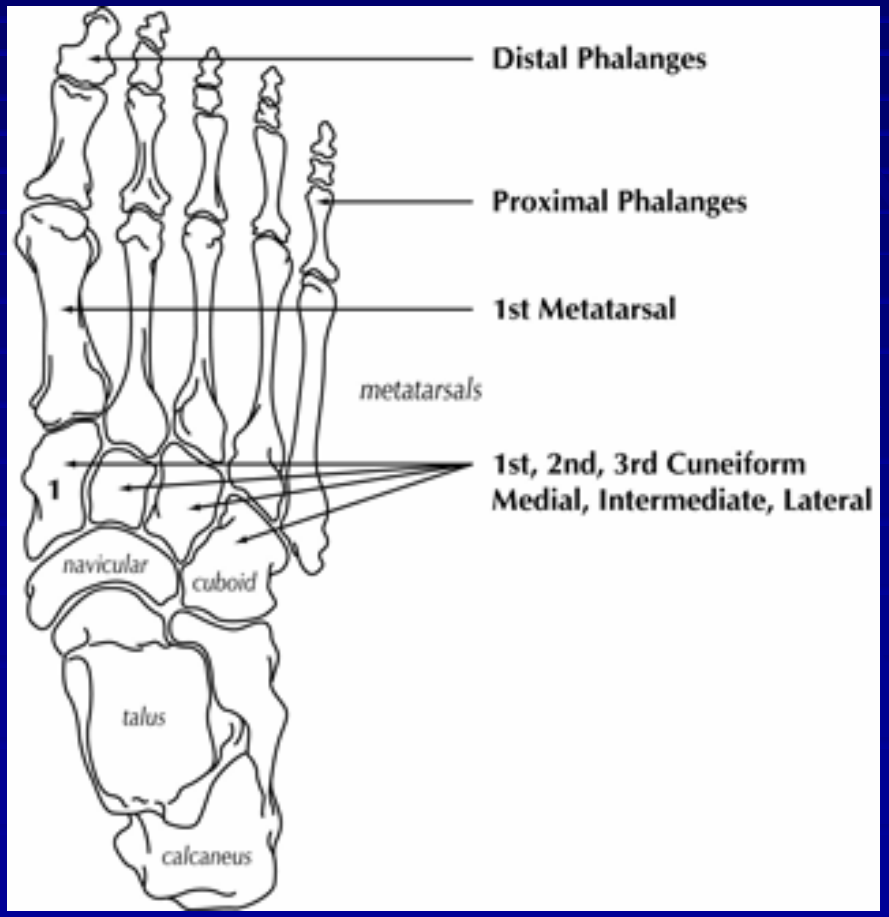
Foot and Ankle Complaints

INTRODUCTION

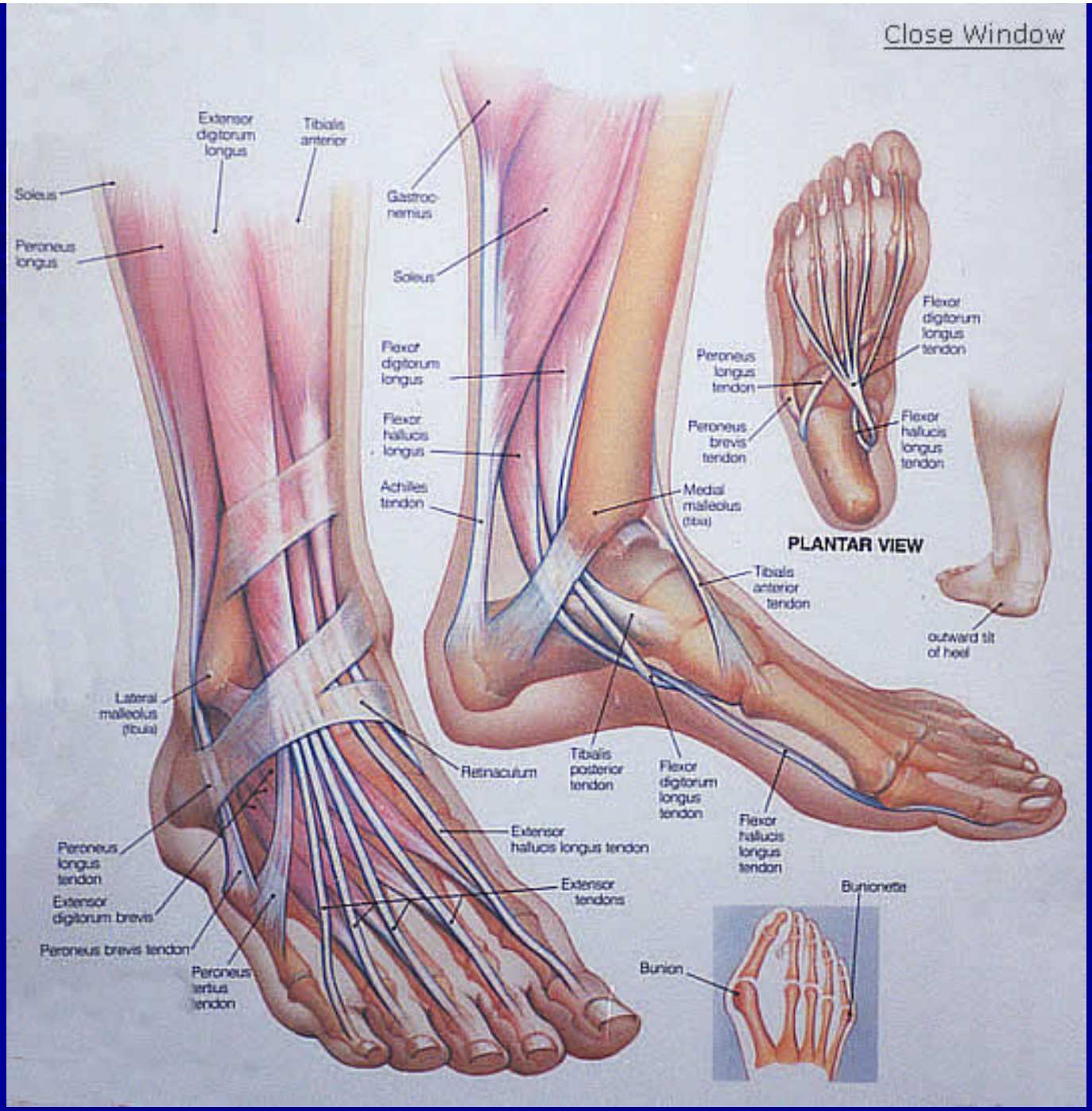
- Anatomy and Function
  - Foot
  - Ankle
- Common complaints
- Common diagnoses

FOOT AND ANKLE ANATOMY

- 26 bones and 2 sesamoids
- Forefoot
  - Metatarsals
  - phalanges
- Midfoot
  - 5 tarsals
- Rearfoot
  - Talus and Calcaneus



Close Window



FOOT AND ANKLE

- FUNCTIONS
  - Absorb impact loading forces
  - Adapt to uneven ground
  - Allow efficient propulsion

FOOT AND ANKLE COMPLAINTS

HISTORICAL CLUES

- Previous injury?
- New shoes?
- New sport/activity?
- Sudden increase in mileage?
- Long term training without rest?

FOOT AND ANKLE
COMMON COMPLAINTS

- Heel pain
- Forefoot pain
- Ankle pain
- Numbness/tingling/burning
- Ankle swelling

FOOT AND ANKLE
COMMON COMPLAINTS

- Heel pain
- Forefoot pain
- Ankle pain
- Numbness/tingling/burning
- Ankle swelling

HEEL PAIN

- Determine location
  - Plantar surface
    - Plantar fasciitis
    - Heel pad atrophy
    - Distal tarsal tunnel syndrome
    - Calcaneal stress fracture
  - Posterior heel
    - Retrocalcaneal bursitis
    - Achilles tendinopathy
    - Sever's disease
    - Stress fracture
    - Lateral Plantar Nerve entrapment

Consider inflammatory conditions also:

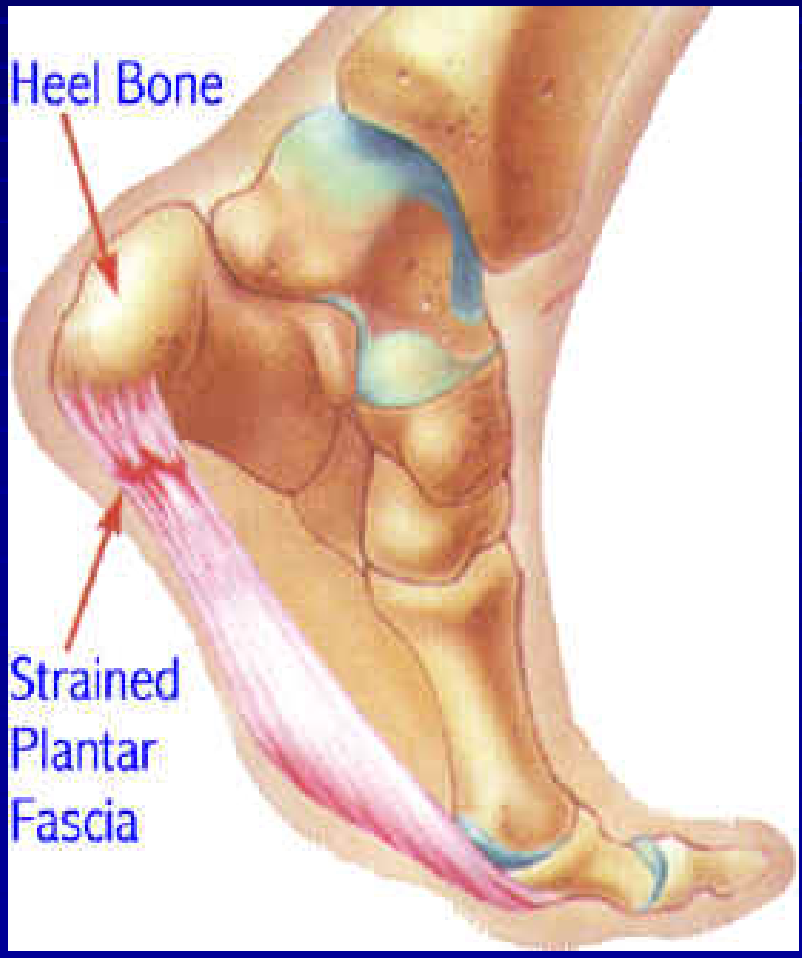
Gout

Reiter's

Psoriasis

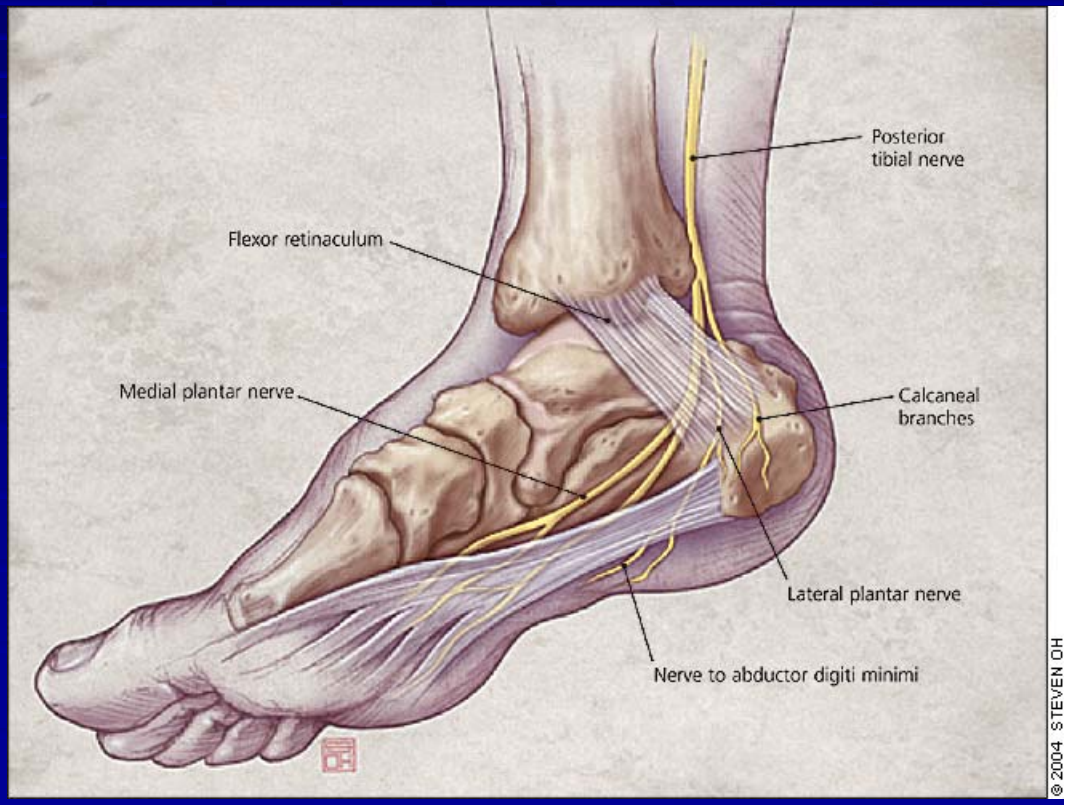
PLANTAR FASCIITIS

- Pain at the most anterior portion of the heel pad
- Medial tubercle
- Worst with first step in the morning or after inactivity
- Pain increases with active dorsiflexion of first toe



PLANTAR FASCIITIS

- Treatment
  - ICE
  - Stretching
  - NSAIDs
  - Correction of arch abnormalities
  - Improved shoe quality
  - Training adjustment
  - Night splints
  - Injections

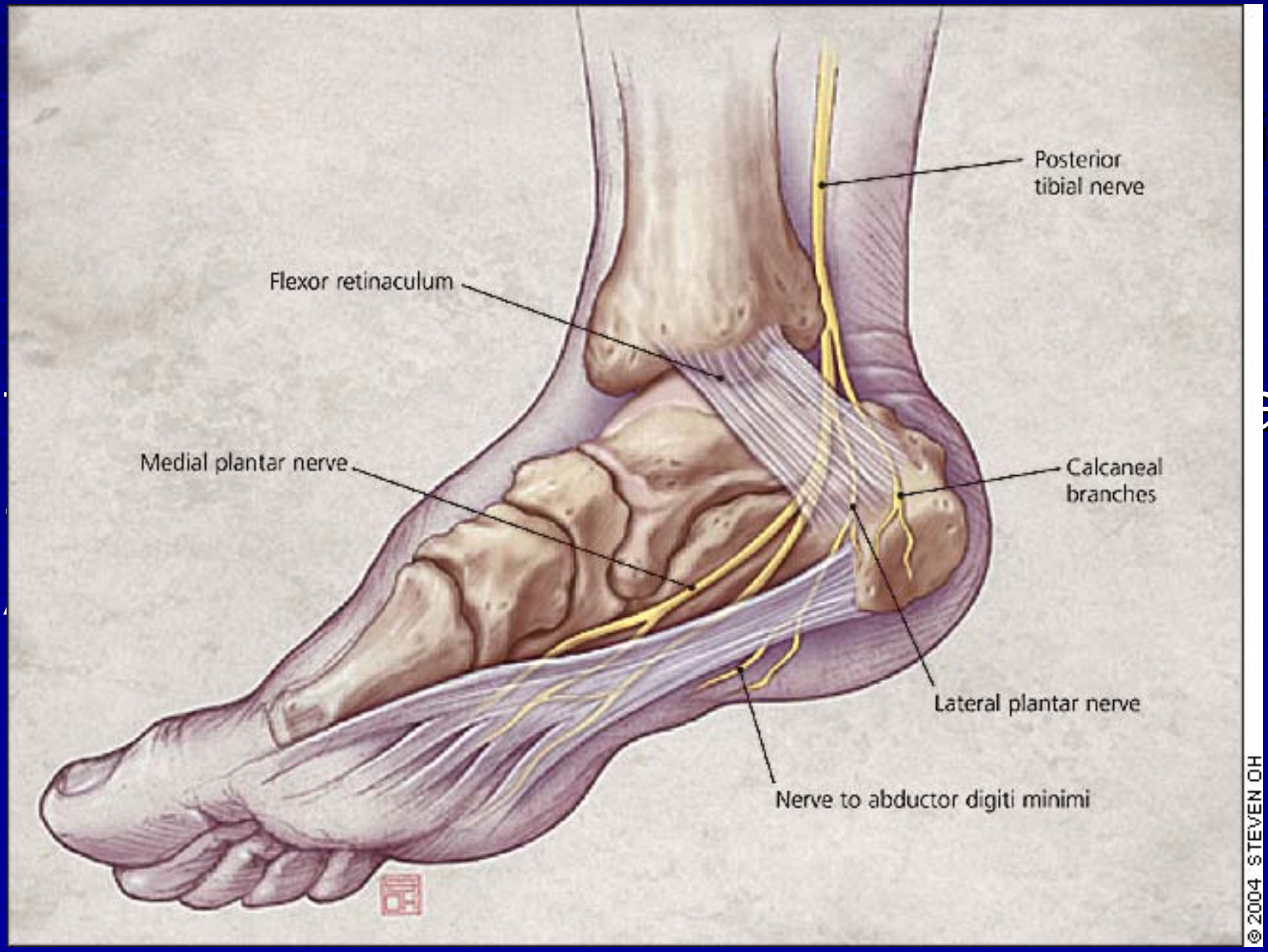


HEEL PAD ATROPHY

- After age 40, adipose tissue begins to atrophy
- Loss of absorbency
- May occur as a complication of plantar fascia corticosteroid injection

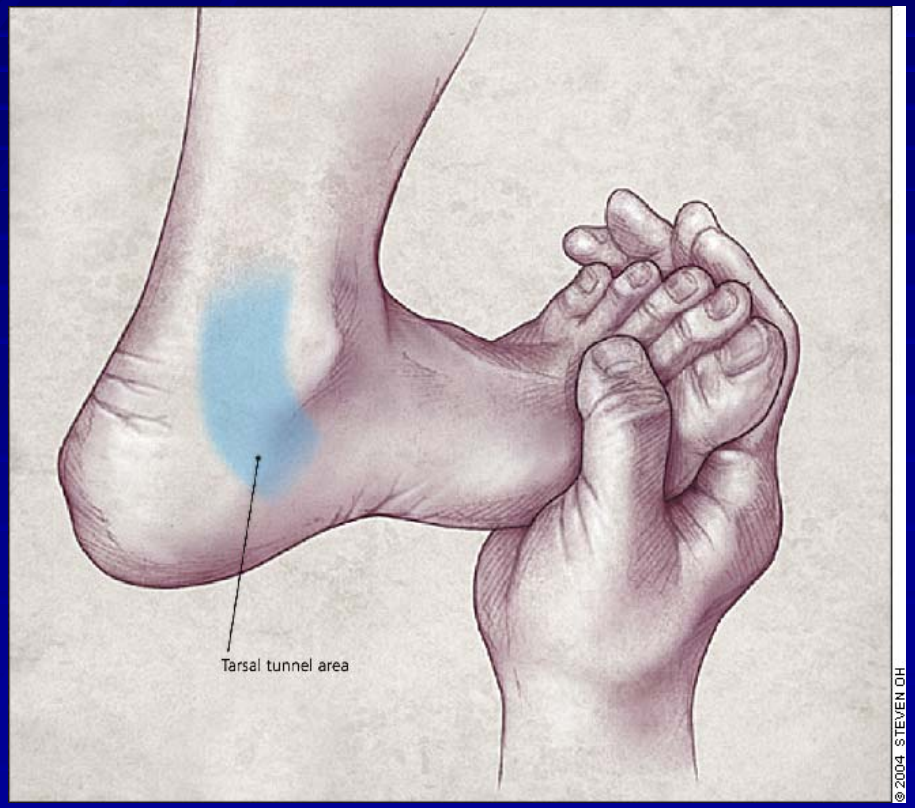
TARSAL TUNNEL SYNDROME

- ts
- al



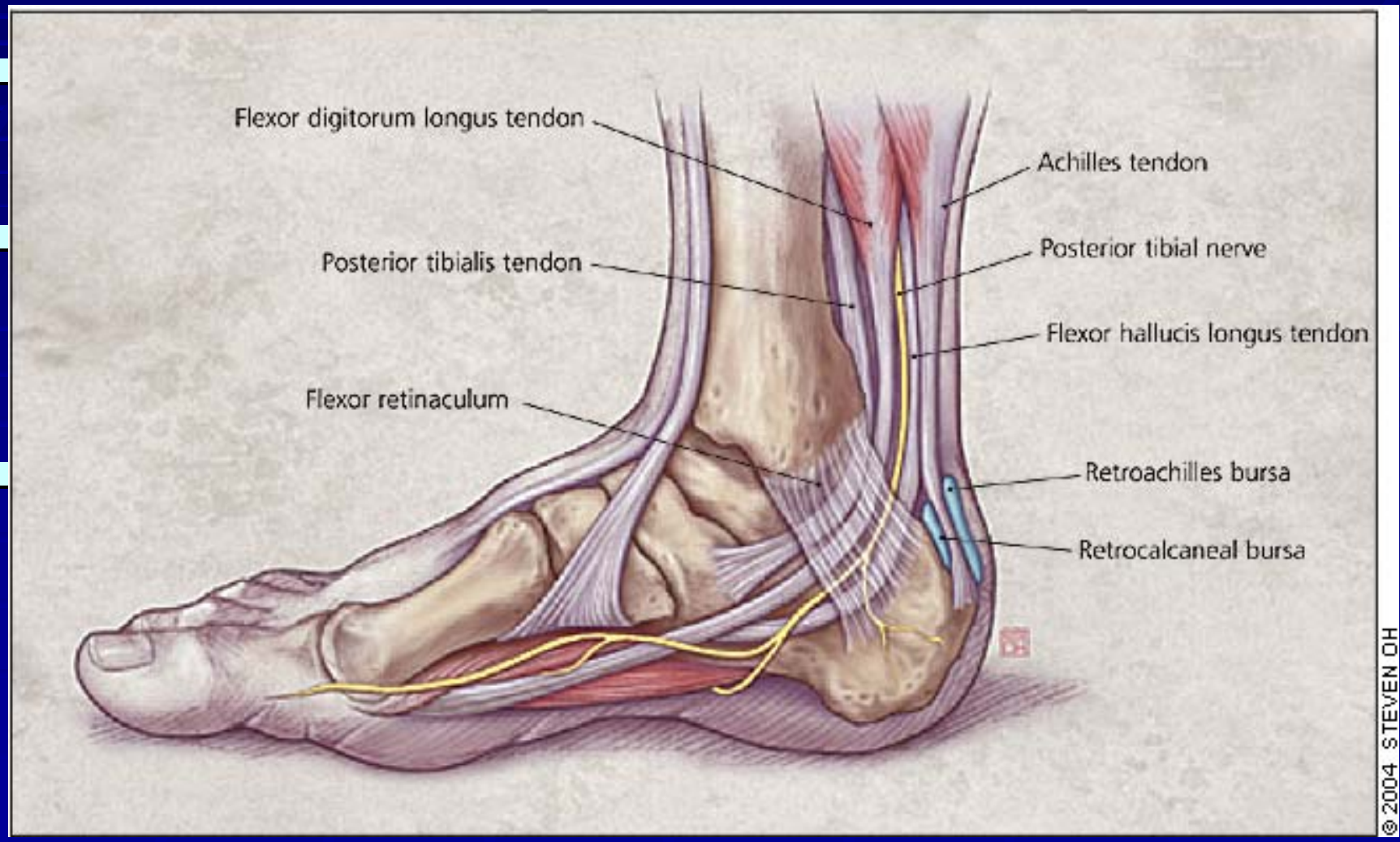
TARSAL TUNNEL SYNDROME

CON'T



- Exam:
  - Positive Tinel's sign over tunnel
  - Palpation of involved nerve causes pain to radiate proximally and distally
- Treatment:
  - Ice, NSAIDs
  - Injection
  - Surgery

RETROCALCANEAL BURSITIS



ACHILLES TENDINOPATHY

- Common cause of posterior heel pain
- Can have pain at insertion or mid-substance of tendon
- Generally occurs after overuse
- Exam:
  - Insertional tendonitis: pain at insertion onto calcaneus
  - Non-insertional tendonitis: mid-substance pain
    - Localized swelling

ACHILLES TENDINOPATHY

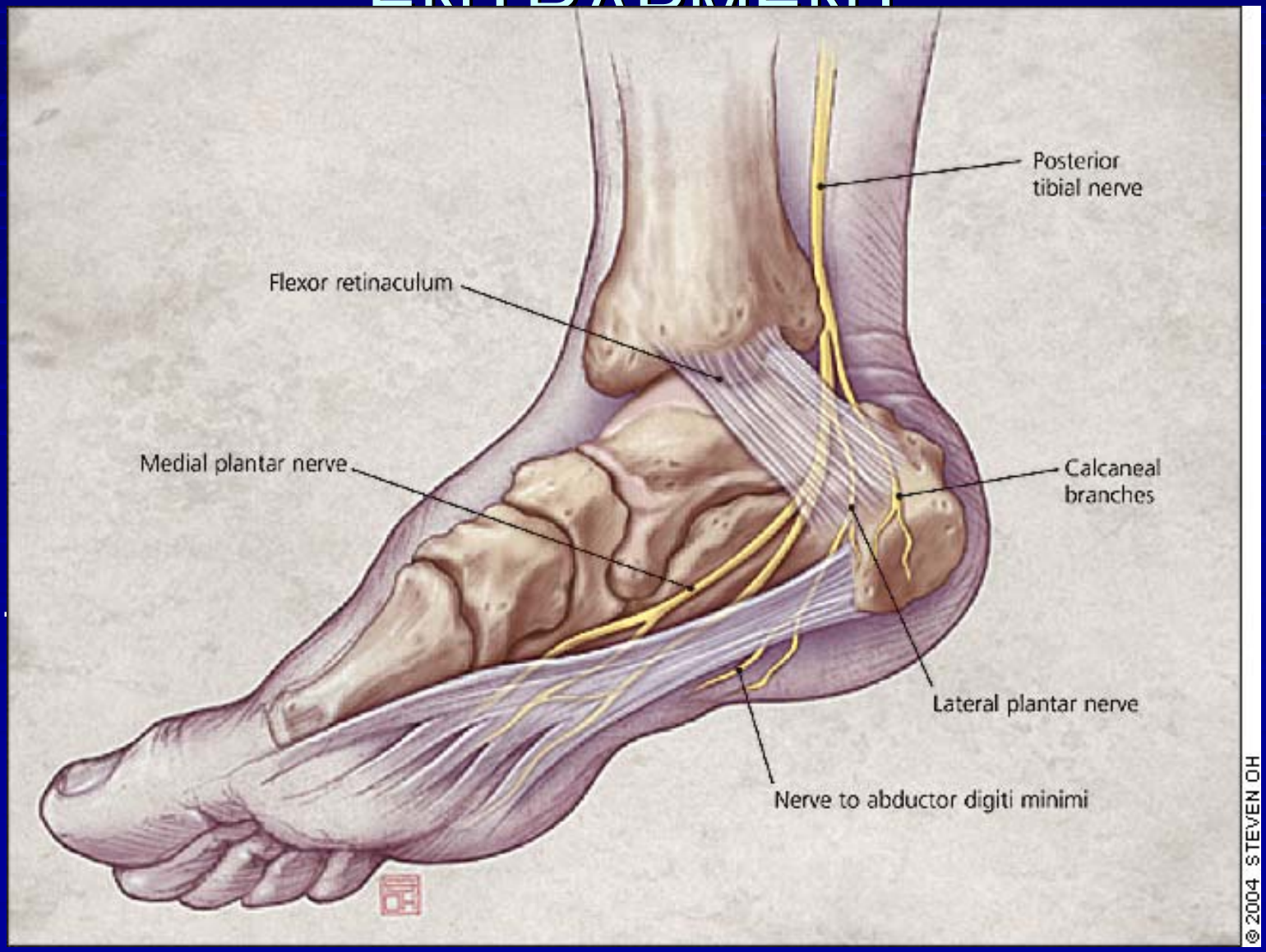
- Treatment:
  - Ice, NSAIDs
  - Physical therapy
    - Flexibility
    - Eccentric exercises
  - Heel lift or orthotic to control pronation
  - Cam walker for severe cases

SEVER'S DISEASE

aka. Calcaneal Apophysitis

- Overuse injury in 8-12 year olds
- Traction apophysitis of os calcis
- Pain increases with activ
- Exam:
  - Localized tenderness of p
  - Heel-cord tightness
  - Weakness of ankle dorsif
- Treatment
  - Relative rest, NSAIDs, ice, stretching, heel cups
  - Strengthening of dorsiflexors

LATERAL PLANTAR NERVE ENTRAPMENT



FOOT AND ANKLE
COMMON COMPLAINTS

- Heel pain
- Forefoot pain
- Ankle pain
- Numbness/tingling/burning
- Ankle swelling

FOREFOOT PAIN

- Acute
  - Fracture of metatarsal
  - Gout
- Trauma
  - Lis Franc sprain/dislocation
  - Stress fracture
- Chronic
  - Stress fracture
  - Metatarsalgia

5th METATARSAL FRACTURE

- Avulsion fracture= Most common
- Jones fracture= Metaphyseal-Diaphyseal junction

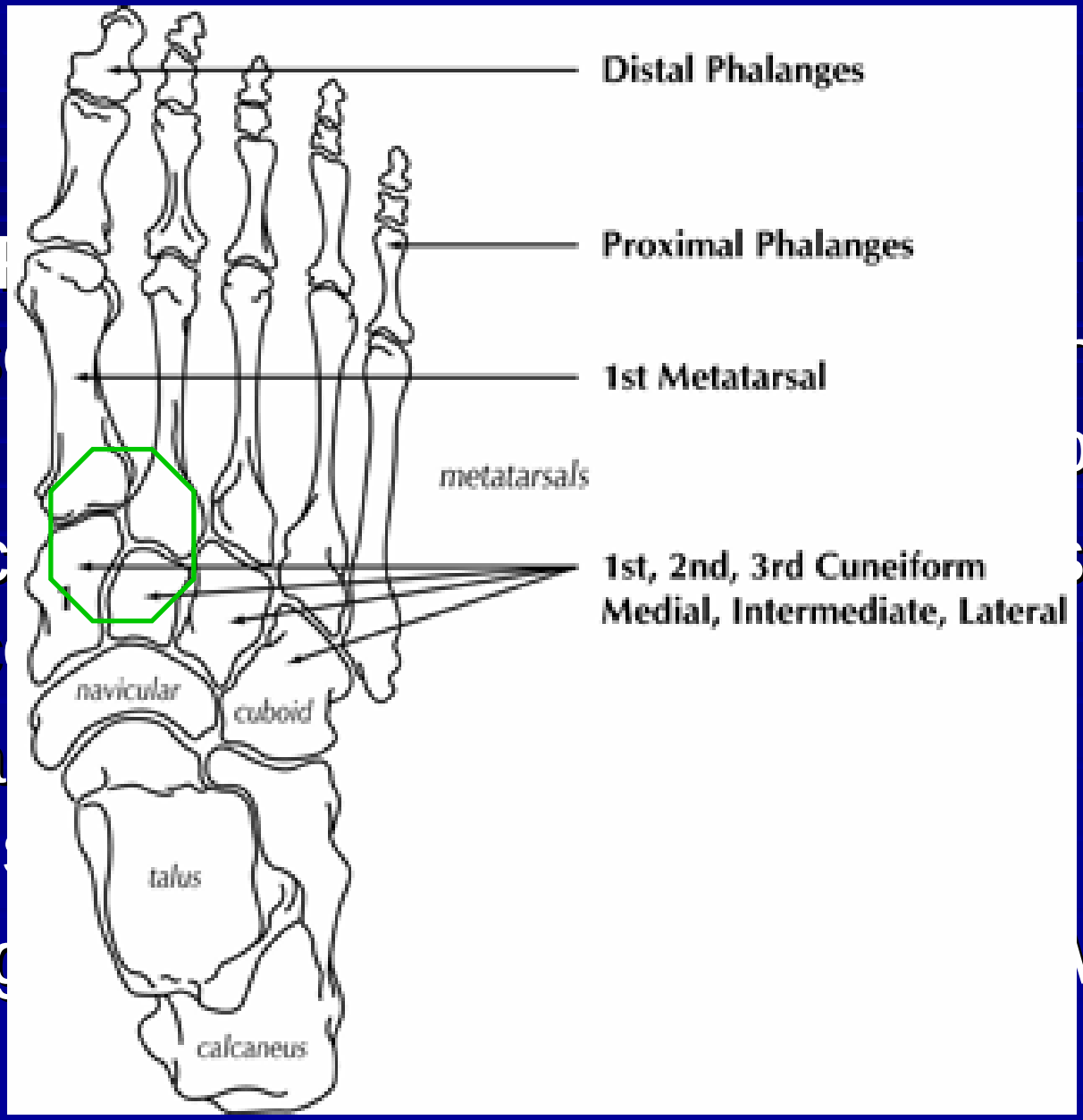
METATARSAL FRACTURE

GOUT

- Commonly involves first MTP joint
- Warm, red, rapid onset
- Exam: painful ROM at toe
- Diagnosis: negative birefringent crystals
  - Xray: erosions of bone
- Treatment:
  - Colchicine
  - NSAIDs
  - Intra-articular steroids

Acute gout with erythema (redness) of the great toe joint.

- Lis
  tars
  and
- Occ
  forc
- Exa
  brui
- Diag



1st

rms

foot is

rotated

WS


Non-reversible compressed image:
For reference only [96]

LIS FRANC SPRAIN

- Treatment:
  - Immobilization—
    - NON-WEIGHT BEARING
  - Surgery commonly
- Complications:
  - Chronic pain

METATARSALGIA

- Pain at base of second metatarsal and heads of second and third metatarsal
  - Any metatarsal can be involved
- Association with high heels, hyperpronation
- May see large callus under metatarsal heads
- Treatment:
  - Paring of callus
  - Orthotics to correct hyperpronation

- **A 40-year-old runner complains of gradually worsening pain on the lateral aspect of his foot. He runs on asphalt, and has increased his mileage from 2 miles/day to 5 miles/day over the last 2 weeks. Palpation causes pain over the lateral 5th metatarsal. The pain is also reproduced when he jumps on the affected leg. When you ask about his shoes he tells you he bought them several years ago. Which one of the following is the most likely diagnosis?**
- A. Ligamentous sprain of the arch
- B. Stress fracture
- C. Plantar fasciitis
- D. Osteoarthritis of the metatarsal joint

STRESS FRACTURE

- Gradual onset of pain with activity
- History:
  - Increased intensity or duration of activity
  - Change in footwear
  - Change in surface
- Initial x-rays are often negative
- Secondary studies: bone scan, MRI
- Key to treatment is pain free ambulation

STRESS FRACTURE

- Common areas involved:
  - Navicular
  - Tibia
  - Fibula
  - Metatarsals
- Less common:
  - Calcaneus
  - Cuboid

FOOT AND ANKLE
COMMON COMPLAINTS

- Heel pain
- Forefoot pain
- Ankle pain
- Numbness/tingling/burning
- Ankle swelling

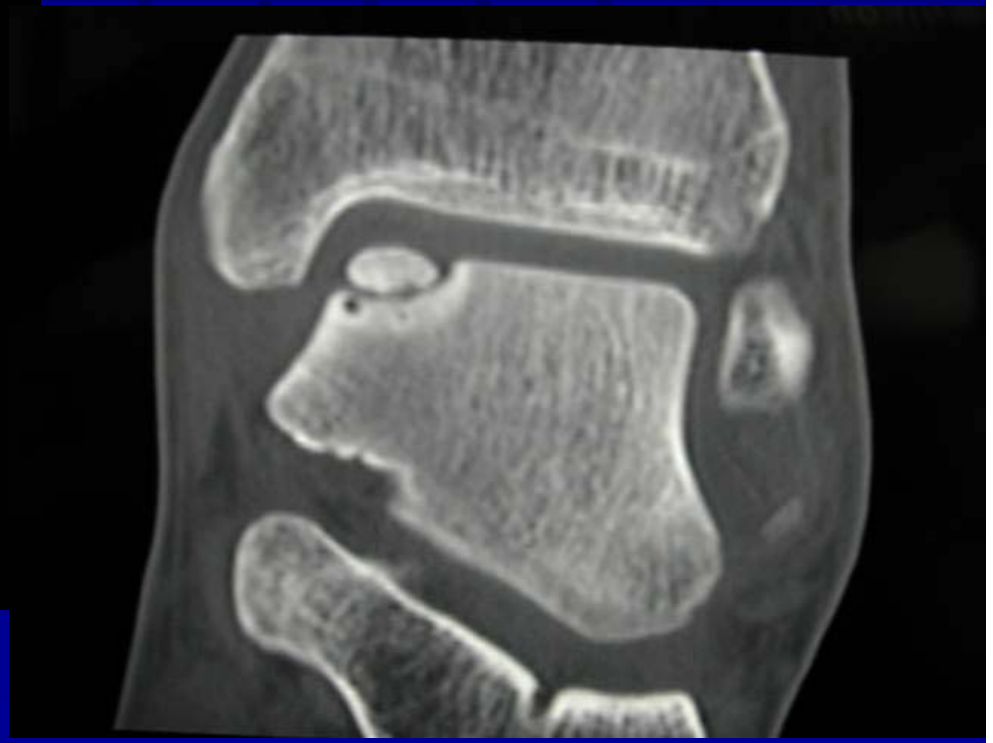
ANKLE PAIN

- Chronic
  - Osteochondral defect/ Osteochondritis dessicans
- Trauma
  - Ankle sprain
  - Ankle sprain
  - Ankle sprain
  - Fracture

OSTEOCHONDRAL DEFECT

- Can occur with up to 6.5% of ankle sprains
- History:
  - Pain, swelling, give way, instability, locking, catching
- Consider if ankle sprains do not respond to 6-8 weeks of conservative therapy
- Plain radiographs first
- MRI very sensitive and can grade lesion
- Treatment:
  - Non-operative = immobilization and limited weight bearing for 6 weeks
  - Surgery for higher grade lesions

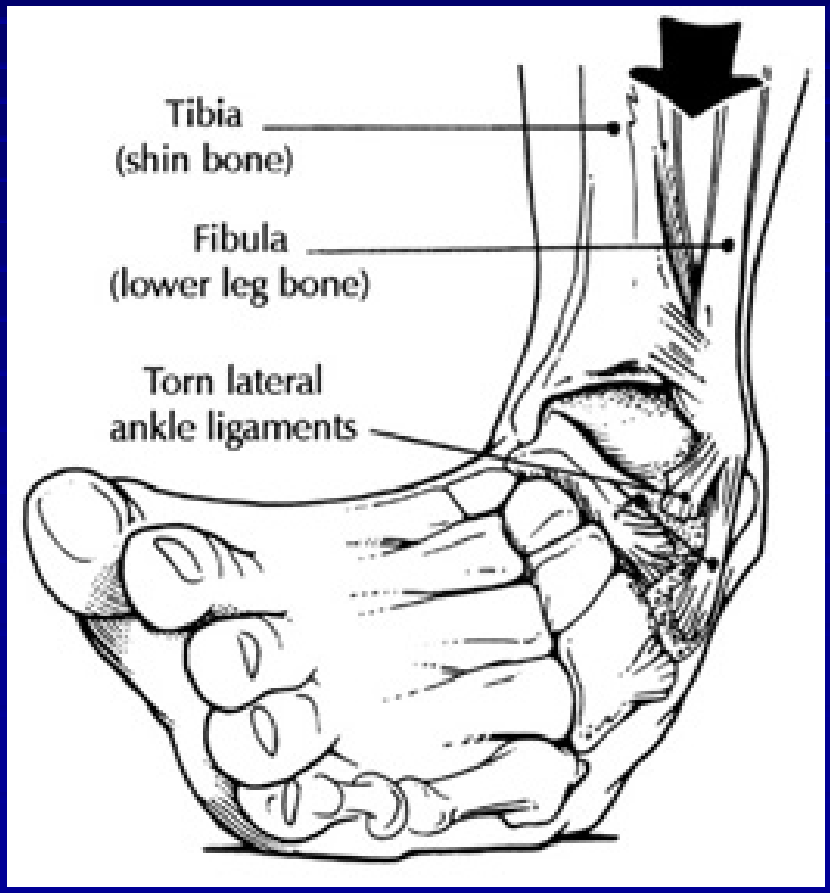
OSTEOCHONDRAL DEFECT

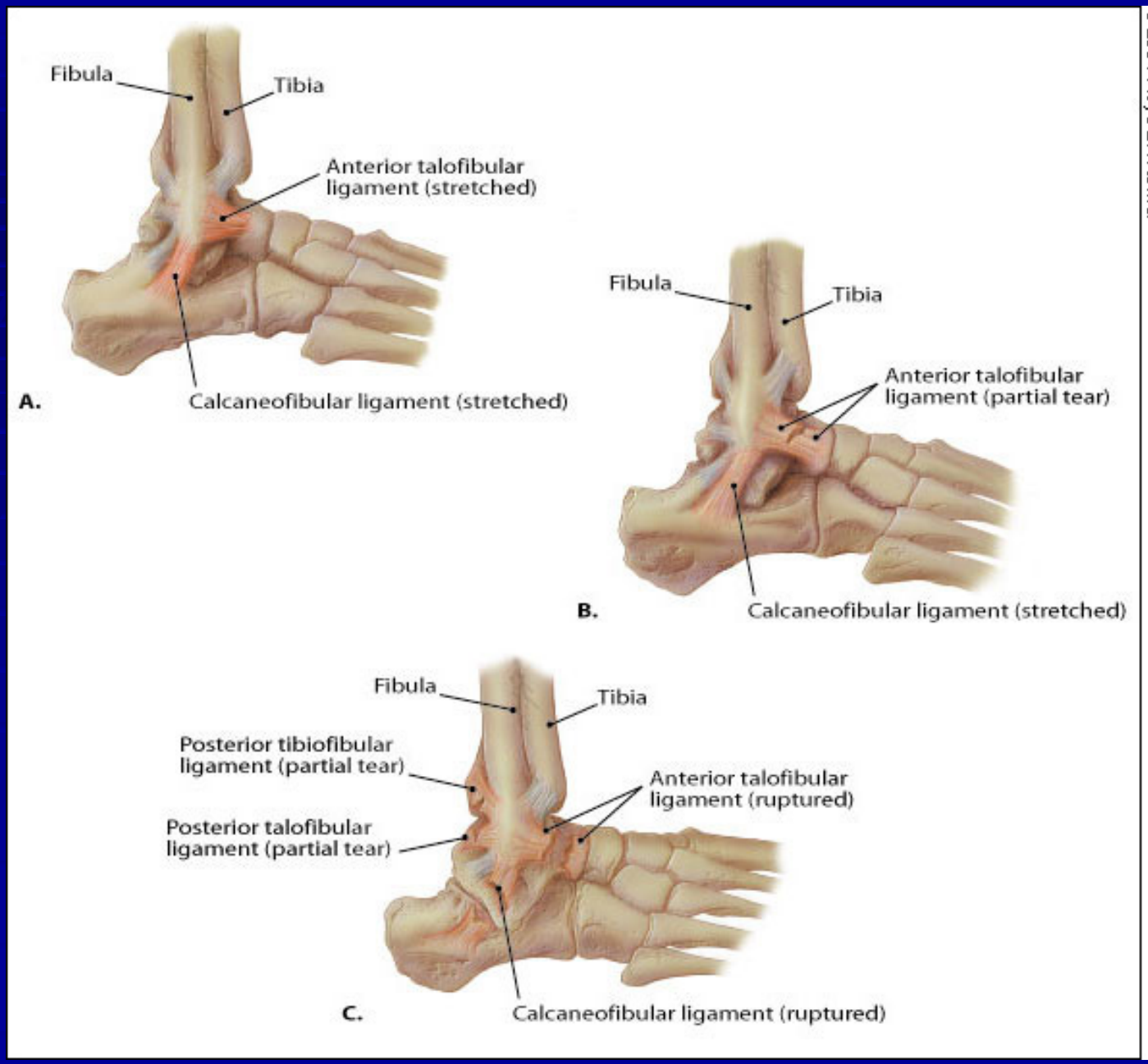


OSTEOCHONDRAL DEFECT

ANKLE SPRAIN

- Most commonly injured joint among athletes
- 85% of all ankle injuries are sprains
- Most (85%) are INVERSION injuries

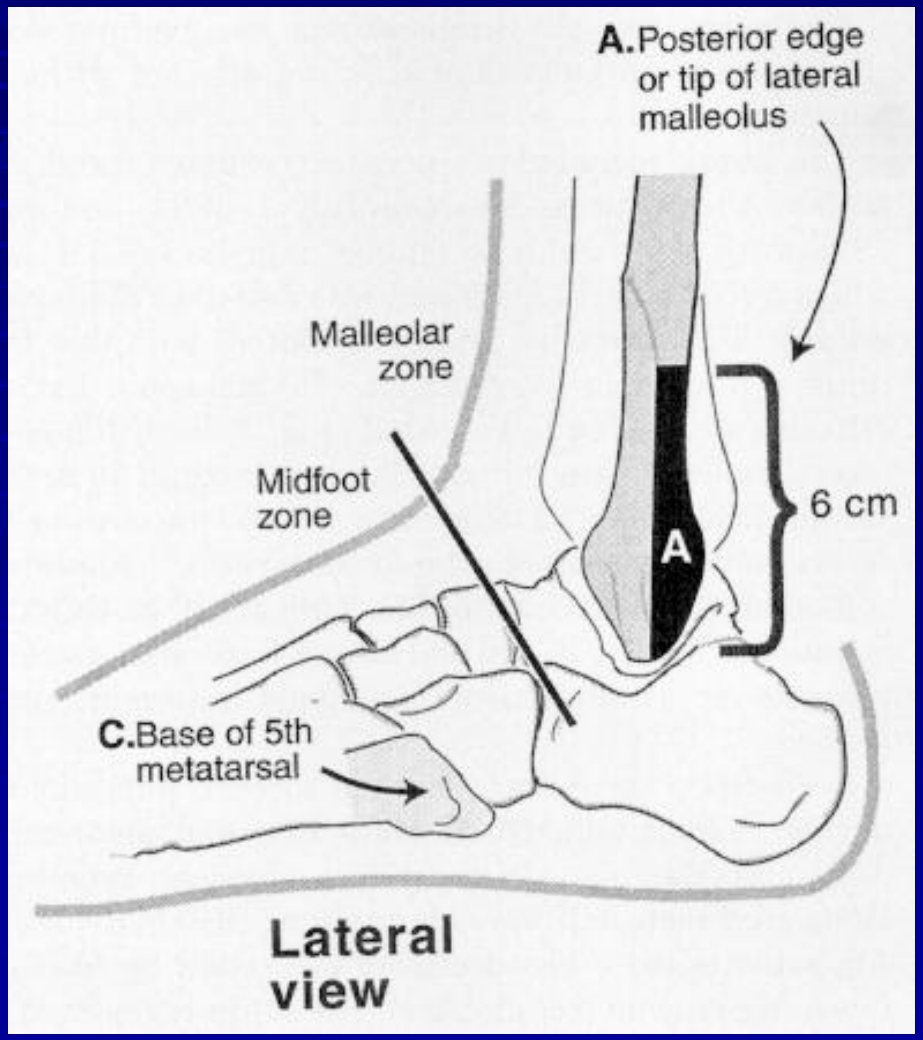


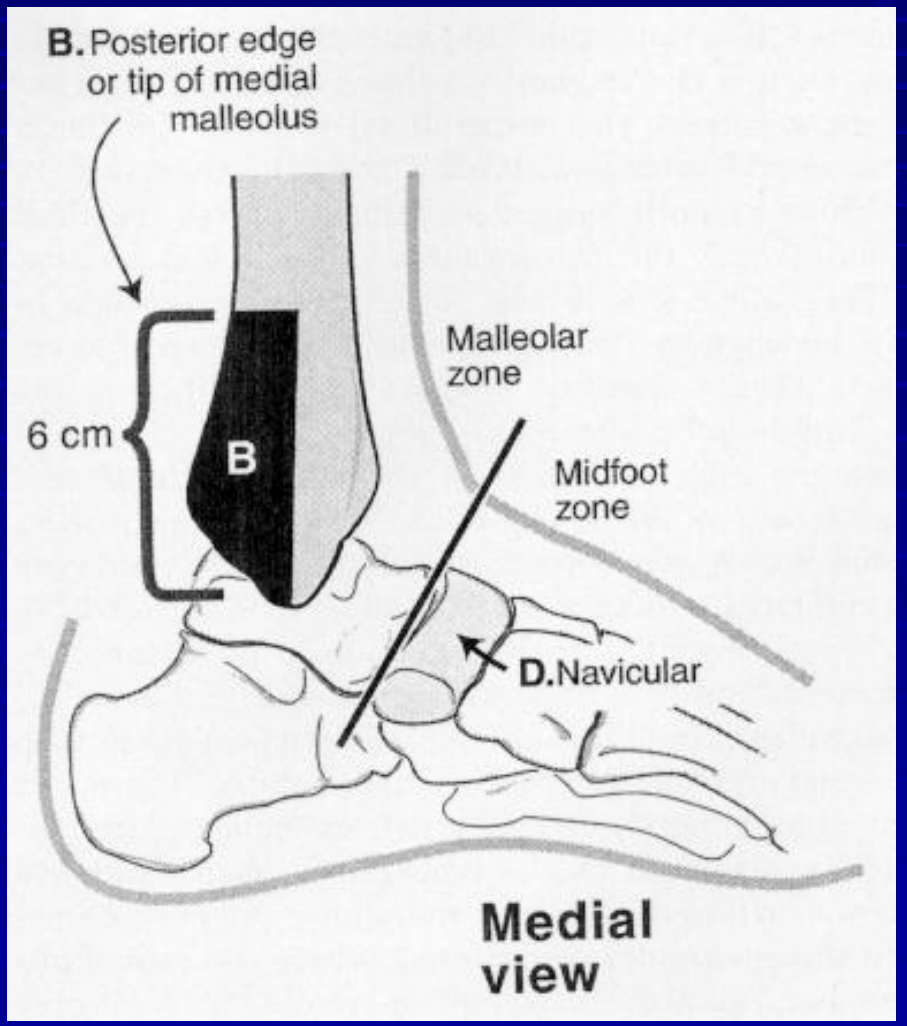


OTTAWA ANKLE AND FOOT RULES

- Purpose: to determine which patients with ankle trauma need radiographs
- Strengths:
  - Decrease unnecessary x-rays, patient waiting times, & diagnostic costs
  - Sensitivity near 100% for detecting malleolar and midfoot fractures
- Limitations:
  - Only for skeletally mature patients
  - Only applies if seen within 10 days of injury

Ottawa Ankle Rules

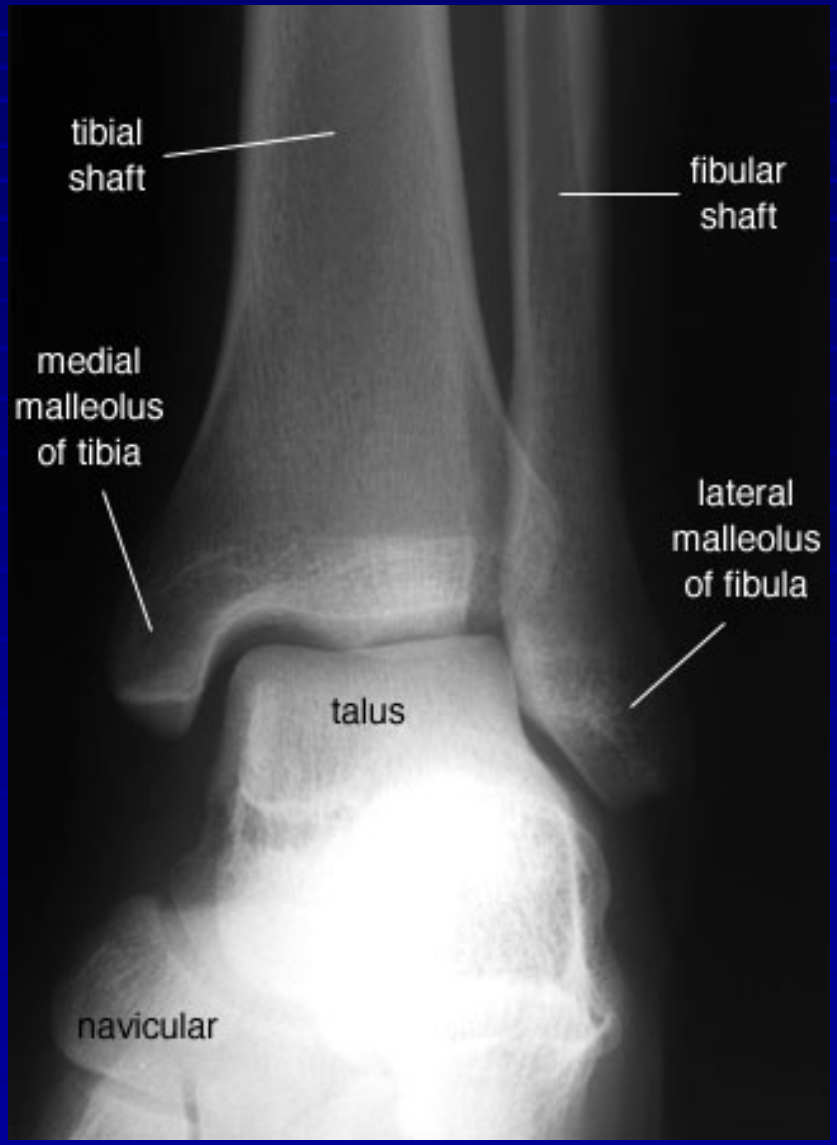




OR INABILITY TO BEAR WEIGHT AFTER INJURY OR IN OFFICE/ED

Radiographs

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

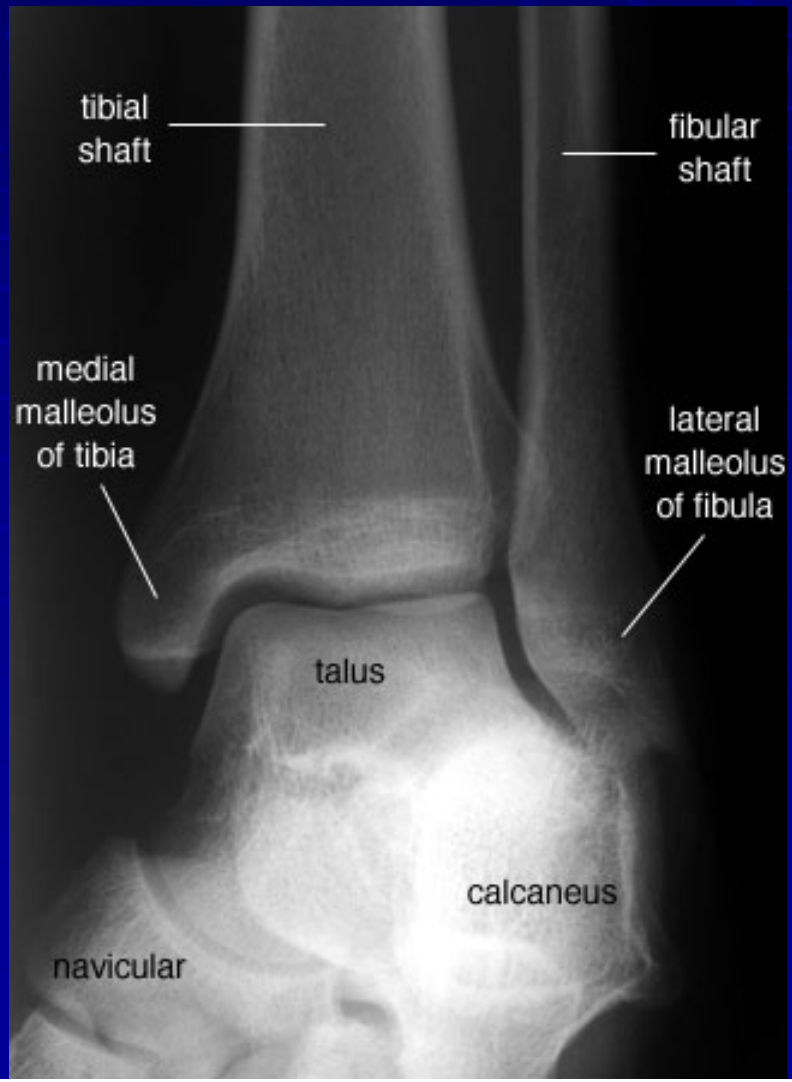


A-P View of Ankle

Radiographs

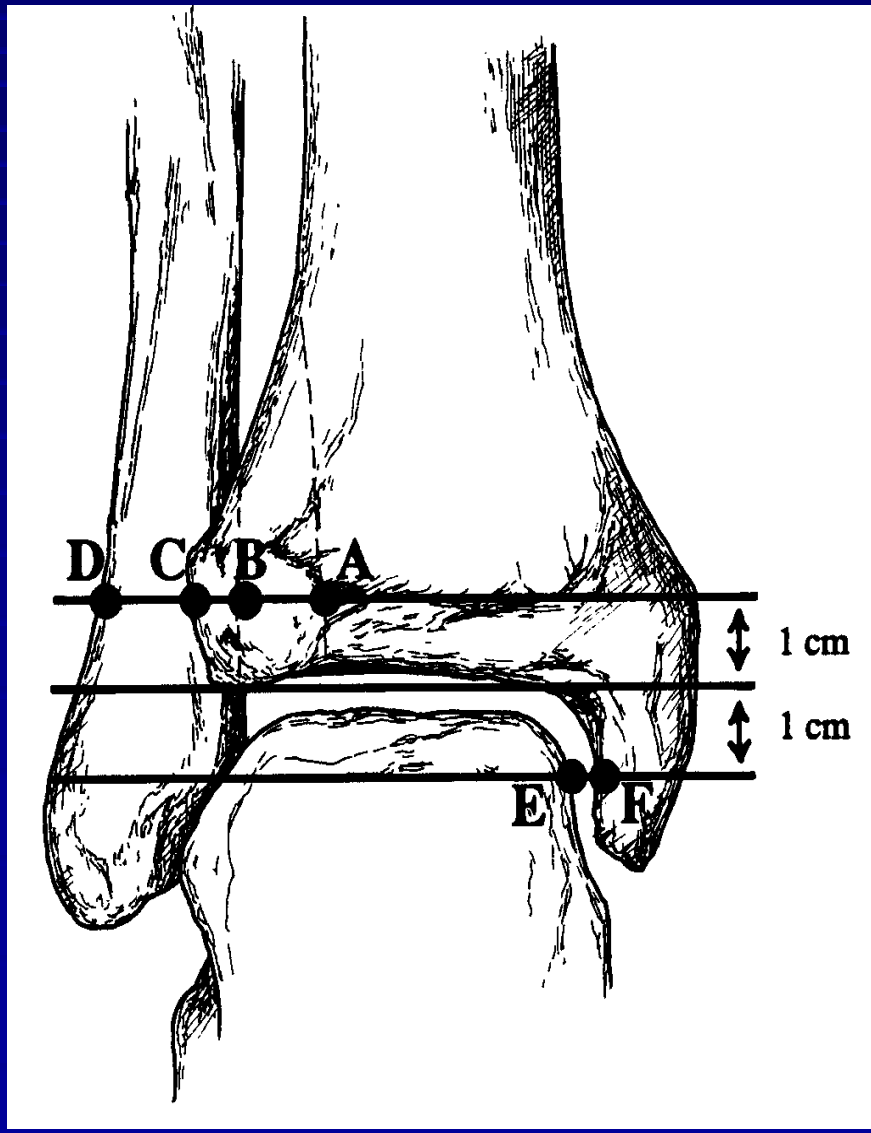
Lateral View of Ankle

Mortise View of Ankle



Mortise View Normals

- E-F Tib-Talo “clear space” should be ≤ 5 mm
- A-B Tib-Fib “clear space” should be ≤ 5 mm



CLASSIFICATION OF LATERAL ANKLE SPRAINS

	Grade I	Grade II	Grade III
Edema, ecchymosis			
Weight bearing			
Ligament pathology	Stretch		
Instability testing			
Time to return to sport			

OTHER (THAN LATERAL) ANKLE SPRAINS

- Syndesmotic or high ankle sprain
  - Stretching/tearing of syndesmosis and/or inferior tibiofibular ligaments
  - Common mechanism forced external rotation of foot or internal rotation of tibia on planted foot
- Isolated deltoid ligament sprain
  - Rare, usually accompanied by lateral malleolar fx and/or syndesmotic injury
- Rehabilitation similar to lateral sprains but more likely to require immobilization and have residual symptoms

- A 21-year-old white female presents to the emergency department with a history c/w lateral ankle sprain that occurred 2 hours ago while playing softball. She complains of pain over the distal anterior talofibular ligament (ATFL), but is able to bear weight. There is mild swelling, mild black and blue discoloration, and moderate tenderness over the insertion of the ATFL, but the malleoli are nontender to palpation. Which of the following statements is TRUE regarding management?

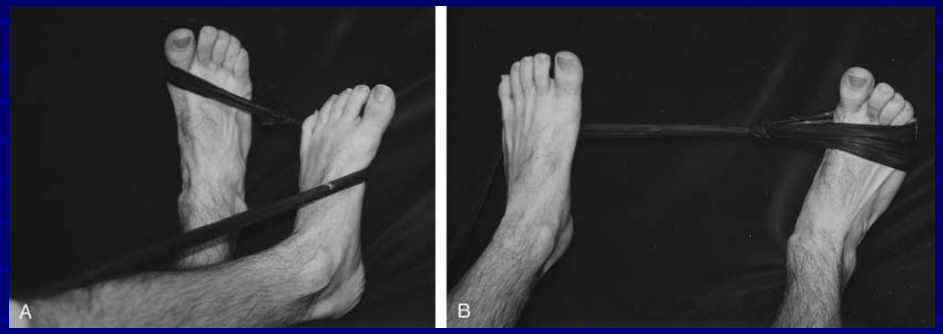
- A: AP, Lateral and 30 degrees internal oblique (mortise view) radiographs should be obtained to rule out fracture
- B: Stress radiographs will be needed to rule out a major partial or complete ligamentous tear
- C: The patient should use crutches and avoid weight bearing for 10-14 days
- D: Early ROM exercises should be initiated to maintain flexibility
- E: For best results, functional rehabilitation should begin within the first 24 hours after injury

ANKLE SPRAIN TREATMENT

- PRICE
  - Protection – stirrup splint, walking cast/boot, crutches if unable to bear weight due to pain
  - Rest
  - Ice – 20 min every 2-3 hours for first 48-72 hours
  - Compression
  - Elevation

ANKLE SPRAIN TREATMENT

- Weight bearing as soon as tolerated
- Passive/active ROM
- Resistance exercises
- +/- Proprioceptive exercises



NON-HEALING ANKLE SPRAINS

- Symptoms not improving after 6 weeks
- Pain and/or recurrent instability
- Top 3 causes:
  - Inadequate rehabilitation
  - Inadequate rehabilitation
  - Inadequate rehabilitation
- Other causes
  - Talar dome OCD, peroneal tendon injury, anterolateral impingement, loose body, OA, tarsal coalition, complex regional pain syndrome

FOOT AND ANKLE
COMMON COMPLAINTS

- Heel pain
- Forefoot pain
- Ankle pain
- Numbness/tingling/burning
- Ankle swelling

NUMBNESS/TINGLING/BURNING

- Heel
  - Jogger's foot
  - Tarsal Tunnel
- Plantar surface of foot
  - Tarsal tunnel
- Toes
  - Morton's neuroma

Peripheral Neuropathy

Diabetes

Nutritional deficiency

Alcoholism

Heavy metal exposure

Chemotherapy

Renal disease

INH therapy

HIV

JOGGER'S FOOT

- Medial plantar nerve entrapment
- Neuropathic pain radiating along medial heel and arch
- Often associated with overpronating styles
- Exam: tenderness at navicular tuberosity, pain with toe raise, forceful heel eversion provokes symptoms

MORTON'S NEUROMA

- Dama
  - sens
    - Usu
- Risk
  - Hig
- Histo
  - Poo
  - Rad
    - wal

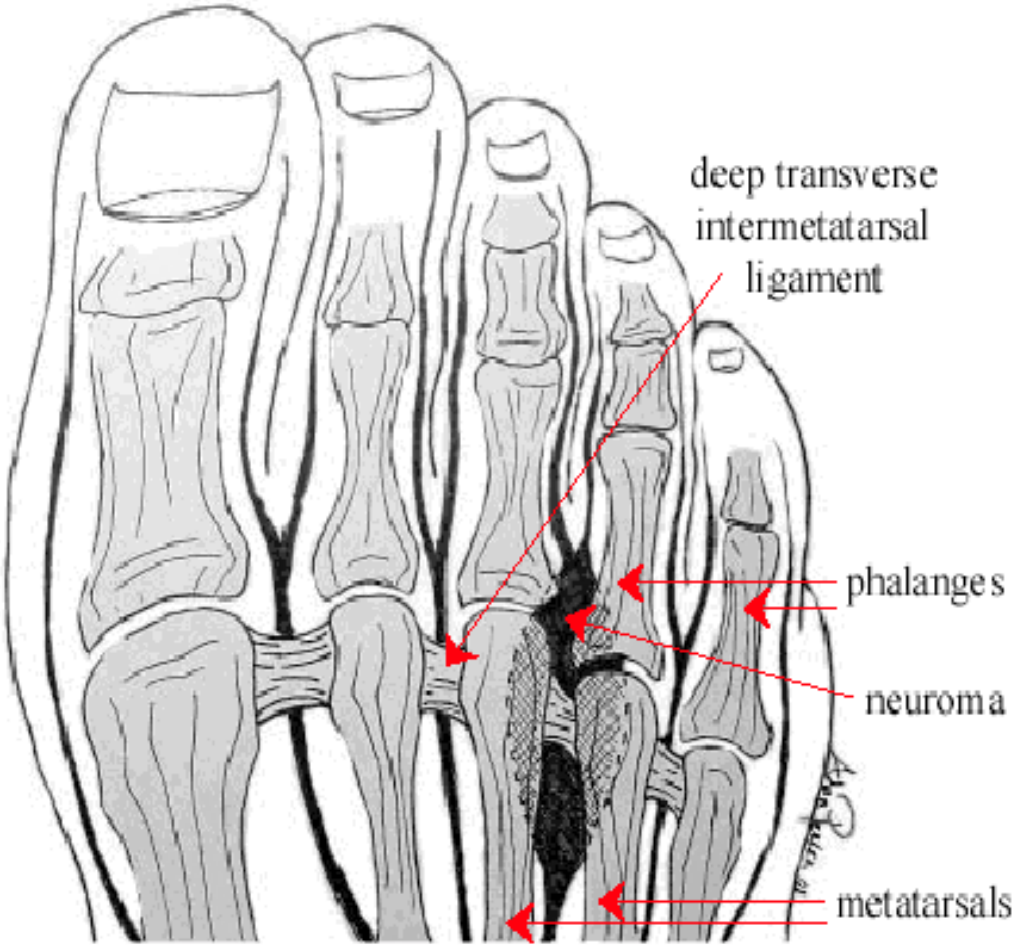


Figure 1. Morton's neuroma found between 3rd and 4th toes underneath the deep transverse intermetatarsal ligament.

MORTON'S NEUROMA

- Exam:
  - Squeeze test (lateral compression of metatarsal heads)
  - May be able to palpate swelling between toes
- Treatment
  - RICE, NSAIDs, proper shoes
  - Injection, metatarsal pads, surgical resection

FOOT AND ANKLE
COMMON COMPLAINTS

- Heel pain
- Forefoot pain
- Ankle pain
- Numbness/tingling/burning
- Ankle swelling

ATRAUMATIC ANKLE SWELLING

- Osteoarthritis
- Rheumatoid arthritis
- Gout
- Infectious
  - Gonorrhea
  - Lyme disease
  - Septic

TAKE HOME POINTS

- Try and localize pain
- Take a look at shoe wear, gait style
- Include a sensory exam
- Consider x-rays if history or trauma or repetitive stress
- Keep systemic illness in mind

RHEUMATOID ARTHRITIS

- ANKLE
  - Ankle sprains- medial and lateral and high
    - Ottawa ankle rules
  - Achilles tendonitis
  - Retrocalcaneal bursitis
  - Posterior tibial tendonitis
  - Sever's disease (calcaneal apophysitis)
  - Tarsal tunnel syndrome
  - OCD
- FOOT
  - Plantar fasciitis
  - Metatarsalgia
  - Morton's neuroma
  - Tarsal tunnel
  - Toe fracture
  - Navicular stress fracture
  - Freiberg's infarction