Foot and Ankle Examination

Introduction
- Wash hands, Introduce self, ask Patients name & DOB & what they like to be called, Explain examination and get consent
- Expose knees and below
- General inspection: patient e.g. age, mobility, trauma, risk factors; around bed e.g. mobility aids.
- Shoes: wear pattern, insoles

Look
- Gait: phases of gait looking at knee, ankle, limp, movement restriction
- Standing inspection:
  - Front: hallux deformities (lateral angulation of big toe = hallux valgus), lesser toe deformities (flexed PIP joints = hammer toes; flexed DIP joints = mallet toes; flexed PIP joints and DIP joints with pes cavus = claw toes)
  - Sides: foot arches (pes plantus = flat foot; pes cavus = high arch, usually with clawed toes – neurological cause)
  - Behind: alignment of hindfoot (5° valgus normal)
  - Tip-toe standing inspection: re-inspect foot arch if there was pes plantus (if it corrects on tip-toe standing, it is ‘flexible pes plantus’; if it does not correct, it is ‘rigid pes plantus’), big toe flexion (no flexion = hallux rigidus), hindfoot varus/valgus angulation change (normal hindfoot 5° valgus should correct into varus)
- Lying inspection: skin (scars/arthroscopic portals, bruising, erythema), joints (swelling, effusions), muscles (wasting), heel (callosities), between toes (ulcers), nails (psoriatic changes), feel up extensor surface of lower leg (psoriasis plaques, rheumatoid nodules, gouty tophi)
- Measure calf muscle bulk: measure calf diameter 10 cm below tibial tuberosity

Feel
Ask if any pain first.
- Temperature
- Bony landmarks – assess joints for tenderness & feel for bony swellings, effusions, synovitis, deformingities
  - Ankle: medial malleolus, lateral malleolus, anterior joint line
  - Hindfoot and midfoot: feel around joints in an n-shape from lateral distal, to lateral proximal, across dorsum, to medial proximal to medial distal
  - Forefoot: feel all joints in circle (metatarso-tarsal joints, metatarsal heads, MTP joints and IP joints)
- Tendons: deltoid ligament (medial ankle), lateral ligament complex (lateral ankle), Achilles tendon
- Plantar fascia: feel for thickening, tenderness, fibromatosis
- Squeeze forefoot (pain may be Morton’s neuroma)

Move
Best assessed with patients legs handing over bed
- Ankle movements: actively and passively (feel for crepitus): dorsiflexion 20° and plantarflexion 40°; inversion and eversion at subtalar joint (by stabilising ankle with one hand and moving heel with other)
- Midtarsal movements: hold calcaneus with one hand and adduct 10° and adduct 20° forefoot with other hand
- Toe movements: ask patient to: straighten toes fully (difficulty = joint disease, extensor tendon rupture, neurological damage); curl toes (can’t curl toes in = tendon/small joint involvement); abduct (spread) toes and adduct toes (hold paper between); move MCPJs and IPJs passively (assess for limited movement and crepitus)
- SPECIAL TESTS
  - Simmond’s test: ask patient to kneel on a chair with feet hanging over edge. Then squeeze both calves and feet should plantar flex (no plantar flexion = Achilles tendon rupture).
  - Muscle power
    - Tibialis anterior: ankle inversion against resistance
    - Peroneus longus and brevis: eversion against resistance

Function
- (Gait: already seen)

To complete exam
- “To complete my examination I would examine the joint above, and also do a full neurovascular exam – would you like me to do this now?”
- Summarise and suggest further investigations you would do after a full history
Common pathology

- **Pes plantus (flat foot)**
  - Loss of medial arch
  - May be flexible or rigid (non-correctable)
  - Flexible pes plantus is normal in toddlers and is often asymptomatic in adults
  - Rigid pes plantus may be due to tarsal coalition or tibialis posterior tendon rupture

- **Hallux valgus**
  - Lateral angulation of big toe
  - Usually occurs in older women
  - Can result in painful bunions on medial aspect of MTP joint (from shoe pressure)
  - May be treated with osteotomy or fusion

- **Gout**
  - Monoarthropathy caused by deposition of monosodium urate crystals in hyperuricaemia
  - Signs: tender, erythematous, inflamed joint
  - MTP joint most commonly affected
  - Acutely managed with NSAIDs/colchicines
  - Prevented by allopurinol, avoiding purine rich foods/drinks and stopping thiazide and loop diuretics

- **Achilles tendon rupture**
  - Patient feels like someone 'kicked them in the back of the leg' while pushing off with foot (e.g. while running)
  - Signs: unable to plantarflex, Simmond’s test positive
  - May be treated by surgical repair, or in an equines cast in older less fit patients

- **Charcot foot**
  - Pain free joint destruction after minor trauma
  - Usually occurs in patients with peripheral neuropathy and diabetes
  - In undeveloped countries, tabes dorsalis and leprosy are common causes
  - Signs: erythema and swelling in the acute phase only, gross joint deformity, instability
  - Managed by educating patient, treating underlying cause, podiatry and joint protection