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The Foot Posture Index-6:
a different way of seeing
your feet

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Thank You!

 **GLATA GREAT LAKES**
ATHLETIC TRAINERS ASSOCIATION






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Learning Objectives


- Describe the role of foot posture and function in relation to overuse conditions of the lower extremity
- Recognize the strengths and shortcomings of various methods to examine and classify foot posture
- Understand the components and scoring of the Foot Posture Index-6
- Apply the Foot posture Index-6 to the evaluation of the foot and ankle pathology in your practice



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Why do we need feet?

- Function of foot and ankle

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Observation: Big Picture

The diagram illustrates the Kinetic Chain, showing the relationship between Pelvic Tilt, Hip Rotation, Knee Rotation, Tibial Rotation, and Subtalar Joint Motion. It shows how these movements are interconnected and affect the overall posture and movement of the lower body. The diagram is divided into two columns: the left column shows the chain from a posterior view, and the right column shows it from an anterior view. The central column lists the movements: Pelvic Tilt, Hip Rotation, Knee Rotation, Tibial Rotation, and Subtalar Joint Motion. The left column lists the corresponding movements: Posterior, External, External, External, and Supination. The right column lists the corresponding movements: Anterior, Internal, Internal, Internal, and Pronation.

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Foot Types

Over-Pronating Feet

- A mobile foot type
- Difficulty with forming a rigid lever
- Hypermobile mid-tarsal joint

Under-Pronating feet

- A rigid foot type
- Difficulty with shock attenuation and accommodating to ground
- Stiff mid-tarsal joint

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Why do we care?

Problems with too much

- Problems with excessive motion
- Plantar fasciitis
- Tendonitis
- "Shin Splints"
- Stress reactions
- Neuromas
- Problems up the chain
 - Anterior knee pain
 - Piriformis syndrome

Problems with too little

- Problems with dissipating forces
- Metatarsalgia
- Stress reactions
- "Shin Splints"
- Ankle sprains
- Problems up the chain
 - Knee pain
 - ITB syndrome

Where does this fit?

```
graph TD; A((Overuse Injury)) --- B((Training errors)); A --- C((Training surface)); A --- D((Nutrition Status)); A --- E((Footwear)); A --- F((Biomechanics)); A --- G((Prior injury history)); A --- H((Prior injury history));
```

The diagram illustrates the factors contributing to overuse injury. At the center is a red circle labeled "Overuse Injury". Surrounding it are seven other circles, each connected to the center by a line. Starting from the top and moving clockwise, the circles are: a green circle labeled "Training errors", a green circle labeled "Training surface", a green circle labeled "Nutrition Status", a blue circle labeled "Footwear", a blue circle labeled "Biomechanics", a purple circle labeled "Prior injury history", and a purple circle labeled "Prior injury history". The background of the diagram is a light gray circular pattern with the words "UNIVERSITY OF INDIANAPOLIS" repeated around the perimeter.

[illegible]

Where does this fit?

```
graph TD; A((Overuse Injury)) --- B((Training errors)); A --- C((Training surface)); A --- D((Nutrition status)); A --- E((Footwear)); A --- F((Biomechanics)); A --- G((Prior injury history))
```




A hub-and-spoke diagram illustrating factors contributing to Overuse Injury. The central node is 'Overuse Injury' (red). It is connected to six surrounding nodes: 'Training errors' (green), 'Training surface' (green), 'Nutrition status' (green), 'Footwear' (blue), 'Biomechanics' (purple), and 'Prior injury history' (purple). The diagram is set against a background of a large, faint, circular seal.

[illegible][illegible]

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Podiatric Model

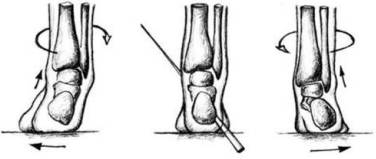

- A brief history
 - Late 1960's, 1970's – Podiatric community adopted theoretical model of "functional foot orthoses" – developed by Root, Orien and Weed
 - Perpetuated in the 80's and 90's

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Subtalar Joint Neutral



- Based on importance of "Subtalar joint neutral" (STJN) position
- Based on premise that abnormal structure will lead to predictable patterns of injury

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Podiatric Model and STJN

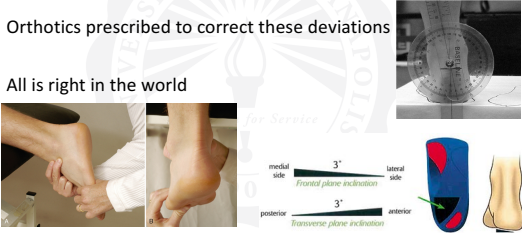

- The Neutral Foot
 - Thought to be where we operated from in normal conditions
 - Deviations from the norm were problematic
 - Treatment aimed at making the foot operate from that position

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Podiatric Model

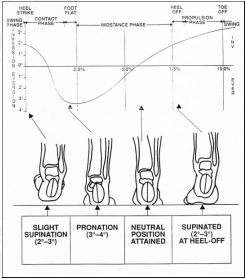

- Careful measurements taken to identify deviations
- Orthotics prescribed to correct these deviations
- All is right in the world

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Normal foot posture and gait

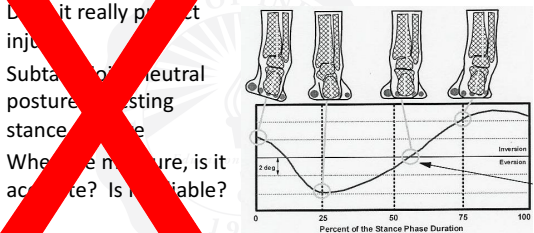

- Challenges to the Podiatric model validity and reliability happened in the mid to late 90's
- Eventually lead to a lot of vigorous debate and a re-thinking of the model

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Problems with the "Old School"

- Does it really protect joints?
- Substantially neutral posture during stance phase
- When the measure, is it accurate? Is it reliable?

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[VIEWPOINT]

PAUL HARRADINE, MScF • LUCY GATES, PhD • CATHERINE BOWEN, PhD

If It Doesn't Work, Why Do We Still Do It? The Continuing Use of Subtalar Joint Neutral Theory in the Face of Overpowering Critical Research


Journal of Sports Physical Therapy 2016;96(1):40-45




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Why?

- It works!
- Nothing better







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Things that we know

- Biomechanical assessment is better with experienced clinicians¹
- Intra-rater reliability is better than inter-rater²
- WB measures are more reliable than NWB³
- Visual analysis of foot posture with guidelines is more reliable than measurement^{2,4}


WHAT we KNOW








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Foot Posture Index-6 (item #1)

Diagram showing the position of the fingers when palpating the head of the talus. The circles indicate the precise point of palpation on the medial and lateral side.



Score	-2	-1	0	1	2
	Talus head palpable in lateral arch but not on medial side	Talus head palpable on both sides but not on medial side	Talus head palpable on lateral and medial side	Talus head palpable on lateral side only but not on medial side	Talus head palpable on lateral side only

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Item #2





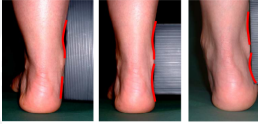









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FPI-6 Item #2

Supinated (-2)
Neutral (0)
Pronated (+2)



Score	-2	-1	0	1	2
	Curve below the malleolus either straight or concave	Curve below the malleolus concave, but flatter than the curve above the malleolus	Both infra and supra malleolar curves roughly equal	Curve below malleolus more concave than curve above malleolus	Curve below malleolus markedly more concave than curve above malleolus

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Item #3

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FPI-6 Item #3

Supinated (-2)

Neutral (0)

Pronated (+2)

Score	-2	-1	0	1	2
	More than an estimated 5° inverted (varus)	Between vertical and an estimated 5° inverted (varus)	Vertical	Between vertical and an estimated 5° everted (valgus)	More than an estimated 5° everted (valgus)

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Item #4

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FPI-6 Item #4

Supinated (-2) Neutral (0) Pronated (+2)

Score	-2	-1	0	1	2
	Area of THU markedly concave	Area of THU slightly, but definitely concave	Area of THU flat	Area of THU bulging slightly	Area of THU bulging markedly

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Item #5

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FPI-6 Item #5

Neutral (0)

This observation should be made taking both the arch height and the arch congruency into consideration.

Supinated foot (-2) Pronated foot (+2)

Score	-2	-1	0	1	2
	Arch high and as convex as convex angle of the posterior end of the medial arch	Arch moderate height and slight posteriorly curved	Arch height normal and congruently curved	Arch lowered with some flattening in the central portion	Arch very low with almost flattening in the central portion - missing ground contact

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Item #6

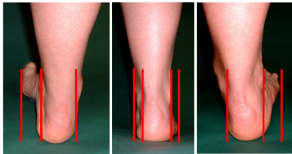





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FPI-6 Item #6

Supinated (-2) Neutral(0) Pronated (+2)



Score	-2	-1	0	1	2
	No lateral toes visible. Medial toes clearly visible.	Medial toes clearly more visible than lateral.	Medial and lateral toes equally visible.	Lateral toes clearly more visible than medial.	No medial toes visible. Lateral toes clearly visible.




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Foot Posture Index Datasheet

FACTOR	PLANE	SCORE 1		SCORE 2		SCORE 3	
		Date	Comment	Date	Comment	Date	Comment
		Left (-2 to +2)	Right (-2 to +2)	Left (-2 to +2)	Right (-2 to +2)	Left (-2 to +2)	Right (-2 to +2)
Forefoot	Palmar head palpation	Fore/verse					
	Curves above and below lateral malleoli	Fore/verse					
	Inversion/eversion of the calcaneus	Fore/verse					
	Ridge in the region of the TNU	Fore/verse					
Forefoot	Congruence of the medial longitudinal arch	Fore/verse					
	Ab/adduction of forefoot on rearfoot (too many toes)	Fore/verse					
	TOTAL						

Reference values
Normal = 0 to +5
Pronated = +6 to +9, highly pronated 10+
Supinated = -1 to -4, highly supinated -5 to -12

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Interpretation

- 0 to +5 - Neutral foot
- +6 to +9 - Pronated foot
- 10+ - Highly pronated foot
- -1 to -4 - Supinated foot
- -5 or more - Highly supinated foot

Reference values
 Normal = 0 to +5
 Pronated = +6 to +9, Highly pronated 10+
 Supinated = -1 to -4, Highly supinated -5 to -12

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So what is normal?⁷

	Pathological	Potentially abnormal	Normal range			Potentially abnormal	Pathological
	< -2 SD	-2 SD	-1 SD	Mean	+1 SD	+2 SD	> +2 SD
FPI logit		-2.2	+0.1	+2.4	+4.7	+7.0	
FPI raw score	< -3	-3	+1	+4	+7	+10	> +10

Gender Differences: Not significant⁶
 BMI differences: Not significant⁶

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Normative Values- Validity⁷

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Is it reliable?


- Cornwall et al 2008
- Morrison and Ferrari 2009
- McLaughlin et al 2016

ORIGINAL ARTICLES
Reliability of the Modified Foot Posture Index
 Mark W. Cornwall, PT, PhD, CPed*
 Thomas G. McRish, PT, PhD, ATC*
 Michael L. Lenz, PT, PhD*
 Bill Vicenzino, BPhy, GradDipSportsPhys, BSc, PhD†
 Judd Wilson, BA‡

Journal of Foot and Ankle Research



Research
Inter-rater reliability of the Foot Posture Index (FPI-4) in the assessment of the paediatric foot
 Stewart C Morrison* and Jill Ferrari

Inexperienced examiners and the Foot Posture Index: A reliability study.



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Is it useful for clinicians?

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So what does it mean?

- Where does this fit in?
- Overuse Injuries
- Part of the puzzle, not the whole puzzle



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Applications

- Education
- Research
- Practice

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Questions?

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