The Wrist Joint & Retinacula

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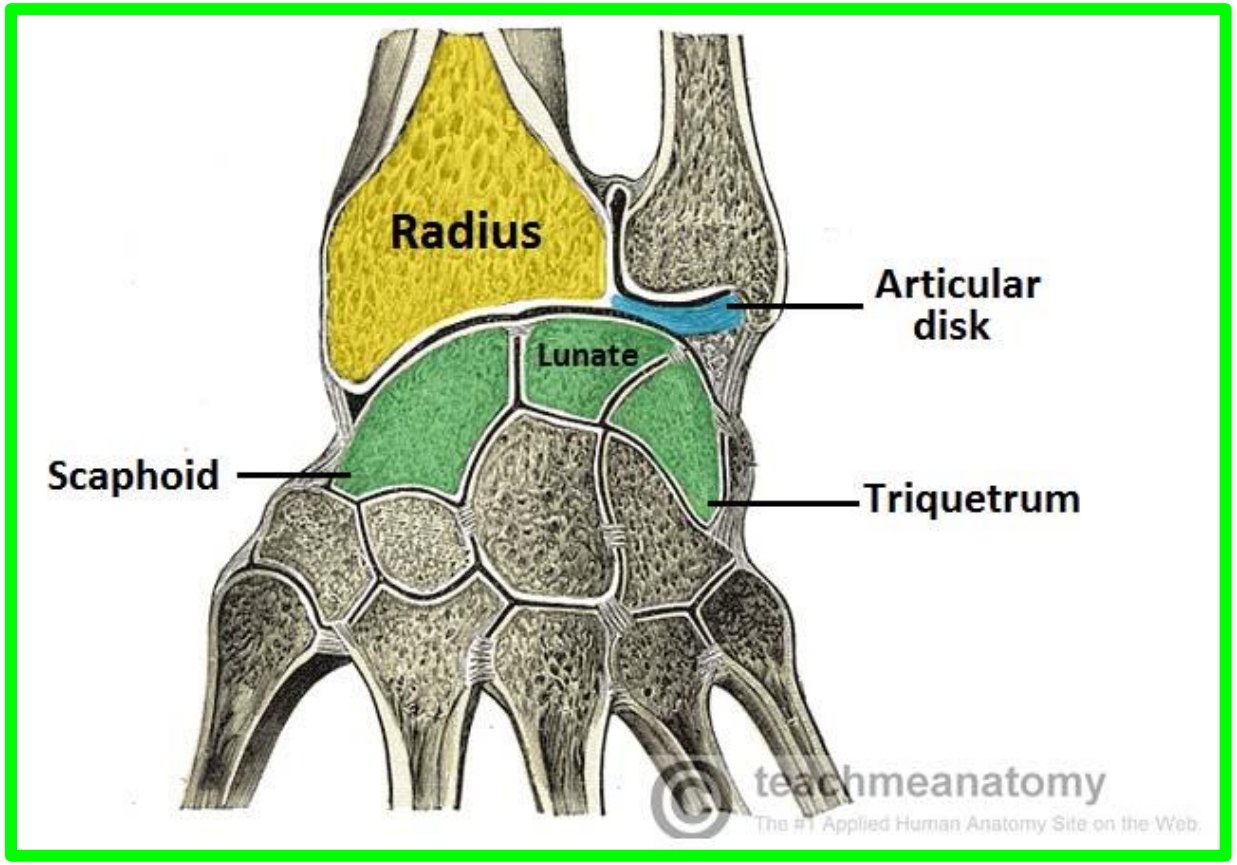
Wrist Joint (Radiocarpal Joint)

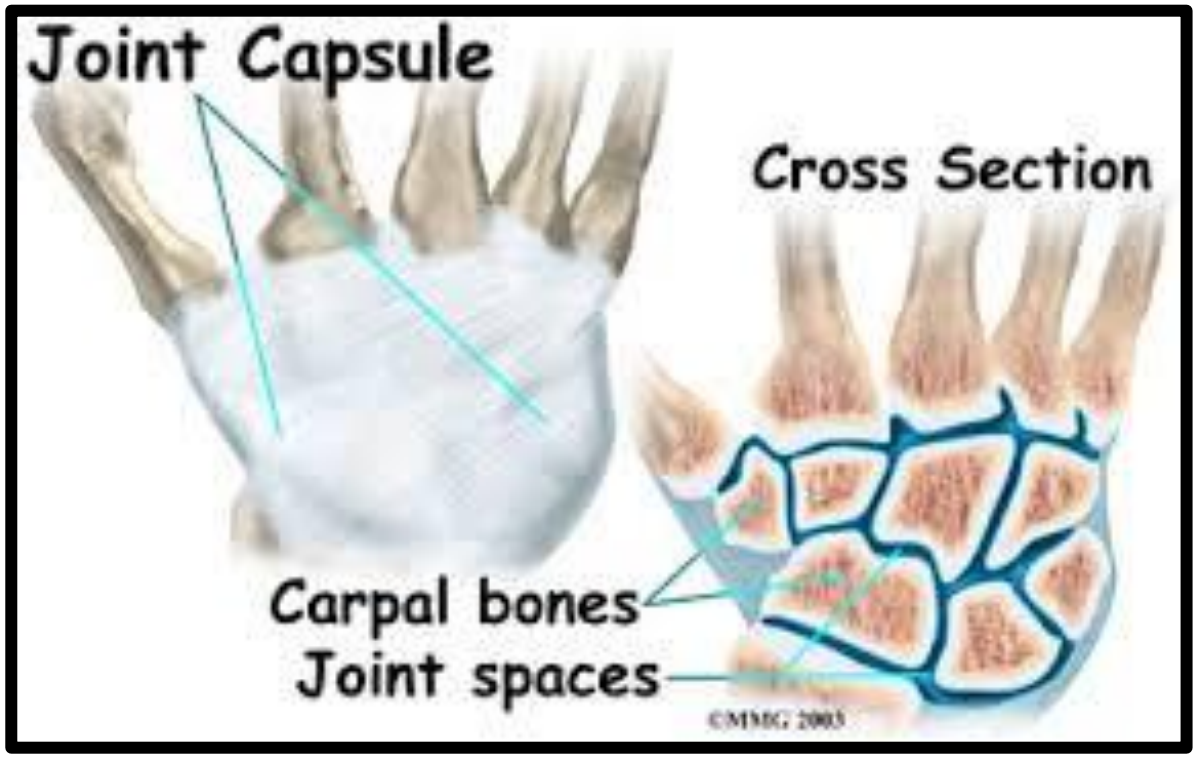
Articulation: Between the distal end of the radius and the articular disc above and the scaphoid, lunate, and triquetral bones below.

- The proximal articular surface forms an ellipsoid concave surface, which is adapted to the distal ellipsoid convex surface.



Wrist Joint (Radiocarpal Joint)

- **Type:** Synovial ellipsoid joint
- **Capsule:** The capsule encloses the joint and is attached above to the distal ends of the radius and ulna and below to the proximal row of carpal bones

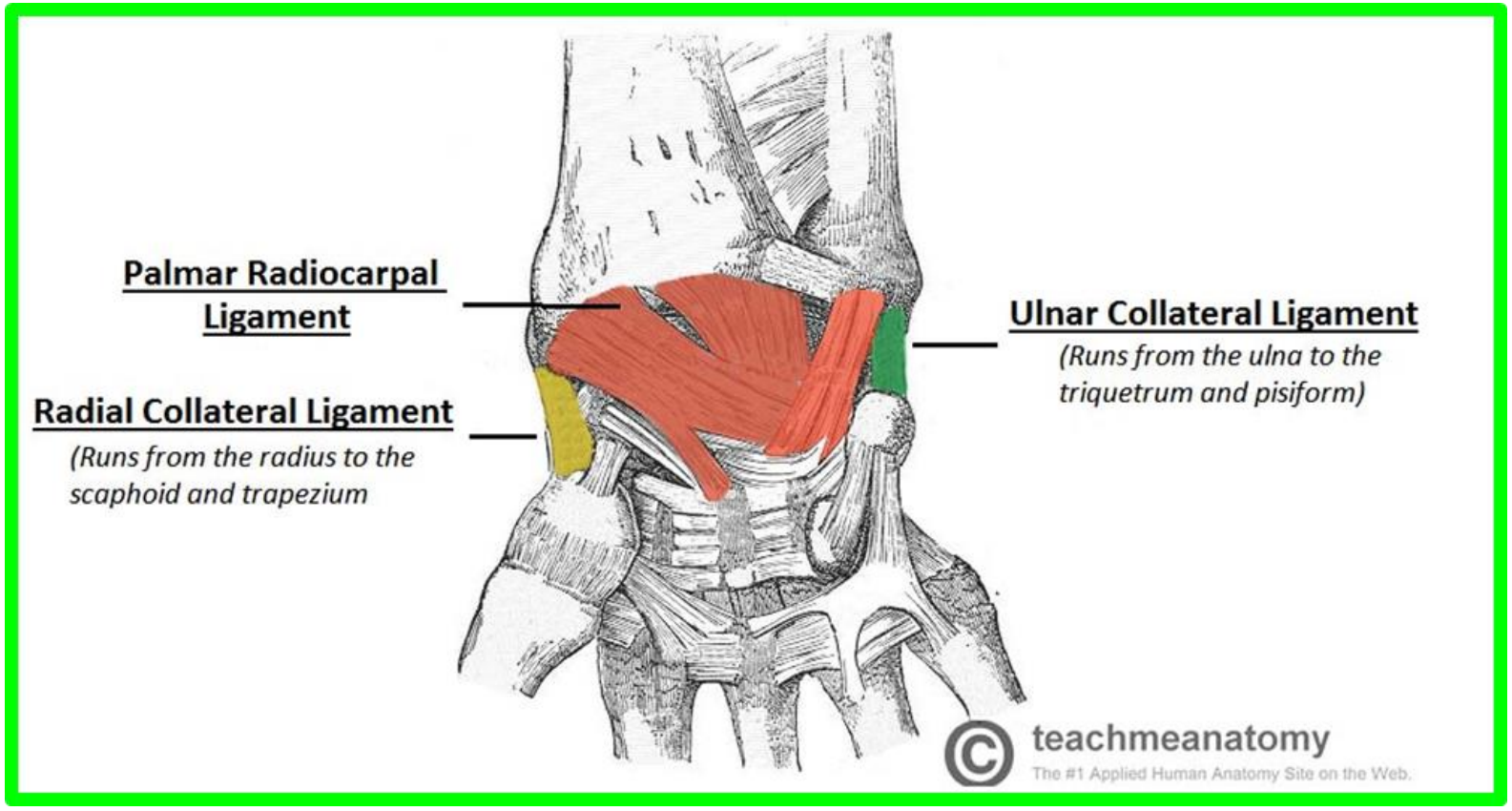


Wrist Joint (Radiocarpal Joint)

- **Ligaments:** Anterior and posterior ligaments strengthen the capsule

✓ **The medial ligament** is attached to the styloid process of the ulna and to the triquetral bone

✓ **The lateral ligament** is attached to the styloid process of the radius and to the scaphoid bone



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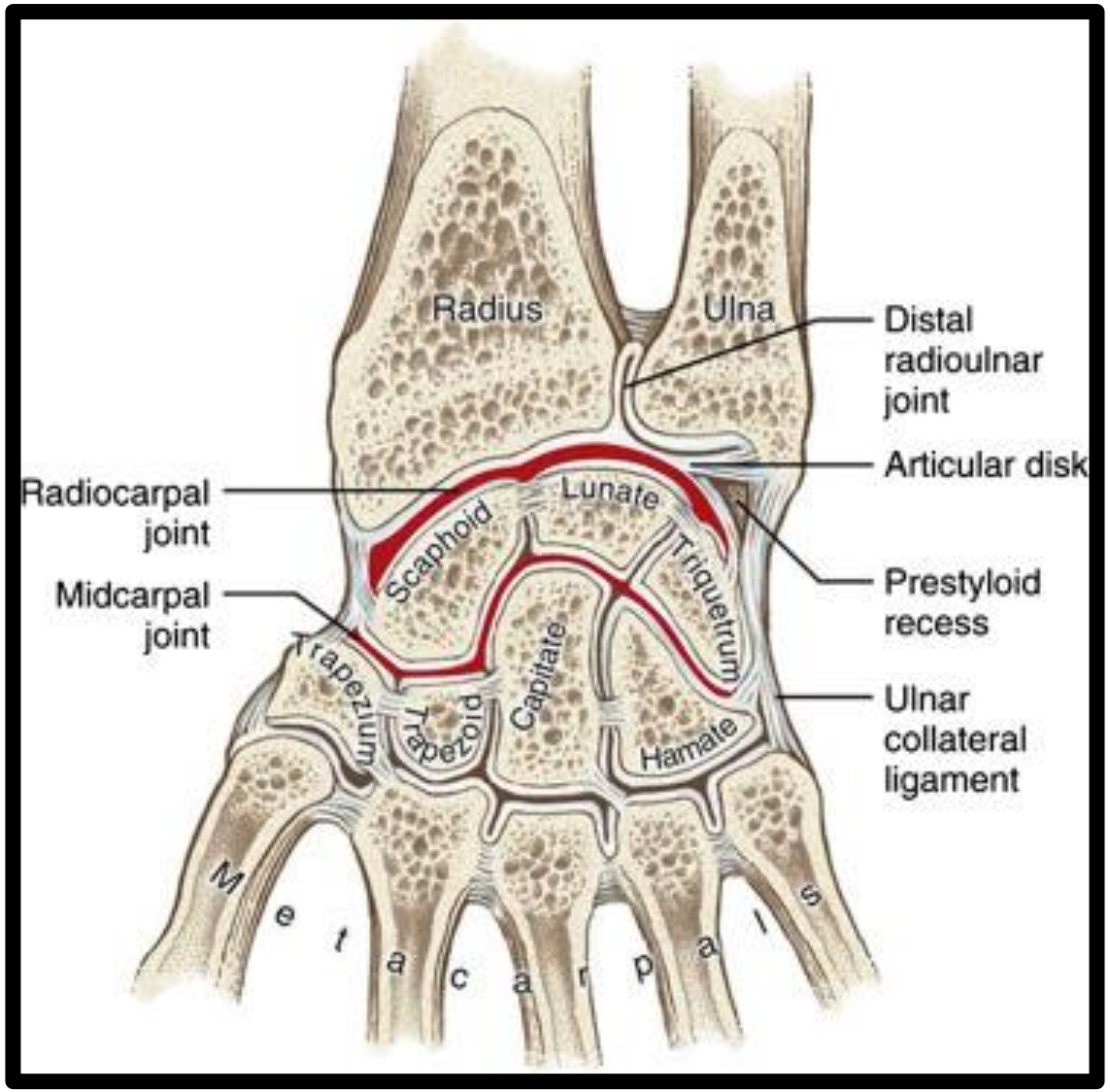
Wrist Joint (Radiocarpal Joint)

Synovial membrane:

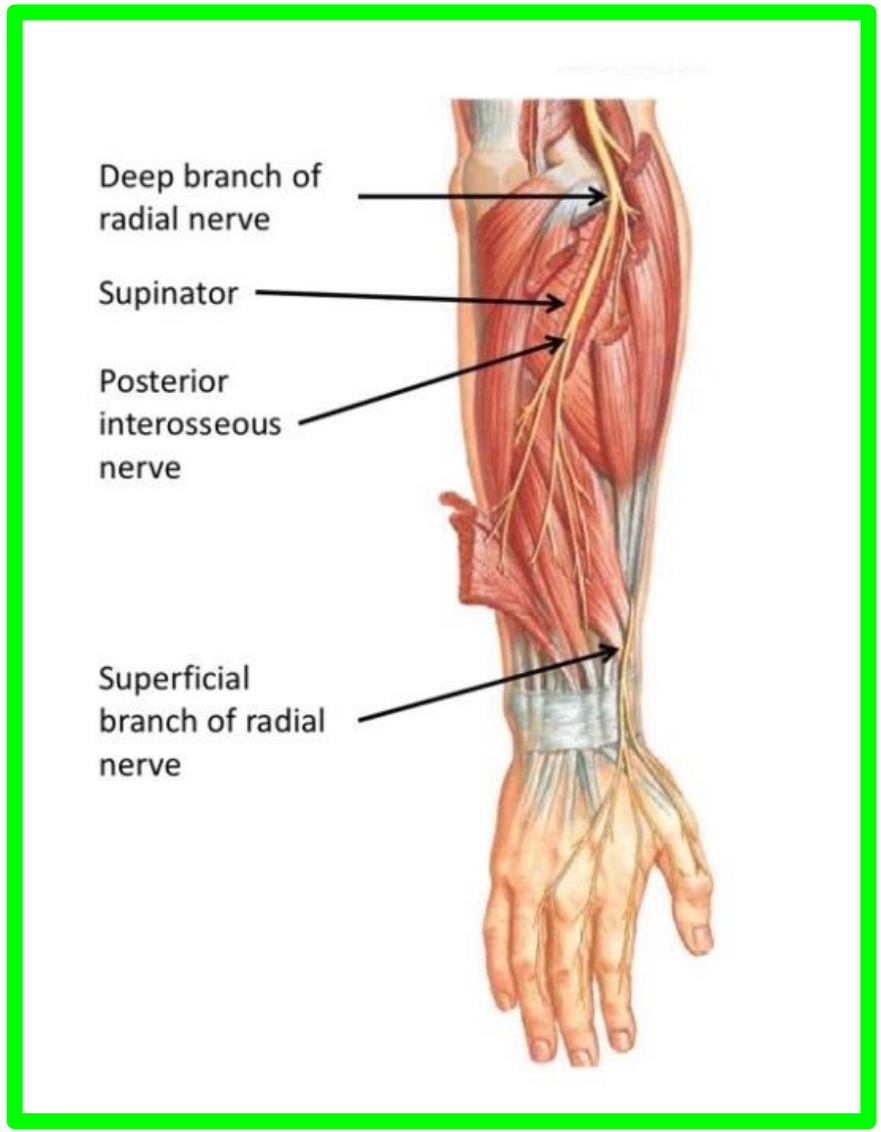
- This lines the capsule and is attached to the margins of the articular surfaces.

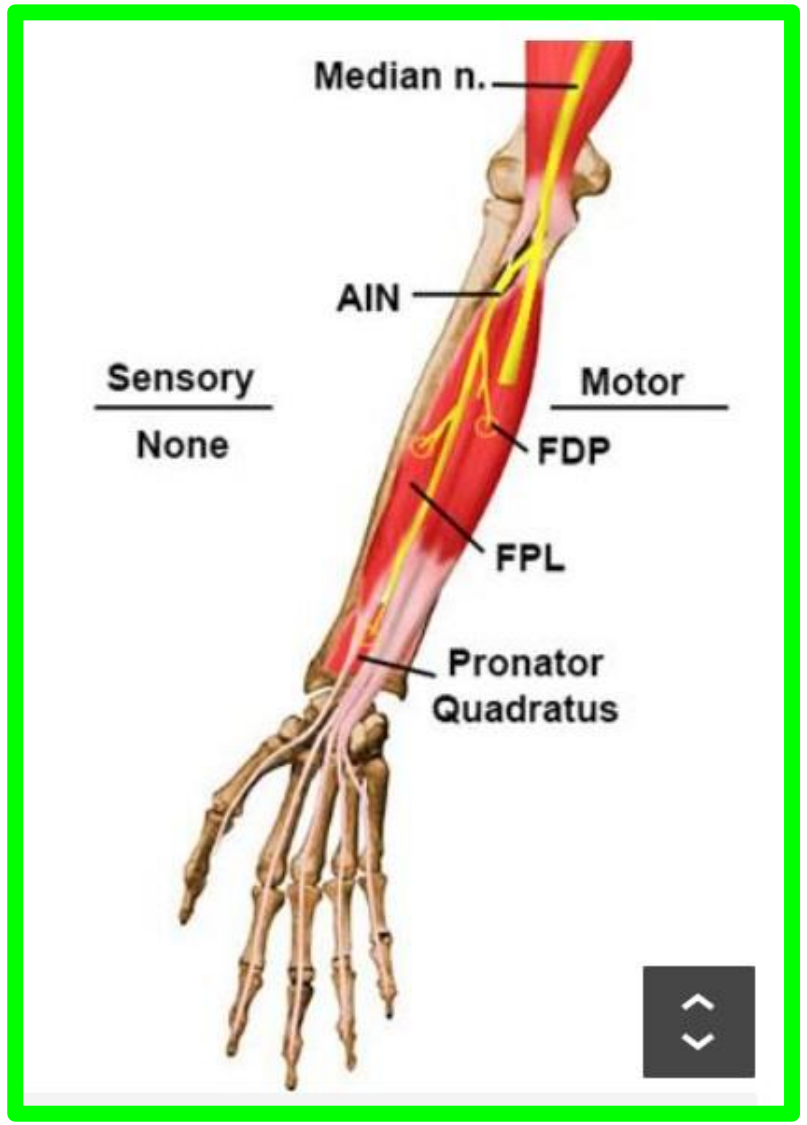
- The joint cavity does not communicate with that of the distal radioulnar joint or with the joint cavities of the intercarpal joints.



Wrist Joint (Radiocarpal Joint)

- **Nerve supply:** Anterior interosseous nerve and the deep branch of the radial nerve





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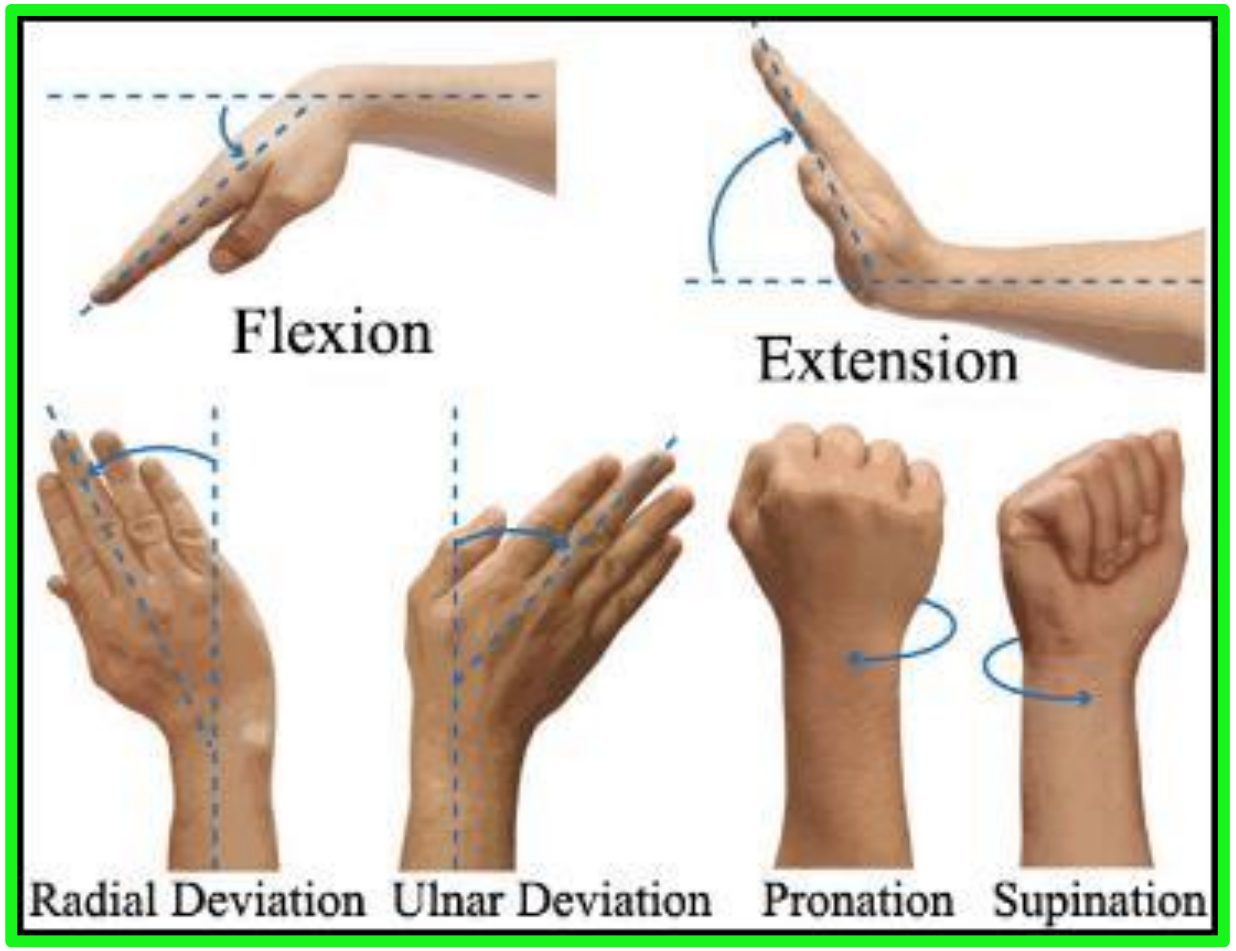
Wrist Joint (Radiocarpal Joint)

Movements

Flexion is performed by the flexor carpi radialis, the flexor carpi ulnaris, and the palmaris longus.

Extension is performed by the extensor carpi radialis longus, the extensor carpi radialis brevis, and the extensor carpi ulnaris.



Wrist Joint (Radiocarpal Joint)

Movements

Abduction is performed by
the flexor carpi radialis and
the extensor carpi radialis longus and
brevis.

Adduction is performed by
the flexor and extensor carpi ulnaris.

Wrist Joint (Radiocarpal Joint)

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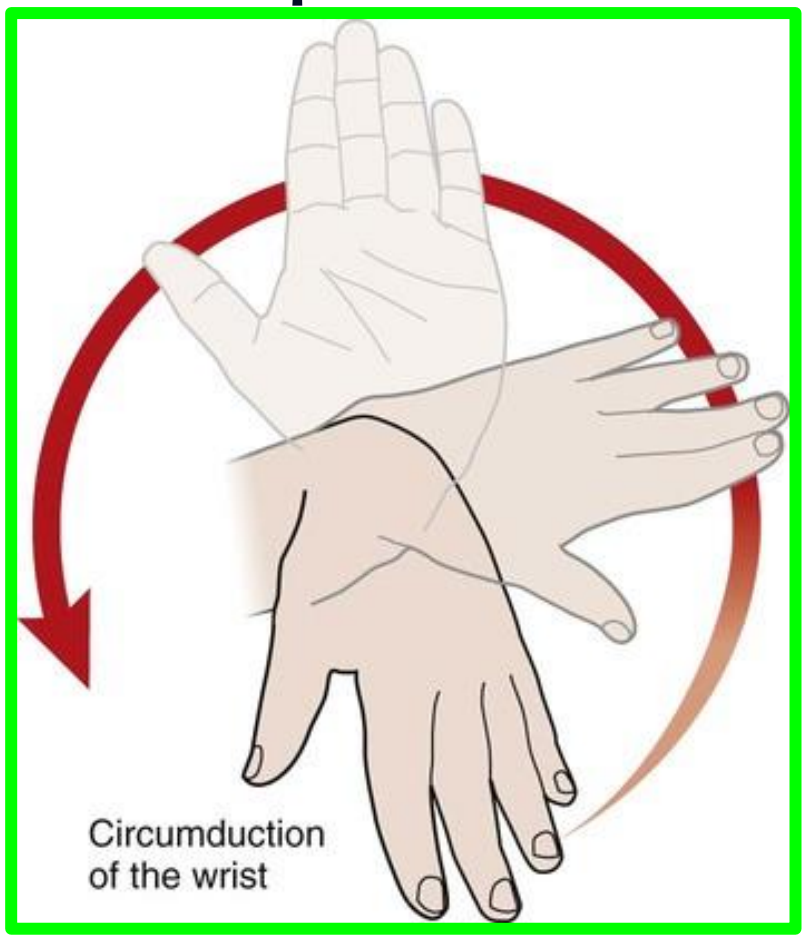
Movements

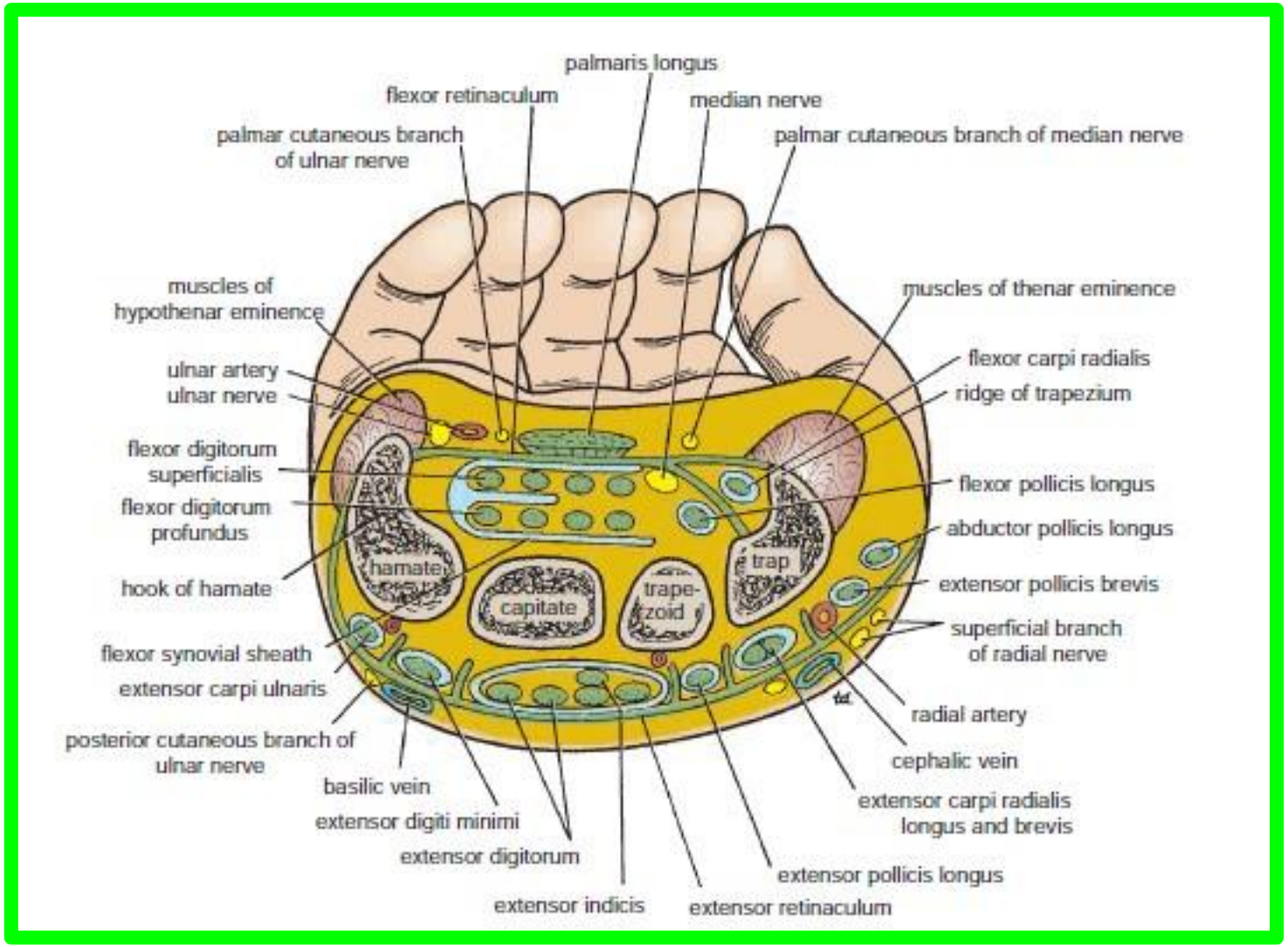
Circumduction of the wrist consists of a circular motion combining flexion, extension, and radioulnar deviation without simultaneous supination or pronation of the forearm.



Important Relations

Anteriorly:

- The tendons of the flexor digitorum profundus and superficialis,
- Flexor pollicis longus,
- Flexor carpi radialis,
- Flexor carpi ulnaris,
- The median and ulnar nerves



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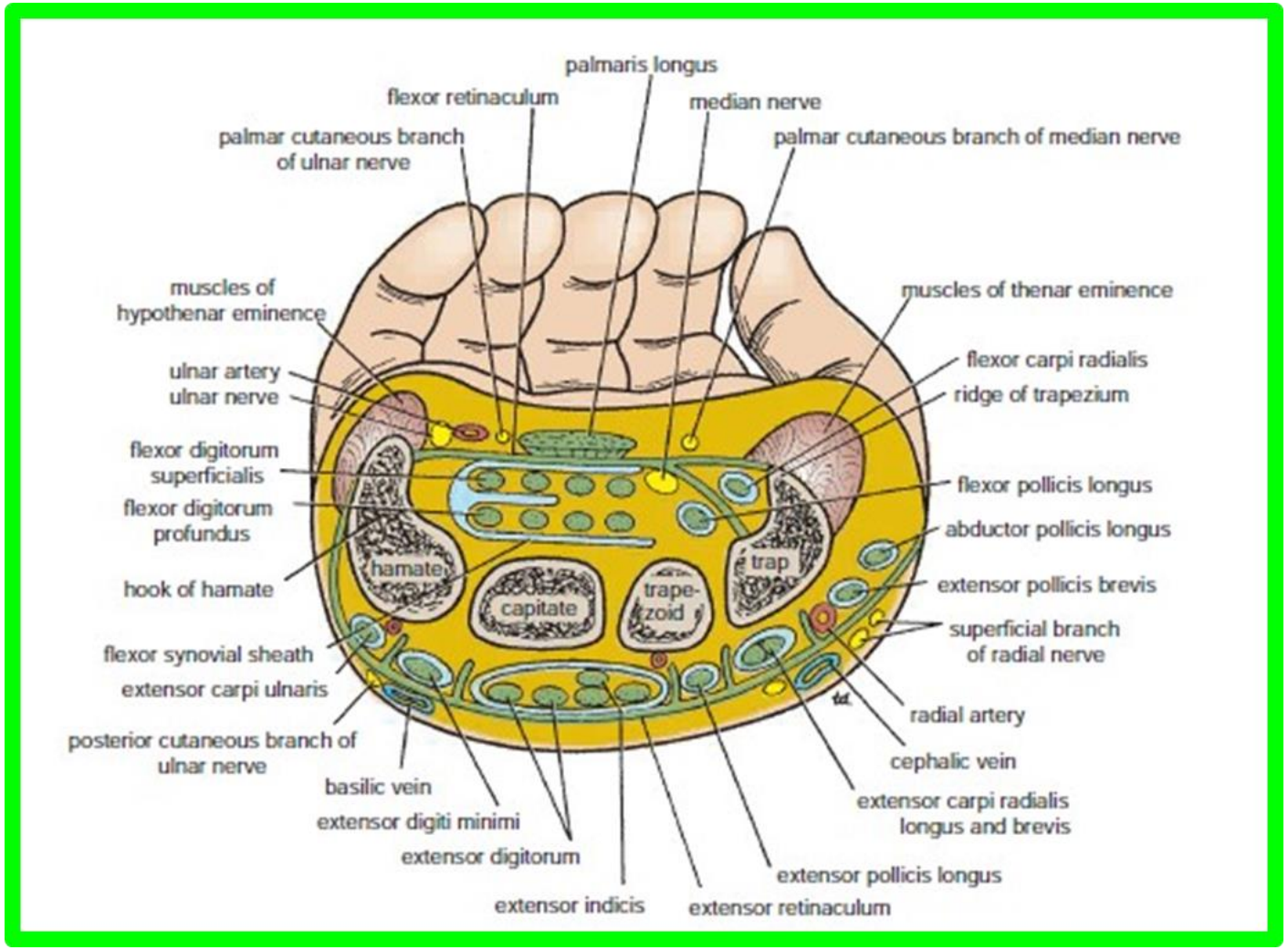
Important Relations

Posteriorly:

- The tendons of Extensor carpi ulnaris, and …
- Extensor digiti minimi,
- Extensor digitorum,
- Extensor indicis,
- Extensor carpi radialis longus and brevis,
- Extensor pollicis longus and brevis,
- Abductor pollicis longus



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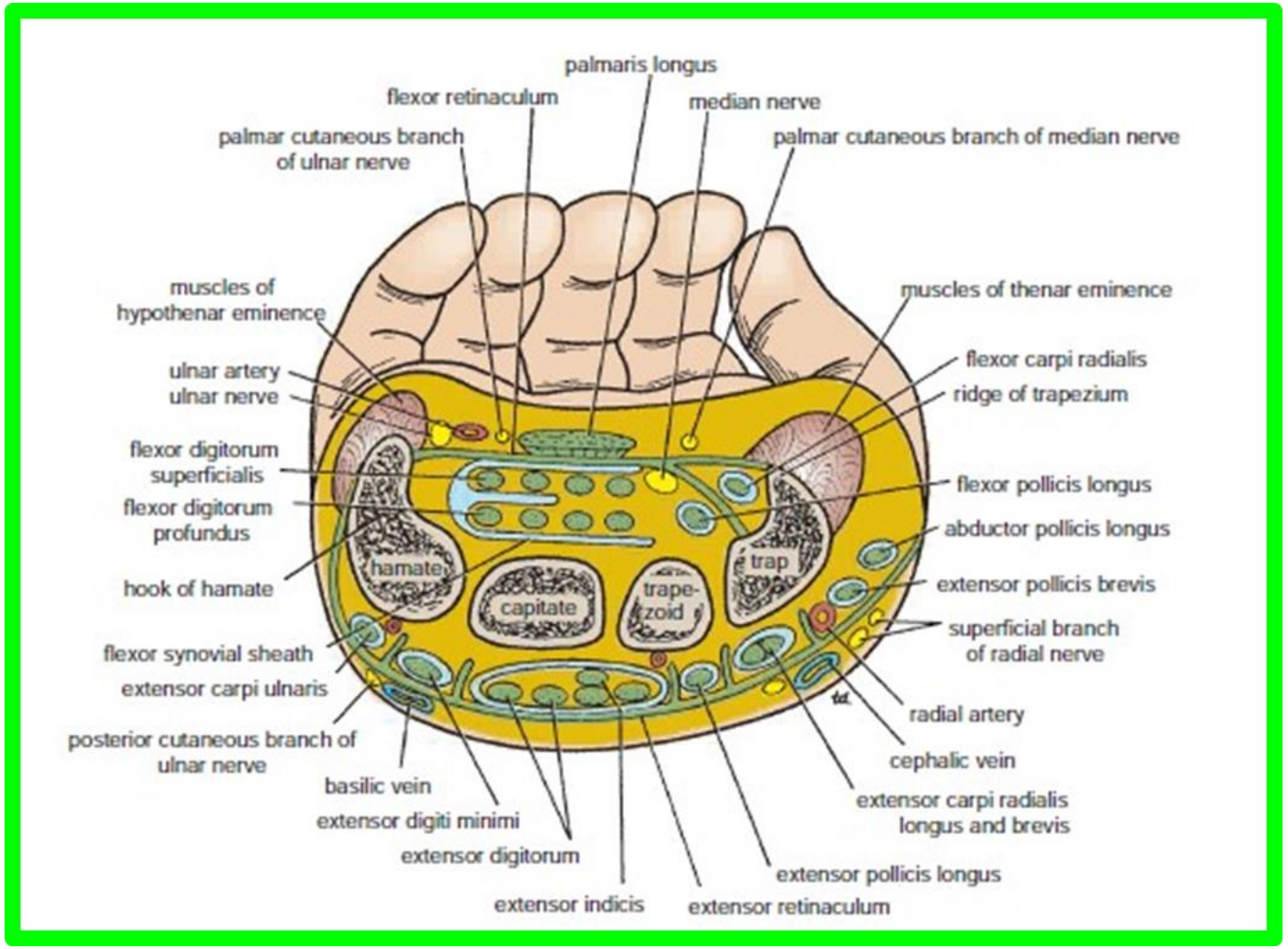
Important Relations

- **Medially:** The posterior cutaneous branch of the ulnar nerve
- **Laterally:** The radial artery



Flexor and Extensor Retinacula

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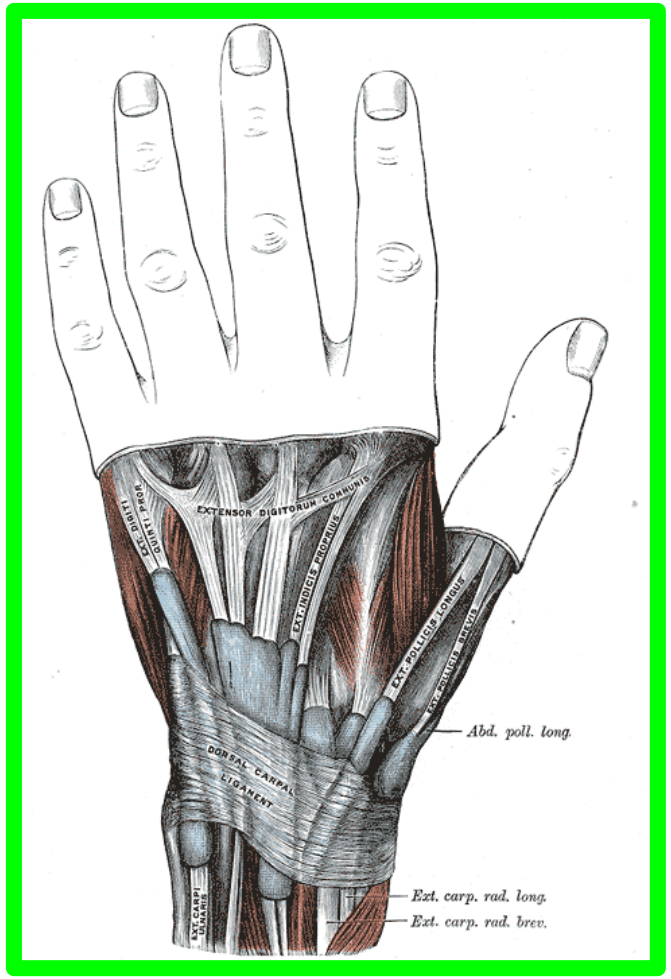
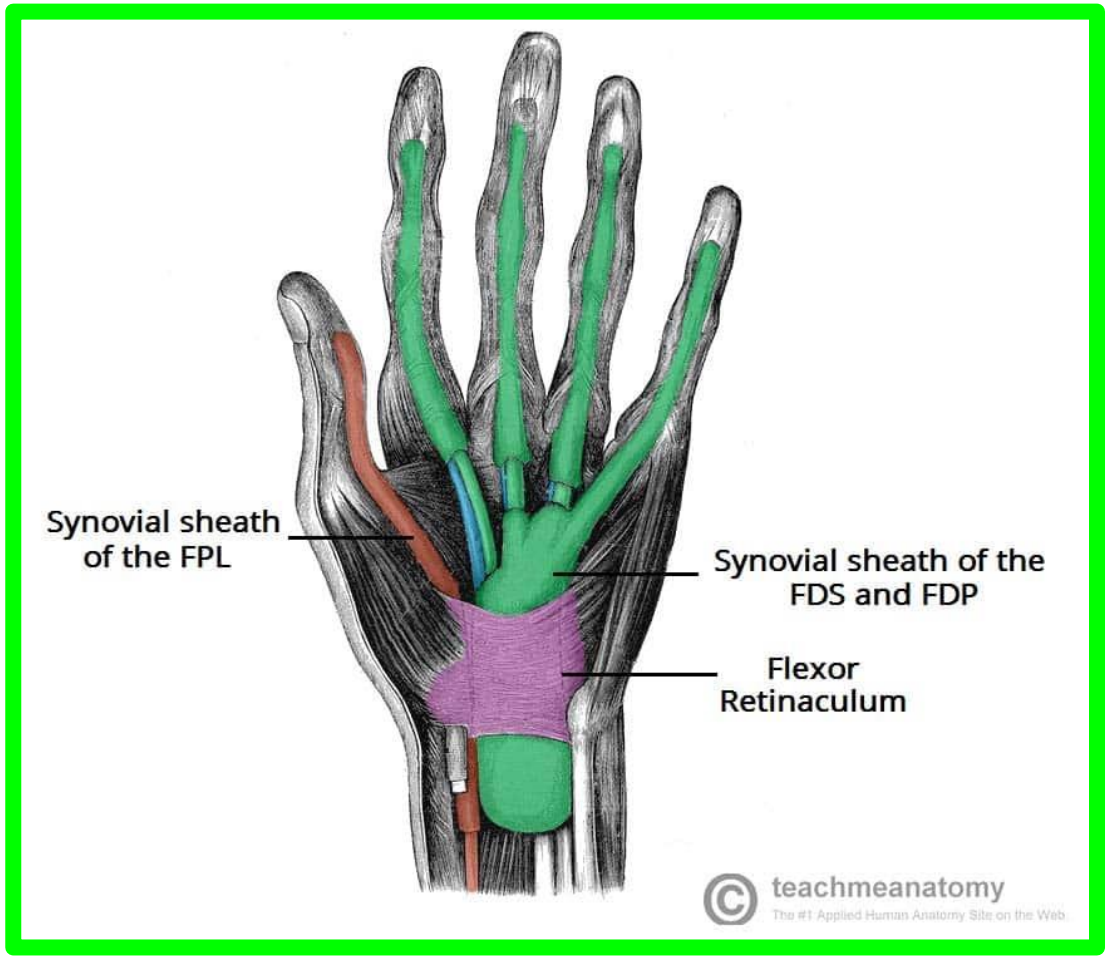
The flexor and extensor retinacula are strong bands of deep fascia that hold the long flexor and extensor tendons in position at the wrist.





The flexor retinaculum

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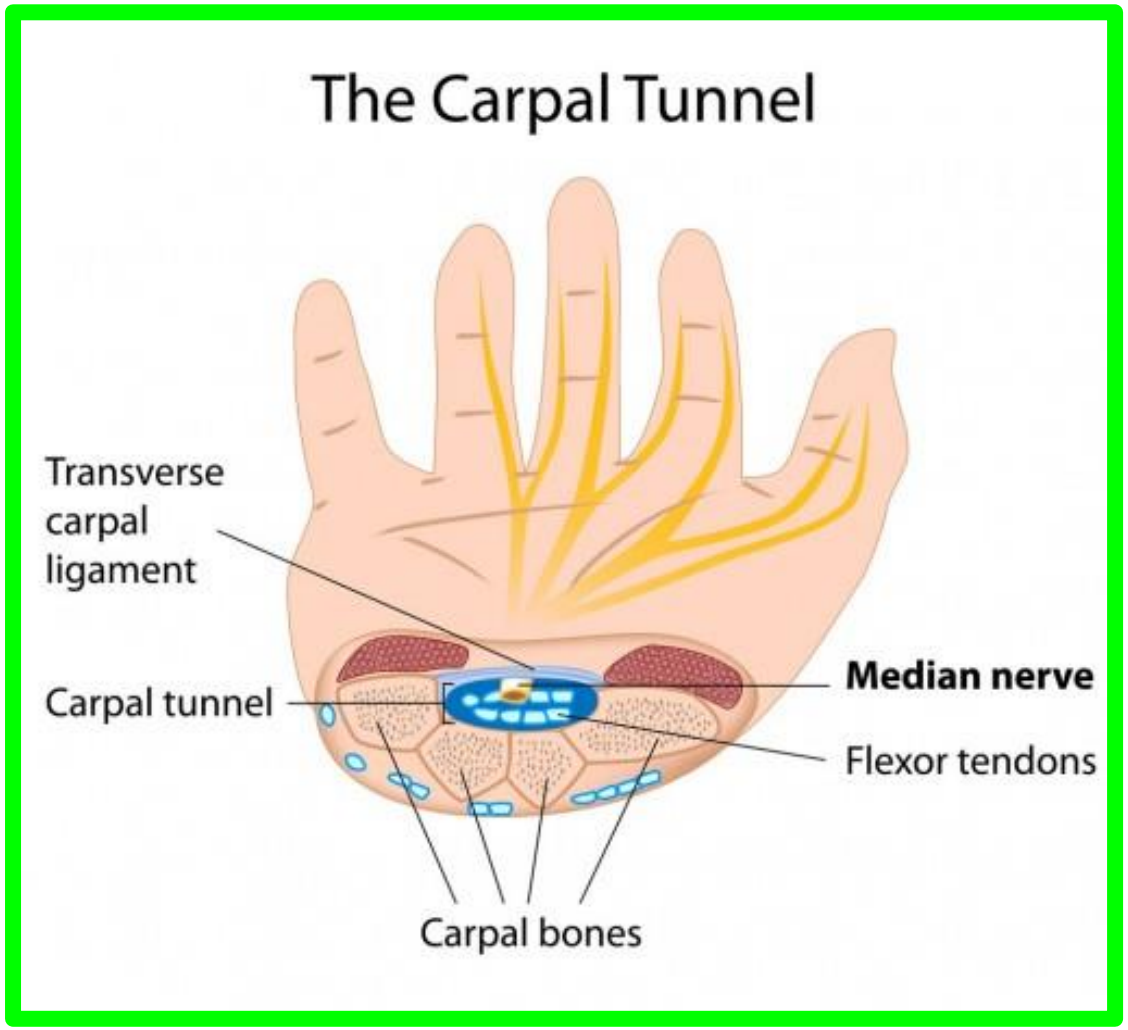
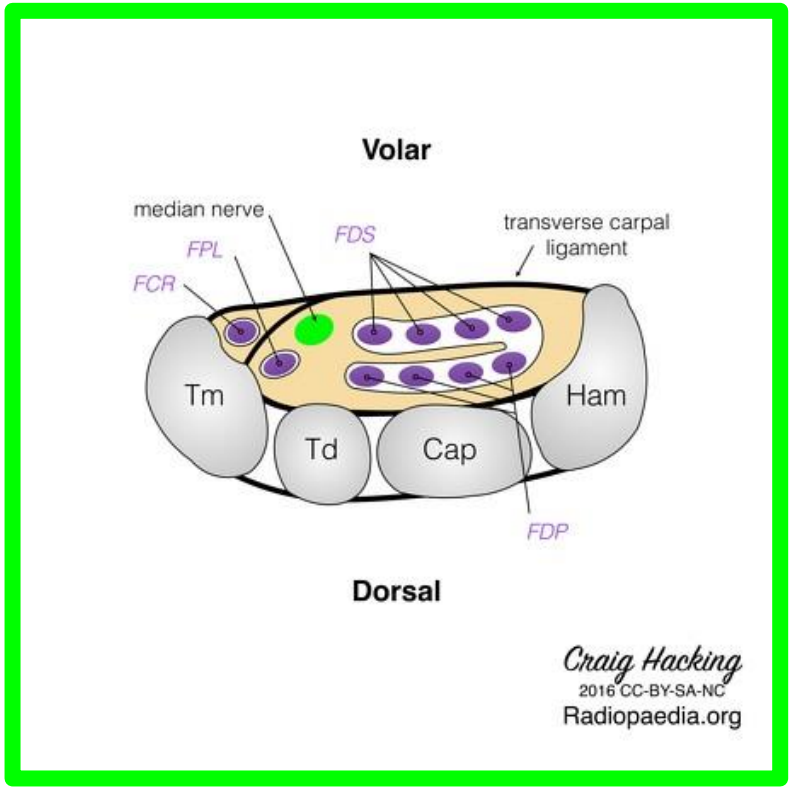
- ✓ is a thickening of deep fascia
- ✓ holds the long flexor tendons in position at the wrist.

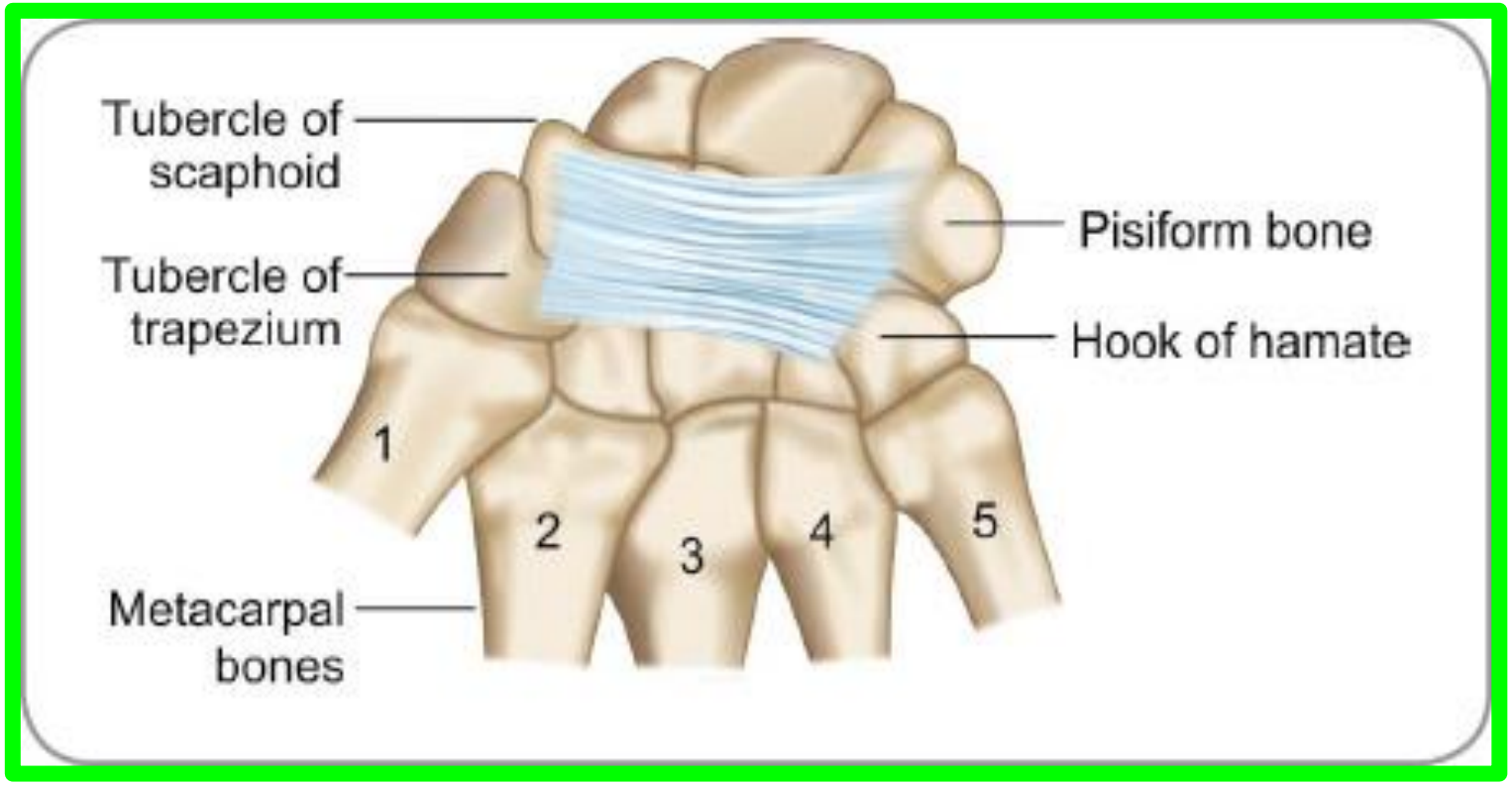
✓ Converts the concave anterior surface of the hand into an osteofascial tunnel, the carpal tunnel, for the passage of the median nerve and the flexor tendons of the thumb and fingers



The flexor retinaculum

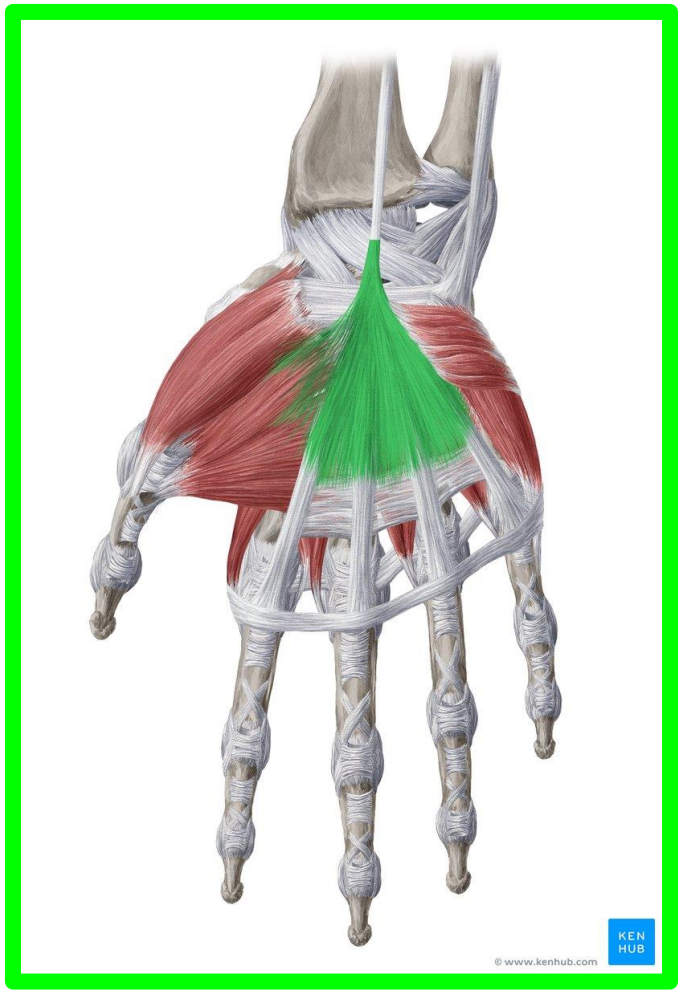
- ✓ It is attached medially to the pisiform bone and the hook of the hamate
- ✓ laterally to the tubercle of the scaphoid and the trapezium bones.
- ✓ The attachment to the trapezium consists of superficial and deep parts and forms a synovial lined tunnel for passage of the tendon of the flexor carpi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

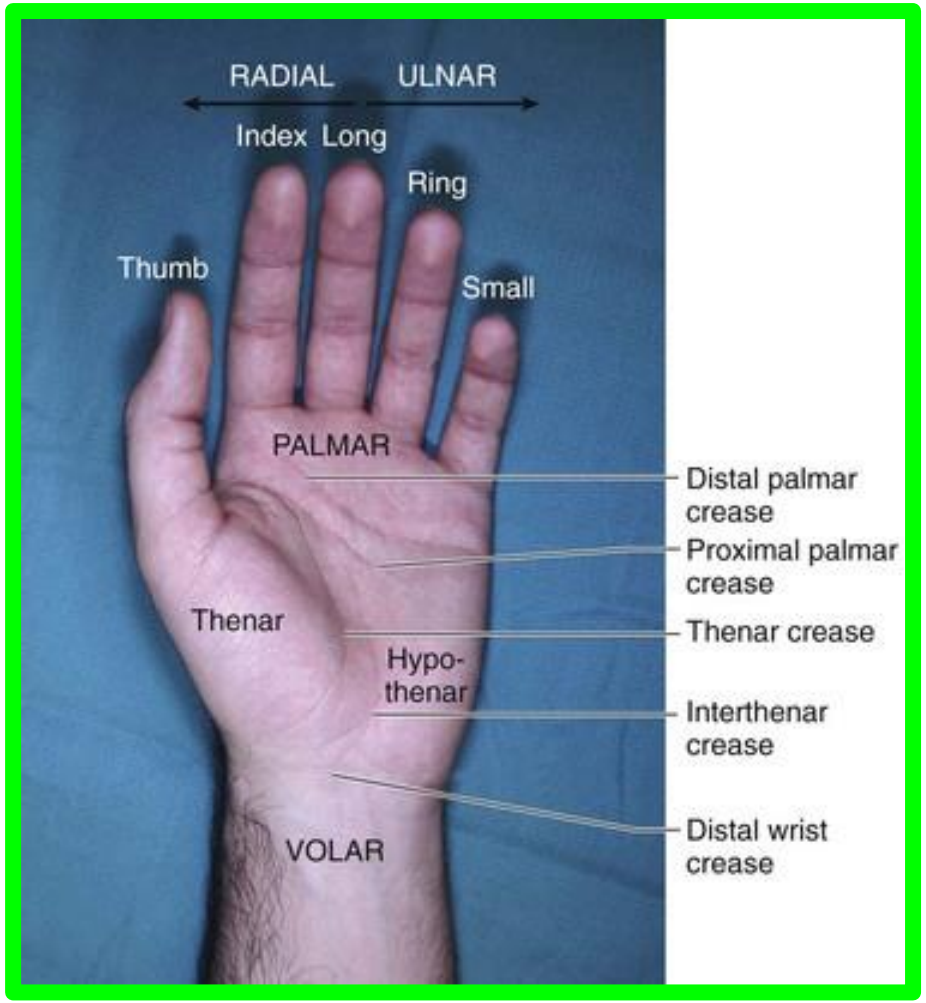




The flexor retinaculum

- ✓ The upper 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 lower border is attached to the palmar aponeurosis





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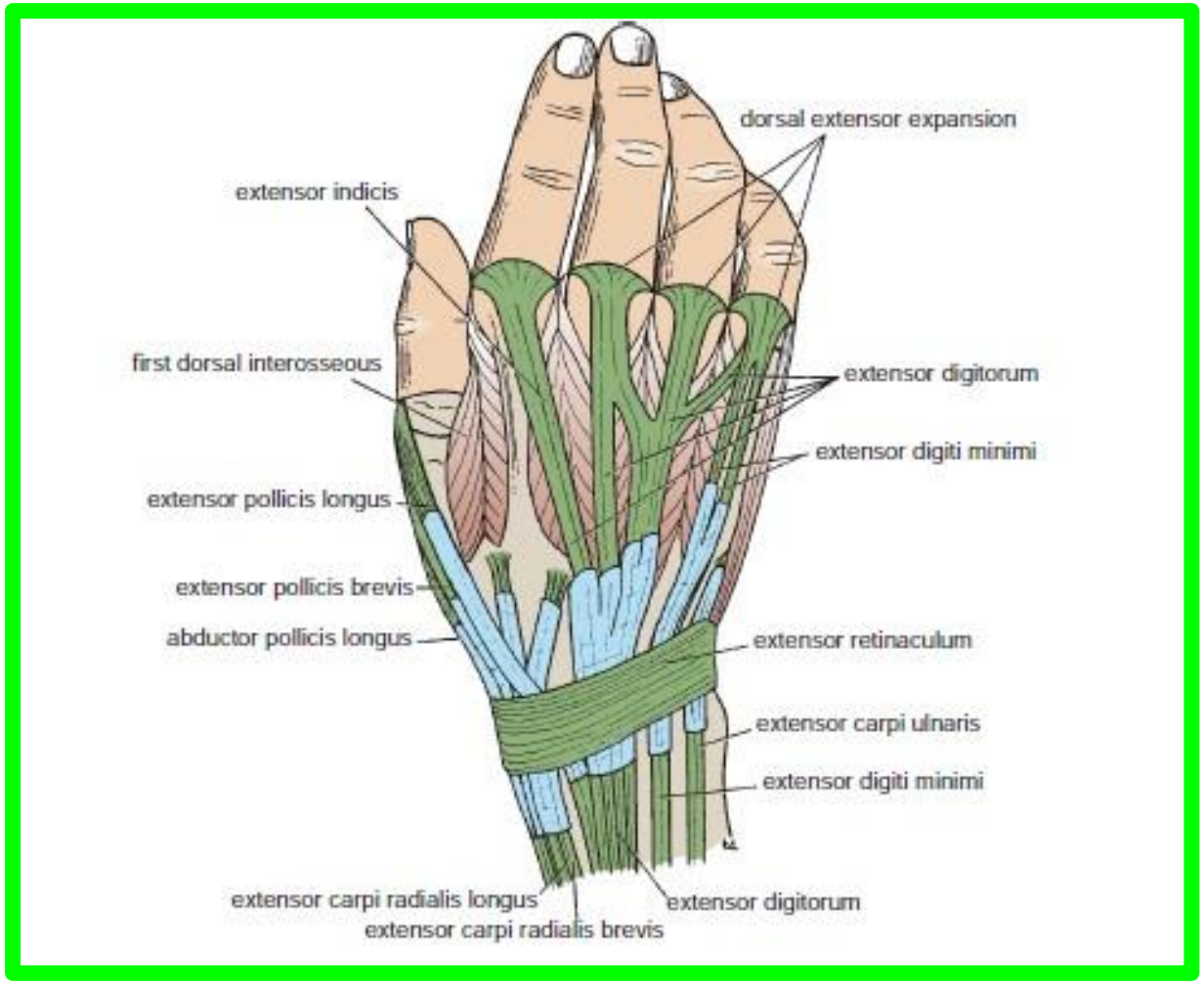
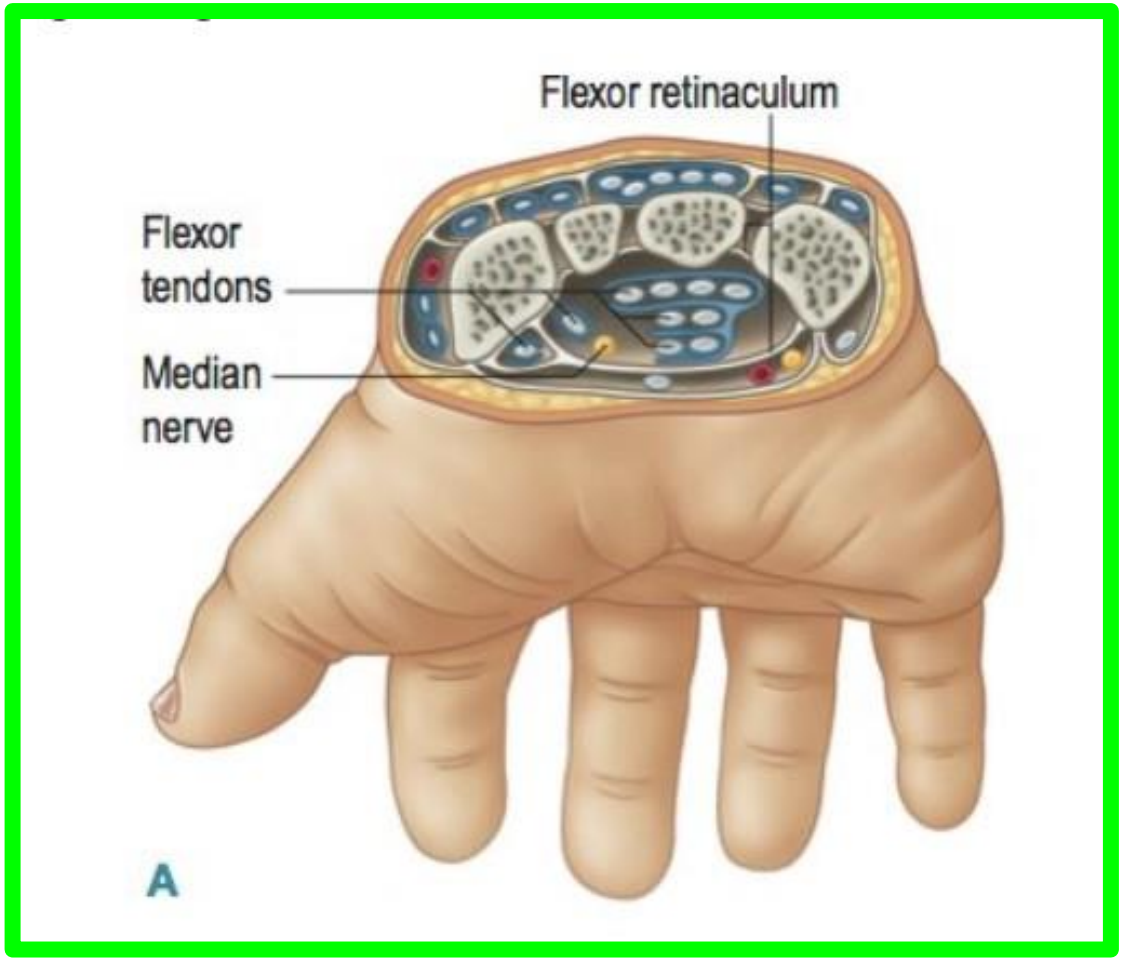
Extensor Retinaculum

- ✓ is a thickening of deep fascia
- ✓ stretches across the back of the wrist and holds the long extensor tendons in position.
- ✓ 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.



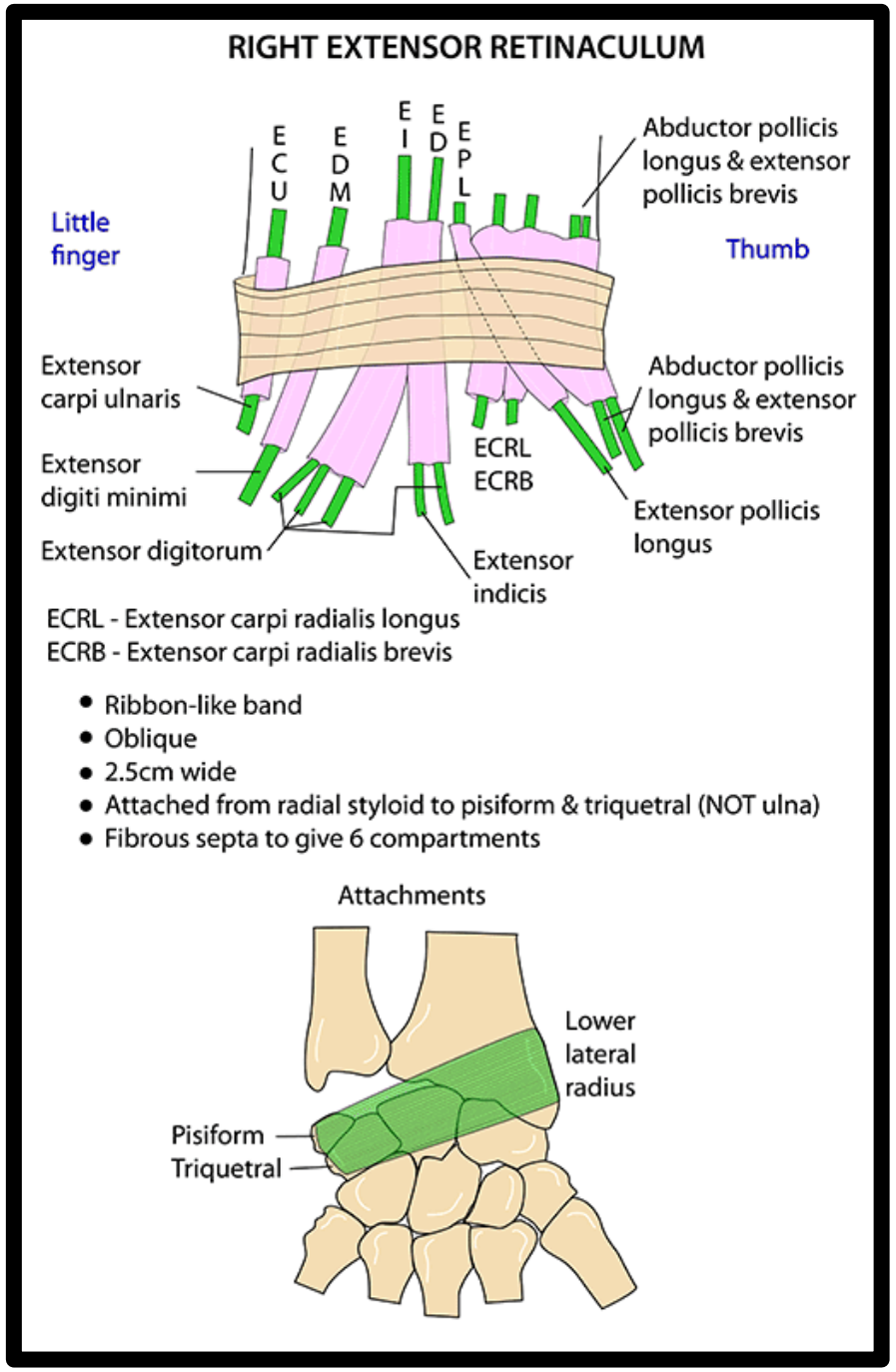
Extensor Retinaculum

- ✓ Each tunnel is lined with a synovial sheath, which extends above and below the retinaculum on the tendons.
- ✓ The tunnels are separated from one another by fibrous septa that pass from the deep surface of the retinaculum to the bones.



Extensor Retinaculum

- ✓ is attached medially to the pisiform bone and the hook of the hamate
- ✓ laterally to the Distal end of the radius.
- ✓ The upper and lower borders of the retinaculum are continuous with the deep fascia of the forearm and hand, respectively.



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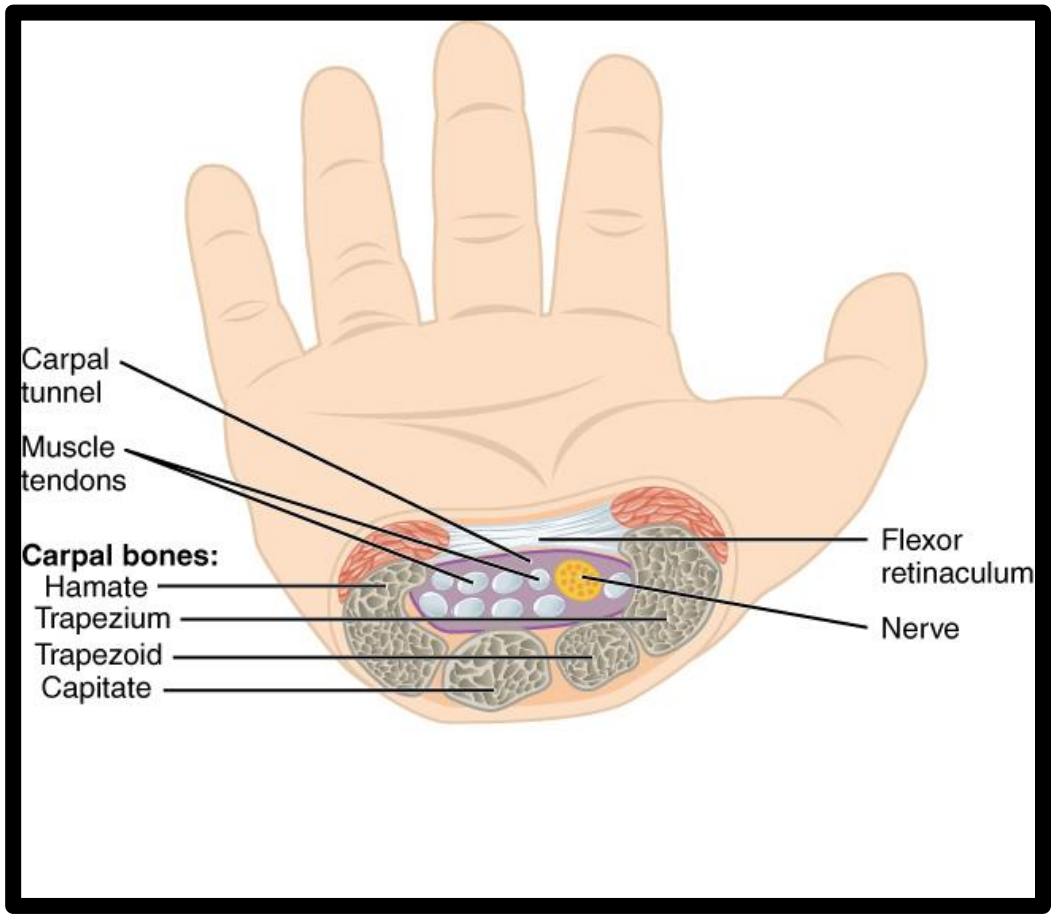
The Carpal Tunnel

- The carpus is deeply concave on its anterior surface and forms a bony gutter.
- The gutter is converted into a tunnel by the flexor retinaculum
- The long flexor tendons to the fingers and thumb pass through the tunnel and are accompanied by the median nerve.



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The Carpal Tunnel

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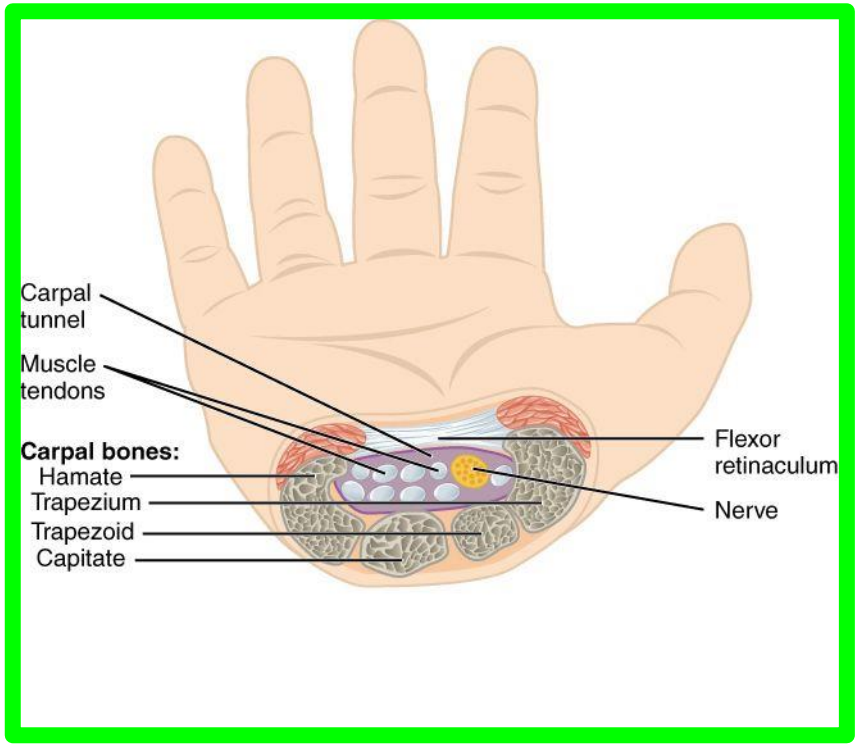
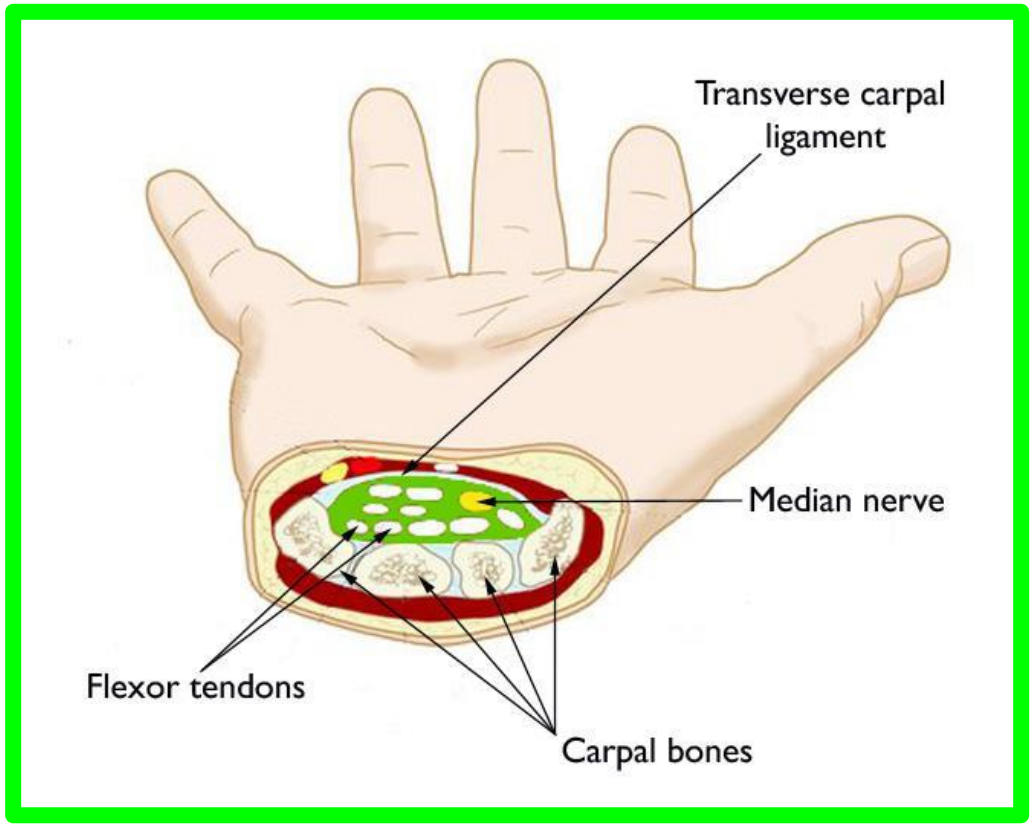
- The four separate tendons of the flexor digitorum superficialis muscle are arranged in anterior and posterior rows
- At the lower border of the flexor retinaculum, the four tendons diverge and become arranged on the same plane.
- The tendons of the flexor digitorum profundus muscle are on the same plane and lie behind the superficialis tendons.





The Carpal Tunnel

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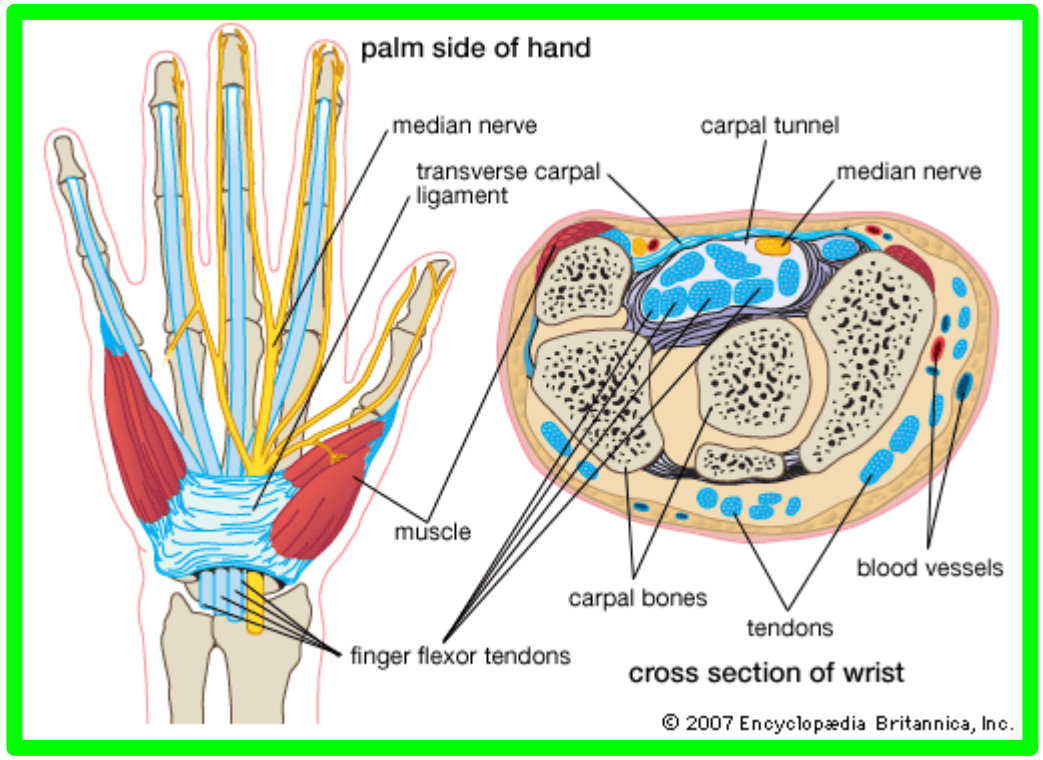
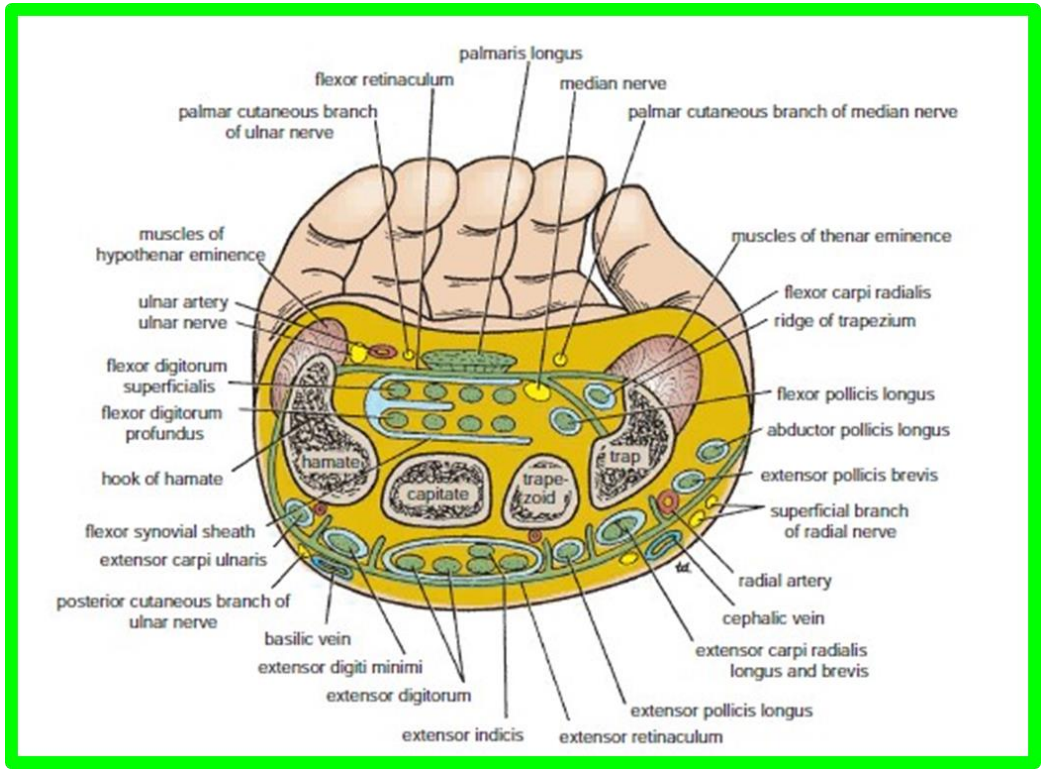
- All eight tendons of the flexor digitorum superficialis and profundus invaginate a common synovial sheath from the lateral side.
- The tendon of the flexor pollicis longus muscle runs through the lateral part of the tunnel in its own synovial sheath.
- The median nerve passes beneath the flexor retinaculum in a restricted space between the flexor digitorum superficialis and the flexor carpi radialis muscles

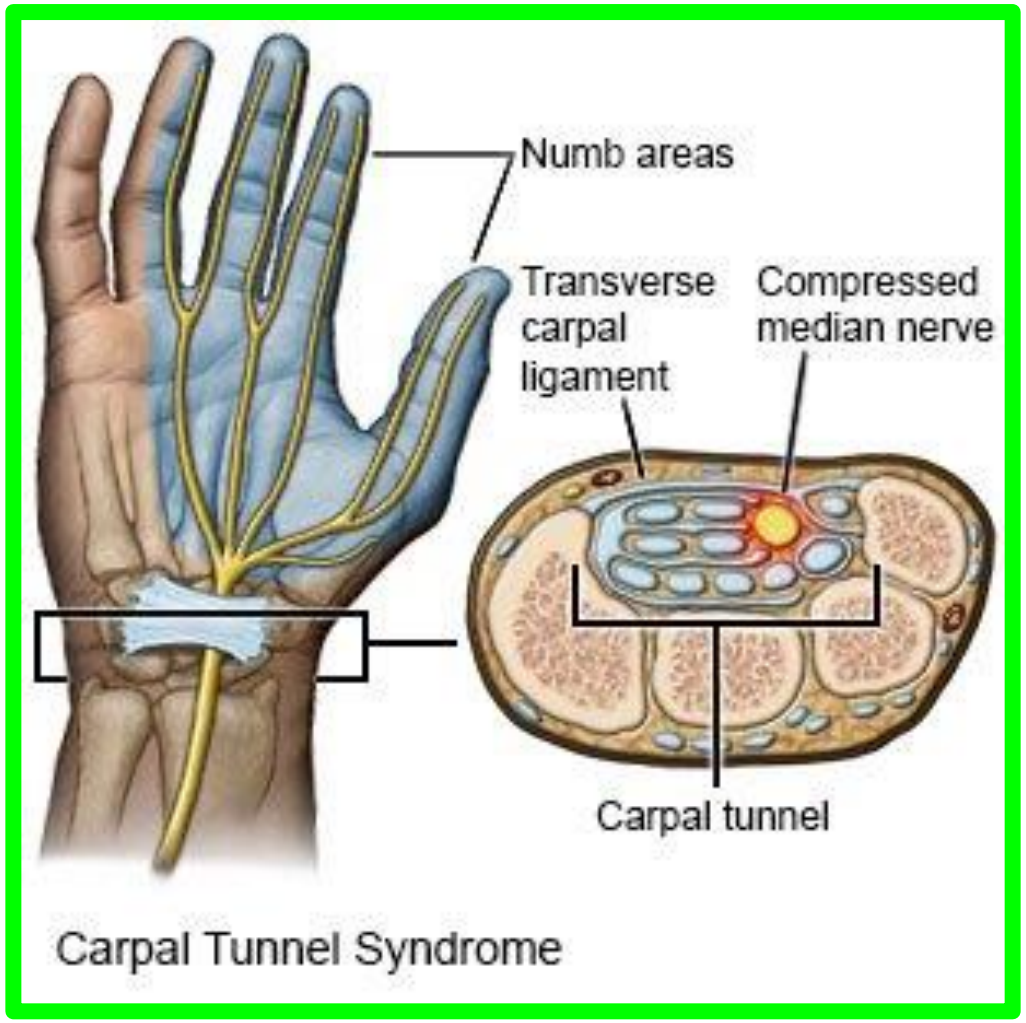




Carpal Tunnel Syndrome

Clinically, the syndrome consists of a burning pain or "pins and needles" along the distribution of the median nerve to the lateral three and a half fingers and weakness of the thenar muscles. It is produced by compression of the median nerve within the tunnel.

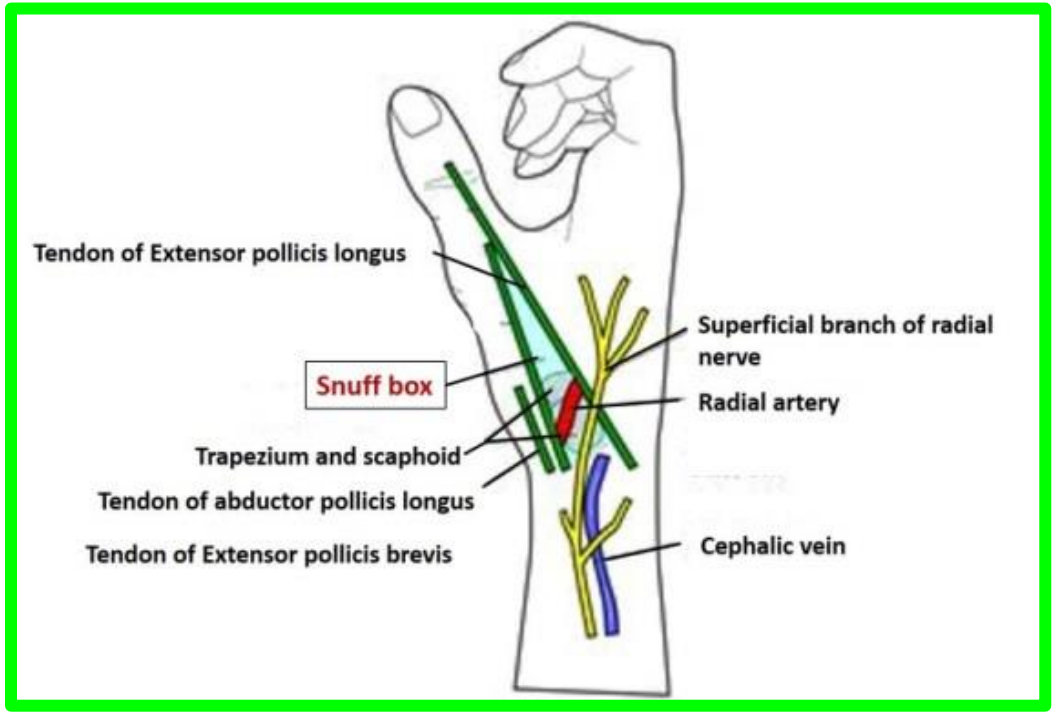
- **The condition is dramatically relieved by decompressing the tunnel by making a longitudinal incision through the flexor retinaculum**

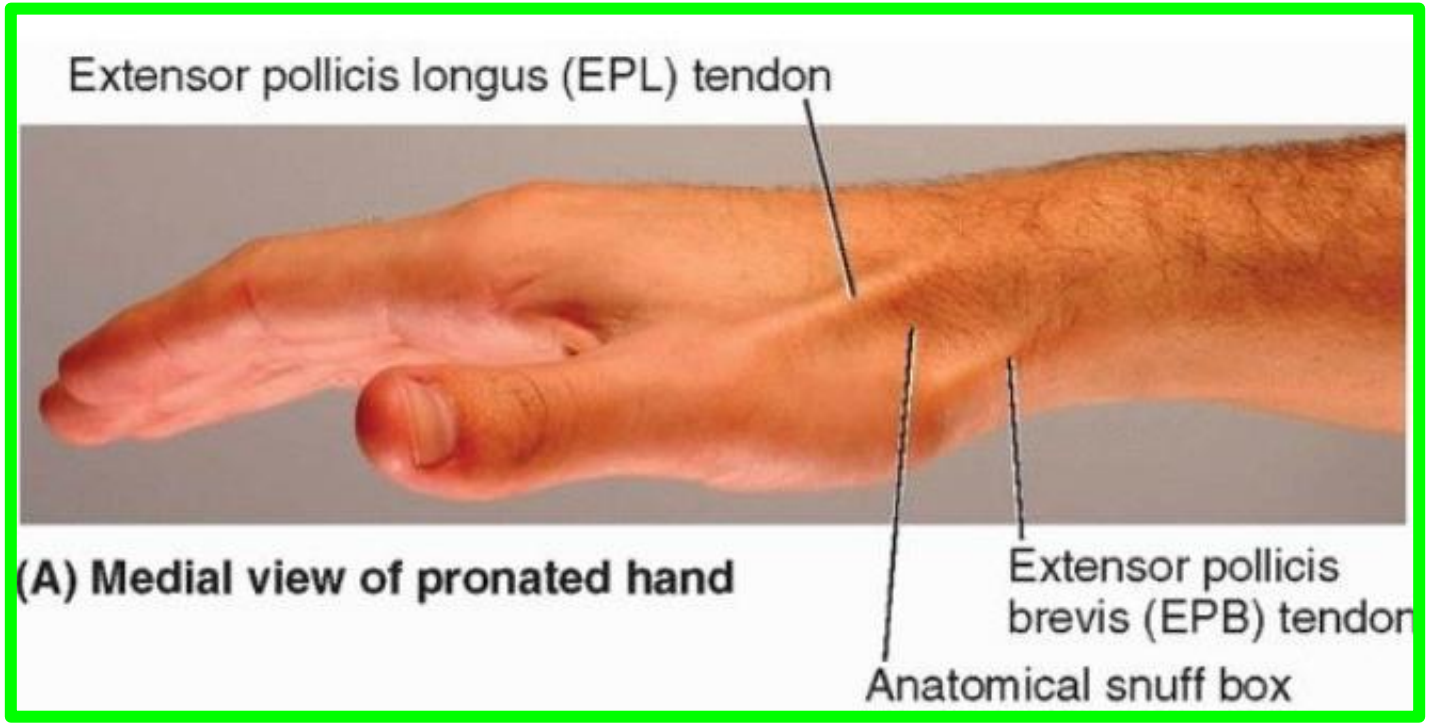


Carpal Tunnel Syndrome

The anatomical snuff box

- The tendons of the APL and EPB bound the anatomical snuff box anteriorly, and the tendon of the EPL bounds it posteriorly.
- The snuff box is visible when the thumb is fully extended; this draws the tendons up and produces a triangular hollow between them.

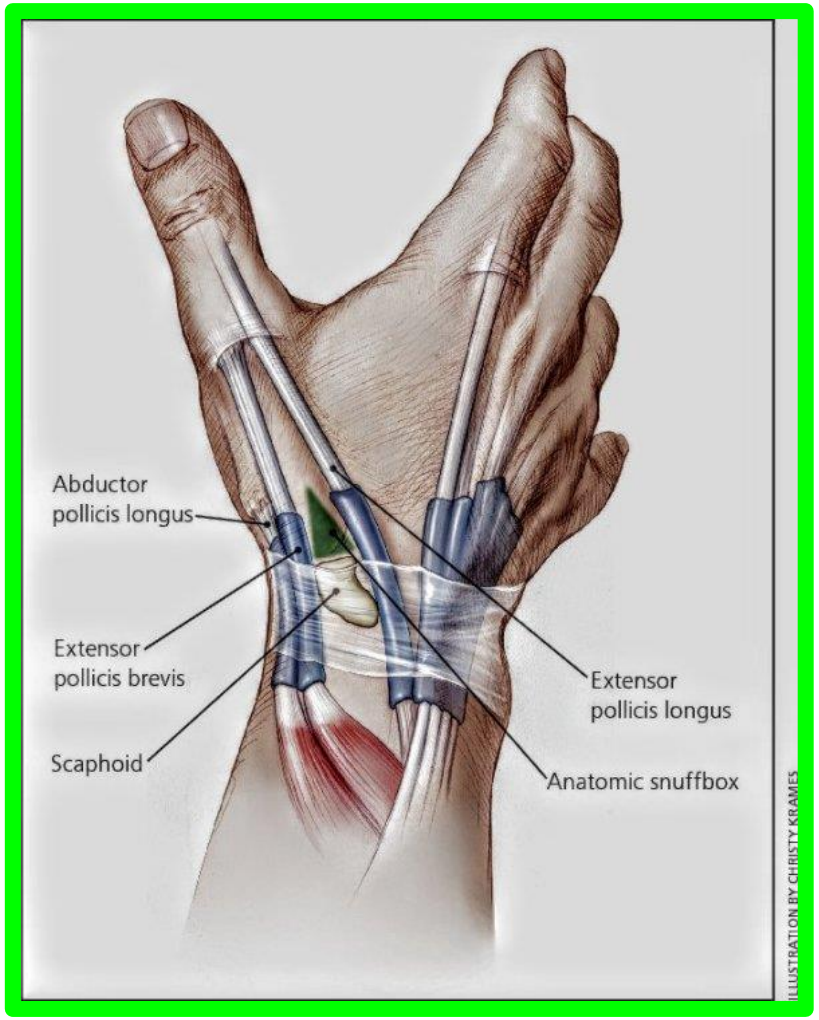


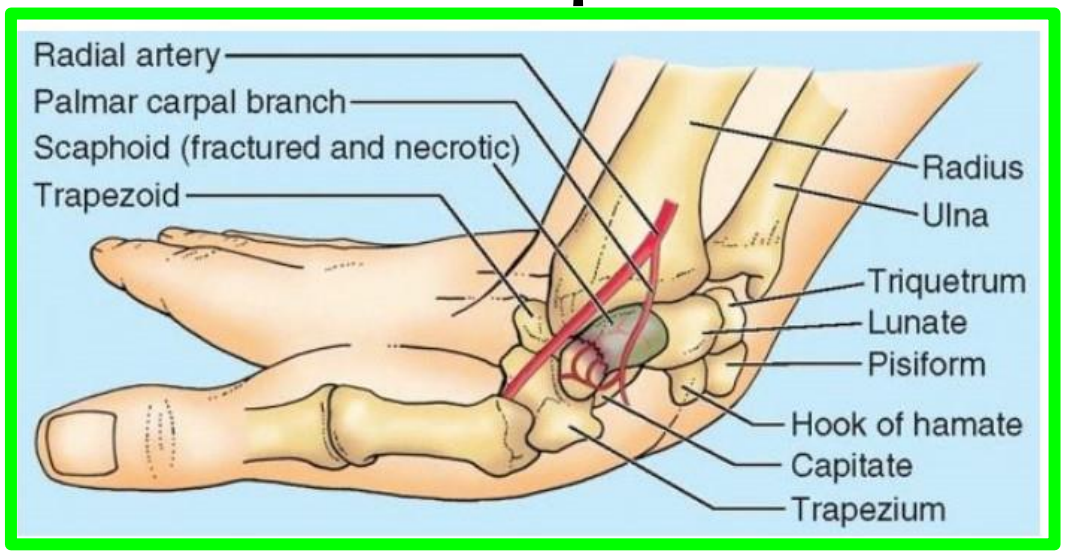


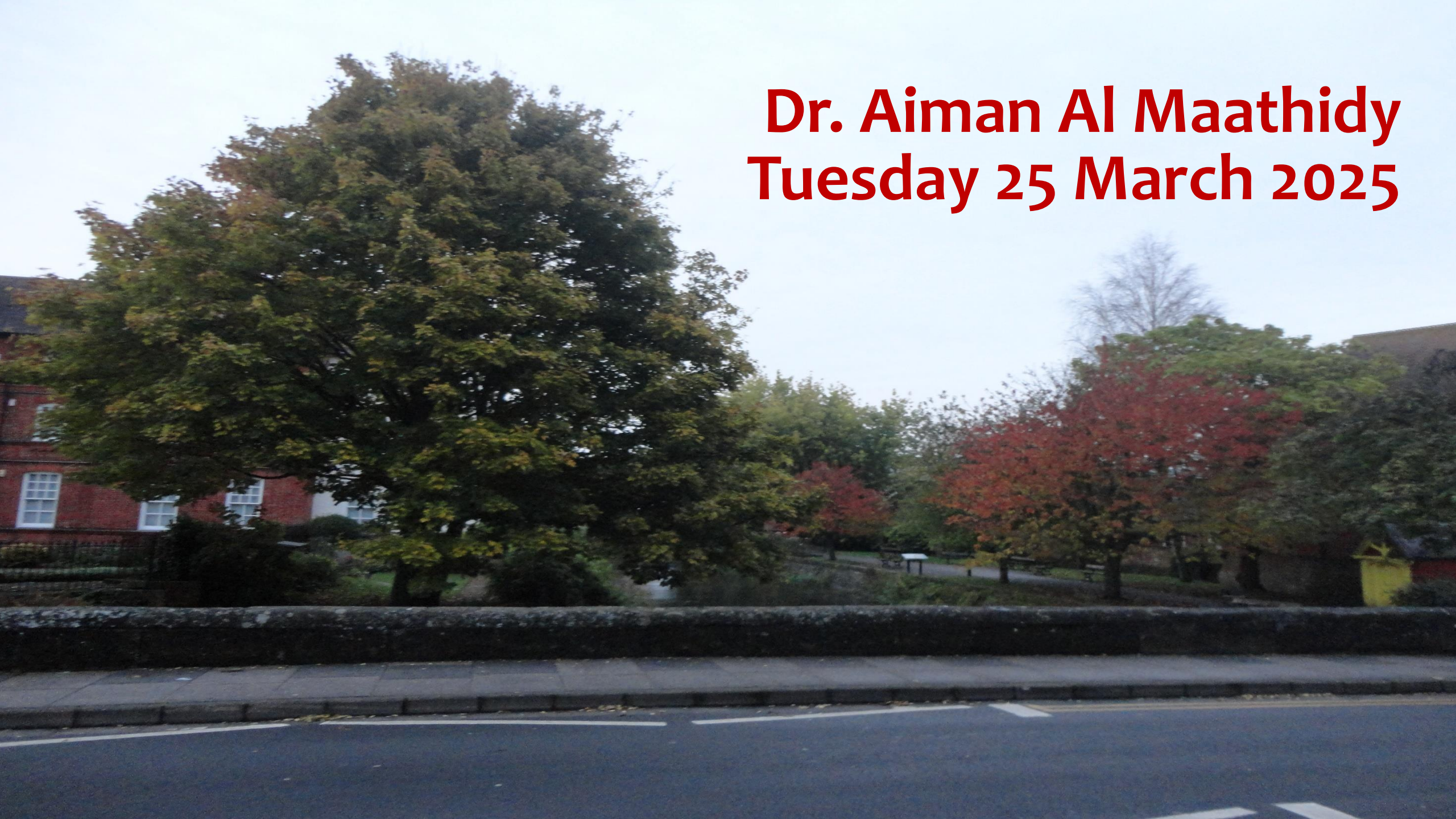
The anatomical snuff box

Observe that the:

- Radial artery lies in the floor of the snuff box.
- Radial styloid process can be palpated proximally and the base of the 1st metacarpal can be palpated distally in the snuff box.
- Scaphoid and trapezium can be felt in the floor of the snuff box between the radial styloid process and the 1st metacarpal.



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