Biomechanics

Foot pronation is: Eversion, abduction and dorsiflexion, begins at heel strike to mid stance
Limited by: Ligamentous and bony integrity + eccentric contraction of tibialis posterior

Chronic hyperpronation - causes laxity of calcaneonavicular ligament and talonavicular joint capsule, elongated plantar fascia, posterior tibial tendinopathy and posterior tibial nerve irritation

- Hyperpronation causes internal rotation of the tibia, resulting in internal rotation of femur (moves femoral head and acetabulum backwards, anterior tilt of the pelvis then hyperextension of lx)

- **Internal tibial rotation:** Causes valgus stress on the knee, MCL and ACL stressed, causes a lateral displacement of the patella

- **Internal femur rotation:** Also causes lateral displacement of the patella, quads, hip adductors/abductors - weakness of gluts causes excessive hip adduction, increases the foot arch during ambulation, also causes weakening of gluteal and abdominal muscles and tightening of hip flexors

Presentation

- Look for lower chain dysfunction
- Excessive forefoot abduction (too many toes)
- Calcaneal eversion (bowing of achilles tendon)
- Navicular drop >10mm (6-8mm normal)
- Posterior tibial weakness (excessive calcaneal eversion when performing a heel raise)
- TTP: Posterior tibialis tendon
- Weak hip abductors (+ve Trendeleberg, single leg squat)
- Flexibility of soleus and gastroc

Management

- Arch supports
- Address leg length inequalities
- Stretching and myofascial release in gastrocnemius and soleus
- Strengthening of posterior tibialis and hip abductor (posterior lunge, clam with a band and side bridge)
- Single leg and Vele's then lungers on unstable surface

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