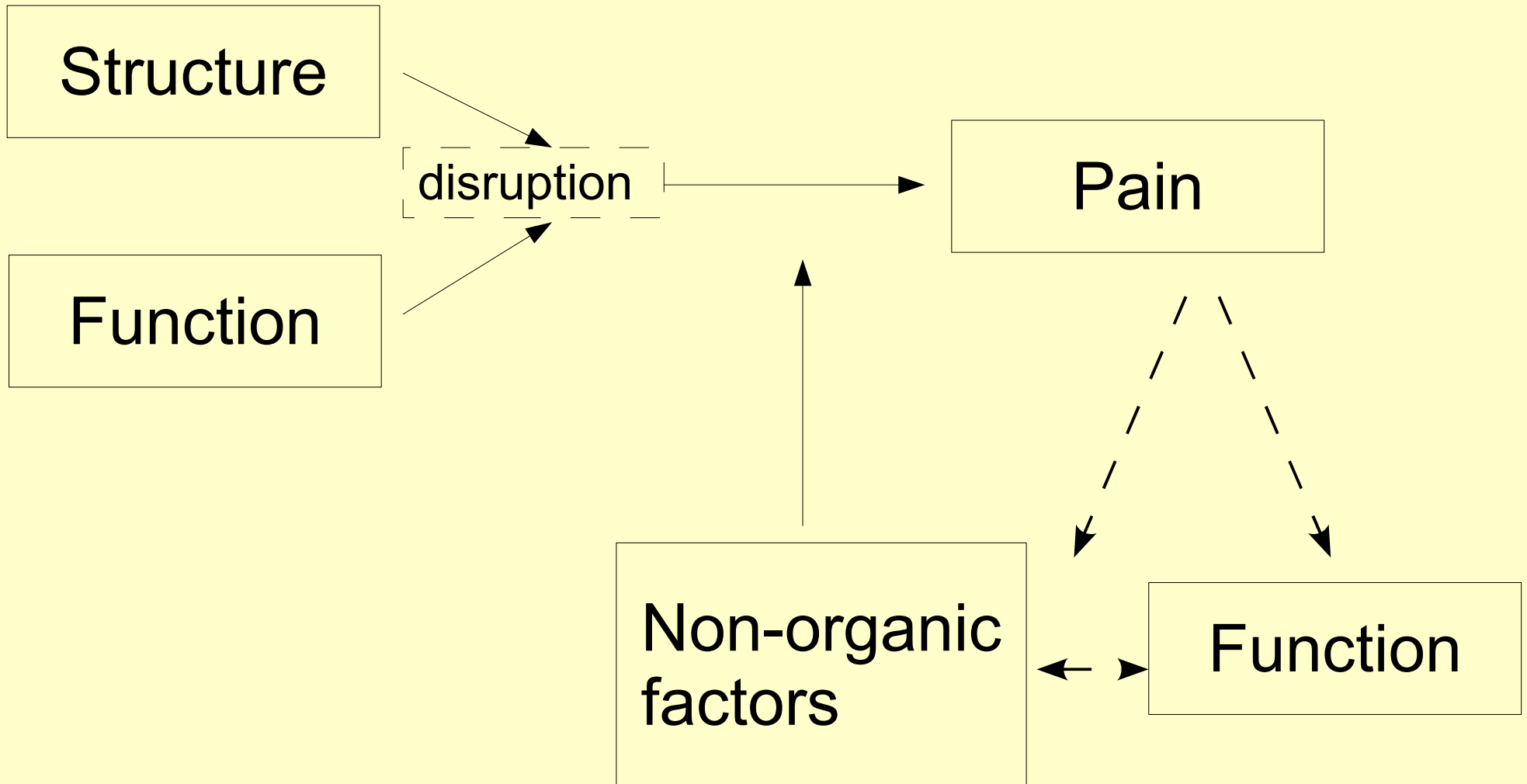


Common pain conditions in foot and ankle region

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Origin of foot pain



Outline of talk

- ◆ Structure and function of foot
- ◆ Etiology of foot pain
- ◆ Painful conditions
 - ◆ hindfoot, midfoot, forefoot
- ◆ Management

Structure and function of foot

Foot Anatomy

Different anatomical components can give rise to pain

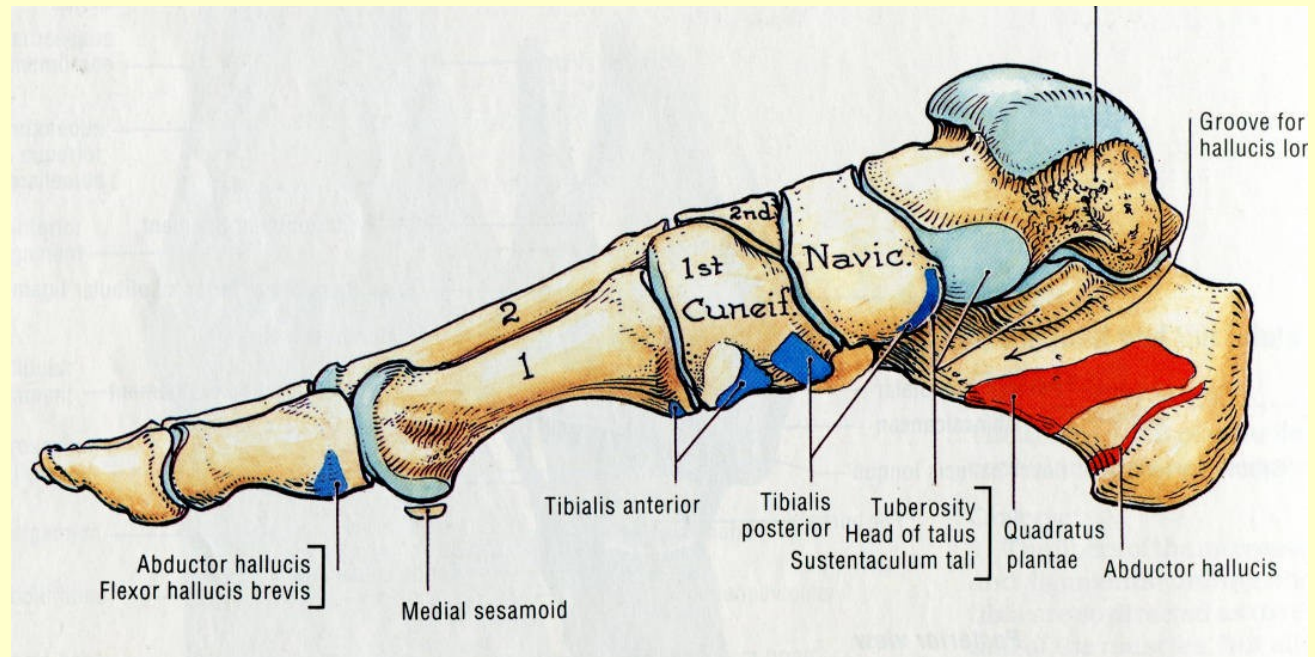
26 bones

Joints

Ligaments

Plantar fascia

Plantar fat pad

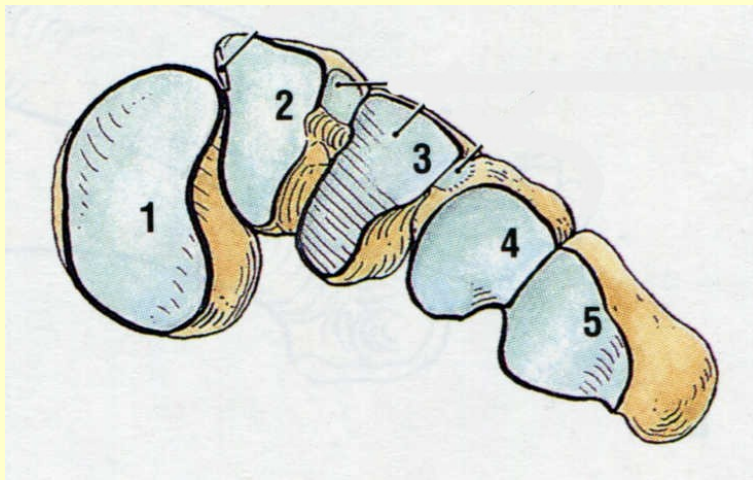


Foot shape

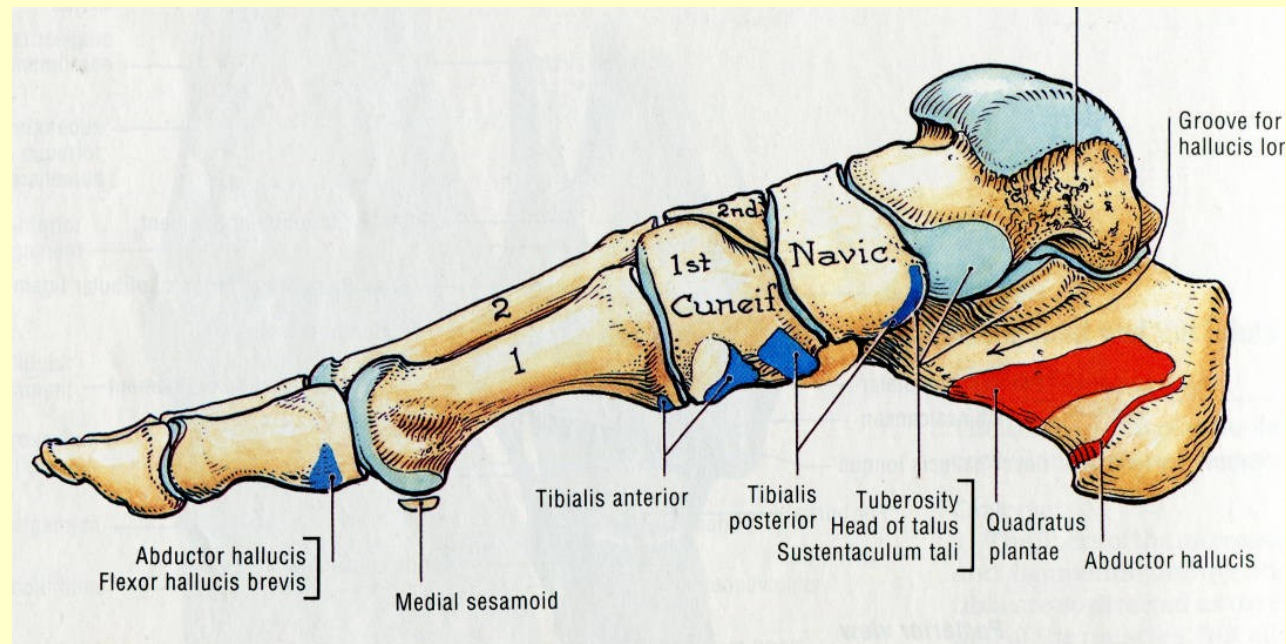
Foot shape is specific for foot biomechanics

Altered shape leads to foot pain

Transverse arch



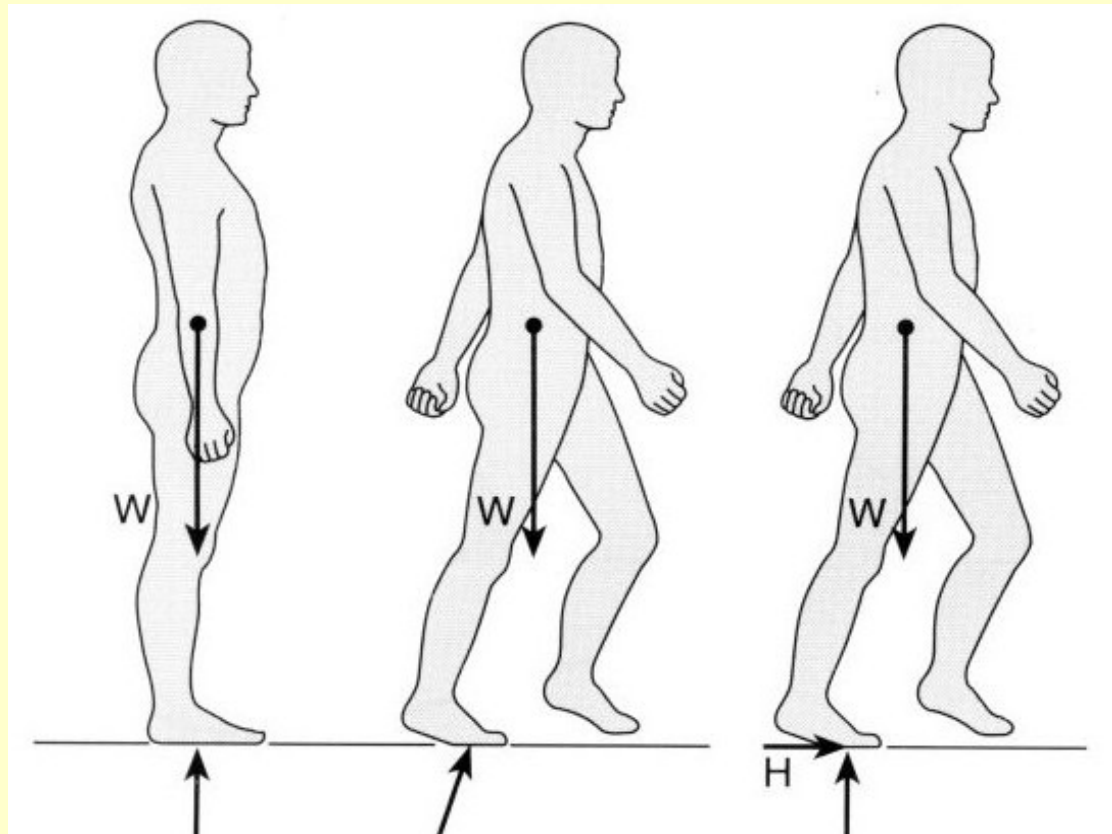
Longitudinal arch



Foot Functions

Abnormal function causes pain

Weight bearing
Ambulation



Functional segments of foot

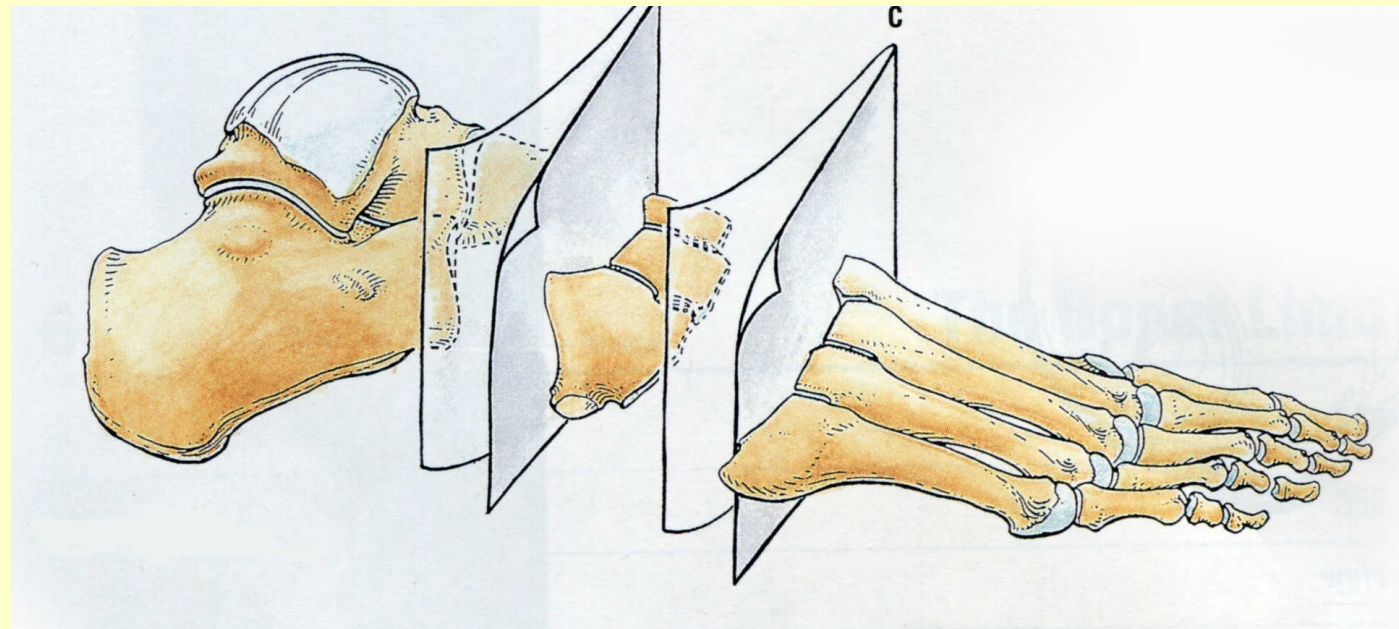
Different segment has different role in biomechanics

Hindfoot

Midfoot

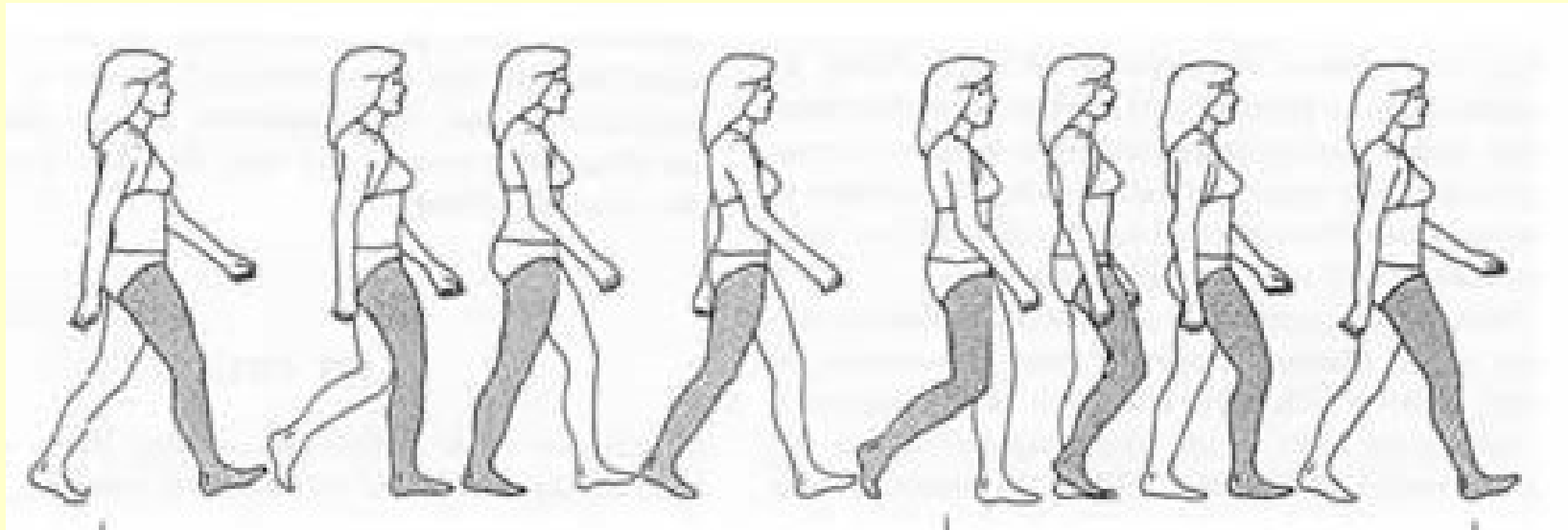
Forefoot

Ankle



Gait cycle

Each foot segment has unique function in the gait cycle



Etiology of foot pain

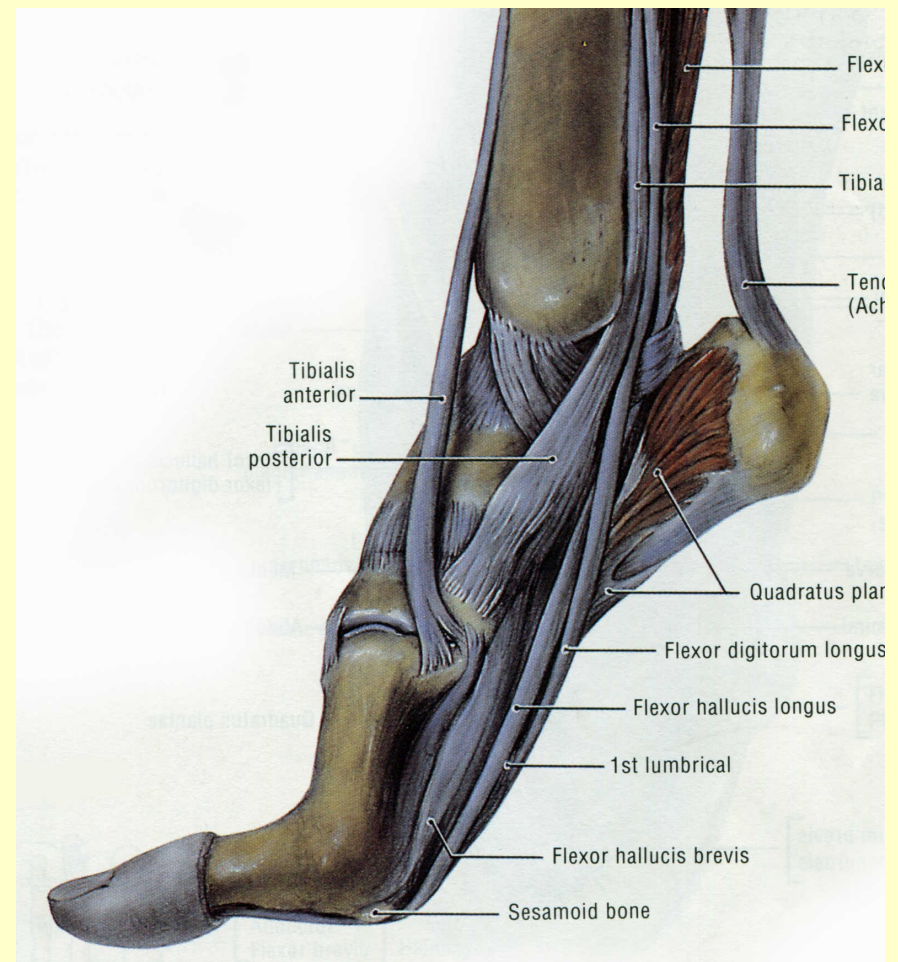
Causes of foot pain

- Injury
- Abnormal biomechanics
- Disease of internal structure

Foot pain caused by injury

Various forms of injury lead to pain

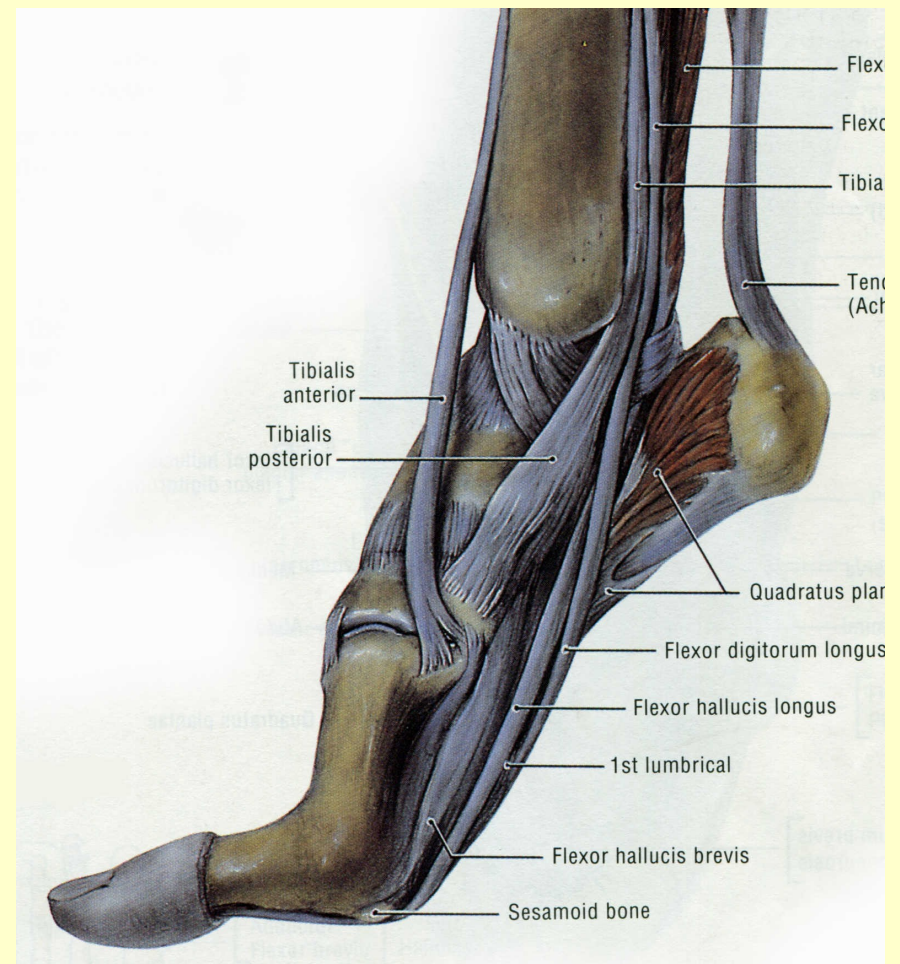
- ★ Single impact
- ★ Repeated microtrauma
- ★ Chronic overuse



Foot pain caused by injury

Injury could involve various components of foot

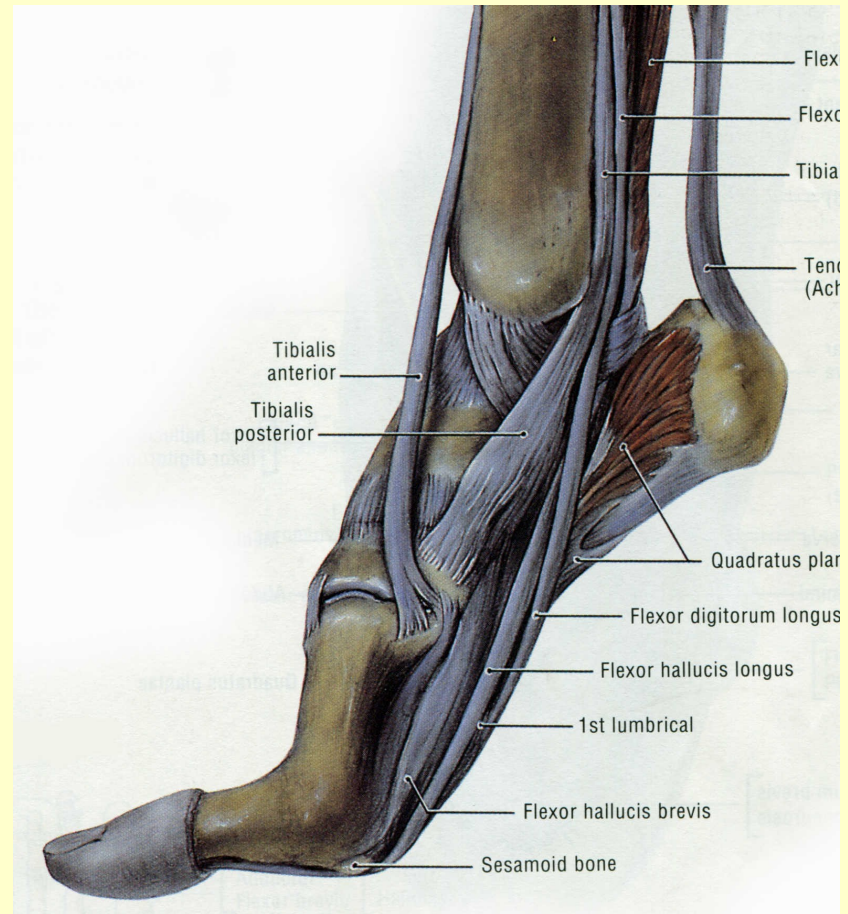
- Ligament
- Muscle
- Tendon
- Bone
- Joint



Abnormal biomechanics and foot pain

Abnormal interaction of foot with external environment causes pain

- Tight heel cord
- Cavus foot
- Flatfoot
- Forefoot deformity
- Footwear



Painful structural disorder of foot

can be systemic disease with local manifestation

- Diabetes
- Gout
- Peripheral vascular disease
- Rheumatoid



Painful local foot pathology

- Deformity
- Arthritis
- Nerve entrapment
- Nail
- Skin: wart, fungus
- Metatarsalgia



Painful conditions of ankle and hindfoot

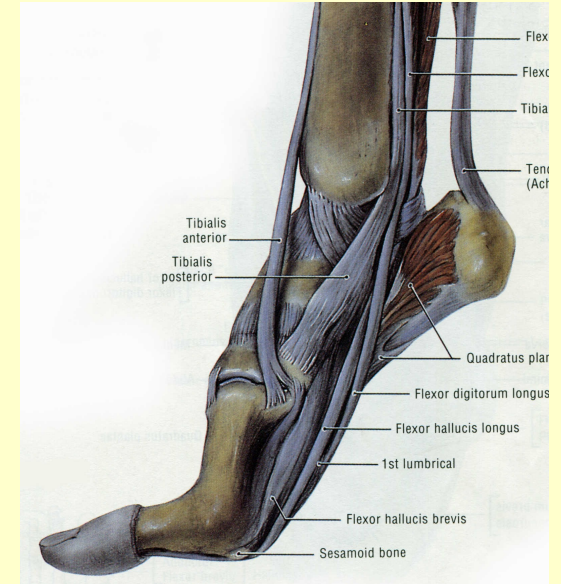
Osteochondral lesion of talus

- Detached cartilage and subchondral bone from talus articular surface
- Acute case: persistent pain after ankle sprain
- Chronic case: activity-related pain and swelling
- MRI to stage lesion
- Low grade:
 - period of protected wt bear
- High grade:
 - arthroscopic debridement



Achilles tendinopathy

- Zone of hypovascularity 2-6cm above insertion
- Midsubstance tendinosis / rupture
- Insertional tendinosis
- Other painful conditions:
 - Haglund deformity
 - Retrocalcaneal bursitis



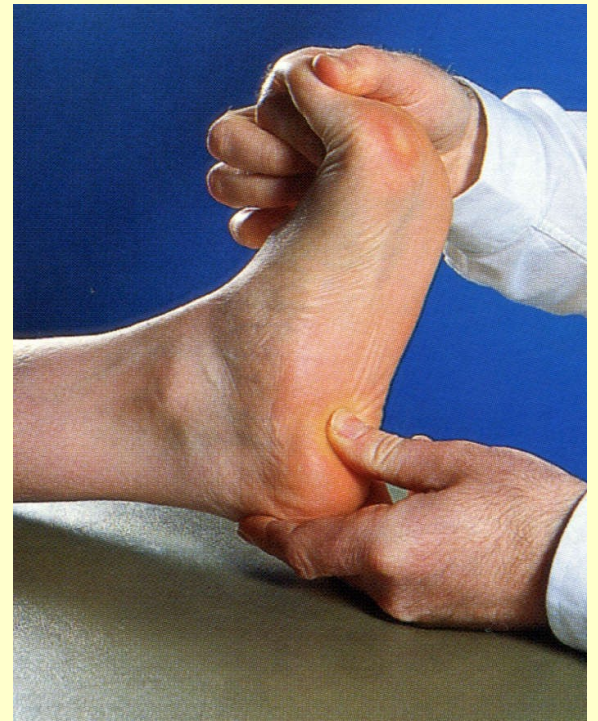
Achilles tendon rupture

- Acute indirect trauma on chronic pre-existing tendinosis
- Sudden forceful plantarflex contraction
- Feel snapping sensation without actual physical contact
- Clinical tests: unable to rise on toes, palpable gap, calf-squeeze test
- Diagnosis easily missed: ankle movement by toe flexor tendons



Plantar fasciitis

- Start-up pain
- Tender spot at medial side of calcaneal tubercle
- Heel spur unrelated to anatomical location
- Shock wave for persistent case
- Distinguish from:
 - Plantar nerve impingement
 - Fat pad atrophy



Painful condition of midfoot

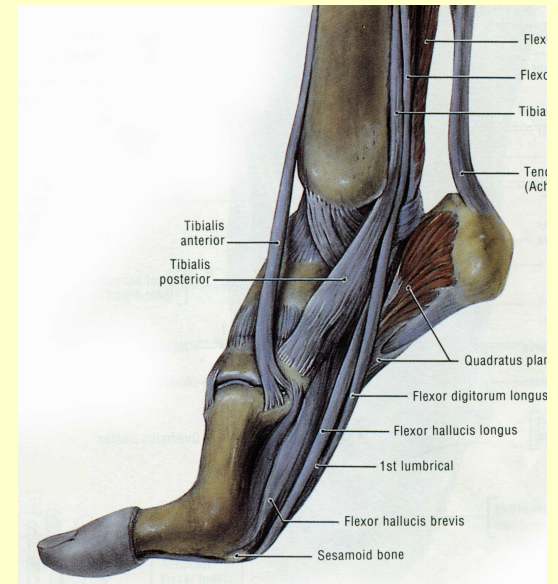
Flatfoot

- Arch height is a morphological variance
- Asymptomatic flatfoot requires no treatment

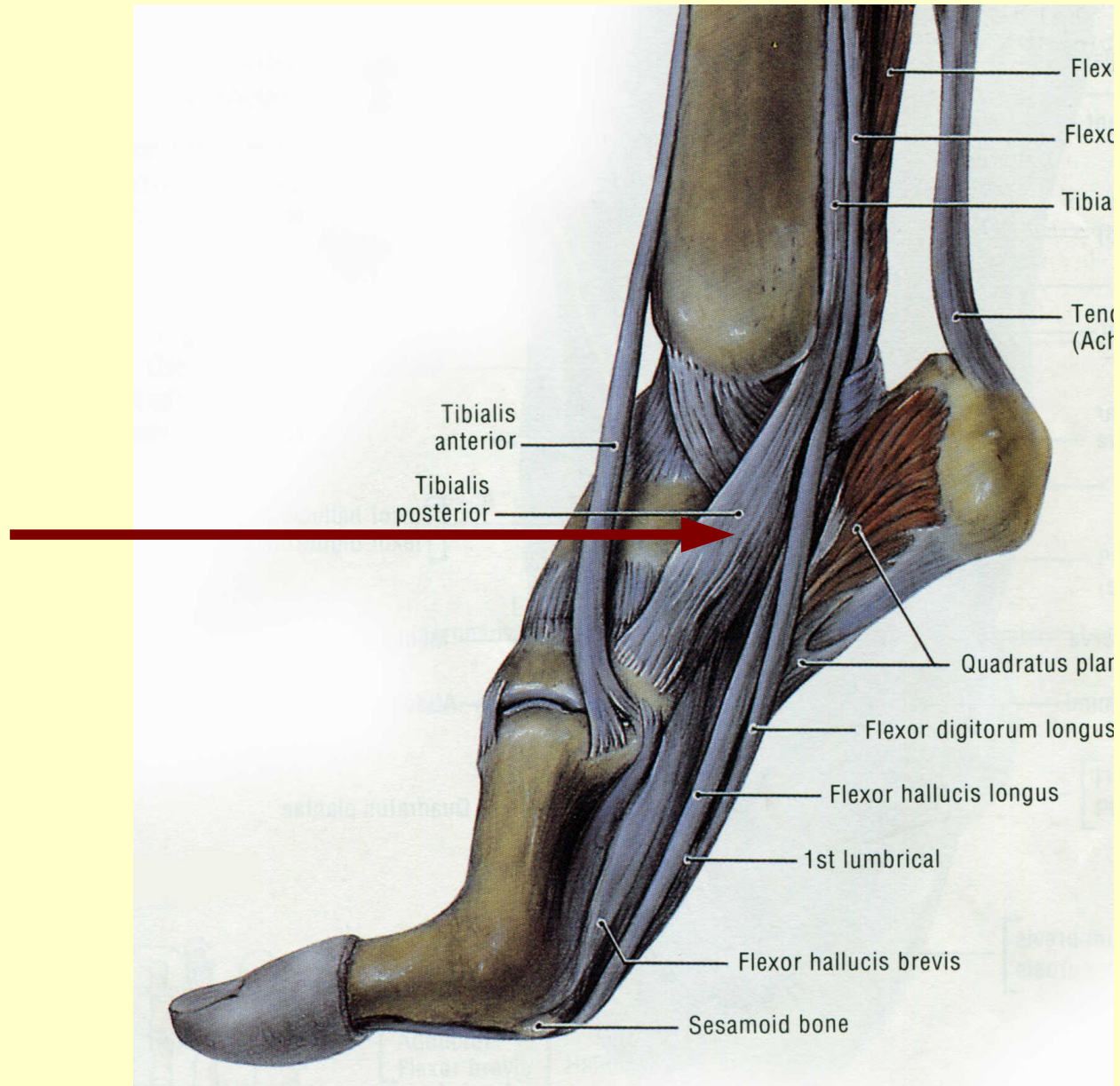


Symptomatic adult flatfoot

- Posterior tibial tendon dysfunction: commonest cause for pathological flatfoot
- Symptom around medial midfoot and plantar arch, radiate along course of posterior tibial tendon



Course of posterior tibial tendon



Pathological flatfoot

- Collapsed foot arch, hindfoot valgus
- Unstable single leg stance
- Early treatment: orthotic support for flexible deformity
- Late stage: reconstruction of tendon and realignment of bone



Painful conditions of forefoot

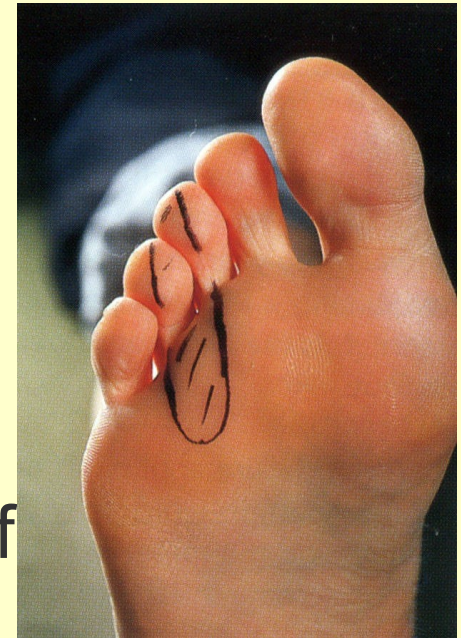
Stress fracture of metatarsus

- Typical activity: athlete, dancer, military
- Xray shows periosteal reaction, sclerosis
- Treated with off-loading
- Operative fixation for professional athlete
- Important to look for predisposing cause: biomechanical disorder
- Distinguish metatarsal base and midfoot injury



Morton neuroma

- Compression neuropathy of plantar digital nerve with perineural fibrosis
- Present as paraesthesia of toes
- Relieved with local massage or take off shoe
- Typically at 3rd inter-space:
 - relative immobile nerve formed by medial and plantar branch
- Beware over-diagnosis, esp with MRI
- Need to treat underlying cause of overload of forefoot



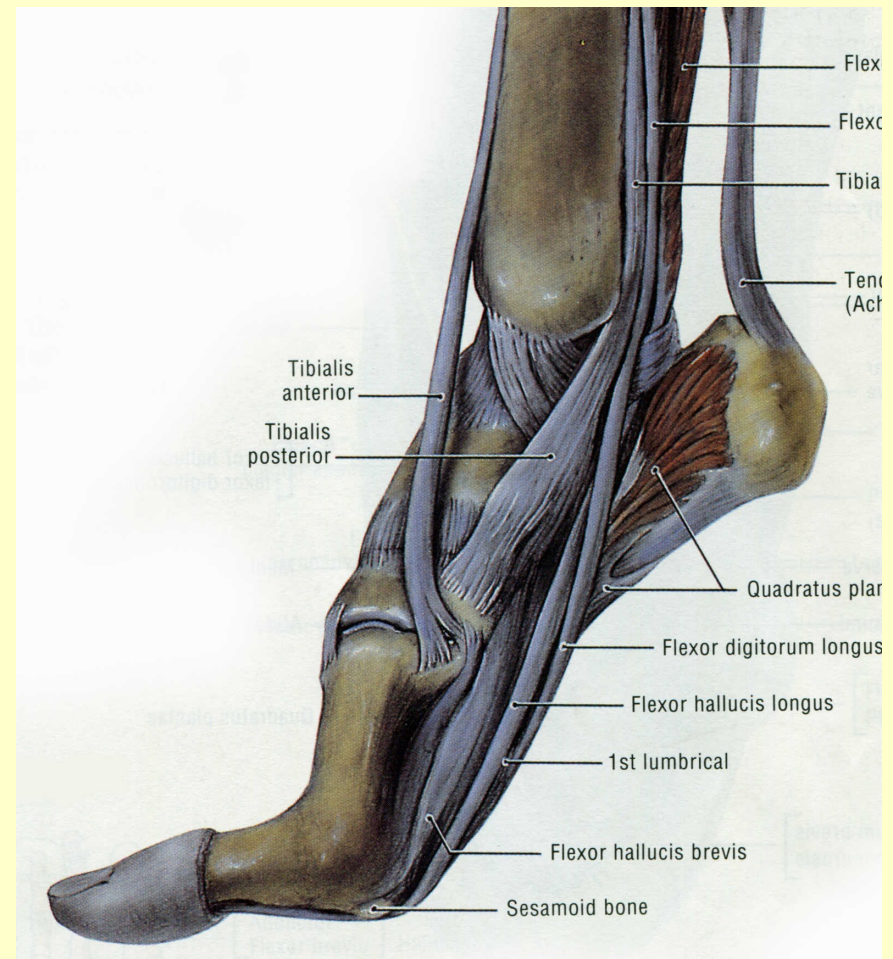
Metatarsalgia

Pain on plantar surface around metatarsal head: “ball of the foot”

- Mechanical causes: forefoot overload
- Structural causes: metatarso-phalangeal jt pathology or deformity

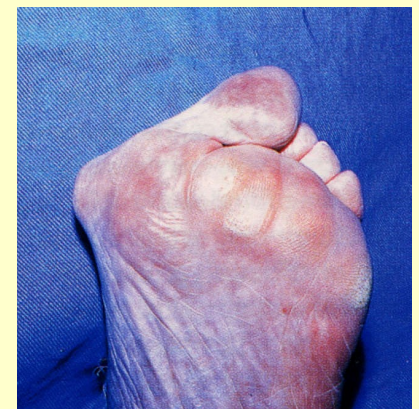
Metatarsalgia: forefoot overload

- Tight heel cord
- Cavus foot
- Hypermobile first ray
- Plantar fat pad atrophy



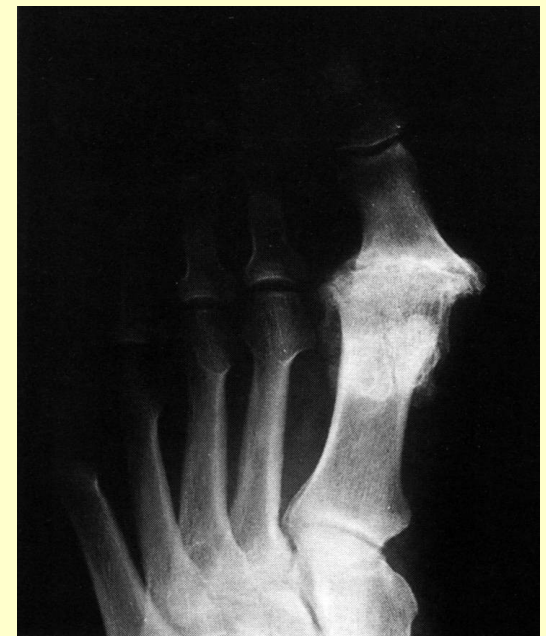
Metatarsalgia of MTP jt pathology

- Synovitis / arthritis
- Can be result of forefoot overload
- Freiberg infraction: osteochondrosis of metatarsal head, commonest 2nd MT, cause swelling and stiffness
- Hammertoe deformity: excessive wt bear of MT head



Hallux rigidus

- Local degeneration of 1st MTP jt
- Present with stiffness, pain on dorsiflexion of toe, eg walk upslope or play tennis
- Tender along dorsal jt line
- Differentiate from hallux valgus
- Treat as arthritis: rest, support, reduce activity



Painful foot conditions of systemic disease

Gout

- Commonest cause of acute mono-arthritis
- 1st MTP jt, ankle, subtalar jt
- Genetic and diet factors
- Xray periarticular punched out lesion, overhang edge, no jt space narrowing
- Surgical excision of tophus may trigger acute gout and wound complications
- Treatment includes identify cause of secondary hyperuricemia



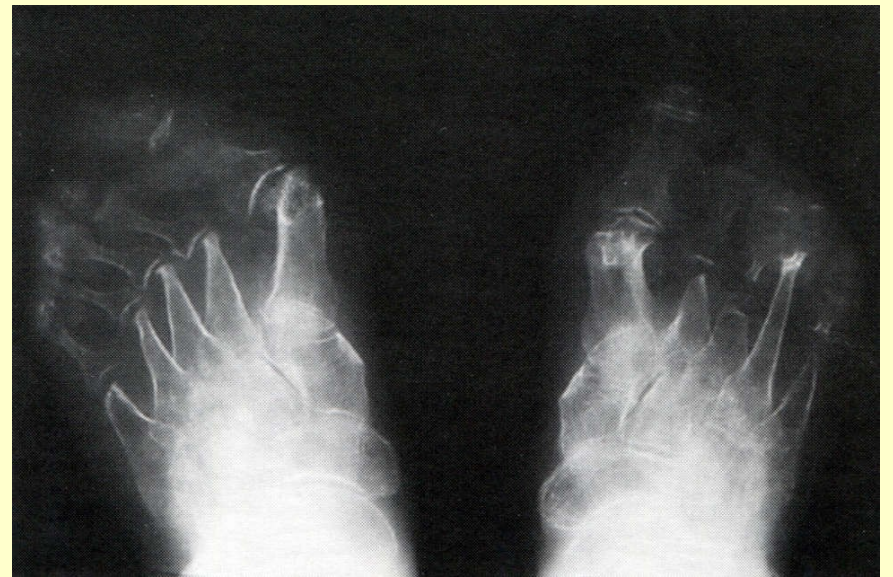
Rheumatoid arthritis

- Foot and ankle are common site of first presentation:
 - MTP jt, flatfoot
- Inflammation of joints, tendons, ligaments
- Blood tests for suspected case



Rheumatoid arthritis

- Drug as disease-modifying treatment
- Maintenance therapy with physio and orthotics
- Surgery for symptomatic deformity



Foot pain with non-organic contributing factor

- Diffuse area of pain
- Inappropriate intensity of pain
- Skin hypersensitivity
- Joint stiffness and irritation
- Muscle wasting
- Avoidance gait

Management of foot pain

Foot pain: history taking

- Onset
- Injury
- Activity
- Medical history
- Family history
- Footwear

Foot pain examinations (1)

- Site of tender
- Deformity / swelling / callosity
- Arch
- Sensation / pulse
- Movement

Foot pain examinations (2)

- Stance / gait
- Nail / skin / shoe
- Other body parts: back, hip, knee

Detect non-organic factors

- Psycho – social history
- Functional history

- Inconsistent physical finding
- Mismatch with anatomy

Xray investigation

- Standing view
- Foot
- Ankle

Foot pain management

- Pain relief
- Systemic disease treatment
- Local support: orthotics
- Footwear
- Surgery
- Preventive measures

Physical therapy

- Swelling control
- Pain relief
- Range maintenance
- Muscle strengthening

Occupational therapy

- Specific skill training
- Strength-based approach

Foot pain surgery

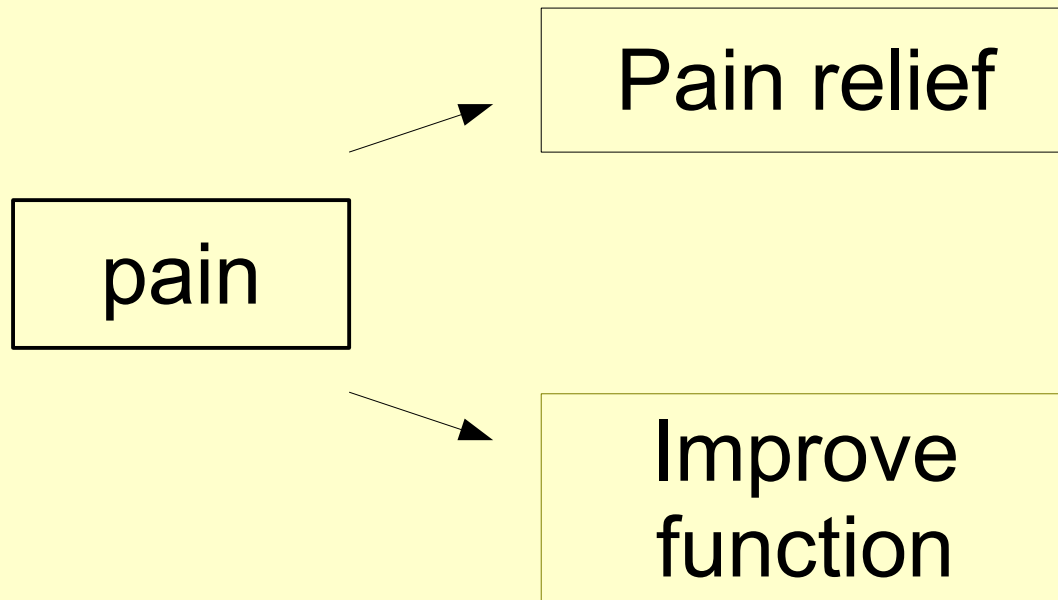
- Correct deformity / biomechanics
- Reconstruct structural deficit
- Surgery for arthritis

Interventional pain management

Non-organic factors

- Identify
- Treat
- Modulate

Pre-defined treatment target



- Based on clinical information
- Set by patient and care-giver
- Revised as treatment continues

Foot pain prevention (1)

- Footwear
- Skin condition
- Foot care, limb conditioning
- Systemic disease control

Foot pain prevention (2)

- Overall health perspective
- Sports activity precaution
- Psycho – social factors
- External environment

Conclusions

Foot pain is common presentation of large variety of medical conditions

Understanding anatomy and function of foot essential to management

Etiology can be systemic disorder , biomechanics deficit, or structural pathology

Identifying underlying abnormality for treatment and prevention of future recurrence