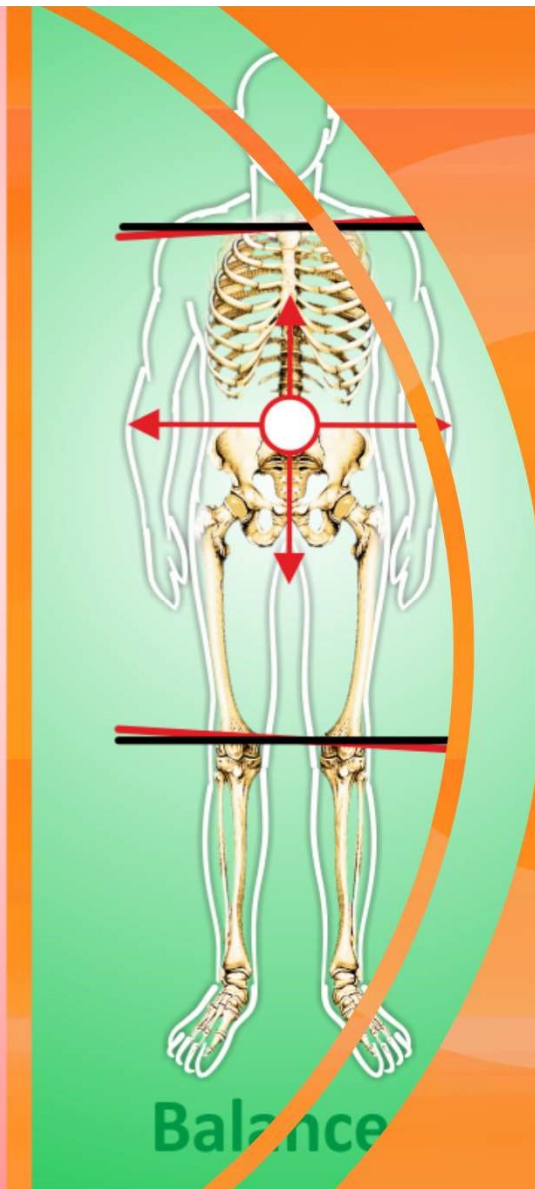
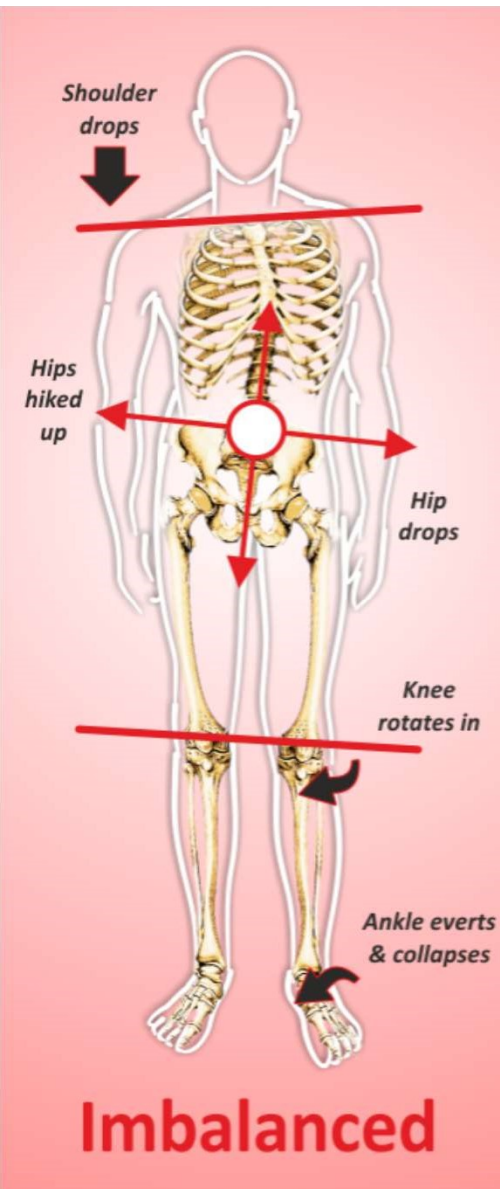




Dealing With Chronic Heel Pain

By: Kevin Martin, PT, DPT
Manager at Lakeshore East

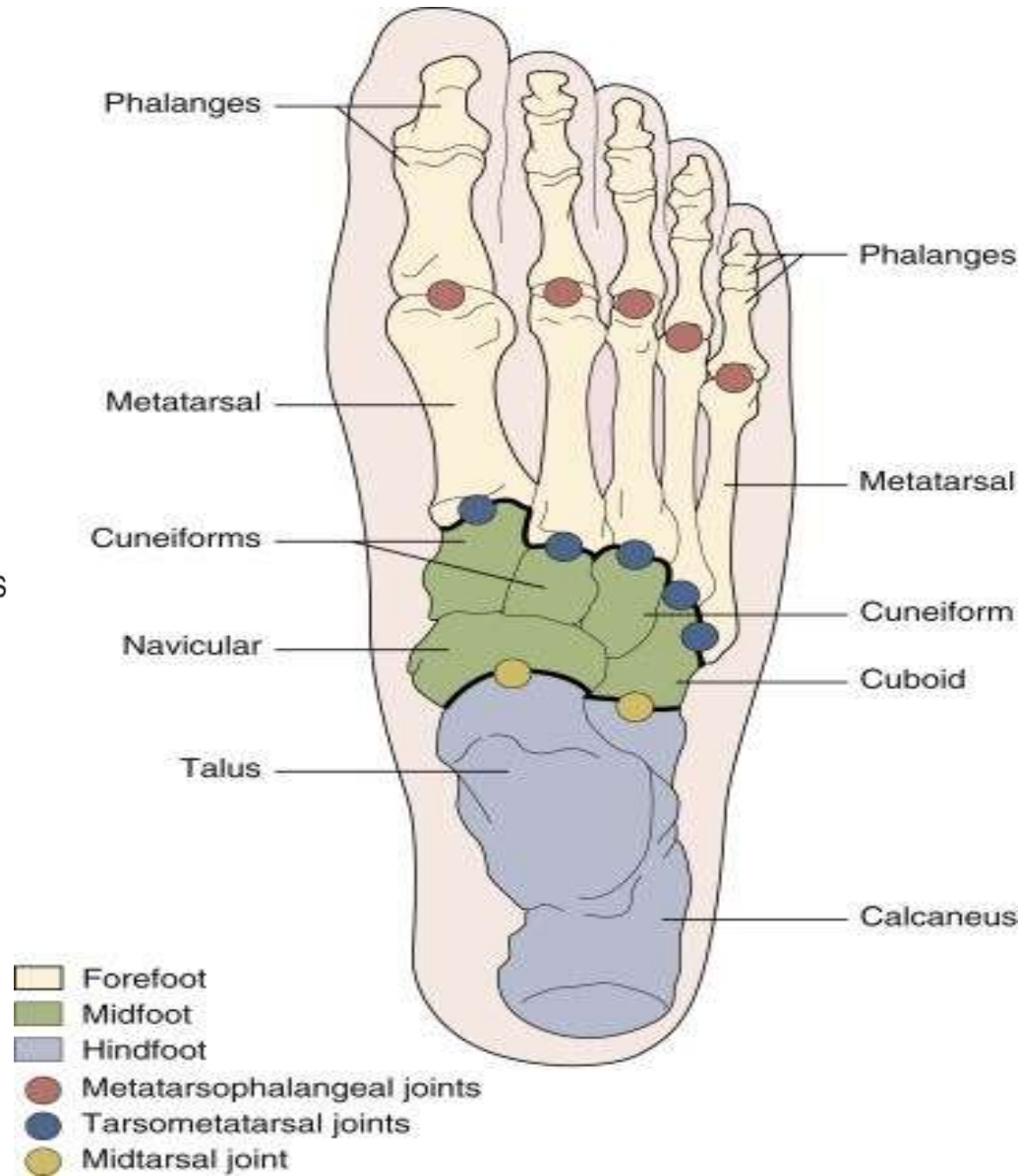
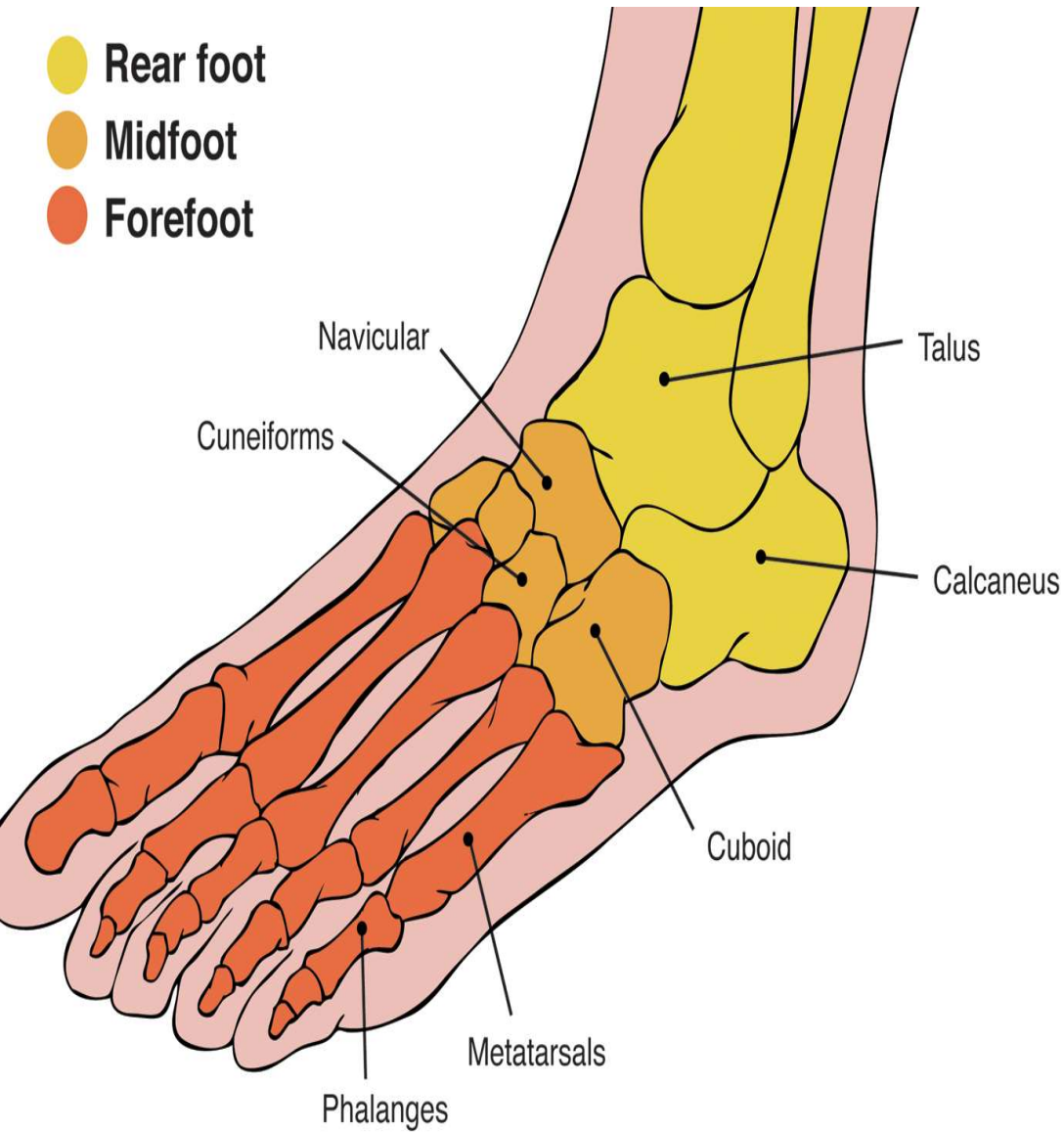


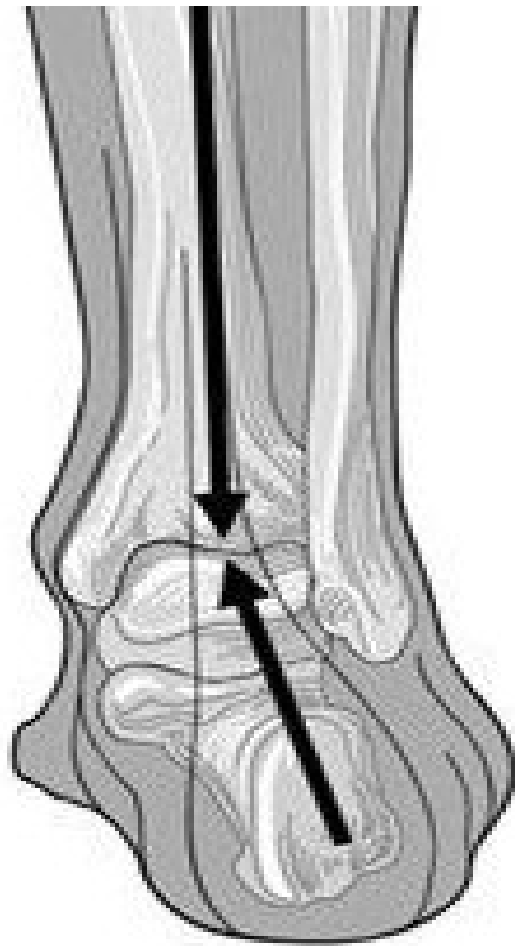
AGENDA/GOALS

Goal: Explain what is happening elsewhere in the body that is leading to compensatory stress/strain on the plantar fascia

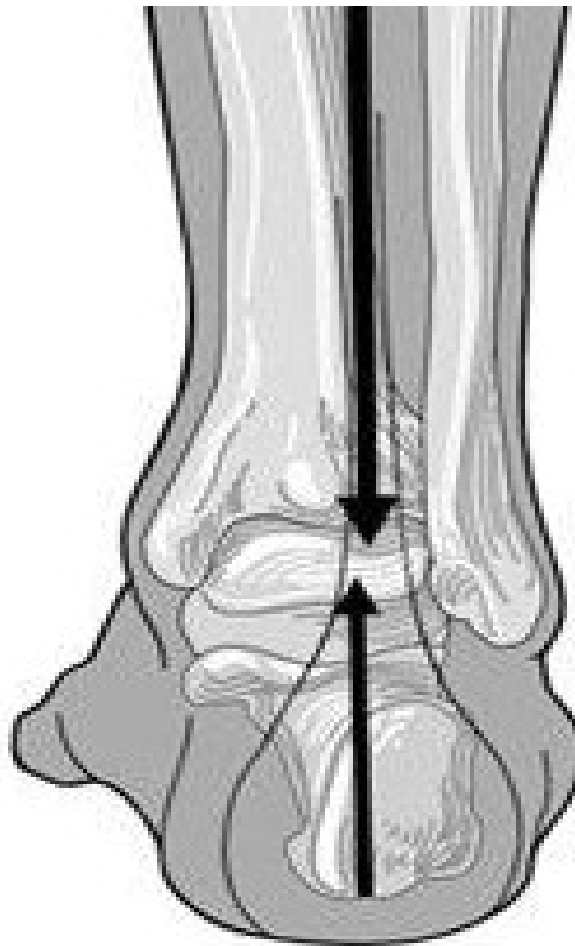
- Anatomy/biomechanics of the foot/ankle
- Kinetic Chain effects
- Review exercises

- Rear foot
- Midfoot
- Forefoot





PRONATED
(right foot)



NORMAL
(right foot)



SUPINATED
(right foot)



PRONATION

NEUTRAL

SUPINATION



Contact phase

Midstance phase

Propulsive phase

ADAPTABLE FOOT/ANKLE COMPLEX

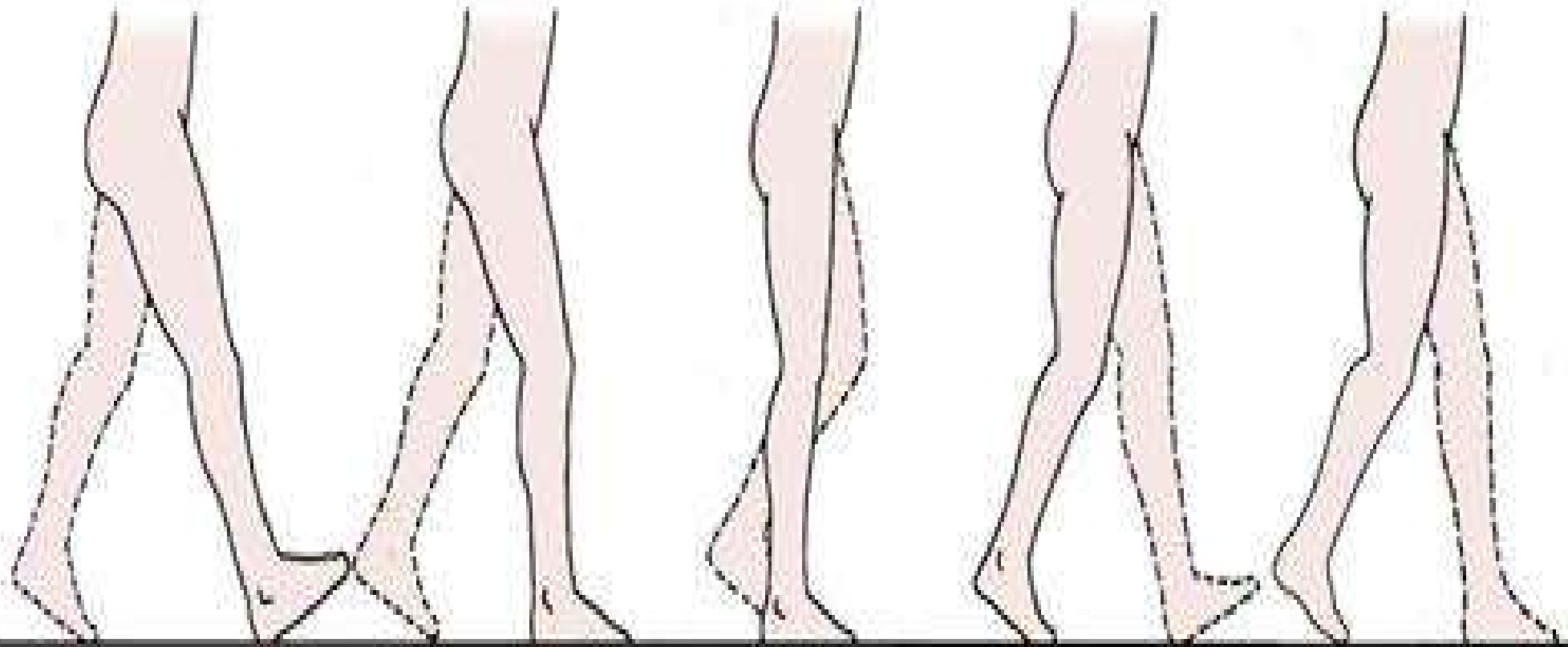
Movement of the subtalar joint transforms the foot from a *flexible* shock absorber structure initially back into a *rigid* lever.

Heel Strike → Foot Flat

- Want mobility
 - Allows foot to adapt to surface when making contact
 - Allows foot to absorb and dissipate forces
 - Subtalar eversion

Push off Phase (Heel lift)

- Want rigidity
- Subtalar Inversion



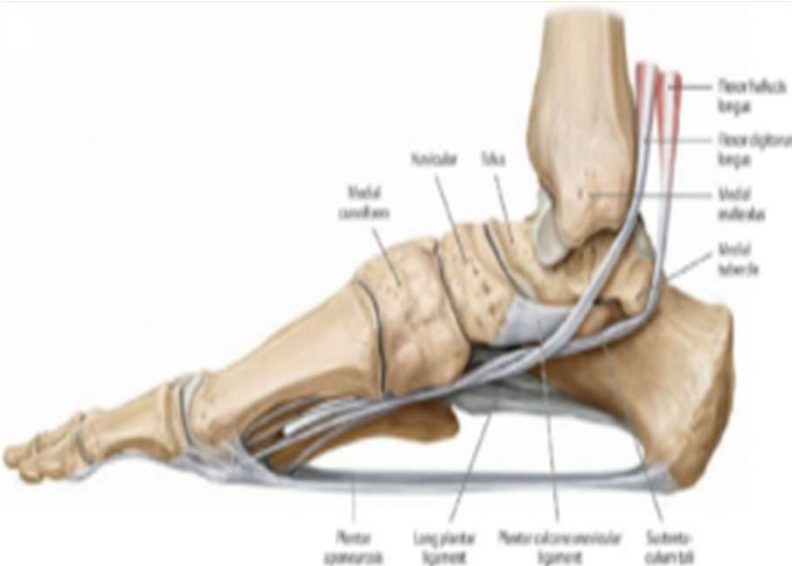
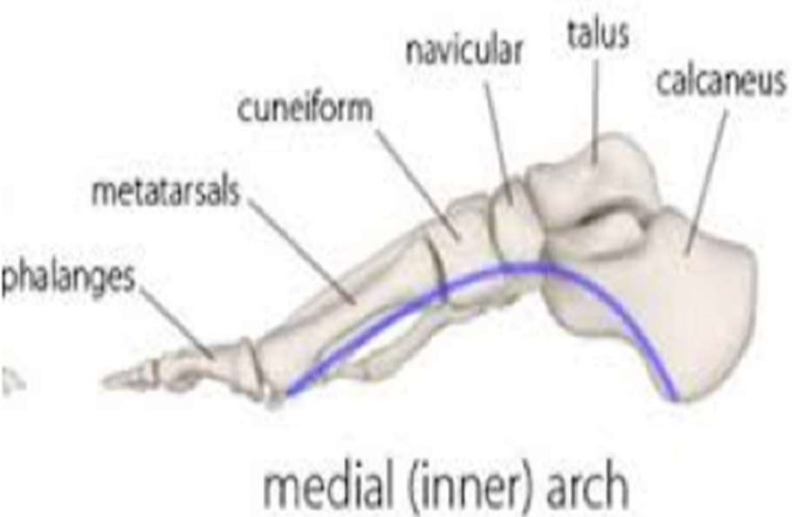
Initial
contact

Loading
response

Midstance
(single-
leg stance)

Terminal
stance

Pre-swing



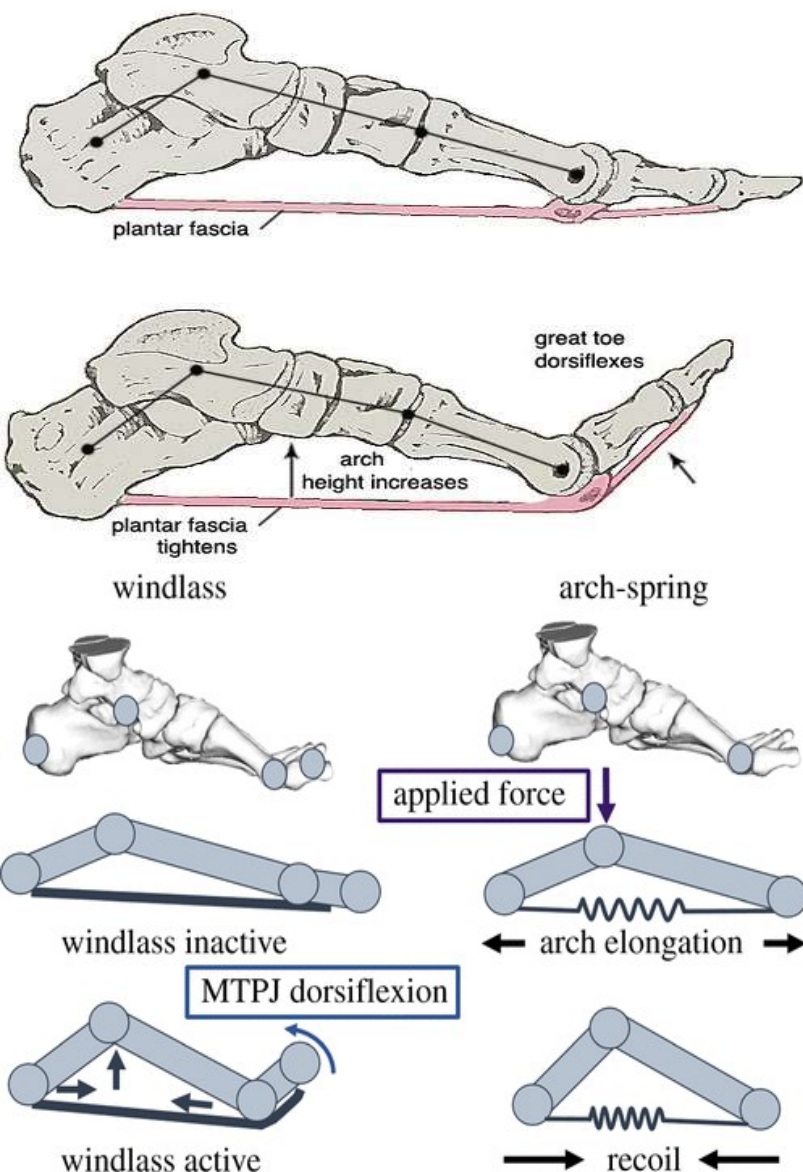
PLANTAR FASCIA

What is it?

- A strong layer of fibrous tissue that originates in the medial calcaneus tubercle and extends into all the flexor tendons of the forefoot

What is its purpose?

- Provides passive support to the longitudinal arch of the foot and helps prevent arch collapse during the early phase of gait
- Is crucial in reconfiguring the foot during push off to rigid platform through the windlass mechanism



WINDLASS MECHANISM

- “Windlass” is the tightening of a rope or cable
- Extending the 1st toe winds up the plantar fascia
- Shortens the distance between the calcaneus and metatarsals to elevate the medial longitudinal arch
- Allows the foot to become a rigid lever which is important during propulsion.



WHY IT BECOMES PAINFUL

Excessive tension → tissue irritation

- Either from repetitive overuse or repetitive stretching

Balance between pronation/supination.

- Too much or too little of either motion at the wrong time of the gait cycle leads to plantar fascia strain

Different foot types experience plantar fascia pain resulting for different reasons

- Lower arches = too much motion
- Higher arches = too little motion.

Excessive Pronation

Prolonged pronation = excessive stretching of the PF

- Heel is everted instead of inverted during push off-foot (unstable)
- Plantar fascia elongation minimizes efficient use of the foot's windlass mechanism
- Places excessive stress on the plantar fascia

FOOT FLAT

Why this happens

- Tight calves
- Weak gluteal muscles
- Tight back
- Flat foot
- History of ankle sprains

MID STANCE



LIMITED MOBILITY

Rigid, higher-arched feet

- Limited pronation initially due to poor talocrural mobility
- Leads to adaptive tissue shortening
- Unable to dissipate forces (poor shock absorption)
- Causes increased tension at the PF

Why this happens

- High arched foot
- Global inflexibility
- History of ankle sprains

Imbalanced



Balanced



LOOKING UP THE KINETIC CHAIN

Too much of treatment is incorrectly focused only on the plantar fascia

- Provides temporary relief
- Need to look elsewhere in the body
- Wrong calf stretches may cause medial arch collapse

Tight Calves

Need good ankle dorsiflexion to allow the body to pass over the foot

- 23x more likely to have plantar fasciopathy if you don't have >0 degrees of DF
- Can compensate for a lack of DF by unlocking the midfoot
- Results in excessive pronation (arch collapse)



Ankle Stretches/Calf Releases





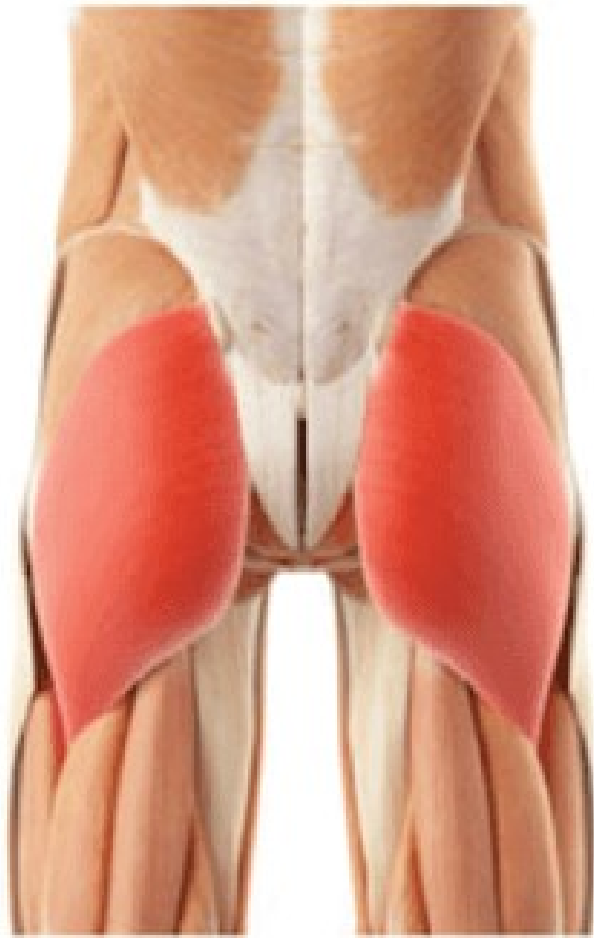
WEAK GLUTEALS

Opposite Gluteus Medius Weakness

- Accelerates opposite extremity pronation

Ipsilateral Gluteus Medius/Maximus Weakness

- Poor shock absorption from ground reaction forces
- Results in greater transmission of shock to the supporting foot structures.



Gluteus Maximus

WEAK GLUTEALS

- Hip thrust w/band
- 90/90s
- Resisted sidestepping



Gluteus Medius



Gluteus Minimus



LOW BACK PROBLEMS

Loss of rotation in lumbar spine

- Unable to get out of pronation

Inhibits gluteal muscles

- Poor shock absorption



QUESTIONS?