Chapter 4
Clinical Assessment of Foot & Toe Injuries
Part II

Objectives
- Identify common foot types and their influence on foot function and biomechanics
- Identify common foot & toe injuries based on their presenting history & visual signs (inspection)
- Discuss anatomical or biomechanical factors associated with these common foot & toe injuries
- Identify special tests that might be used to evaluate these injuries
- Discuss basic management strategies for dealing with these injuries

Foot Types

- **Pes planus**
- Normal
- **Pes cavus**

**Foot Types**

- Normal
  - Designed to absorb & dissipate forces
    - bony architecture
    - ligamentous support
    - muscle control

**Foot Types**

- Pes planus
  - Talar head displaces medially & plantarward
    - supple
      - medial longitudinal arch appears normal in non-weight-bearing, but disappears with weight-bearing
    - rigid
      - Absence of medial longitudinal arch in both weight-bearing and non-weight-bearing

**Foot Types**

- Pes planus
  - Biomechanical factors
    - weakness of posterior tibialis
    - weakness of anterior tibialis
    - weakness of toe flexors
    - stretching or weakness of spring ligament
Foot Types

- Pes planus
  - semirigid orthotics
  - motion control shoes

- Pes cavus
  - inability to absorb forces or dissipate forces
  - associated with stress fx
    - metatarsals
    - tibia
  - associated with claw toes

Foot Types

- Pes planus
  - special tests
    - Feiss’ line
    - navicular drop test

- Pes cavus
  - soft orthotics
  - soft midsoles

History

- Location of pain
  - Midfoot
    - medial cuneiform
    - middle or intermediate cuneiform
    - lateral cuneiform

- Midfoot Injuries
  - fx
  - sprain
  - strain/inflammation of tendon insertion sites
  - tarsal coalition

Symptoms
- localized pain?
- diffuse pain?

MOI
- compressive force
- rotational force
- repetitive stress
**Inspection/Palpation**

- Midfoot injuries
  - Fracture/dislocation
  - Sprain
  - Strain/inflammation of tendon insertion sites
  - Tarsal coalition

**Visual Signs**
- Deformity?
- Crepitus?
- Swelling?
- Discoloration?

**Palpation**
- Localized point tenderness

**Stress/Special Tests**

- Midfoot injuries
  - Fracture/dislocation
  - Sprain
  - Strain/inflammation of tendon insertion sites
  - Tarsal coalition

**Stress Tests**
- Glide tests
- Tap test

**RROM**
- PF
- DF
- IN

**Diagnostic Tests**
- X-ray
- Bone scan
- MRI

**Management**

- Midfoot injuries
  - Fracture/dislocation
  - Sprain
  - Strain/inflammation of tendon insertion sites
  - Tarsal coalition

**Treatment**
- Ice
- Anti-inflammatories
- Spring steel innersole
- Boot or cast

**History**

- Location of pain
  - Forefoot
    - Metatarsals
      - Fracture
      - Midshaft
      - Avulsion
      - Lisfranc fx/dislocation

**Visual Signs**
- Deformity?
- Crepitus?
- Swelling?
- Discoloration?

**Symptoms**
- Heard a snap or pop
- Sharp pain
Stress/Special Tests

- Location of pain
  - Forefoot
    - Metatarsals
      - Fracture/dislocation
        - Midshaft
        - Avulsion
        - Jones fx
        - Lisfranc fx

Stress Tests
- Tap test

AROM
- DF
- PF
- IN
- EV

Diagnostic Tests
- X-rays

Management

- Treatment
  - Ice
  - Anti-inflammatories
  - Orthotics

History

- Location of pain
  - Forefoot
    - Between metatarsals
      - Neuroma
      - Intrinsic muscles

Symptoms
- Burning pain
- Electric shock
- Dull ache

MOI
- Gradual onset
- Improper shoes
- Forceful contraction
- Stretching beyond normal limits of ROM

Inspection/Palpation

- Forefoot injuries
  - Between metatarsals
    - Neuroma
    - Intrinsic muscles

Signs
- Swelling?

Palpation
- Point tenderness
- Compression of neuroma reproduces pain

Stress/Special Tests

- Forefoot injuries
  - Between metatarsals
    - Neuroma
    - Intrinsic muscles

Tests
- Morton’s Test
- Abducting of toes

Management

- Treatment
  - Ice
  - Anti-inflammatories
  - Orthotics
History

- Location of pain
  - Metatarsophalangeal joints (MTP)
    - Great toe (1st MTP)
      - Sprain
        - Collateral
        - Capsule (turf toe)
      - Muscle/tendon strain – what muscles?
      - Sesamoiditis
      - Hallux valgus - bunion
      - Hallux rigidus – rigid great toe with limited ROM
      - Gout

Symptoms

- Great toe (1st MTP) sprain
  - Collateral
  - Capsule (turf toe)

MOI

- Valgus stress
- Varus stress
- Hyperextension

Inspection/Palpation

- Great toe (1st MTP) sprain
  - Collateral
  - Capsule (turf toe)

Signs

- Swelling?
- Discoloration?

Palpation

- Point tender over MTP, particularly plantar surface

Stress/Special Tests

- Great toe (1st MTP) sprain
  - Collateral
  - Capsule (turf toe)

Tests

- Valgus stress test
- Varus stress test
- Hyperextension of MTP

Management

- Great toe (1st MTP) sprain
  - Collateral
  - Capsule (turf toe)

Treatment

- Ice
- Anti-inflammatories
- Spring steel innersole
- Taping of MTP to prevent hyperextension

- See textbook for signs, symptoms, palpation, stress/special tests, and management

History

- Location of pain
  - Great toe (1st MTP)
    - Muscle/tendon strain – what muscles?
      - FHL
      - FHB
      - EHL
      - EHB
History

- Location of pain
  - Great toe (1st MTP)
    - Sesmoiditis
  - See textbook for signs, symptoms, palpation, stress/special tests, and management

- Location of pain
  - Great toe (1st MTP)
    - Hallux valgus – bunion
  - See textbook for signs, symptoms, palpation, stress/special tests, and management

- Location of pain
  - Great toe (1st MTP)
    - Hallux rigidus – rigid great toe with limited ROM

- Location of pain
  - Metatarsophalangeal joints (MTP)
    - 2nd-5th MTPs
      - Sprain
      - Metatarsalgia

  - Sprain
  - Metatarsalgia

Symptoms
- Increased callus formation (2nd head)

MOI
- Repetitive stress
- Trauma to metatarsal arch

Inspection/Palpation

- Location of pain
  - Metatarsophalangeal joints (MTP)
    - 2nd-5th MTPs
      - Sprain
      - Metatarsalgia

  - Sprain
  - Metatarsalgia

Tests?

- Location of pain
  - Metatarsophalangeal joints (MTP)
    - 2nd-5th MTPs
      - Sprain
      - Metatarsalgia

  - Sprain
  - Metatarsalgia
Management

**Location of pain**
- Metatarsophalangeal joints (MTP)
  - 2nd - 5th MTPs
    - sprain
    - metatarsalgia

**Treatment**
- ice
- anti-inflammatories
- tear drop pad
- spring steel innersole

History

**Location of pain**
- Phalanges
  - Collateral sprain
  - Fx
  - Dislocation
  - Hammer toes
  - Claw toes

**Symptoms**
- Heard a pop/snap
- Sharp pain
- Dull ache

**MOI**
- Valgus/varus stress
- Compressive force
- Axial force
- Hyperextension
- Repetitive stress

Inspection/Palpation

**Location of pain**
- Phalanges
  - Collateral sprain
  - Fx
  - Dislocation
  - Hammer toes
  - Claw toes

**Possible Signs**
- Swelling
- Deformity
- Discoloration

**Palpation**
- Swelling
- Crepitus

Stress/Special Tests

**Phalange injuries**
- Collateral sprain
- Fx
- Dislocation
- Hammer toes
- Claw toes

**Possible Stress Tests**
- Valgus stress test
- Varus stress test
- Tap test

**Diagnostic Tests**
- X-rays

Predisposing Factors

**Location of pain**
- Phalanges
  - Collateral sprain - ?
  - Fx – foot structure with decreased ability to dissipate forces (stress fx)
  - Dislocation - ?
  - Hammer toes – shoes that are too short
  - Claw toes – associated with pes cavus foot

**Management**

**Location of pain**
- Phalanges
  - Collateral sprain
  - Fx
  - Dislocation
  - Hammer toes
  - Claw toes

- buddy taping
- spring steel innersole
### History

- **Location of pain**
  - Medial arch/medial calcaneus
  - Tarsal tunnel syndrome
  - See textbook for signs, symptoms, & management

### Questions?