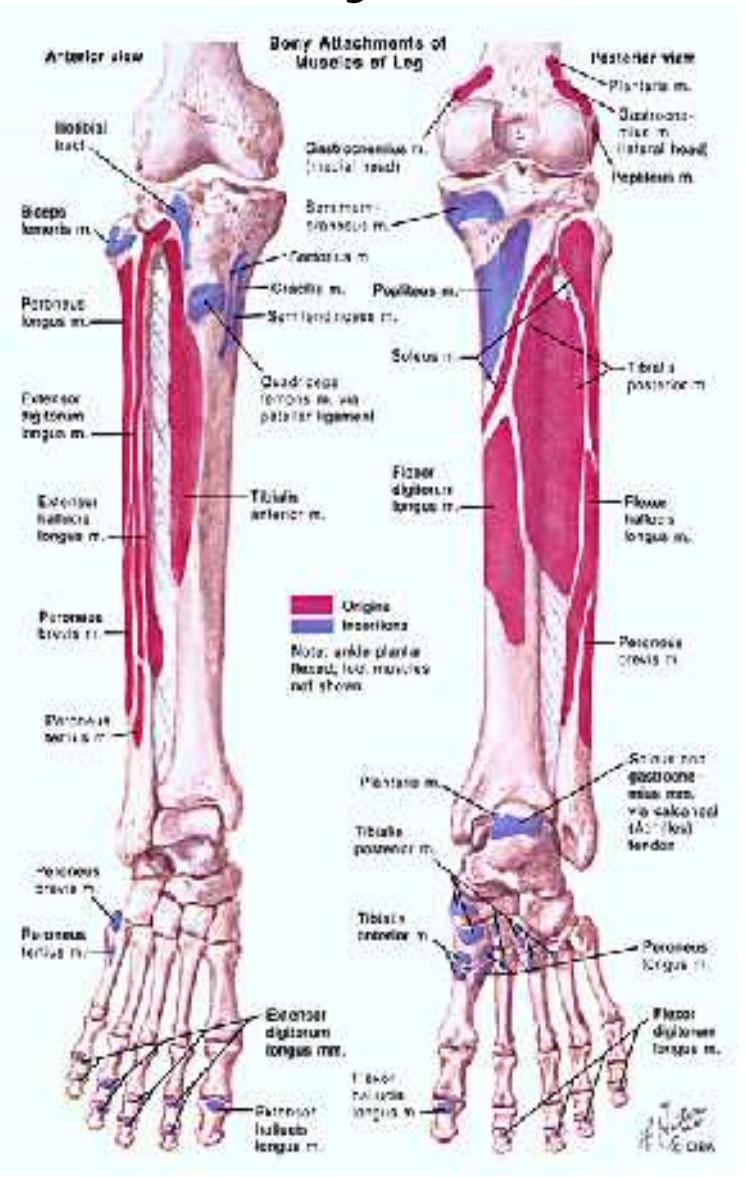
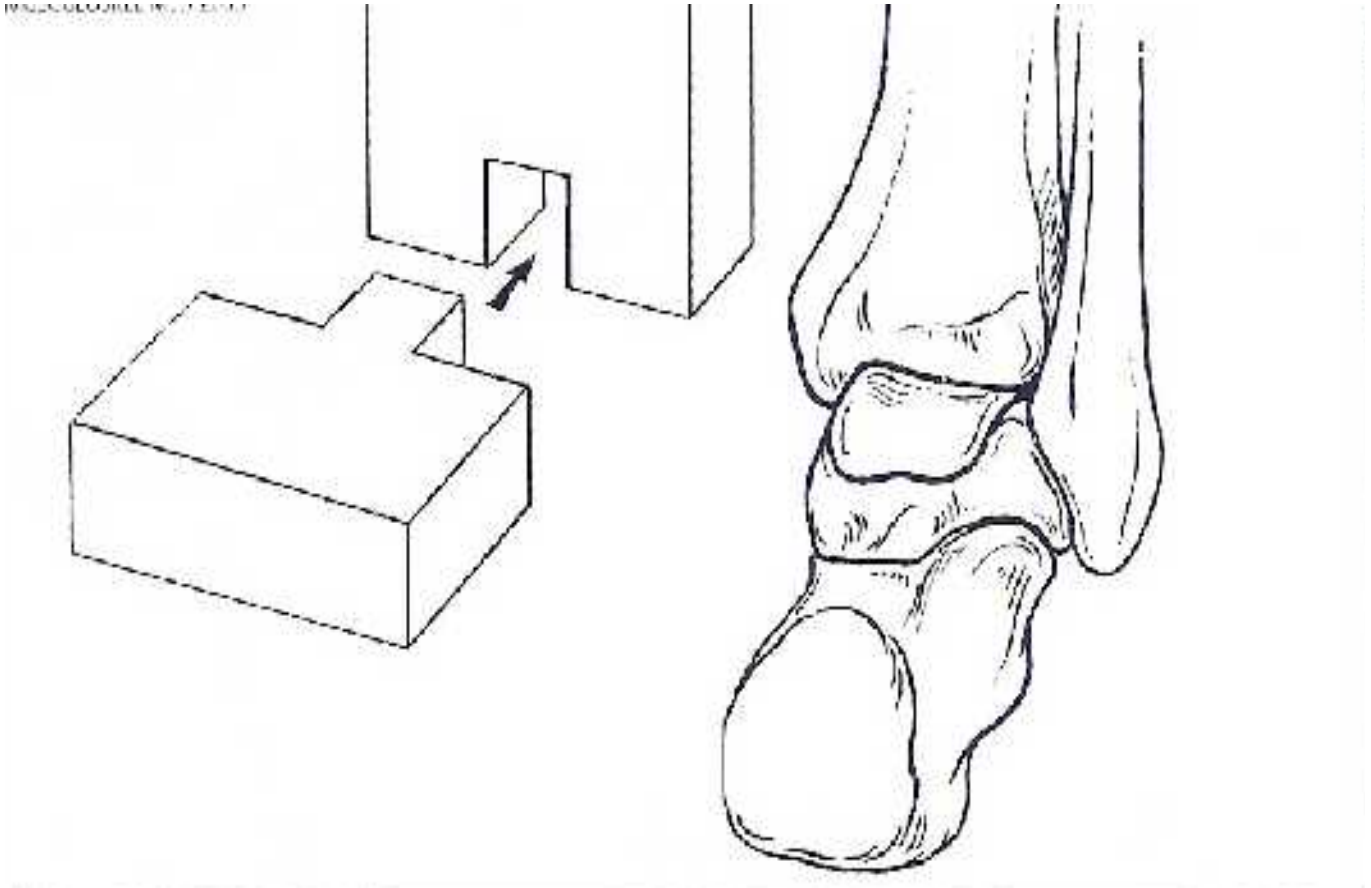
Ankle Injuries: Sprains and More

Bony Anatomy

- Tibia
- Fibula
- Talus

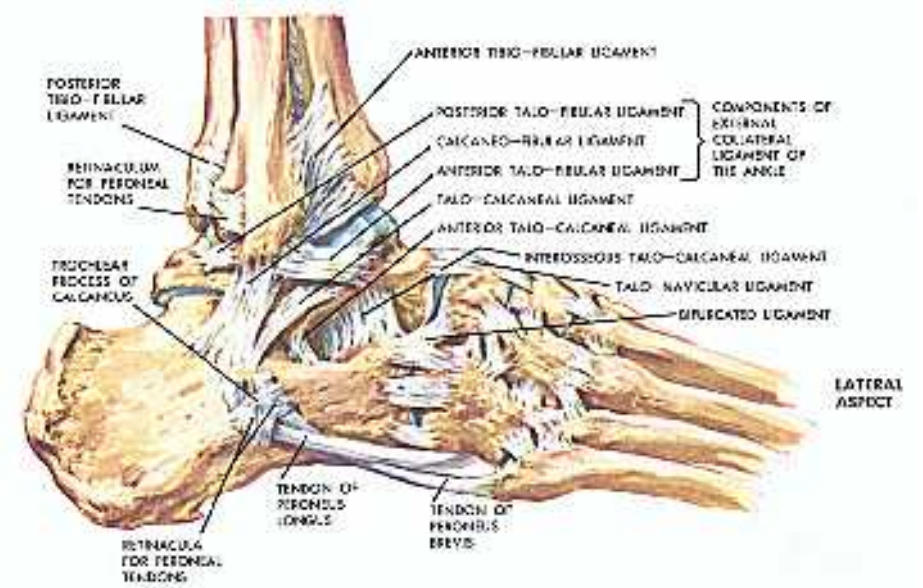


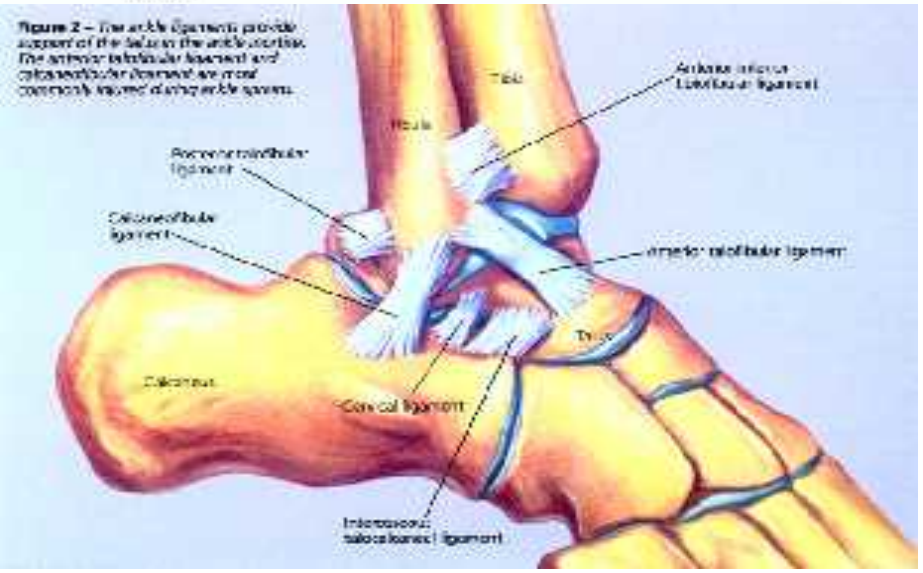
Mortice and Tenon Joint



Lateral Ligaments

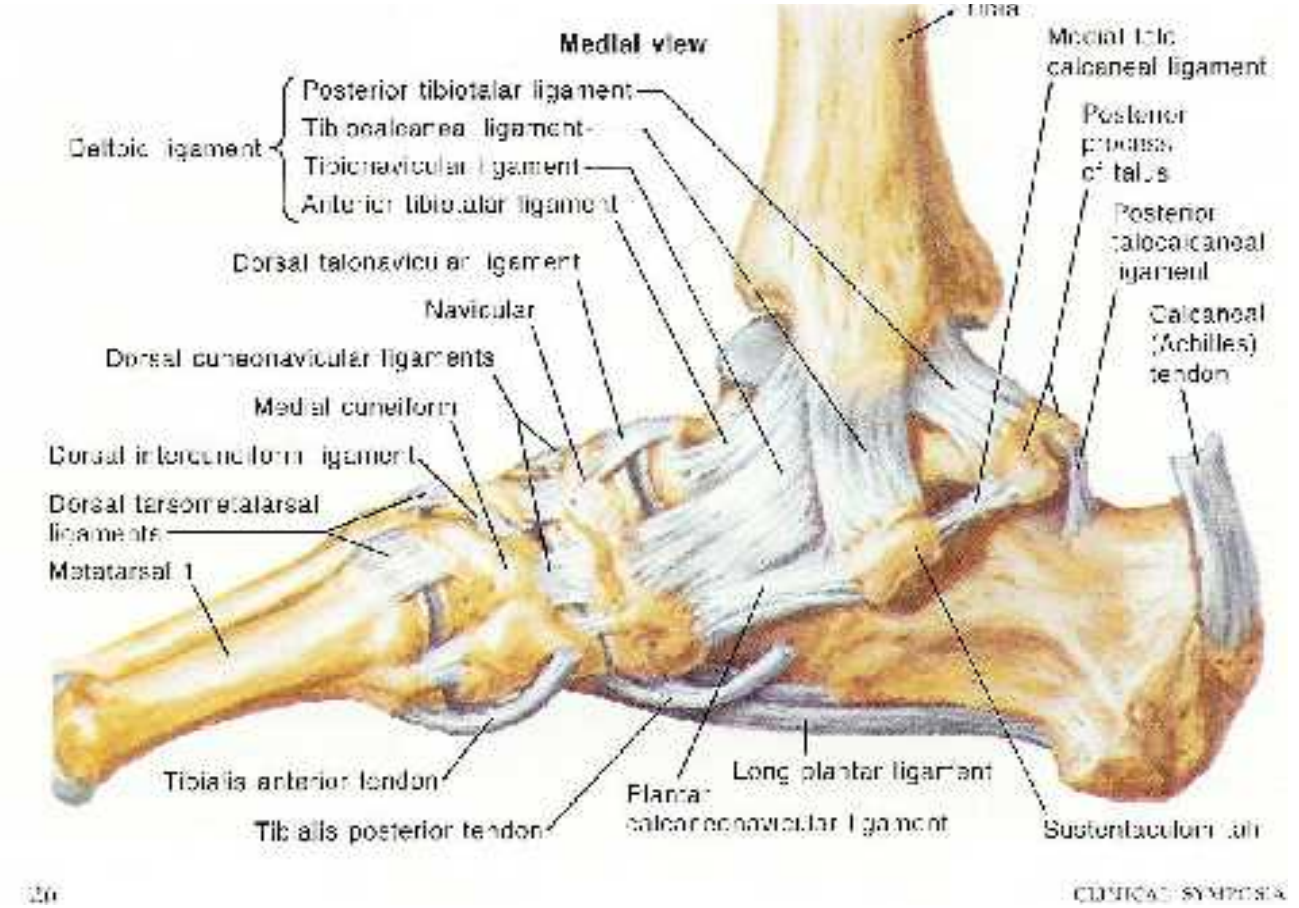
- Anterior talofibular
- Calcaneofibular
- Posterior talofibular





Medial ligaments

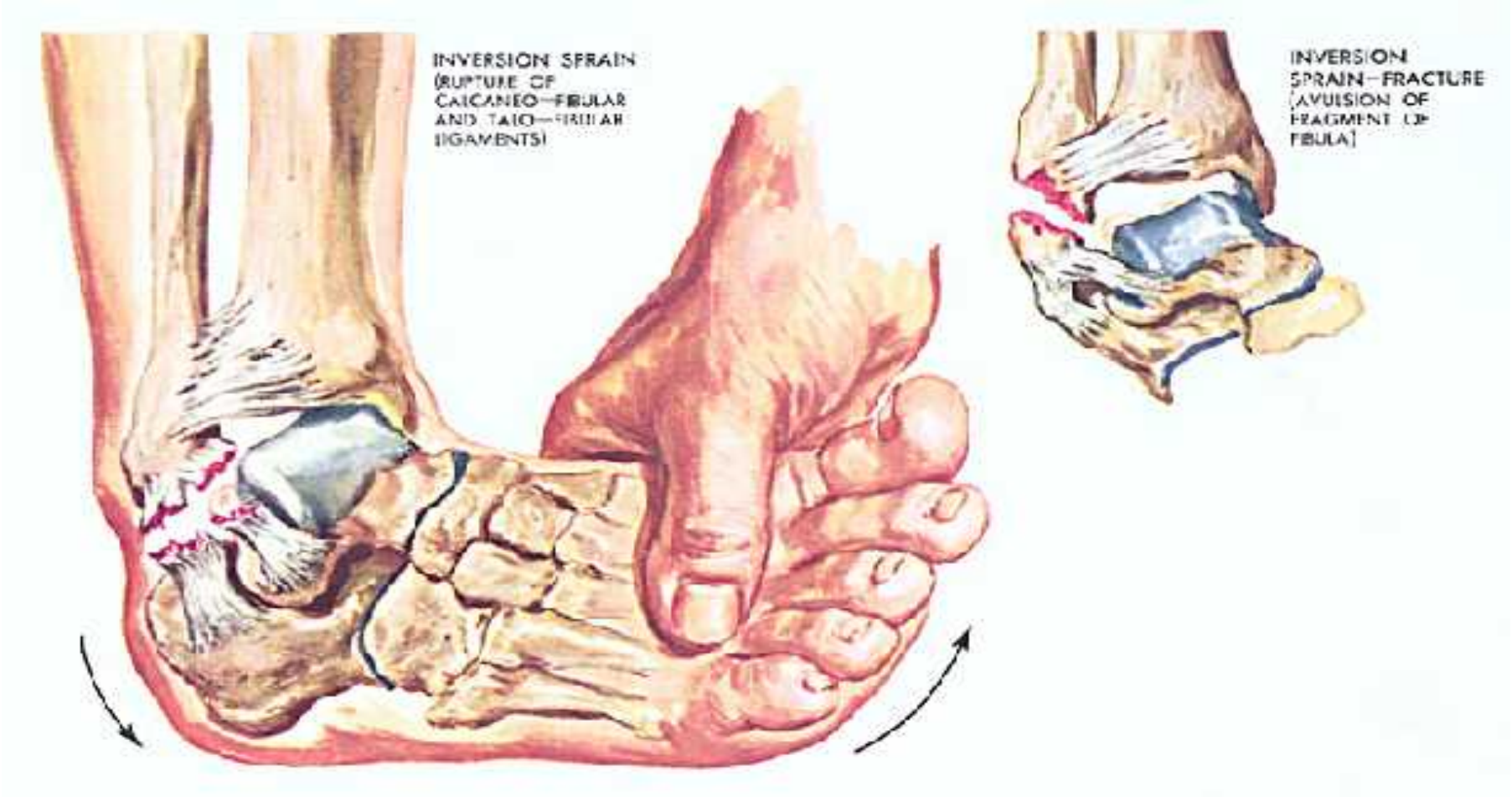
- Deltoid



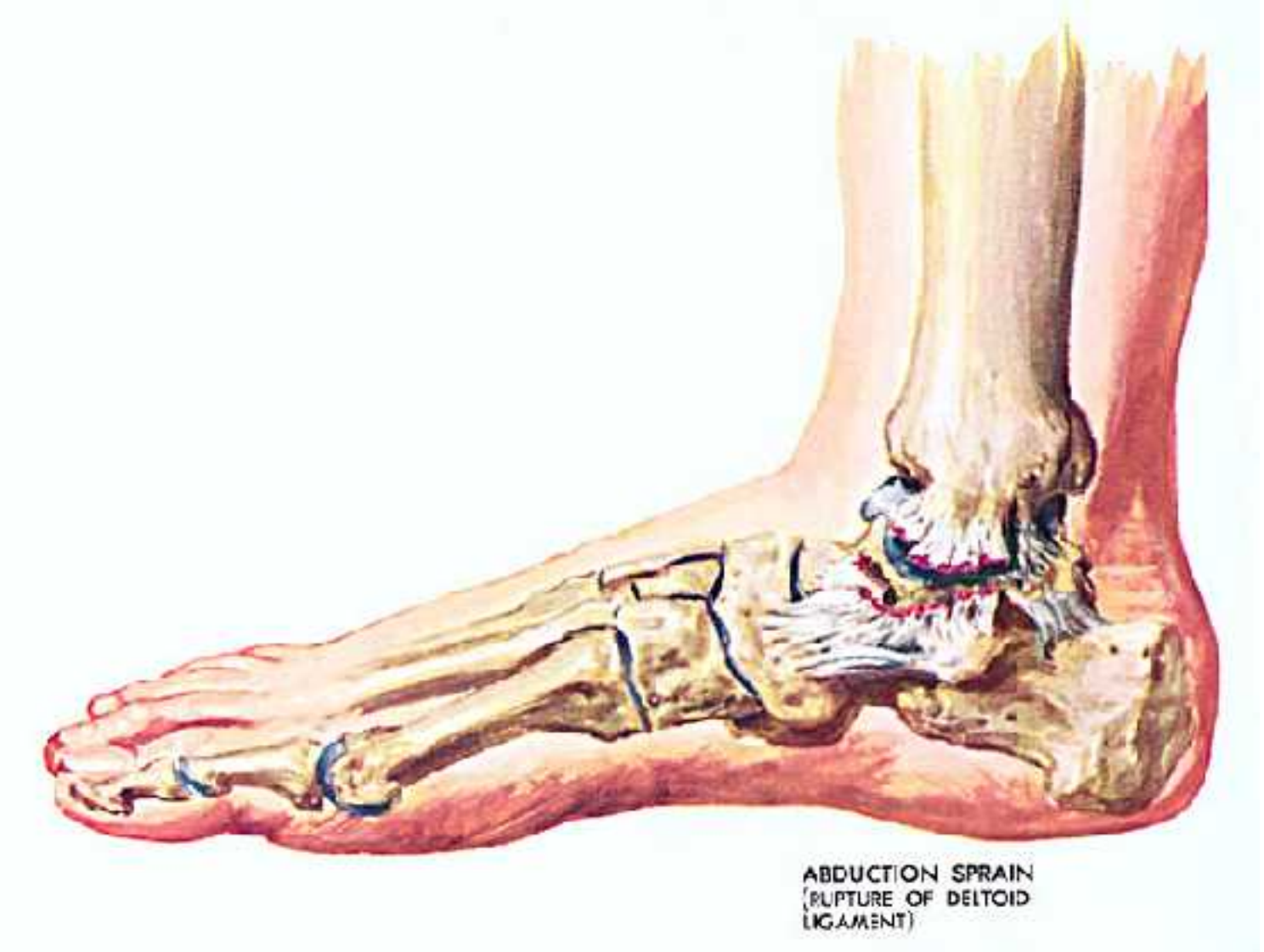
Mechanism of Injury Definitions

- Plantar flexion: toes down
- Dorsiflexion: Toes up
- Inversion: Heel in
- Adduction: Heel in
- Eversion: Heel out
- Abduction: Heel out

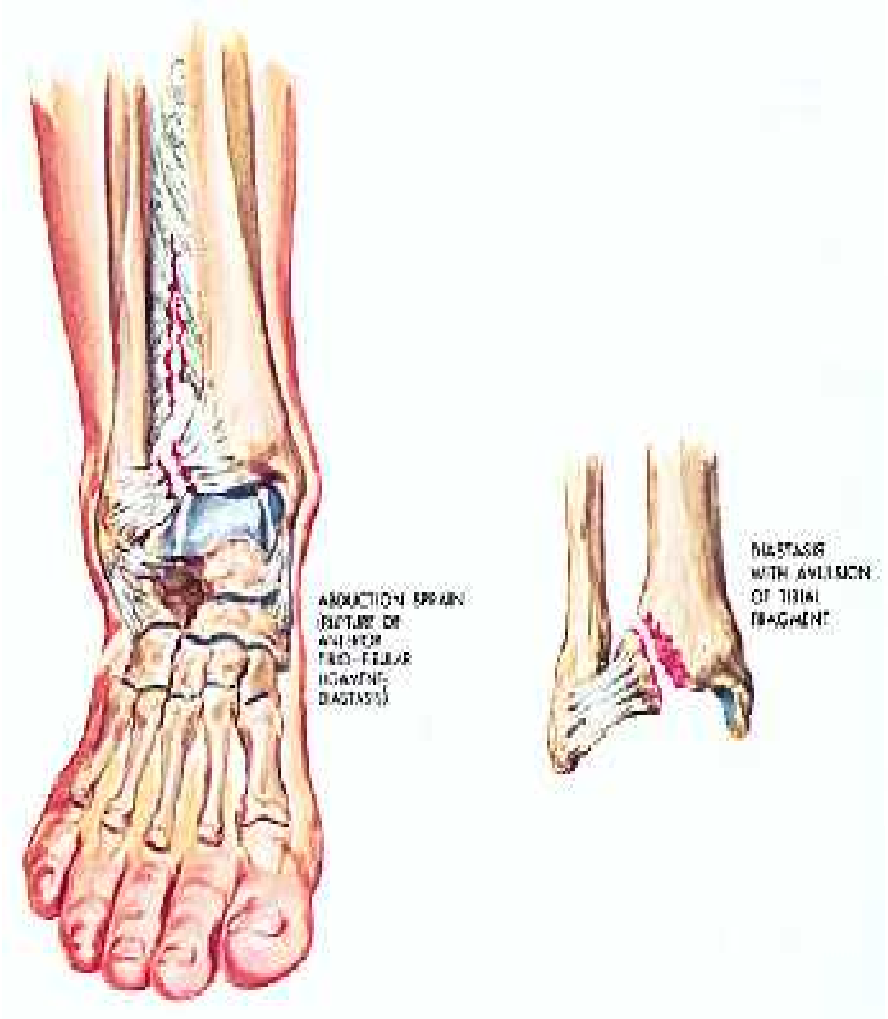
Inversion Injury

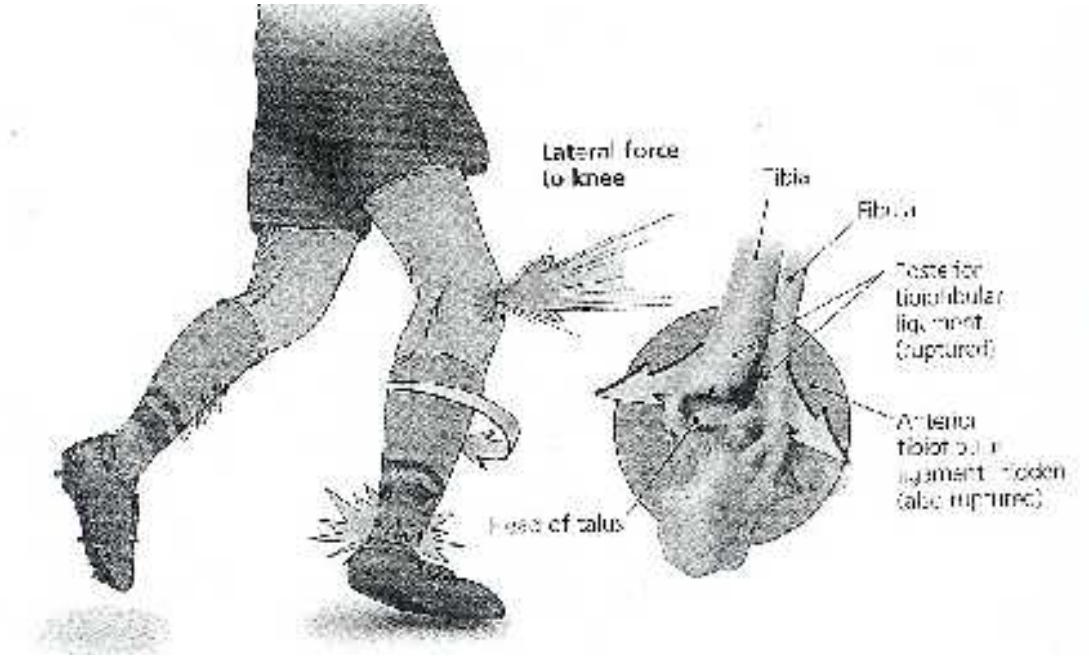


Eversion Injury



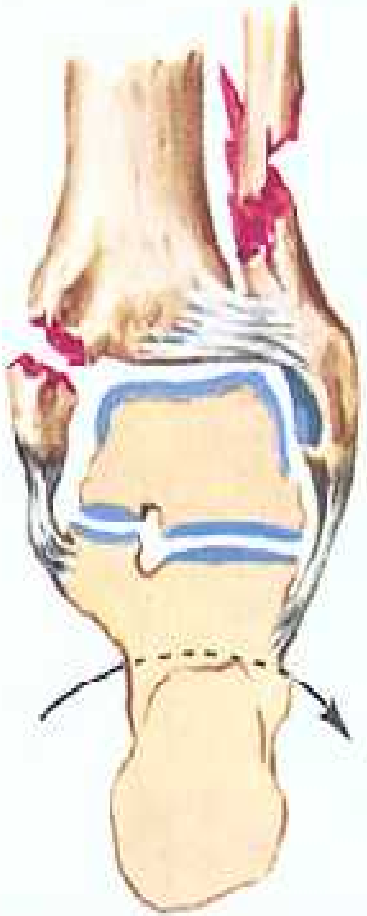
External Rotation Injury





External Rotation

FIBULAR FRACTURE



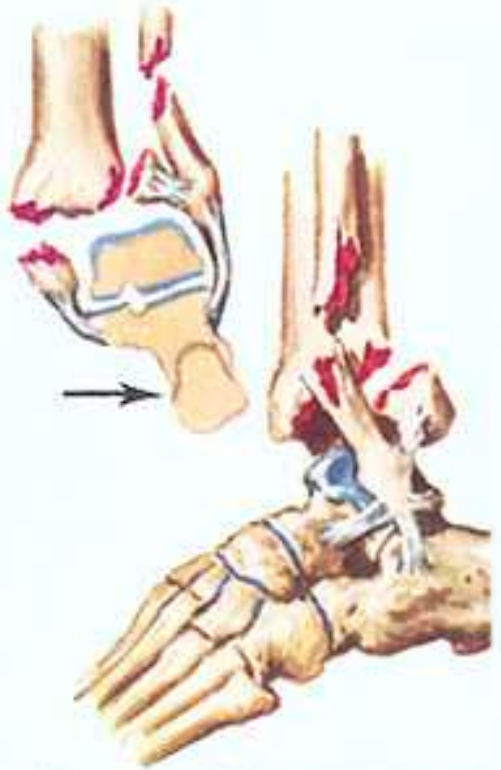
TIBIAL AND FIBULAR FRACTURES

TIBIAL AND FIBULAR FRACTURES, DIASTASIS AND DISPLACEMENT

Abduction

TIBIAL FRACTURE

TIBIAL FRACTURE PLUS DIASTASIS

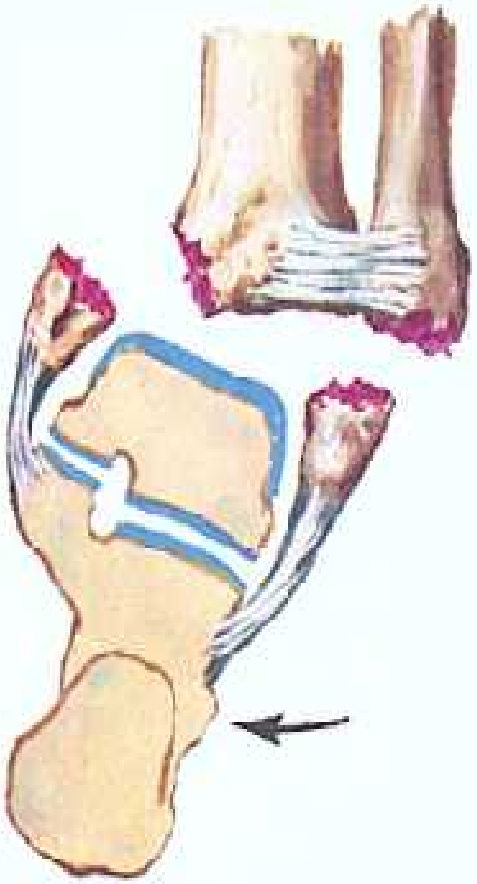


TIBIAL AND FIBULAR FRACTURES
DIASTASIS, MARKED ABDUCTIO
AND RETRODISPLACEMENT

Adduction

FIBULAR FRACTURE

TIBIAL AND FIBULAR FRACTURES



TIBIAL AND FIBULAR FRACTURES, WITH MARKED DISPLACEMENT

Abduction and External Rotation

Vertical Compression

MARGINAL FRACTURE

COMMINUTED FRACTURE

Ankle Sprain Occurrence

- 27,000 ankle ligament injuries per day in United States
- Ankle sprains are more than 25% of injuries in football, basketball, soccer and volleyball

Making The Diagnosis History

- Mechanism of injury
  - Plantar flexion and inversion
  - Uneven terrain-stepping in a hole
  - Landing on another player's foot
  - Teammate on back of ankle while foot is externally rotated

Making The Diagnosis
History

- Audible pop
- Immediate swelling
- Inability to bear weight
- These are all signs of a more severe injury

Physical Examination

- Observe for:
  - Swelling
  - Deformiity
- Palpate for tenderness
  - Ligaments
  - Bones

Physical Exam
Drawer test

- ATFL
- >4mm difference

Physical Exam
Talar Tilt Test

- CFL
- > 6° difference

Physical Exam
Squeeze Test

- Anterior tibiofibular ligament
- High ankle sprain

Physical Exam
External Rotation Test

- Anterior tibiofibular ligament
- High ankle sprain

Physical Exam
Palpation

- Length of tenderness predicts severity
- One week for each cm above ankle joint

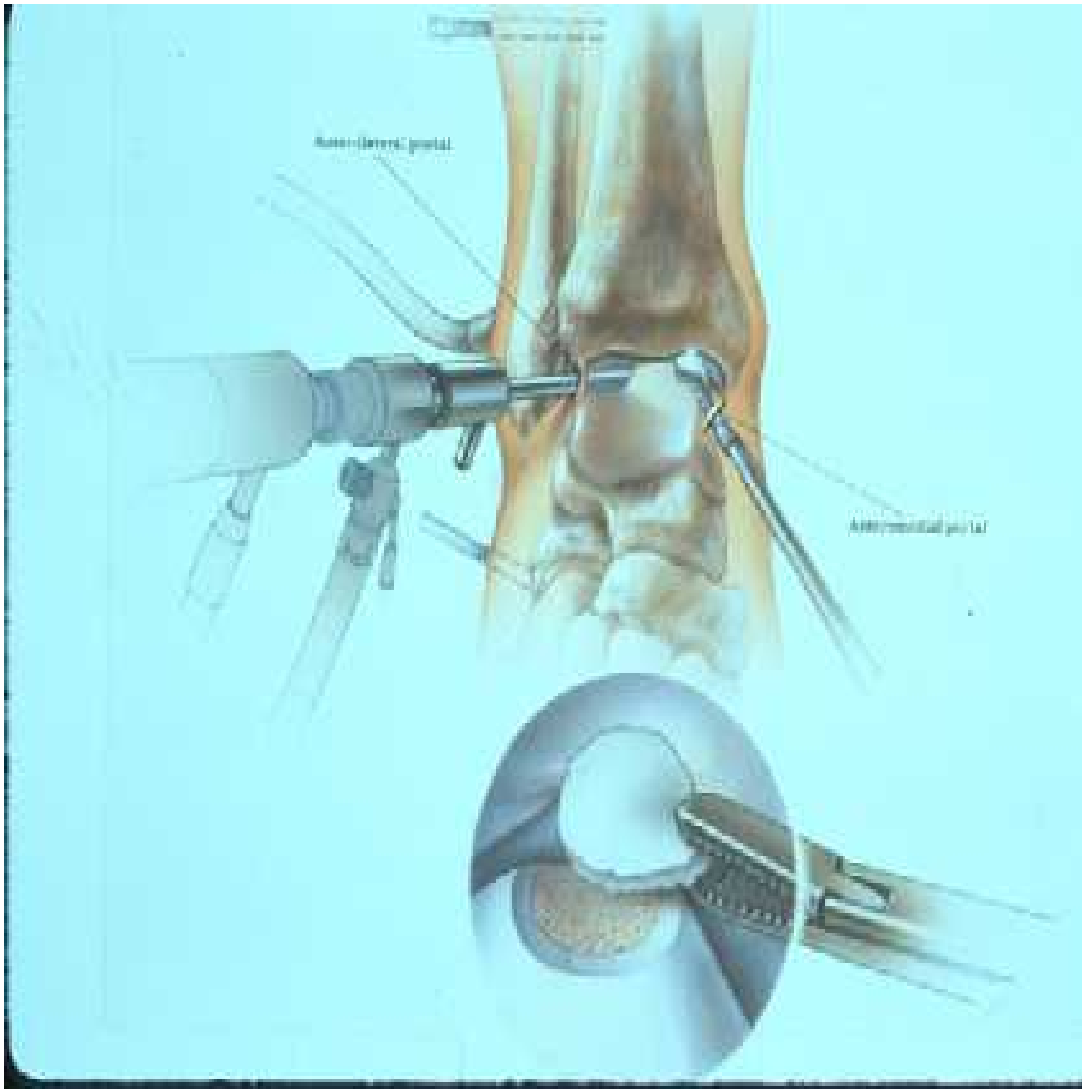
Classification of Ankle Sprains

Grade	*Signs and symptoms*
I: partial tear of a ligament	Mild tenderness and swelling Slight or no functional loss (i.e., patient is able to bear weight and ambulate with minimal pain) No mechanical instability (negative clinical stress examination)
II: incomplete tear of a ligament, with moderate functional impairment	Moderate pain and swelling Mild to moderate ecchymosis Tenderness over involved structures Some loss of motion and function (i.e., patient has pain with weight-bearing and ambulation) Mild to moderate instability (mild unilateral positivity of clinical stress examination)
III: complete tear and loss of integrity of a ligament	Severe swelling (more than 4 cm about the fibula) Severe ecchymosis Loss of function and motion (i.e., patient is unable to bear weight or ambulate) Mechanical instability (moderate to severe positivity of clinical stress examination)

Classification and Return to Sport

• Grade I	7-14 days
• Grade II	2-6 weeks
• Grade III	4-26 weeks
• High ankle sprain	1 week per cm

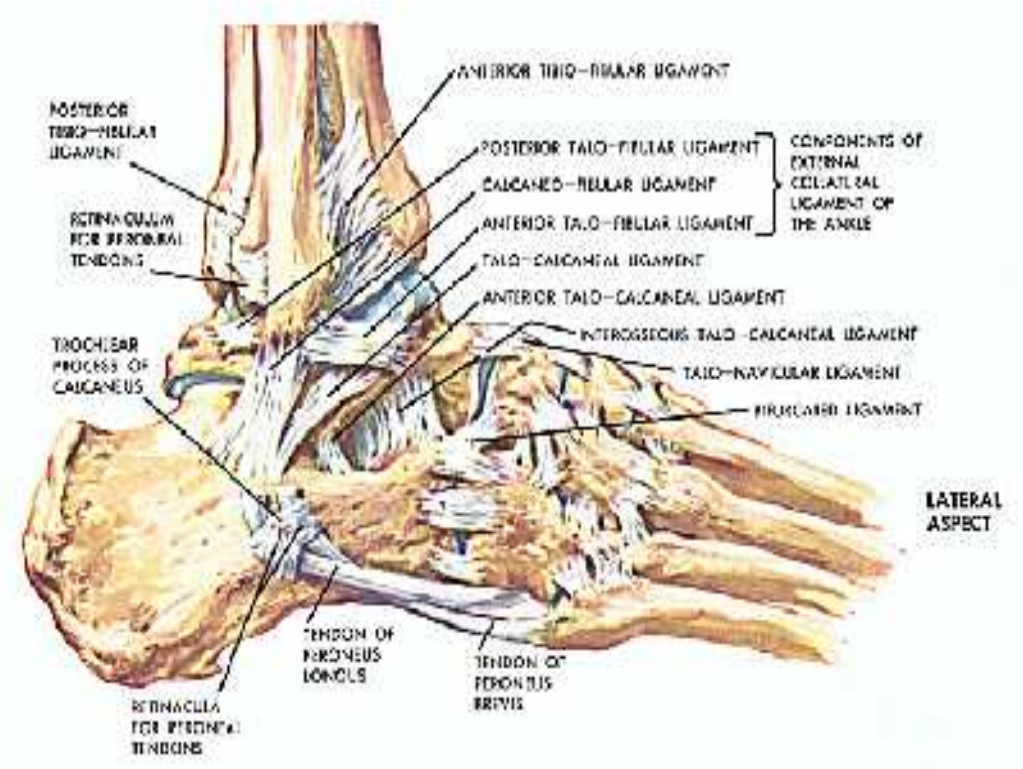
Differential Diagnosis
Physeal Fractures OCD



Differential Diagnosis

Jones Fracture

Peroneal Tendon Subluxation



Treatment RICE

- Rest
- Ice
- Compression
- Elevation

Treatment Grade I and II Functional Bracing

Treatment Grade III and Syndesmosis

Surgery or cast – NO!
Functional Bracing –YES!

- Return to work 2 to 4 times sooner
- No difference in long term stability
- No surgical complications
- 87% excellent and good results with bracing
- 60% excellent and good results with surgery

Rehabilitation

- Decrease swelling
- Regain range of motion
- Strengthen muscles
- Balance and proprioceptive training
- Functional drills

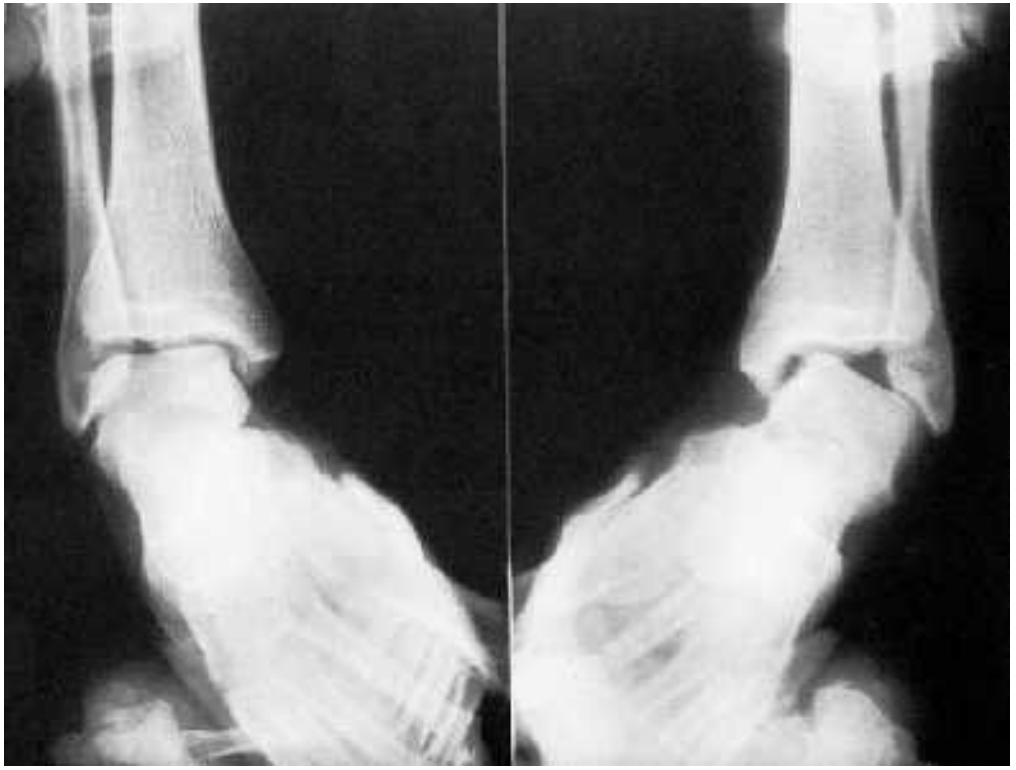
Balance and Proprioception

Return to Play

- Run without pain or limitations
- Sport specific movements without pain or limitation
- 90% strength
- Protective brace

Failure to Recover
Giving Way and Recurrent Sprains

- Rehabilitation
- Bracing
- Surgical reconstruction of ligaments



Failure to Recover
Intra Articular Problems

- OCD
- Loose bodies
- Bone spurs
- Arthritis
- Soft tissue impingment

Prevention

- High top shoes
- Taping
- Shoes and tape
- Braces

Prevention

- Conditioning
  - Agility
  - Flexability
- Proprioception
- Strengthening
- Stretching and warming up
- Recognize effects of fatigue