

# Why Do Your Feet Hurt?

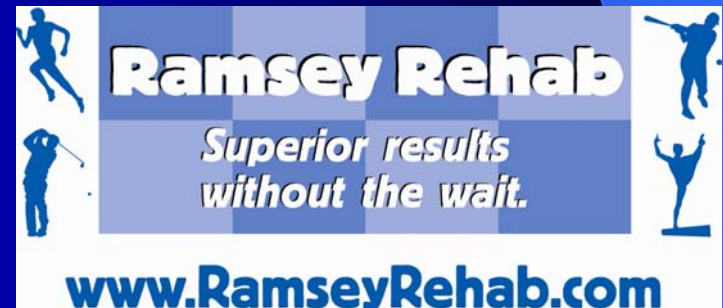


Ramsey Rehab Community Lecture Series

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# Why Do Your Feet Hurt?

## Lecture Outline

- Lower Extremity Biomechanical Evaluation
  - Structure
  - Flexibility
  - Strength
  - Walking and Running
- Sneakers
- Orthotics
  - Types
  - Benefits

# Lower Extremity Biomechanical Evaluation

- Structure
- Flexibility
- Strength
- Gait



# Structures of the Lower Extremity

- Back
- Hips
- Knees
- Ankles
- Feet

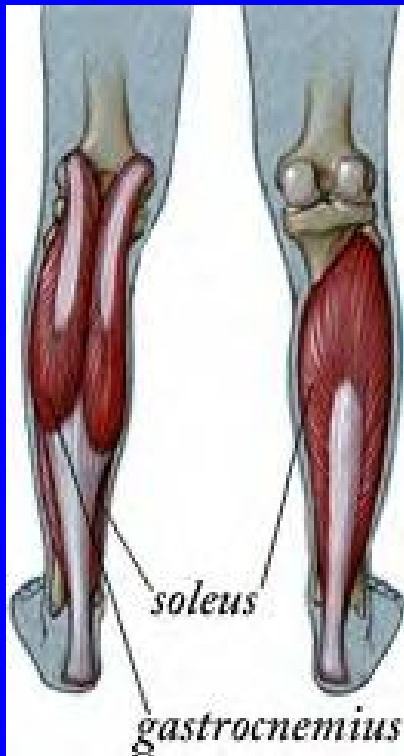


# Flexibility

## Hamstrings



## Calf Muscles



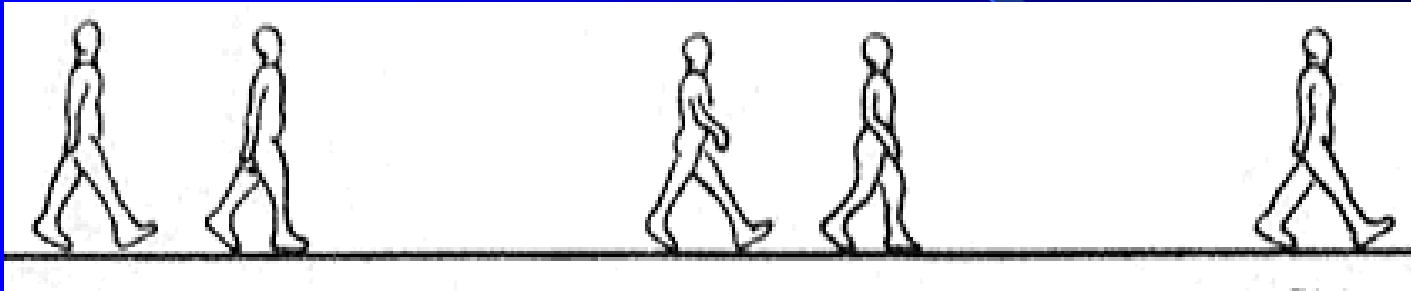
## Hips



# Strength

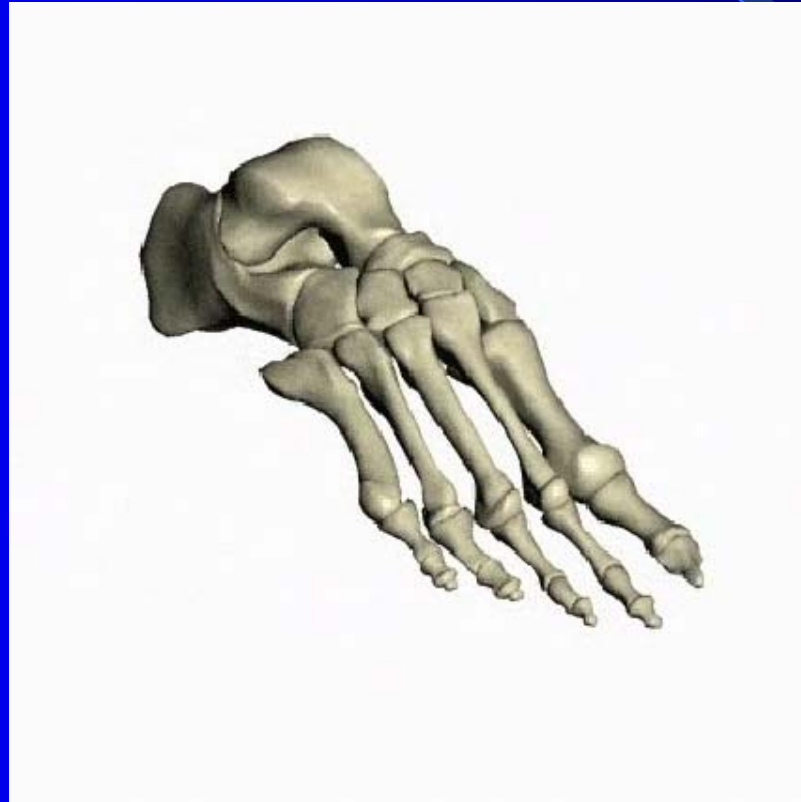
- Core
- Hamstrings
- Quadriceps
- Gluteals

# Gait



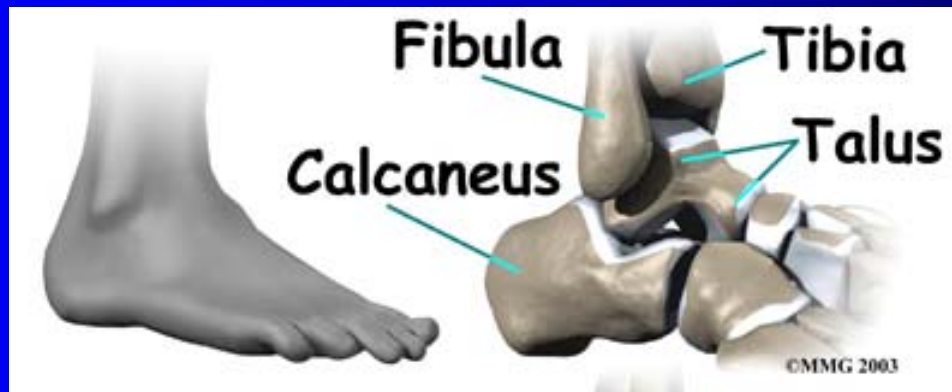
- **Hips:** Rotated? Tilted?
- **Knees:** Bent? Inward? Outward?
- **Feet:** Supinated? Pronated?

# Structures of the Foot



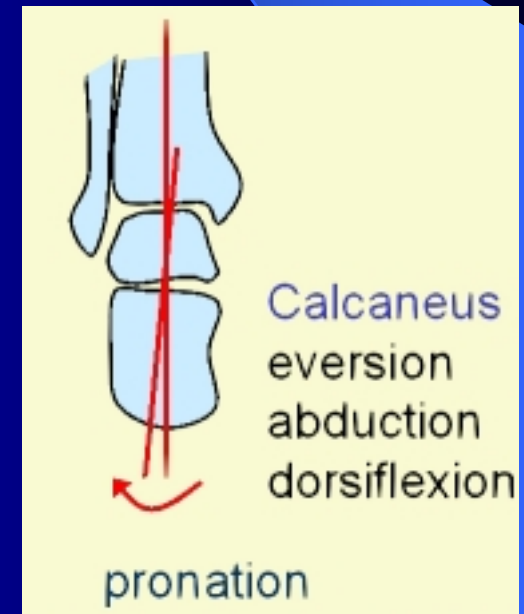
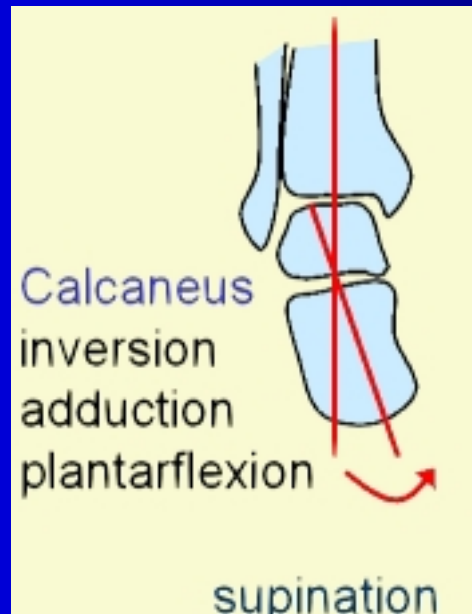
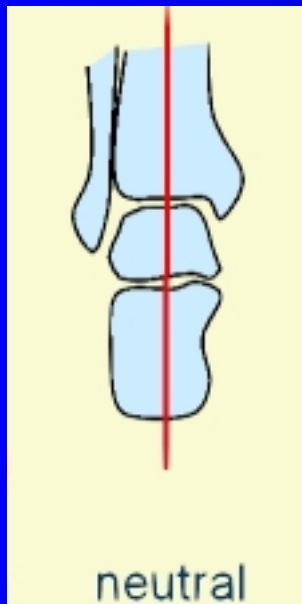
# Talus

- A Square Shaped Bone That Sits In Between Your Ankle Bones
- The “Coach” Of The Foot



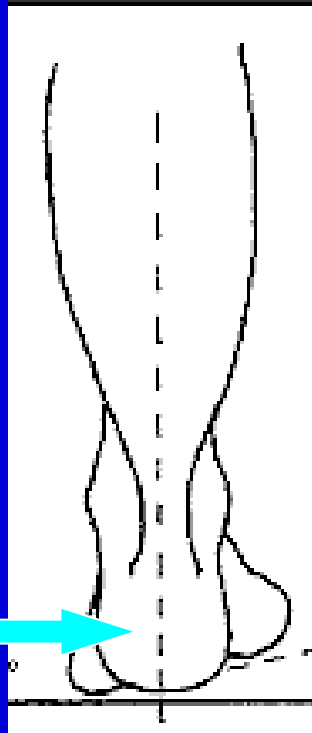
# Subtalar Joint Neutral

- We use the talus bone in its neutral position to help us determine the structure of your foot



# Rear Foot

- We look at the bisection of your heel in respect to the bisection of your lower leg to help determine its position and structure

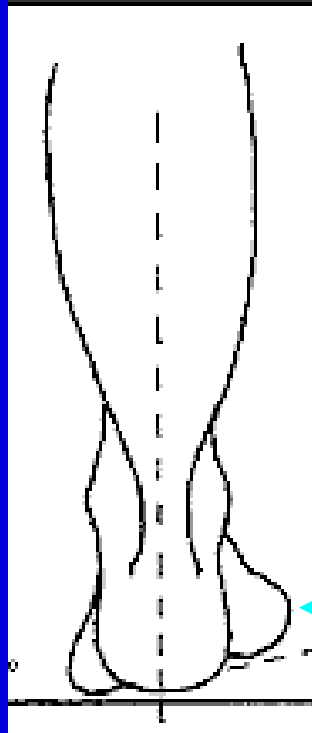


Rear Foot



# Fore Foot

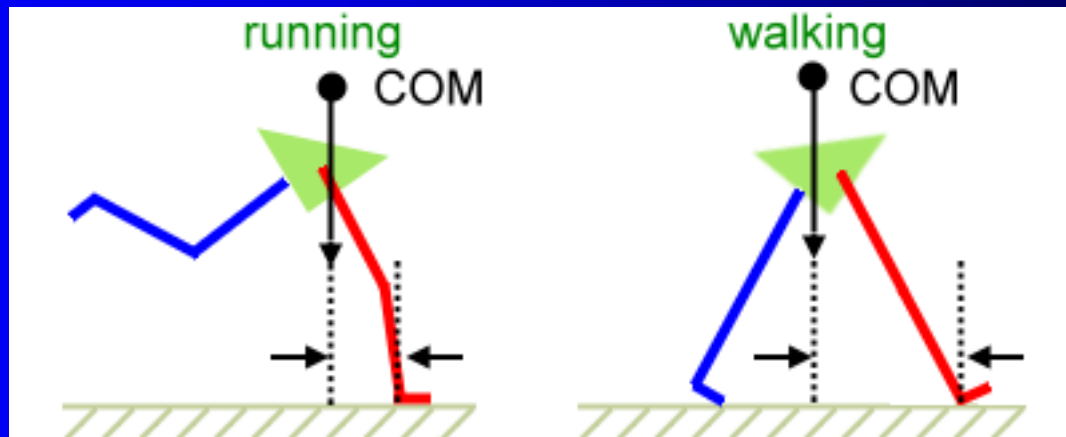
- We look at the bisection of your heel in respect to the metatarsals (the “knuckles” of your foot)



Fore Foot

# Walking, Jogging, and Running

- Why run or walk for fitness? Many benefits!
- Cardiovascular, weight control, stress management, and competition
- Many differences between running and walking biomechanically



# Walking and Running Biomechanics

- Forces:
  - Walking 1 to 1 ½ times your body weight
  - Running 3 to 4 times body weight
- Time on ground:
  - Walking 0.6 sec
  - Running 0.2 sec
- Speed changes: Walking is 2-4mph
  - Jogging is 5-9 mph
  - Running is 10 mph +

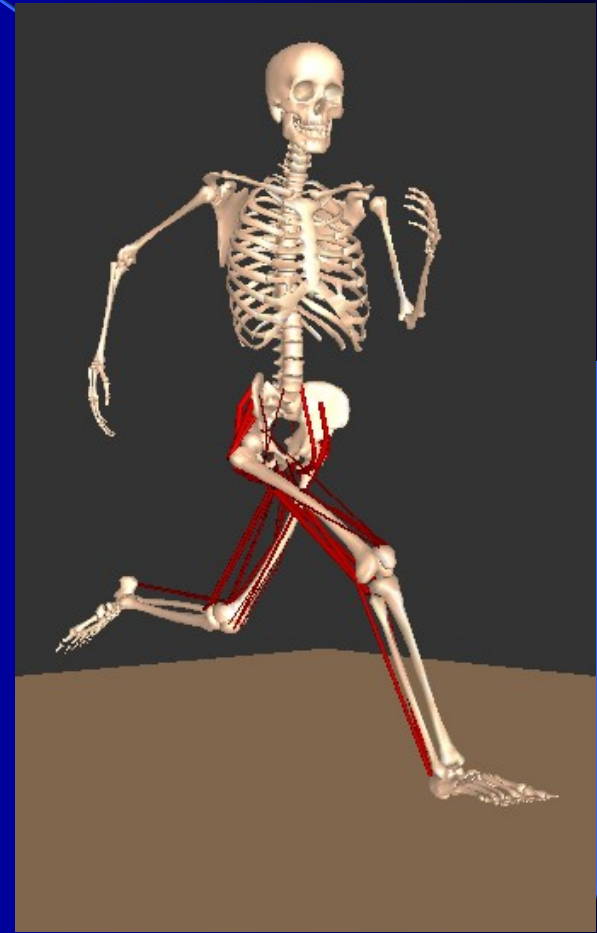
# Biomechanics of Running

Less time on ground (stance)

More time in air (swing)

“Float” phase

Base of gait narrows



# Foot Position and Shoes



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?

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### Pronation and Supination

**Supination**

Ankles lean outward

High arch

**Neutral**

Ankles do not lean

Normal arch

**Pronation**

Ankles lean inward

Low arch (flat foot)

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# Pronation

- Flattening out of the arch when the foot strikes the ground
- Helps absorb shock and to assist in balance
- Excessive pronation: increased stress on the inside foot and knee

# Supination

- Allows the foot to be a more stable, rigid structure for when we push off on our next step
- Excessive supination: predisposes the ankle to injury
- ***Everybody Pronates And Supinates!!!***

# Running Shoes

Foot Shape	Low flexible arch “flat foot”	Medium arch	High rigid arch
Running Mechanics	Over Pronator	Neutral	Under Pronator
Shoe Category	Motion Control Straight shape used to control excessive foot motion	Stability Semi-curved shape, allows foot to pronate naturally	Cushion Semi-curved shape, promotes normal pronation movement

# What Is an Orthotic Device?

- Brings the ground to your foot
- Helps re-align the foot and lower ankle into a more neutral position
- Effective during walking, running or with any sport activity



# Types of Orthotics at Ramsey

- BFO – Semi Flexible Foam Orthotic Shell That Provides Support, Control And Durability



# Types of Orthotics at Ramsey

- XPE – Semi Rigid Orthotic That Won't Compress Or Change Its Shape During Normal Use



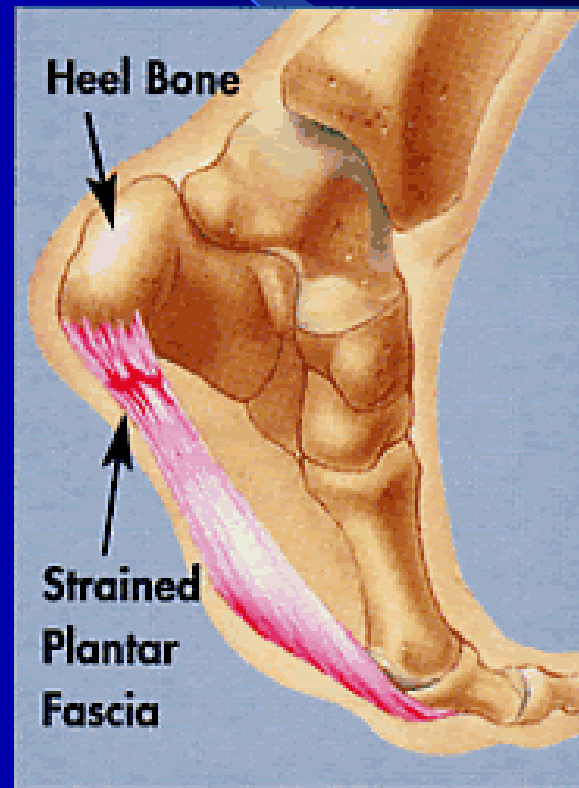
# Types of Orthotics at Ramsey

- Prescription Lab Orthotics Are Created From A Plaster Cast/Impression Then Sent To An Outside Lab For Fabrication



# Common Problems Treated with Orthotics

- Arch And Heel Pain
- Plantar Fasciitis
- Chronic Ankle Sprains



# Common Problems Treated with Orthotics

- Flat Feet
- Metatarsalgia
- Shin Splints



# Common Problems Treated with Orthotics

- Knee Pain
- Patellofemoral Syndrome
- Hip Pain
- Low Back Pain



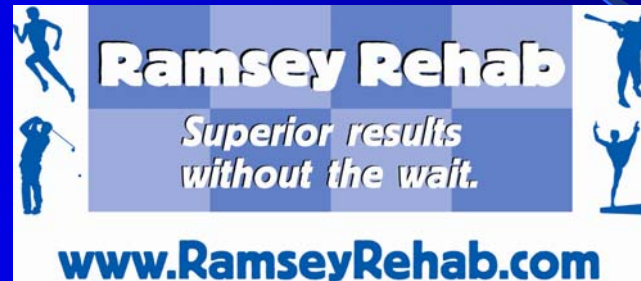
# Other Programs At Ramsey

- **Running Clinic \$75**
- Computerized Video Analysis
- Running Shoe Assessment
- Postural Assessment
- Strength And Flexibility Screen
  
- **Vo2 Max Testing \$ 99**
- Peak Oxygen Consumption
- Anaerobic Thresholds
- Target Intensity Zones
- Calories Burned At Different Heart Rates



# Thanks!

## Questions?



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