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- Call 866-782-6258 (M-F, 8 AM-8 PM ET)
- Email customerservice@PhysicalTherapy.com

Treatment of the Complicated Foot

Paul Drumheller, MPT, OCS, SCS, CSCS

- Presenter Disclosure: Paul Druhmheller received an honorarium for this course. He is also the owner and presenter of continuing education course: “When the Feet Hit the Ground Everything Changes.”
- Content Disclosure: This learning event does not focus exclusively on any specific product or service.
- Sponsor Disclosure: This course is presented by PhysicalTherapy.com.

Learning Outcomes

The participant will be able to…

- Identify at least two factors of why raising the big toe during stretching to improve ankle dorsiflexion is effective.
- Identify at lest three proper taping technique to treat someone who has a pronated foot.
- Identify at least three effective exercises to treat someone who has a pronated foot.
- Discuss at least two strategies on how a custom orthotic can be effective for treating foot pain.
- Summarize at least two factors of how proximal strengthening exercises can affect the function of the foot.

Background…

- About how and why this course came together.

Image by PIRO4D from Pixabay

Starting the Process…

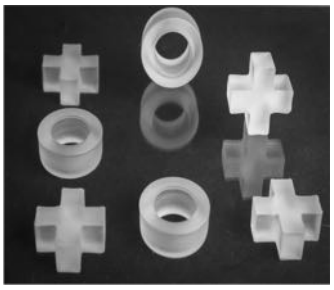
- Complete subjective eval…Listen just not hear!
- How long have symptoms been present?
- Previous injury?
- Previous treatments?
- Watch them walk
  - What is “Normal?”

Quick Review of Normal and Abnormal Gait Mechanics

The Primary Function of the Foot

- Lateral calcaneus
- Medial calcaneus
- 5th ray
- 1st ray / hallux / big toe

- Once this happens… the foot has done it's job!!!



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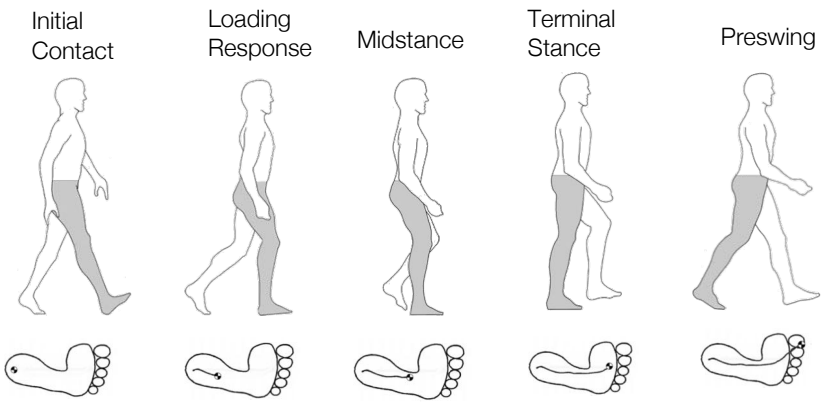
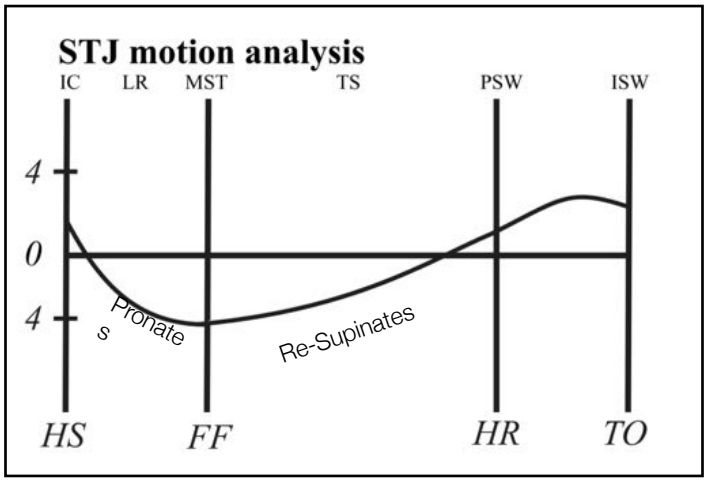
Gait Mechanics



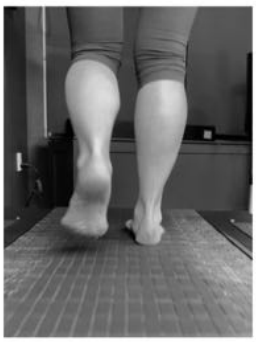
Ideal "Normal" Gait



- Initially walk without lines on the skin
- Look at one foot at a time

Video Gait Analysis: Look at One Foot at a Time

Rear view is essential

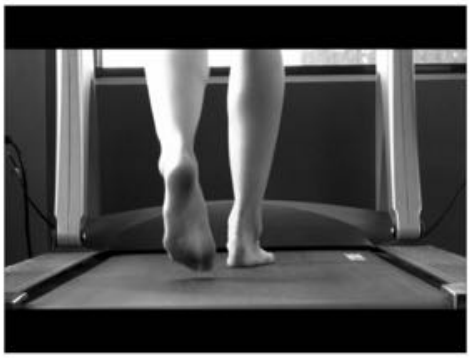


Side view

What to Look For?

- Does lateral calcaneus hit the ground first?
- How many toes? (should see two lateral toes)
- Does rearfoot go through neutral?
- When does re-supination occur?

- Lateral calcaneus hits the ground first
- How many toes (should see two lateral toes)
- Does rearfoot go through neutral
- When does re-supination occur



Does the Foot Have a Dysfunction in Mobility or Stability

- Always address Mobility issues first
  - Talocrural Joint
  - Subtalar Joint
  - Midfoot – Calcaneocuboid and Talonavicular
  - 1st MTP Joint

If Mobility Problem…

- Get it to move!!!
  - Joint mobilizations – several ways to these
  - Mobilization with movement
  - IASTM
  - Stretching
  - Exercises that emphasize mobility
  - Fibular relocation taping
  - Neutral / less stiff shoe
  - Lateral wedges

Stretching to Improve Function

- Usually gait is affected by…
  - Lack of ankle dorsiflexion
    - Can be mobility or stability problem
  - Lack of subtalar joint eversion
    - Foot stays supinated and lacks mobility

Ankle Dorsiflexion Stretches

Address gastrocnemius and soleus

Stretch DF with raising big toe

- By raising the big toe, the 1st ray plantarflexes and creates an arch to the foot and supinates the subtalar joint.
- The maximum amount of ankle DF in gait is required at terminal stance and the subtalar joint should be supinated to create a stiff midtarsal joint to allow for an effective push off to the next step.

This is most effective for someone who pronates late or too long.

- Keep back foot pointing forward and RAISE the big toe

Ga

Be aware of possible midtarsal joint damage with stretching against a wall, off a step or with pro stretch

Two Other Options…

Exercises to Improve Mobility

- Typically for a rigid supinated (uncompensated) foot
- Be creative about using props as needed to force pronation
  - SLB transverse plane mobility
  - Anterolateral lunge
  - SLB "Y" balance LE reach

SLB Transverse Plane Mobility

Anterolateral Lunge

SLB "Y" Balance LE Reaches

Taping to Increase Pronation

- Fibular Repositioning Taping
  - Will increase pronation at the subtalar joint and decrease stress on lateral side of the foot – Mulligan technique…

Shoes for Decreased Mobility

- Neutral shoe is usually the best but may need stiffer heel counter if there is a lot of rearfoot varus

Orthotics for Rigid Foot

- Typical pattern is rearfoot varus and plantarflexed 1st Ray
  - Lateral rearfoot post
  - Short lateral flange
  - Forefoot (medial or lateral) post to sulcus
  - 1st ray cut-out

If Stability Problem…

Usually causes medial foot and/or ankle pain due to excessive or uncontrolled pronation…

But can cause lateral ankle pain from compressing the lateral ankle

Get more stability!!!

Exercises	Wedges	Navicular sling taping	Proper shoes	OTC or custom orthotics

Exercises to Address Stability Issue

Best way to make stable foot is by raising big toe – NOT curling toes to the ground

Again… By raising the big toe, the 1st ray plantarflexes and creates an arch to the foot and supinates the subtalar joint

When the rearfoot supinates the midtarsal joints become stiffer

Be Creative…Think about an exercise that will work on decelerating pronation

Open Chain versus Closed Chain

Typical resisted ankle Dorsiflexion, Inversion and Eversion

- Remember the subtalar joint moves diagonally (DF, ABD and EV) and (PF, ADD and INV)
  - NOT straight side to side

Not bad to start if the foot has been immobilized but should be able to get away from them fairly quickly

Practice raising big toe instead of toe curls…

Closed Chain Stability Exercises

Split stance trunk rotation

Raise big toe then SLB with sagittal plane trunk movements

SLB resisted hip IR and deceleration of pronation

Split Stance Trunk Rotation

SLB with Sagittal Plane Trunk Movements

SLB Resisted Hip IR & Deceleration of Pronation

Think Up the Chain

Proximal / hip strengthening exercises can be effective in treating the foot since hip external rotators can decelerate hip adduction and IR thus decreasing knee valgus thus not forcing the foot into pronation and allowing the foot to re-supinate faster

Practice Stand and Squeeze test…

Taping to Stabilize the Foot

- Navicular Sling taping
  - Inverts the rearfoot and holds the navicular up to help decelerate pronation quicker and allowing the foot to resupinate faster
  - STILL allows the foot to pronate…

Navicular Sling Taping Method

When the Feet Hit the Ground...
EVERYTHING CHANGES

Shoes for Lack of Stability

Somewhat of a tricky question since there are a lot of variables to consider

Easiest answer… is a stability shoe with a stiffer heel counter

Severely unstable may need a motion control shoe

- MOTION CONTROL SHOE

  STIFF HEEL COUNTER

Orthotics for Unstable Foot

- Another complicated answer since there are so many variables to address…
- A semi-rigid to rigid device will work the best but need to consider varus (medial) rearfoot and forefoot posting
- If the rearfoot is in a good position (slightly inverted) at initial contact this will slightly stiffen the midfoot and allow the foot to control pronation and resupinate faster – especially if the forefoot is posted medially– essentially bringing the ground up to the foot

Semi-Rigid to Rigid Orthotic

Summary…

- Be aware of what the foot should do in “normal” gait…
- Become competent in assessing all parts of the foot in NWB and WB
- Realize if the foot has a mobility or stability problem
- Stretching of gastrocnemius and soleus can help with mobility or stability problem
- Exercises can be very effective for mobility and stability issues
  - Know why you are doing an exercise
- Foot tapings
  - Fibular reposition for increasing pronation
  - Navicular sling to increase stability
- Shoes – Stability is between Minimalist / Neutral and Motion Control
  - Look at stiffness of heel counter
- Orthotics – Can have good success with custom and over the counter
  - We use Vasyli – heat moldable

Shameless Plug

- If you want to learn more or want to clarify what you learned today and practice while receiving feedback, you can take the class…
- "When the Feet Hit the Ground…Everything Changes"
- OR…"When the Feet Hit the Ground…Running
- Get more course information and sign up at
  - Whenthefeethittheground.com

Q & A

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