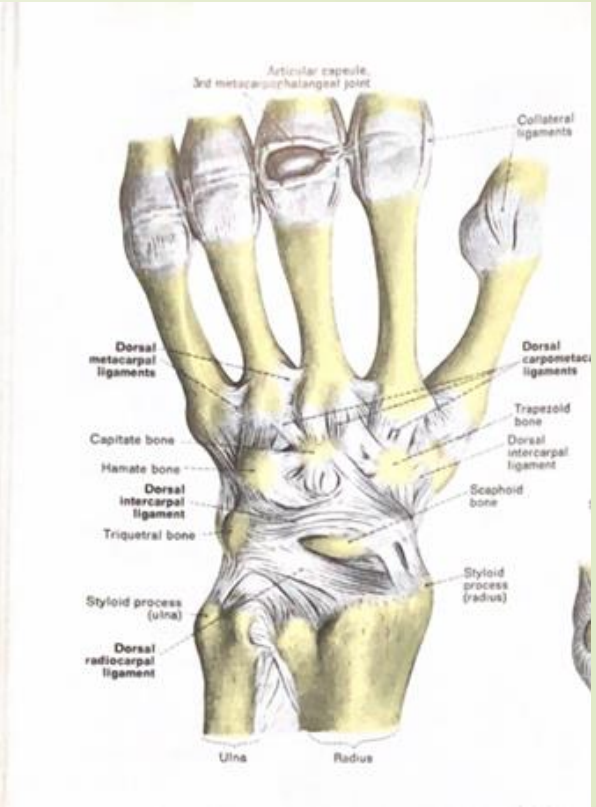
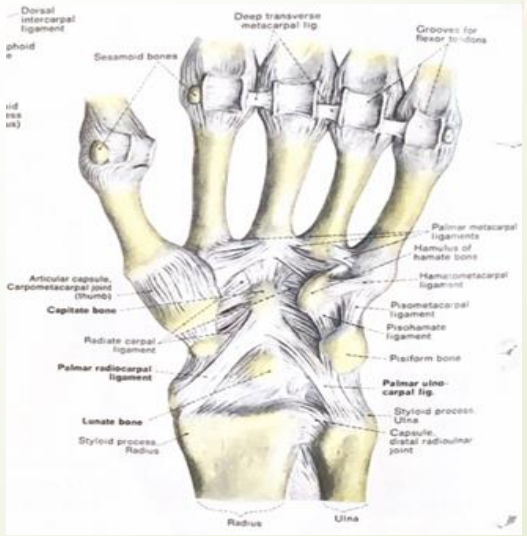
Wrist

- The wrist (carpus) is a complex of the eight small carpal bones that connect the forearm and hand
- Before learning the anatomy of the hand, having a sound knowledge of the arrangement of the bones, tendons, arteries, and nerves in the region of the wrist is essential. From a clinical standpoint, the wrist is a common site for injury.



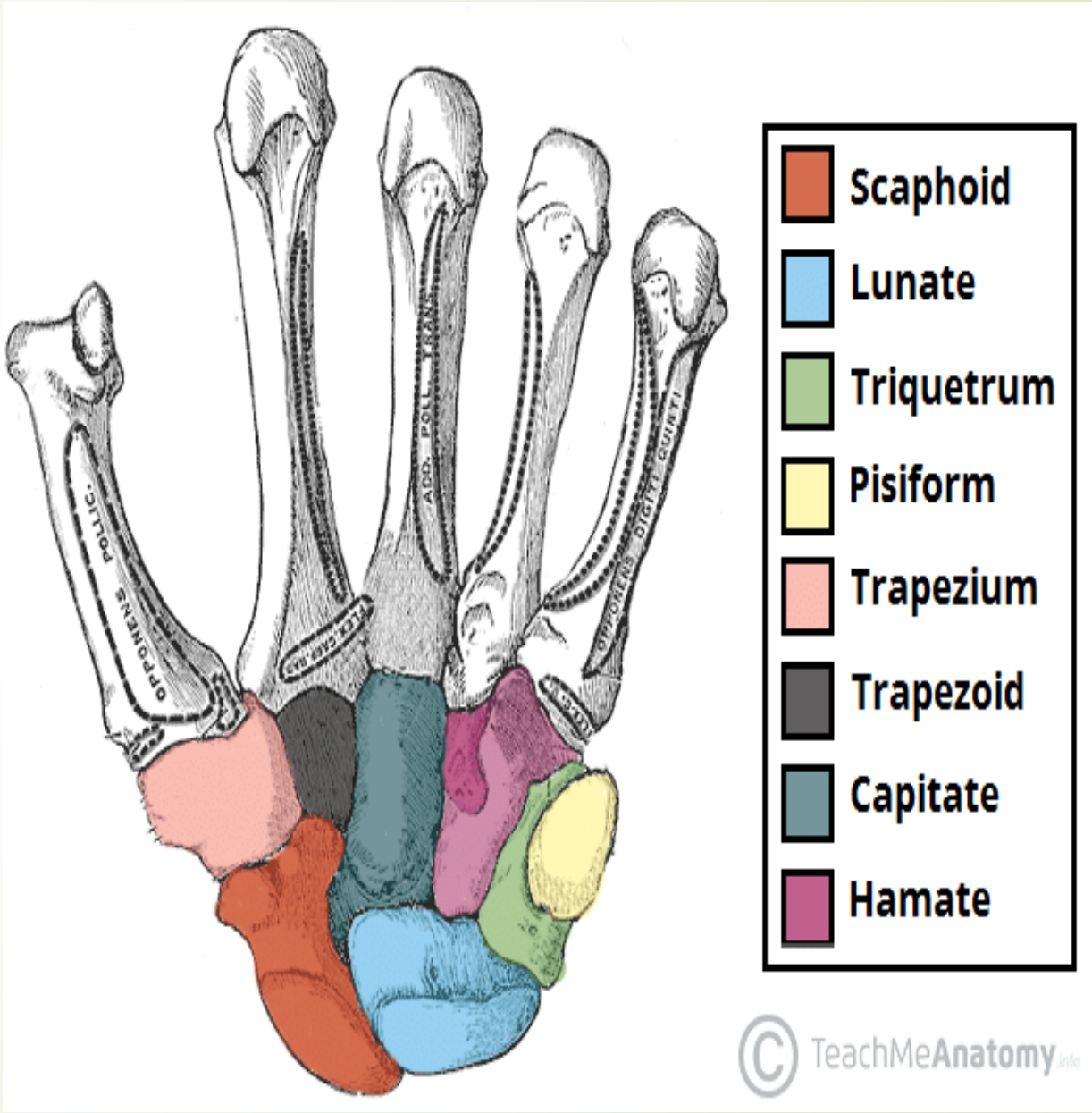


Carpal Bones

The carpal bones are a group of eight, irregularly shaped bones. They are organised into two rows: proximal and distal.

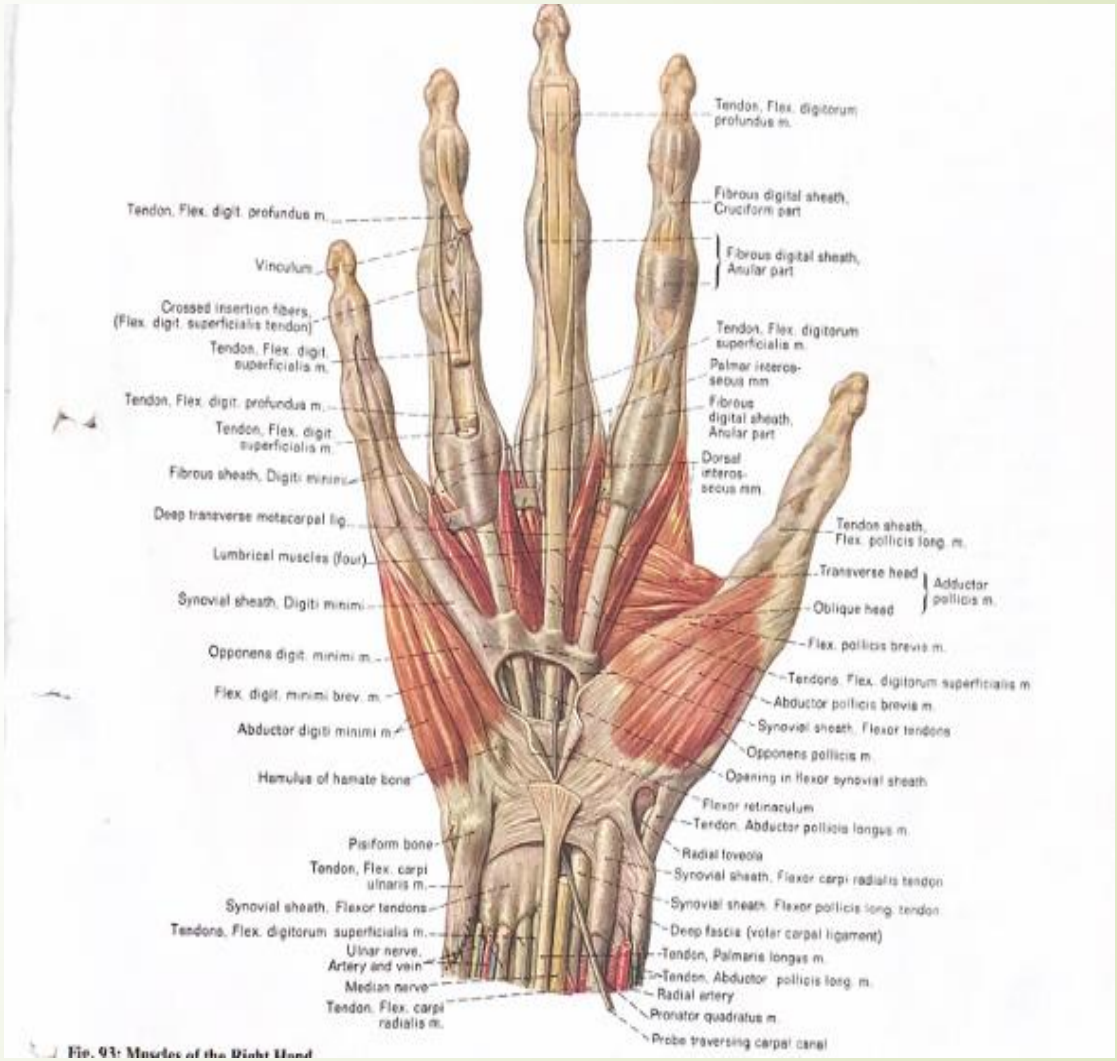
Proximal Row (lateral to medial)	Distal Row (lateral to medial)
• Scaphoid	• Trapezium
• Lunate	• Trapezoid
• Triquetrum	• Capitate
• Pisiform (a sesamoid bone, formed within the tendon of the flexor carpi ulnaris)	• Hamate (has a projection on its palmar surface, known as the 'hook of hamate'

Collectively, the carpal bones form an **arch** in the coronal plane. A membranous band, the flexor retinaculum, spans between the medial and lateral edges of the



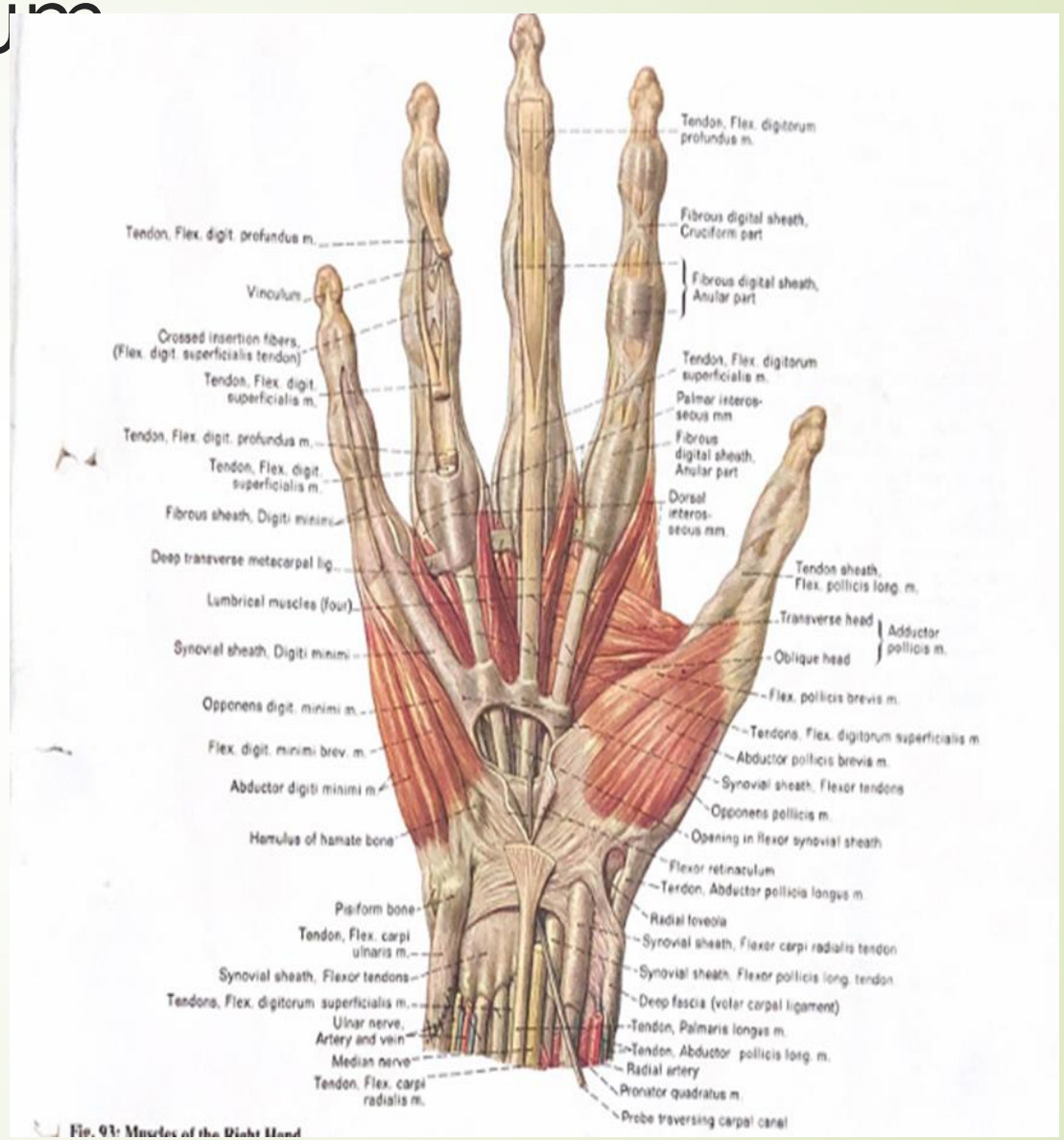
Flexor and Extensor Retinacula

- The flexor and extensor retinacula are strong bands of deep fascia that hold the long flexor and extensor tendons in position at the wrist.



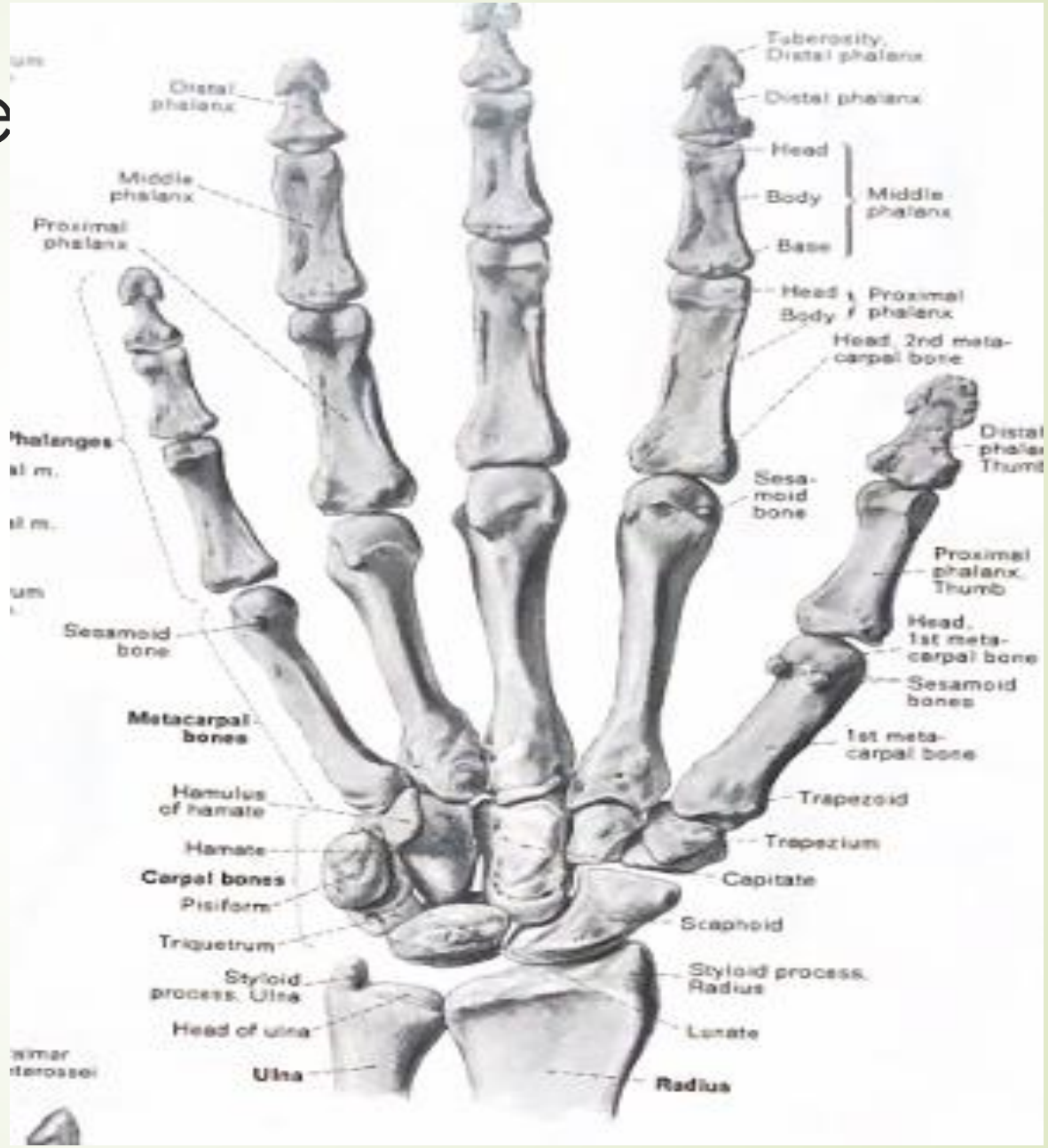
Flexor Retinaculum

- The flexor retinaculum is a thickening of deep fascia that holds the long flexor tendons in position at the wrist. It stretches across the front of the wrist and converts the concave anterior surface of the wrist into an osseofascial tunnel, the carpal tunnel, for the passage of the median nerve and the flexor tendons of the thumb and fingers



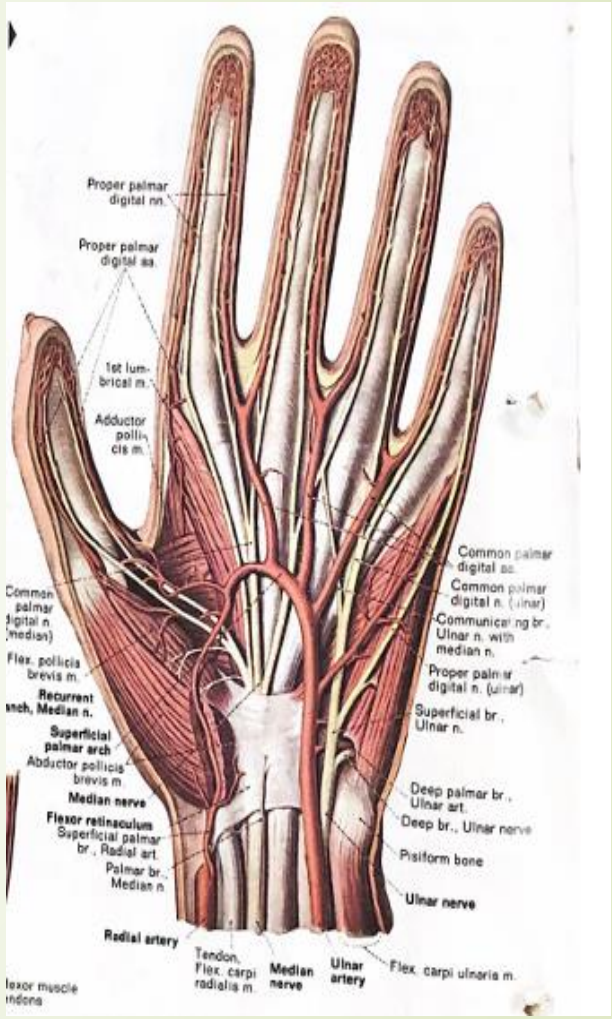
The Attachme

- It attaches medially to the pisiform bone and the hook of the hamate and laterally to the tubercle of the scaphoid and the trapezium bones. The attachment to the trapezium consists of superficial and deep parts and forms a synovial-lined tunnel for passage of the tendon of the flexor carpi radialis.

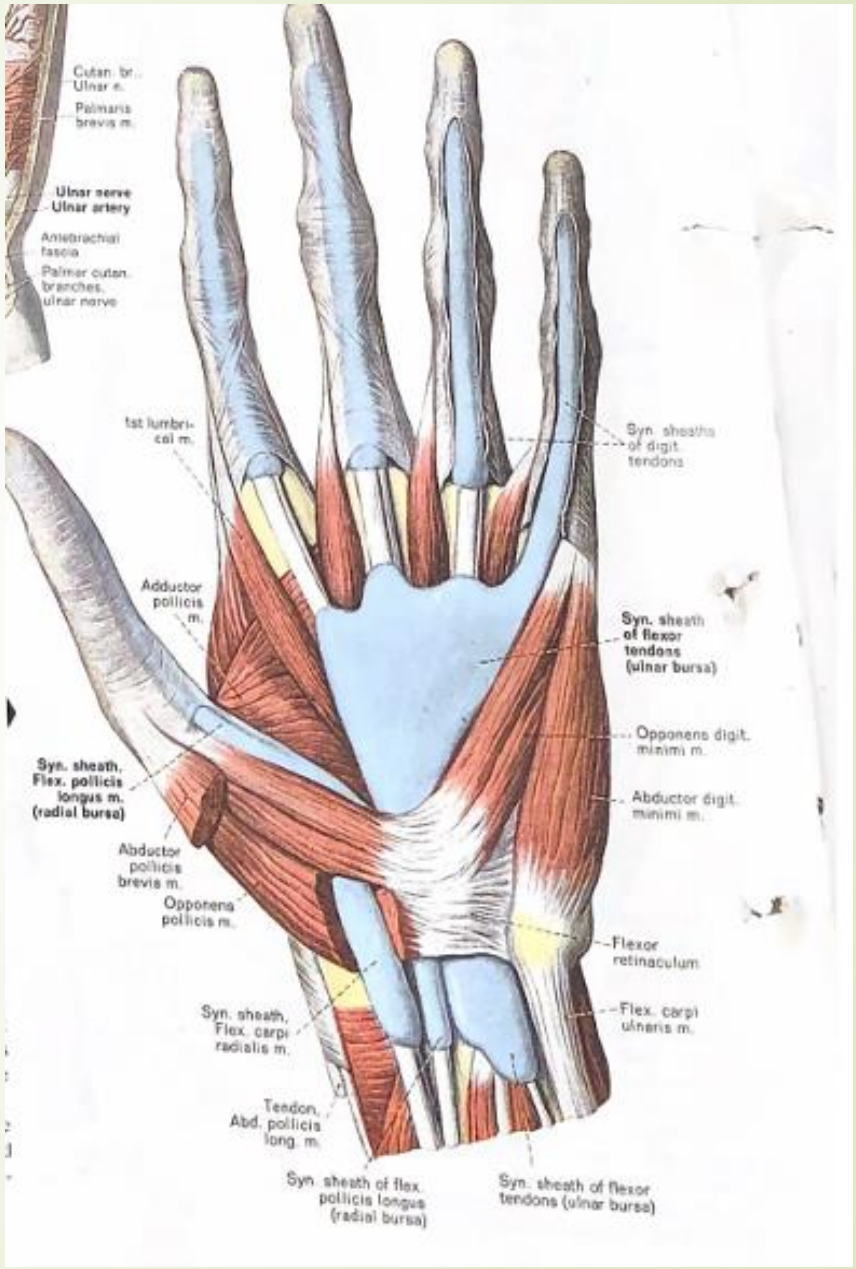


Carpal Tunnel

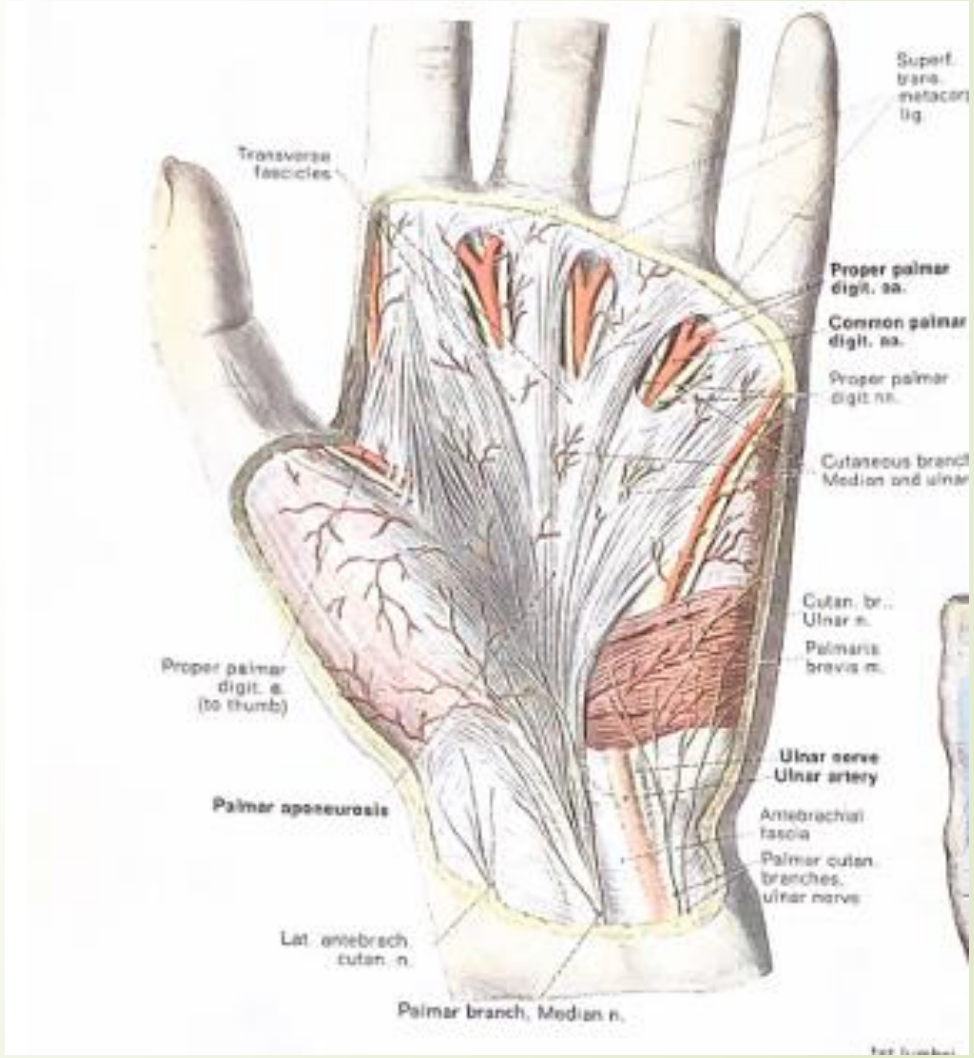
- The carpus is deeply concave on its anterior surface and forms a bony gutter. The gutter is converted into a tunnel, the carpal tunnel, by the covering flexor retinaculum
- The long flexor tendons to the fingers and thumb pass through the tunnel and are accompanied by the median nerve.
- The four separate tendons of the flexor digitorum superficialis muscle are arranged in anterior and posterior rows, those to the middle and ring fingers lying superficial to those of the index and little fingers. The four tendons diverge and become arranged on the same plane at the distal border of the flexor retinaculum



- The tendons of the flexor digitorum profundus muscle are on the same plane as one another and lie deep to the superficialis tendons. All eight tendons of the flexor digitorum superficialis and profundus invaginate a common synovial sheath from the lateral side
- The tendon of the flexor pollicis longus muscle runs through the lateral part of the tunnel in its own synovial sheath. The median nerve passes deep to the flexor retinaculum in a narrow space between the tendons of the flexor digitorum superficialis and the flexor carpi radialis muscles.



- The proximal border of the retinaculum corresponds to the distal transverse skin crease in front of the wrist and is continuous with the deep fascia of the forearm. The distal border is attached to the palmar aponeurosis



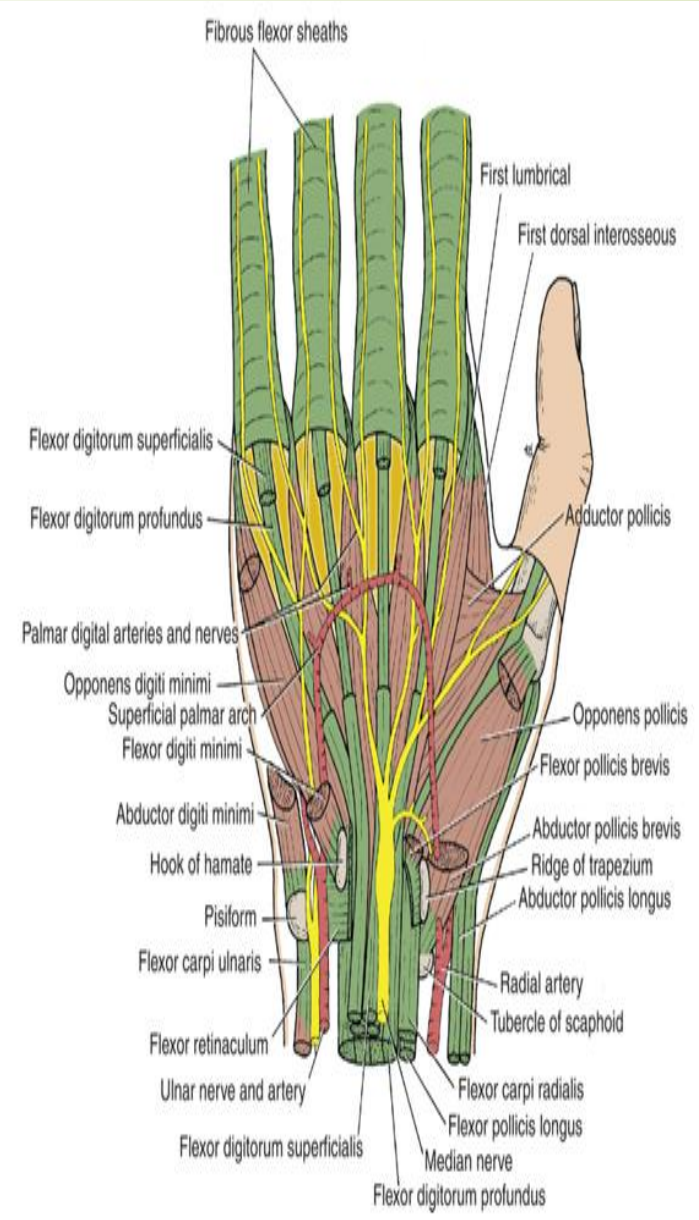
Structures that pass above the flexure retinaculum

- Flexor carpi ulnaris tendon, ending on the pisiform bone (this tendon does not actually cross the flexor retinaculum but is included for the sake of completeness) Ulnar nerve, lying lateral to the pisiform bone Ulnar artery, lying lateral to the ulnar nerve Palmar cutaneous branch of the ulnar nerve Palmaris longus tendon (if present), passing to its insertion into the flexor retinaculum and the palmar aponeurosis Palmar cutaneous branch of the median nerve



The following structures pass deep to the flexor retinaculum (within the carpal tunnel), from medial to lateral

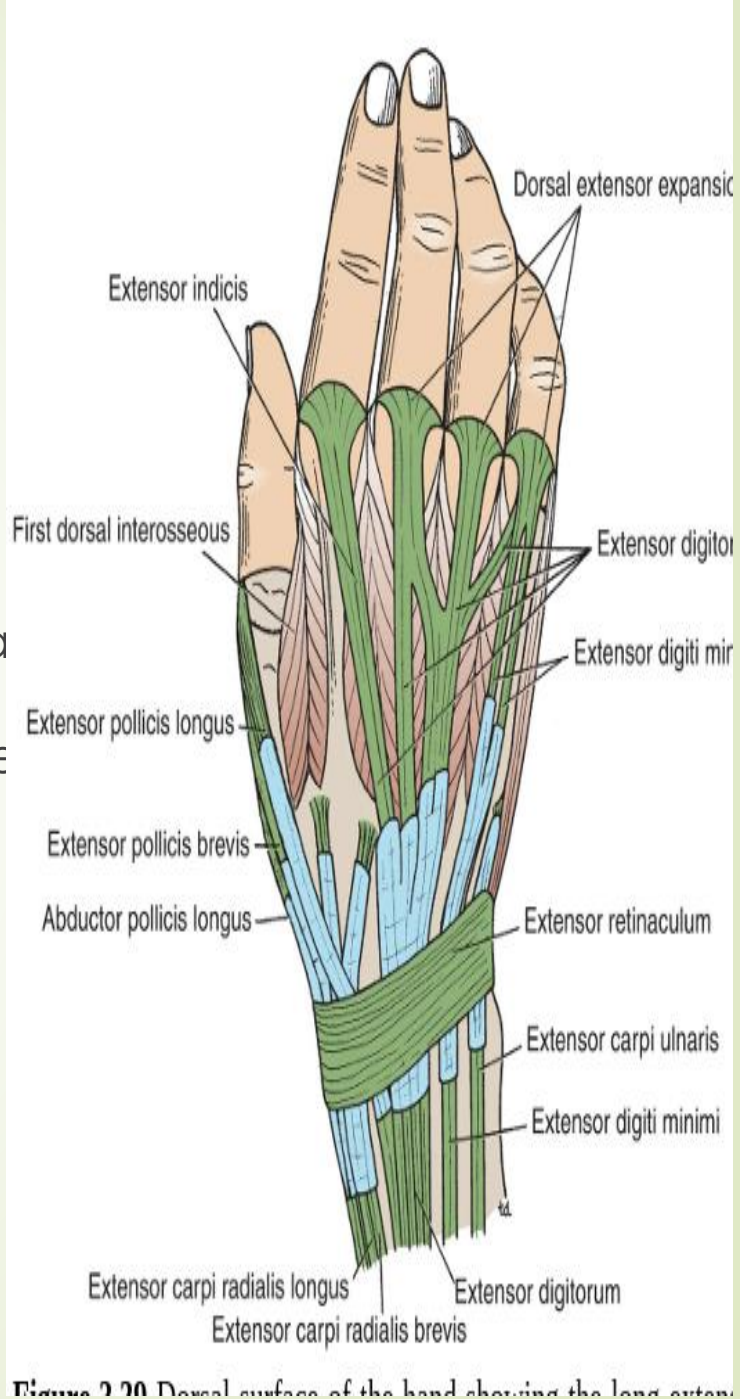
- Flexor digitorum superficialis tendons and, deep to these, the tendons of the flexor digitorum profundus (both groups of tendons share a common synovial sheath)
- Median nerve
- Flexor pollicis longus tendon, surrounded by a synovial sheath
- Flexor carpi radialis tendon, going through a split in the flexor retinaculum (synovial sheath surrounds the tendon)



Extensor Retinaculum

The extensor retinaculum is a thickening of deep fascia that stretches across the back of the wrist and holds the long extensor tendons in position

- It converts the grooves on the posterior surface of the distal ends of the radius and ulna into six separate tunnels for the passage of the long extensor tendons
- Each tunnel is lined with a synovial sheath, which extends proxima and distal to the retinaculum on the tendons. The tunnels are separated from one another by fibrous septa that extend from the deep surface of the retinaculum to the underlying bones



structures pass deep to the extensor retinaculum from medial to lateral, within the six extensor tunnels of the retinaculum

- Extensor carpi ulnaris tendon, which grooves the posterior aspect of the head of the ulna
- Extensor digiti minimi tendon, situated posterior to the distal radioulnar joint
- Extensor digitorum and extensor indicis tendons, sharing a common synovial sheath and situated on the lateral part of the posterior surface of the radius
- Extensor pollicis longus tendon, winding around the medial side of the dorsal tubercle of the radius
- Extensor carpi radialis longus and brevis tendons, sharing a common synovial sheath and situated on the lateral part of the posterior surface of the radius
- Abductor pollicis longus and extensor pollicis brevis tendons, having separate synovial sheaths but sharing a common compartment

The following structures pass superficial to the extensor retinaculum, from medial to lateral

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