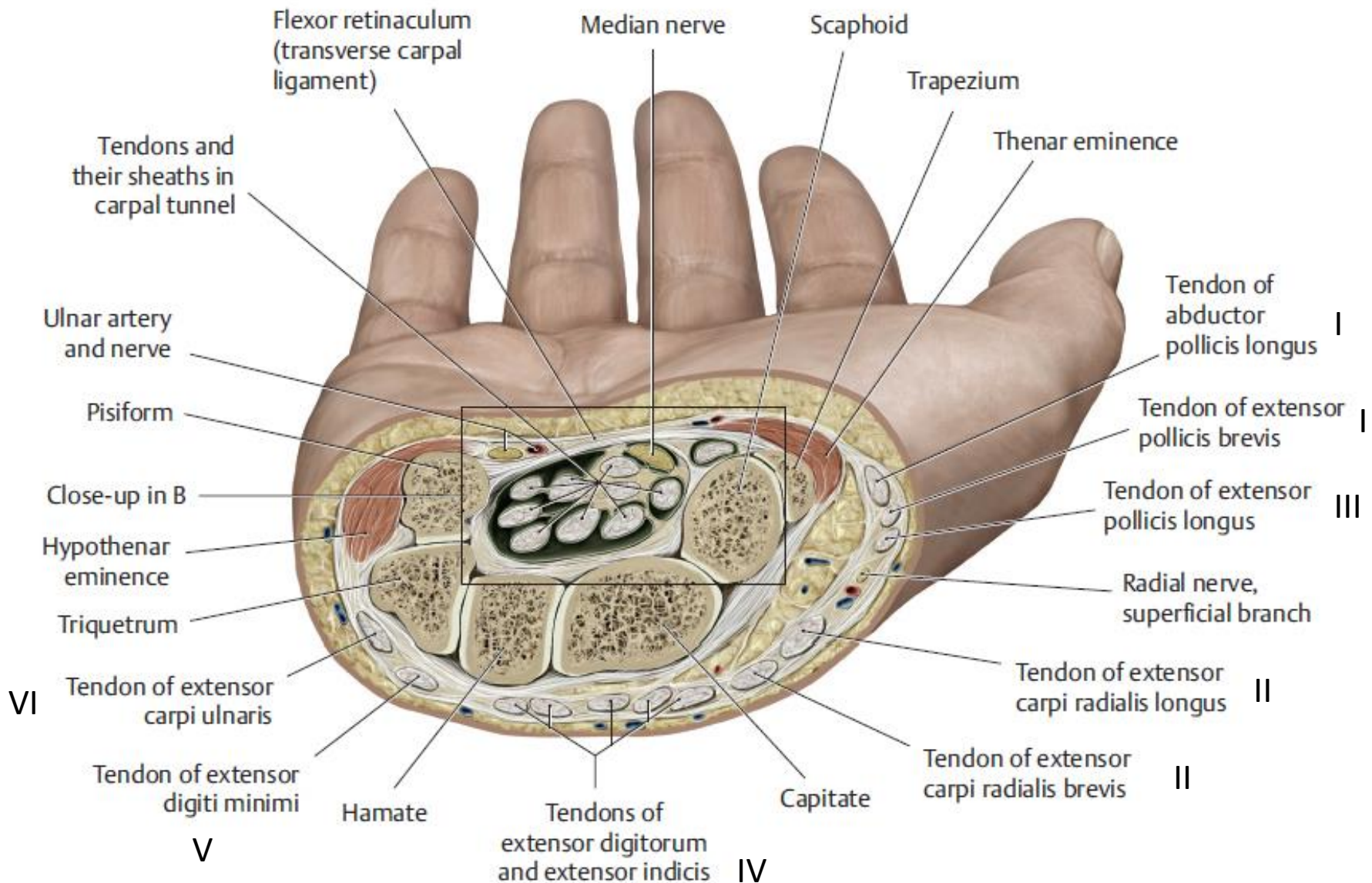
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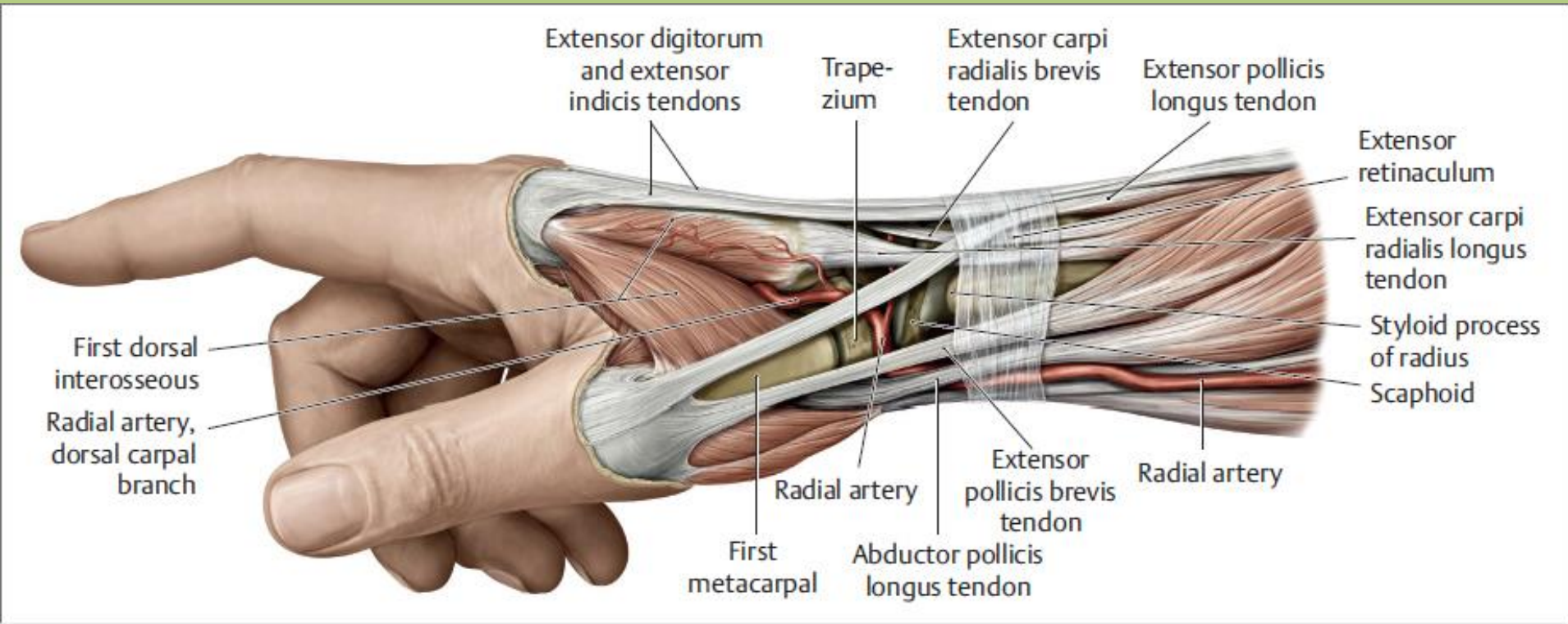


Surface anatomy

Dorsal tendon compartments: I-VI



Anatomical snuffbox



- **Content: radial artery**

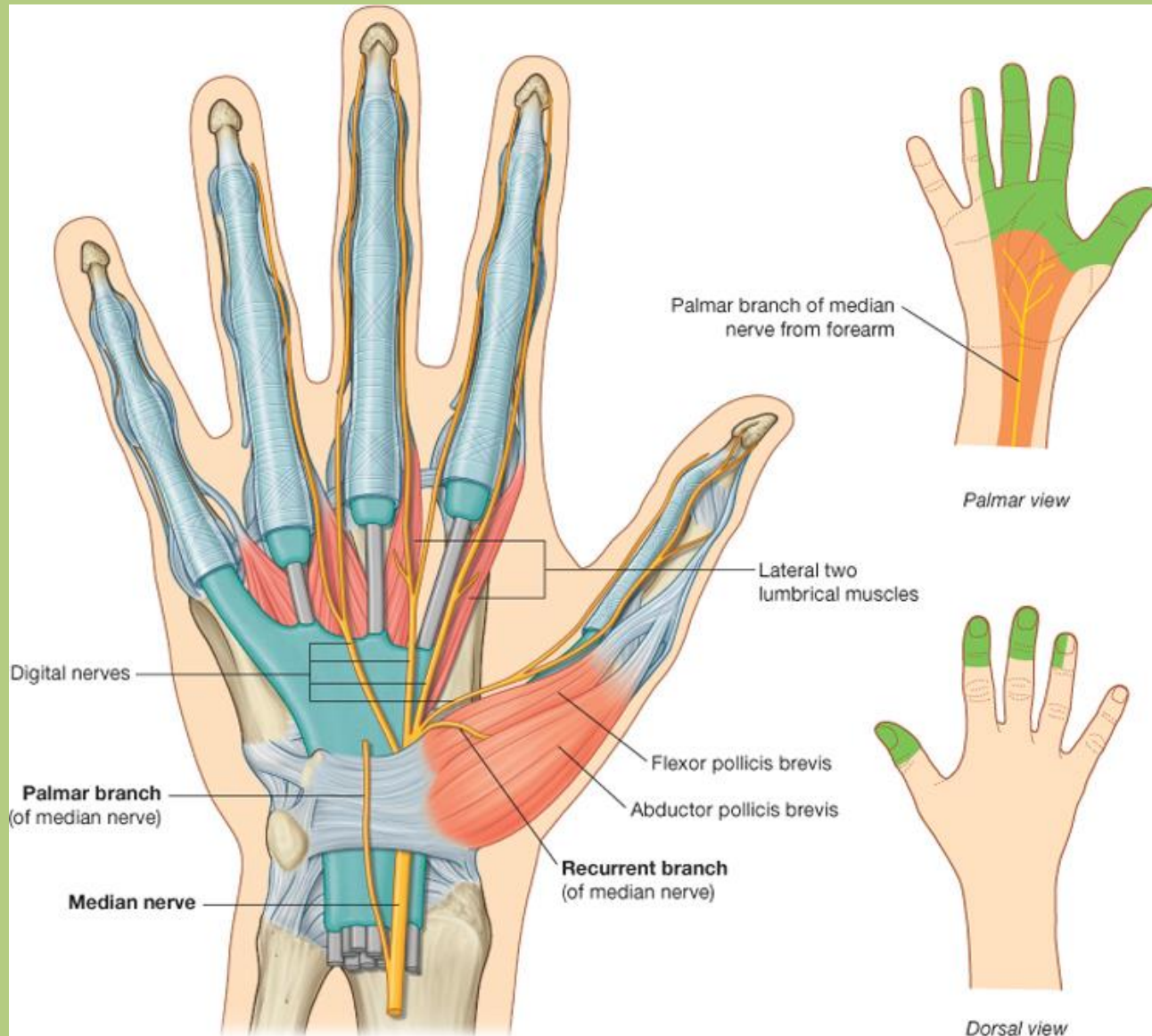
Hand muscles

Thenar muscles

Abductor pollicis brevis

Thenar muscle

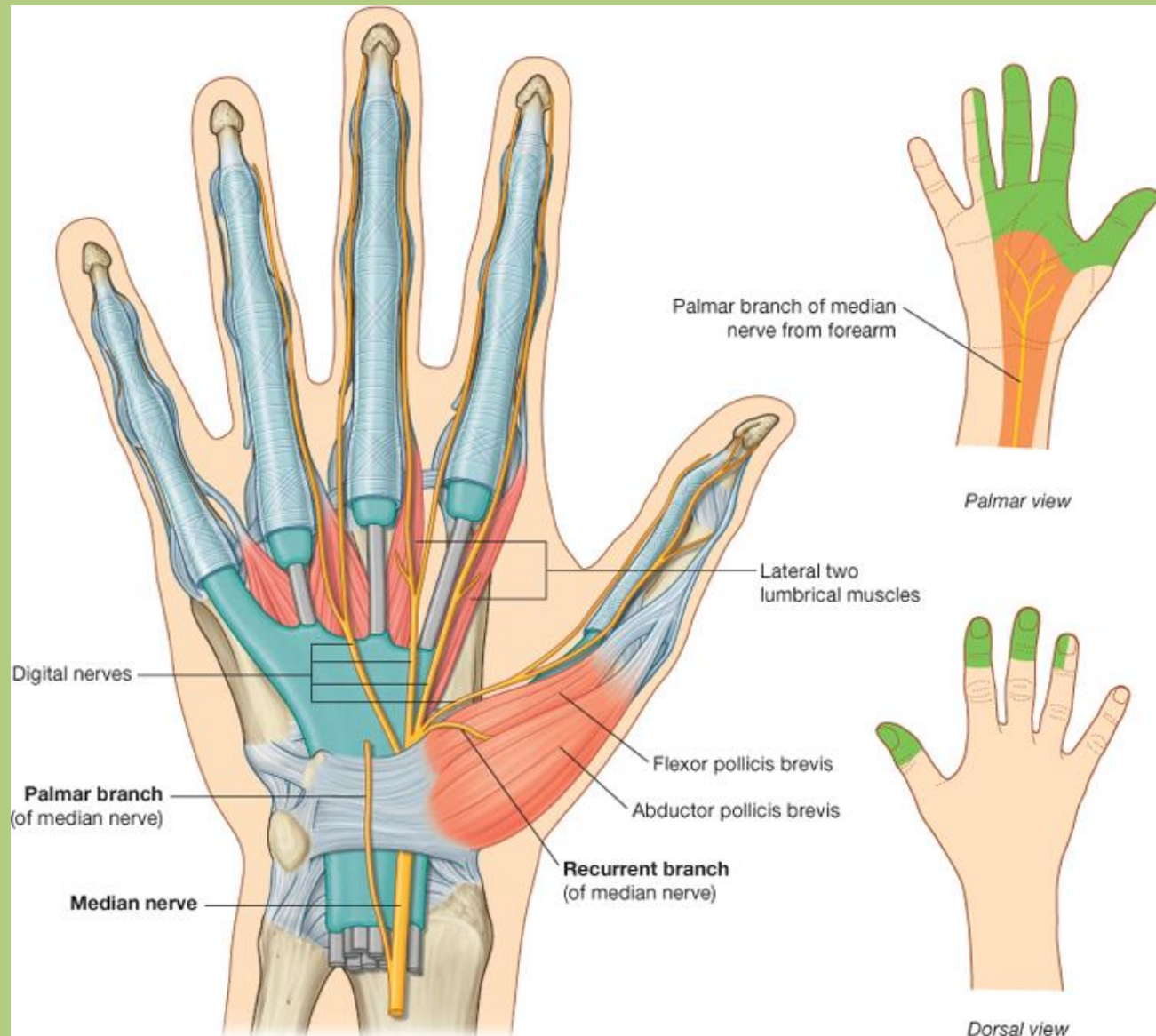
- **Origin:** scaphoid
- **Insertion:** proximal phalanx of the I. finger
- **Action:** abduction
- **Innervation:** median nerve



Flexor pollicis brevis

Thenar muscle

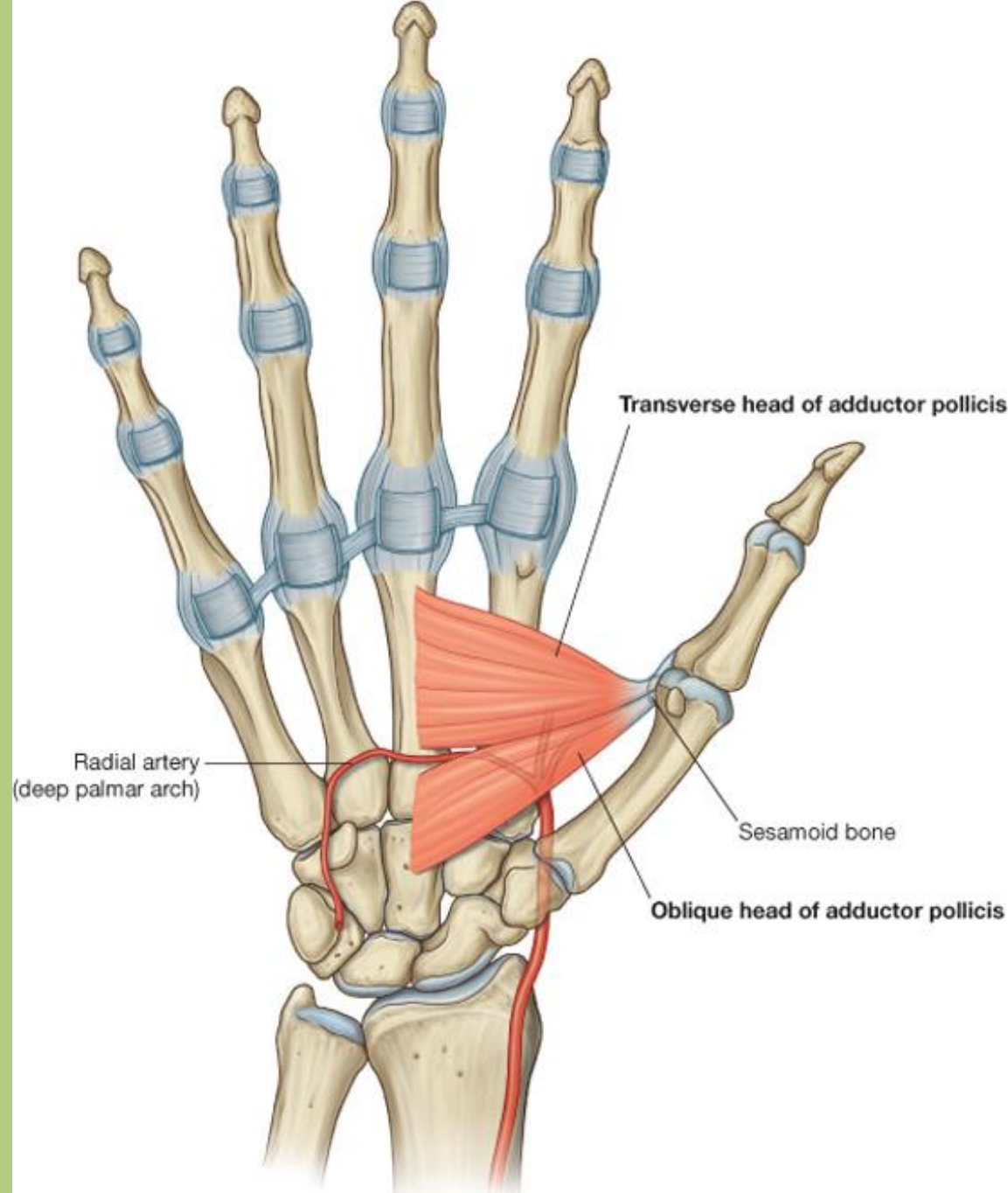
- **Origin:** trapezium
- **Insertion:** proximal phalanx of the I. finger
- **Action:** opposition and flexion
- **Innervation:** median and ulnar nerves



Adductor pollicis

Thenar muscle

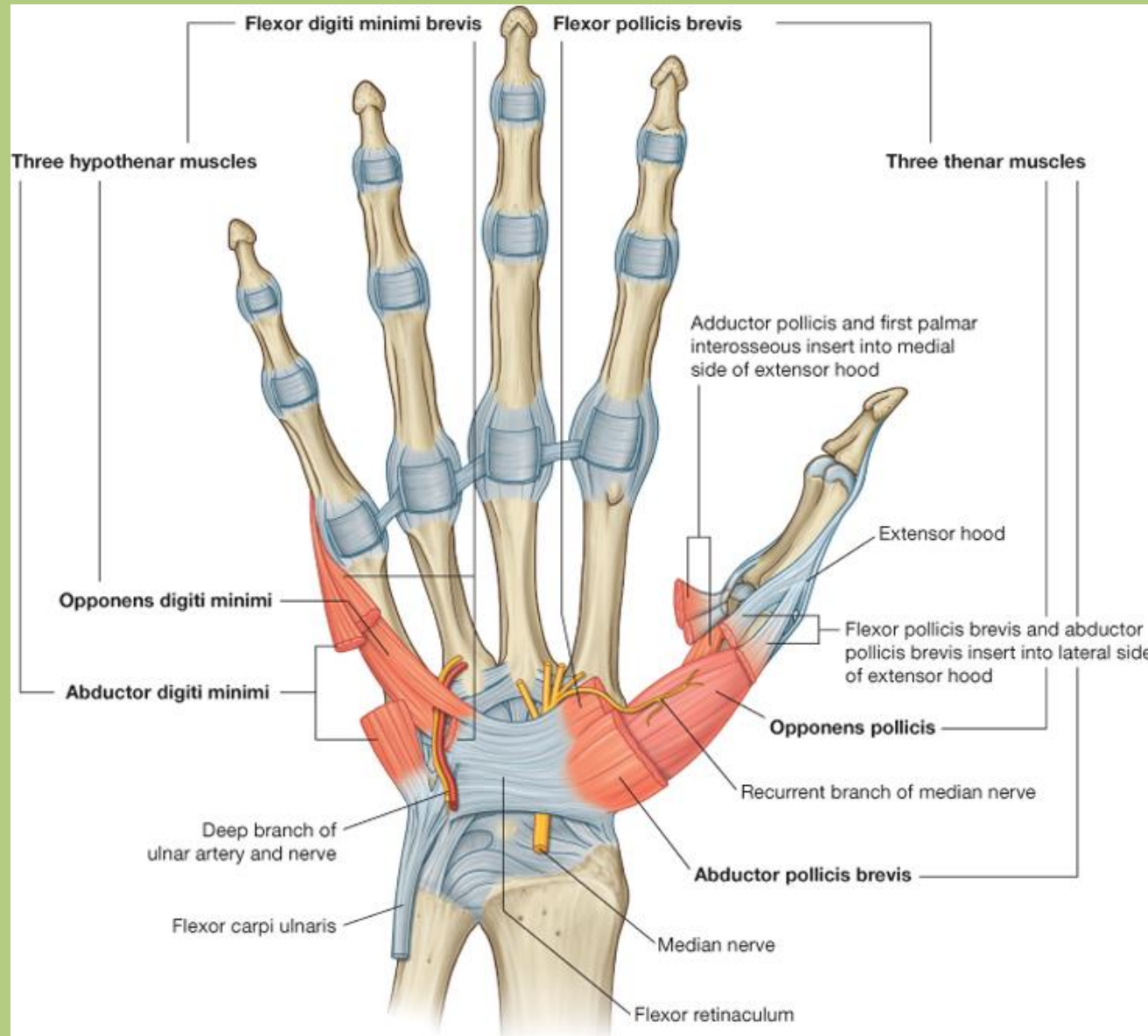
- **Origin:** *oblique head:* capitate, *transverse head:* III. metacarpal
- **Insertion:** proximal phalanx of the I. finger
- **Action:** adduction and opposition
- **Innervation:** ulnar nerve



Opponens pollicis

Thenar muscle

- **Origin:** trapezium
- **Insertion:** I. metacarpal
- **Action:** opposition
- **Innervation:** median nerve



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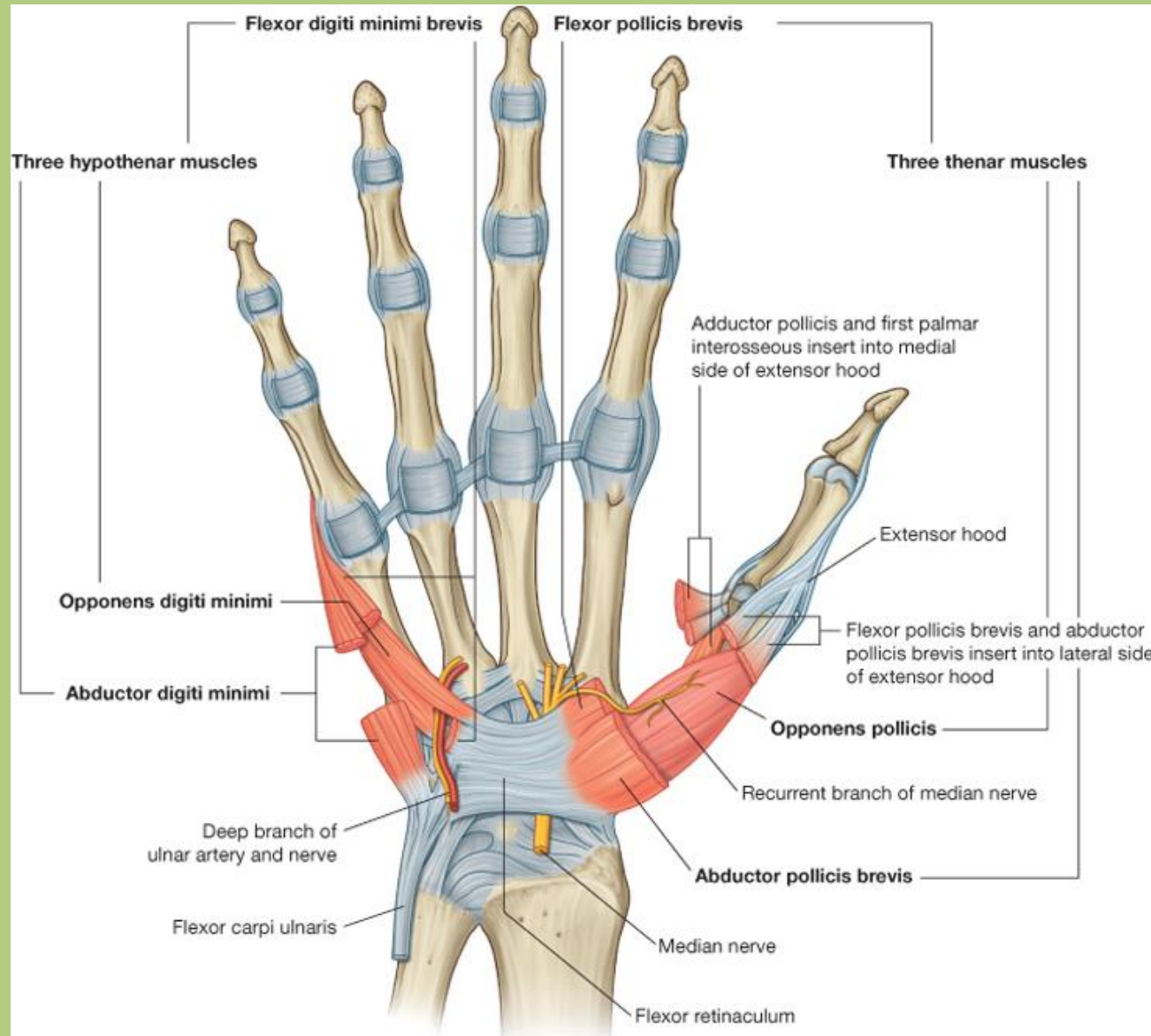
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Hypothenar muscles

Abductor digiti minimi

Hypothenar muscle

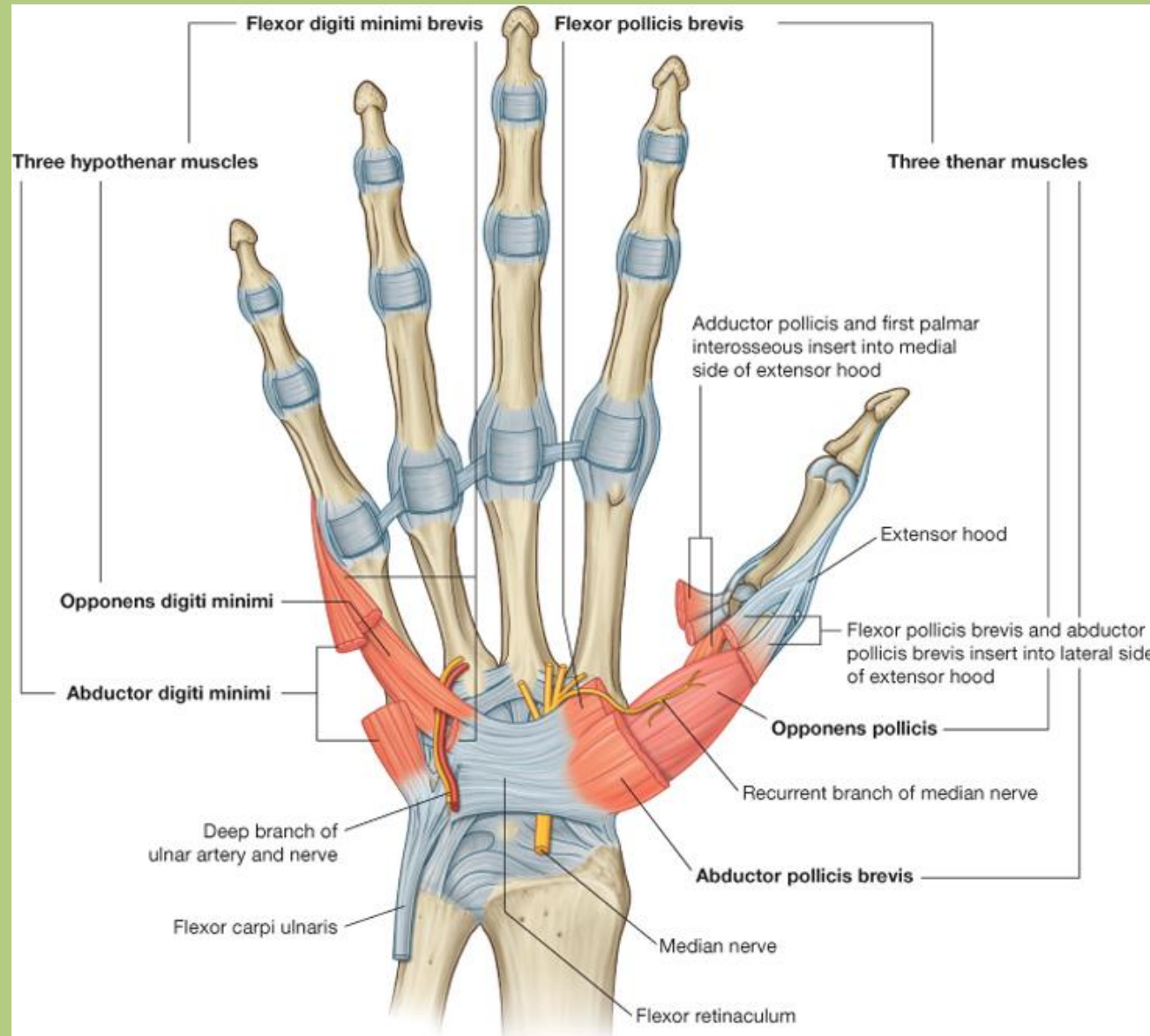
- **Origin:** pisiform
- **Insertion:** proximal phalanx of the V. finger
- **Action:** abduction and flexion
- **Innervation:** ulnar nerve



Flexor digiti minimi (brevis)

Hypothenar muscle

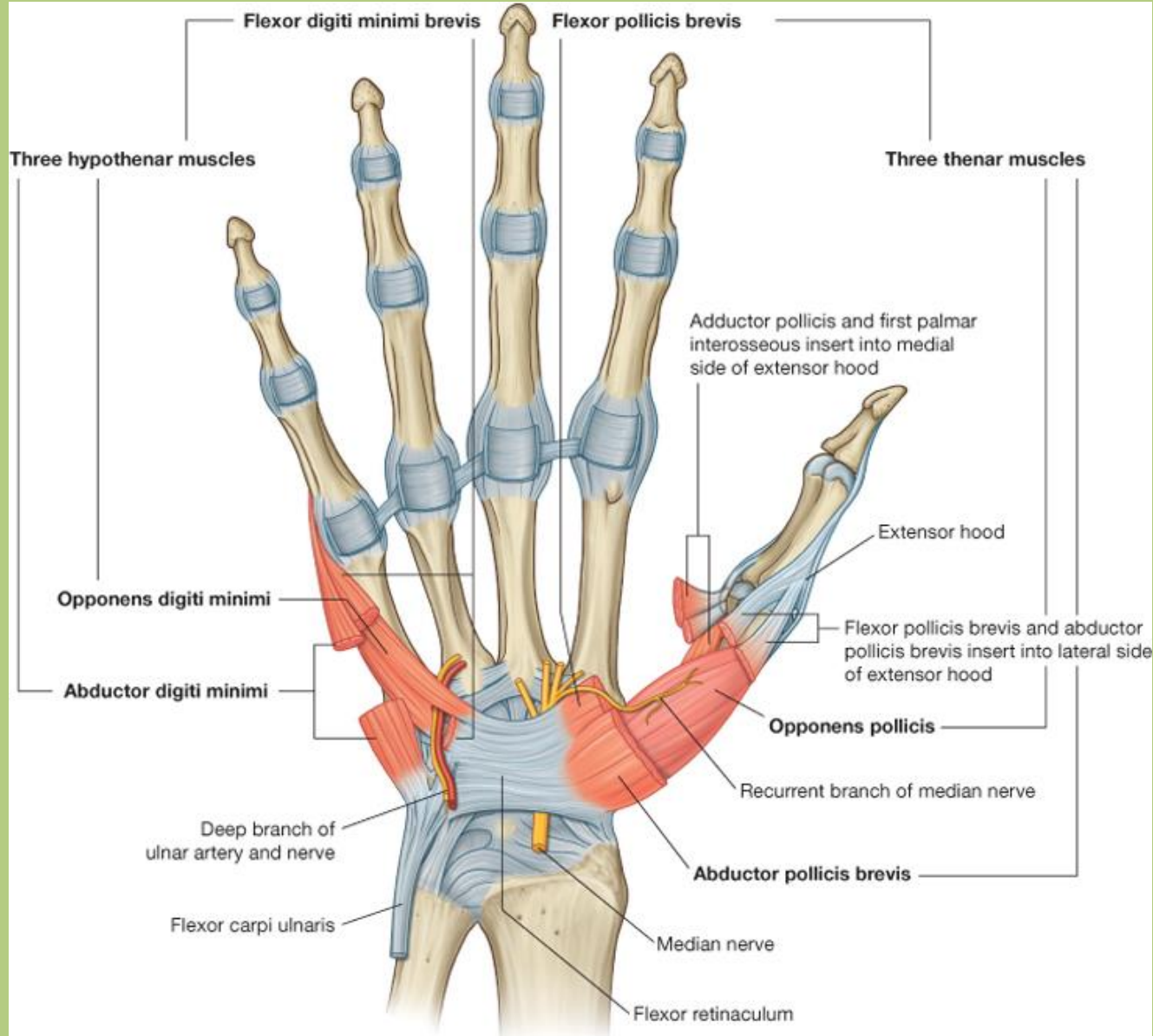
- **Origin:** hook of hamate
- **Insertion:** proximal phalanx of the V. finger
- **Action:** flexion
- **Innervation:** ulnar nerve



Opponens digiti minimi

Hypothenar muscle

- **Origin:** hook of hamate
- **Insertion:** V. metacarpal
- **Action:** opposition
- **Innervation:** ulnar nerve

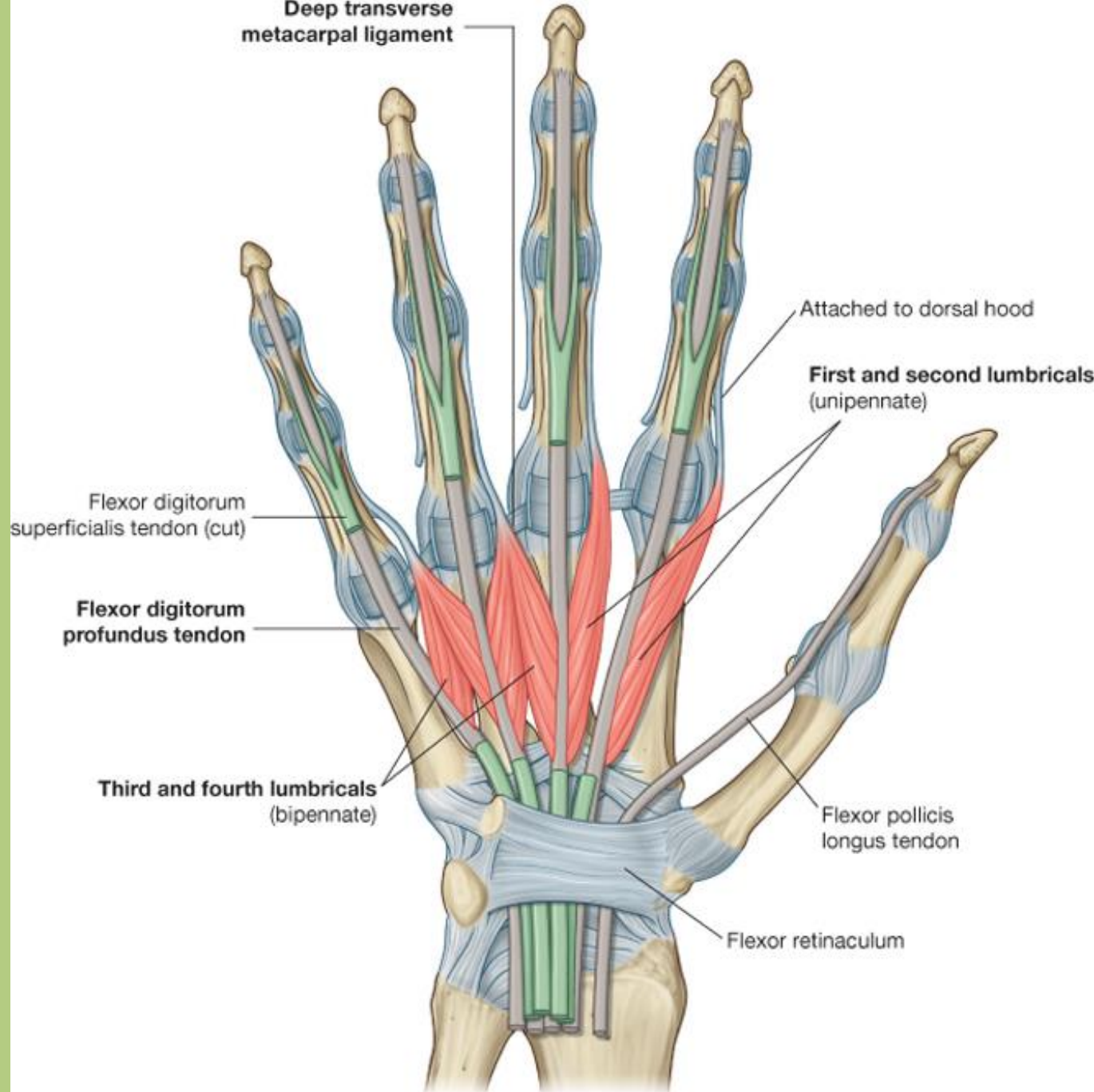


Mesothener muscles

Lumbricals

Mesothenar muscle

- **Origin:** tendons of the flexor digitorum profundus
- **Insertion:** dorsal aponeuroses of the II-V. fingers
- **Action:** flexion in the metacarpophalangeal joints, extension in the interphalangeal joints
- **Innervation:** ulnar and median nerves



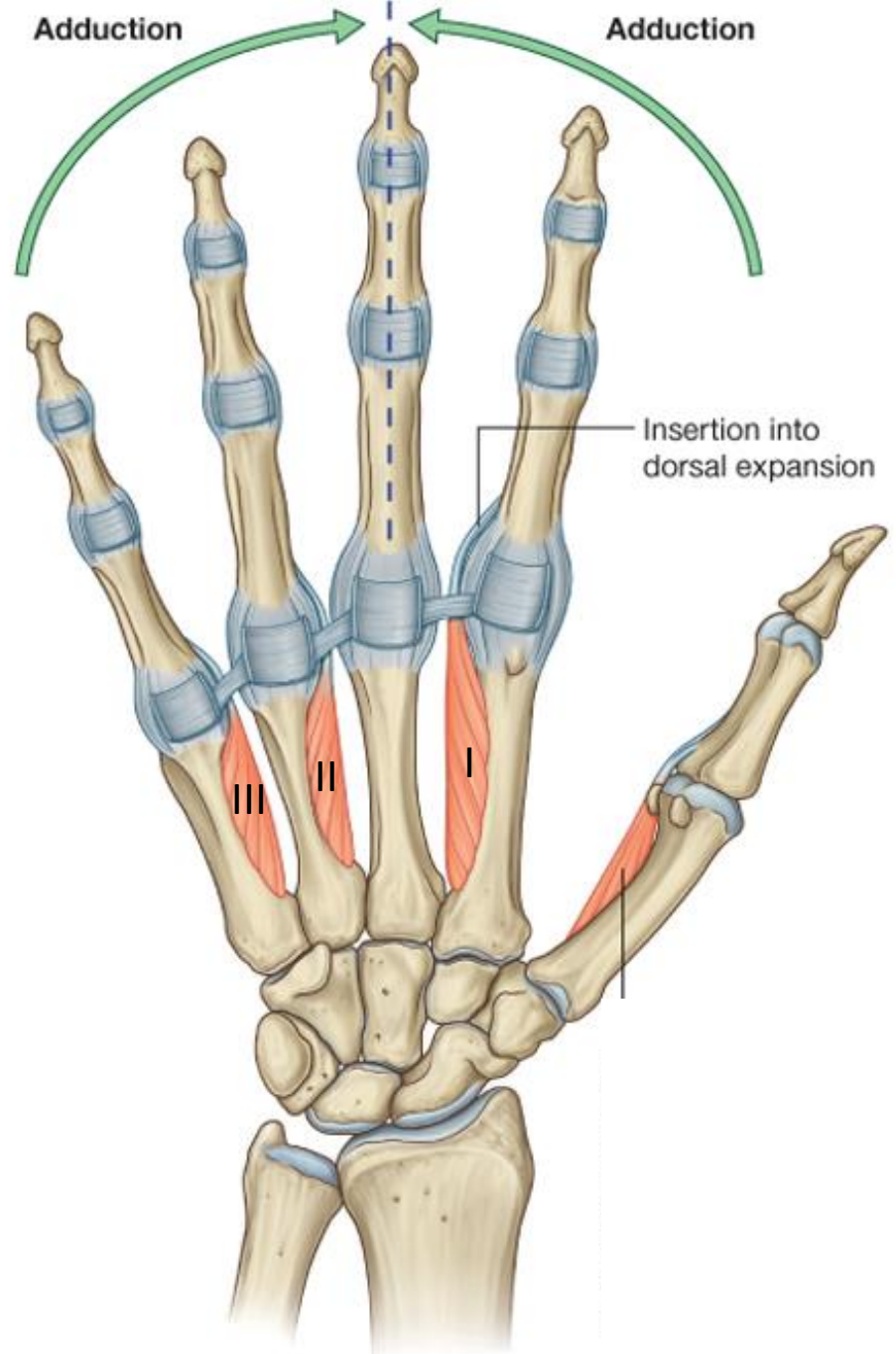
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Palmar interossei

Mesothenar muscle

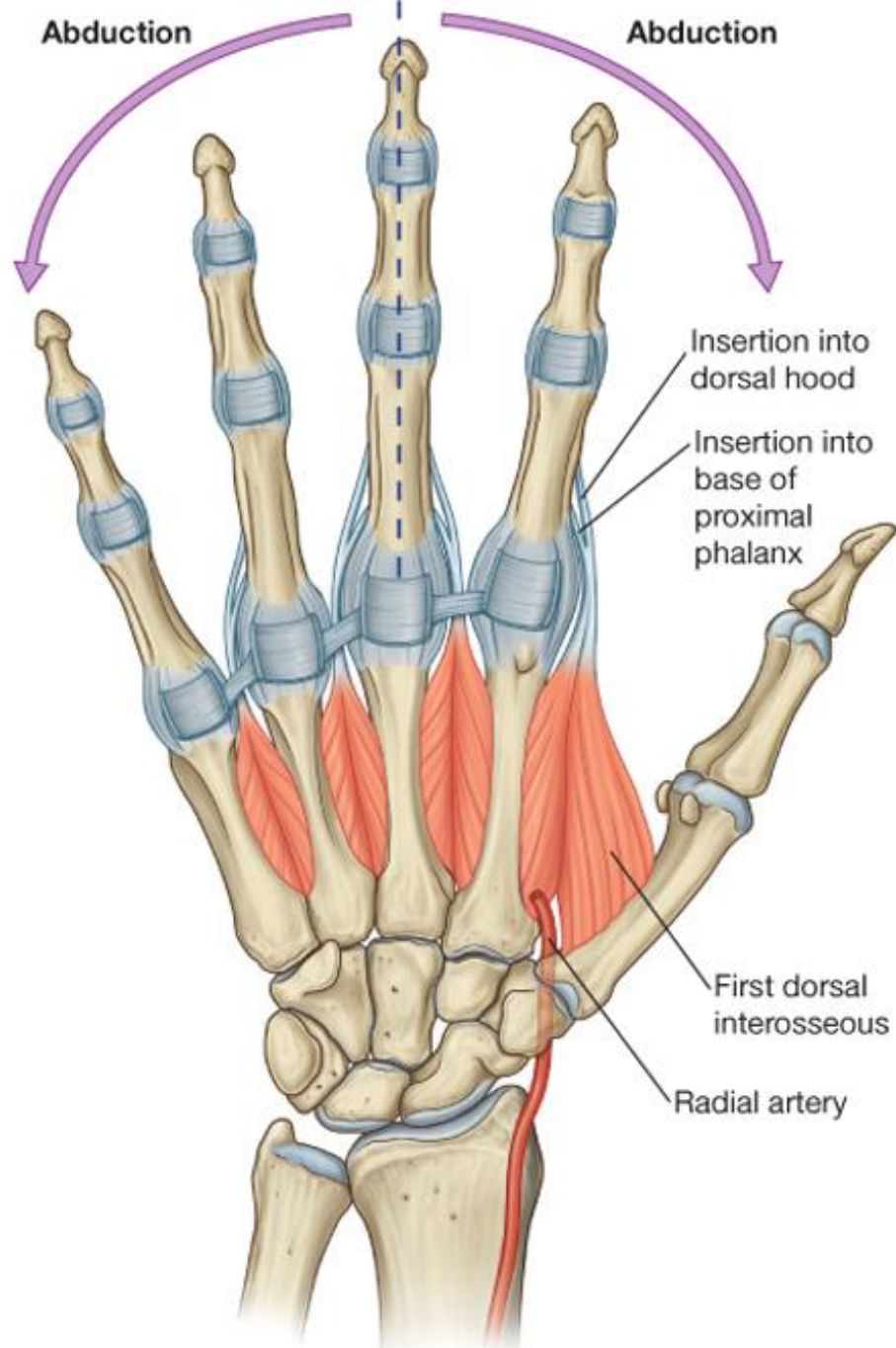
- **Origin:** metacarpals
- **Insertion:** dorsal aponeuroses of the II-V. fingers
- **Action:** adduction
- **Innervation:** ulnar nerve



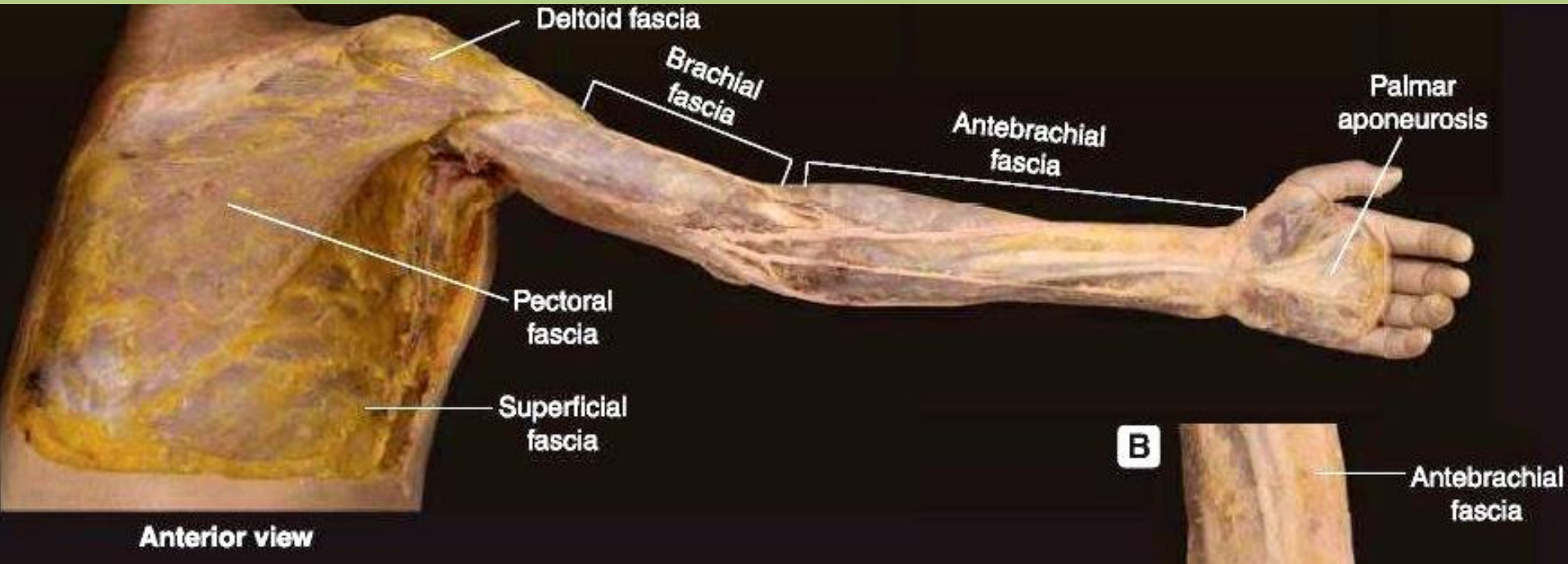
Dorsal interossei

Mesothenar muscle

- **Origin:** metacarpals
- **Insertion:** dorsal aponeuroses of the II-V. fingers
- **Action:** abduction
- **Innervation:** ulnar nerve



Fasciae of the upper limb



Fascia is a thin *connective tissue* covering of each muscle. It's built up by *multiple layers with fluid in between called hyaluronan*. Fascia has nerves that make it almost as **sensitive** as skin. When stressed, it tightens up. When it tightens around muscles, it can limit mobility and cause painful knots to develop.

How to keep fasciae healthy

- **Stretch regularly**



foam rollers

- **Focus on posture**

Thank you for your
attention.

References:

Gray's Anatomy for Students

Thieme: Atlas of Anatomy, General Anatomy and Musculoskeletal System

<https://www.hopkinsmedicine.org/health/wellness-and-prevention/muscle-pain-it-may-actually-be-your-fascia>