

FOOT POSTURE INDEX



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THE ORTHOPEDIC EVALUATION PROCESS

History	Palpation
Visual Inspection	AROM
-Discoloration	PROM
-Deformity	MMT
-Edema / Swelling	Special Tests
-Posture	Neurologic / Circulatory
-Gait	



THE GAIT EVALUATION

- 1) Weight-Bearing Stance Assessment
 - Postural assessment (Anterior, Lateral & Posterior)
 - Foot Posture Index (Foot Position / Abnormalities)
- 2) Dynamic Gait Assessment
- 3) Non-Weight Bearing Assessment
 - Foot Position / Abnormalities
 - Postural deformities



WEIGHT-BEARING EVALUATION

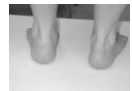


WEIGHT-BEARING POSTURAL EXAM

Anterior	Lateral	Posterior
ASIS	Kyphosis	Scapulae
Iliac Crest	Lordosis	PSIS
Greater Trochanters	Genu Recurvatum	Iliac Crest
Fibular Heads	Tibial Recurvatum	Greater Trochanters
Patellar Position	Pes Planus	Fibular Heads
Genu Varum / Valgum	Pes Cavus	Popliteal Space
Tibial Varum / Valgum		Genu Varum / Valgum
Pes Planus / Cavus		Tibial Varum / Valgum
		Pes Planus / Cavus
		Calcaneal Position



WHAT IS THE FOOT POSTURE INDEX?



Diagnostic tool aimed at quantifying the degrees to which a foot can be considered to be pronated, supinated or neutral

A method to rate and score various features of the foot posture

The patient is observed in relaxed double limb standing with feet shoulder width apart & weight equally distributed on both feet

*Approximates foot position during mid-stance of the gait cycle



HOW WAS FPI DERIVED?

Research: Review of 140 papers and identified 36 distinct clinical measures of foot posture¹

Criteria for Use / Development:

- Measurements that were easy to conduct
- Measurements that were time efficient
- Measurements that did not use costly technology
- Results were simple to understand
- Results yield quantifiable results



EVIDENCE SUPPORTING FOOT POSTURE INDEX

Inter-tester reliability = 0.83 – 0.86 in experienced examiners^{1,3,6}

Inter-tester reliability is lower for older adults⁶

Inter-tester reliability = 0.72 - 0.73 in inexperienced clinicians¹¹

Predicts 64% of variance in static stance¹

Predicts 41% of variance in mid-stance phase of gait¹

FPI score is influenced by age & pathology²

FPI score is not influenced by gender or BMI²

Normative value in pediatric patients (ages 6-11 years) is 4⁴



FOOT POSTURE INDEX AS A PREDICTOR OF INJURY

Positively predicts injury risk in collegiate dancers⁷

High correlation between FPI scores and plantar pressures⁸

Highly correlated with Navicular Drop measure⁹

Positively predicts medial compartment knee OA¹⁰



FOOT POSTURE INDEX SCORING

Started as eight-item scale (FPI-8), currently based on six-item scale (FPI-6)⁵

Rearfoot:

- 1) Talar Head Palpation
- 2) Curves Above and Below Malleoli
- 3) Calcaneal Inversion / Eversion

Forefoot:

- 4) Talonavicular Congruence
- 5) Medial Arch Height
- 6) Forefoot Abduction / Adduction (Too Many Toes Sign)



FOOT POSTURE INDEX SCORING

FACTOR	PLANE	SCORE 1		SCORE 2		SCORE 3	
		Date	Comment	Date	Comment	Date	Comment
		Left	Right	Left	Right	Left	Right
		(-2 to +2)	(-2 to +2)	(-2 to +2)	(-2 to +2)	(-2 to +2)	(-2 to +2)
Rearfoot	Talar head palpation	Transverse					
	Curves above and below lateral malleoli	Frontal / Medial					
	Inversion/eversion of the calcaneus	Frontal					
Forefoot	Bulge in the region of the TNJ	Transverse					
	Congruence of the medial longitudinal arch	Superior					
	Ab/adduction of forefoot on rearfoot (too-many-toes)	Transverse					
TOTAL							



TALAR HEAD PALPATION



Score	-2	-1	0	1	2
	Talar head palpable on lateral side but not on medial side	Talar head palpable on lateral side/slightly palpable on medial side	Talar head equally palpable on lateral and medial side	Talar head slightly palpable on lateral side/ palpable on medial side	Talar head not palpable on lateral side/ but palpable on medial side






CURVES ABOVE & BELOW MALLEOLI

Score	-2	-1	0	1	2
	Curve below the malleolus either straight or concave	Curve below the malleolus concave, but flatter / more shallow 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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CALCANEAL INVERSION / EVERSION

	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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TALONAVICULAR CONGRUENCE

Supinated (-2)	Neutral (0)	Pronated (+2)			
					
Score	-2	-1	0	1	2
	Area of TNJ markedly concave	Area of TNJ slightly, but definitely concave	Area of TNJ flat	Area of TNJ bulging slightly	Area of TNJ bulging markedly

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MEDIAL ARCH HEIGHT

Neutral (0)

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




Supinated foot (-2)

Pronated foot (+2)

Score	1	2	3	4	5	6
	Arch high and acutely angled towards the posterior end of the medial arch	Arch moderately high and slightly acutely posteriorly curved	Arch moderately high and slightly acutely posteriorly curved	Arch lowered with some flattening in the central portion	Arch very low with severe flattening in the central portion - arch making ground contact	Arch very low with severe flattening in the central portion - arch making ground contact

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FOREFOOT ADDUCTION / ABDUCTION

	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 INTERPRETATION & EBP

Total score is derived by adding the six individual scores together to determine a composite score

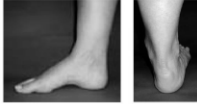
Research demonstrates inter-tester reliability of $k=0.62-0.91$ and intra-tester reliability of $k=0.81-0.91$

FP1 Score	+10 to +12	+5 to +9	0 to +4	-1 to -4	-5 to -12
Interpretation	Highly Pronated Foot	Pronated Foot	Neutral Foot	Supinated Foot	Highly Supinated Foot

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SAMPLE FPI SCORES

Example 1: Abnormal frontal plane observations predominate in a patient; with transverse and sagittal plane measures resulting near normal.



Fore-foot position	+1
Heel-toe curve	+1
Transverse curve	+1
Toe prominence	0
Compliance of the	+1
Articulation of FF	+1
TOTAL	+2

Example 2: The rearfoot factors may be near less marked in a patient while the midfoot/forefoot observations indicate substantial instability in the midfoot.



Fore-foot position	+1
Heel-toe curve	+1
Transverse curve	+1
Toe prominence	+1
Compliance of the	+1
Articulation of FF	+1
TOTAL	+2

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QUESTIONS?



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