# Functional Foot Disorders

An Osteopathic Approach to Diagnosis and Treatment

#### Functional Foot Disorders



#### Functional Foot Disorders



Tibia (shin bone) Fibula (lower leg burg) Torn lateral ankle ligaments.

#### Functional Foot Disorders

- Goals:
- Restore function to the foot and lower leg.
- Remove pain/discomfort where possible.
- Understand how the lower extremity works with the rest of the body.
- Know when to refer and who to refer to.

- The foot has 26 bones, 144 ligaments and 20 muscles.
- The lower leg has 2.5 bones, 8 ligaments (some overlap with the foot in the ankle) and 12 muscles
- The upper leg has 1.5 bones, 8 ligaments and 13 muscles

The Foot







ANATOMA



Distal Phalanges Middle Phalanges Proximal Phalanges Tibial Sesamoid Fibular Sesamoid Metatarsals



#### Cuneiforms

Medial Cuneiform Middle Cuneiform Lateral Cuneiform



Cuboid

Navicular

Talus



Calcaneus















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#### Subcutaneous exposure



calcaneus with overlying fat pad partially cut away \_







# Achilles tendon -Fibula Peroneus longus Lateral malleolus Peroneus brevis

OMMG 2003

#### Calcaneus

Retinaculum

#### The Arches

#### Stones and Steel

#### The Simple Arch







Leaf Springs



#### **Rear leaf springs**



AT A 90° SHACKLE ANGLE SPRING RATE IS NOT AFFECTED.
AT SHACKLE ANGLES LESS THAN 90° (POSITION "A") SPRING RATE STIFFENS.
AT SHACKLE ANGLES GREATER THAN 90° (POSITION "B") SPRING RATE SOFTENS.




















### Back to the Foot



Lateral (or Load Bearing) Arch



















# Medial (or Spring) Arch



















Transverse Arch









## Cutaneous Nerve Distribution







#### Nerves of the Foot





Dorsal view of foot illustrating the dorsal nerves that innervate the foot.



**Plantar View** 

Plantar view of the foot illustrating the plantar nerves.

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#### **Cutaneous innervation of the foot**



Saphenous nerve ①
Deep peroneal ②
nerve

- Superficial 
  Superficial
- Medial plantar @ nerve
- Lateral plantar G nerve
- Calcaneal branch 3 (tibial nerve)
  - Sural nerve 🕖

**Dorsal surface** 

**Plantar surface**
#### CUTANEOUS DISTRIBUTION RIGHT LOWER LEG POSTERIOR





Reflexology



#### **Stimulated Reflexology Points**



#### **How Reflexology Works**

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![](_page_78_Figure_0.jpeg)

![](_page_79_Figure_0.jpeg)

- 1. Brain
- 2. Sinuses/Outer Ear
- 3. Sinuses/Inner Ear/Eye
- 4. Temple
- 5. Pineal/Hypothalamus
- 6. Pituitary
- 7. Side of Neck
- 8. Cervical Spine
- 9. Shoulder/Arm
- Neck/Helper to Eye, Inner Ear, Eustachian Tube
- 11. Neck/Thyroid/Parathyroid/Tonsils
- 12. Bronchial/Thyroid Helper
- 13. Chest/Lung
- 14. Heart
- 15. Esophagus

![](_page_79_Figure_16.jpeg)

- 17. Diaphragm
- 18. Solar Plexus
- 19. Liver
- 20. Gallbladder
- 21. Stomach
- 22. Spleen
- 23. Adrenals
- 24. Pancreas
- 25. Kidneys
- 26. Waist Line
- 27. Ureter Tube
- 28. Bladder
- 29. Duodenum
- 30. Small Intestine
- 31. Appendix

![](_page_79_Figure_32.jpeg)

![](_page_79_Figure_33.jpeg)

![](_page_80_Figure_1.jpeg)

Ligaments

![](_page_82_Figure_1.jpeg)

![](_page_83_Picture_1.jpeg)

![](_page_84_Picture_1.jpeg)

![](_page_85_Picture_1.jpeg)

![](_page_86_Figure_1.jpeg)

![](_page_87_Picture_1.jpeg)

![](_page_88_Picture_1.jpeg)

![](_page_88_Picture_2.jpeg)

# Lower Leg

#### ANTERIOR LOWER RIGHT LEG

![](_page_90_Figure_2.jpeg)

Order of structures across dorsum of foot in direction of arrow: tibialis anterior, extensor hallucis longus, anterior tibial artery/vein, deep fibular nerve, extensor digitorum longus, fibularis tertius

Mnemonic: "Timothy Has A Very Nasty Diseased toe"

#### POSTERIOR LOWER RIGHT LEG

![](_page_90_Figure_6.jpeg)

Order of structures behind medial malleolus as indicated by arrow: Tibialis posterior, flexor digitorum longus, posterior tibial vein & artery, tibial nerve, flexor hallucis longus Mnemonic: Timothy Doth Vex All Nervous Housemaids OR Tom Dick And A Very Nervous Harry

![](_page_91_Figure_1.jpeg)

![](_page_91_Figure_2.jpeg)

![](_page_92_Figure_0.jpeg)

![](_page_93_Picture_0.jpeg)

![](_page_94_Figure_1.jpeg)

Tendo patellæ External tuberosity of tibia Head of fibula Tubercle of tibia

Swell of anterior tibial muscle — Intermuscular space — Swell of extensor longus digitorum — Swell of peroneus longus and brevis —

Crest of the tibia-

![](_page_95_Picture_0.jpeg)

Adapted from Corel Draw 9 Library

![](_page_96_Figure_0.jpeg)

**Right Knee Anatomy Anterior View** of Knee Femur Superior View of Tibial Plateau Patella Head of Posterior Medial fibula cruciate Medial meniscus ligament condyle Lateral condyle Posterior cruciate Lateral ligament meniscus Medial Head of meniscus fibula -Orientation Anterior cruciate Tibia ligament Fibula Lateral meniscus Anterior cruciate ligament Tibia

#### Anatomy of the Knee Joint

![](_page_98_Figure_1.jpeg)

![](_page_99_Figure_0.jpeg)

![](_page_100_Figure_0.jpeg)

Interosseous Membrane

![](_page_102_Figure_1.jpeg)

![](_page_102_Figure_2.jpeg)

![](_page_102_Figure_3.jpeg)

![](_page_102_Figure_4.jpeg)

![](_page_103_Picture_0.jpeg)

![](_page_103_Picture_2.jpeg)

![](_page_104_Picture_1.jpeg)

![](_page_104_Picture_2.jpeg)

![](_page_104_Picture_3.jpeg)

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![](_page_105_Picture_1.jpeg)

IOM - Interosseous Membrane IOL - Interosseous Ligament AITFL - Anterior Inferior TibioFibular Ligament PITFL - Posterior Inferior TibioFibular Ligament Carpentry 101

Carpentry 101

![](_page_107_Picture_1.jpeg)




# Carpentry 101



# Lower Leg/Interosseus Membrane Diagnostics

#### Interosseous Membrane Problems



Anterior View

#### Interosseous Membrane Problems

Normal

	T i b i a	Abnormal			
4		Lateral View			

#### Foot Tender Points

# Counterstrain Points



# Counterstrain Points



Lateral Arch

## Counterstrain Points

PLANTAR FOOT TENDER POINTS



# Common Foot Problems

## Morton's Neuroma

# Morton's Neuroma







#### Plantar Fasciitis

## Plantar Fasciitis



#### Plantar fasciitis



## Plantar Fasciitis



### Bunions

## Bunions





## Bunions







Displaced Sesamoid Bone

## Midfoot Problems

#### Mid-Foot Problems



# Proprioceptive Foot Problems

#### Proprioceptive Foot Problems

- If your patient has foot problems that originate FROM the foot, they need to be corrected there.
- When you palpate the patient's cranium, if their strain pattern shifts when they stand, then the proprioceptive feedback from their feet is impacting the cranium.
- Release the feet first. If this does not correct the problem, then add shims as noted on the next slide.

#### Proprioceptive Strain Patterns Place shims here to correct:



Figure 1: Correction of cranial strain patterns via the feet

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#### Proprioceptive Foot Problems

 This placement of shims becomes a treatment that is effecting the body with every step. These patients will unwind and change quickly (weeks to months). Please follow them at every visit to make certain that your shim placement does not become a hinderance. Diagnosis

# Lower Leg Diagnosis

- Knee:
  - •Tibial rotation
  - •Tibial glides and slides
  - •Ligaments
- Lower leg:
  - •Proximal fibular head
  - Distal fibular head
  - Intraosseous membrane
  - •Ligaments

# Ankle Diagnosis

- Dorsiflexion
- Plantarflexion
- Anterior movement
- Posterior movement
- Fibular head motion

- Talus
  - Anterior/posterior glide
  - Rotation
  - •Sub-talar ligaments
- Calcaneous
  - •Free motion in all directions

- Navicular
  - Anterior/posterior glide
  - Superior/inferior glide
  - Rotation
  - •Ligaments
  - •Free motion in all directions
  - •Keystone for the medial arch

- Cuboid
  - Anterior/posterior glide
  - Superior/inferior glide
  - Rotation
  - •Ligaments
  - •Free motion in all directions
  - •Keystone for the lateral arch

- Cuneiforms
  - Anterior/posterior glide
  - •Superior/inferior glide
  - Rotation
  - •Ligaments
  - •Free motion in all directions
  - Second is the keystone for the transverse arch

- Proximal metatarsal heads (Lisfranks joint)
  - Anterior/posterior glide
  - Superior/inferior glide
  - Rotation
  - Ligaments
  - Free motion in all directions
  - Arch (they are not keystones, but influence them)

#### Fin