Equinus

- Less than 10° ankle dorsiflexion is Equinus
- Equinus can be asymptomatic, but can also cause many pathologic entities:
  - Plantar fasciitis
  - Pes planus
  - HAV
  - Metatarsalgia
  - Achilles tendinosis
  - Charcot’s midfoot collapse
  - Diabetic ulcerations
Over Pronation

- Flexible Flatfeet
- Sinus Tarsi Syndrome
- Tarsal Tunnel Syndrome
- Posterior Tibial Tendon Dysfunction
- Plantar Fasciitis
- Metatarsalgia (Ball of foot pain)
- Hallux Limitus
- Hallux Abducto Valgus (HAV / Bunion)

- Equinus
- Achilles Tendonitis
- Peroneal Muscle Spasm
- LLD
- Tibial Stress Syndrome (Shin Splints)
- Tired Aching Leg
- Patello-Femoral Syndrome
- Ilio-tibial Band Syndrome (Outside knee pain)
- Lumbo-sacral pain (Lower Back Pain)
**Over Pronation**

- STJ Pronation: Abduct, Evert, Dorsiflex
- Overpronation at the STJ commonly exhibits:

![Diagram of foot and ankle movements](image)

- Arch lowers & elongates
- Calcaneal Eversion
- Internal Tibial Rotation
Flatfeet

- Most are asymptomatic
- Flexible $\rightarrow$ Hubscher Maneuver $\rightarrow$ Resupination

- Foot appears externally rotated in relation to the leg
- WB axis of the LE is medial to the mid-axis of the foot
Flatfeet

Fig. 11-8. A, Normal calcaneal stance position with an acceptable degree of heel eversion in a 24-month-old child. Note the significant medial fat pad in the arch increasing the overall flattened attitude of the foot. B, Abnormal calcaneal stance position in a 10-year-old child. At this age the calcaneus should appear vertical. Any significant calcaneal eversion that is noted beyond the age of 7 or 8 should be considered abnormal.
Hallux Abducto Valgus
Interesting Facts

- Effect of shoes (Sim-Fook 1958)
  - Hallux valgus: 17x more common in shoe wearers than unshod members
  - Hallux varus: 4x more common in unshod members than in the shod
First MTPJ ROM

- Extension / dorsiflexion 70°-90° (min. 65°)
- Flexion / plantarflexion 45°
- Angle measured from the long axis of the metatarsal not the ground.
Functional Hallux Limitus

- First Ray Hypermobility
  - First Ray dorsiflexed due to GRF
  - Decreased hallux DF → Limited hallux ROM
  - Joint jamming → Pain & Arthritis

- Over Pronation
Functional Hallux Limitus

- Orthotics:
  - Minimal Arch Fill
- Orthotics:
  - Reverse Mortons Extension
Plantar Fasciitis
Achilles’ Tendonitis

When the foot accelerated into an excessively pronated position
→ Calcaneus everts
→ Increase medial tendo achilles traction
→ Transverse shearing
Peroneal Tendonitis

- Peroneals have the longest moment arm when exerting STJ pronations or resisting STJ supinations.

- Increased peroneal muscle contractile activity may lead to either tendonitis or muscle fatigue.
Sinus Tarsi Syndrome

- Subacute or chronic pain on the lateral aspect of sinus tarsi
Tarsal Tunnel Syndrome

- Entrapment or compression neuropathy within the tarsal tunnel beneath the flexor retinaculum
- Stretching of the Tibial Nerve
- Analogous to Carpal Tunnel Syndrome in the wrist
Tired Aching Legs

- Abnormal traction on calf muscles occurs when the leg internally rotate
- Muscles of lower limb attempt to stop this excessive pronation and become fatigue
Shin Splints (Tibial Stress Syndrome)

- Excessive stretching (traction) of the soft tissue structures (deep flexors and extensors of the leg) along the shin bones (tibia and fibula)
Patello-femoral Syndrome (knee pain)

Excessive pronation

⇒ Excess tibial internal rotation
⇒ Medial displacement of patello-femoral path
⇒ Lateral displacement of patella
⇒ Cartilage under patella soften and resulted in pain and inflammation
Ilio-tibial band syndrome

Excess pronation

⇒ Excess internal tibial rotation
⇒ The ilio-tibial band to shear over the lateral femoral condyle
⇒ Friction, tightness, and secondary inflammation
Limb Length Discrepancy (LLD)

- Pathologic if > 5mm discrepancy
- Longer leg pronates
  - Shorter leg supinates
Treatment

- RICE
- Pain reduction
- Anti-inflammatory modalities
- Biomechanic support
- Cortisone injection
- Surgical correction