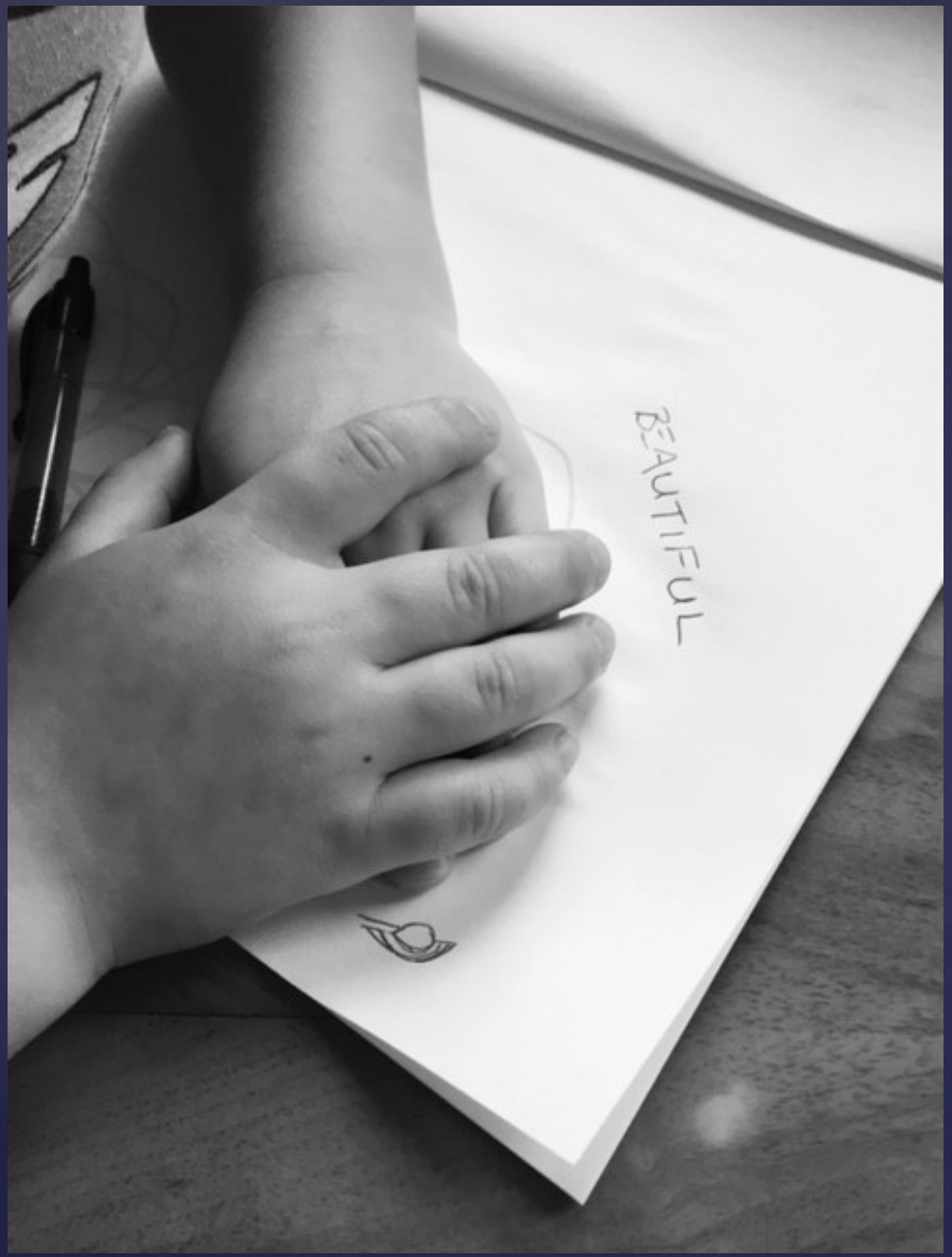
Common pathology of the foot and ankle

Kathleen Martinelli, MHS, PA-C



Disclosure Statement

I have no financial relationship with any commercial interest related to the content of this activity.

Objectives

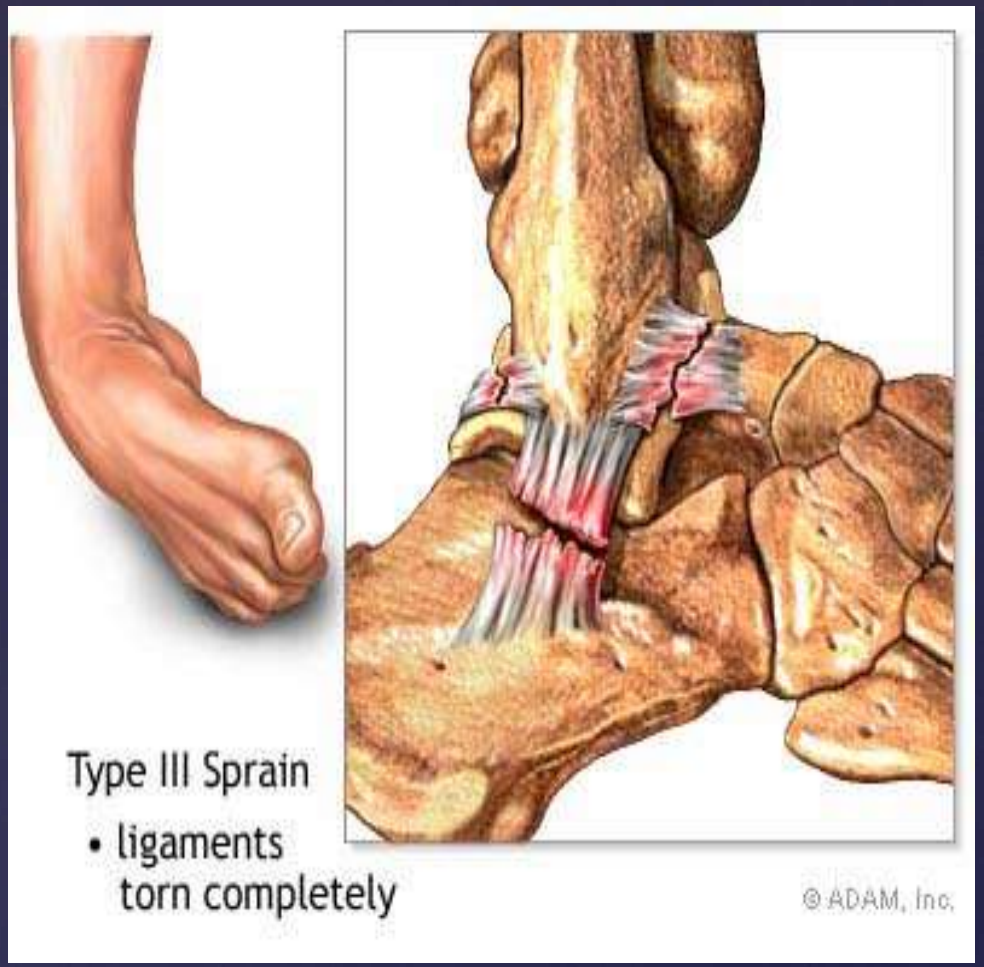
- Conduct a comprehensive evaluation of a patient with a foot or ankle complaint
- Demonstrate proficiency in creating a list of differential diagnoses and appropriate diagnostics (if applicable) for a patient presenting with a foot and ankle complaint
- Describe and initiate the appropriate treatment plan and referral (if indicated) for a patient with a foot and ankle complaint
- Recognize urgent/emergent foot and ankle injuries that require surgical referral

- Ankle Sprains, including high ankle sprains
- Ankle fractures
- Midfoot Sprain, including Lis Franc injuries
- Foot fractures, including Jones Fractures, stress fractures
- Foot and ankle tendonitis, including Achilles tendonitis, plantar fasciitis, posterior tibialis tendonitis, peroneal tendonitis
- Achilles rupture
- Other: Morton's neuroma, os trigonum, accessory navicular

Ankle Sprains

Mechanism of Injury

- Inversion
  - Most common
  - Usually combined with plantar flexion
  - ATFL
  - CFL
  - PTFL, Joint Capsule, Tendons, Bone



Grading: Inversion Sprains

- Mild
- Moderate
- Severe
- Don't get caught up in the specifics – treat the *patient* not the *definition*.

Diagnostics

- X Ray
  - Ottawa Rules
- MRI
  - Injuries that don't respond to conservative treatment after 6-8 weeks (PT, PT, PT)
  - Suspicion of Osteochondral injury, occult fracture
  - Chronic instability

X-rays are ESSENTIAL!

Treatment

- **Phased approach**
- Goals:
  - Decrease inflammation
  - Allow soft tissues, ligaments, capsule to heal without structural stretching and instability
  - Return patient to pre injury level of function

- Anterior Tibiofibular ligament
- Hyperrotation and hyperdorsiflexion
- Partial injury or full disruption of ligament

Syndesmotic or High Ankle Sprain

Ankle Fractures

History

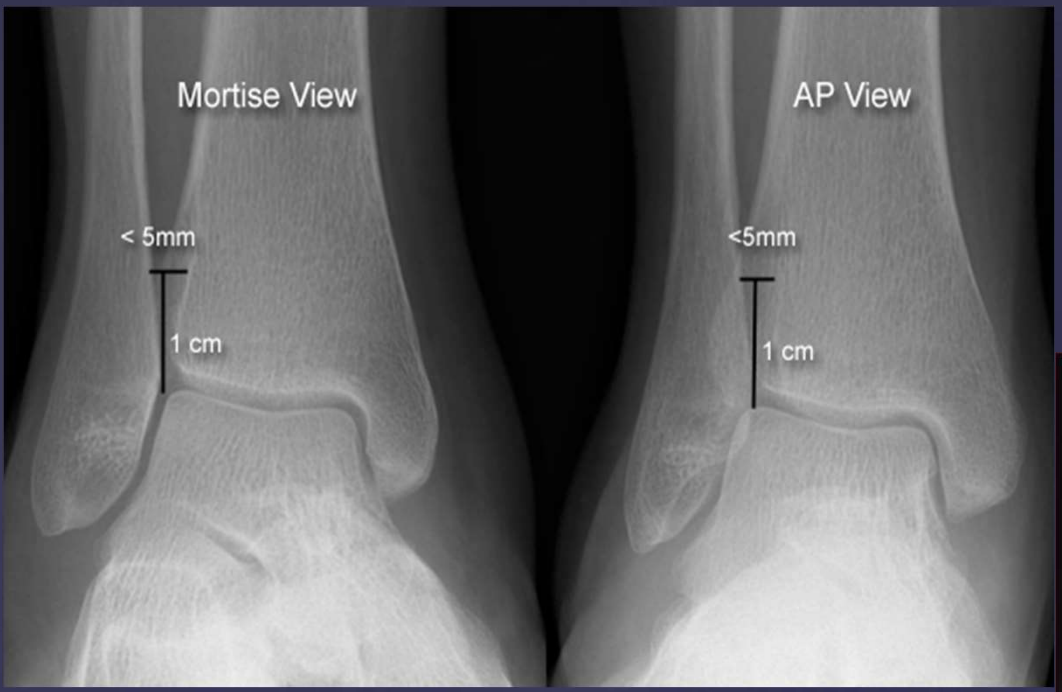
- Mechanism of Injury
- Location of pain (medial, lateral, foot or ankle)
- Comorbidities that may increase risk of fracture (osteoporosis, hypovitaminosis D, chronic steroid use)

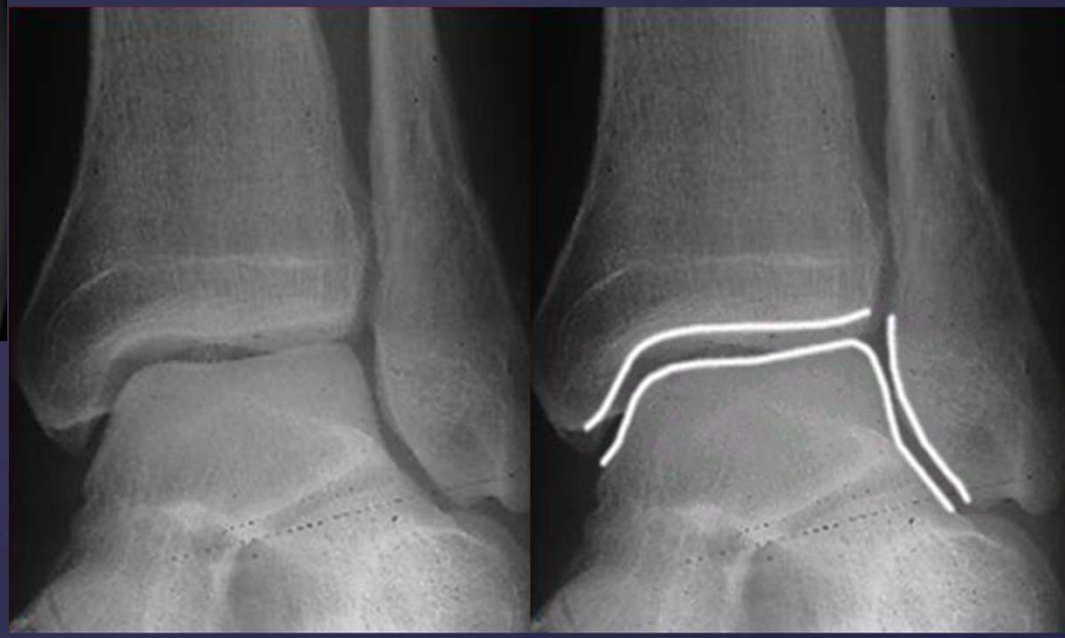
Physical Exam

- Deformities, swelling, ecchymosis
- Areas of tenderness including joint above and below (foot and knee)
- Weight bearing upon arrival

Ankle Radiographs

- A-P, lateral, mortise views
- Looking for fracture, dislocation, abnormal widening of “mortise”
- Don’t forget to image the foot if clinically indicated





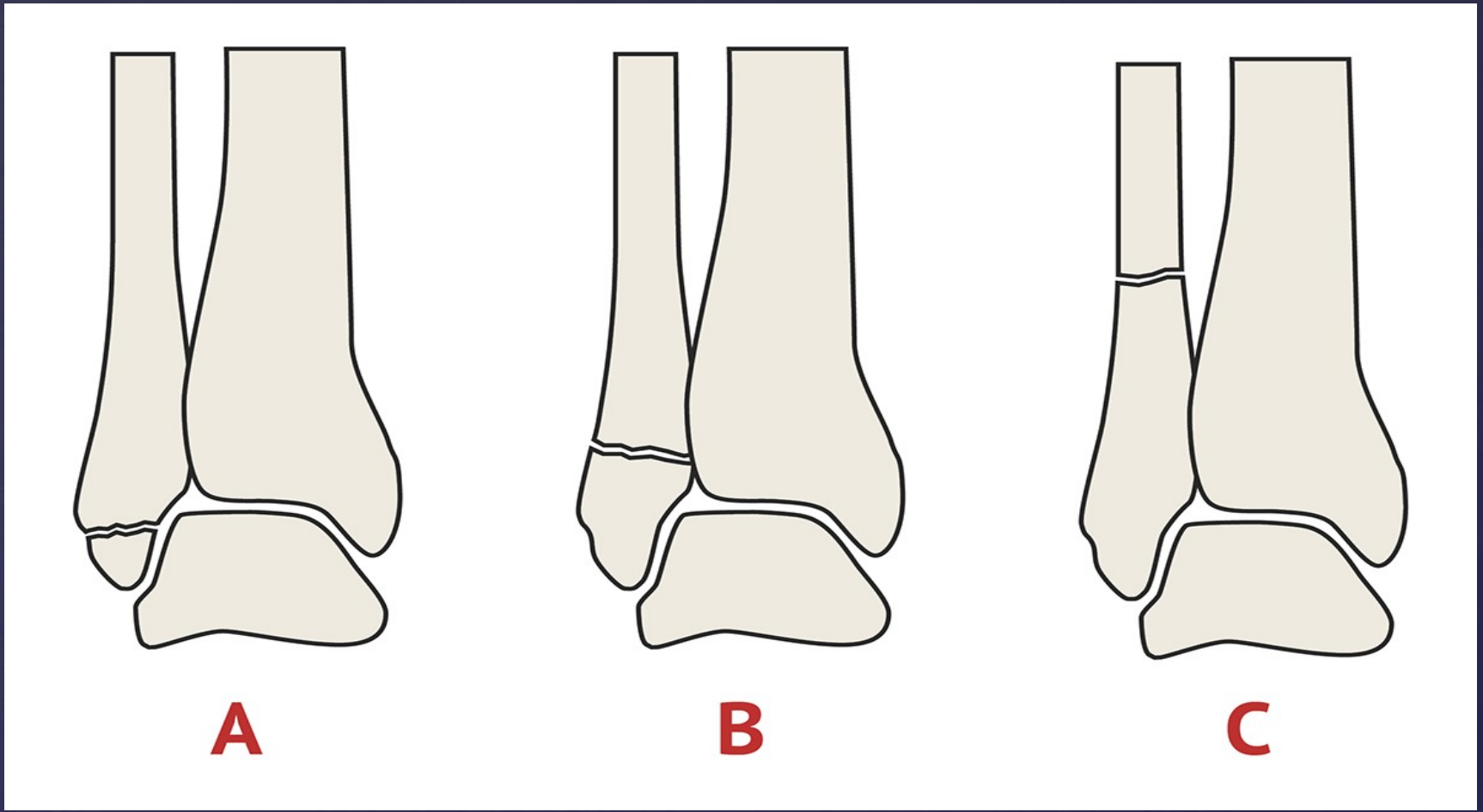
AP mortise view

Clear space

Mortise View

Classification of Ankle Fractures

- Several classification systems
- Describe what you see!
- Most important factor in determining non operative vs. operative treatment is **STABILITY**



Weber Classification


R
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16
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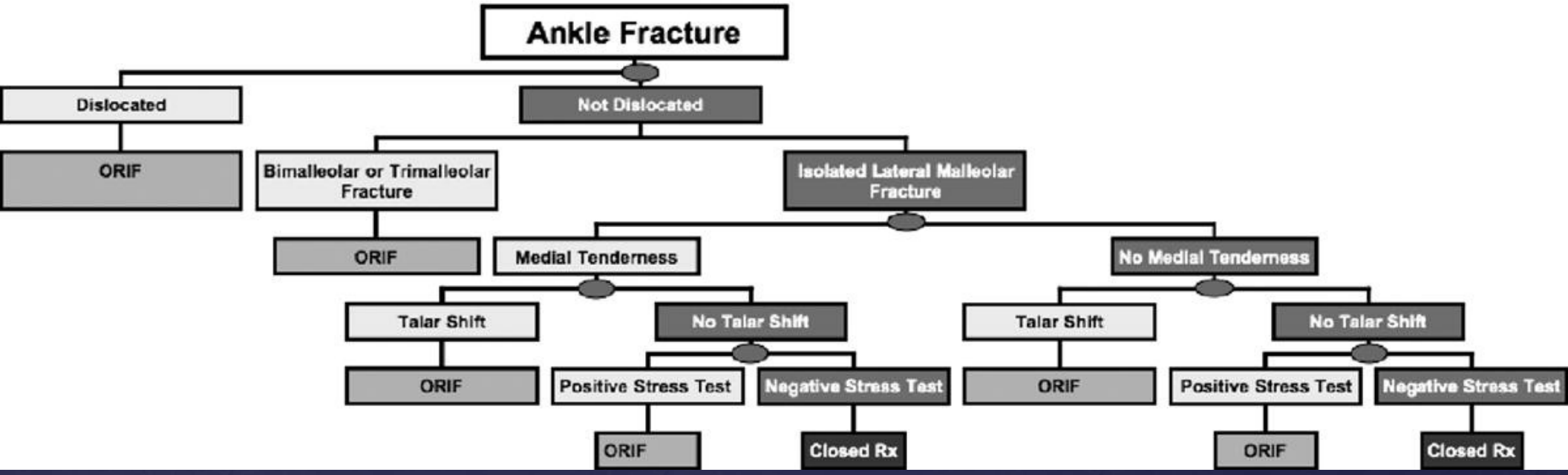
Decision Tree for Ankle Fractures Based on Stability Criteria



Clinical Utility of a Stability-Based Ankle Fracture Classification System
James D. Michelson, MD,* Donna Magid, MD,† and Kathleen McHale, MD
J Orthop Trauma
2007;21:307–315

- Unstable injuries with no OBVIOUS fracture
- Associated injuries (base of the 5th MT fracture, midfoot injury, proximal fibula fracture)

What NOT to miss!

Case Study

- 23 yr old in office for follow up s/p fall while roller skating 3 days ago.
- C/o right medial ankle pain and swelling
- Told in ED he had ankle sprain and placed in posterior splint and on crutches.

Physical Exam

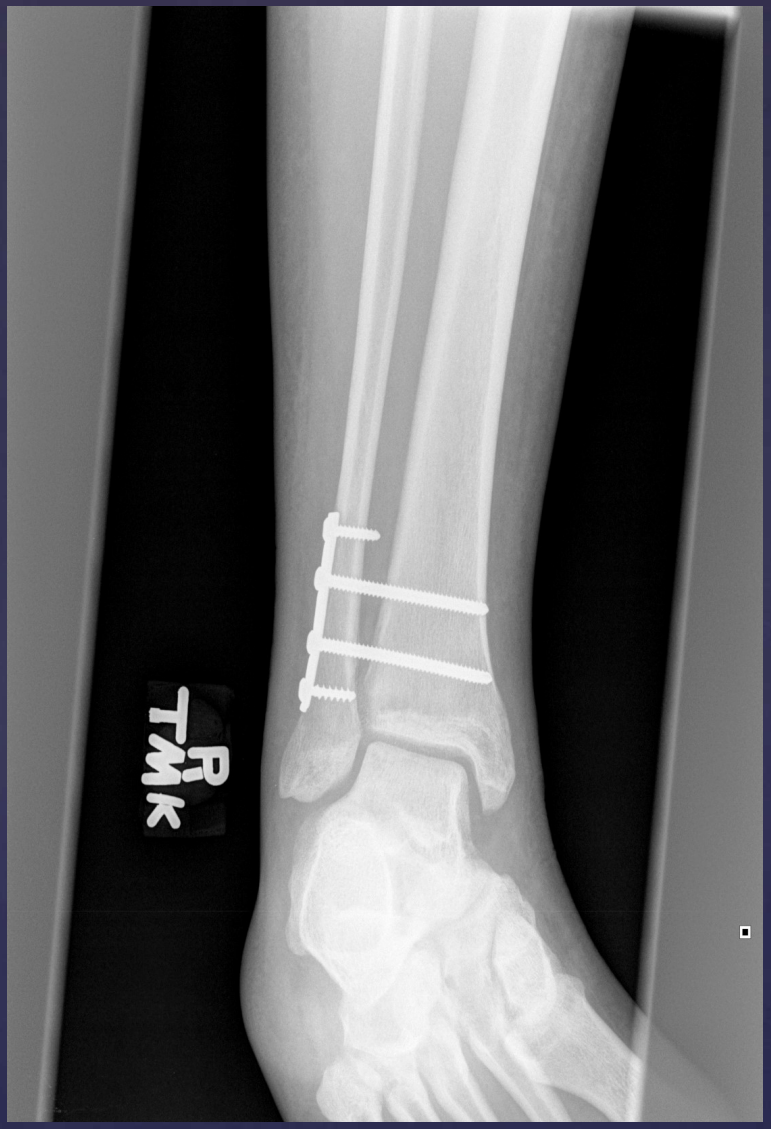
- Tenderness to palpation over medial malleolus and deltoid ligament
- Soft tissue swelling medial ankle
- Unable to weight bear


R

R

Are we missing something?

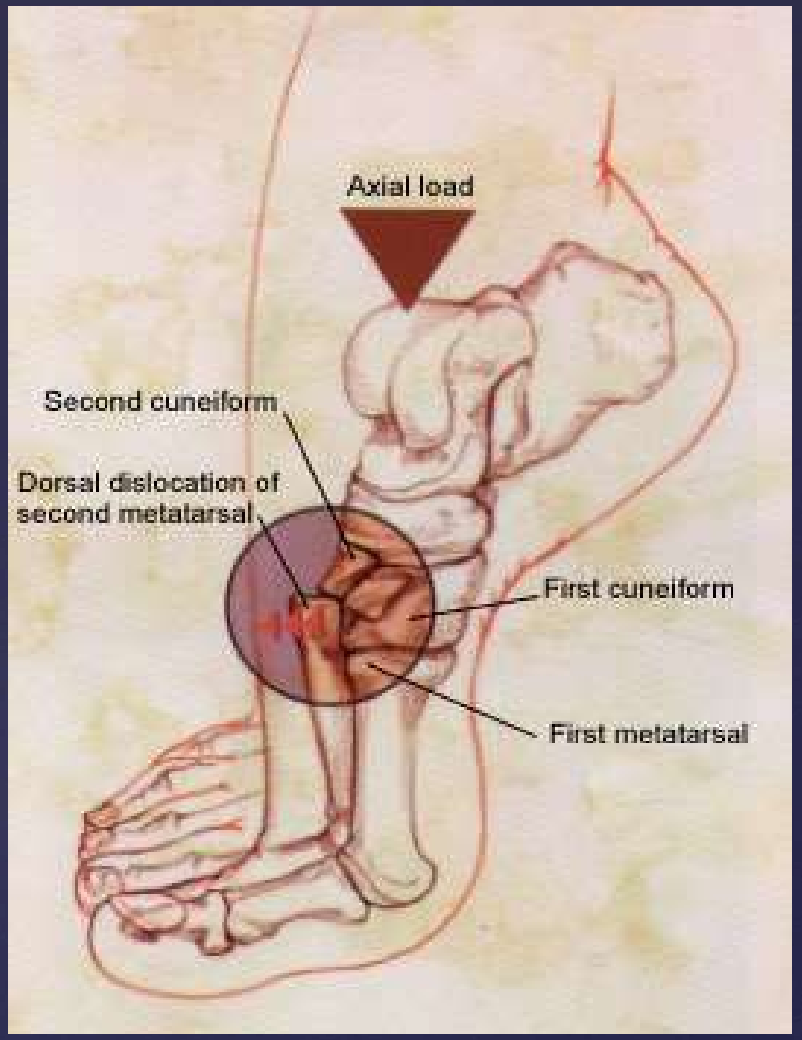

R
CXM



Maisonneuve Fracture

Foot Anatomy

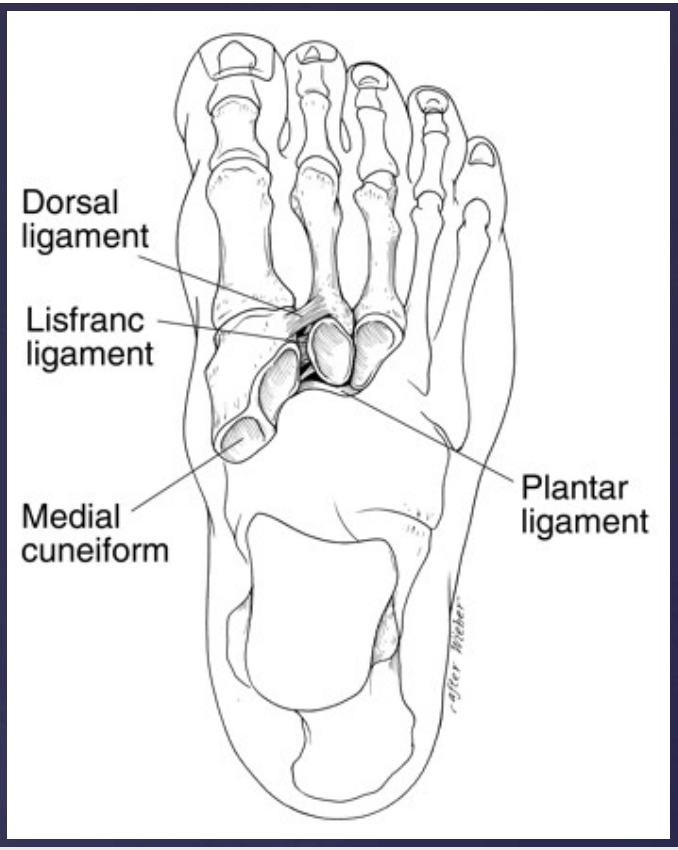
- Surgeon in Napoleon's army
- Mechanism
- Forced Plantar Flexion
- "Fall off horse with foot in stirrup"
- Fracture and/or dislocation of 2nd metatarsal joint

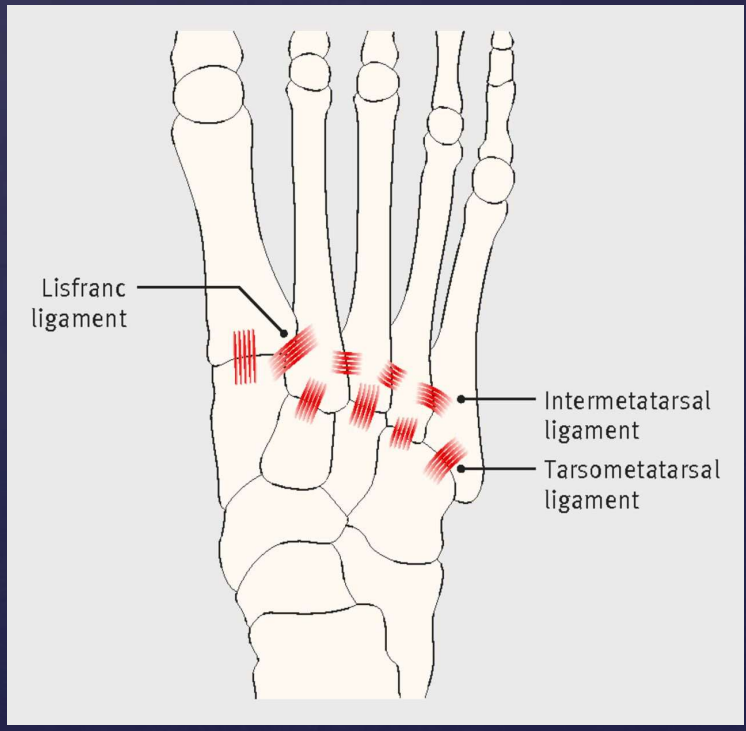


Lis Franc Injury

Lis Franc injury

- No transverse ligament between 1st and 2nd MT bases
- Bone architecture
  - "Keystone"
- "Weak Link"
  - Prone to injury





Lis Franc Injury

- Radiography
  - *WEIGHT BEARING*
  - AP, Lateral, Oblique Foot

  - Careful evaluation of 1st and 2nd M.T. relationship
    - Diastasis or widening
    - Fleck Sign

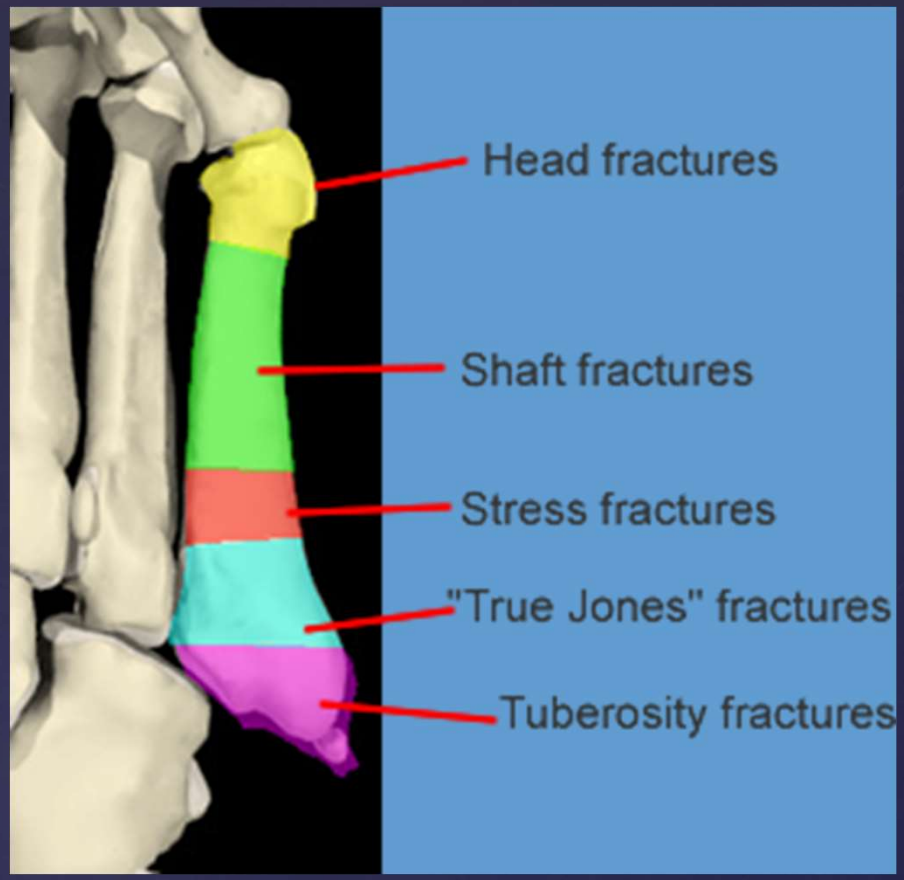
Lis Franc Injury

Lis Franc Injury

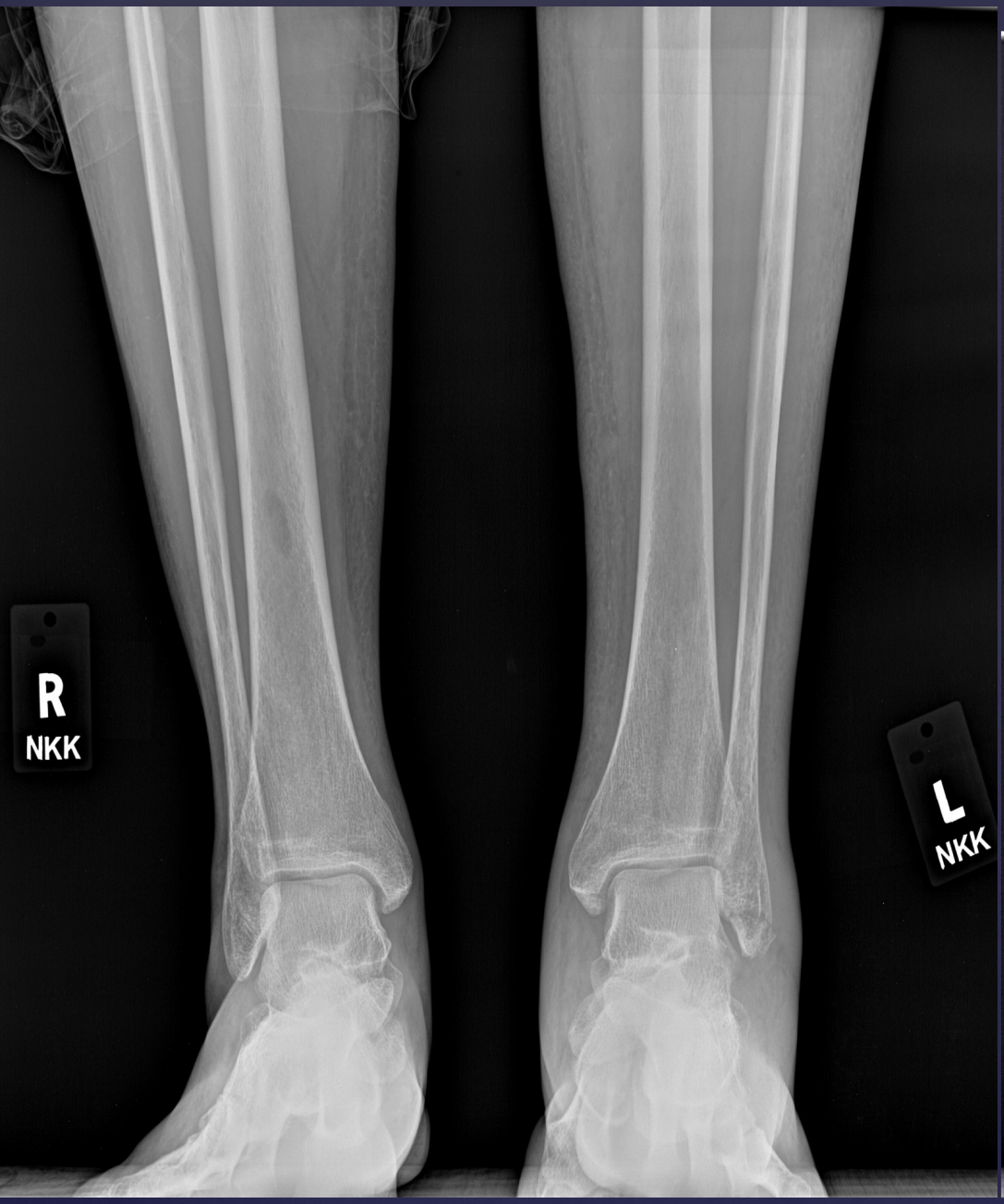
- Minimally Displaced
  - Cast immobilization 6 wks, NWB
- Moderately/Severely Displaced
  - Surgical Correction
- Often Missed
- Delayed Diagnosis leads to poor outcome
- Must be suspicious

5th Metatarsal Fractures

- Avulsion Fx vs. Jones Fx
- Jones: 6-8 wks NWB vs. surgical fixation.



Which fracture is the most commonly missed?


R
NKK
L
NKK


L
NKK

Stress Fractures

- History (increased activity, foot deformity)
- Tenderness to palpation and soft tissue swelling
- No radiographic changes until 6 weeks
- Don't confuse with Morton's Neuroma

- Female Triad
- Vitamin D deficiency and supplementation recommendations
  - 1000-2000 units/day
  - 50,000 units once/week x 3 months and recheck

Stress Fractures

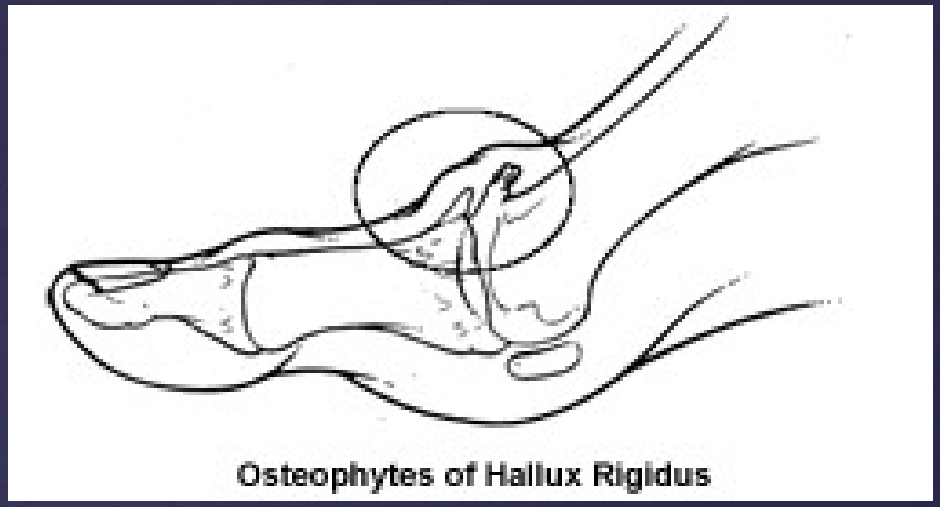
Navicular Fracture

- Point tenderness
- Runner's injury
- 6 weeks of NWB
- Consider surgical fixation

Accessory Navicular

Hallux Rigidus

- May be some intraarticular cartilage damage
- Conservative tx with Morton's extension orthotic
- Consider Dorsal Cheilectomy



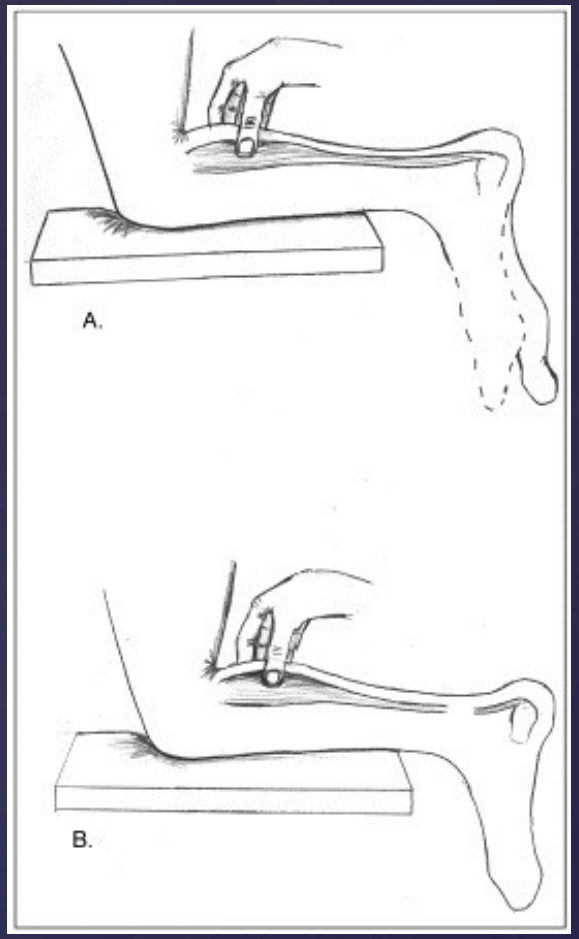
Osteophytes of Hallux Rigidus

Achilles Tendonitis

- CC: Posterior heel pain
- PE: Tenderness along tendon vs. insertion site
  Haglund's deformity
- Tx: Ice, Rest, Stretching/PT, NSAIDS, Inserts, Debridement (insertional much more likely to require surgical intervention)
- Eccentric Calf Strengthening for Intra substance tendonitis

Achilles Rupture

- CC: “It felt like I was shot in the back of the leg”
- PE: Defect, Thompson’s Test, Plantaris/Medial Gastroc tear
- Tx: Serial casting vs. Surgical Repair = Very similar outcomes

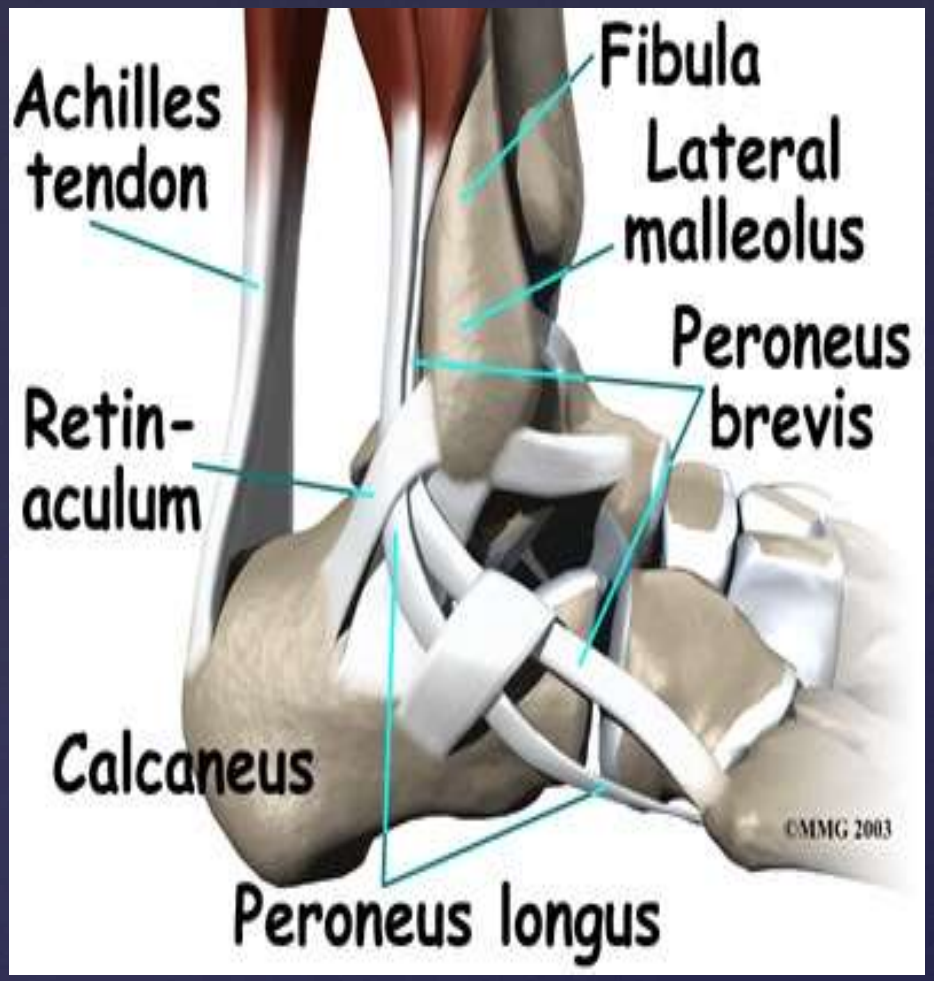


Plantar Fasciitis

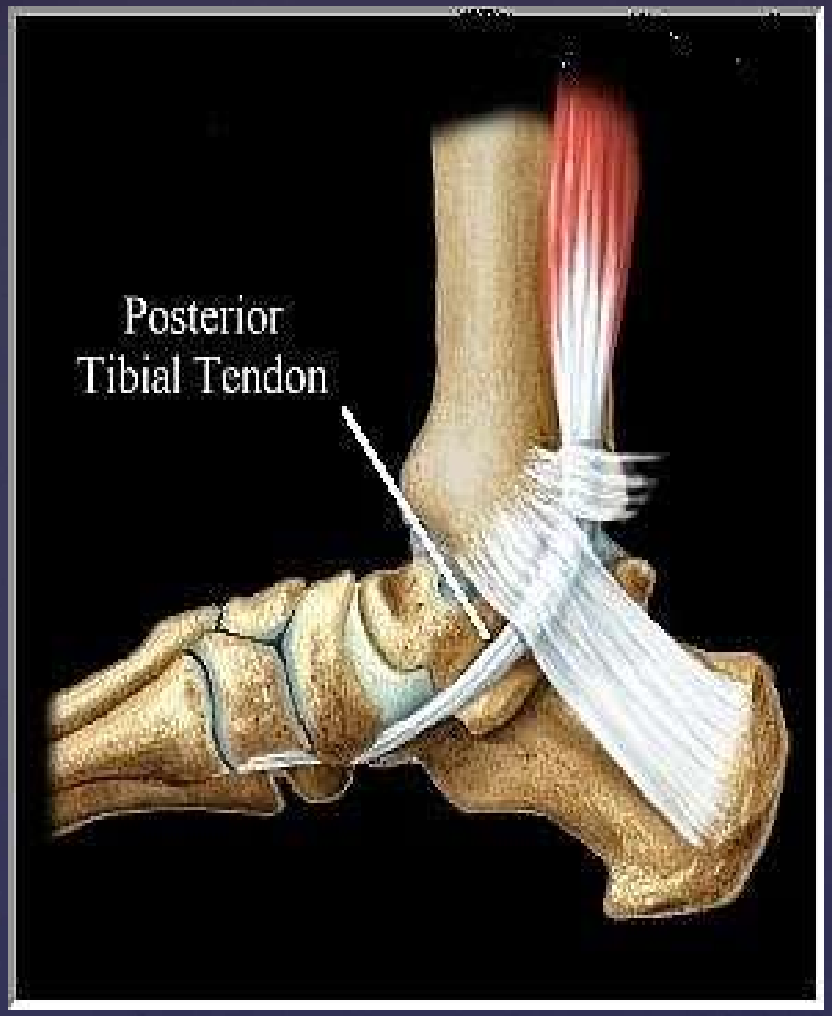
- CC: Heel pain, esp 1st thing in the am
- PE: Medial calcaneal tenderness; check foot anatomy (arches, pes planus)
- Xrays: ? Traction spur
- Tx: Ice, NSAIDS, inserts, stretching/PT, ? Injections (PRP)

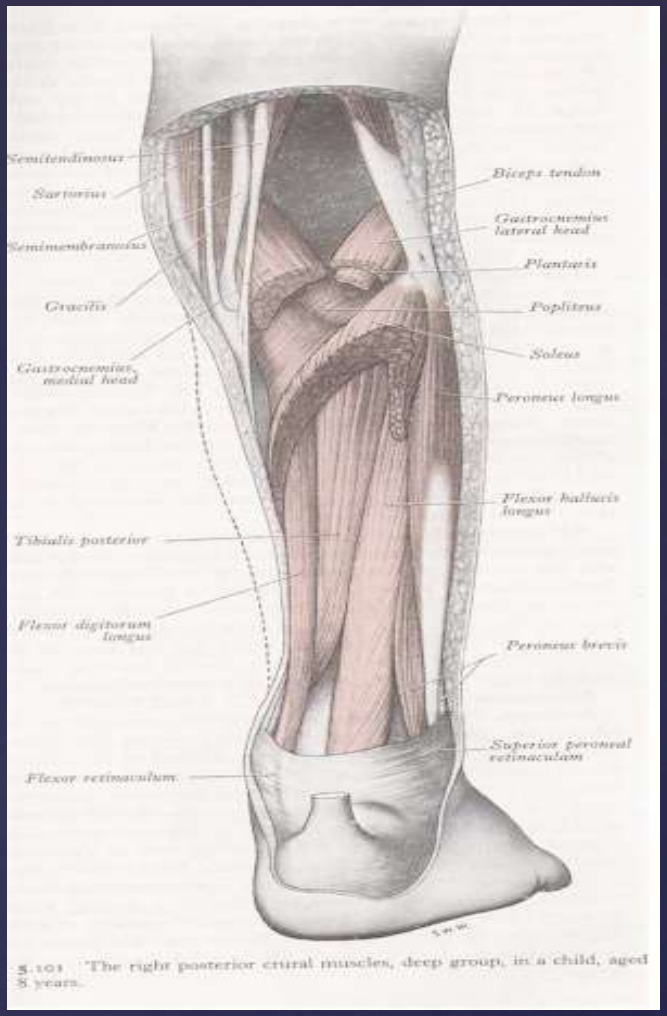
- "Tissue-Specific Plantar Fascia-Stretching exercises"*

*DiGiovanni, Benedict F., MD, et al (2003) JBJS. 85:1270-1277



Peroneal Tendonitis





5.101 The right posterior crural muscles, deep group, in a child, aged 5 years.

Posterior Tibialis Tendonitis

Posterior Tibialis Tendonitis

Posterior Tibialis Tendonitis

- If inflamed but functional treat with immobilization followed by orthotics if indicated.
- If tendon is insufficient patient needs AFO to support midfoot/hindfoot
- Likely will result in surgery eventually d/t midfoot collapse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Os Trigonum

Case Study

- 65 yr old male presents with 4 weeks of atraumatic, progressive medial ankle pain and mild swelling. Exam reveals tenderness along PT tendon and pain with attempted heel raise, but able to achieve hindfoot varus. He has had no previous eval or treatment for this problem. Appropriate next step is:
  a) Immobilize with cast or walking boot x 4 weeks
  b) MRI to r/o PT insufficiency
  c) Order foot orthotics and begin aggressive physical therapy
  d) Cortisone injection for acute inflammation

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Case Study

- 45 yr old female 5 weeks s/p inversion ankle injury with persistent swelling, pain and difficulty weight bearing without a brace. At her f/u visit you:
  a) Order MRI to r/o osteochondral injury
  b) Palpate the syndesmotic ligament to determine if she has high ankle sprain
  c) Put her back in a walking boot for 2 weeks, then begin PT

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THANK YOU!