From Childhood to Adulthood
OMT for LOWER EXTREMITY
Hip, Knee, Ankle, Foot

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March 1, 2019

Objectives

1. **Demonstrate knowledge of the anatomy of the lower extremity- Hip, Knee, Ankle, Foot**
2. **Discuss and describe the clinical presentation and diagnosis of common injuries to the lower extremity**
3. **Describe and demonstrate a complete H&P examination of the lower extremity**

Objectives

4. Describe and demonstrate OMT techniques to treat lower extremity injuries and conditions:

Specifically

1. FPR for Musculature/plantar fascia
2. Iliopsoas Muscle Energy/Hip capsule bounce
3. 5 (6 or 7)-Step Knee Treatment
4. Ankle/foot HVLA and articulation

Hip Problems

- A patient presents with hip pain…

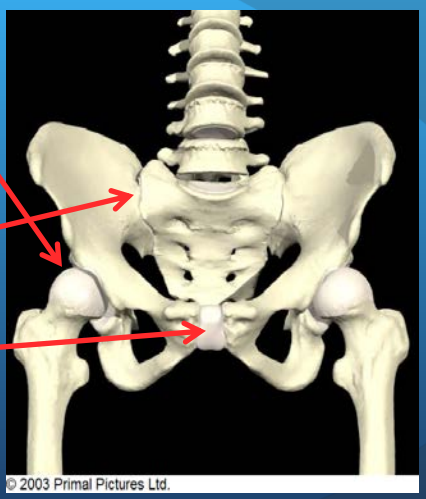
Common Hip DDx

- Strain (muscles)
- Sprain (ligaments)
- Arthritis (OA, RA)
- Bursitis
- Radiculopathy
- Fracture
- Tumor
- Infection
- Synovitis
- Traumatic
- Somatic Dysfunction

Anatomy

Pelvic girdle has three joints:

- Acetabulofemoral joint - (hip joint)
- Sacroiliac joint (sacrum is the base of the spine & the innominate is considered part of the leg)
- Pubic symphysis (anterior strut that provides stability during walking or sitting)
  - The main motions of the pubic symphysis are superior/inferior glide and separation/compression



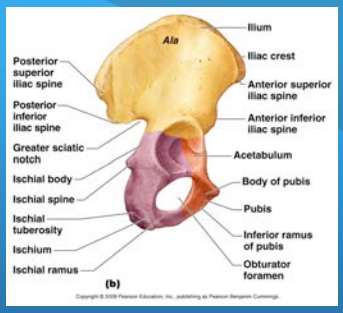
Anatomy

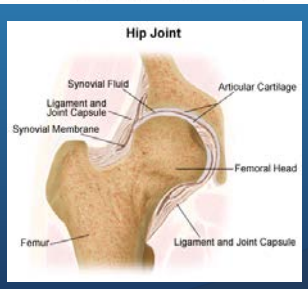
Acetabulofemoral joint:

- Ball & socket joint- mobility & weight bearing
- Intrinsic stability due to shape, ligamentous & cartilaginous attachments

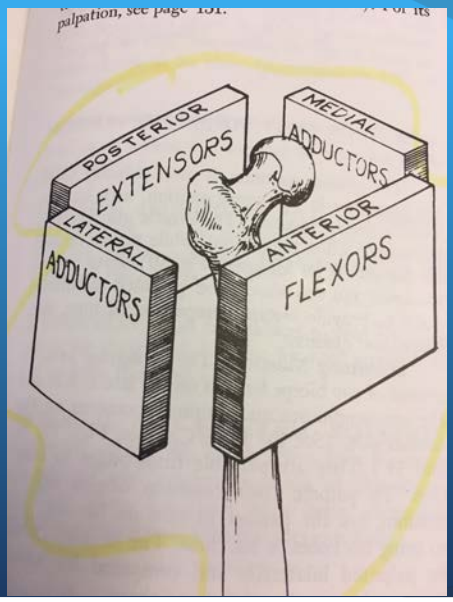
Consists of:

- Acetabulum
  - Ilium
  - Ischium
  - Pubis
- Femoral head





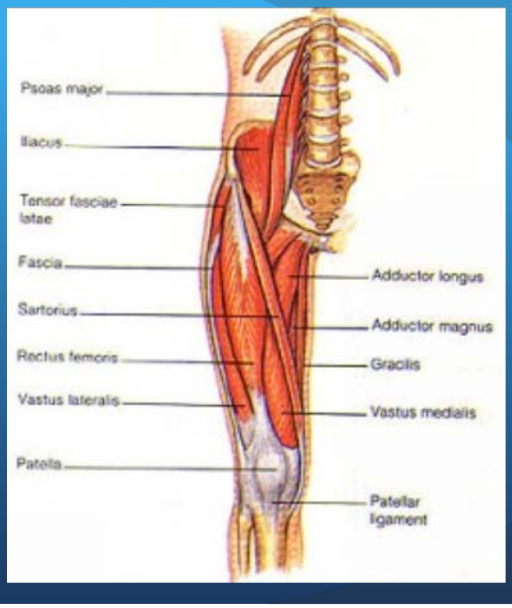
Mechanics



Muscle Function

Hip Flexors:

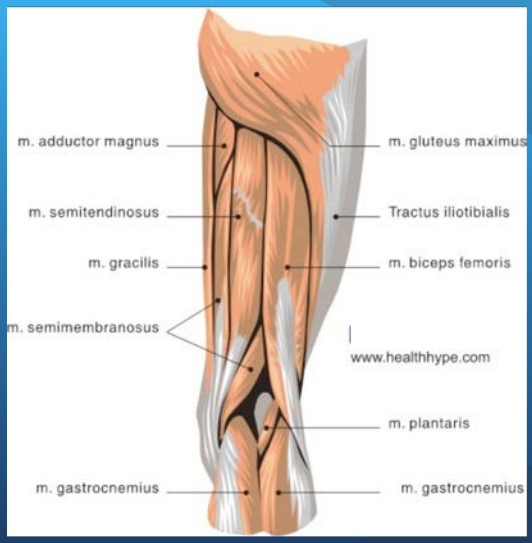
- **Iliopsoas** - (hypertonic, runners, soccer, skaters have increased lumbar lordosis)
- Rectus femoris (stiff knee gait , retro patellar pain)
- Sartorius



Muscle Function

Hip Extensors

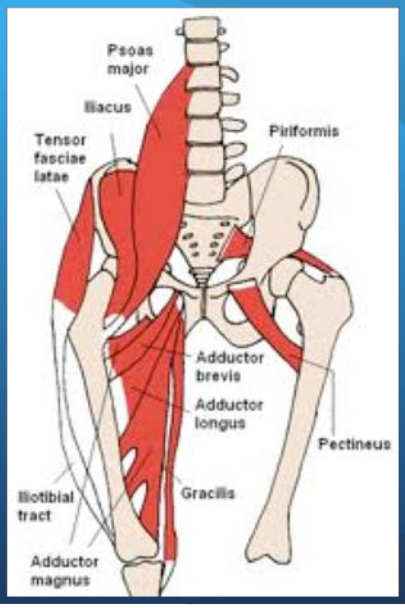
- **Gluteus maximus**
- Hamstrings
  - *Medial hamstrings*
    - Semimembranosus
    - Semitendinosus
  - *Lateral hamstrings*
    - Biceps femoris



Muscle Function

Adductors – 5 muscles

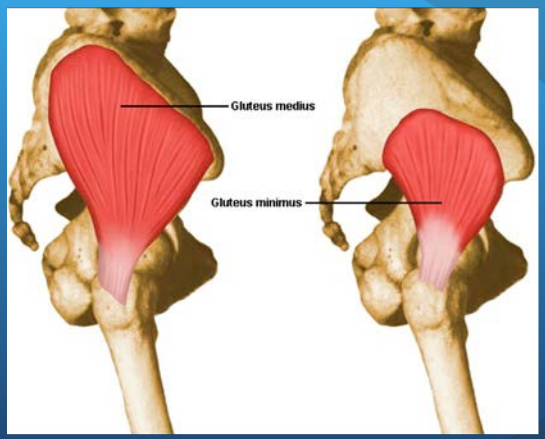
- **Adductor longus**
- Adductor brevis
- Adductor magnus
- Pectineus
- Gracilis



Muscle Function

Abductors

- **Gluteus medius**
- Gluteus minimus



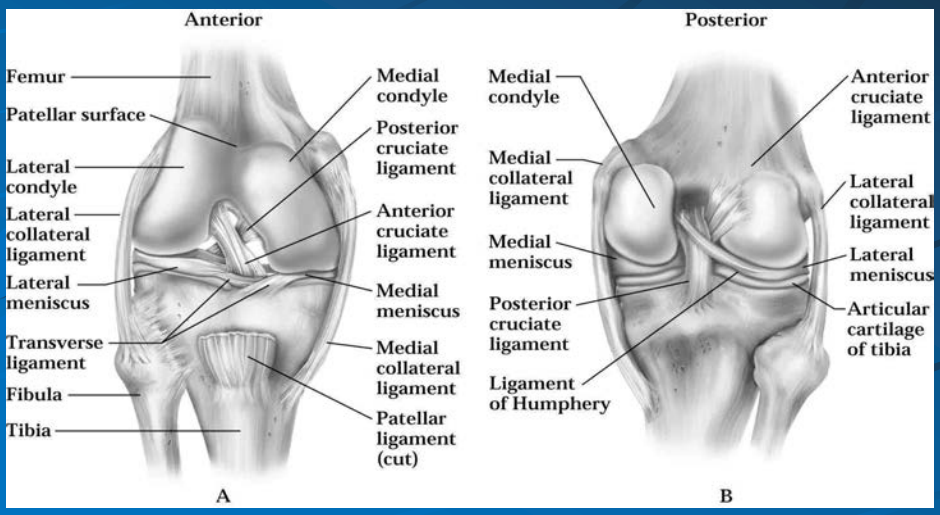
Knee Problems

- **A patient presents with knee pain…**

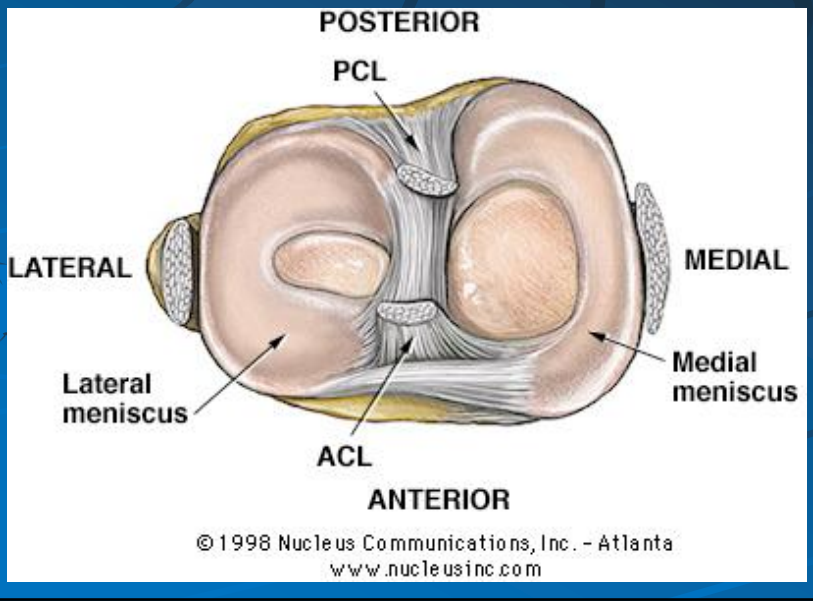
Common Knee DDx

- Strain (muscles)
- Sprain (ligaments)
- MCL, LCL
- Medial/lateral Meniscal tear
- ACL/PCL tear
- Arthritis (OA, RA)
- Bursitis
- Radiculopathy
- Fracture
- Tumor
- Infection
- Synovitis
- Baker Cyst
- Traumatic
- **Somatic Dysfunction**
  - **Fibular head**
  - **Tibiofemoral**
- Chondromalacia patella
- Osgood-Schlatter

Knee Anatomy



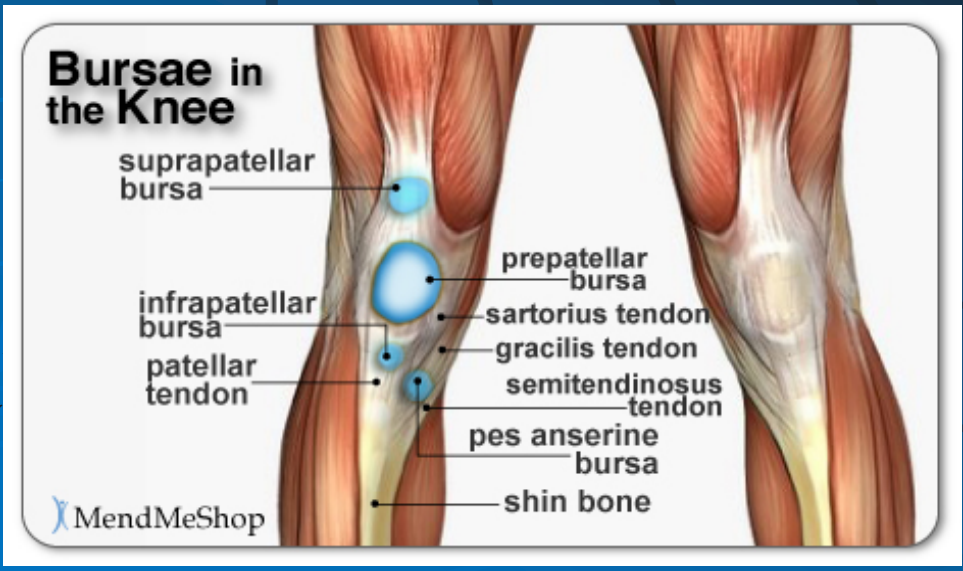
Meniscus



Observation, Inspection

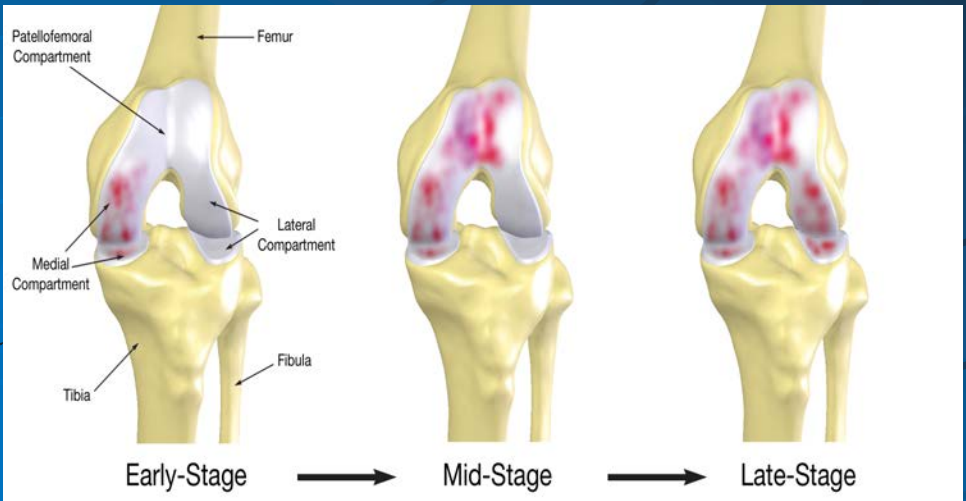
http://www.mendmyknee.com/_img/bowlegged.jpg

Bursitis



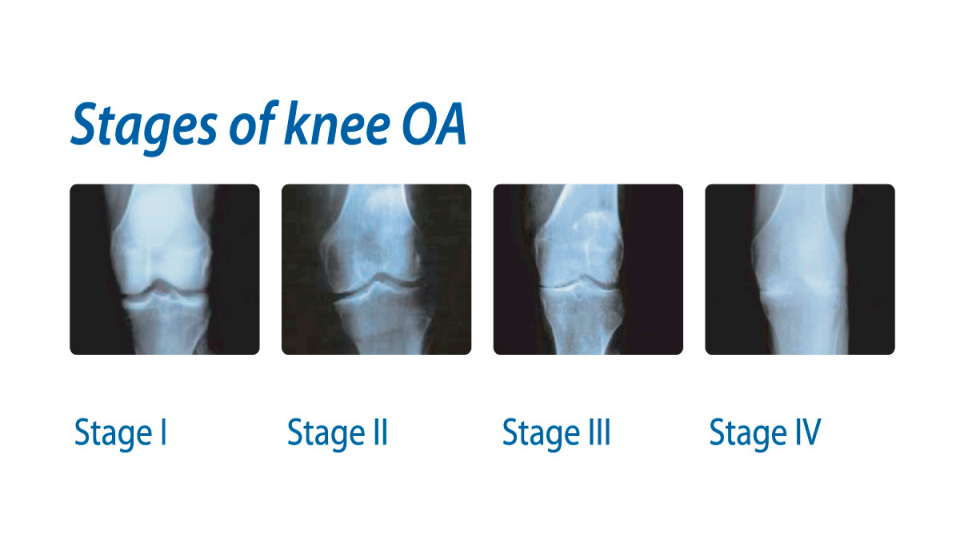
http://thepainsource.com/wp-content/uploads/2010/09/bursas-of-the-knee-mendmeshop.jpg

Osteoarthritis Knee



http://www.regionalorthopedic.com/wp-content/uploads/2012/05/StagesofKneeOAIllustration.jpg

Osteoarthritis Knee



http://www.medicalgrapevineasia.com/mg/wp-content/uploads/2012/11/stages-of-knee.jpg

KNEE ROM

- Flexion 120-135 Degrees
- Extension 0-5 Degrees
- Tib-fib ER/IR 10 Degrees

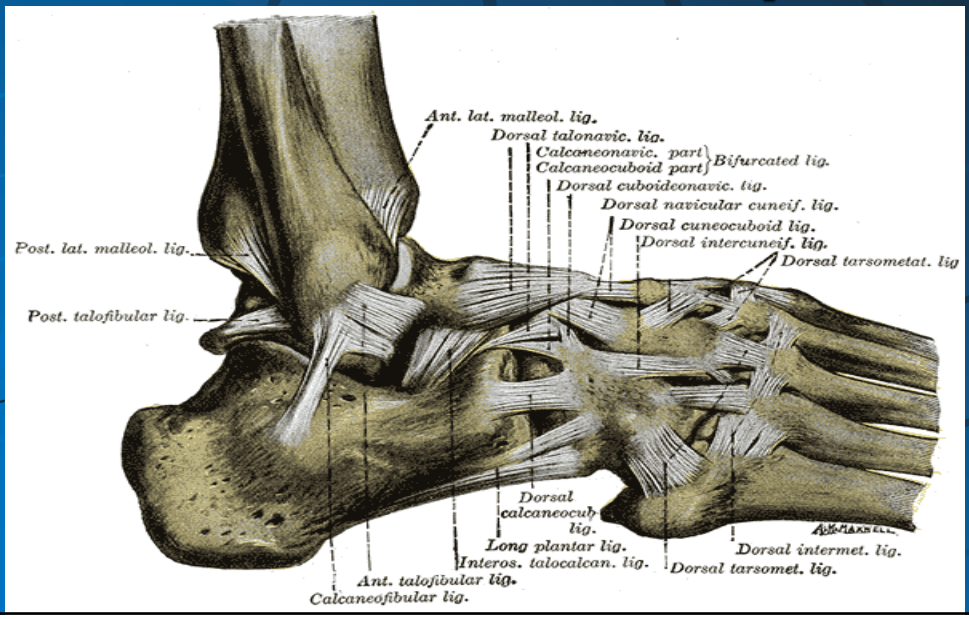
Ankle/Foot Problems

- A patient presents with ankle/foot pain…

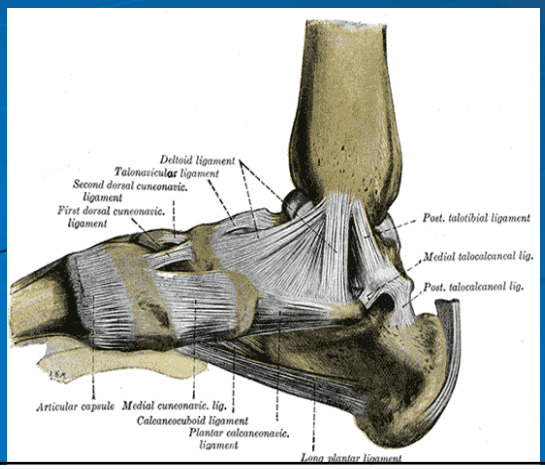
Common Ankle/Foot DDx

- Strain (muscles)
- Sprain (ligaments)
- Arthritis (OA, RA)
- Fracture
- Radiculopathy
- Fracture
- Traumatic/Achilles Tendon
- Plantar fasciitis
- Somatic Dysfunction

Lateral Ankle Complex



Medial Ankle Complex



- Triangular deltoid ligament
  - attachments
    - tuberosity of navicular
    - sustentaculum tali
    - calcaneus
    - medial tubercle of talus

Epidemiology

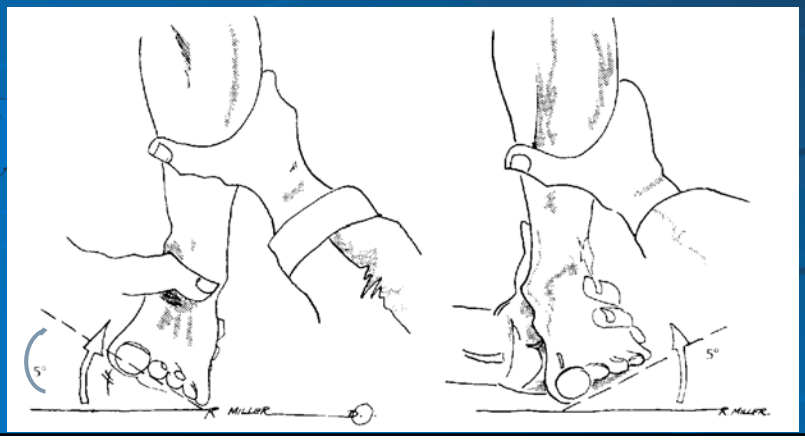
- Estimated that there is one inversion injury of the ankle per 10,000 persons per day (U.S. 23,000/day)
- Ankle sprain is the most common sports injury (can be treated acutely and chronically with OMT!*)
- In running and jumping sports accounts for 25% of injuries
- Large majority of pts. are <35y.o., most are 15 - 19y.o.

Clinical Evaluation Ankle/Foot

- lateral malleolus
- arches
- plantar fascia
- 5th Metatarsal base
- ligaments - (next two slides)
  - Valgus test
  - Varus test

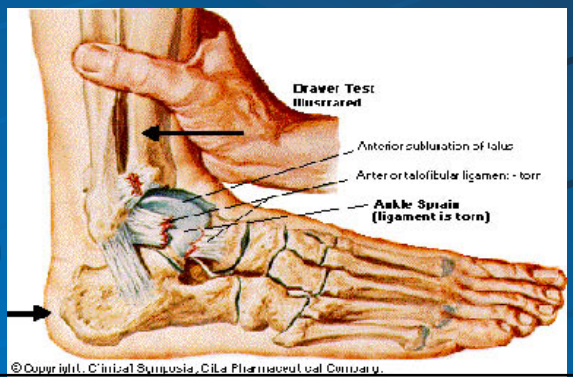
Clinical Evaluation Ankle/Foot

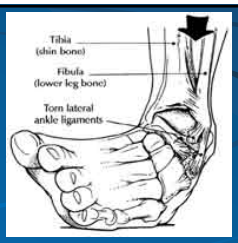
- **Varus Test** - Lateral ligaments
- **Valgus Test** - Deltoid (medial) ligament



Physical Exam

- Tests for ankle stability
  - Anterior drawer test
    - if positive is indicative of ATFL tear
    - perform at neutral and at 10 degrees of plantar flexion

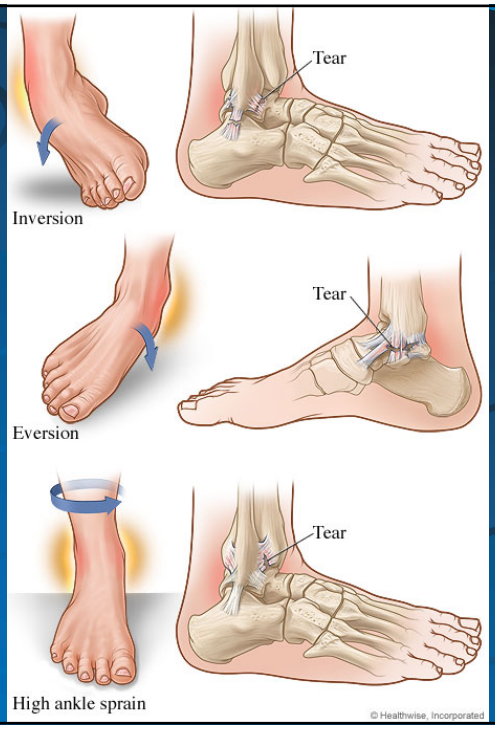




Mechanism of Injury

- Tears progress in predictable sequence
  - ATFL, anterolateral capsule, distal tibiofibular ligament, CFL, PTFL
  - if PTFL ruptures, ankle dislocation may occur, eversion injuries may fracture the fibula
  - inversion is most common sprain ….85%

- **Inversion 85%**
- **Eversion 15%**



Physical Exam

- **Palpate**
  - **point of maximal tenderness**
  - **include palpation of proximal fibula**

Bones of the Foot

- Calcaneus
- Talus
- Navicular
- Cuboid
- Cuneiforms (3)
- Metatarsals (5)
- Phalanx (14)
- Accessory bones (up to 24)

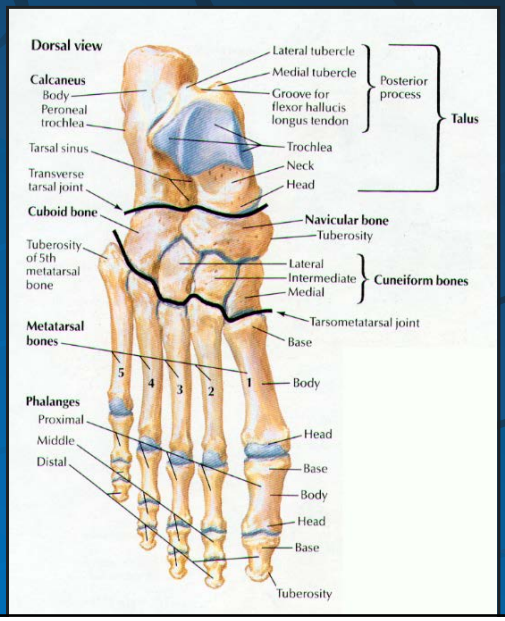
Be Mindful of the 5th

Rearfoot Injuries

- Talar Stress Fractures
- Calcaneal Stress Fractures
- Retrocalcaneal bursitis.
- Plantar fasciitis
- Somatic dysfunctions

Metatarsalgia

- Pain in the region of the metatarsal heads.
- Ground reactive forces are not properly distributed.



Plantar Fasciitis

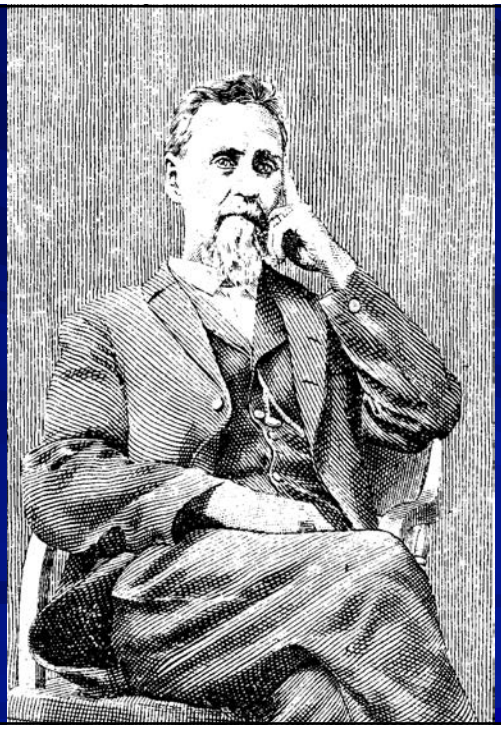
- SSX- First step in AM worst & w/ activity
  - Point tender over medial calcaneal tuberosity
  - Gastroc/achilles tight, overpronation common
  - Pain reproduced w/ jumping on involved toes
  - Fat Pad Syndrome- No pain w/ toe jumping
- may see heel spur in 30%

Plantar Fasciitis

- Plantar Fascia- maintains longitudinal arch
  - Provides shock absorption
  - Helps develop push-off power- running/jumping
- Weight gain, growth spurt, poor shoeware
- Can be treated quickly and effectively with OMT!* (FPR)

OMT for Lower Extremity

1. Hip
    1. FPR Muscles
    2. Spencer Technique for the Hip
    3. Fulford (see below)
2. Knee
    1. 5 (6, 7)-Step Knee Treatment
        1. Popliteal fossa MFR
        2. Fulford technique
        3. Fibular Head FPR (jiggle technique)
        4. BLT
        5. Patellar MFR
3. Foot/Ankle (HVLA, MFR, FPR)



Questions?

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