



Foot Pain

Seyed Reza Najafizadeh.MD

Rheumatology Research Center
Tehran University of Medical
Sciences



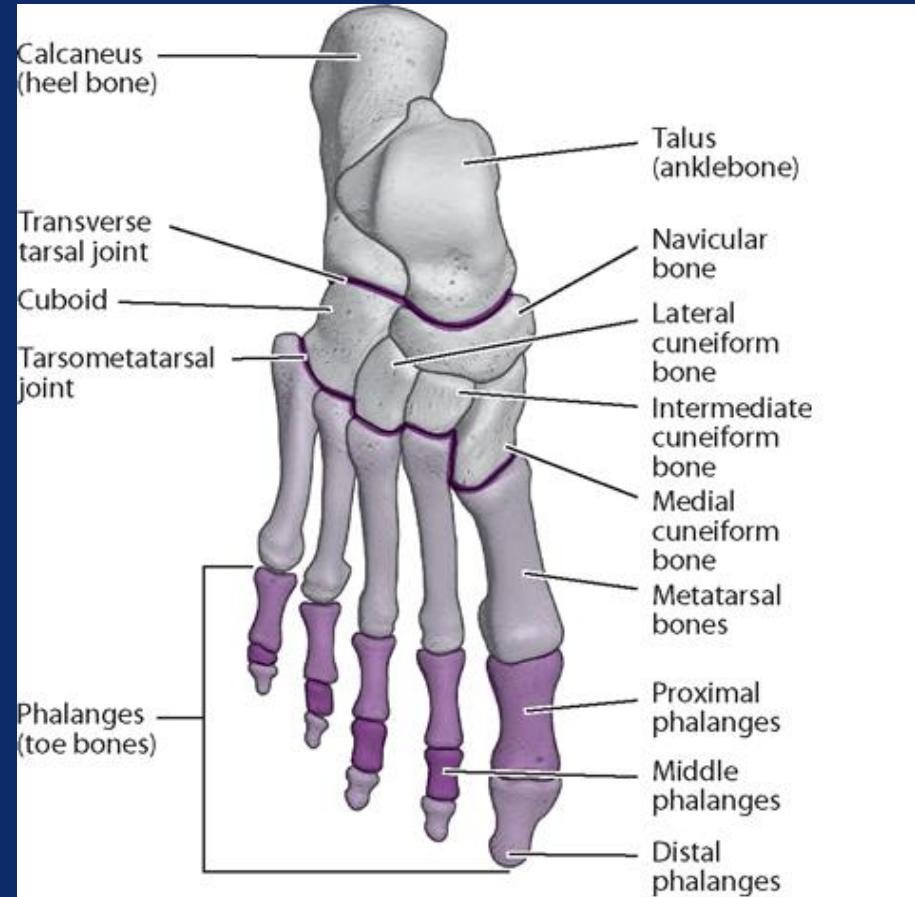
Foot Pain

Foot pain is an important public health challenge

- Foot pain is experienced by 17 to 42% of the adult population.
- Increasing incidence (age – obesity).
- It is often disabling and can impair mood, behaviour, self-care ability and overall quality of life.

Foot Anatomy

- The feet are flexible structures of bones, joints, muscles, and soft tissues.
- The foot contains:
- 26 bones (14 phalangeal, 5 metatarsal, and 7 tarsal)
- 33 joints
- 19 muscles
- 107 ligaments

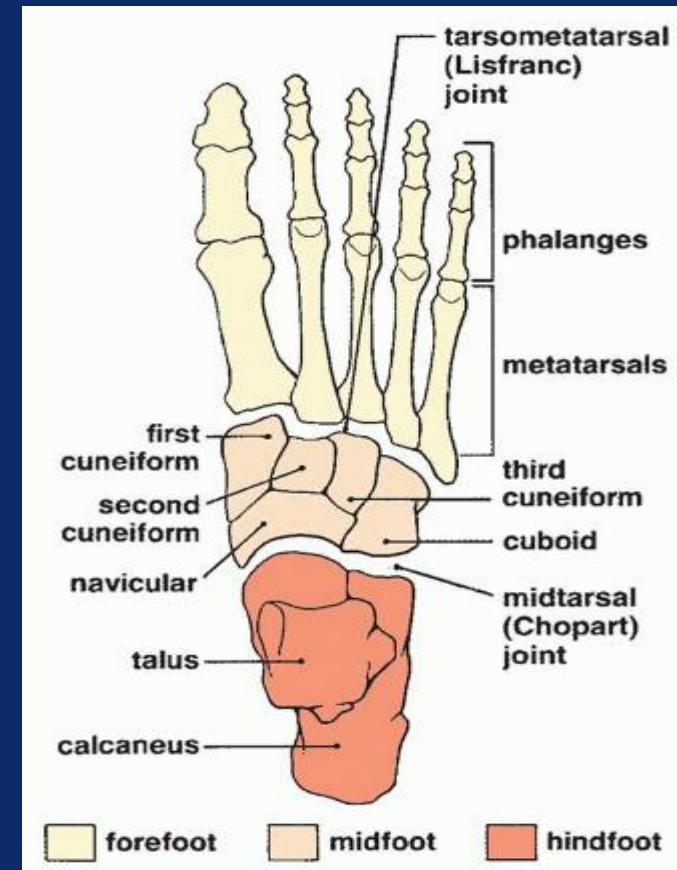


Source: Imboden JB, Hellmann DB, Stone JH: *Current Diagnosis & Treatment: Rheumatology*, 3rd Edition: www.accessmedicine.com

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Foot Anatomy

- **Hindfoot:** Talus and calcaneus
- **Midfoot:** Navicular, cuboid and three cuneiform.
- **Forefoot:** Metatarsals, sesamoids and phalanges





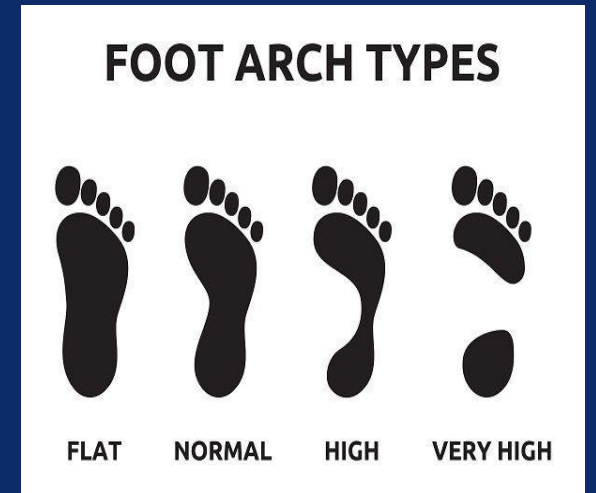
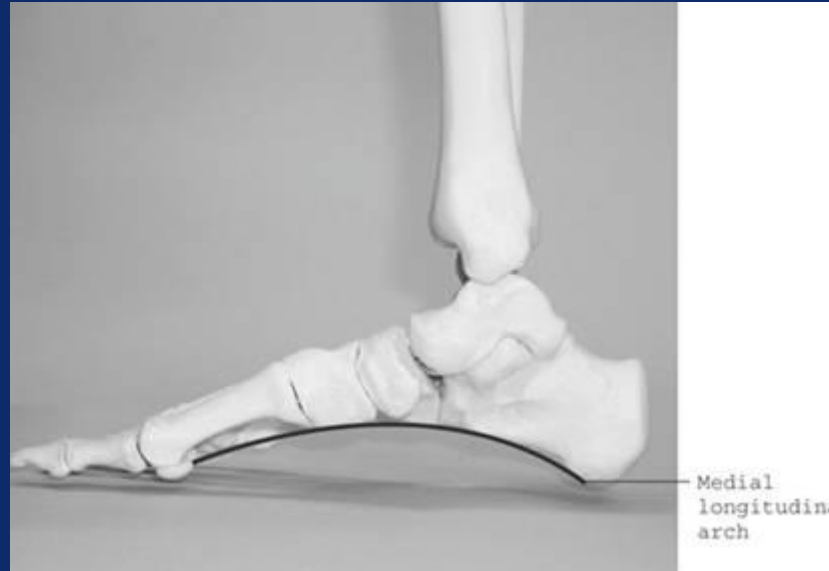
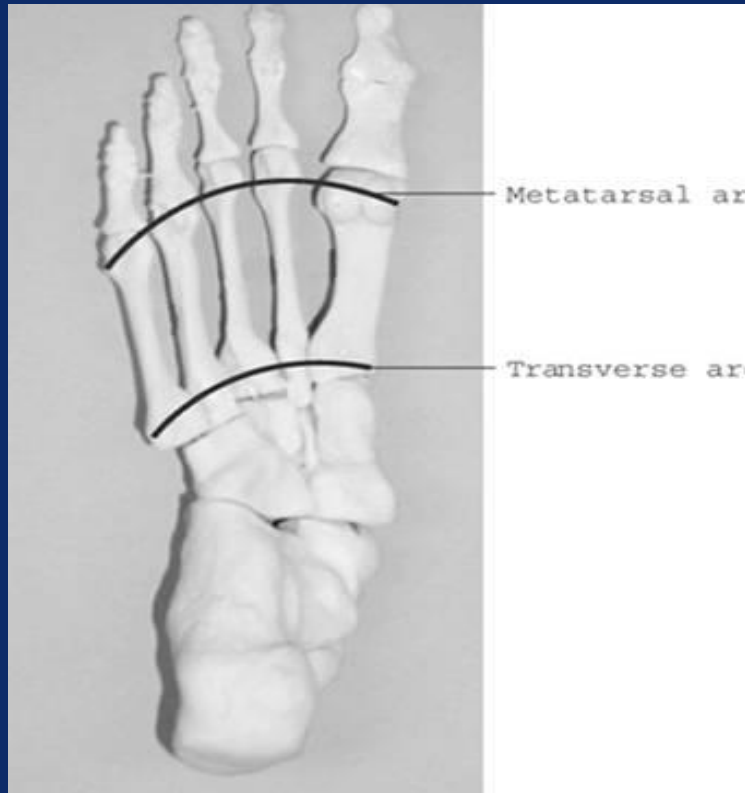


Foot Anatomy

➤ There are 4 arches:

- The metatarsal, transverse arch, medial longitudinal arch, lateral longitudinal arch.
- Foot arches support the body weight.
- Absorbing shock of weight bearing.
- Providing a space on the plantar aspect of the foot for the blood vessels, nerves, and muscles.

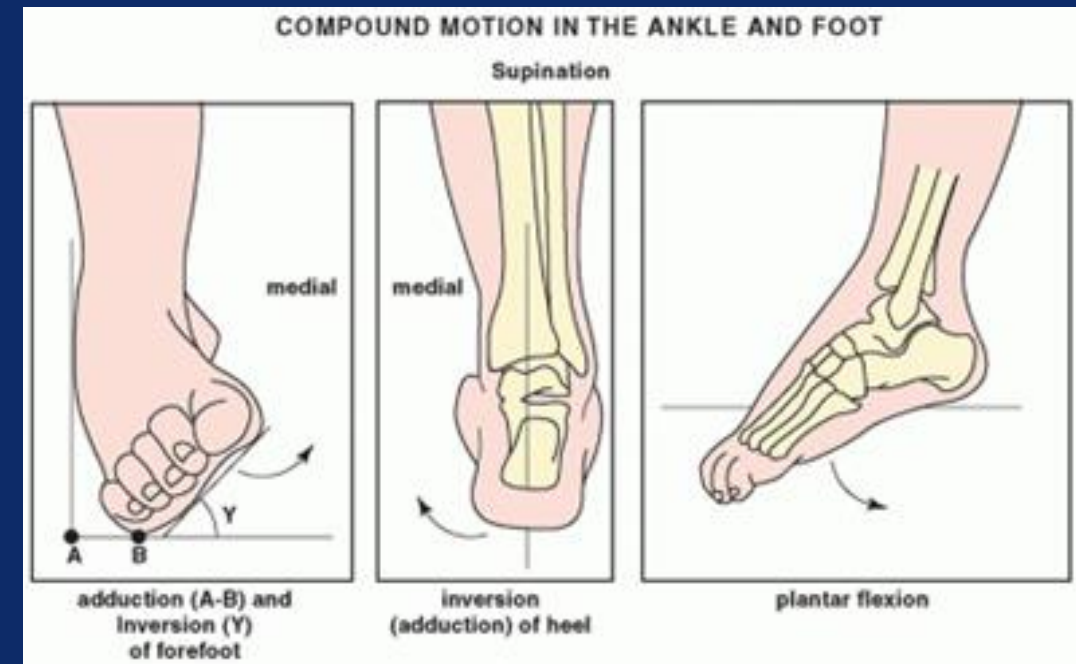
Arches of the Foot



Inversion, Varus, Adduction and Supination

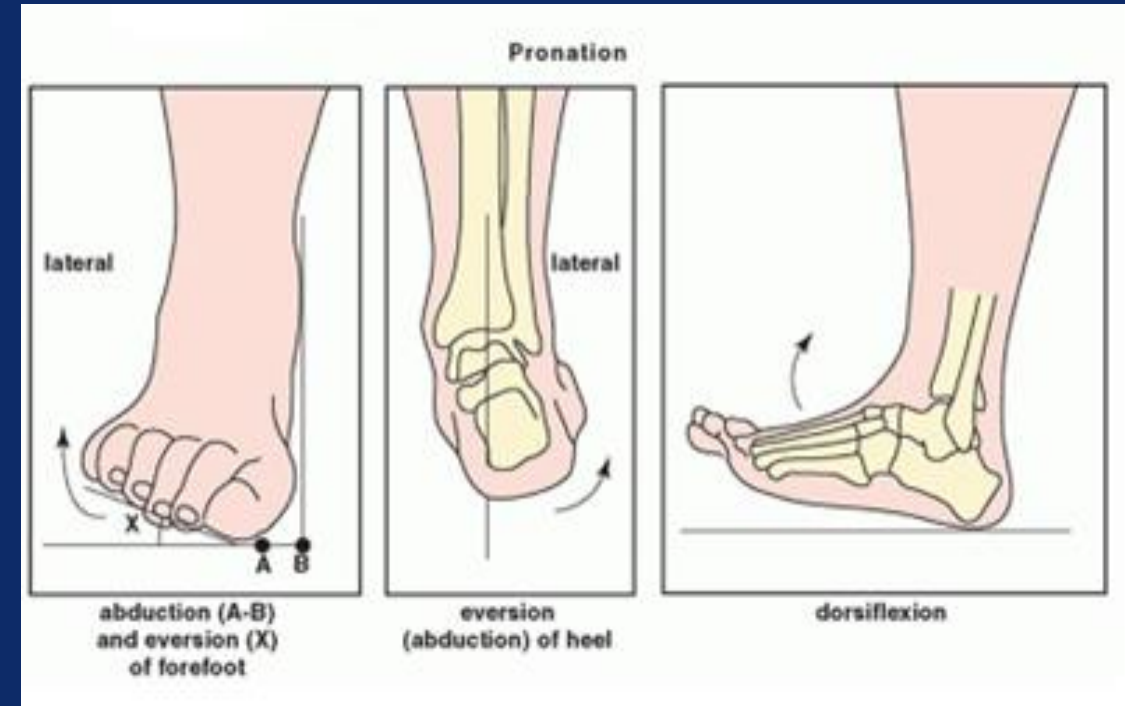
Produce medial movements of the foot.

- These muscles pass behind and in front of the medial malleolus



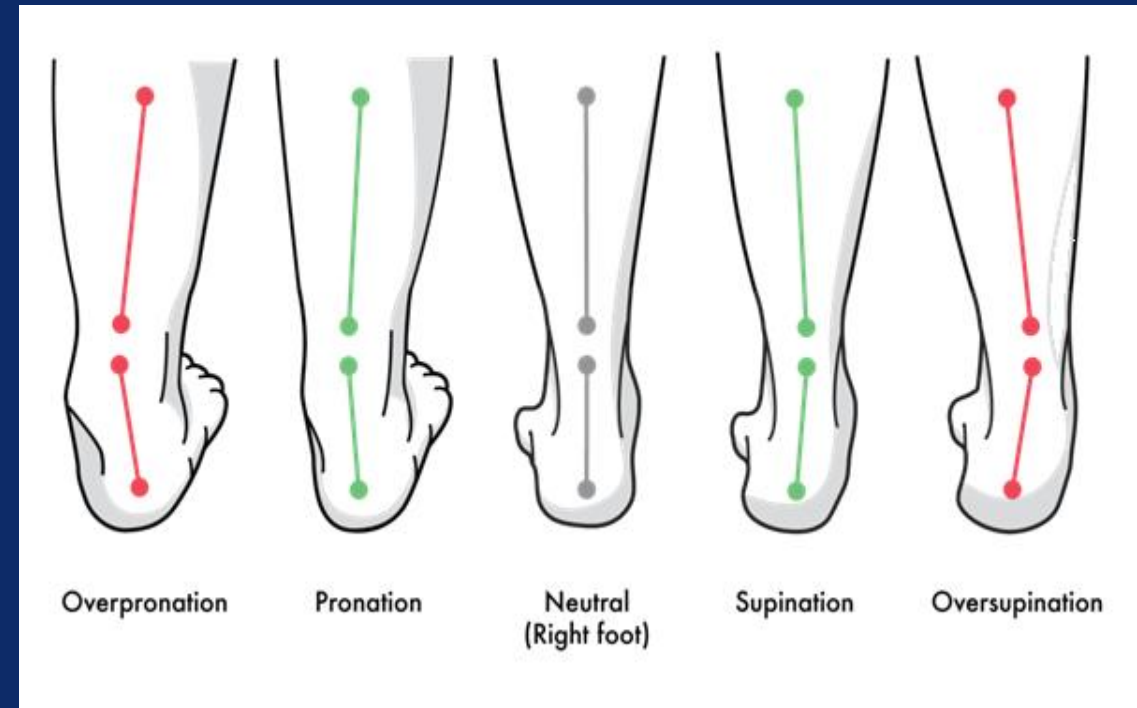
Eversion, Valgus, Abduction, and Pronation

- Produce lateral movements of the foot.
- Muscles passing behind the lateral malleolus are the fibularis longus and the fibularis brevis.

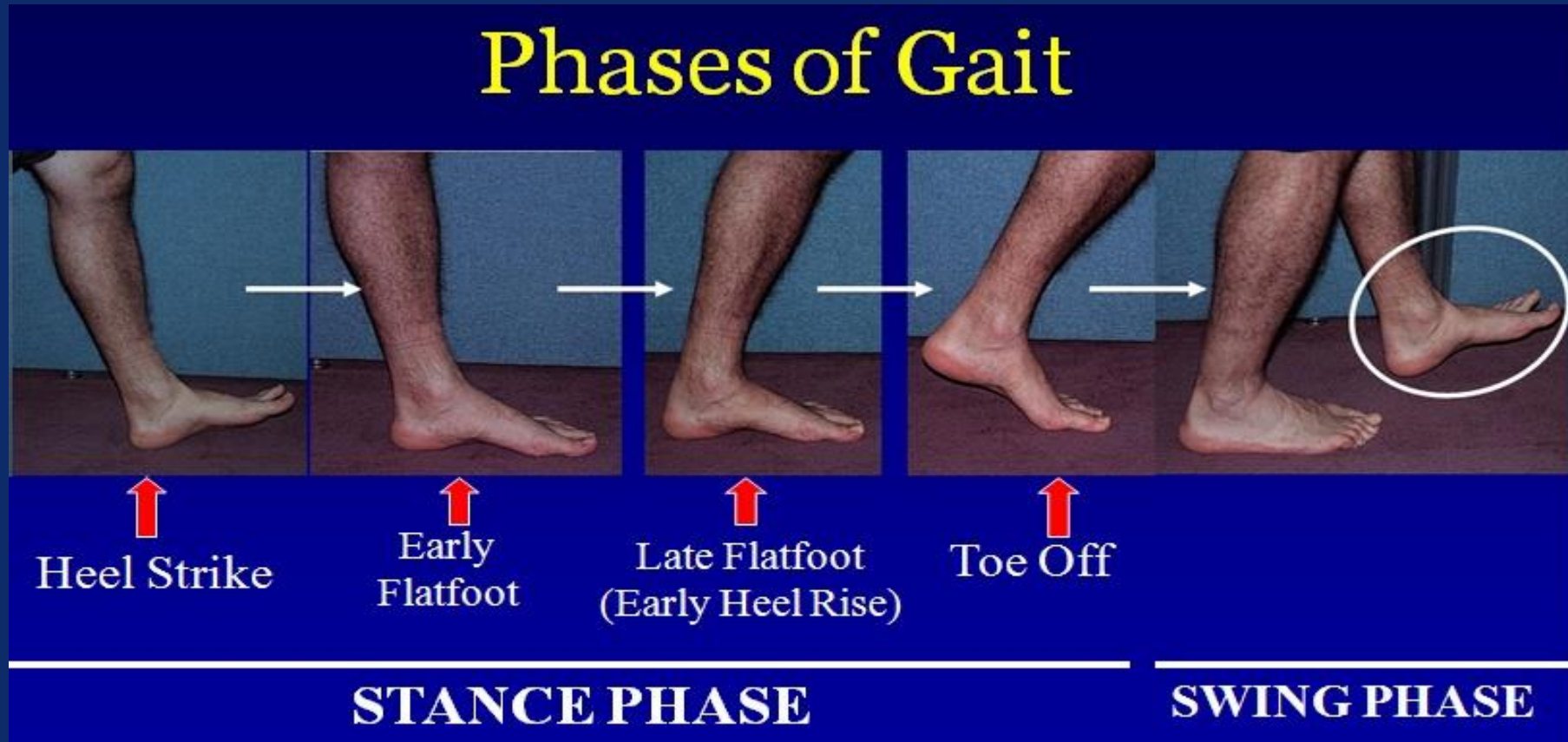


Structural Deformities

- Forefoot varus, forefoot valgus and rearfoot varus produce excessive pronation or supination.
- The deformities will make the foot more difficult to act like a shock absorber.
- The compensation usually causes overuse injuries.



The Phases of Walking



ANATOMY-BASED APPROACH TO DIAGNOSIS

- **History:**

1. Is the pain constant or intermittent?
2. Are there associated symptoms (eg, numbness, paresthesias)?
3. Does the pain radiate?
4. Is there night time pain?
5. Did the pain develop following a specific injury or a change in sports or work activity?
6. Was there a change in shoe wear before the pain started?
7. Do you have any significant chronic illnesses (eg, diabetes)?
8. Have you had a significant gain in weight during the past year?

Foot Anatomy

➤ Examination (inspection):

- Examination of the foot begins with **close observation**.
- Look for swelling, color change, the height and shape of the arch, and any abnormalities or asymmetries.
- Abnormal callus patterns on the plantar surface.
- Asymmetry in the forefoot width or arch height.
- Hammering of the toes, bunions or bunionettes, splaying of the toes, or abnormally short metatarsal segments.

Examination

- Locating areas of tenderness or warmth, which suggests inflammation.
- On the dorsal surface, feel **for tarsometatarsal bossing**, which is associated with midfoot arthritis, **ganglions**, and **spurring** over the MTP joints.
- On the plantar surface, for **callus formation**.



Palpation

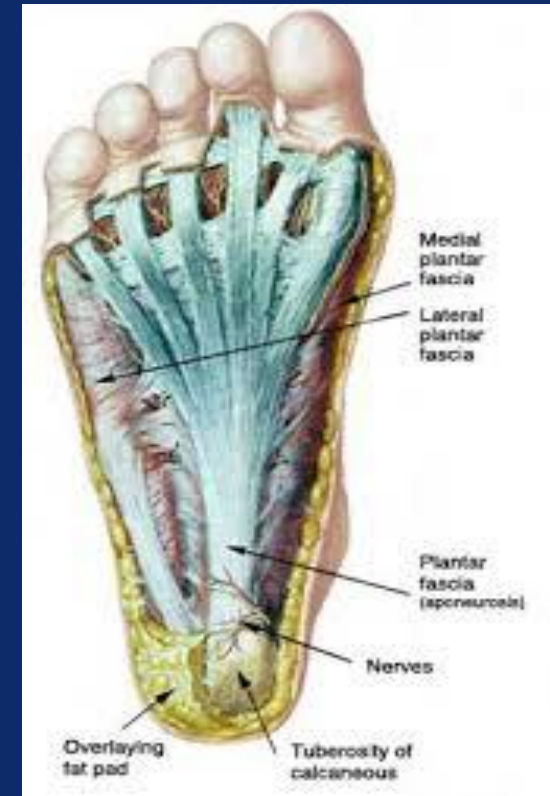
- **Palpation:**
- Palpate the plantar location of the **metatarsal heads**. Metatarsal heads that have **subluxed** through the metatarsal capsules are palpable.
- Palpate for **nodules along the plantar arch**, tenderness at the calcaneus, and a **Haglund** deformity at the heel.
- Palpable abnormal bony prominences particularly at the medial or lateral midfoot may represent an accessory ossicle or a tarsal coalition.



Heel pain

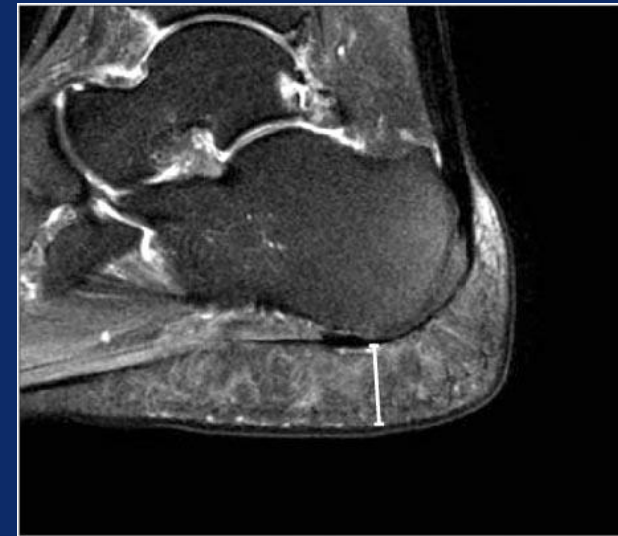
Plantar fascia

- The plantar fascia is a broad fibrous aponeurosis that originates from the medial and anterior aspects of the calcaneus and helps to divide the intrinsic plantar musculature of the foot into 3 distinct compartments, medial, central, and lateral.
- Distally, the plantar fascia forms 5 digital bands at the metatarsophalangeal joints.
- The plantar fascia has a continuous connection with the Achilles tendon, leading to tightening of the plantar fascia when tensile loads are applied to the tendon.



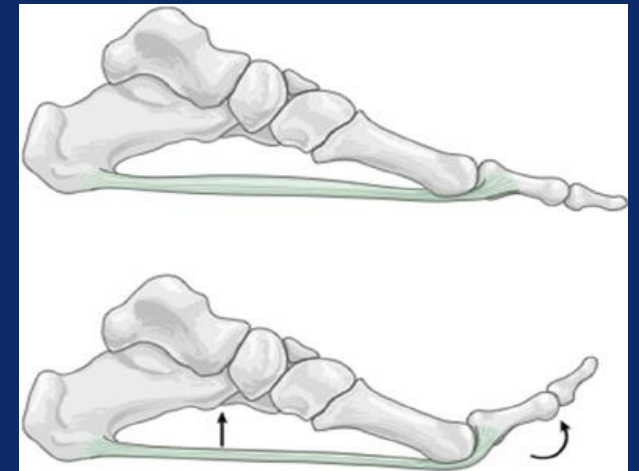
Heel fat pad

- Anchored to both the calcaneus and skin.
- Acting as a shock absorber for the hindfoot, by heel strike during ambulation.
- 110% of one's body weight when walking and 250% of body weight when running.
- After 40 years of age, it begins to degenerate, losing some of its thickness and height.



Plantar fasciitis

- **Plantar Fascia:**
- On static, support the longitudinal arch of the foot.
- On dynamic, shock absorption .
- The plantar fascia merges distally with the capsule of the MTP joints and proximally with calcaneal capsule and Achilles.



Plantar fasciitis

Risk factors

➤ Risk factors:

- Reduced elasticity of fat pad and plantar fascia(due to aging and obesity)
- Faulty structure of the foot, **flat feet or high-arched feet** are more prone to developing plantar fasciitis.
- **Hallux limitus** or **bunions** that affect the flexibility and normal motion of the first MTP
- Non-supportive footwear on hard, flat surfaces puts abnormal strain on the plantar fascia.
- Obesity.
- Professions requiring prolonged standing.
- Limited ankle dorsiflexion

Plantar fasciitis

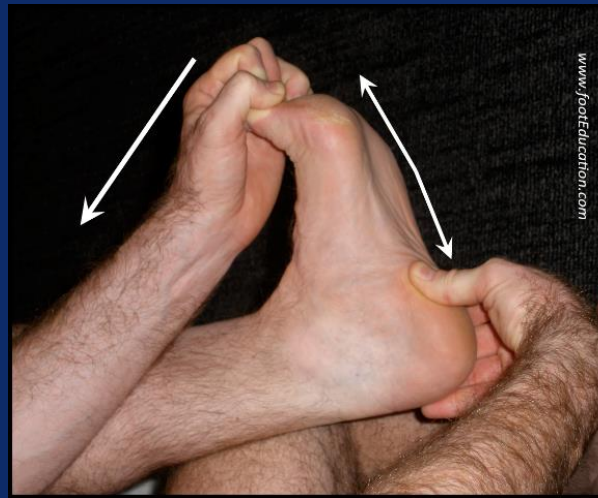
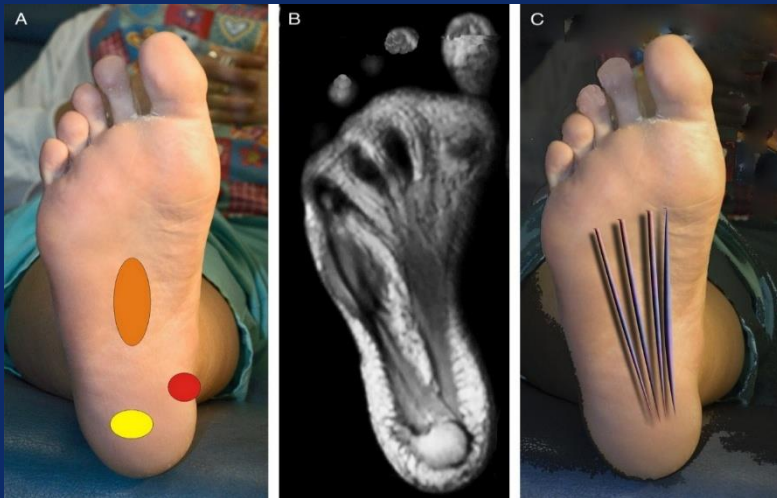
Symptom and sign

- **Pain** begins gradually.
- Pain is typically worse with the first steps in the morning.
- Pain is severe when patient begin walking or running, but gradually subsides with activity.
- Dull pain often persists throughout the day.
- Night pain is not typical of plantar fasciitis (R/O calcaneal stress fracture).
- Usually stabbing, non-radiating, and not associated with neurologic symptoms.
- Pain may be seen along the course of plantar fascia.

Plantar fasciitis

Symptom and sign

- Focal tenderness over the plantar-medial calcaneus that worsens with **passive toe dorsiflexion**,
- Pain may localized in midsubstance of plantar arch.



Plantar fasciitis

Symptom and sign

- Tightness of the Achilles tendon is common.
- Weight bearing, passive toes dorsiflexion, tiptoes and toe-walk test.

windlass test



Plantar Fasciitis

Differential diagnosis

- Posterior aspect of the heel and ankle should be palpated for tenderness to rule out **retrocalcaneal bursitis** and **Achilles tendonitis**.
- Percussing over tarsal tunnel behind medial malleolous.
- S1 radiculopathy(SLR and Achilles tendon reflex).
- Squeeze of calcaneus(medial to lateral)
- Imaging is not required for the diagnosis (failure of conservative management and are suspicious of other diagnosis).

Imaging

Plain Radiography

- Up to 75% of patients with pain have been shown to have spurs.
- Spurs are also common in those without heel pain.
- In a randomly chosen sample of patients, a 13.2% incidence of heel spurs but only a 5.2% incidence of heel pain.



Sonography

- The normal fascia is reported to be 2 to 4 mm thick and has a slightly echogenic fibrillar pattern at ultrasound.
- **Increased thickness** (greater than 4 mm), and **hypoechoogenicity** in sonography.



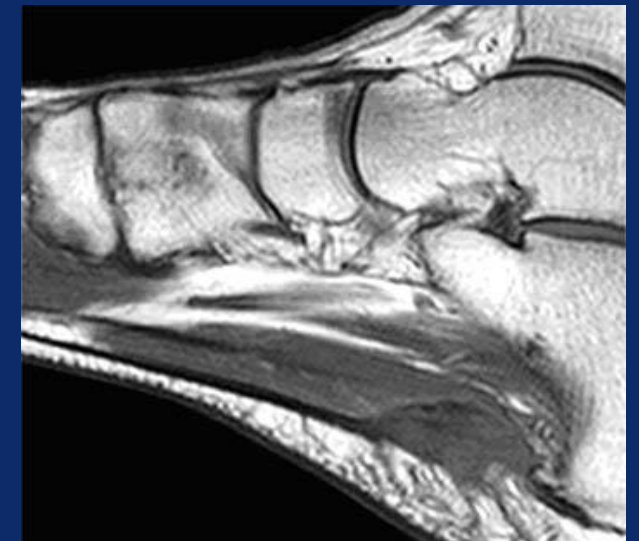
Imaging

MRI

- **T1/PD:** intermediate signal
- **T2:** high signal
- **STIR:** very sensitive in the detection of both fascial and perifascial edema (poorly marginated areas of high signal intensity).

Plantar fascial thickening:

Often fusiform and typically involves the proximal portion



Plantar Fasciitis Treatment

➤ Initial therapy (first 6 weeks):

- Stretching exercises for plantar fascia and calf muscle.
- Avoiding the use of flat shoes and barefoot walking.
- Using prefabricated silicone heel shoe inserts and arch support.
- Decreasing physical activities such as running, dancing, jumping.
- Short term NSAIDS.
- Weight reduction
- Appropriate foot wear

- Injections

Plantar Fasciitis Treatment



Plantar Fasciitis Treatment

➤ After 6 weeks of initial therapy:

- Molded shoe inserts
- Night splints
- Immobilization with a cast?
- ESWT



Plantar Fasciitis Treatment

➤ Second line treatments:

Unproven benefit

- Autologous whole blood or PRP injections??
- Botulinum toxin??
- Surgery

Fat pad pain

- Fat pad contusion or fat pad syndrome may develop **acutely** after a fall onto the heels from a height.
- **Chronically** because of the excessive heel strike with poor heel cushioning or repetitive stops, starts and change direction.
- The patient often complains of marked heel pain during weight-bearing activities.
- The pain is often felt laterally in the heel due to the pattern heel strike.
- Examination reveals tenderness often in the posterolateral heel region.

Fat pad pain

- Treatment consists primarily of avoidance of aggravating activities, in particular, excessive weight bearing.
- Silicone gel heel pad.
- Good footwear are important.
- Heel lock taping will often provide symptomatic relief.



Achilles Tendinopathy

- Achilles tendinopathy is characterized by pain and swelling in the Achilles tendon.
- There are three common clinical presentation:
- ***Non-insertional Achilles tendinopathy:*** In this, type the pathology is typically located 2-6cm above the insertion of the Achilles tendon to the heel bone.
- ***Insertional Achilles tendinopathy:*** In this type, the pathology is located at the insertion of the Achilles tendon to the heel bone.
- ***Achilles tendon rupture:*** Rupture of the Achilles tendon, usually 2-6cm from the insertion to the heel bone, may not be clinically obvious and may be confused with tendonitis.

Achilles tendon insertion and Haglund's deformity

- Insertional Achilles tendinopathy accounts for 20 to 25 percent of Achilles problems.
- Patients develop pain around the insertion of the Achilles tendon into the calcaneus.
- Pain arise from injury to the distal Achilles tendon or a Haglund's deformity.
- Distance runners and athletes involved in running and jumping sports.
- Intense inflammatory response may lead to calcification at the tendon insertion or formation of a bony exostosis.
- Men are at greater risk and affected in up to 89 percent of sports-related cases.



Achilles tendon insertion and Haglund's deformity

- **Tenderness** is located at the insertion of the Achilles tendon or directly over the exostosis with a Haglund's deformity.
- Prominent **bump** on the upper posterior calcaneus that is characteristic of the Haglund's deformity.
- If **retrocalcaneal bursitis** is the source of pain, squeezing the soft tissue behind the Achilles tendon and just above the superior border of the calcaneus is likely to be painful.
- Both the tendon and bursae are easily seen on ultrasound and MRI, which can help to identify Achilles pathology.

Achilles Tendinopathy

Non insertional

➤ Risk factors:

- Competitive athletes
- Cold weather training
- Age, male gender and obesity
- Fluoroquinolone antibiotics
- Glucocorticoids
- Shoes with negative heels

Achilles Tendinopathy



Achilles Tendinopathy

- **Imaging:**
- X-rays will usually be negative for non-insertional Achilles tendonitis.
- For insertional Achilles tendonitis, a calcaneal spur can be seen in an x-ray.



- MRI may not be indicated for an initial assessment of Achilles tendonitis, unless we are suspicious of tendon rupture.

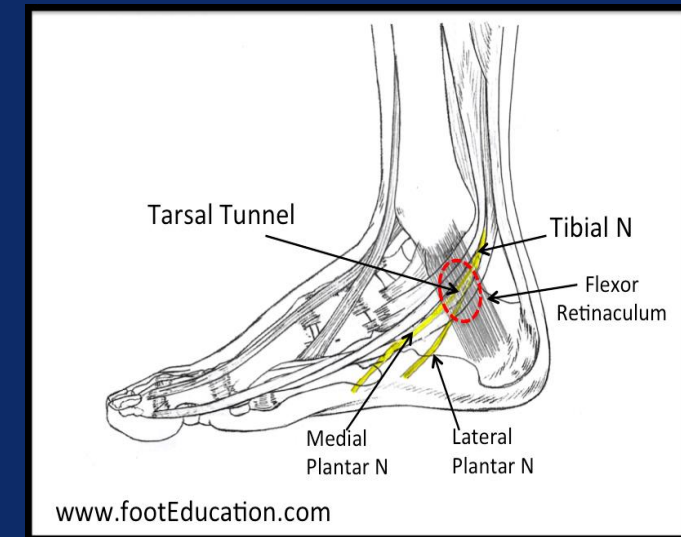
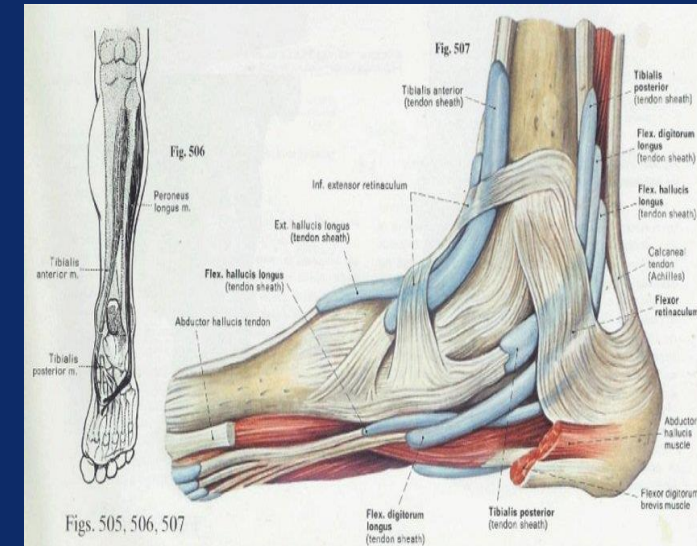
Achilles Tendinopathy

- **Treatment:**
 - Activity Modification
 - Shoe Wear Modification.
 - Anti-inflammatory medications.
 - ☐ Calf and Achilles Stretching.
 - ☐ Double leg heel rises
 - ☐ Eccentric Achilles Tendon Exercises
-
- Cast or Walker boot
 - Surgery.



Tarsal tunnel syndrome

- The tarsal tunnel is a bony canal that runs below the medial malleolus and through which travel the **posterior tibialis**, **flexor hallucis**, and **flexor digitorum tendons**, **posterior tibial artery and vein**, and **tibial nerve**.
- Arthritic change or a bone spur off the medial malleolus may reduce the space within the tarsal tunnel.
- Often affects individuals with a prior injury to the medial ankle or a markedly pronated foot.



TTS, clinical

- Pressure on the tibial nerve causes neuropathic pain that typically radiates to the plantar surface of the forefoot.
- Over time, compression of the tarsal tunnel can also result in injury of the **posterior tibialis** or **flexor hallucis tendons**.



TTS, clinical

- Aching, burning, numbness, and tingling involving the sole of the foot, the distal foot, the toes, and occasionally the heel.
- The pain may radiate up to the calf or higher.
- May be irritating at night and may be worse after standing.
- A markedly pronated foot and significant calcaneal valgus,.



TTS, Physical examination

- The physical examination may be normal in patients with tarsal tunnel syndrome of relatively recent onset.
- Examination may disclose a prominent **Tinel's sign** over the nerve posterior to the medial malleolus with sensory loss over the plantar surface of the foot, not extending onto the dorsal foot.
- Ultrasound imaging may demonstrate swelling or anatomical changes in the tarsal tunnel.



TTS, Treatment

- Comfort shoes designed to disperse the force more evenly across the foot.
- Prefabricated orthotic with a supportive arch.
- Weight loss.
- Activity modification to limit the amount of standing and walking.
- Non-steroidal anti-inflammatory medications.
- Corticosteroid injections.
- **Operative treatment with great caution!**

Kohler's Disease

Navicular Avascular Necrosis in Children

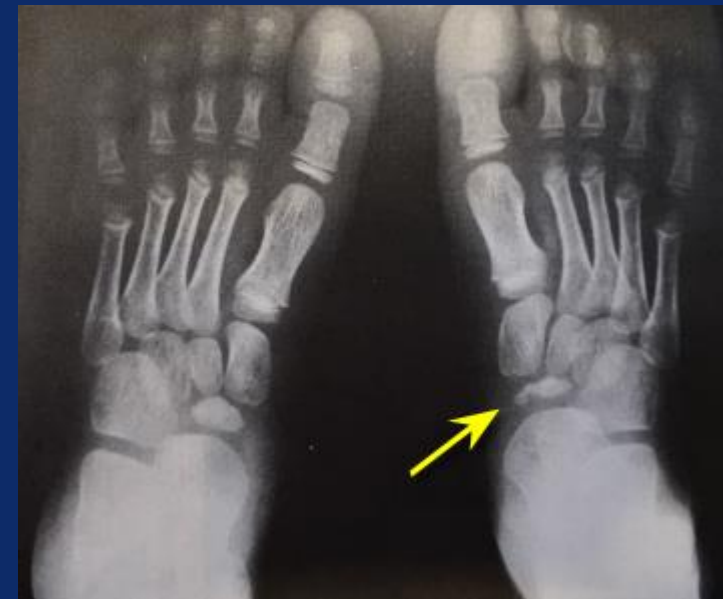
- It is caused by a loss of blood supply to navicular bone, which leads to avascular necrosis of the bone.
- Kohler's disease typically occurs in children between the ages of 4 and 9 and tends to be more common in boys.
- Patient to have pain and swelling in the midfoot with weight bearing.
- Navicular bone is the last bone in this area to ossify.

Physical Examination

- Generalized pain in the midfoot, particularly on the inside.
- Patients will often walk with a limp and there may be some associated swelling.

- **Imaging Studies**

- The x-rays will show areas of loss of the normal shape of bone, flattening, sclerosis and fragmentation of navicular bone.
- 25% is bilateral and may be seen in asymptomatic children.



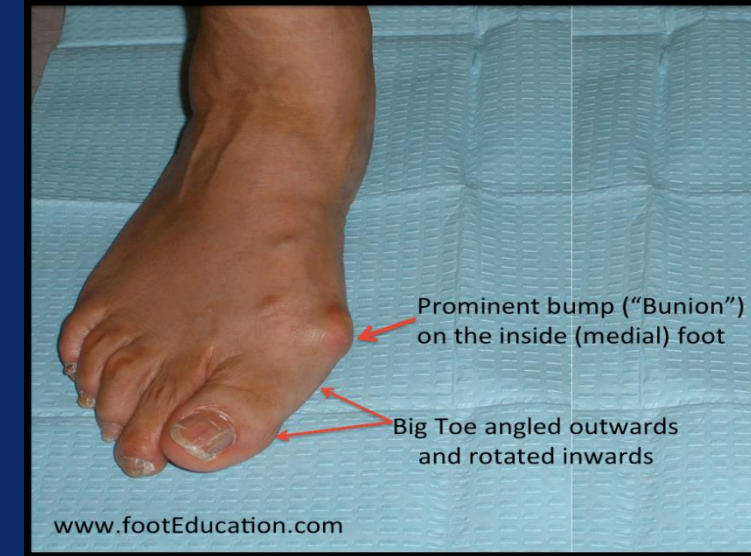
Kohler's Disease

Treatment

- Children are placed in comfortable supportive shoe or a walker boot to limit the loading to this area.
- **Minimize weight-bearing activities:** Children should be encouraged to avoid any significant loading activities, such as running or jumping, until the condition settles.
- **Casting:** If the symptoms of Kohler's disease does not settle, it may be necessary to put children in a short-leg walking cast for up to six weeks, followed by comfort shoes. This will often allow the bone to settle and the symptoms to improve.

Hallus Valgus Bunion (turnip)

1. Defined as a lateral deviation of the hallux on the first metatarsal.
 2. The deformity often also involves rotation of the toe in the frontal plane causing the nail to face medially (eversion).
- The prevalence of HV is approximately 23 percent among adults aged 18 to 65 years.
 - 30 percent among adult females.
 - The prevalence is greater among shod, compared with barefoot populations.
 - Twice as often in women than men in non-shod populations.



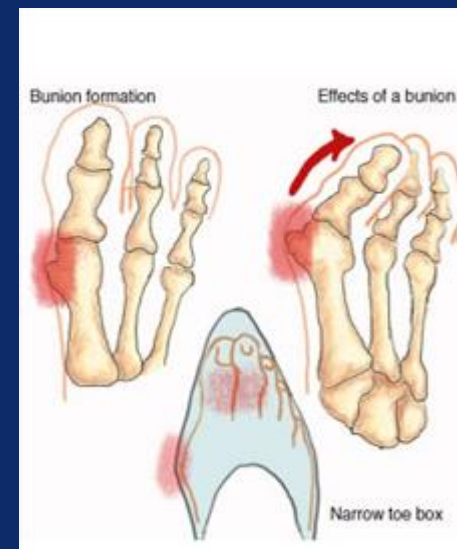
Hallus Valgus Bunion

- Etiology of hallux valgus (HV) deformity is **unknown**.
- HV deformity is multifactorial.
- Abnormal foot biomechanics and anatomy affecting the first ray.
- Joint hypermobility.
- Inflammatory joint disease.



Hallus Valgus

- HV can lead to a number of painful complications in or around the first MTP joint:
- Inflammation of a **medial bursa** protecting the joint.
- Degeneration of the cartilage covering the metatarsal head.
- **Hammertoe deformity of the second toe.**
- **Central metatarsalgia.**
- Synovitis of the MTP joint.



Bunions

- There is no direct correlation between the size of the bunion and the patient's symptoms.
- Some patients with severe bunion deformities may have minimal symptoms, while patients with mild bunion deformities may have significant symptoms.
- Symptoms are often exacerbated by restrictive shoe wear, particularly shoes with a narrow toe box or an uncomfortable, stiff, toe box.
- Patients with bunions often have a positive family history.



Hallus Valgus Bunion

- Drifting of the big toe actually causes the big toe joint to "subluxate", which means it moves out of place.
- In mild and moderate bunions, this joint may be reduced on physical examination.
- With increased deformity or arthritic stiffness the first MTP joint cannot be fully straightened to a normal position.
- Patients may also have a **skin callus at the base of their second toe** in the sole of the forefoot because the second toe carries more weight.

Imaging

- The degree of big toe angulation can be measured on x-ray.
- Big toe angulation less than 15 and intermetatarsal angle less than 9 degrees are normal.
- **Mild deformities** are considered a big toe angulation of >15 and <20 degrees.
- **Moderate deformities** from 20-40 degrees.
- **Severe deformities** the great toe angulation is greater than 40 degrees.
- It is important that the x-rays be obtained in a **full weight-bearing** position in order to adequately assess the alignment issues associated with the bunion deformity.



Bunion

Non surgical treatment

1. **Shoe modification:** wide, low-heeled shoes, or specially altered shoes with increased medial pocket for the first MTP joint to minimize deforming forces
2. Orthoses to improve support and alignment
3. Night splinting to improve toe alignment
4. Stretching and/or mobilization/manipulation to maintain joint mobility
5. Medial bunion pads to prevent irritation
6. Ice applied after activity to reduce inflammation
7. **Analgesics:** acetaminophen or NSAIDs

Treatment

Non-Operative Treatment: Bunions



Hallus Valgus Bunion Surgery

- Surgery should only be considered for bunions that are moderately to severely painful, and **NOT** for correction of the cosmetic appearance.
- The primary indication for operative intervention is pain that is not relieved by appropriate non-operative management.
- There are well over 150 different bunion correction surgery described in the orthopaedic literature.

Hallux rigidus

- Stiffness resulting in limited great toe extension (Limitation and DJD).
- For normal walking, **approximately 65 degrees of extension** of the first MTP joint is ideal.
- Mean MTP dorsiflexion when standing and walking is **44 degrees**.
- In HR, normal extension is usually **reduced by 50 percent** or more.
- While diagnostic criteria vary, most experts consider first MTP **extension of less than 30 degrees as abnormal**.
- Patients with HR complain of great **toe pain, stiffness**, or an uncomfortable bump on the top of their first MTP.
- While the majority of individuals have significant pain, **some patients may be mildly symptomatic**.



Hallux rigidus

- Redness may be present around the first MTP joint.
- Examination often reveals **squaring or enlargement** of the joint.
- Palpation may reveal bone spurs, local warmth, or focal tenderness.
- A family history of HR suggests greater risk, particularly for those with bilateral involvement.
- Unilateral HR is associated with trauma and female gender.
- Hallux valgus are more common in individuals who develop HR.



Hallux rigidus

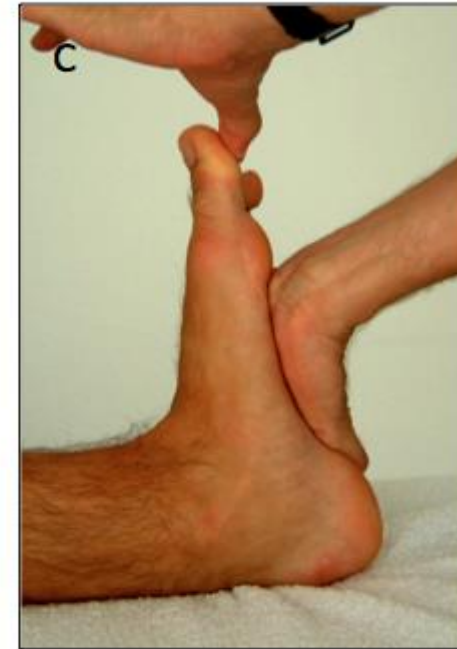
Functional Hallux Limitus Stretch Test



1. Ankle in plantar flexion.
Verify full ROM of the 1st MP
joint.



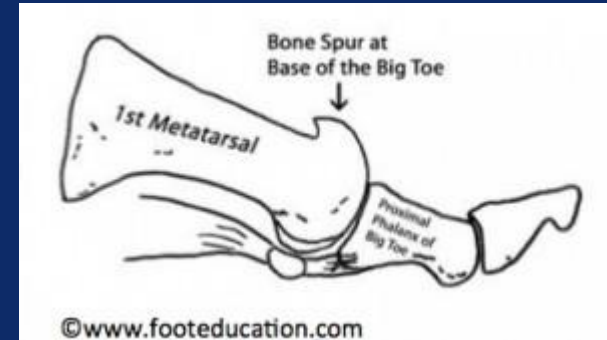
2. Ankle in dorsiflexion by
pressure applied at the
metatarsal heads



3. Forced passive dorsiflexion of the
MP1 joint.
Inability to dorsiflex
= Positive test

Hallux rigidus

- Anteroposterior (AP) and lateral radiographs of the first MTP joint shows loss of joint space, bone spurring, and sometimes calcifications.
- Ultrasound reveals degenerative change at the MTP and can demonstrate joint effusions with hypoechoic change or associated injuries to the extensor tendon.



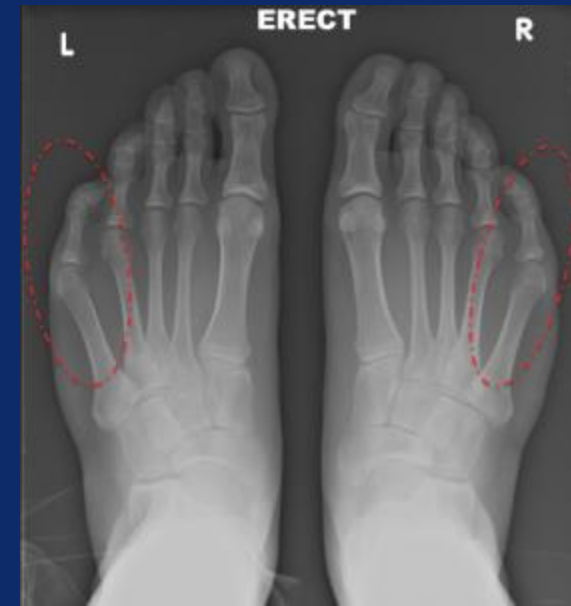
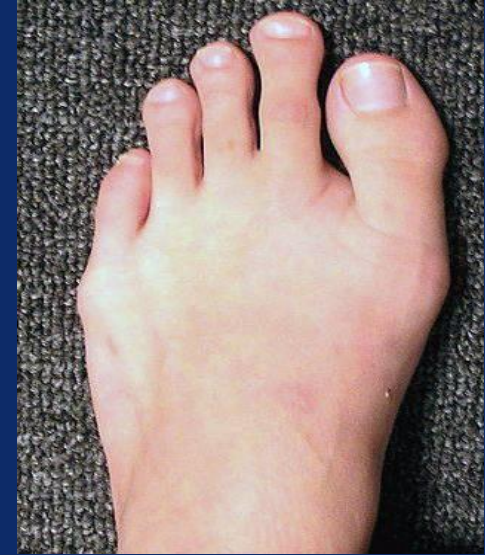
Hallux rigidus Management

- **Limiting great toe motion:**
 1. The pain associated with movement of this joint can be limited with the use of a **stiffed-soled shoe**, with a slight **rocker bottom** contour.
 2. A rigid shank, a foot plate inserted under the orthotic shoe.
 3. Use of a wide-toe box made of soft material.
- Exercises.
- NSAIDS.
- Glucocorticoid injection.
- Surgery.



Bunionette Tailor's bunion

- Painful bony prominence that occurs over lateral aspect of fifth MTP joint.
- Prominence of the metatarsal head and **varus angle** or **subluxation** of the fifth MTP joint.
- There can be swelling in this area representing a bursa, which is a fluid-filled sac.
- Sometimes, patients also have a bunion of the big toe.



Metatarsalgia

- Metatarsalgia is the term commonly used to describe pain at the **plantar surface** of the distal diaphysis of the second and third metatarsals.
- Pain arises from partial or complete **collapse of the transverse arch** formed by the metatarsal heads.
- Metatarsalgia can develop from **poor gait biomechanics, abnormal foot anatomy, or congenital abnormalities** affecting the foot or ankle.
-
- The condition can also occurs in otherwise normal feet.
- Obesity and poor fitting shoes.



Metatarsalgia

- **Causes:**
- Loss of the support provided by the **transmetatarsal ligaments** and **weakness of intrinsic foot muscles**.
- If too much pressure is placed on these ligaments, they can break down over time and allow the first ray to deviate (Toe splay). →
- Metatarsal head may sublux toward the plantar surface of the foot.
- In extreme cases, this leads to a hammer toe deformity.

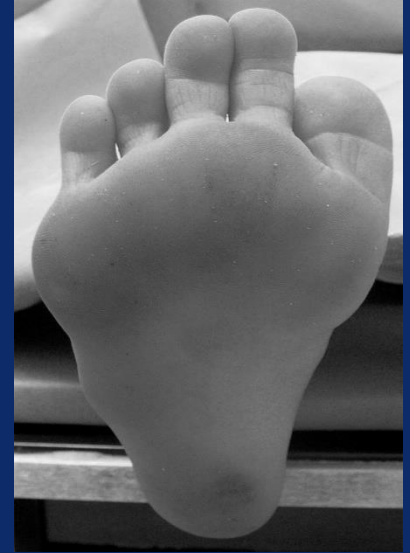


Metatarsalgia

- Patients complain of sharp pain on the plantar surface of the foot in the area of the distal metatarsals.
- The pain is often described as feeling like they are **stepping on a stone**.
- The second and third metatarsal heads are the most common location of the pain.
- Barefoot walking increases the discomfort.
- **Dorsal pain occurs more often with a stress fracture** and is not typical of metatarsalgia.
- **Burning or neuropathic pain** points toward neuroma or neuritis.
-
- Along with **stress fracture** and **Morton neuroma**, the differential diagnosis in adolescents includes **Freiberg disease**.

Metatarsalgia

- Older patients and women are at greater risk of developing metatarsalgia.
- Athletes in sports like distance running are at increased risk.
- The most common anatomic abnormality associated with metatarsalgia is a **short first metatarsal or a long second metatarsal**.



Metatarsalgia

- Pes planus or pes cavus changes of the arch are often associated with metatarsal pain even when metatarsal length remains normal.
- **Failed bunion** or **HR surgery** may displace pressure from the first MTP plantar surface to the central metatarsals, metatarsalgia.

Metatarsalgia

- **Flattening of the transverse arch** or **splaying of the toes**, when the patient stands, and **loss of the metatarsal arch** on the plantar surface that is seen when the patient sits.
- Abnormal **plantar calluses** can develop over any of the metatarsal heads, most often over the second, often referred to as Morton callus.
- Palpation elicits pain at the distal plantar diaphysis just proximal to the metatarsal head.
- **Neither standard radiographs nor ultrasound helps to confirm the diagnosis.**
- The initial treatment for metatarsalgia consists of metatarsal pads.
- Surgery ?



Morton neuroma

- Interdigital neuromas of the foot.
- Etiology is not fully understood but is similar to metatarsalgia, involving collapse of the transverse arch that places traction and increased pressure on the interdigital nerve, ultimately leading to injury.
- Overpronation and tight shoes are often associated.
- Burning pain in the third intermetatarsal space (between the third and fourth distal metatarsals) that may radiate towards the toes.
- May also develop in the second or fourth interspaces.



Morton neuroma

- Some patients may complain of numbness of the involved toes or pain that increases with activity.
- Examination may reveal **a clicking sensation** (Mulder's sign) when palpating the involved interspace while simultaneously squeezing the metatarsal joints.



Morton neuroma

- **Ultrasound** offers an option for identifying Morton neuroma with accuracy comparable to MRI.
- Can distinguish a neuroma from **intermetatarsal bursal swelling** or **synovitis** in adjacent joints.
- Characteristic **lesions over 5 mm** in diameter are considered clinically important.
- The use of MRI to diagnose Morton neuroma is problematic because features consistent with neuroma may appear in as many as one-third of asymptomatic individuals.

Morton neuroma

- **Treatment:**
- Conservative.
- Metatarsal support or bar.
- Strength exercises for the intrinsic foot muscles.
-
- A wide toe box shoes.
- Inserts are often placed in both shoes, even when symptoms are unilateral.



Morton neuroma

- **Treatment:**
- Injection of a glucocorticoid and local anesthetic into the site of tenderness can be performed using a **dorsal**, not plantar, **approach**.
- Injection of alcohol and radiofrequency therapy to ablate the neuroma.
- Surgical removal of the neuroma and nerve may be necessary in patients who remain symptomatic after 9 to 12 months of nonoperative therapy.

Freiberg disease

- Ischemic injury to epiphysis of the head of second, third, or fourth metatarsal.
- Common in **adolescent females** and may be associated with repetitive trauma or anatomic variants (short or hypermobile first metatarsal).
- **Gradual onset of dull**, aching in forefoot sometimes as a sensation of walking on a pebble.
- Pain may be exacerbated by walking barefoot.

Freiberg disease

- **Physical examination:**
 - Pain over the affected metatarsal head.
 - May be associated with swelling or elevation of the corresponding toe, crepitus on passive ROM.
- **Diagnosis:**
 - Plain radiography
- **Treatment:**
 - Rest, NSAIDS, methatarsal orthosis to reduce pressure.



Hammer toes and claw toes

- **Claw toe** is, dorsiflexion of the proximal phalanx on the MTP joint, combined with flexion of both the proximal and DIP joints.
- **Hammer toe**: deformity of the **PIP joint** causing it to be permanently bent.
- **Mallet toe**: Bending of the **DIP joint**.



Hammer toes and claw toes

- Pain may be felt at the plantar surface over the MTP joint.
- PIP joint is pushed against the shoe and **calluses** form over the joint.
- **Mallet toes**, **crossover toes**, and **claw toes**.
- Most of these deformities are treated only when they create significant symptoms.



Hammer toes and claw toes

- When cause significant pain or interfere with gait, surgical correction is required.
- For less severe symptomatic cases, hammer toe pads, buddy taping.
- shoes with a roomy toe box.
- various orthotic straps and forefoot padding.



