

Exertional Tendinopathies

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Exertional???

- Webster- precipitated by physical exertion but usually relieved by rest
- Exertion- mental or physical effort/energy



Tendinopathies/tendinitis/tendinosis

- Etiology
- Pathology
- Diagnosis
 - History
 - Physical
 - Diagnostic test
- Treatment
 - Nonoperative
 - Operative
- Examples

Tendinopathies/tendinitis

- > 50% occupational disorders can be classified as a type of tendinopathy or tendinitis

Table 3
Most Common Diagnoses and Locations of Chronic Tendinitis

Diagnosis	Location
Rotator cuff tendinitis	Supraspinatus tendon insertion
Lateral epicondylitis (tennis elbow)	Common wrist extensor tendon origin
De Quervain's disease and trigger finger	Sheath/pulley of abductor pollicis longus and long finger flexors
Hamstring tendinitis	Hamstring tendon origin
Quadriceps tendinitis	Quadriceps tendon insertion
Patellar tendinitis (jumper's knee)	Patellar tendon origin
Achilles tendinitis	Sheath, midsubstance, or calcaneal insertion
Posterior tibial tendinitis	Midsubstance

Almekinders LC Tendinitis and other chronic tendinopathies JAAOS 1998

Tendon Load

- Anabolic and catabolic
- Amount, intensity, frequency
- Intrinsic factors
 - Genetics, age, gender
 - Biomechanics
 - Body composition
 - Local cytokine production
 - Small proteins active cell signaling

Cook JL Purdam CR Is tendon pathology a continuum? A pathology model to explain the clinical presentation of load induced tendinopathy BrJSports Med 2008 409-416

Etiology

- Inflammatory- minimal
- Failed Healing- angiofibroblastic hyperplasia
- Degenerative
 - Irreversible degenerative changes, disintegration of matrix

Etiology

Table 1
Etiologic Factors in
Chronic Tendon Problems

Extrinsic factors

- Repetitive mechanical load
- Increased duration
- Increased frequency
- Increased intensity
- Technique errors

Equipment problems

- Footwear
- Racquet size
- Running surface
- Protective gear

Intrinsic factors

Anatomic factors

- Malalignment
- Inflexibility
- Muscle weakness
- Muscle imbalance
- Decreased vascularity

Age-related factors

- Tendon degeneration
- Decreased healing response
- Increased tendon stiffness
- Decreased vascularity

Systemic factors

- Inflammatory enthesopathy
- Quinolone-induced tendinopathy

Etiology

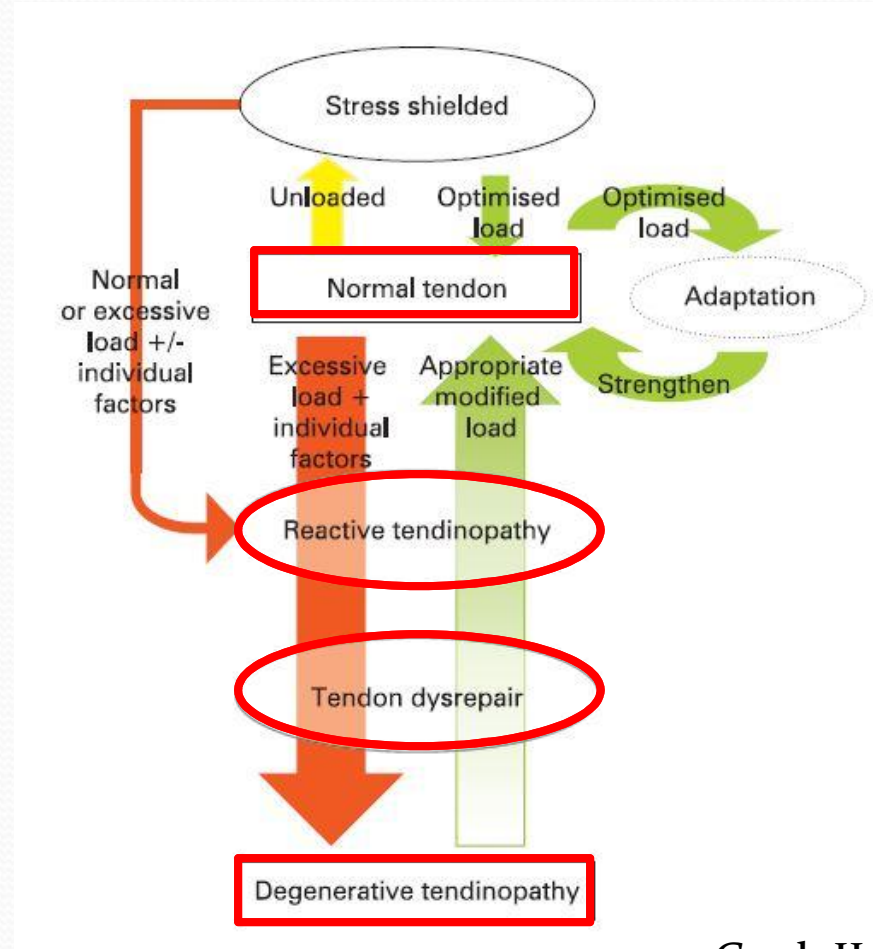
- Limited support-
Ergonomic changes will
result in less
tendinopathy's
- However may help
treatment



"No wonder your arm aches. Shackles should be placed at eye level. Man, it's an ergonomic nightmare down here."

Almekinders LC 1998

Continuum of pathology



Cook JL BrJSports Med 2008 409-416

Diagnosis

- **History**
- Physical
- Diagnostic tests

Radiographs

- Not always on initial visit but usually in work related for causality
- Calcification/ossification supports chronicity
 - Lateral epicondylitis
- R/o adjacent pre-existing arthritis
 - ie de Quervain's and Thumb CMC arthritis
- If trauma involved- Fracture

Advanced Imaging

- Bone scans rarely used
 - RSD/ CRPS
- Ultrasound
 - Tendinopathy
 - Tendon rupture
 - Location rupture
- MRI
 - As US
 - Soft tissue
 - Rule out if diagnosis difficult

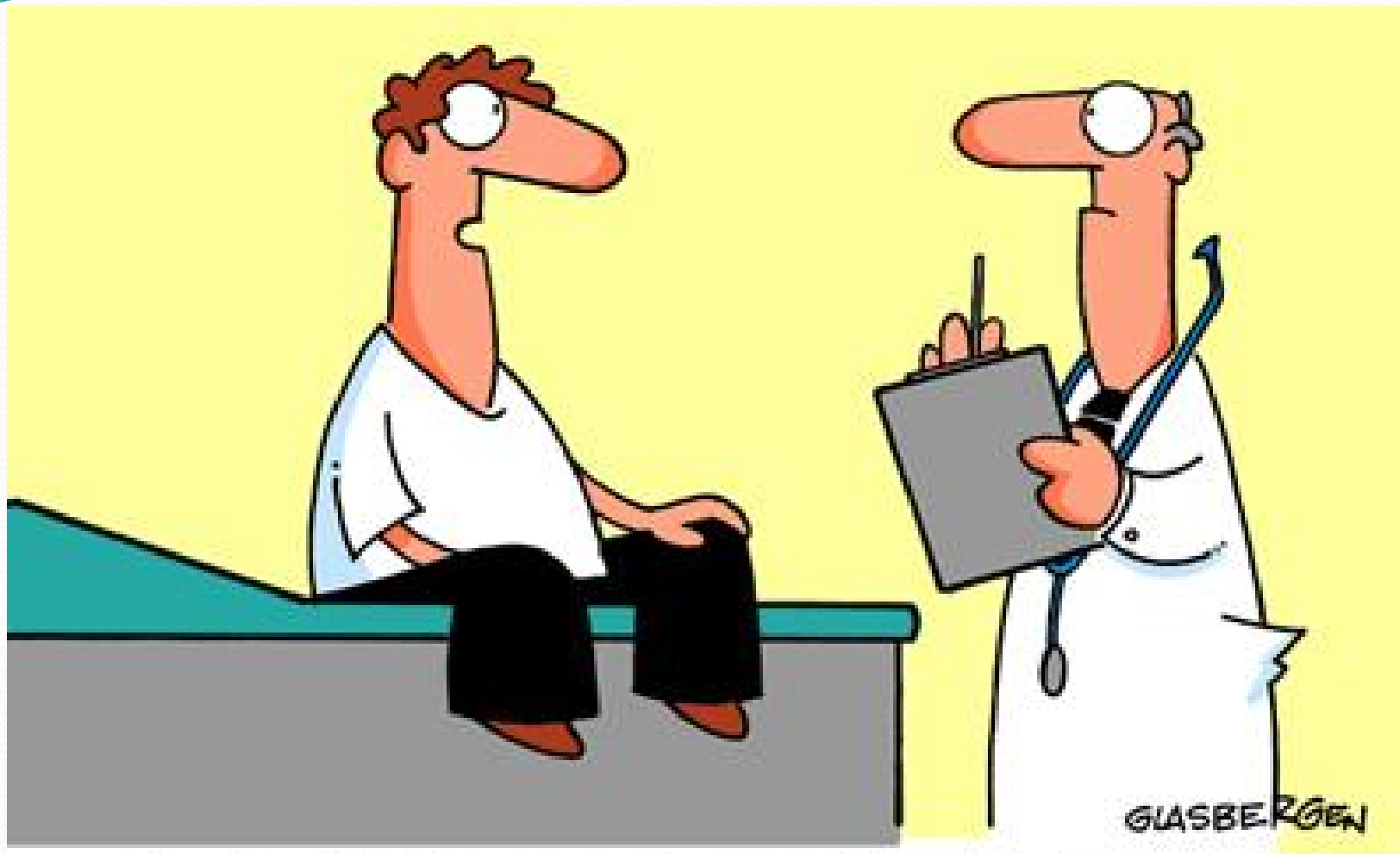


Diagnostic Injections

- Confirm source of pain

Laboratory Studies

- Infection
- Diabetes, thyroid
- Inflammatory arthritis



**“I already diagnosed myself on the Internet.
I’m only here for a second opinion.”**

Nonoperative Treatment

- Explain
 - Diagnosis
 - Treatment nonoperative and operative
- NSAID
- Cortico-steroids- Injectable, Oral

Physical/Hand therapy

- Evaluate worker
- Improve flexibility
- Correct muscle imbalance
- Strengthening
 - Eccentric in shoulder/elbow
- Modalities- ? Benefit
 - Passive, **Active better**
 - Heat/ice
 - US
 - Iontophoresis

Operative

- Early
 - Severe disability
 - Clearly identifiable problem
- Failed non operative 4-6 months

Workplace Disorders

- Different than Non-Work Related
 - Psychosocial factors
 - Job issues
 - Treatment
 - Team



Workplace Disorders

Treatments:

- Education
- Adjust expectations
- Attempt work prior to surgery
- ? permanent job modification



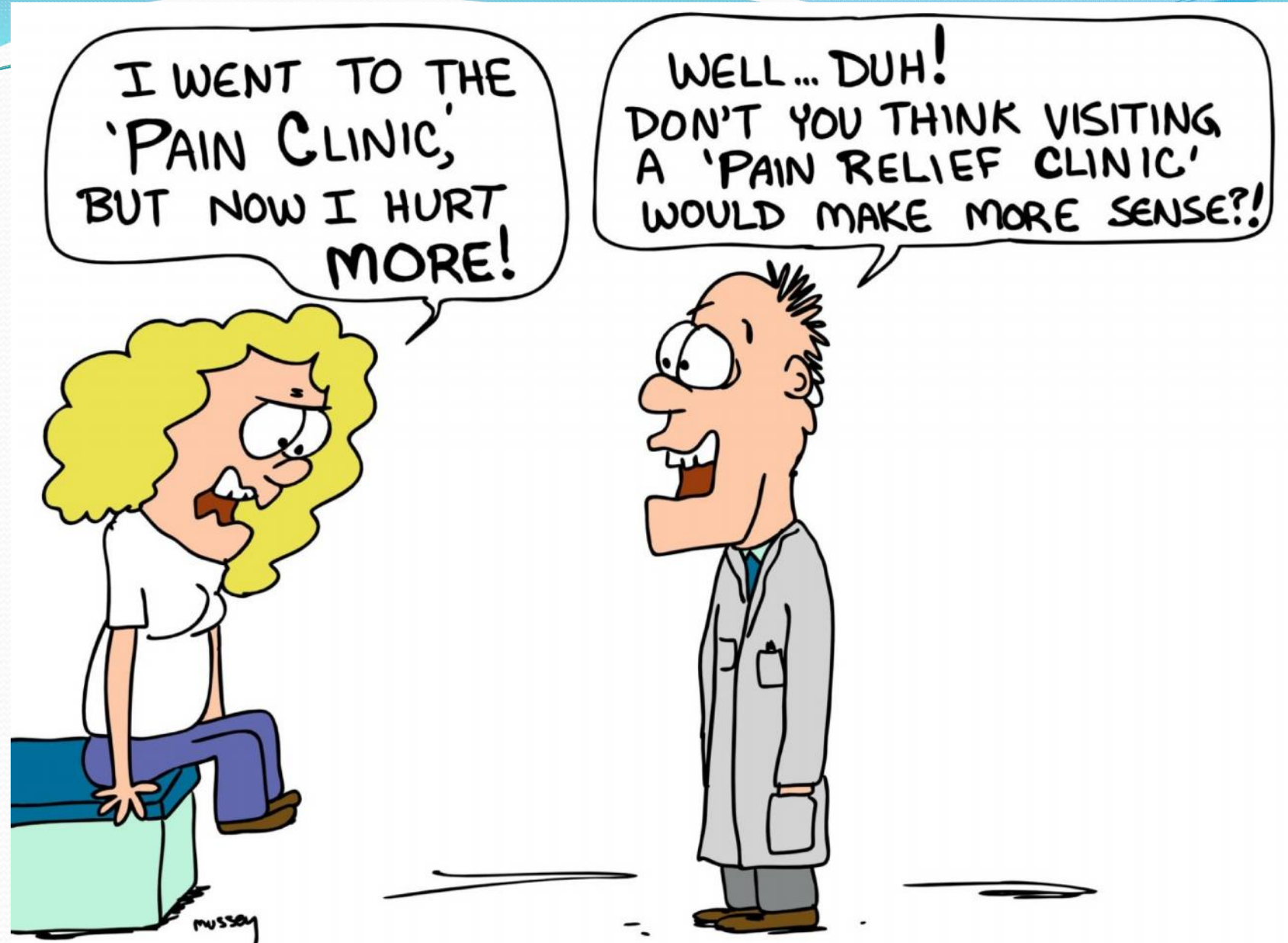
Return to work following injury: the role of economic, social, and job-related factors.



E J MacKenzie, J A Morris, Jr, G J Jurkovich, Y Yasui, B M Cushing, A R Burgess, B J DeLateur, M P McAndrew, and M F Swiontkowski

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- younger age
- higher education
- higher income
- strong social support
- employment not physically demanding
- **Receipt of disability compensation had a strong negative effect on RTW**



Tennis Elbow (*Epicondylitis*)

Common condition

- Insertional Tendinopathy
 - Microtears in tendon
- Pain at lateral elbow
 - Increases with resisted wrist extension





"It's not Tennis Elbow. This is from under use...Elbow Macaroni Syndrome."

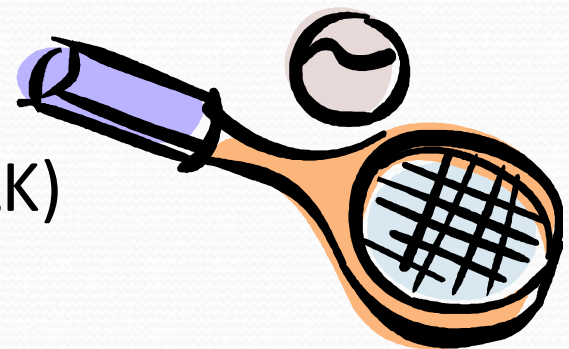
Tennis Elbow Non-op Treatment

- Educate
- NSAID
- Avoid Provocative activities- Palm up
- Relative rest
 - Counterforce strap
 - Wrist splint
- Stretching
- Eccentric strengthening
- ?? Steroid injections
- ?? PRP etc.



Tennis Elbow Treatment

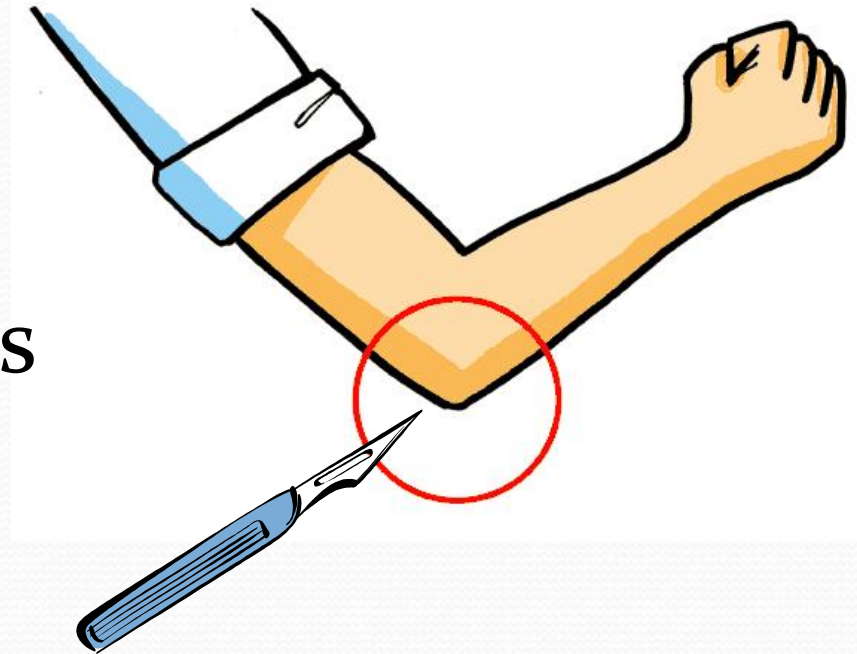
- Surgery:
 - 6-12 months symptoms
 - Failed nonoperative management
- Preop MRI in work related
- Procedures:
 - Percutaneous release- (HLK)
 - Elbow arthroscopy- debride (HLK)
 - Open procedure



Tennis Elbow Surgery

Percutaneous Release

- Minimal incision
- Faster rehabilitation
- Minimal scar
- Potential cost savings
- Don't see joint
- Don't debride





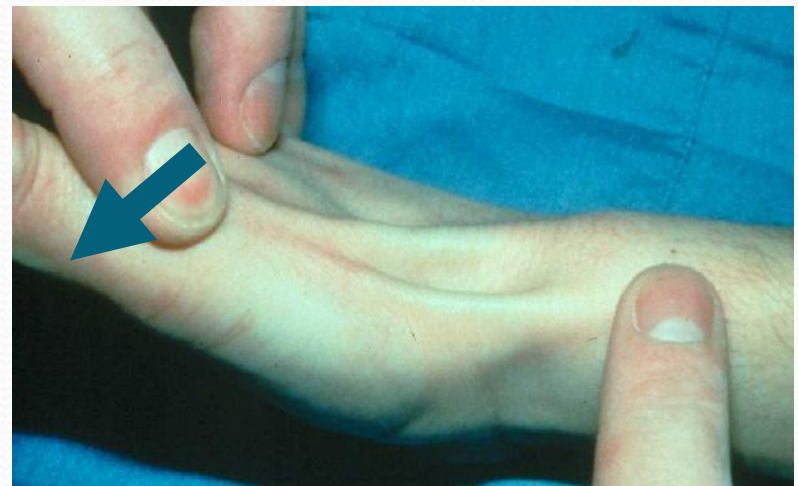
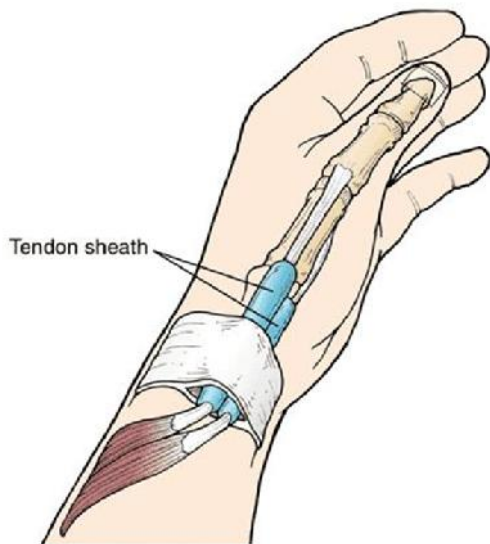
Tennis Elbow Post-op

- Recovery varies
- Light activities 5-10 days
- Stretch helps
- Lift palm up
- Usually PT
- In WR may take 6 months to heavy



deQuervains

- Peri (Para)-Tendinitis (..osis No inflammation)
- Common cause- Radial wrist pain
- Tender first dorsal extensor compartment



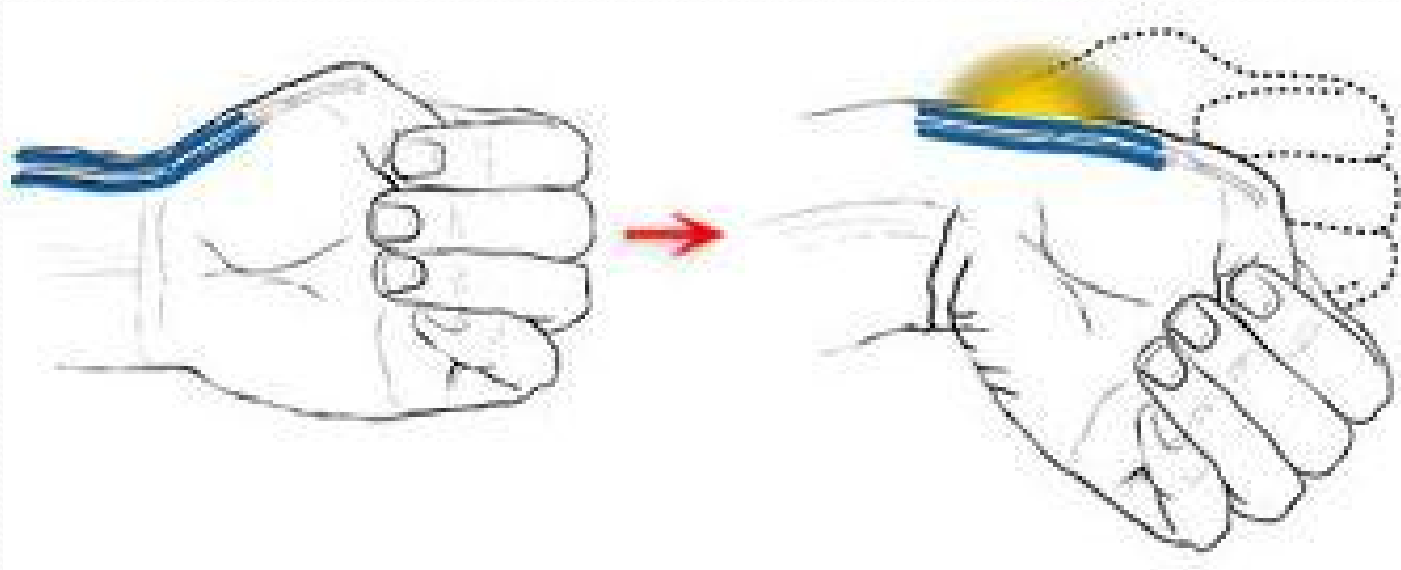
+ resisted Extension

deQuervain's Tenosynovitis

- Incidence
 - Women > Men
 - 8/1 in some reports
- Risk Factors
 - Combination of factors : some evidence
 - Post partum
 - Anatomic predisposition- **Septum**

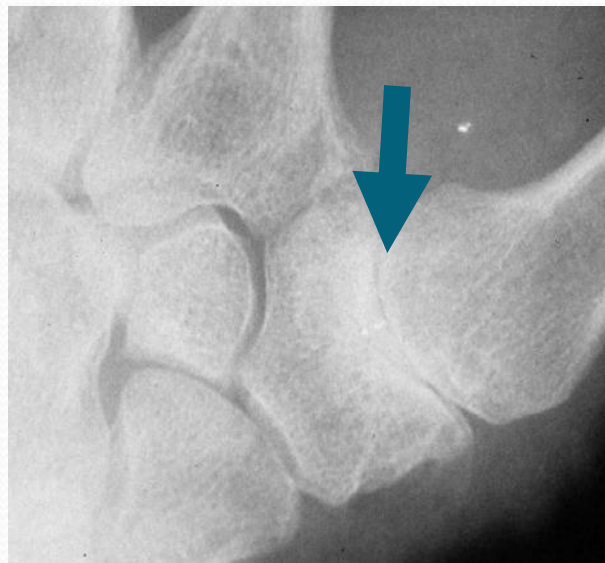
deQuervain's Tenosynovitis

- + Finkelstein's Test



deQuervains

Differential Diagnosis



**CMC
DJD**

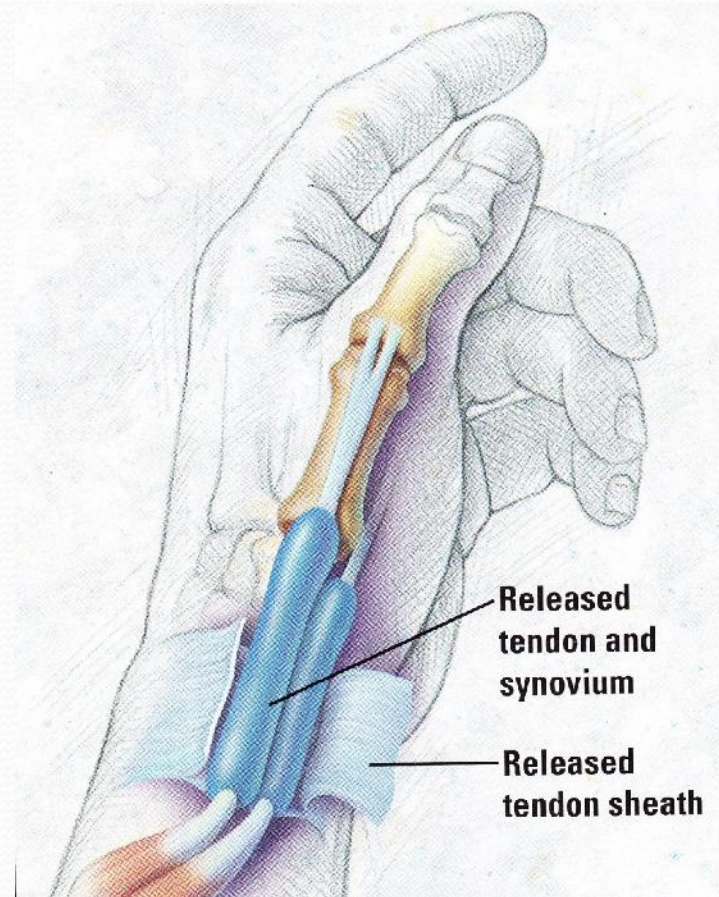
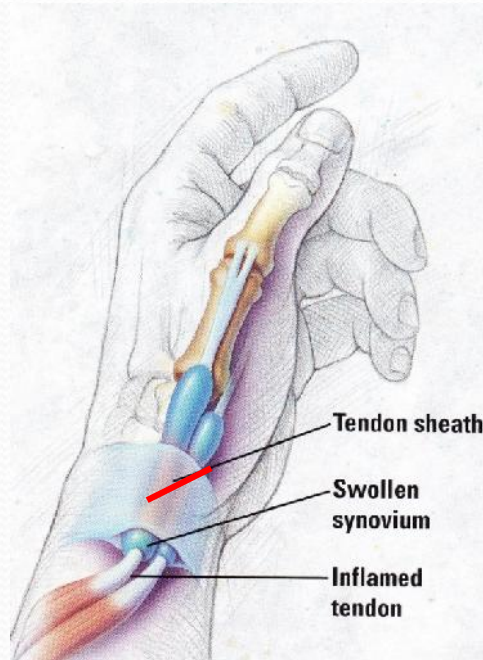
deQuervain's Tenosynovitis

- Splinting
- NSAIDs
- Cortisone injection



deQuervain's Tenosynovitis

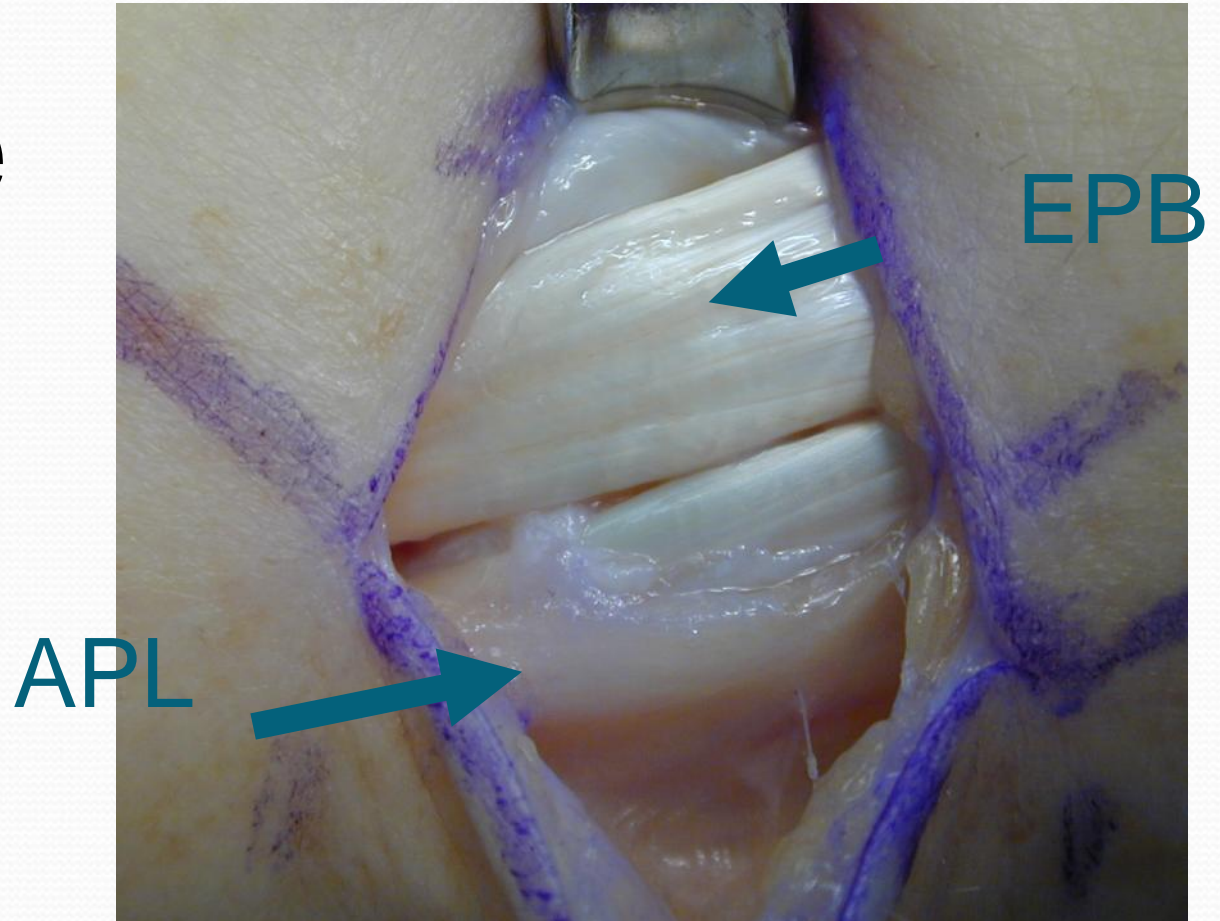
- Surgical Release



deQuervains

Surgical Treatment

Complete
Release

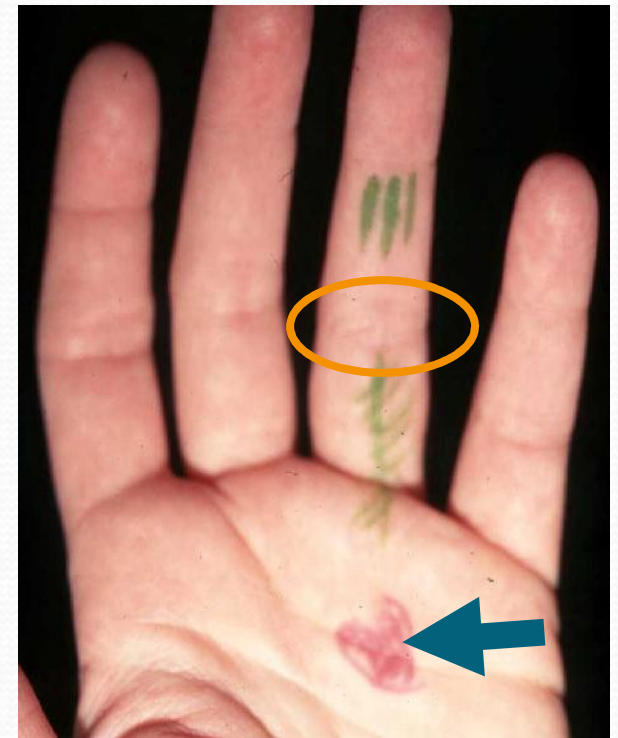


deQuervain's Tenosynovitis

- Post op
 - 1 to 3 weeks splinting
 - Tendon gliding, avoid maximal flexion
- Return to work

Trigger Digits

- Snapping, pain in digit
- Tender in palm over A-1 pulley
- May seem to be at PIP Joint



Trigger Finger

- Incidence
 - 2-3% population
- Risk Factors
 - Woman
 - Diabetes
 - 10% incidence
 - Combination of factors



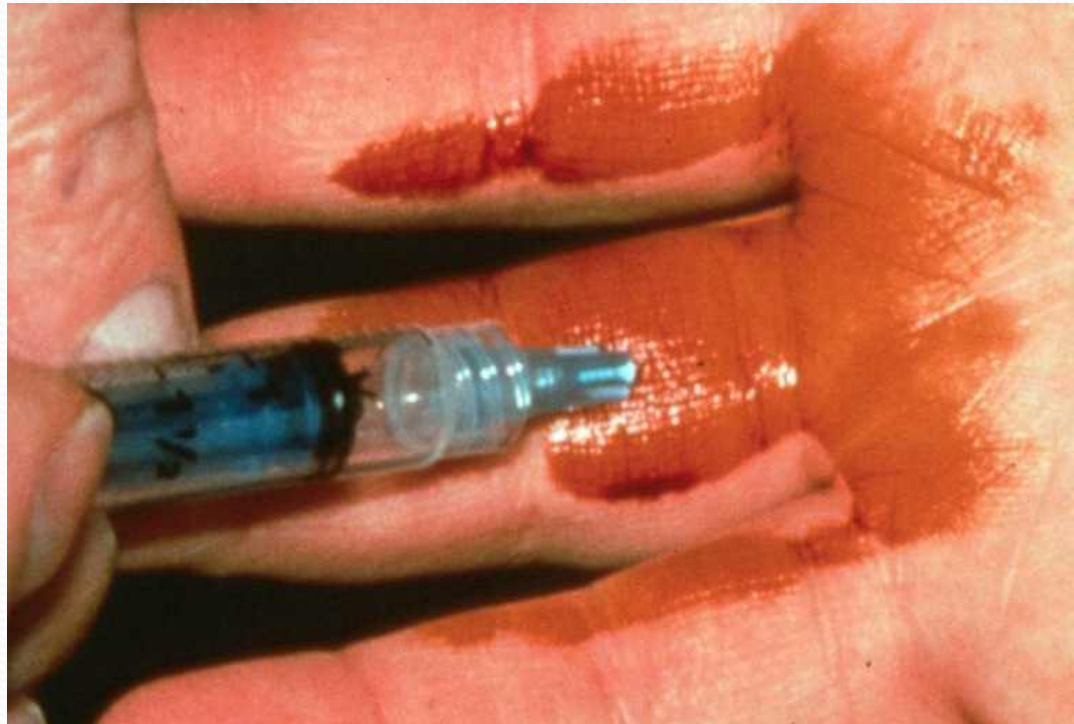
Trigger Digits

- Locked in flexion



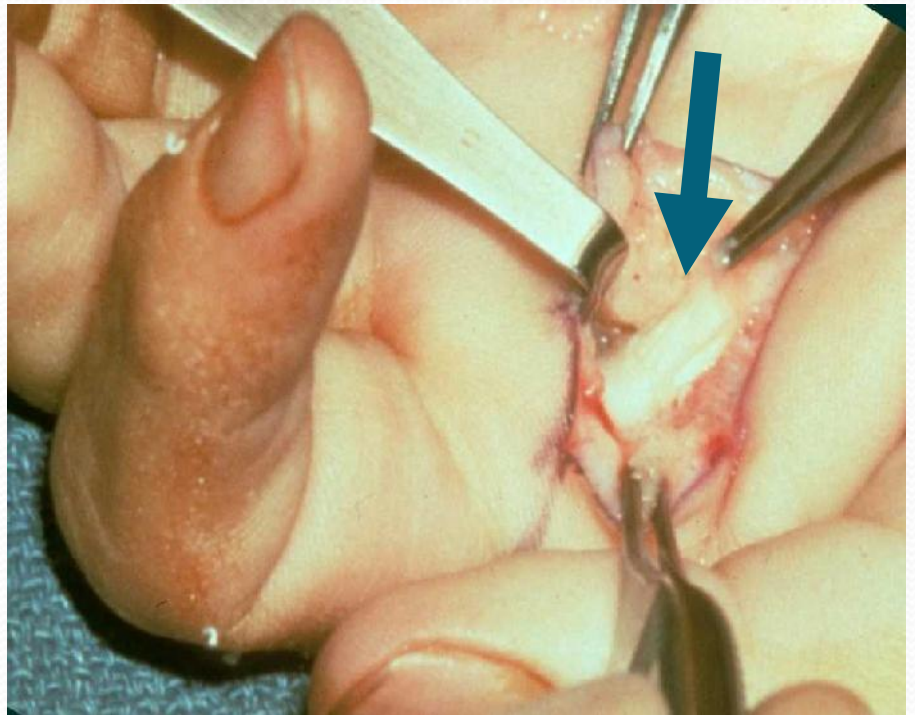
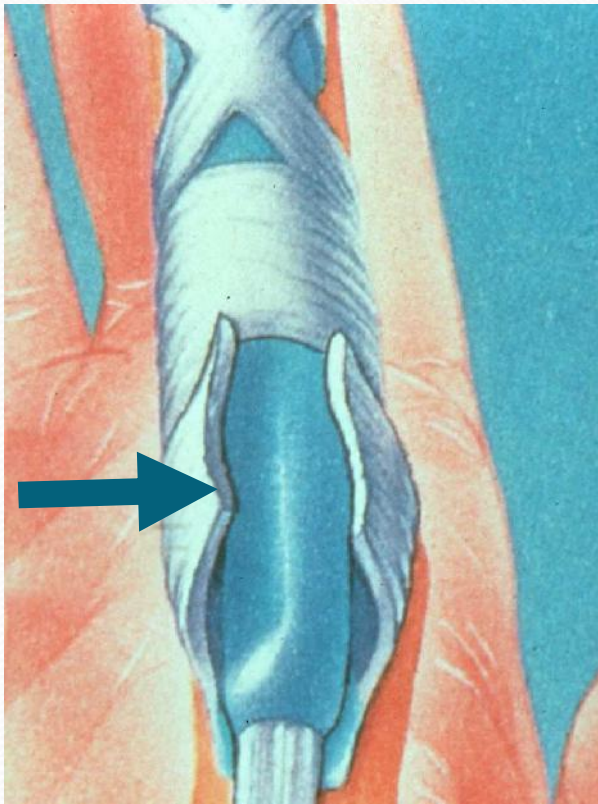
Trigger Digits Treatment

- Splint
- NSAID
- Inject



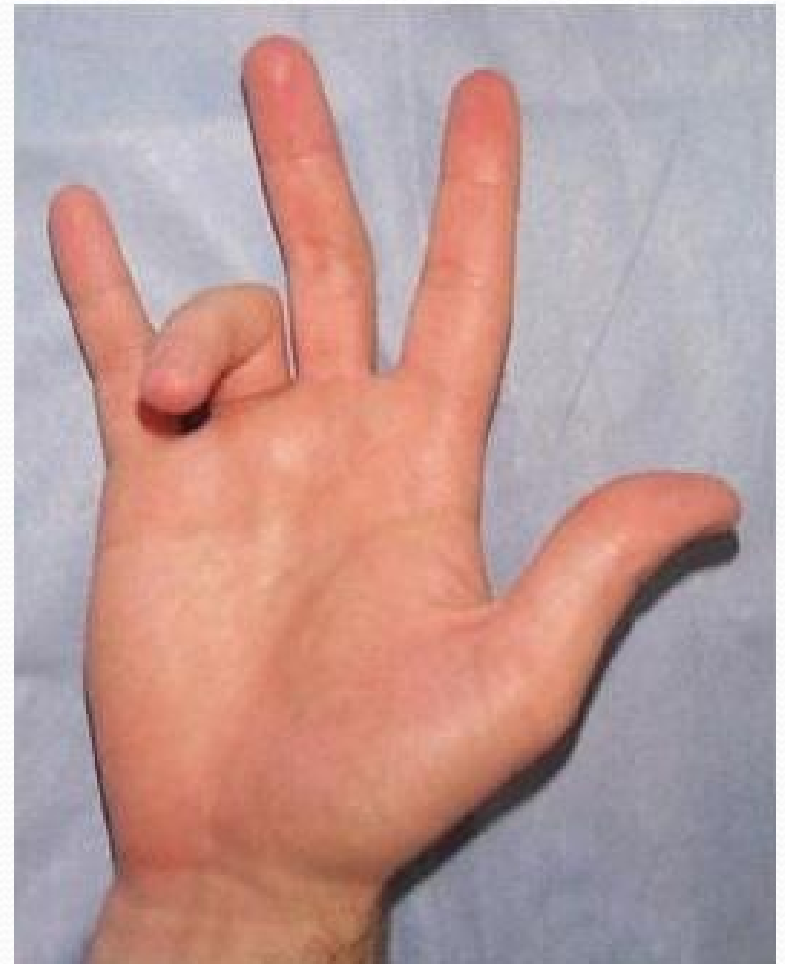
Trigger Digits Treatment

■ Decompress

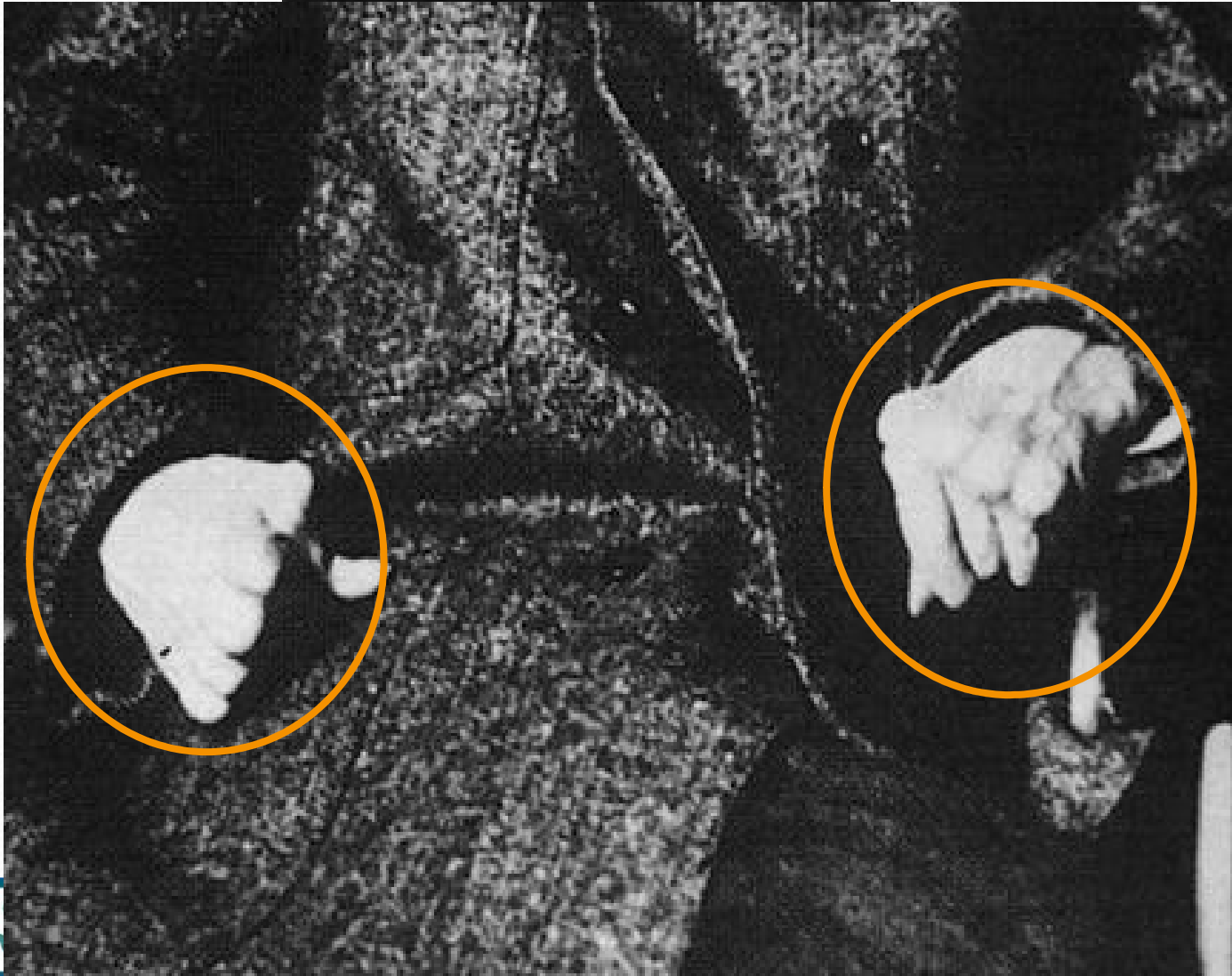


Trigger Finger

- Post op
 - Early ROM
- Return to work
 - Job dependent
 - days to 3 weeks
- Complications
 - recurrence
 - Stiffness ↑ DM



PIERRE-AUGUSTE RENOIR



Impairment or Disability



Questions



Thank you!

