

# TREATMENTS FOR ACHING HANDS

- Neil G. Harness, MD
- Orthopaedic Surgeon
- Hand Surgeon
- Kaiser Permanente
- Orange County

# THE HUMAN HAND

- Complex and beautiful
- Versatility sets us apart from all other creatures on the planet
- Provides powerful grasp and great precision
- Allows manipulation of small objects
- Tool for communication
  - Human touch



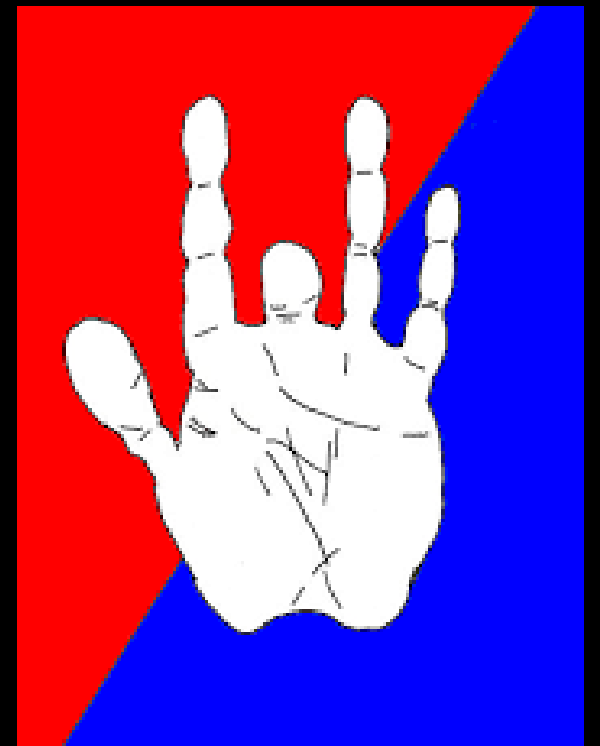
# WHAT DO HAND SURGEONS DO?

- Any problem of the arm, elbow, forearm, wrist and hand
  - Skin
  - Nerve
  - Vascular
  - Muscle
  - Tendon
  - Ligament
  - Cartilage
  - Bone



# WHAT DO HAND SURGEONS DO?

- Non-operative care
  - Fractures – reduction/casting
  - Tendonitis
  - Arthritis
  - Nerve disorders
- Operative care
  - Fractures – operative fixation
  - Tendons, vessels, ligaments
  - Arthritis – joint replacement
  - Nerve disorders
  - Joints- arthroscopy



# FUN HAND FACTS

- 27 bones, 29 joints and at least 123 named ligaments in the human hand
- Opposable thumbs set our hands apart from other animals
- Most primates have opposable thumbs (humans/apes) but humans can move the thumb farther across the palm than any other primate.

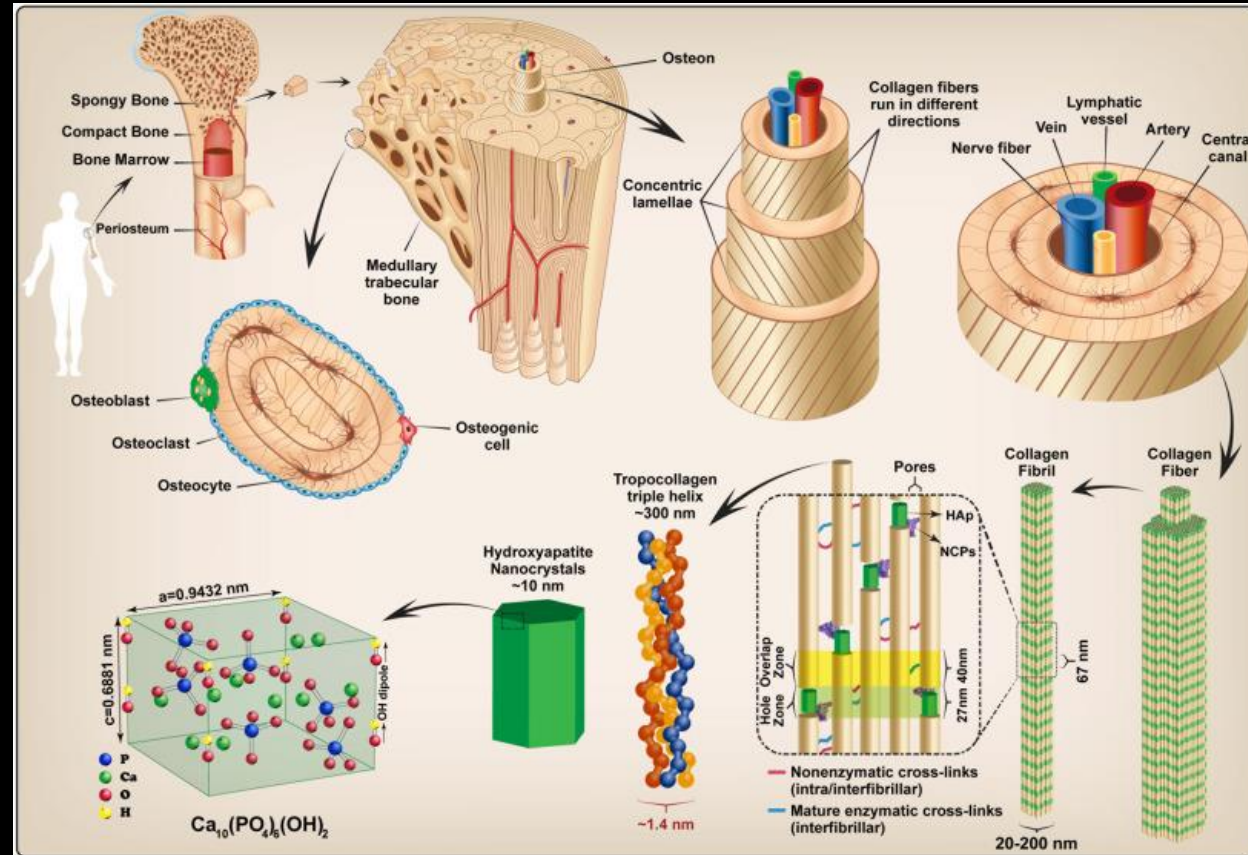
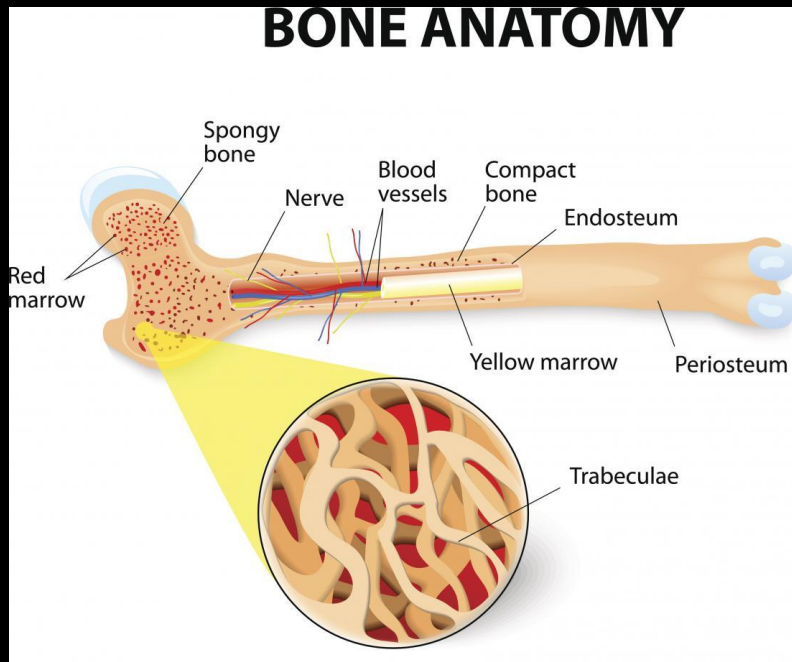


# ANATOMY 101

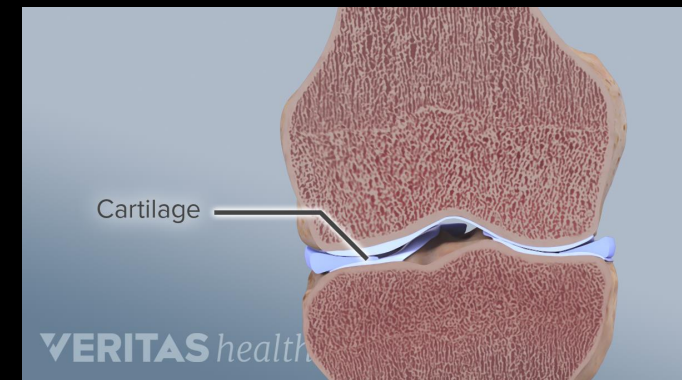
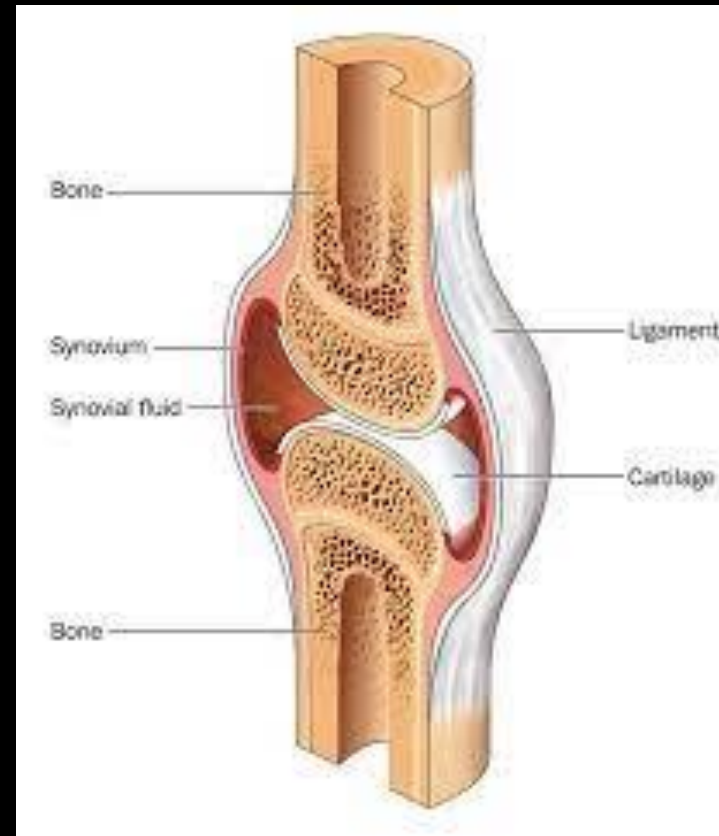
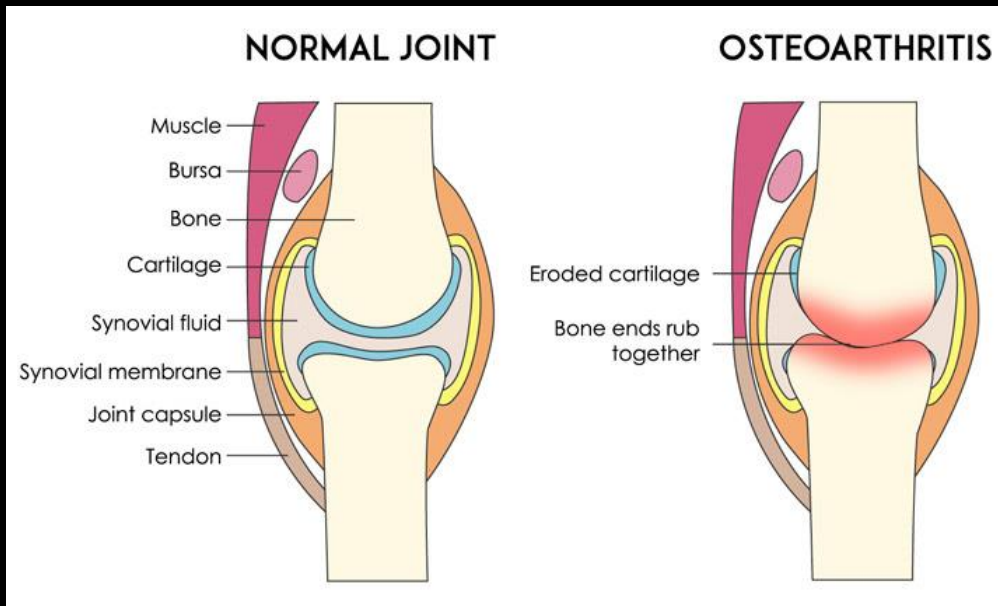
- Connective tissue
  - Bones
  - Cartilage
  - Tendons
  - Ligaments
  - Fascia/Fat
- Muscle tissue
- Nerve tissue
- Circulatory tissue – Blood vessels
- Epithelial tissue – Skin
- Lymphatic tissue



# BONE



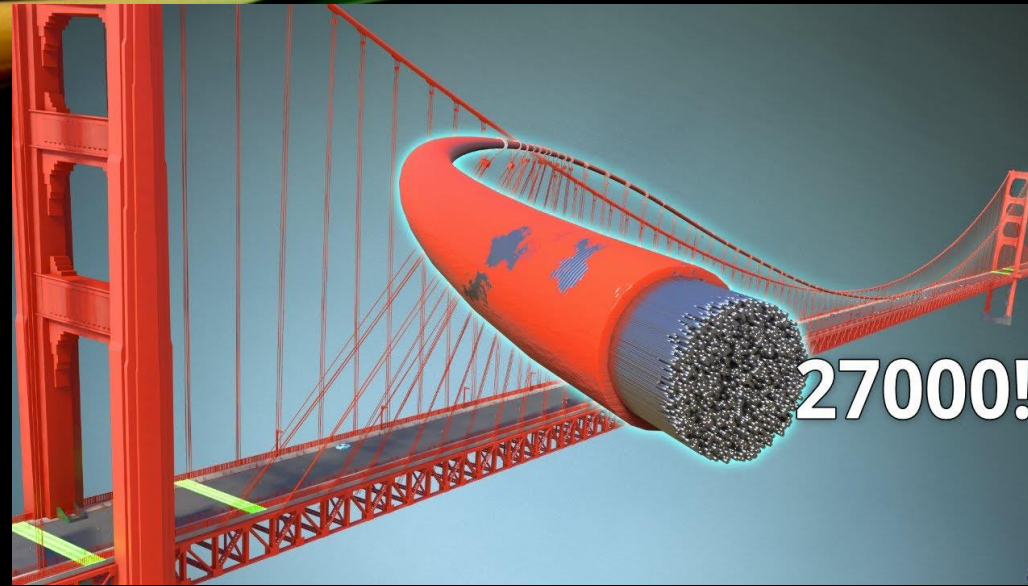
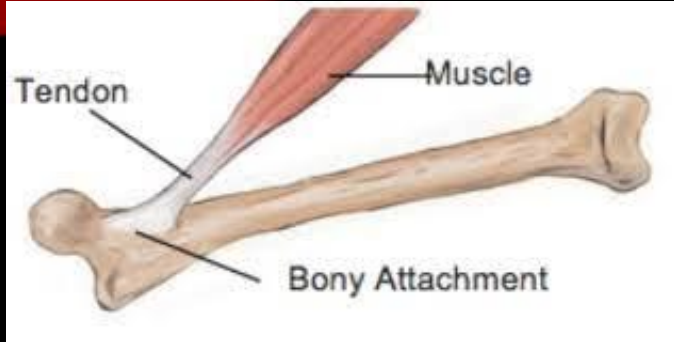
# CARTILAGE



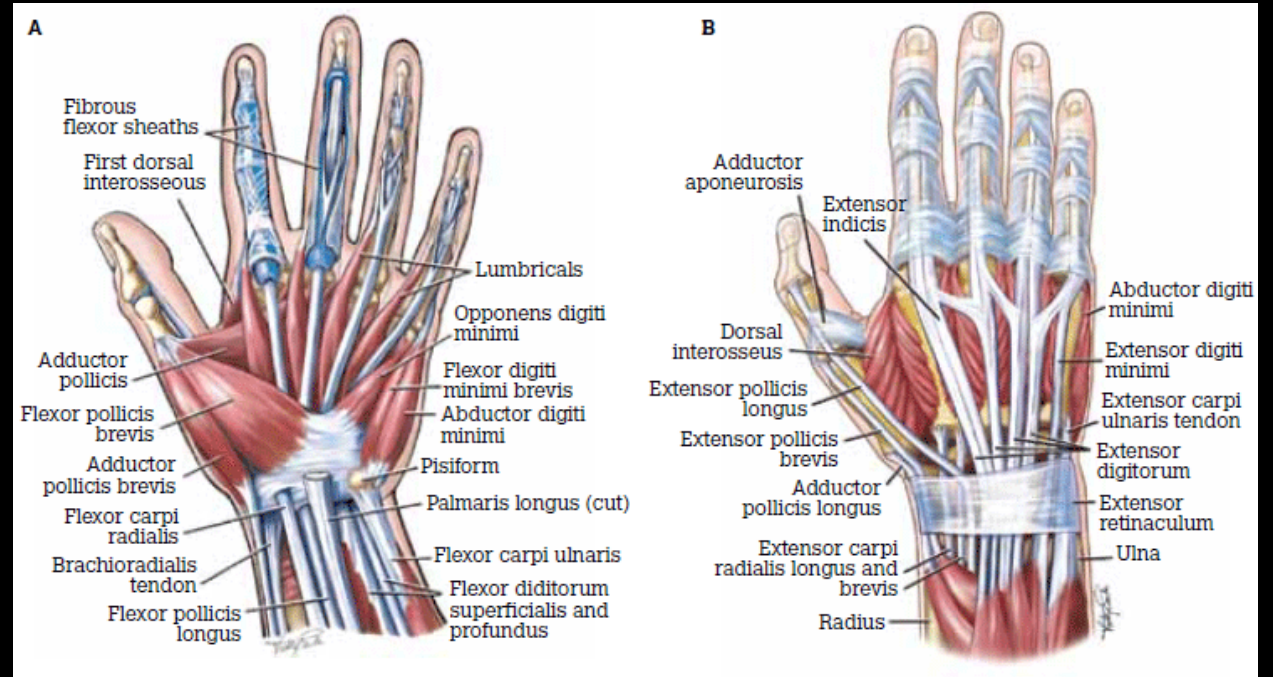
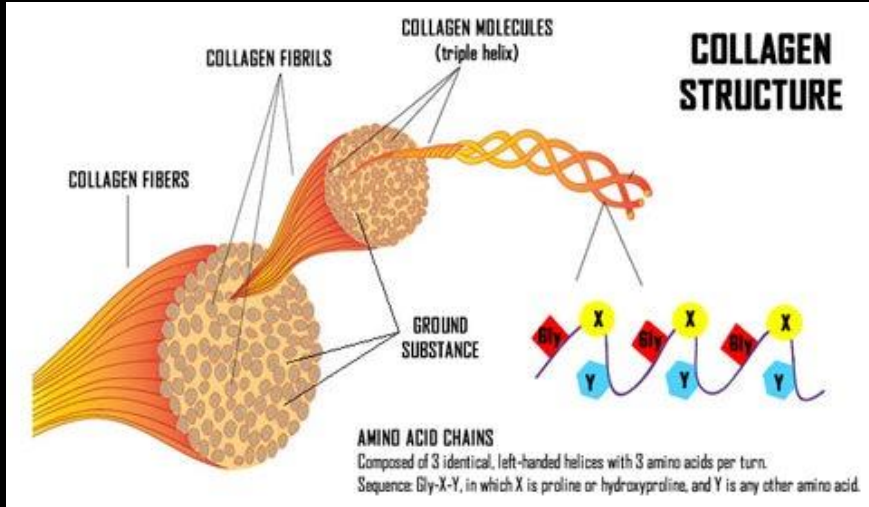


# BONE

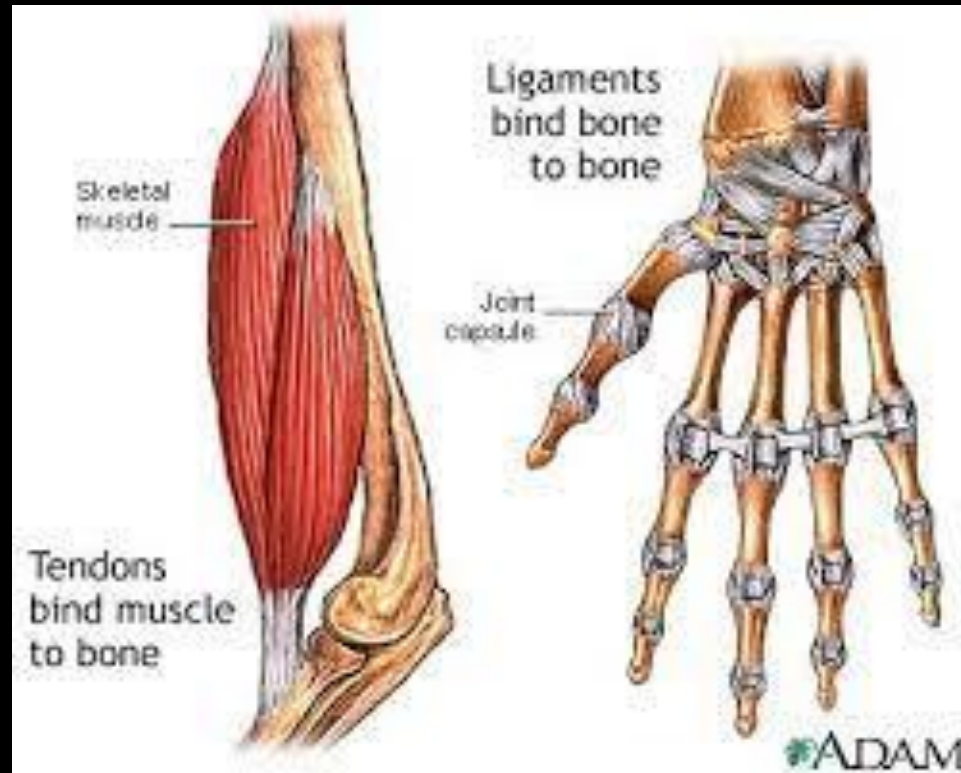




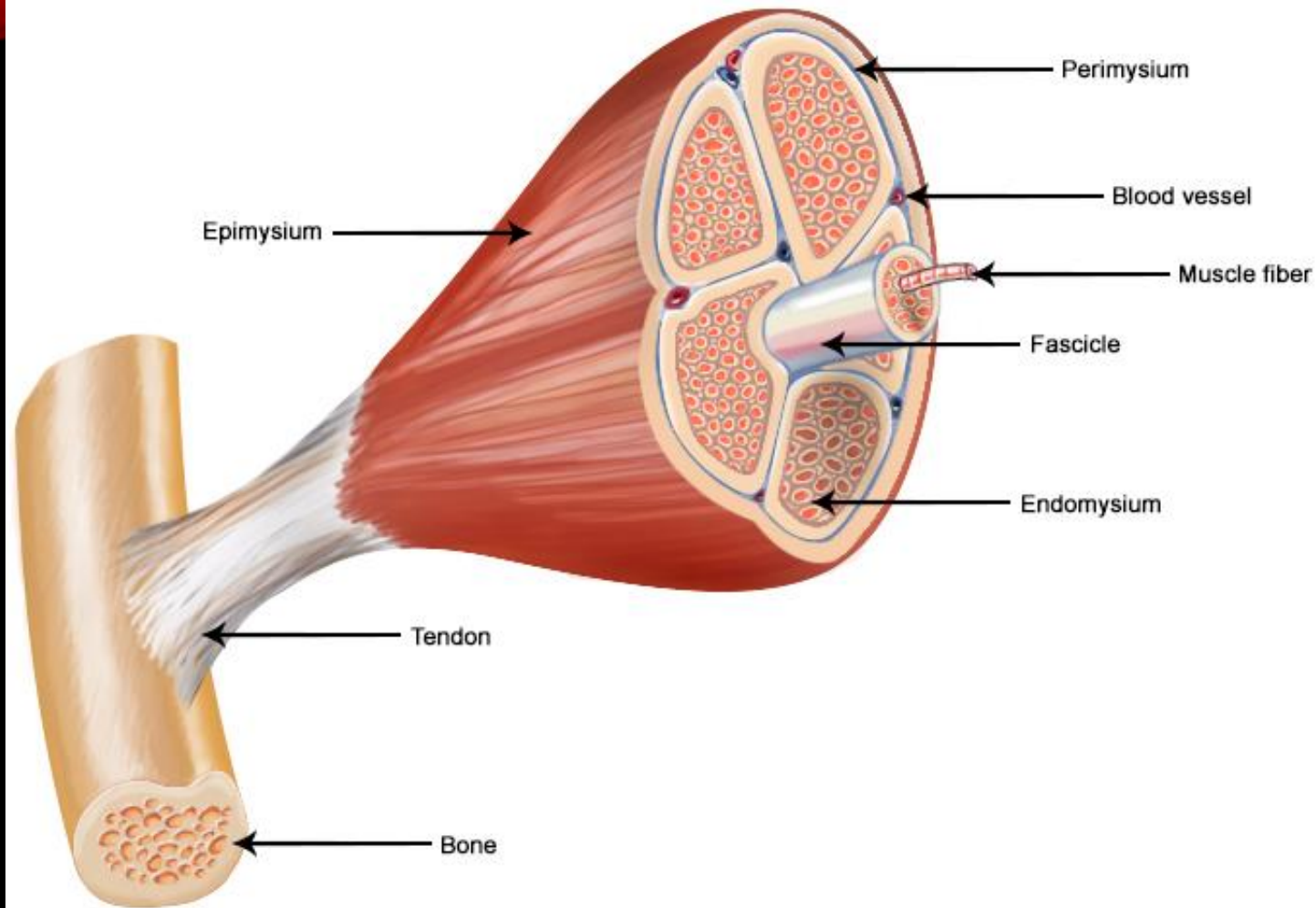
# TENDON



# LIGAMENT

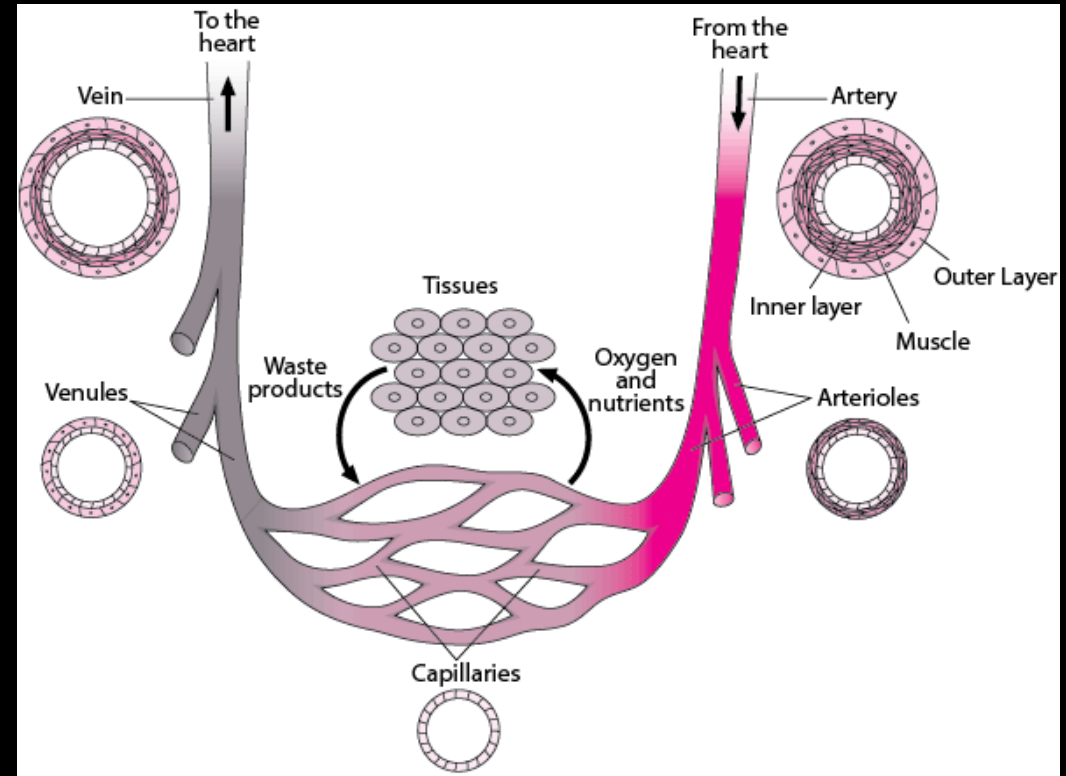
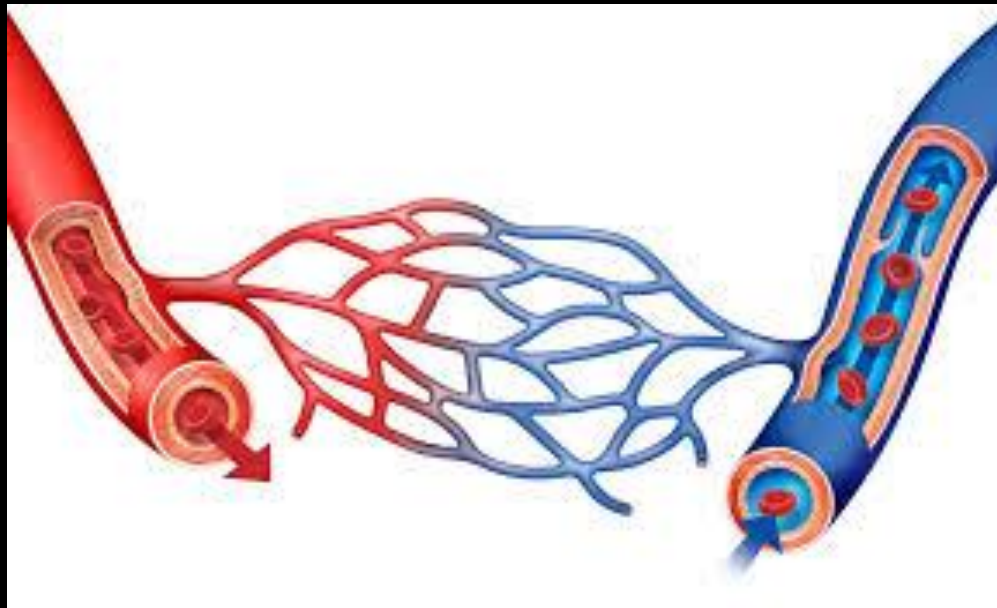
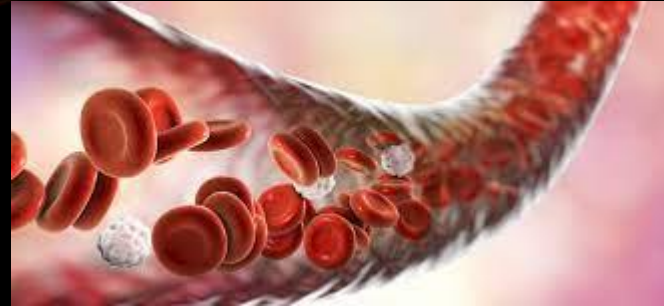


## Structure of a Skeletal Muscle

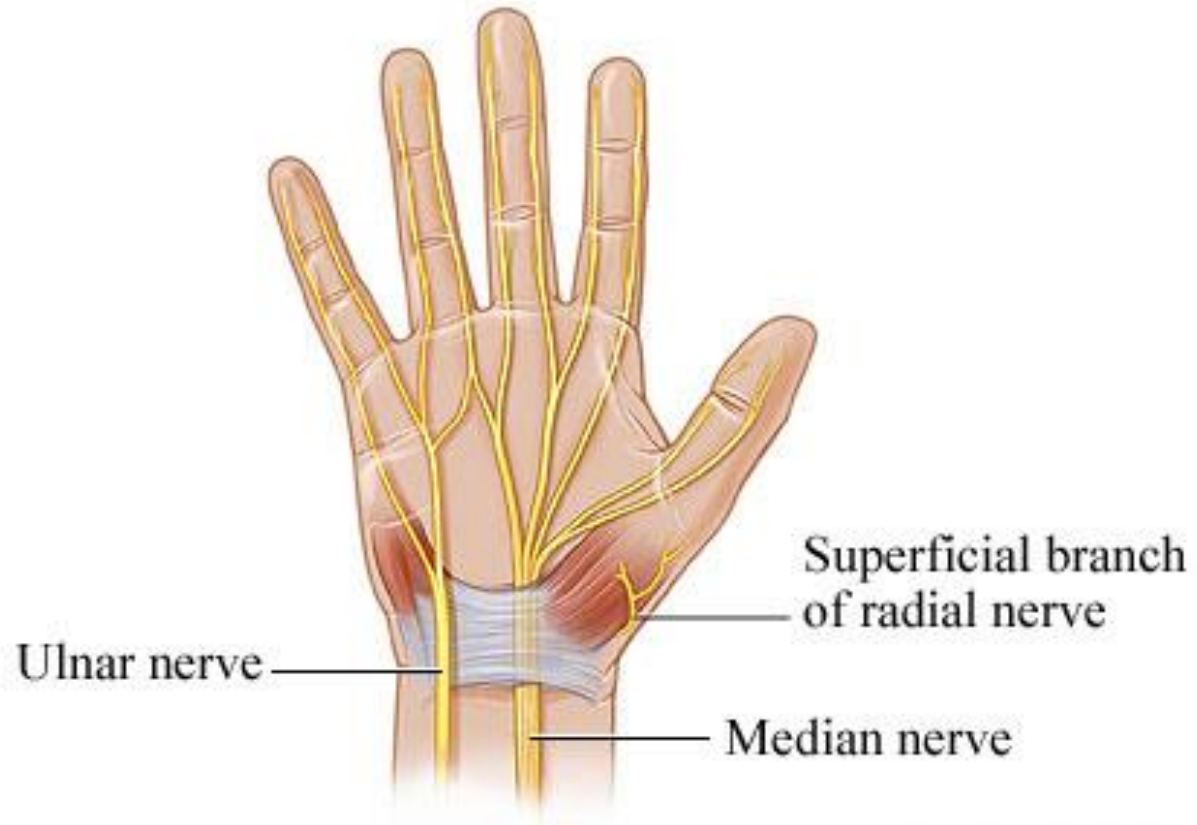


# MUSCLE

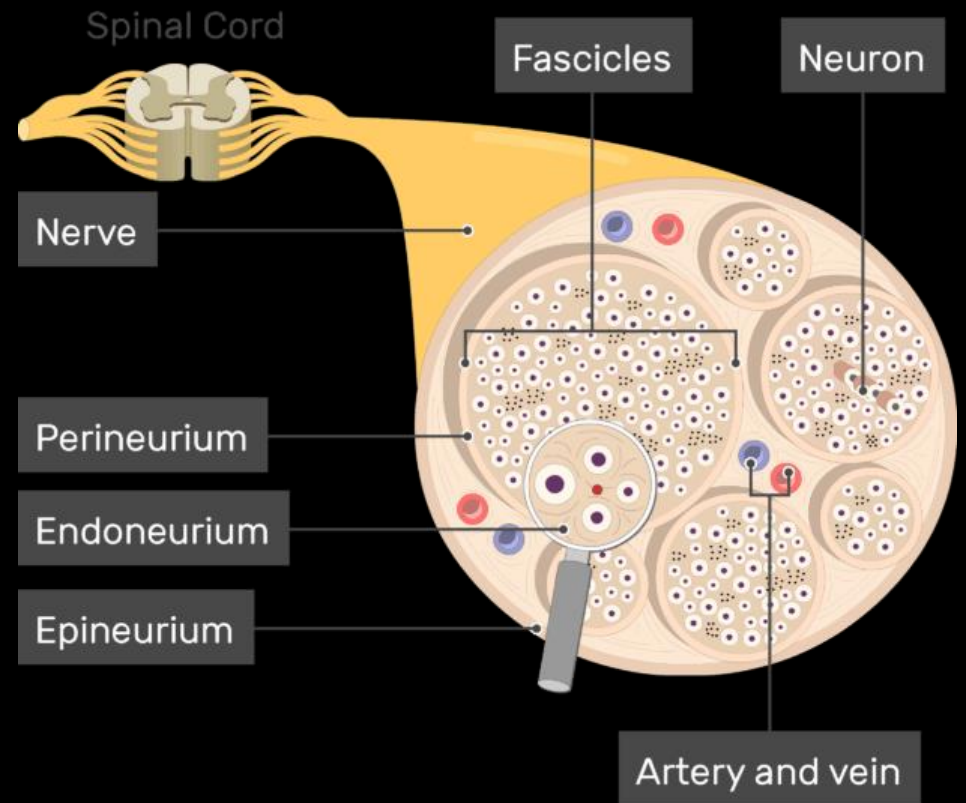
# BLOOD VESSELS



# NERVE



© Healthwise, Incorporated



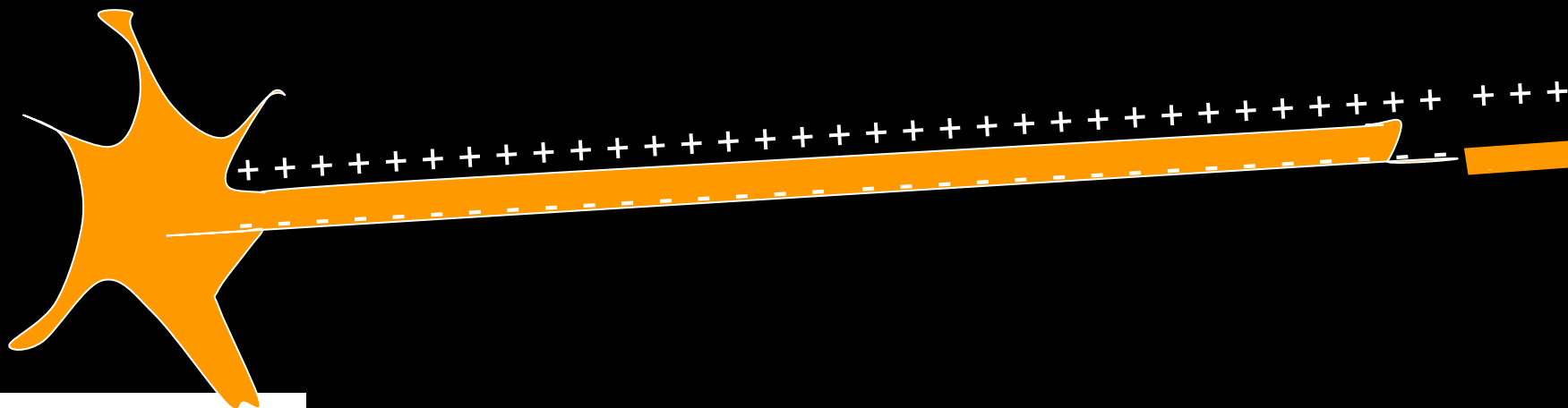
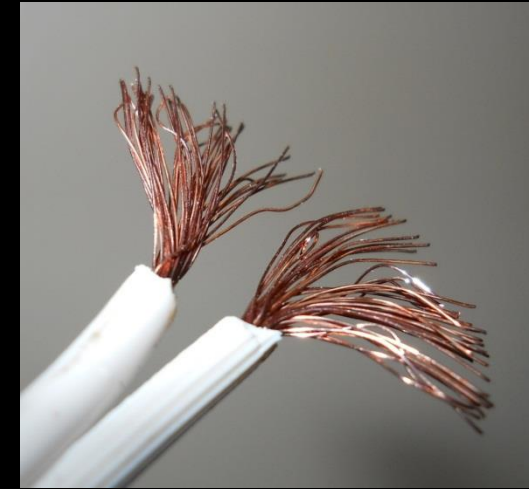
## Nerve Fiber Counts

Electric cord: ~60 strands, 2 fascicles

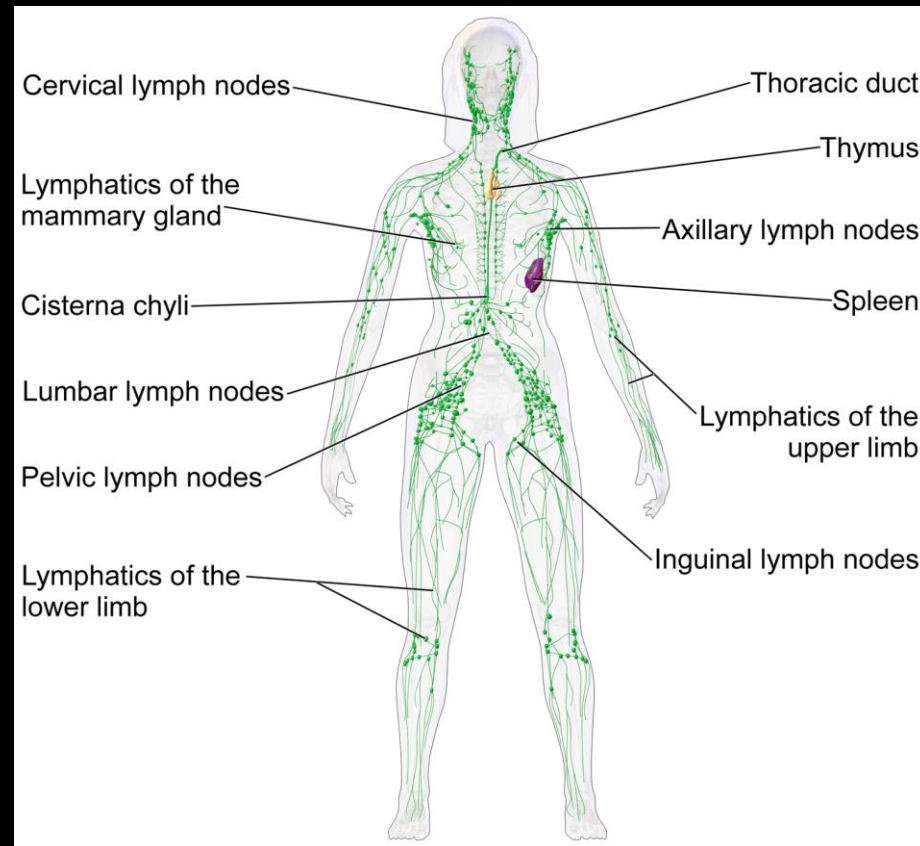
Digital nerve: ~1500 fibers, 3-5 fascicles

Median nerve: ~25,000 nerve fibers

Brachial plexus: ~145,000 nerve fibers

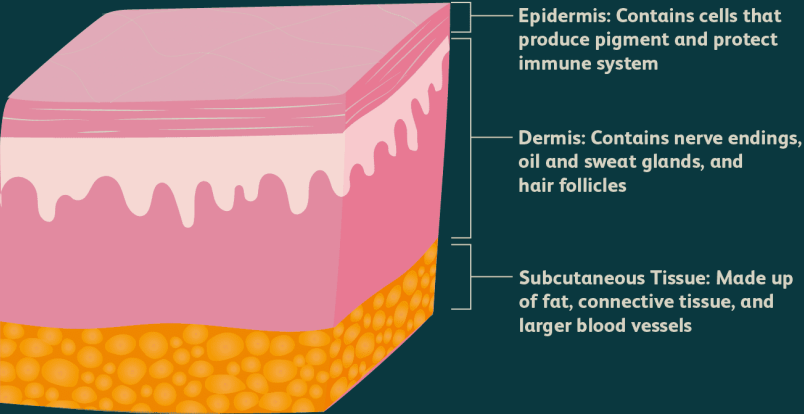


# LYMPHATIC CHANNELS



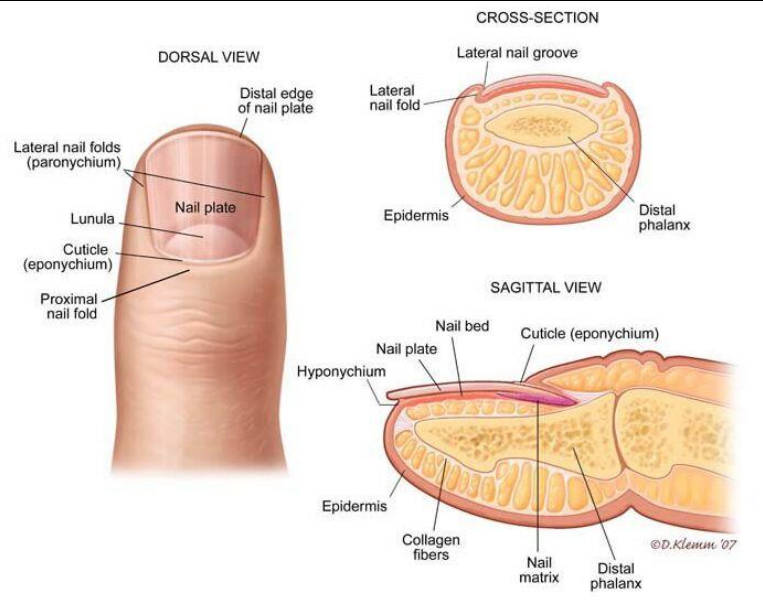


# Layers of the Skin



verywell

# SKIN/FAT/NAIL



# OVERVIEW

- Infections
- Trauma
- Numbness
- Non-traumatic pain
- Lumps and Bumps

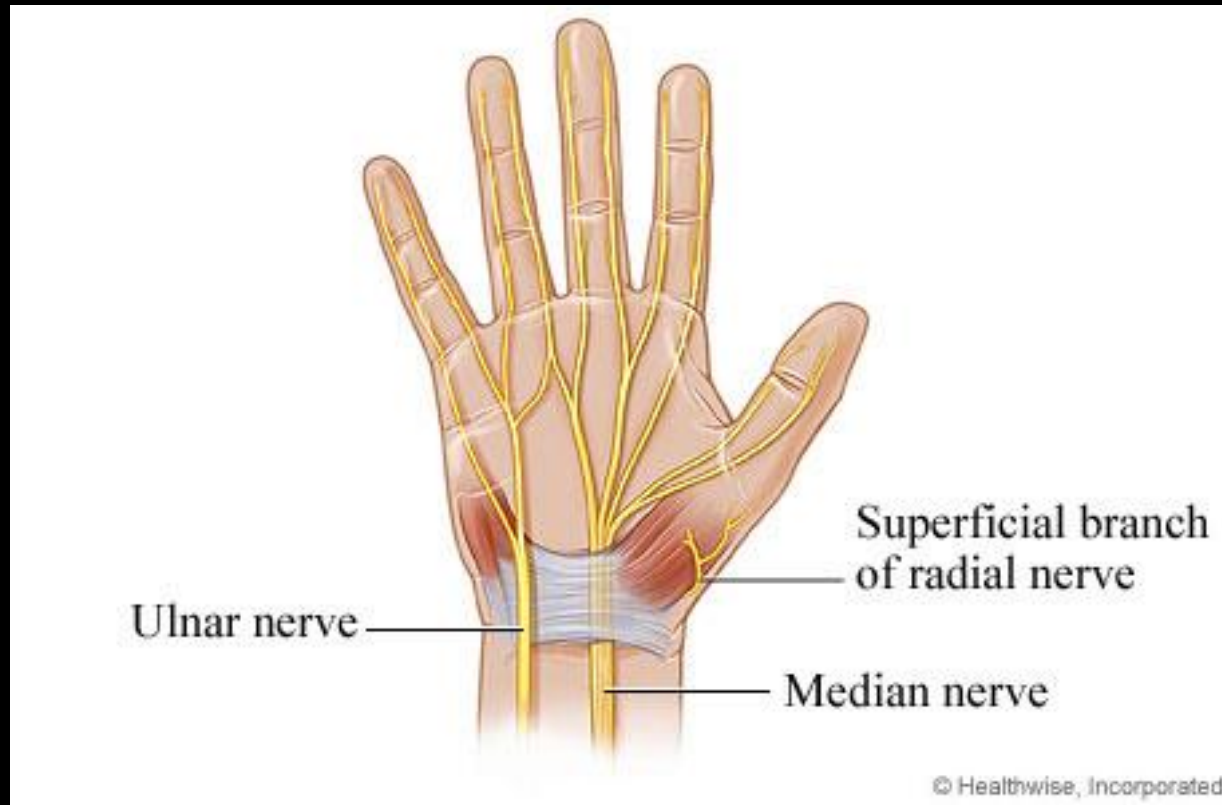


# 50-YEAR-OLD CONCERT PIANIST

- CC: My fingers are numb
- History:
  - 2 months tingling in fingers with sleep
  - Worse with driving, after piano
  - Worse when holding the cell phone and texting
  - Worse when holding the Ipad
  - No treatment yet

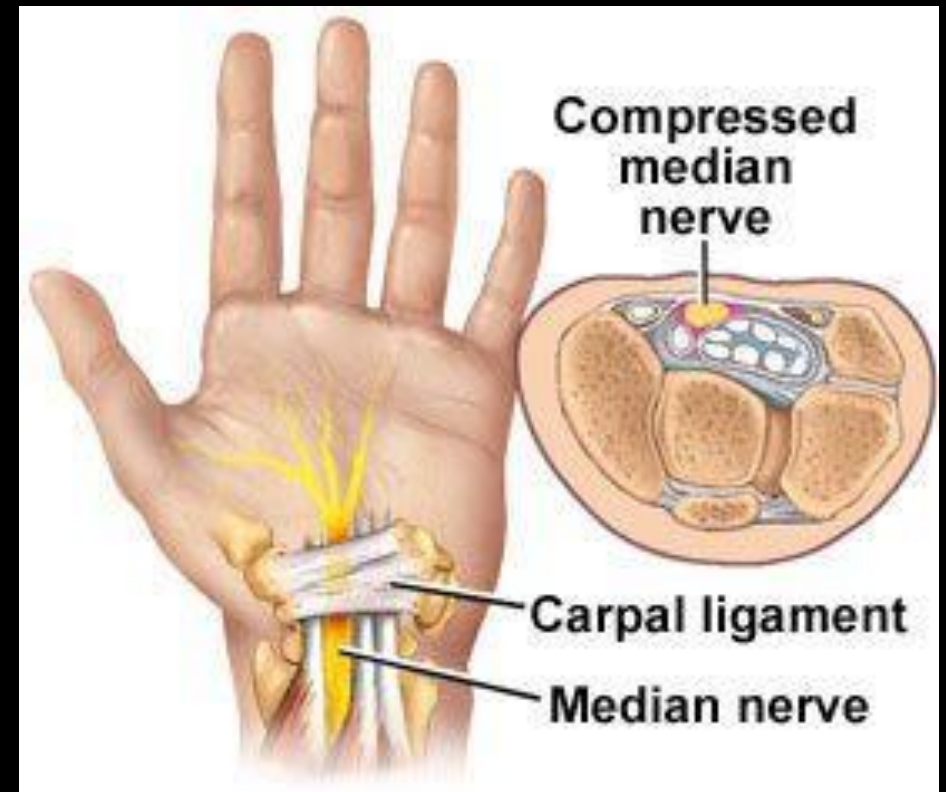


# NUMBNESS AND TINGLING



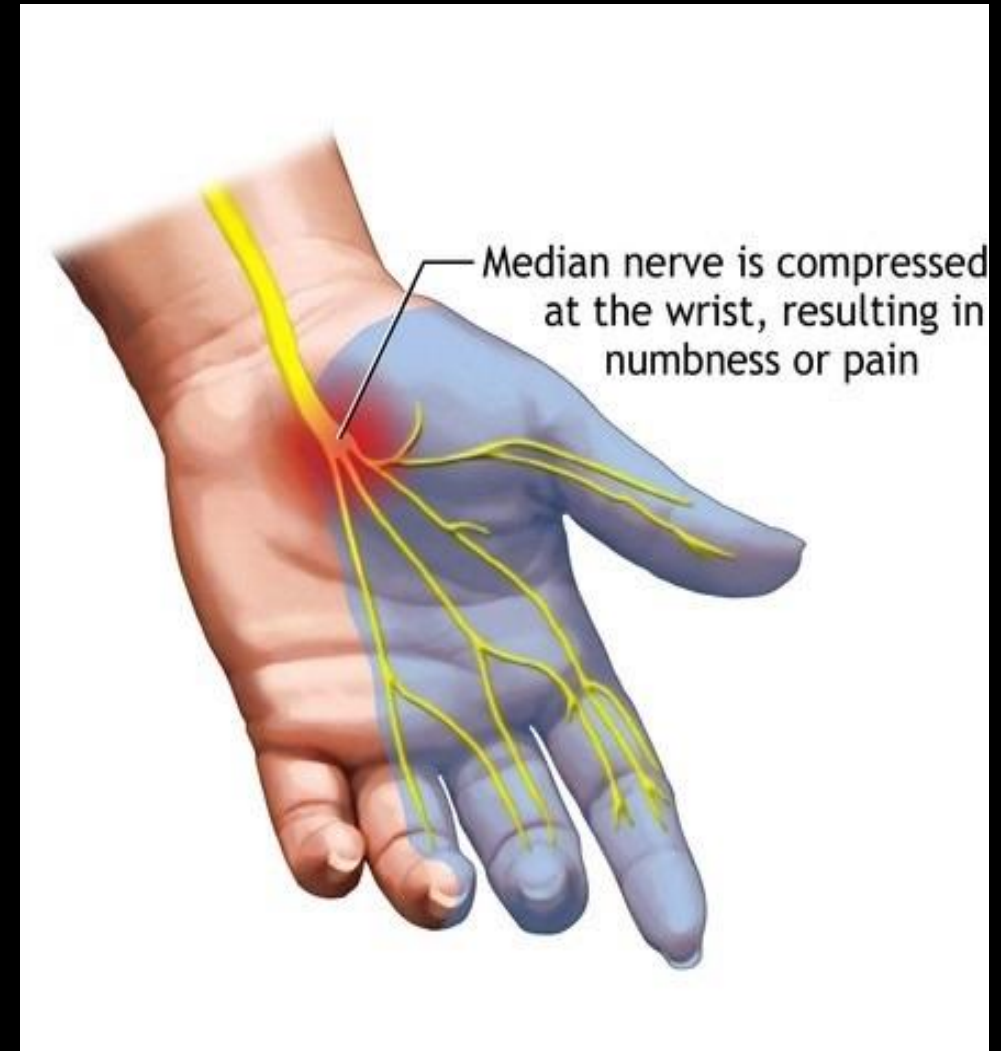
# CARPAL TUNNEL SYNDROME (CTS)

- Most common nerve compression problem
- Average age 54; 70 % female
- The median nerve pinched within a small tunnel in the wrist
- The carpal tunnel
  - 9 tendons and 1 nerve
- Etiology – increased pressure in the tunnel
  - Idiopathic - most cases
  - Pregnancy, diabetes, overuse, certain arthritis conditions

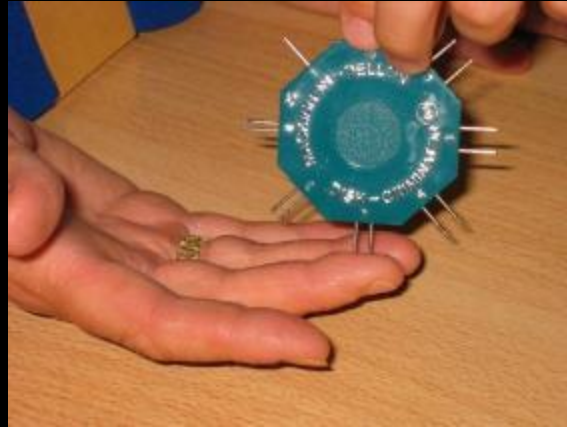


- Symptoms

- Numbness/tingling
- Night symptoms – 80% of the time this is CTS
- Pain – less common
- Gripping/grasping – increase symptoms
  - Driving, holding cell phone, repetitive motion
- Clumsiness, dropping things
- Differential
  - Median nerve compression proximally or cervical nerve root
  - Diabetic neuropathy



- Proactive tests
  - Tinel's sign
  - Durkan's test
  - Phalen's Test
- Decreased sensibility to light touch
  - 2 pt discrimination (normal 5-6 mm)
- Thenar atrophy
- Imaging/Electrodiagnostic tests
  - Symptoms atypical
  - Workman's compensation



## Tinel's Sign



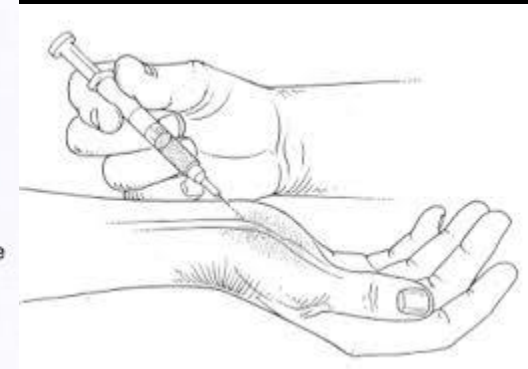
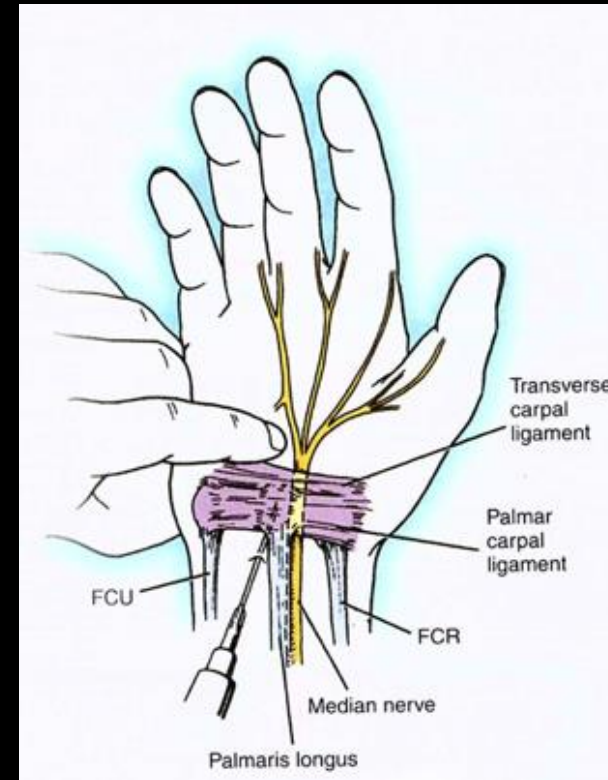
## Durkan's Test



## Phalen's Test



- Treatment
  - Brace – 6 week trial
  - Oral steroid or injection of steroid
  - Surgery
- Carpal tunnel steroid injection
  - 80% will get some symptom relief
  - Only 1/5 will have symptom relief at 1 year
    - Usually mild symptoms or short duration
  - Transient relief of symptoms – greater likelihood of success with surgery.





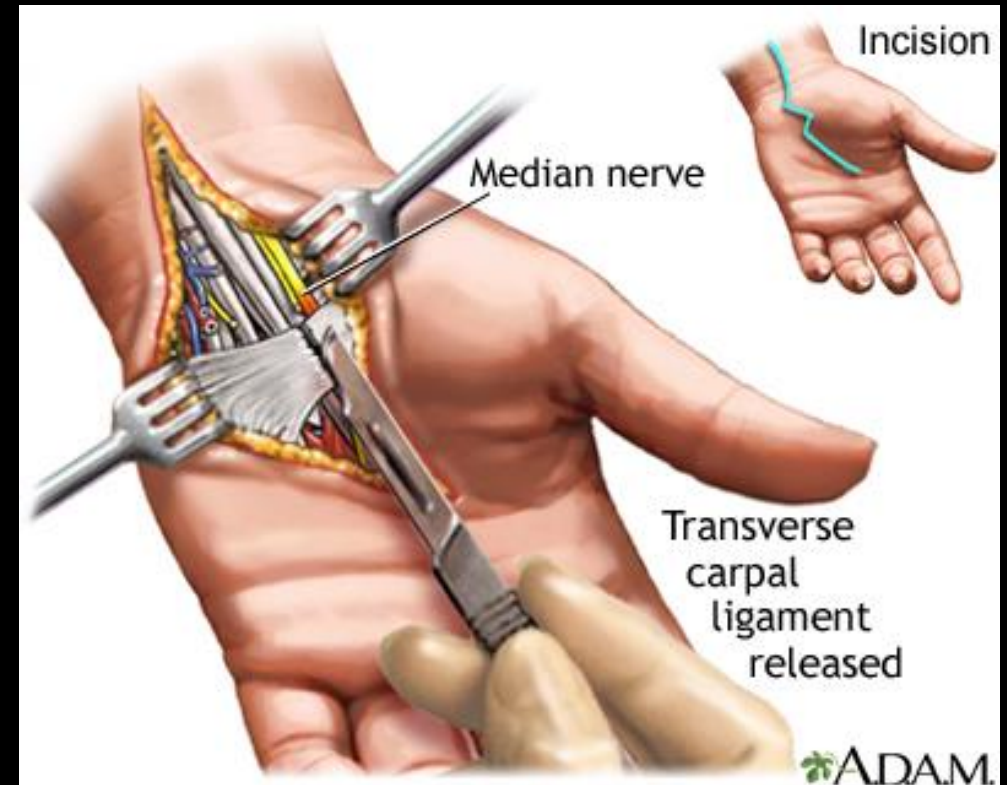
# SURGICAL TECHNIQUES

- Open
- Limited open
- Endoscopic

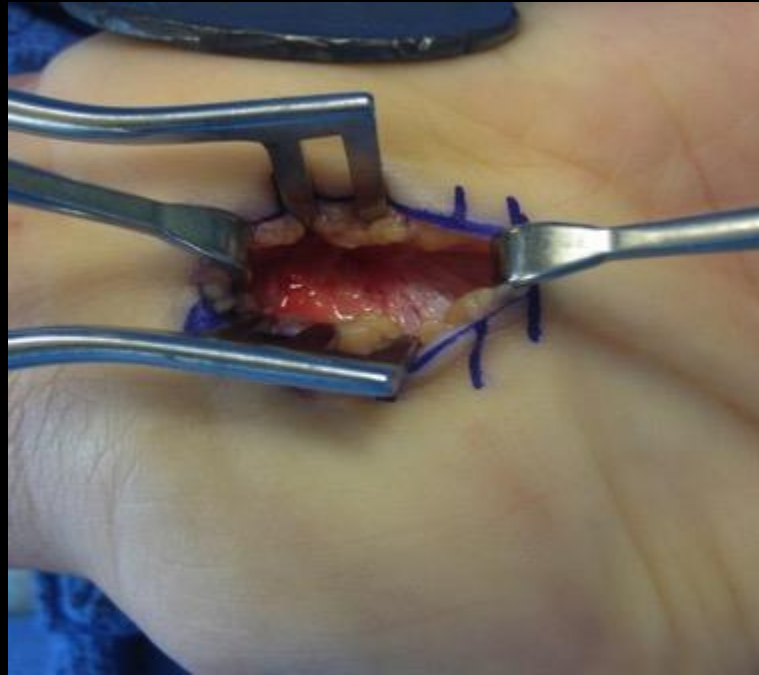


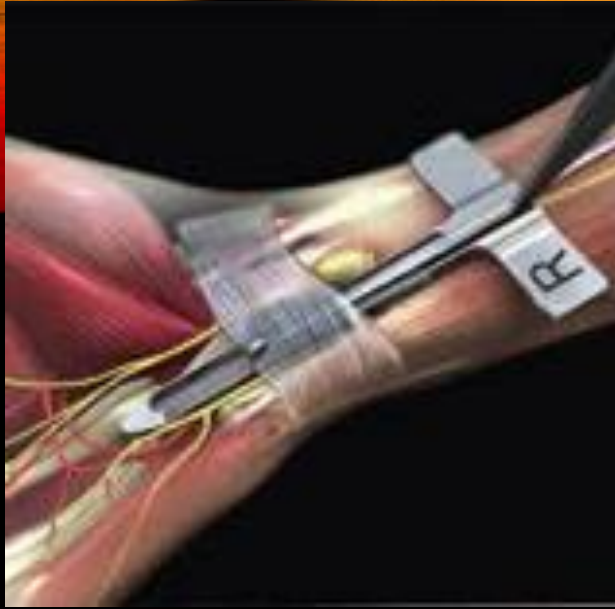
# TRADITIONAL OPEN CTR

- Single large incision over palm and wrist
- Local or regional anesthetic
- 10 minutes to perform
- Safe
- Visualize nerve
- Visualize intracarpal pathology
- Ensured release



# LIMITED (MINI) OPEN CTR





## ENDOSCOPIC

- Small incision in wrist
- Avoids palm incision
- Cannula placed inside carpal tunnel
- Endoscope allows visualization
- Special blade used to cut transverse carpal ligament

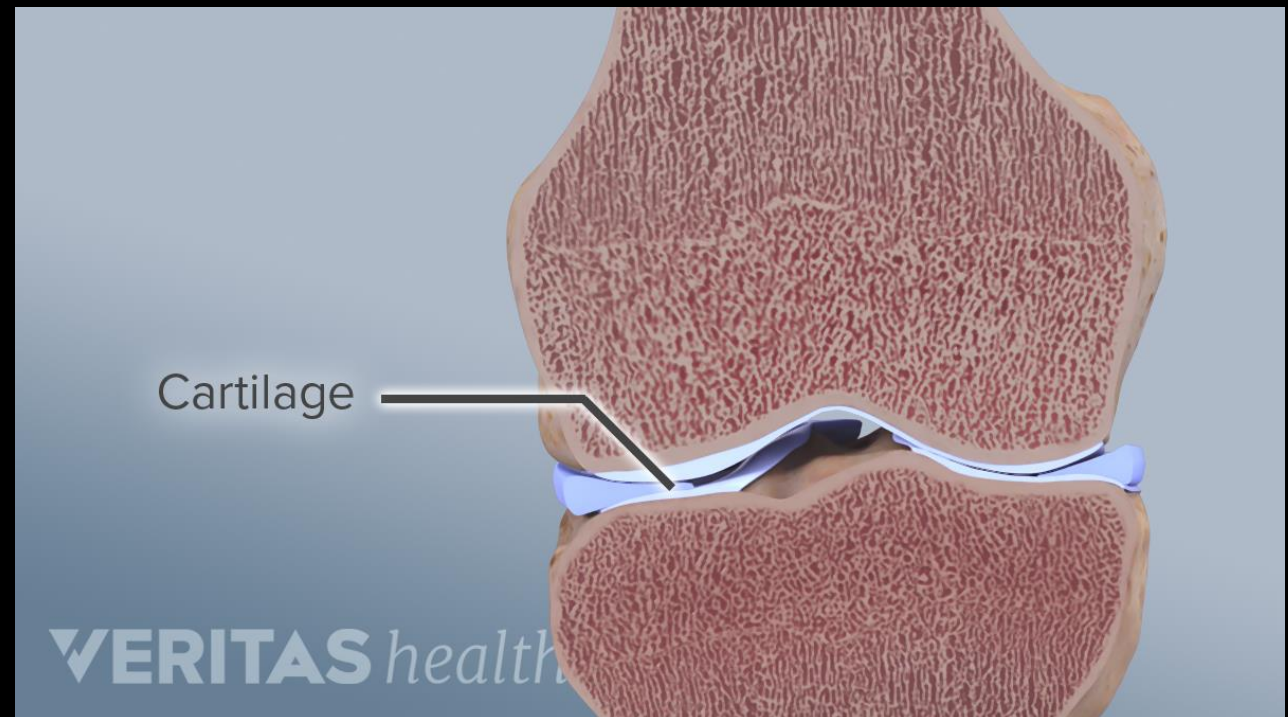
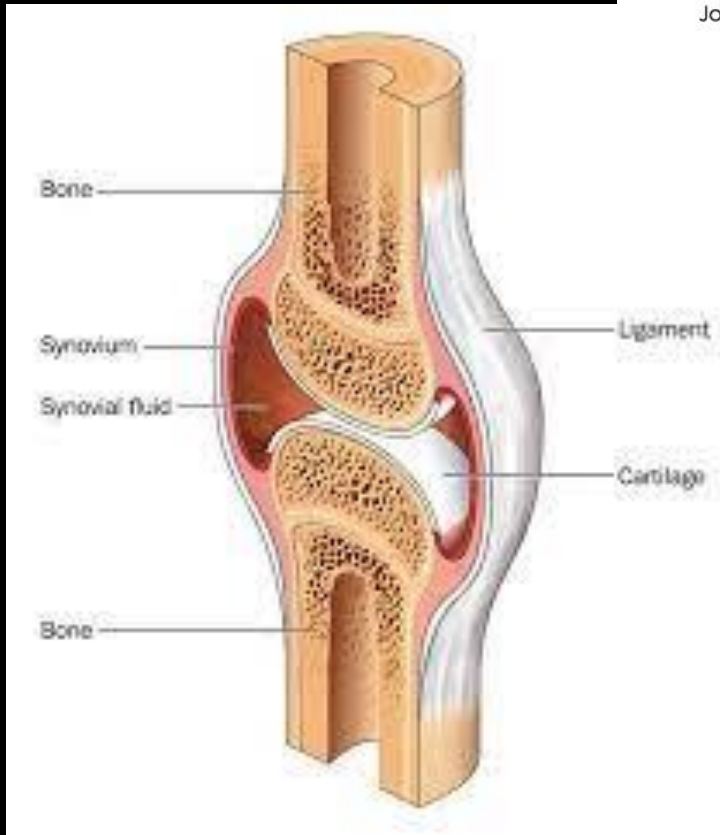
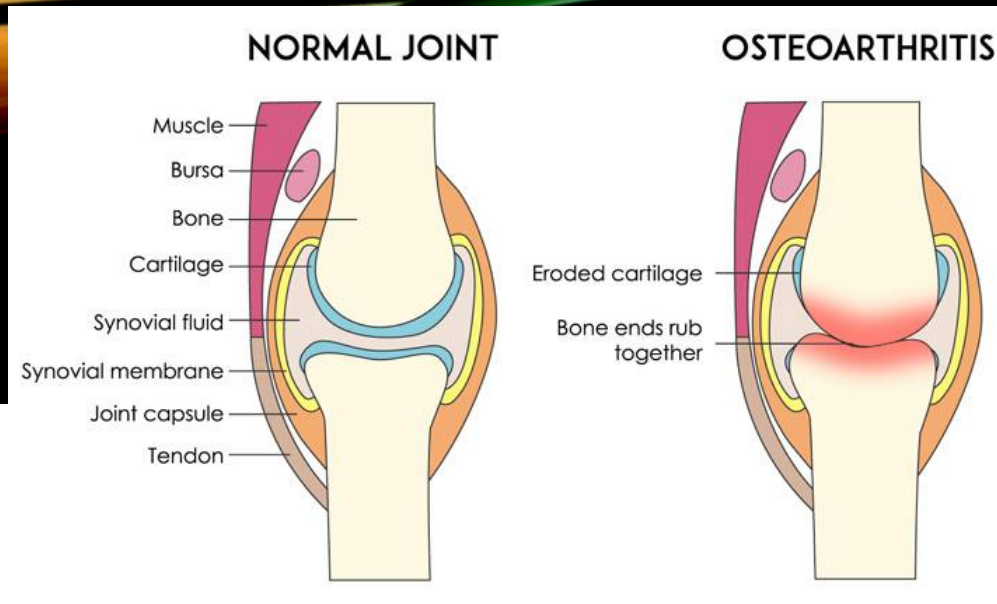


# 55 YEAR-OLD PHYSICIAN

- CC: My thumb hurts
- History:
  - 55 y.o. female physician
  - 3 months pain with pinch/grip
  - Unable to open water bottle
  - No treatment yet

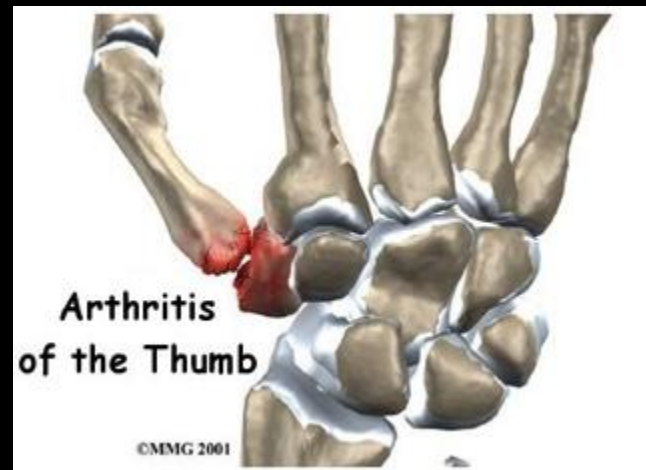


# CARTILAGE



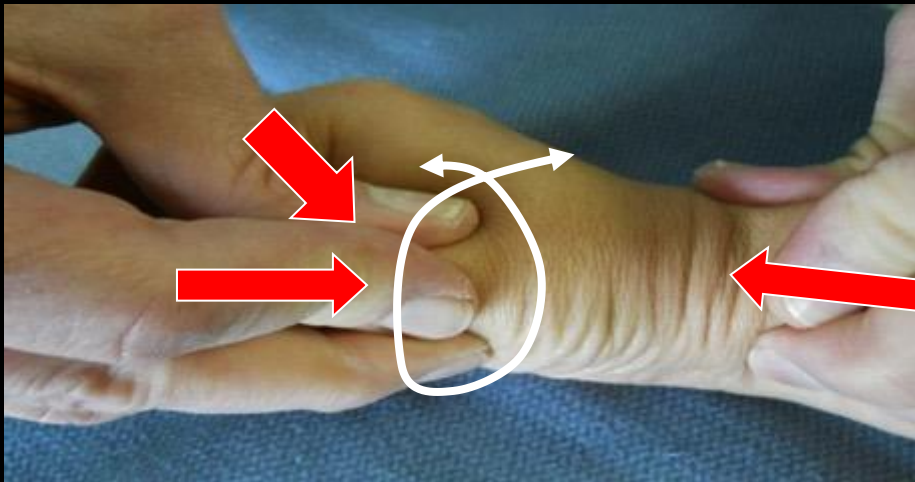
# CMC ARTHRITIS

- More common in women than men (3:1)
- Pain at base of the thumb and radial wrist
- Treatment
  - Initial – brace, ibuprofen, glucosamine/chondroitin sulfate
  - Functional aids (jar openers, gripping devices)
  - Steroid injection
    - Short term – months to 1 year
  - Surgery
    - CMC arthroplasty



# CMC OA

- Tender at CMC and/or STT joint
- Pain/crepitation at CMC and/or STT joint
- Grind test – direct pressure on base of thumb metacarpal with shucking or twisting of the CMC joint – reproduces pain and feel sandpaper sensation

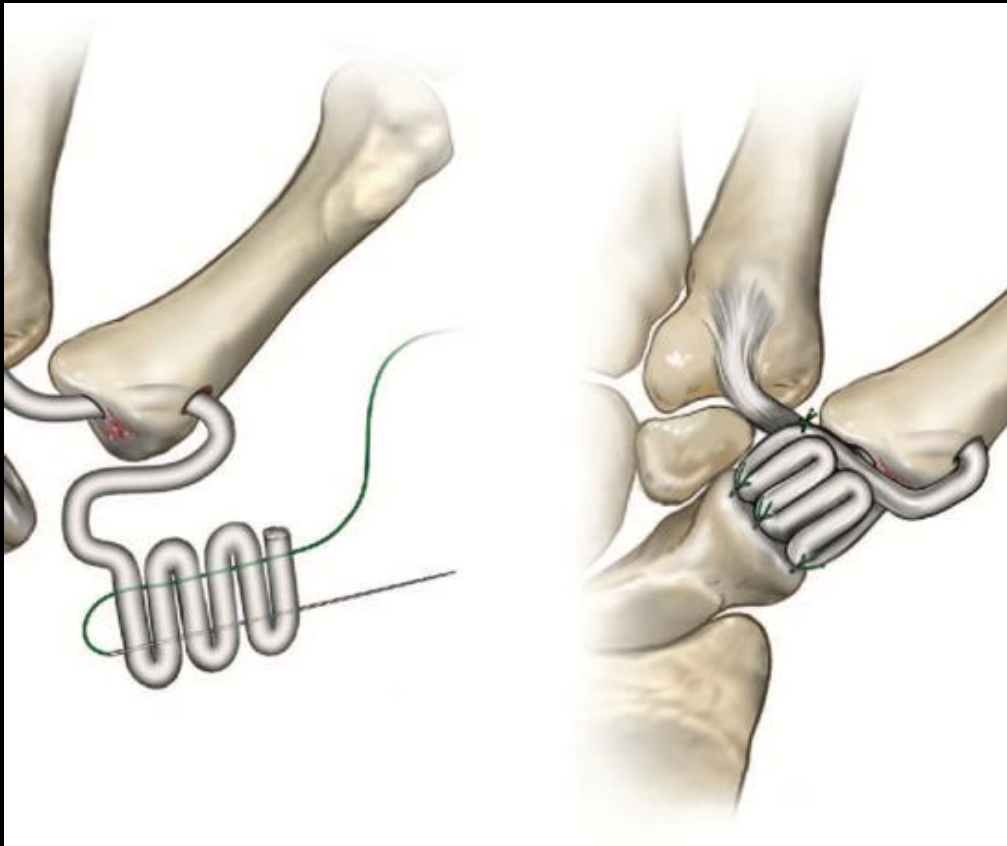




# TREATMENT OPTIONS



# CMC ARTHROPLASTY



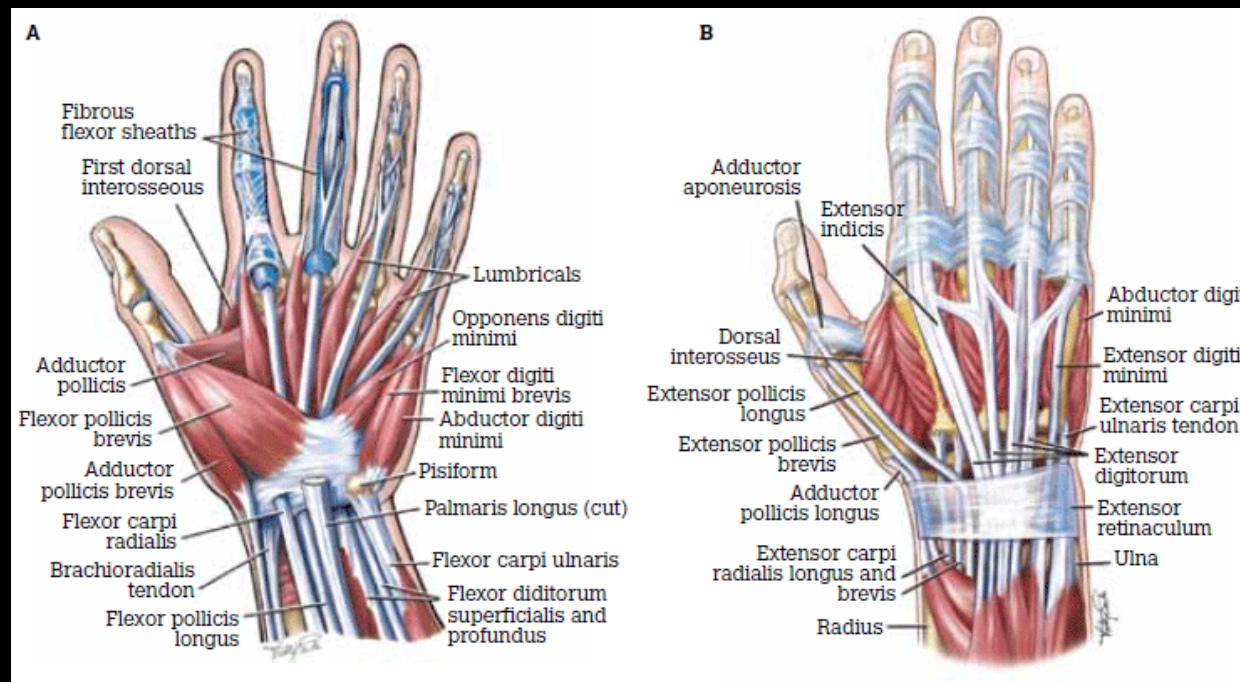
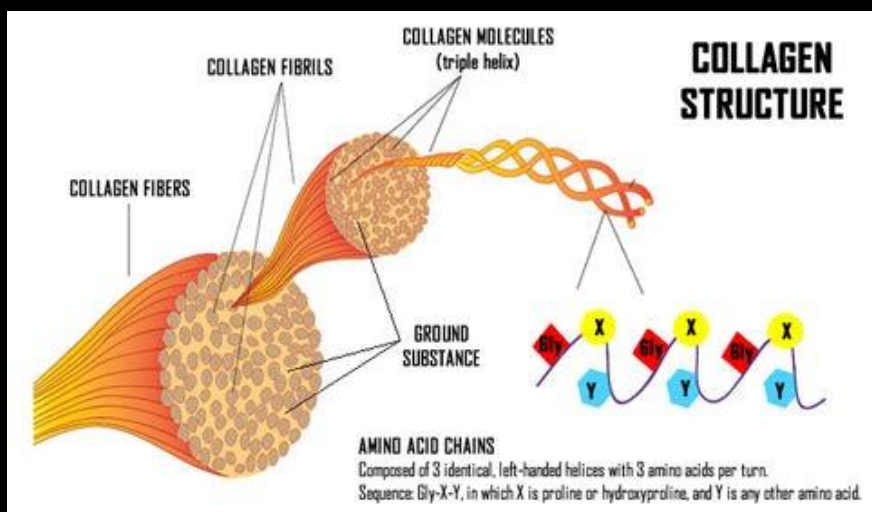
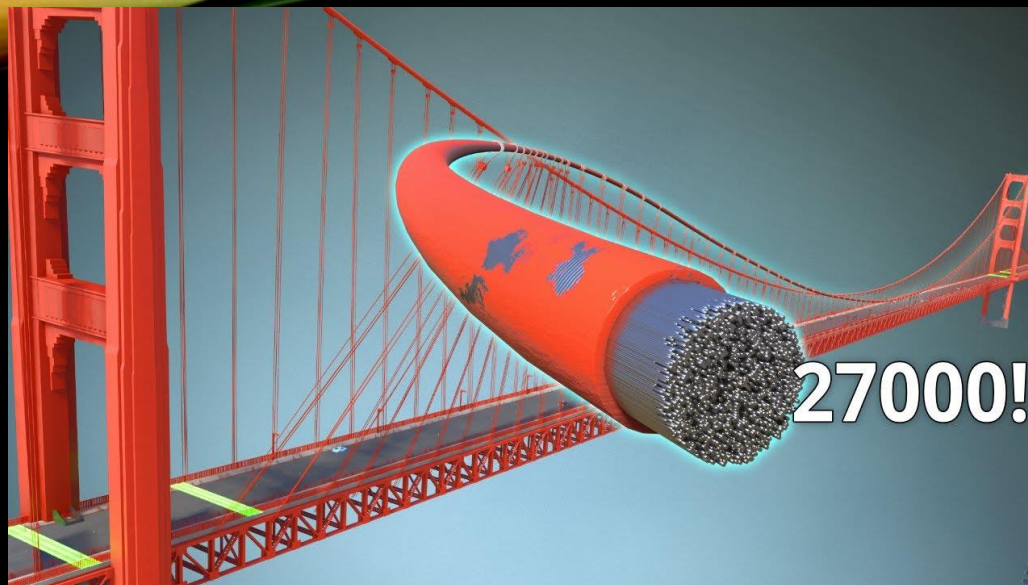
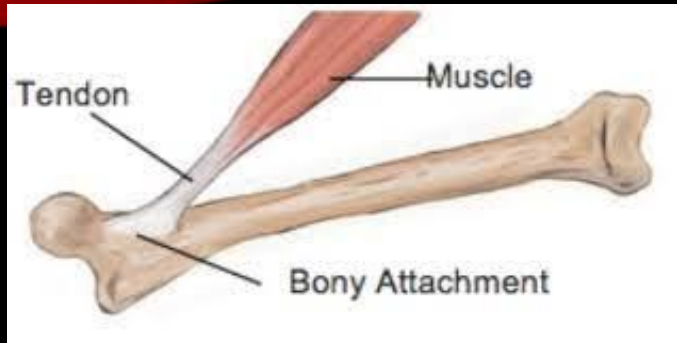
- Trapezium is removed
- Space can be filled with tendon
- 4-6 weeks cast immobilization
- 4-6 months for full recovery
- >90% pain relief
- Grip and pinch improve by 15-20%
- Surgery designed for pain relief



# 35-YEAR- OLD FEMALE

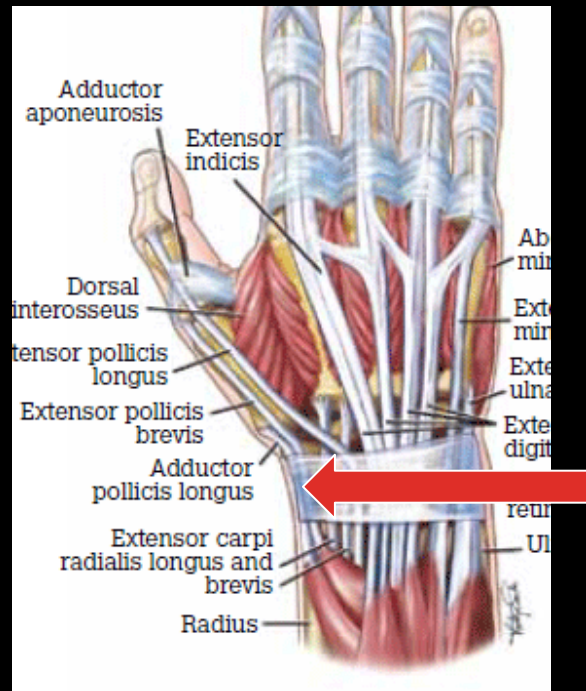
- My wrist hurts
- History:
  - Had baby 3 months ago
  - Pain with lifting infant
  - Pain with thumb motion

# TENDON



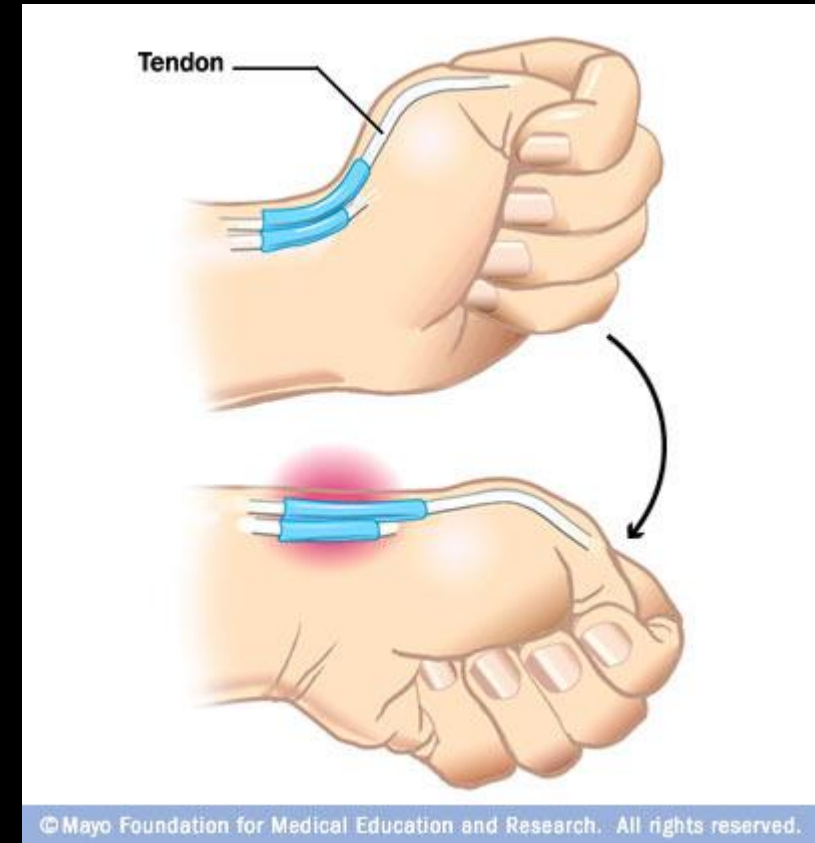
# DEQUERVAIN'S TENOSYNOVITIS

- Female > male
- Childbearing and perimenopausal years
- Repetitive activities, trauma, pregnancy
- Radial wrist pain
- Friction between tendons and the tunnel



# DEQUERVAIN'S TENOSYNOVITIS

- PE
  - TTP over first compartment
  - Finklestein test
  - Small ganglions over the radial styloid is common
- Differential –
  - OA - thumb, wrist
- Treatment
  - NSAID
  - Thumb spica brace
  - Steroid injection
  - Surgery



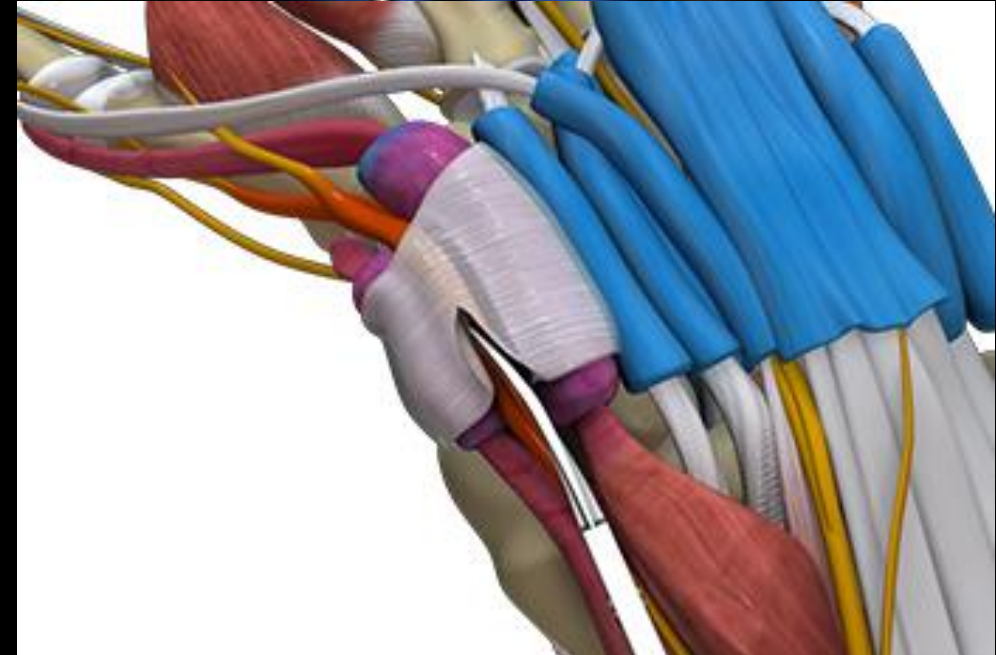
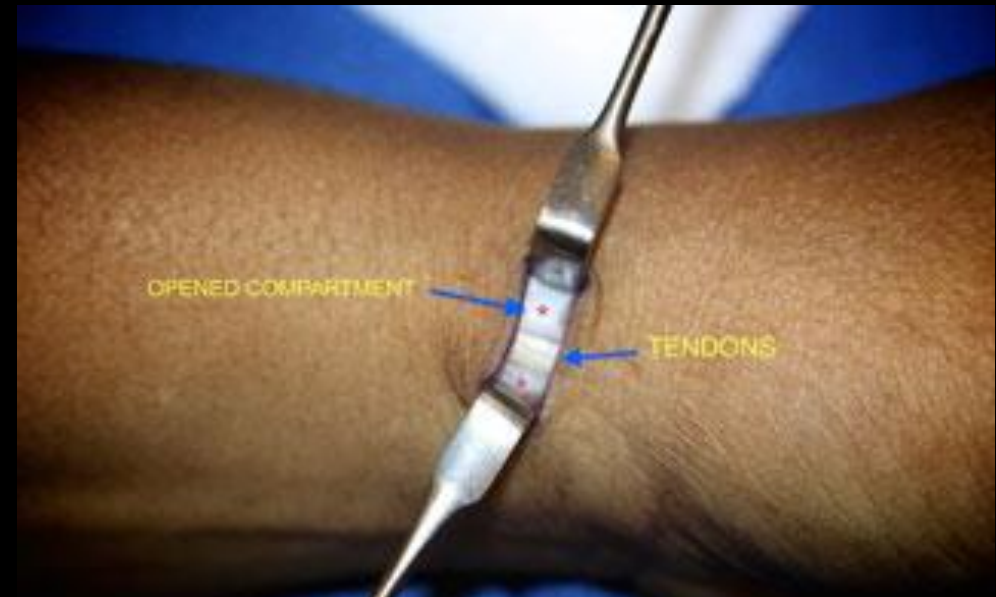
# DEQUERVAIN'S STEROID INJECTION



- 60% of patients have pain relief at 13-18 months
- Hypopigmentation
- Fat atrophy
- Use water soluble steroid (dexamethasone)
- 1-2 injections max
- Warn diabetics of transient rise in glucose and likely less effective

# DEQUERVAIN'S RELEASE

- Small incision
- Tendon sheath released
- Essentially 100% success rate





# 21 YEAR-OLD MALE

I have a lump on my wrist

## History:

- Construction worker
- Noticed for 4 months
- No injury
- Pain with pushups
- Some days lump “disappears”
- Father died of cancer



- Benign fluid filled cyst – “jelly like”
- Dorsal wrist – most common
- PE
  - pain with wrist extension (dorsal)
  - Trans illumination test
- Treatment
  - Rest, bracing, nsaids
  - Needle aspiration – 60-70% recurrence rate
  - Surgical excision – 5% recurrence rate



## 65 YEAR-OLD MALE

- I can't straighten my finger
- History:
  - Pain in palm with lump for 4 months
  - No pain now but hard to put hand in his pocket



# DUPUYTREN DISEASE

- Benign fibromatosis of the palm
- Most common in 40 + white men but seen in all races and sexes
- Ring finger most common
- Nodules in palm that can be painful in early phase (eventually painless)
- Cords along length of finger can contract over time
- Never causes loss of finger flexion, only extension



# DUPUYTREN DISEASE

- Treatment
  - Always observation until MP joint 30 and/or PIP 10 degrees
  - Needle aponeurotomy, collagenase, open surgery
  - Needle/collagenase – 50% recurrence at 4-5 years
  - Open surgery – 50% recurrence at 10-12 years



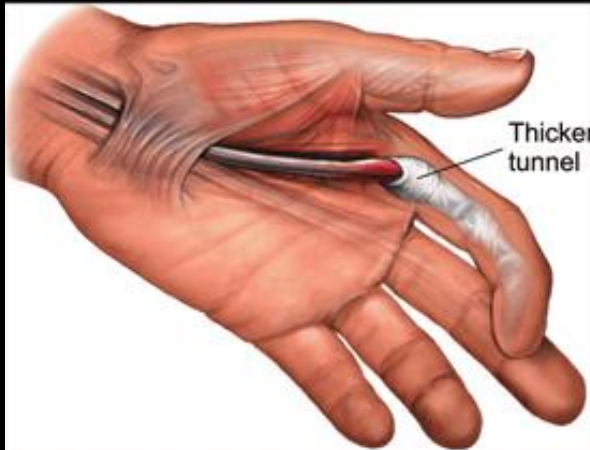
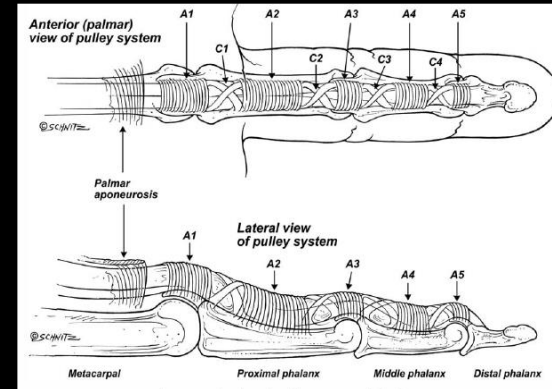
## 65 YEAR-OLD MALE

- I can't straighten finger
- History:
  - Diabetic
  - Pain with gripping
  - Waking up in morning with finger "stuck"
  - Fingers intermittent "pop"
  - Now permanently flexed



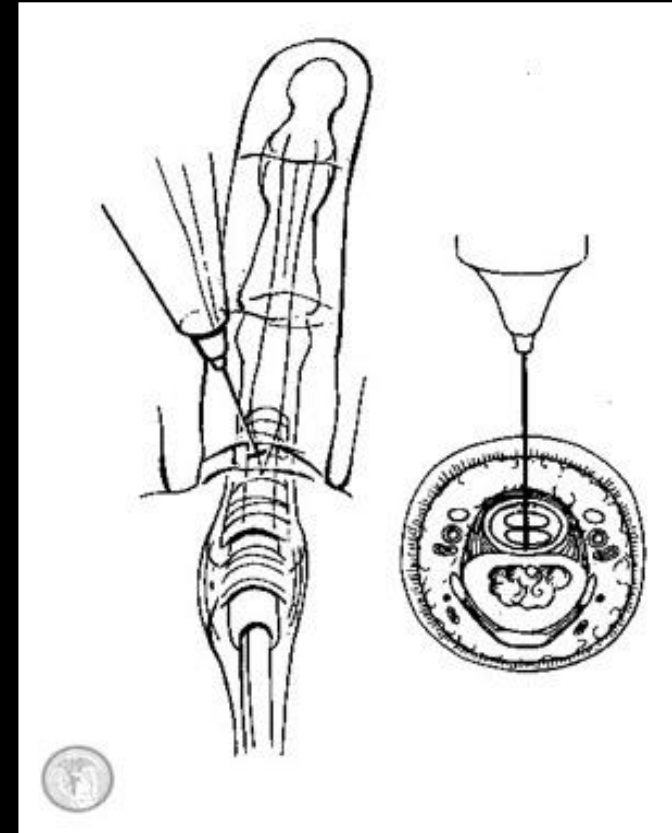
# TRIGGER FINGER

- Trigger finger
  - Tendon thickens and tunnel narrows in response to friction (fibrocartilaginous metaplasia)
  - Thickened tendon/sheath catch (trigger) with movement



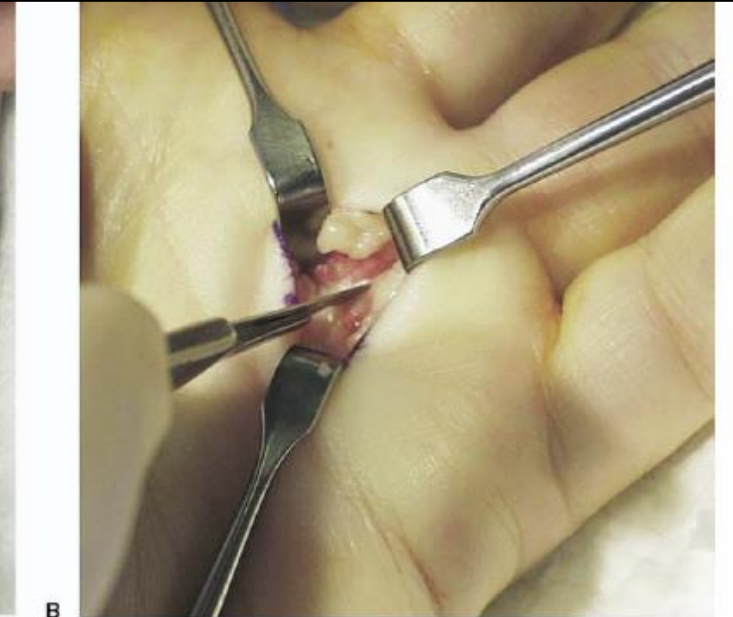
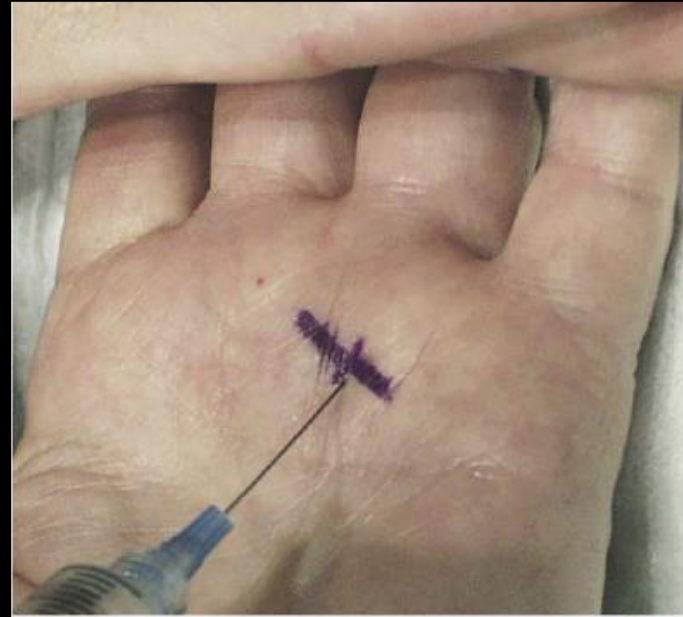
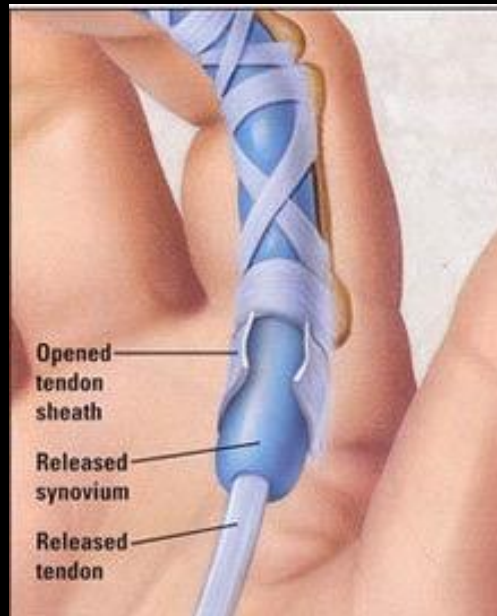
# TRIGGER FINGER

- Physical exam
  - Finger pops with flexion and/or extension
  - Tender with palpation of A1 pulley
- Treatment
  - Rest, nighttime finger extension splinting, nsaids
  - Injection of steroid at A1 pulley level
    - no need to be in the tunnel
    - 70% success in non-diabetic, <50% in diabetic





- Release A1 pulley – nearly 100% success
  - Tenderness at incision site for weeks to months
  - Stiffness common and sometimes requires therapy



# THANK YOU

Neil G. Harness, MD

Kaiser Permanente Orange County