

WRIST JOINT & 1ST CARPOMETACARPAL JOINT

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Clinical Integration

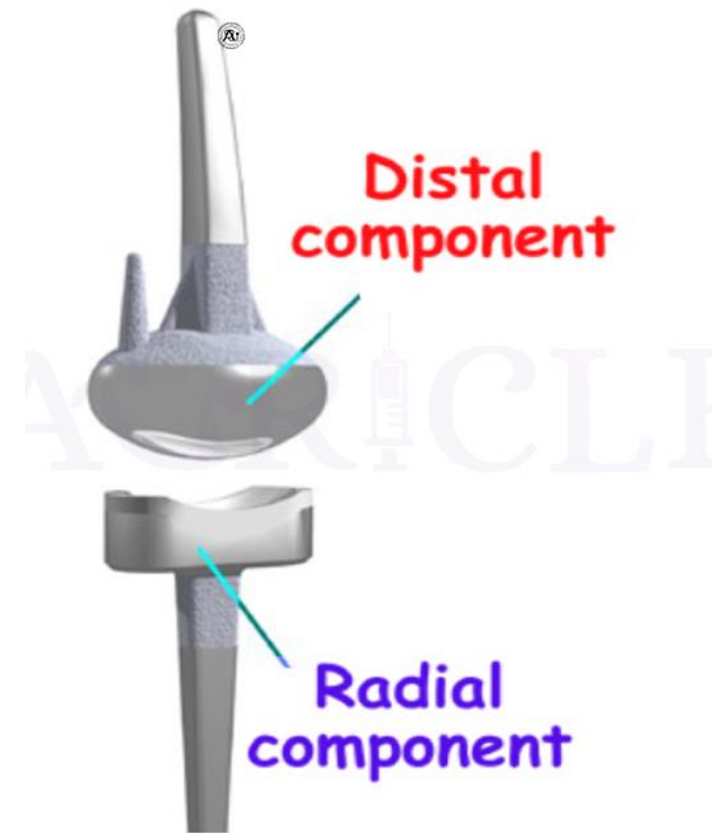
A 23-year-old male reports that he was playing “hoops” with friends from college, tripped as he was driving to the basket, and **fell on his outstretched right hand** with the palm down. Two days later, he phoned his anatomist father and related that his **right wrist** was **painful**. Later that day, he visited his father who noted that the **wrist** was slightly **swollen, tender**, but without deformity. He instructed his son to extend the right thumb, thereby accentuating the **anatomical “snuff box,”** which is extremely **tender** to deep palpation. His father told him a radiograph is needed.

- ◆ **What is the most likely diagnosis?**
- ◆ **What is the most likely anatomic defect?**

Wrist joint

Also called as **Radiocarpal joint**

- **Ellipsoid** variety of synovial joint
- Bi-axial
- Proximal articular surface presents an elliptical socket
- Distal articular surface is convex



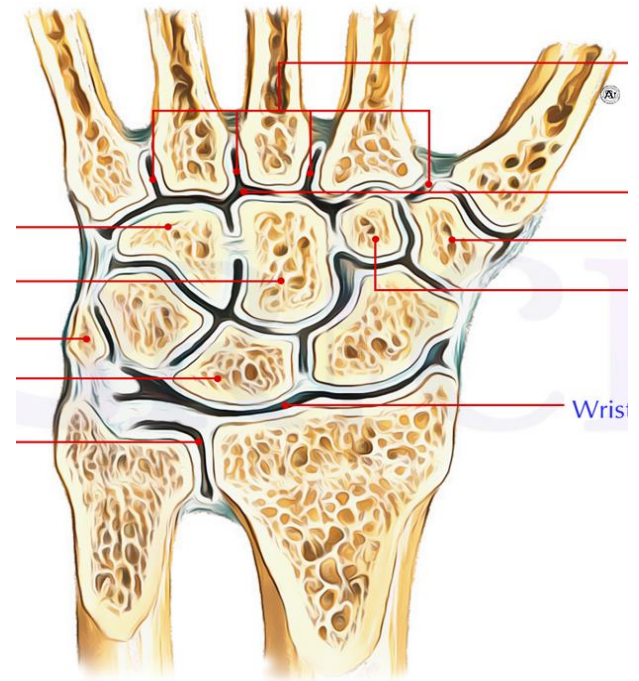
Articulating surfaces

Proximal articulating surface

Distal articulating surface of radius and the articular disk of the inferior radioulnar joint

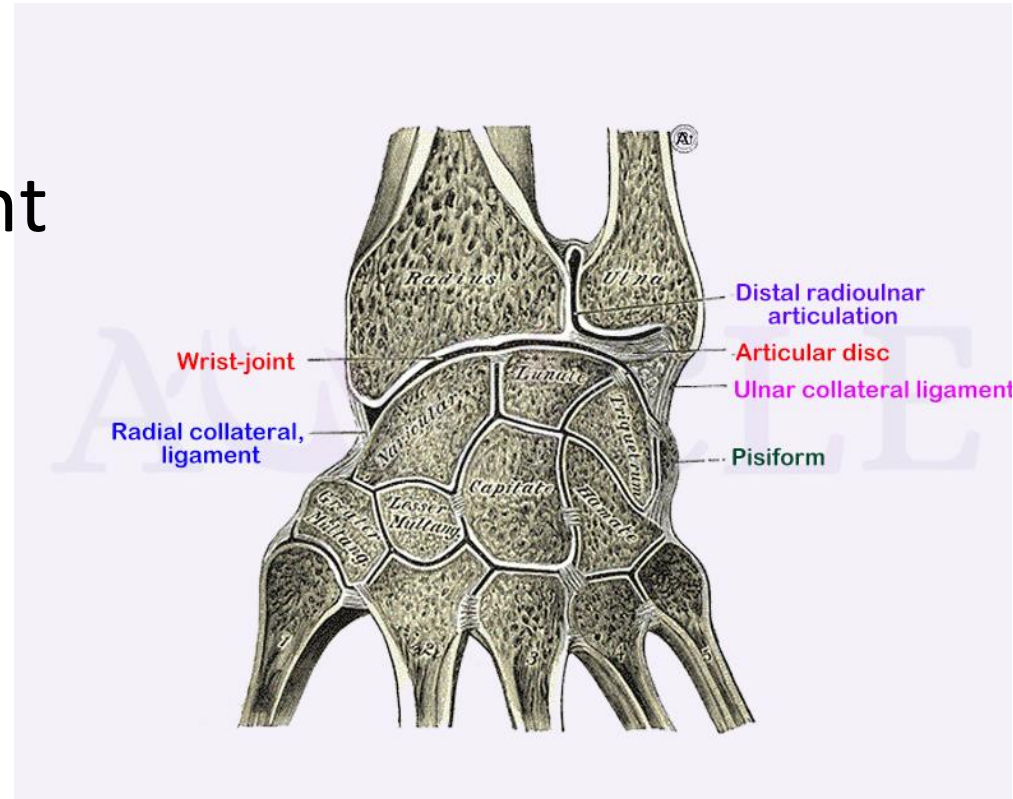
Distal articulating surfaces

Convex, Scaphoid, lunate and triquetral



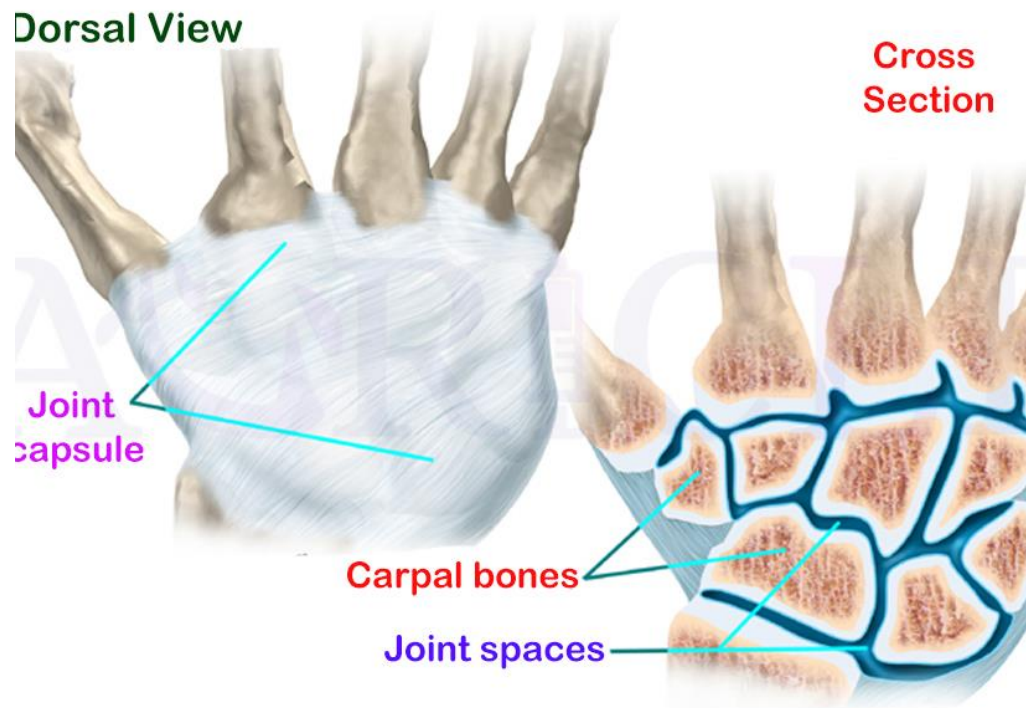
Ligaments

- Capsular ligament
- Radial collateral ligament
- Ulnar collateral ligament



Capsular ligament

- Surrounds the joint is attached to the peripheral margin of the proximal and distal articular surfaces and blends with the palmar and dorsal radiocarpal ligaments



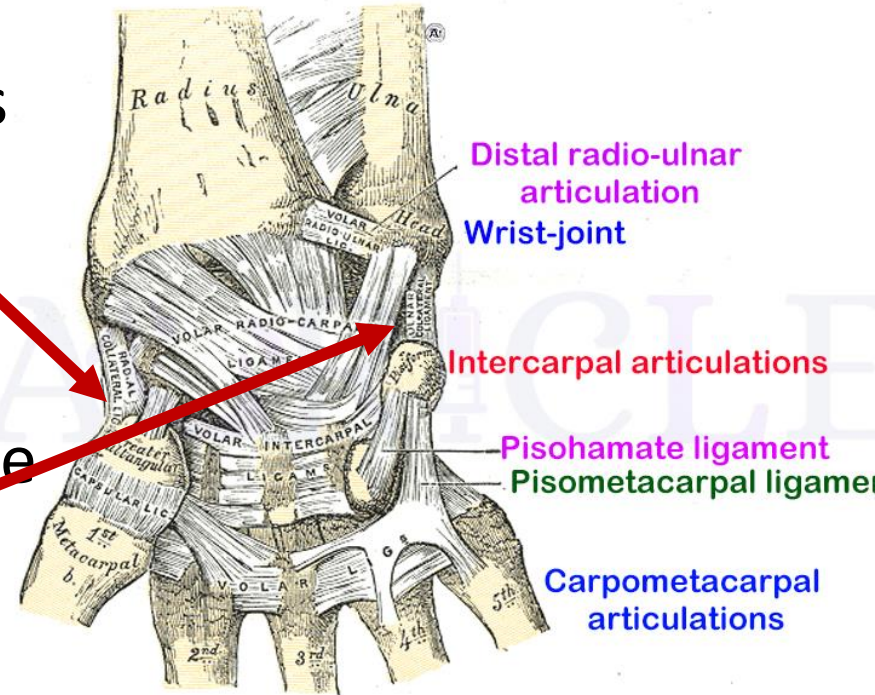
Radial & Ulnar collateral ligaments

Radial collateral ligament

From styloid process of the radius to Scaphoid and trapezium

Ulnar collateral ligament

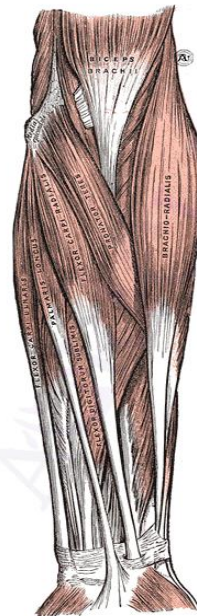
From styloid process of ulna to the Triquetral and pisiform



Relations

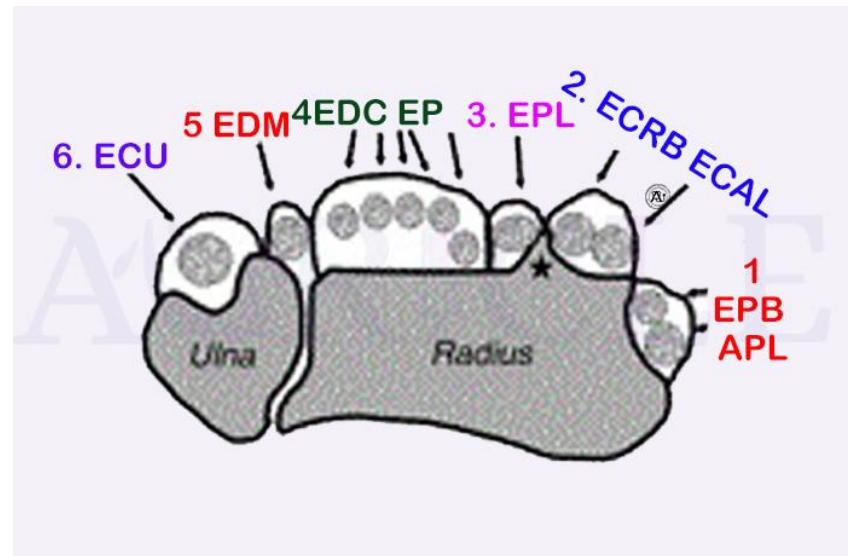
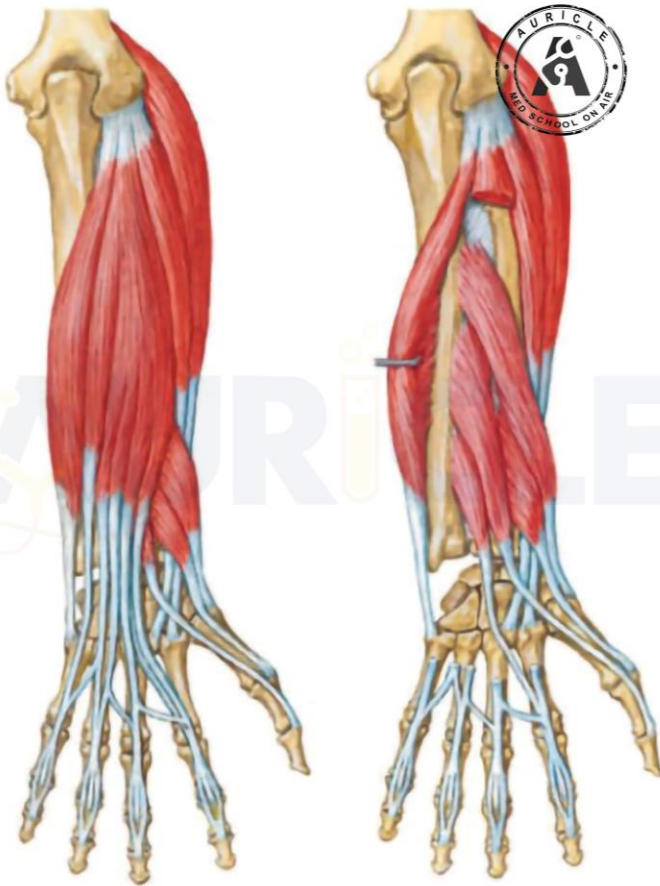
Anterior proximal to flexor retinaculum, arranged in 3 planes.

- Superficial- flexor carpi radialis, flexor carpi ulnaris & palmaris longus
- Intermediate-radial artery, median nerve , flexor digitorum superficialis, ulnar vessels & nerve.
- Deep-flexor pollicis longus ,anterior interosseous vessels & nerve, flexor digitorum profundus.



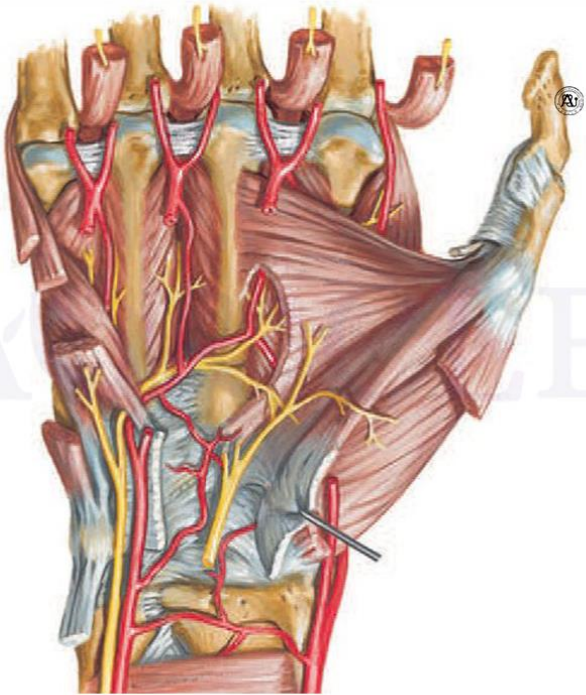
Posterior relations

Extensor tendons of wrist , fingers and associated synovial sheath.



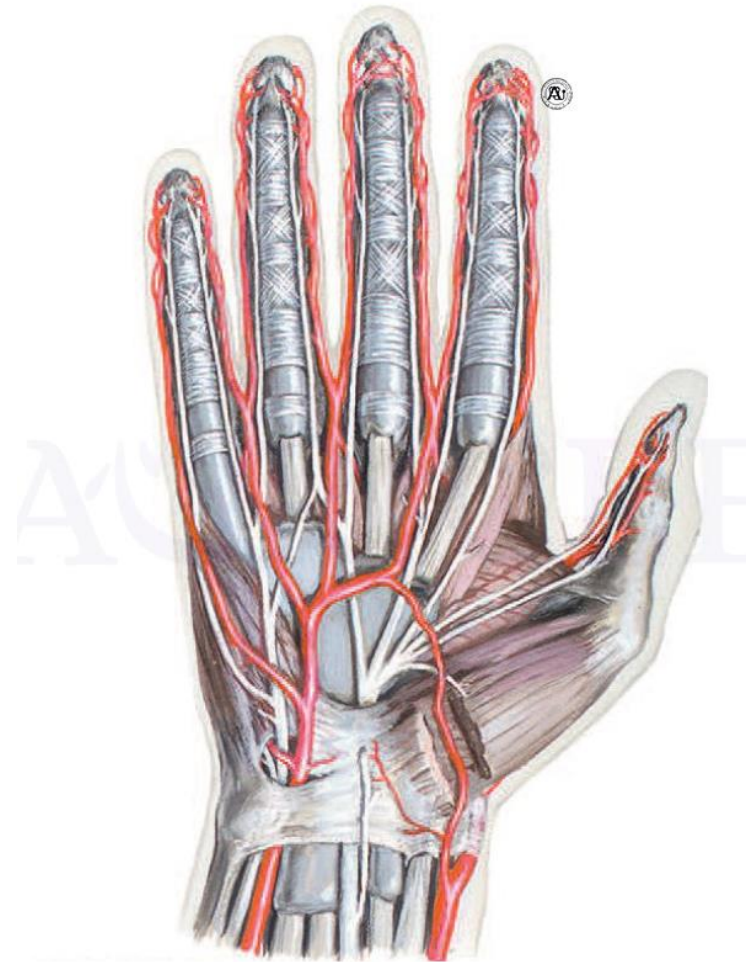
Blood supply

Blood Supply Palmar & dorsal carpal arches, formed by anterior interosseous, anterior & posterior carpal branches of radial & ulnar arteries, recurrent branches of deep palmar arch.



Nerve supply

Anterior & posterior interosseous nerves.



Movements

- **Flexion-85 °** :fexor carpi radialis flexor carpi ulnaris, Flexor degitorus superficialis & profundus, Flexor polcis longus
- **Extension-60°**: extensor carpi radialis longus, extensor carpi radialis brevis
- **Adduction-45°** ulnar deviation-flexor carpi ulnaris and extensor carpi ulnaris.
- **Abduction-15 :** apponents pollicis longus, fexor carpi radialis flexor carpi ulnari, extensor carpi radialis longus, extensor carpi radialis brevis.

Q)Abduction of Hand is caused by:

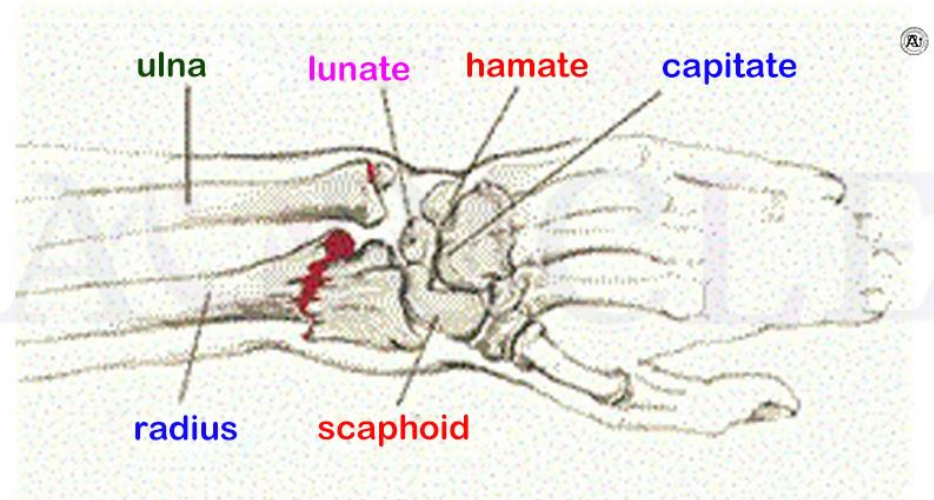
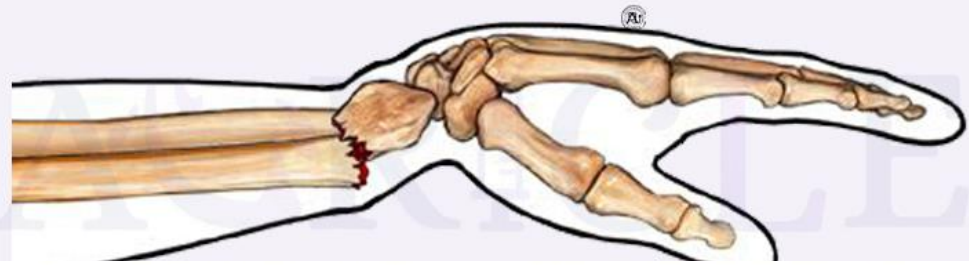
- a. Flexor carpi radialis
- b. Flexor carpi ulnaris
- c. Flexor digitorum profundus
- d. Flexor digitorum superficialis

Q) Range of extension at wrist joint is

- A) 85°
- (B) 60°
- (C) 45°
- (D) 15°

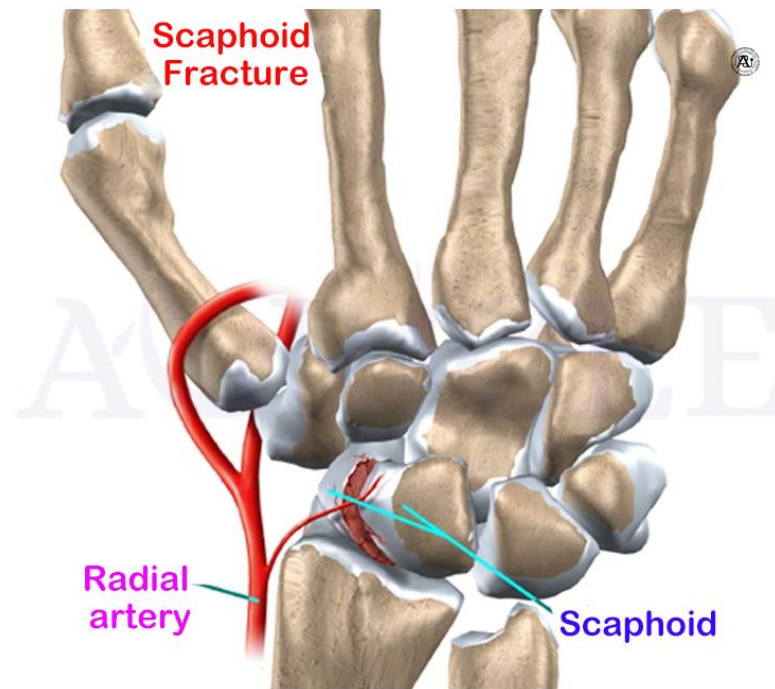
Applied anatomy

- Colle's-fracture on outstretched hand.
- Distal end of radius with dorsal angulation.
- Dinner fork deformity.
- Smith's-reverse colle's, fall on the back of hand.
- Distal fragment displaced ventrally.



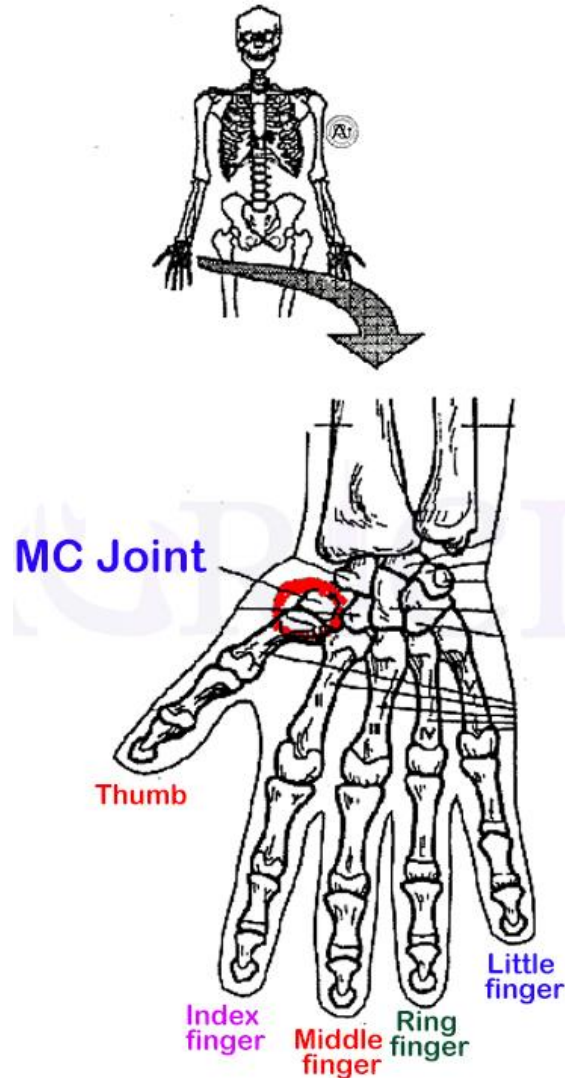
Applied..

- Scaphoid fracture



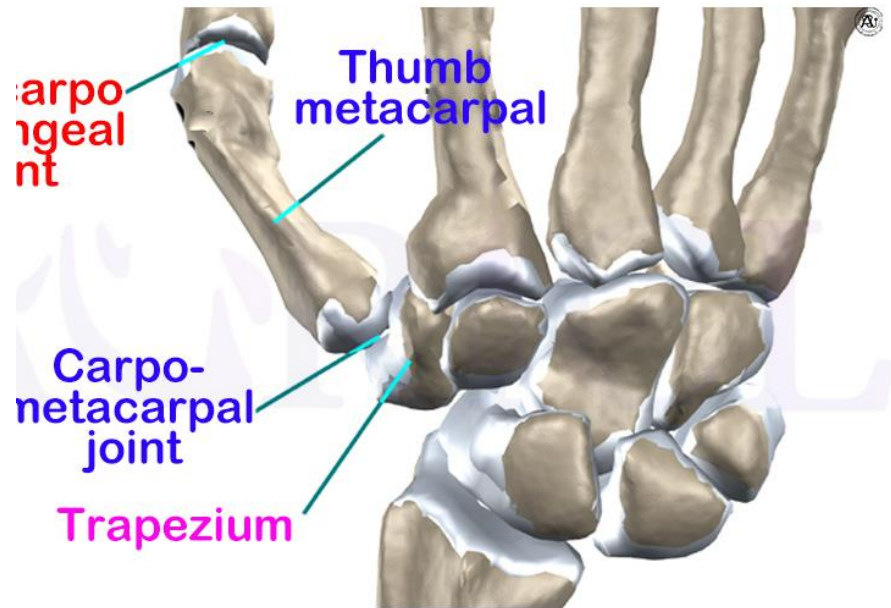
Carpometacarpal joint of thumb

- Saddle/sellar
- Synovial
- Separate joint Cavity
- Greater range of movements.



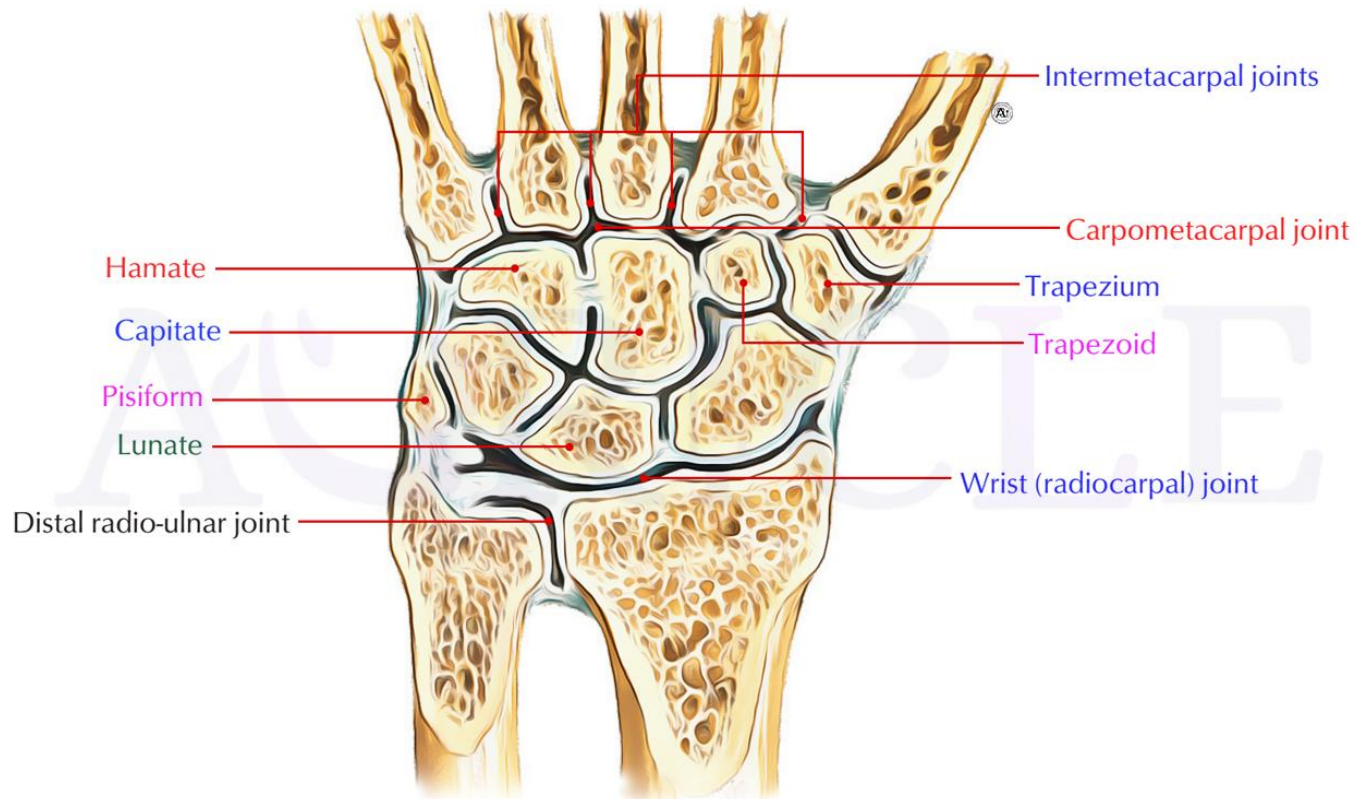
1st Carpo metacarpal joint

- Distal articular surface of trapezium & base of the 1st metacarpal bone.
- Convexo-concave, reciprocally curved.



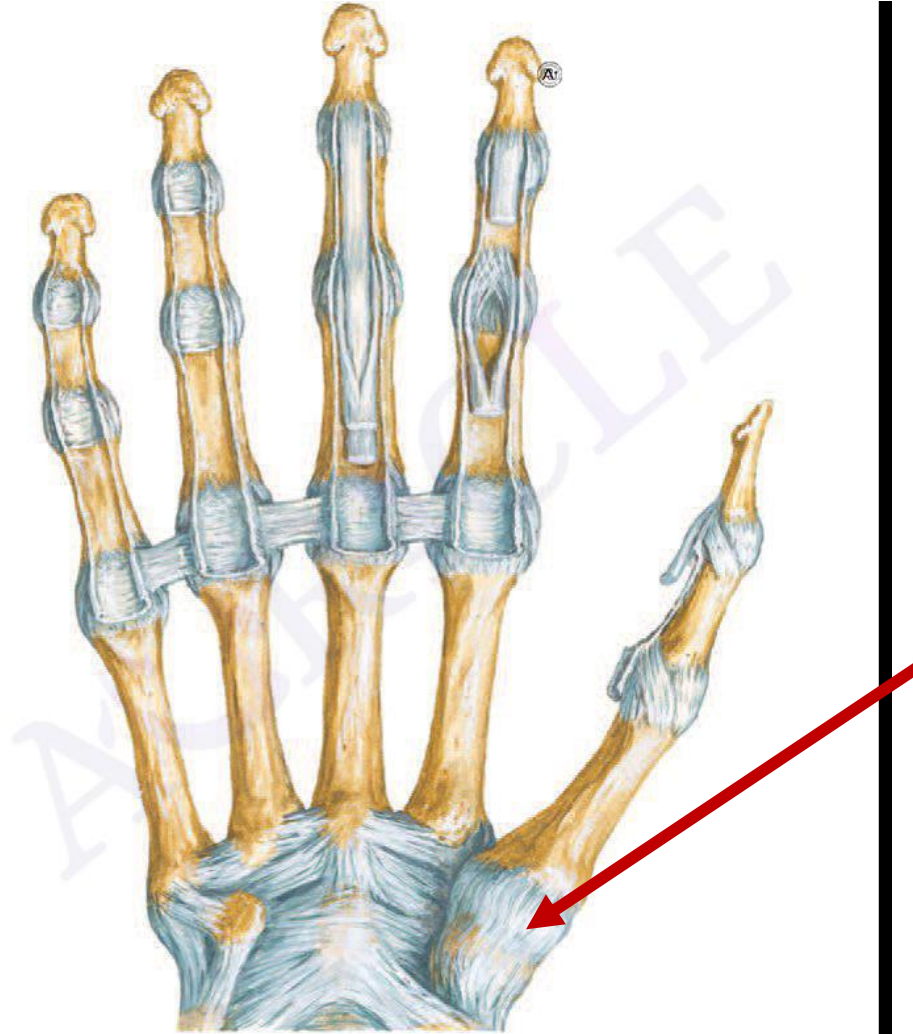
1st Carpo metacarpal joint

- Ligaments-capsular,lateral,dorsal & palmar.
- Capsular-loose,but strong enveloping the joint completely.



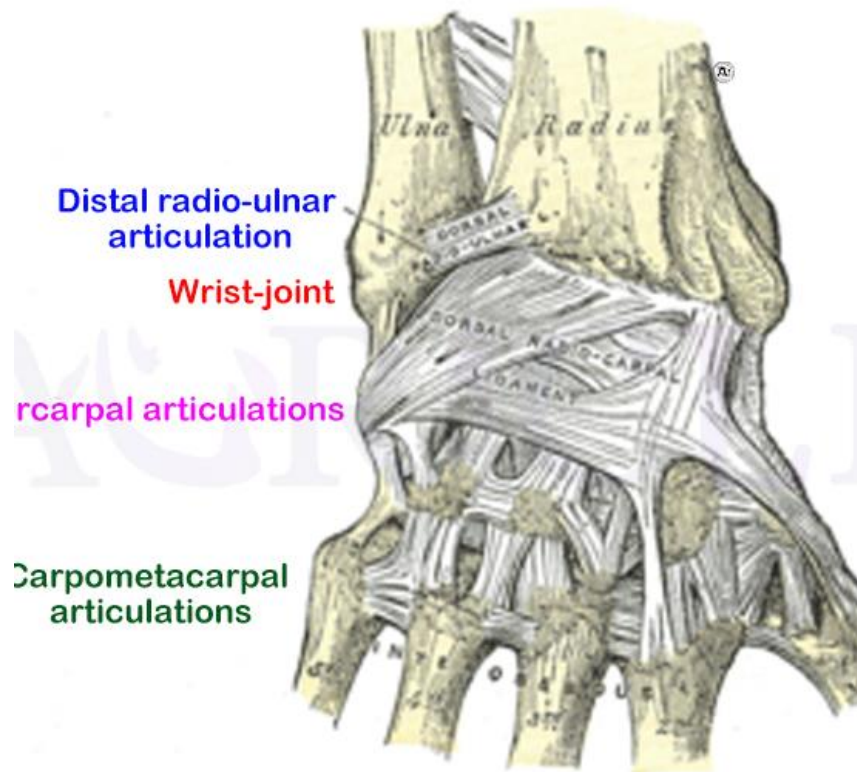
1st Carpo metacarpal joint

- Lateral ligament-lateral surface of trapezium to the radial side of the base of the 1st metacarpal bone.



1st Carpo metacarpal joint

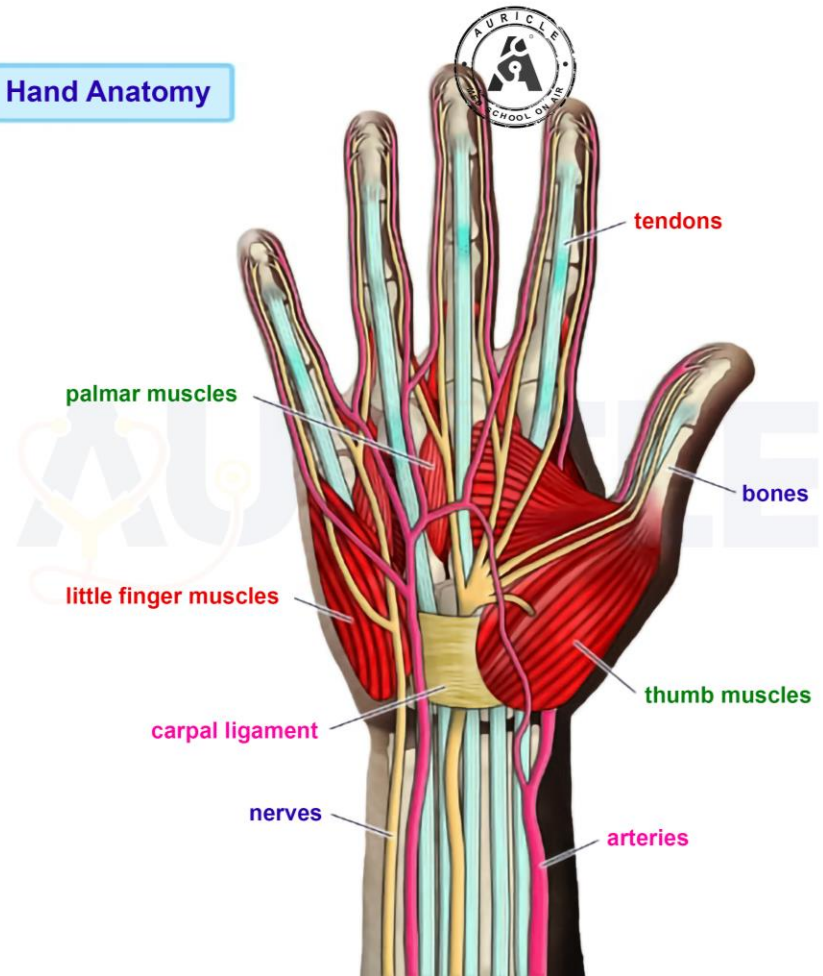
- Dorsal & palmar ligaments form oblique bands, extend from surface of trapezium to ulnar side of the base of 1st metacarpal bone.



Relations

- Front-flexor pollicis brevis, abductor pollicis brevis & opponens pollicis.
- Behind- extensor pollicis longus & extensor pollicis brevis.
- Lateral-abuctor pollicis longus & extensor pollicis brevis.
- Medial-1st dorsal interosseous muscle.

Hand Anatomy

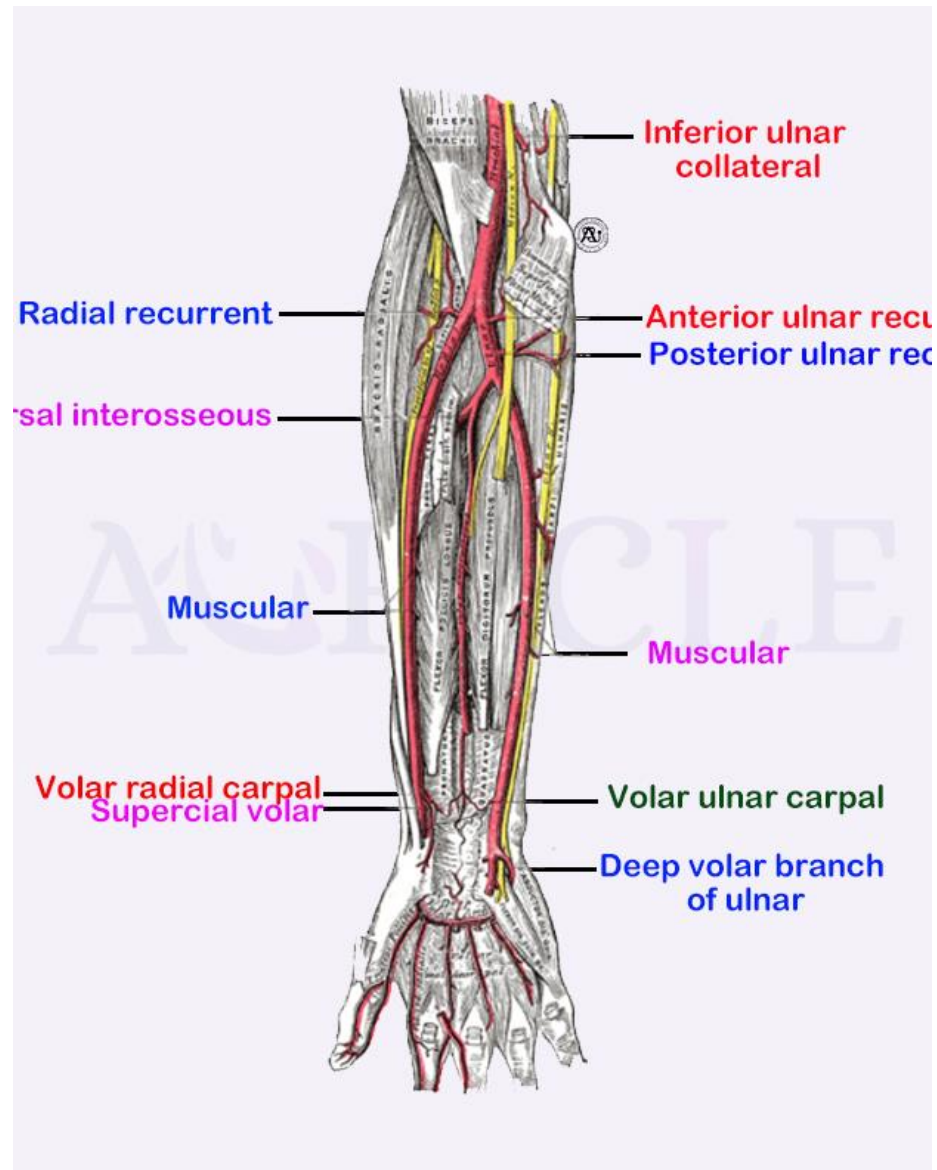


Movements

- **Flexion**- flexor pollicis brevis, opponens pollicis & flexor pollicis longus. Conjoint medial rotation.
- **Extension**- abductor pollicis longus, extensor pollicis brevis & extensor pollicis longus.
- **Abduction** -abductor pollicis longus & abductor pollicis brevis.
- **Adduction** -adductor pollicis.
- **Opposition** -abductor pollicis longus & brevis, flexor pollicis brevis & opponens pollicis.

Blood & nerve supply

- Radial artery.
- Median nerve



Q) Wrist is which type of synovial joint:

- a. Condylar
- b. Ellipsoid
- c. Hinge
- d. Trochoid

Q) About radius bone TRUE is:

- a. Radial groove is present
- b. Major contributor to wrist joint
- c. Radial artery lies medial to styloid process of radius
- d. Medial bone of forearm

Q) Adduction of hand at wrist is done by:

- a. Flexor carpi radialis
- b. Palmaris longus
- c. Flexor digitorum profundus
- d. Flexor carpi ulnaris
- e. Flexor digitorum superficialis

Thank you!