Functional Anatomy of the Foot

Chapter 4

Student Learning Outcomes

- After this lesson, students will be able to:
  - identify the bony anatomy, joints, and major ligaments of the foot
  - describe the arches of the foot and their function

Bony Structure of the Foot

- Hindfoot
- Midfoot
- Forefoot

Lateral view

Bony Anatomy

- Hindfoot
  - Provides stability and shock absorbency at initial foot strike

Lateral view

Bony Anatomy

- Joints of the Hindfoot
  - Subtalar

Medial view

Lateral view

Bony Anatomy

- Ligaments supporting the subtalar joint
  - interosseous talocalcaneal
  - cervical
Bony Anatomy

Movements of the Hindfoot
- Pronation
  - Eversion
  - Abduction
  - Dorsiflexion
- Supination
  - Inversion
  - Adduction
  - Plantarflexion

Bony Anatomy

Movements of the Hindfoot
- Weight bearing
  - Talus moves on the fixed calcaneus
- Non-weight bearing
  - Calcaneus moves on the fixed talus

Bony Anatomy

Midfoot
- Provides the ability to adapt to uneven surfaces

Bony Anatomy

Joints of the Midfoot
- Talocalcaneonavicular
- Cuneonavicular
- Cuboideonavicular
- Intercuneiform
- Cuneocuboid
- Calcaneocuboid

Bony Anatomy

Ligaments Supporting the Midfoot
- Each intertarsal joint supported by ligaments
- Talocalcaneonavicular joint
  - Dorsal talonavicular
  - Bifurcate
  - Plantar calcaneonavicular (spring)

Bony Anatomy

Ligaments Supporting the Midfoot
- Calcaneocuboid joint
  - Bifurcate
  - Long plantar
Bony Anatomy

- Movements produced by midfoot
  - Superior/inferior glide between each intertarsal joint

Bony Anatomy

- Movements of the Forefoot
  - Tarsometatarsal (Lisfranc)
  - gliding
  - Intermetatarsal
  - gliding
  - Metatarsophalangeal joints
    - flexion, extension
  - Interphalangeal
    - flexion, extension

Arches of the Foot

- Maintained by 3 mechanisms
  - Wedging of interlocking tarsal & metatarsal bones
  - Tightening of the lig. on plantar surface
  - Intrinsic & extrinsic muscles of the foot & their tendons

Arches of the Foot

- Function as shock absorbers
  - Medial longitudinal
    - Formed by
      - Calcaneus
      - Talus
      - Navicular
      - 3 cuneiforms
      - 1-3 metatarsals

Arches of the Foot

- Function as shock absorbers
  - Medial longitudinal
    - Maintained by
      - Tib ant
      - Tib post
      - FDL
      - FHL
      - Abd hallucis
      - FDB
      - Plantar fascia
      - Plantar calcaneonavicular lig
**Arches of the Foot**

- Function as shock absorbers
  - Lateral longitudinal
  - More stable than medial
- Formed by
  - Calcaneus
  - Cuboid
  - 4-5 metatarsals

**Lateral Longitudinal Arch**

- Maintained by
  - Peroneus longus
  - Peroneus brevis

**Transverse Arch**

**Windlass Mechanism**

**Structural Abnormalities**

- Pes Planus
- Pes Cavus

**Forefoot Varus**
Questions?