



EUROPEAN
ATHLETICS

COACHING SUMMIT SERIES

Athlete Profiling

Injury Prevention



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Special interest in:

- Basketball
- Athletics
- Race Walking

Research

Performance markers
(screening / HR
assessments /
biomechanics)



Athlete Profiling

Affects on Common Race Walking
Injuries



Aim of session

- Aim:
 - Demonstrate two KEY areas of testing
 - Highlight how to develop a profiling system
 - How this could be linked to
 - reductions in injury
 - Improvements in performance
 - Assessment of the kinetic chain

Identify a problem and create a solution

A continual process of development



Profiling

Process of building information about an athlete

Physical

Mental

Skill level

Follows a 4 stage process

1. *Understanding*: Highlight areas for development
2. *Analysis*: Identify the characteristics and desired movements/strength/flexibility patterns
3. *Interpretation*: Screen the athlete
4. *Delivery*: Analysis of the results with aim to develop method of improving that athlete

Profiling

Understanding

Consider all components of a muscle

- Effects on directly length
- Effects on kinetic chain
- Effects on given athletes performance

Remember all athletes are individuals

Profiling

Analysing

Additional stress on a joint / muscle will cause excessive work load & possibly lead to injury & reduction in performance

- Examples are:
 - Tibialis anterior injury due to hip tightness
 - Hamstring tightness / injury due to shoulder girdle tightness

Psoas Muscle

Function

Stabilise spine

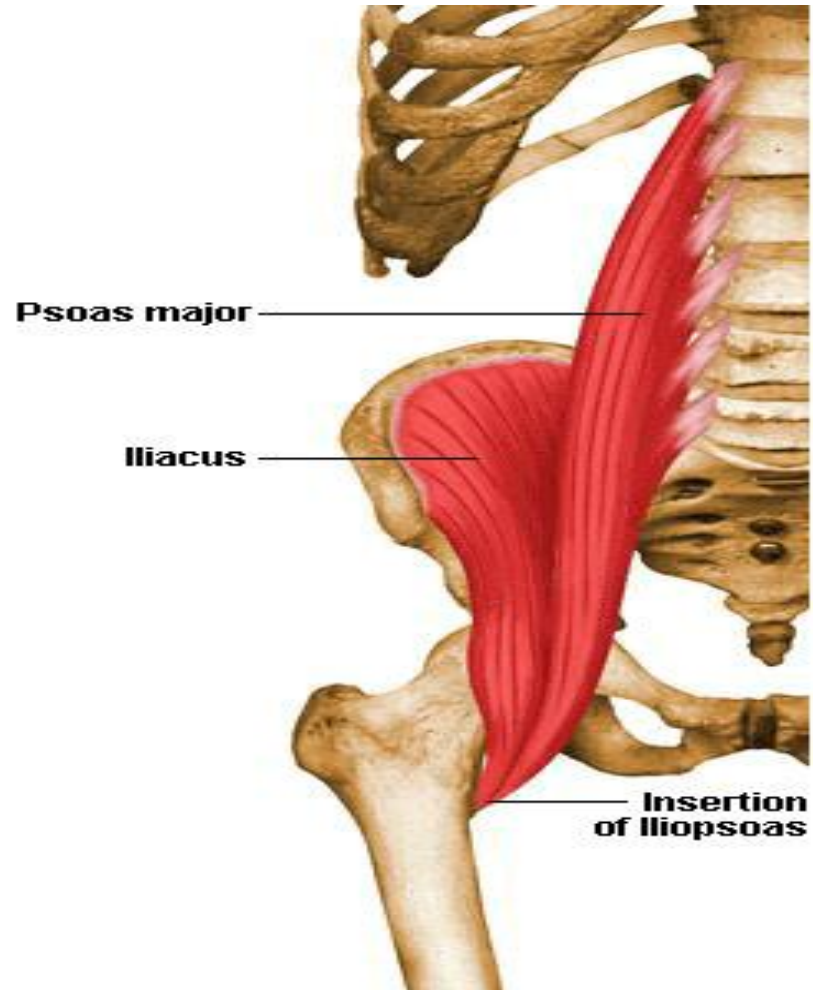
Hip flexor

Mild external rotator of hip

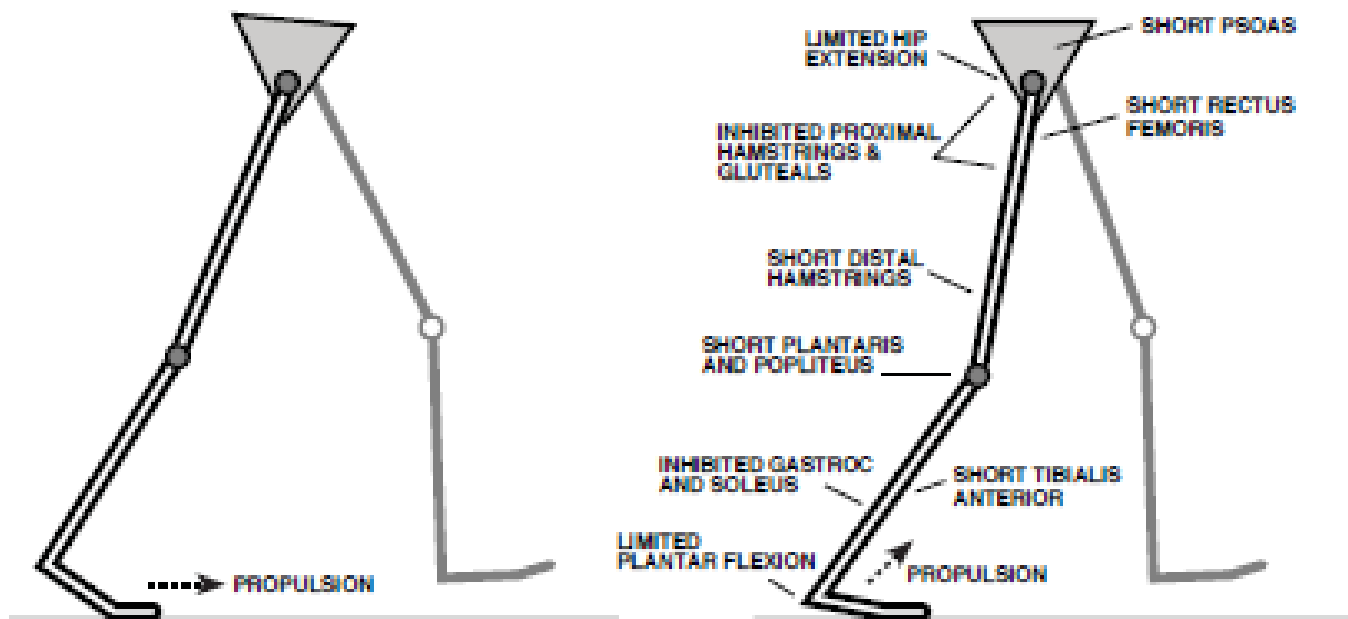
Works

Concentrically

Eccentrically



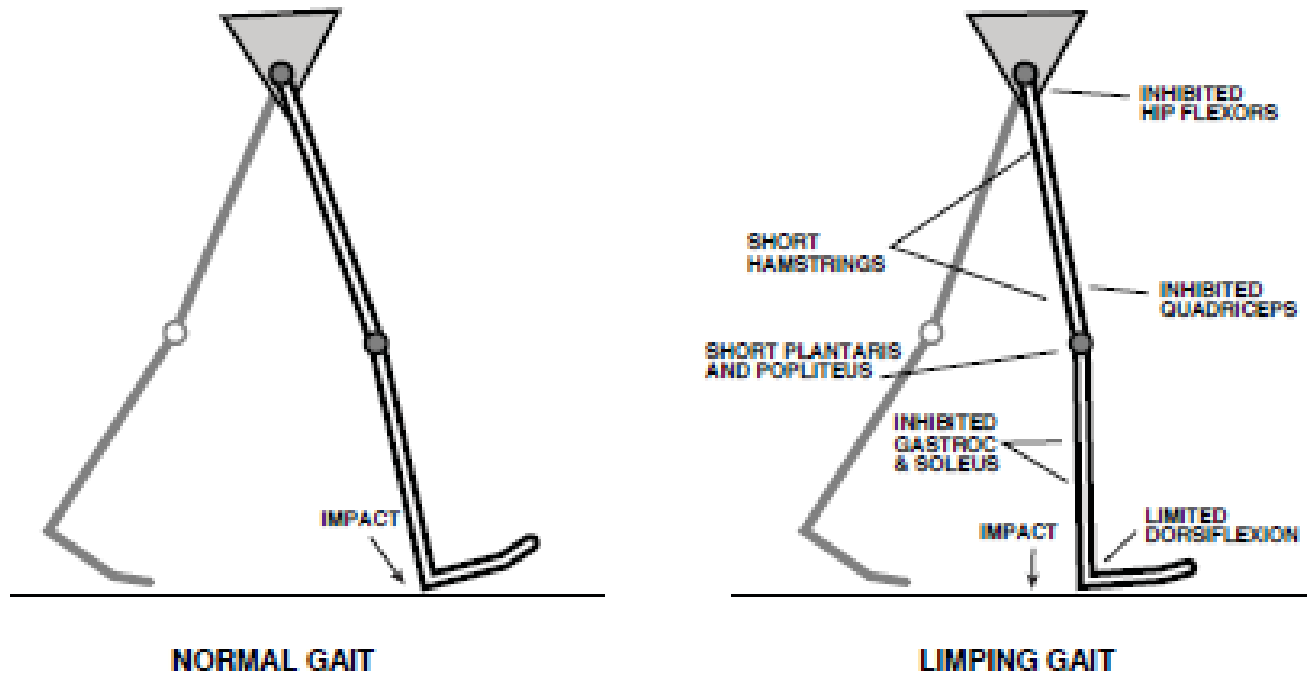
TOE OFF



Shortened Psoas & Rectus Femoris Muscle

Effects of shortening the Psoas muscle around the hip, resulting in early knee bend and delayed heel off due to excessive pronation of the foot resulting in reduced activation of Tibialis Posterior & Gastrocnemius

HEEL STRIKE



Shortened Psoas & Rectus Femoris Muscle

Reduced pelvic posterior tilt on leg swing side, increases activation of hamstrings (inhibits their eccentric elongation prior to heel strike)

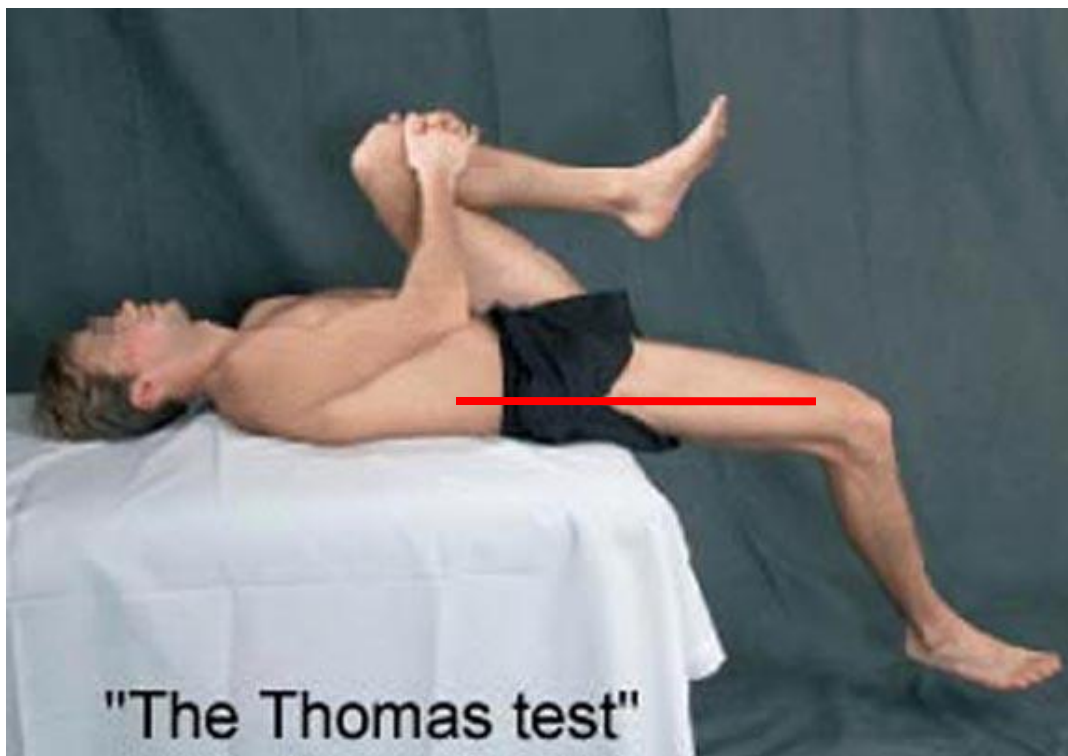
Over pronation restricts ankle ROM, overstretching Tibialis posterior and reducing ankle dorsiflexion

Screening for Psoas tightness

Muscle Length

Hip should be able to become horizontal with the bed (as red line)

Shortness is indicated by the knee not being able to reach this position



Screening for Psoas Activation

Kinetic Chain assessment

Lumbar spine should be controlled. NOT following the leg

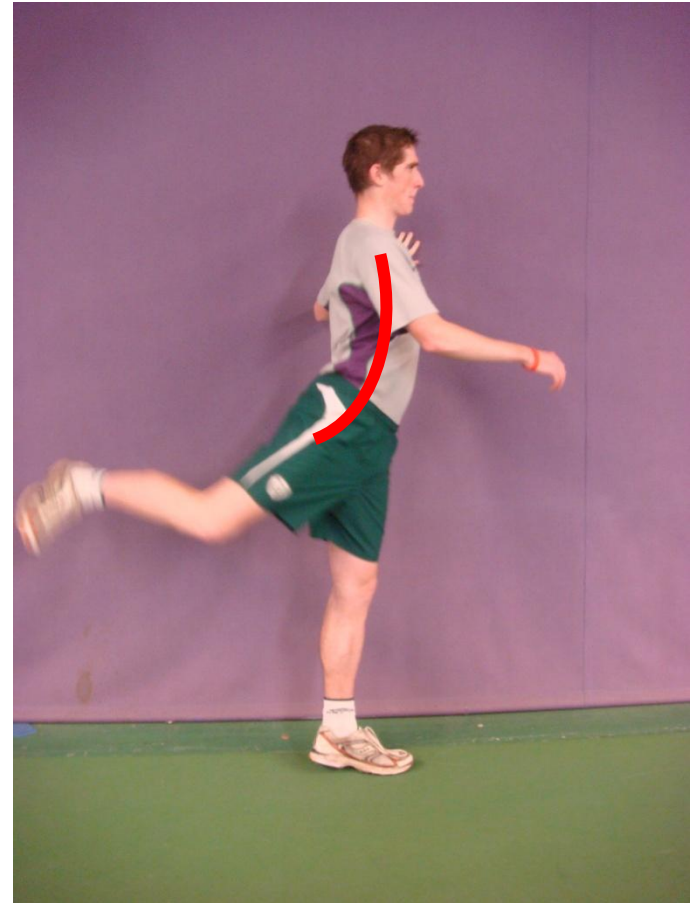
Hip should be able to turn inwards towards end

Leg should be straight



Screening for Psoas Activation

Wrong Technique shown by red lines demonstrating lower spine movement



Treatment for tight Psoas

Kneel on right knee

Push hip forward (do not let spine curve)

Lean to left (arm above head)



Rotate body round to right

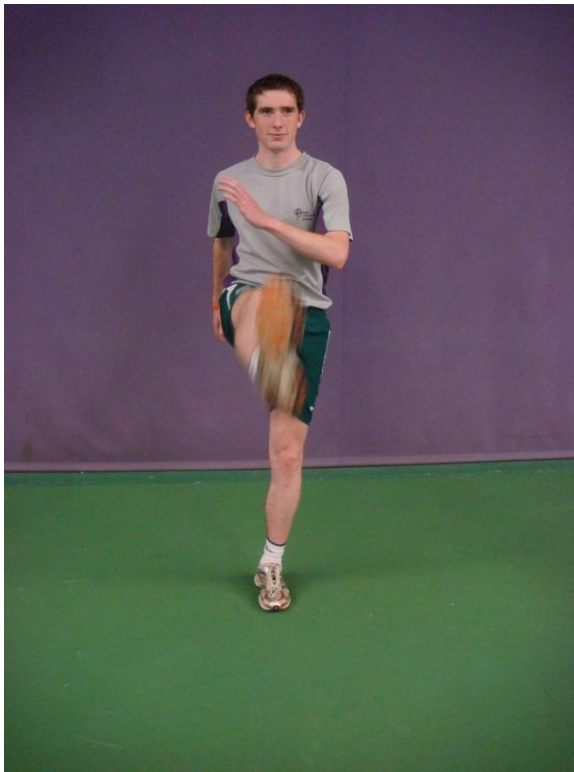
Keep hip pushed forward



Treatment for Activation of Psoas

Level 1

Leg swings



Level 2

Add head rotation with arm swings

Disassociates glute / psoas / spinal control



Tibialis Posterior

Function

Inversion of the foot

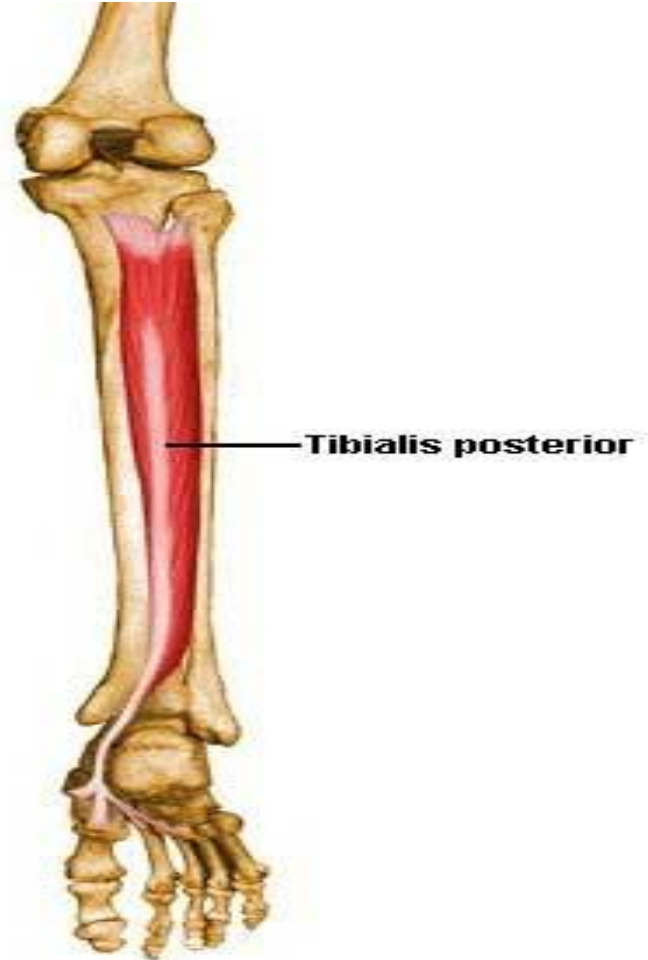
Plantar flexion of the foot

Along with peroneus longus
stabilise the ankle joint
(talus & sub-talar joint)

Works

Concentrically

Eccentrically



Screening for Tibialis Posterior Weakness

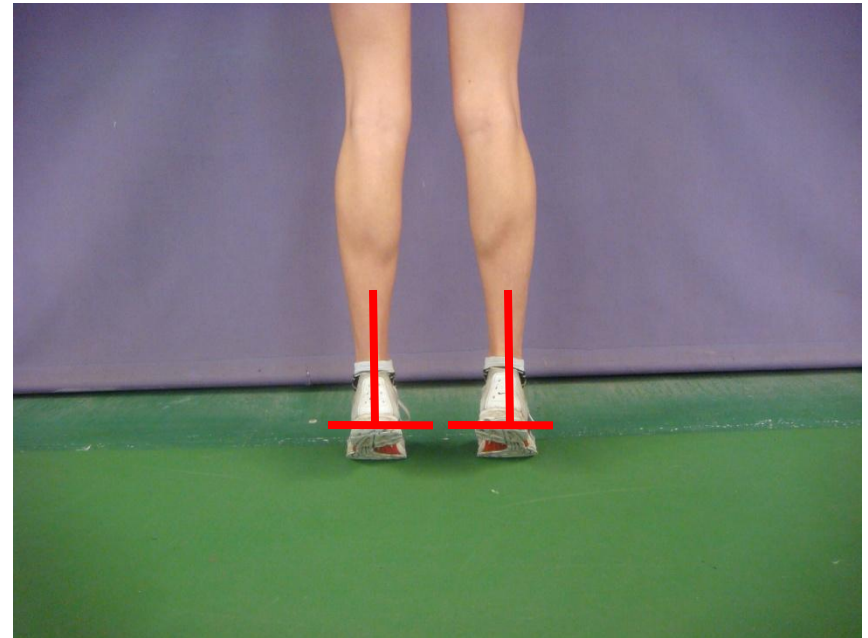
Wrong technique

Heal flick switches muscle off



Correct technique

Weight coming straight up therefore has to be using the muscle correctly



Screening for Tibialis Posterior Weakness

Kinetic Chain assessment

Tip toes should be
able to maintain
good heel alignment

This video shows the
heel flick in the
wrong direction



Screening for Tibialis Posterior Weakness

Kinetic Chain assessment

Unable to stabilise
from hip. This
increases the heel
flick in the wrong
direction

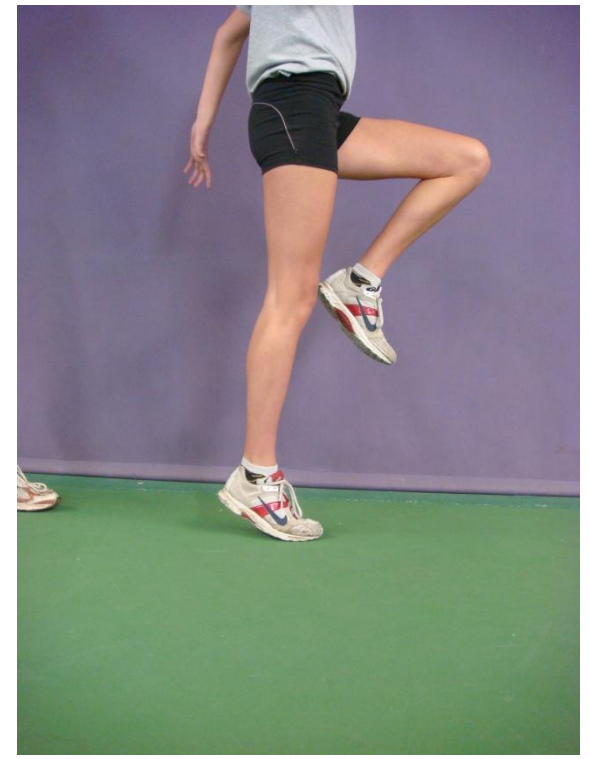


Exercise for Tibialis Posterior Weakness

Lean backwards
Lift toes off floor

Keep toes off & bring body to upright position

Drive up onto single leg with tip toes



Additional areas to screen

- **Gluteus Medius strength**
 - lunge / hip abduction / squat (determine strength or tightness)
- **Glute Medius control kinetic chain**
 - lunge with trunk or head rotation
- **Ankle ROM & muscle strength & control**
- **Hip rotation**
 - internal $>30^\circ$ and external $>60^\circ$ and abduction $>40^\circ$ (optimal)

These are based on optimal models so should be adapted for each individual

Additional areas to screen

- **Thoracic rotation**
- **Lumbar rotation**
- **Shoulder Range Of Movement (ROM)**
 - Require 85° extension & 35° flexion
- **Pectoral girdle** (ability to depress, pectoralis major or minor tightness)
- **Cervical side flexion** (upper traps)

These are based on optimal models so should be adapted for each individual

THANK YOU FOR LISTENING

Questions?



Referneces

- Anterior Tibial compartment pressure during race walking: L. Sanzen / A. Forsberg / N. Westlin. American journal of Sports Medicine (1986). Vol 14. pg 136
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- massage & bodywork november/december edition 2008
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- Football rescue

www.footballrescue.com/tibpost.jpg

- Thanks to Leeds Met Carnegie Race Walking Squad (Brendon & Lauren)

