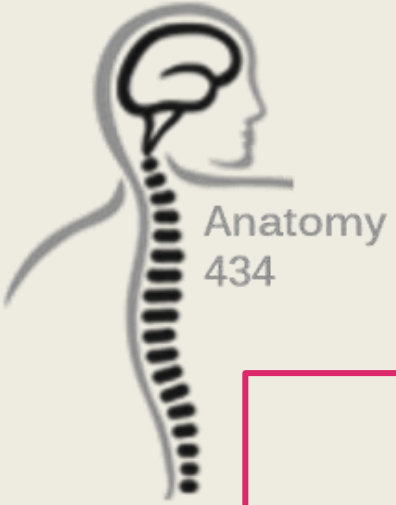


Hand and Wrist

Anatomy Team 434

Color ***Index:***

- Important Points
- Helping notes
- Explanation

If you have any complaint or suggestion please don't hesitate to contact us on:
AnatomyTeam434@gmail.com

OBJECTIVES

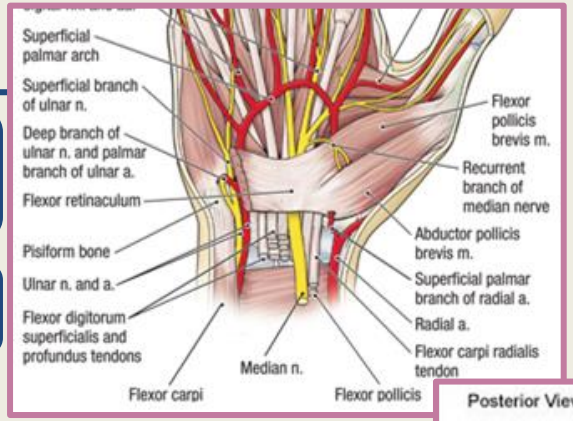
At the end of the lecture, students should be able to:

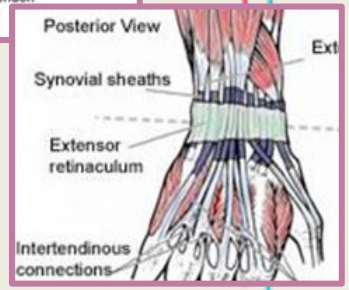
1) Describe the anatomy of the deep fascia of the wrist & hand (flexor & extensor retinaculae & palmar aponeurosis).
2) List the structures passing superficial & deep to flexor retinaculum.
3) Describe the anatomy of the insertion of long flexor & extensor tendons.
4) Describe the anatomy of the small muscles of the hand (origin, insertion action & nerve supply)

Retinacula

Formed of: Flexor Retinaculum (Anterior) & Extensor Retinaculum (posterior) formed of of Bands of Deep Fascia at the wrist

Fouction: Hold the long flexor and extensor tendons in position at the wrist.





Attachments:

Medially

Both retinacula attached to Pisiform & Hook of Hamate

Laterally

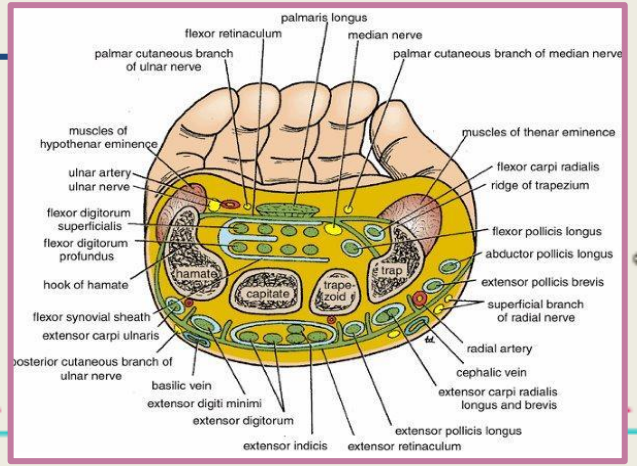
Flexor Retinaculum to Tubercle of Scaphoid & Trapezium.

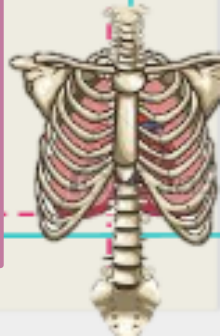
Extensor Retinaculum to Distal end of Radius

Structures Superficial to Flexor Retinaculum

From Medial to Lateral: (these structures above flexor retinaculum)

1. Tendon of Flexor carpi ulnaris.
2. Ulnar nerve.
3. Ulnar artery.
4. Palmar cutaneous branch of ulnar nerve.
5. Palmaris longus tendon.
6. Palmar cutaneous branch of median nerve.



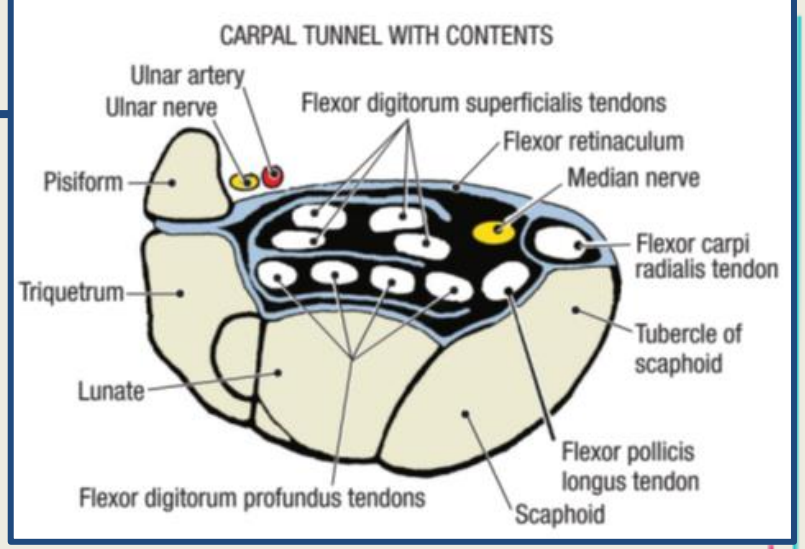


Carpal Tunnel

Formed from: Concave anterior surface of the **Carpus** covered by **Flexor Retinaculum**

Contents (From Medial to Lateral):**(important)**

- Tendons of flexor digitorum superficialis and profundus
- Median nerve
- Flexor Pollicis Longus
- Flexor carpi radialis



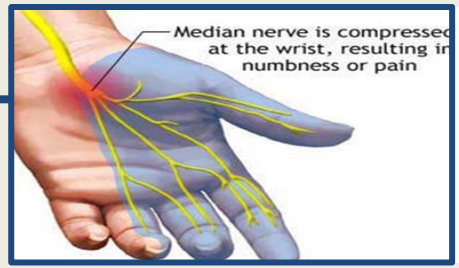
Carpal Tunnel syndrome

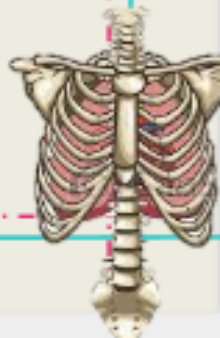
Causes:

•Compression of the median nerve within the carpal tunnel

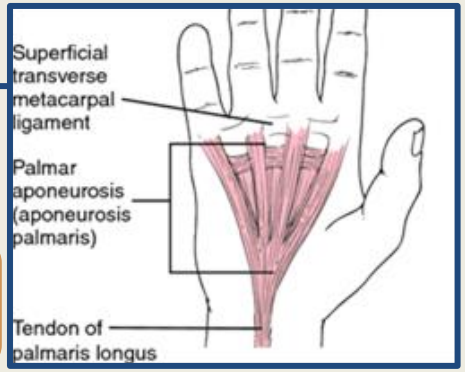
Manifestations:

- Burning pain (pins and needles) in the **lateral three and half fingers.**
- No paresthesia over the thenar eminence.
- Weakness or atrophy of the thenar muscles (Ape Hand).
- Inability to Oppose the thumb.





Palmar Aponeurosis



Features: Thickened deep fascia ,Triangular in shape , occupies the central area of the palm.

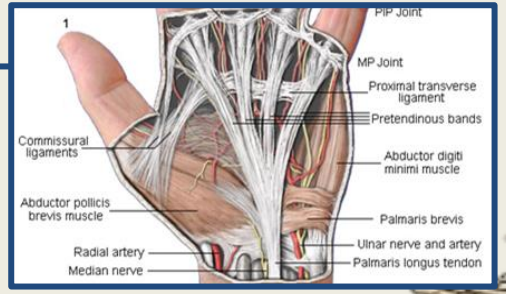
Apex: attached to the distal border of flexor retinaculum
receives the **insertion of palmaris longus** tendon.

Base: divides at the bases of the fingers into four slips that pass into the fingers.

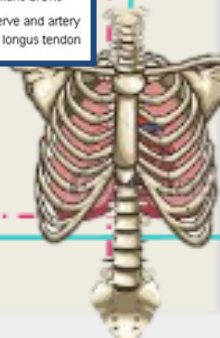
Functions: attached to the overlying skin and improves the grip. Gives **origin to palmaris brevis.**

- Protects the underlying tendons, vessels & nerves.

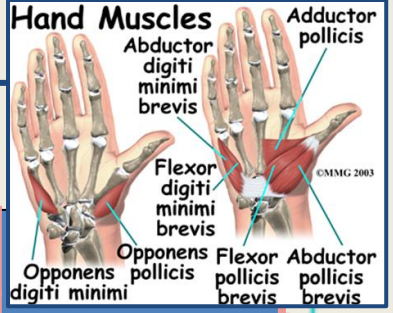
Palmaris Brevis



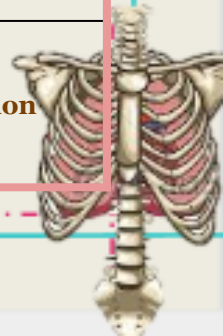
Origin	Insertion	Nerve supply	Action
Flexor retinaculum & Palmaris retinaculum	Skin of Palm	Ulnar (Superficial) Branch	Corrugation of skin to improve Grip



Short Muscles of Thumb & Little Finger



	1)Hypothenar Eminence (3)			2)Thenar Eminence (3)			3)Adductor Pollicis
Muscle	Abductor digiti minimi	Flexor digiti minimi	Opponens digiti minimi	Abductor pollicis brevis	Flexor pollicis brevis	Opponens pollicis	
Origin	Pisiform	Flexor retinaculum	Palmar surface of 5th metacarpal	FR Scaphd& Trapez	Flexor retinaculum	Flexor retinaculum	Oblique Head: Ant. bases of 2nd &3rd meta Trans Head: 3rd meta
Insertion	Base of Prox ph			Base of Prox ph		Lateral part of 1ST Met	Medial side of base of prox.ph of thumb
NS	All by Deep branch of Ulnar			All from Median N			Deep branch of Ulnar
Action	Abduction	Flexion	Pulls the 5th metacarpal forward (Cup the palm)	Abduction	Flexion	Opposition	Adduction



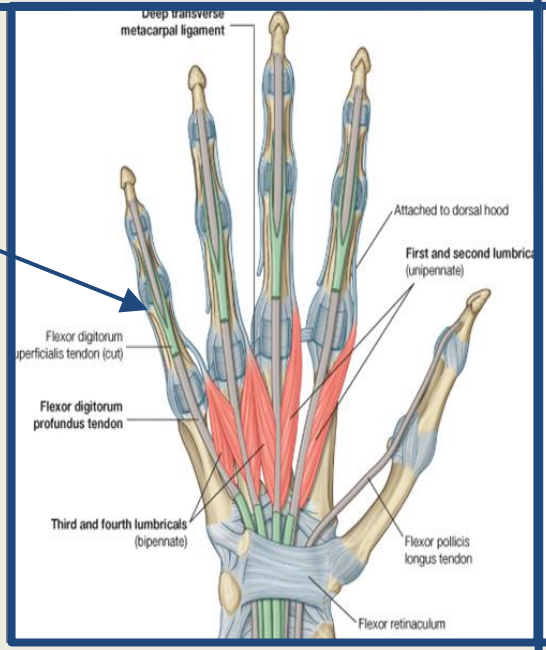
the origin of Opponens digiti minimi not correct (flexor retinaculum)

Insertion of Flexor Digitorum Superficialis & Profundus

Flexor digitorum superficialis:

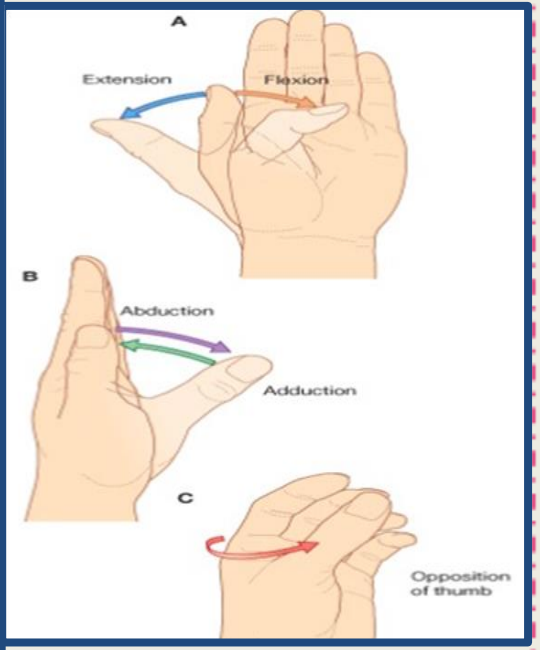
Each tendon:

1. **divides into two halves pass around the Profundus Tendon**
2. **The two halves meet on the posterior aspect of Profundus tendon (partial decussation of fibers).**
3. **Reunion of the two halves.**
4. **Further Division into two slips attached to the Borders of Middle Phalanx.**

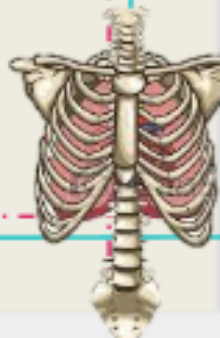


Flexor digitorum Profundus: Inserted into the Base of the Distal Phalanx.

Movements of Thumb



1. **Flexion & Extension.**
1. **Abduction & Adduction**
1. **Opposition**

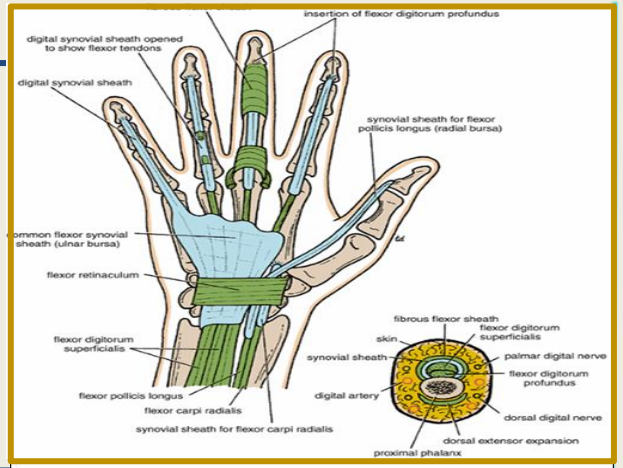


Fibrous Flexor (Digital) Sheath

A Strong Fibrous Sheath, which covers **the anterior surface** of the fingers and attached tothe sides of the phalanges.

- Its Proximal end is **opened** Its Distal end is **closed**

The Sheath with the anterior surfaces of the phalanges & the interphalangeal joints form an **Osteofibrous blind Tunnel** for the long flexor tendons of the fingers.



Synovial Flexor Sheaths

Common Synovial sheath (Ulnar Bursa): Contains tendons of Flexor Digitorum Superficialis & Profundus

The **Medial** part of the sheath extends distally(without interruption) on the tendons of the little finger.

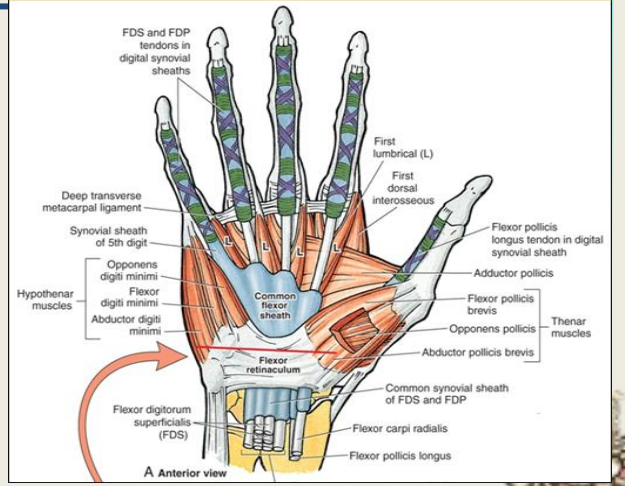
The **Lateral** part of the sheath stops on the middle of the palm.

The distal ends of the long flexor tendons to(Index, Middle & Ring) fingers acquire **Digital Synovila Sheaths**

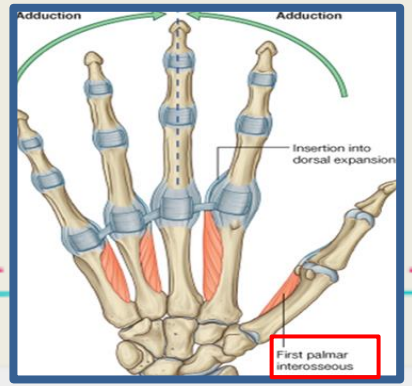
Flexor Pollicis Longus tendon has its own synovial sheath **(Radial Bursa)**

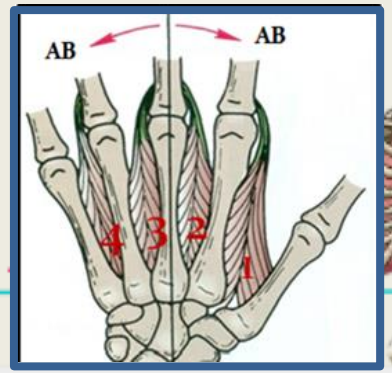
Function of Synovial Sheaths:(very important)

Allow the long tendons to move smoothly with a minimum of friction beneath the flexor retinaculum and the fibrous flexor sheaths.

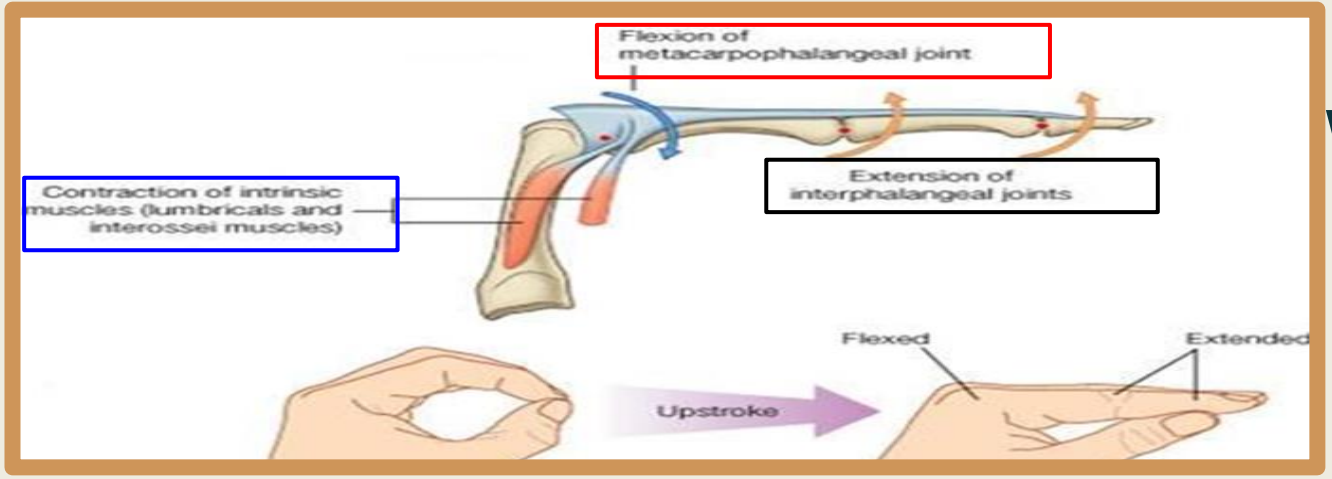


	Lumbrical Muscles(4)		Palmar interossei(4)	Dorsal interossei(4)
Origin	Tendons of flexor digitorum profundus		1st (in thumb): Base of 1stmetacarpal. Other three: Ant. Surface of Shafts of 2nd , 4rd & 5th metacarpals.	Contiguous sides of shafts of Metacarpals
Insertion	EXT. EXP of medial four fingers		Proximal phalanges of thumb ,index, ring, & little fingers and Extensor expansion	Proximal Phalange of index, ring ,mid finger & EX
NS	1ST & 2ND	Median N	Ulner n. deep Branch	
	3RD & 4TH	Ulnar N. Deep branch		
Action	Flex metacarpophalangeal joints and extend interphalangeal joints of fingers Except thumb		Adduction of fingers toward center of the 3rd one.	Abduction of fingers away from the 3rd one.





Action of Lumbricals & Interossei



writing position

Extensor Expansion

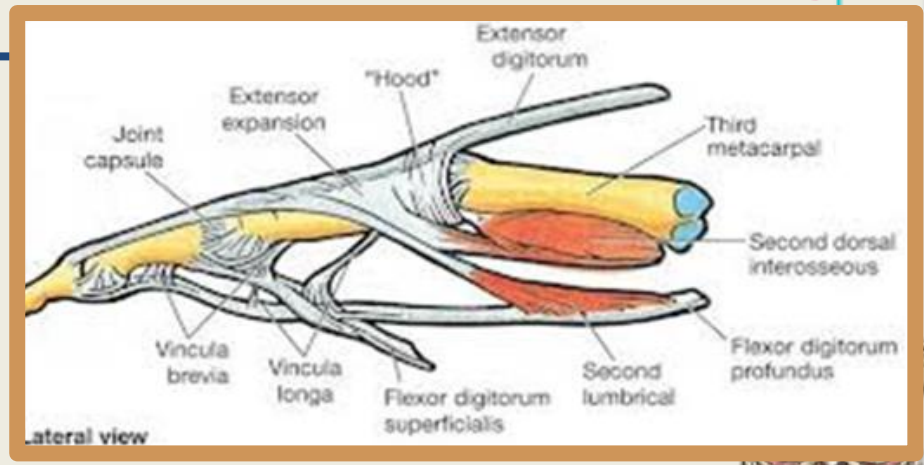
Formed from the expansion of the tendons of extensor dig. at the PIJ, the expansion

The tendon splits into three parts:

- ☐ <u>One Central</u>: inserted into the base of Middle phalanx.
- ☐ <u>Two laterals</u>: inserted into the base of the Distal phalanx.

The Expansion Receives the insertions of:

- ☐ Corresponding <u>Interosseous muscle</u> (on each side).
- ☐ <u>Lumbrical muscle</u> (on the lateral side).



MCQ

Q1)Which one of the following thenar muscles has an ulnar nerve supply?

A. Abductor pollicis brevis
B. adductor pollicis
C. flexor pollicis brevis

Q2)Which of the following group of muscles oppose the action of Palmar interossei?

A. Lumbrical muscles
B. Dorsal interossei
C. Hypothenar eminence

Q3)Compression of the flexor retinaculum will most likely affect which of the following nerves?

A. Median nerve
B. Ulnar nerve
C. Thoracodorsal nerve

Q4)The common synovial sheath continues from the palm to the index finger?

A. T
B. F

1) B
2) B
3) A
4) F (medial part, minimus)

For extra questions:
http://www.med.umich.edu/lrc/coursepages/m1/anatomy2010/html/musculoskeletal_system/forearm_questions.html

GOOD LUCK

Done By Anatomy Team 434 ..