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Oral presentation

The predictive value of the foot posture index on dynamic function

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Introduction
Keenan et al [1] identified the six-item version of the Foot Posture Index (FPI) as a valid, simple and clinically useful tool. The model combines measures of the standing foot posture in multiple planes and anatomical segments. It provides an alternative to existing static clinical measures when dynamic measures are not feasible. Redmond et al. [2] found the model able to predict 41% of the variation in the complex rotation of the ankle joint, representing inversion/eversion, during midstance of walking. To our knowledge no studies have been published on the relationship between the FPI and the movement of the midfoot during walking.

The purpose of this study was to investigate the use of FPI classification as a predictor for dynamic midfoot kinematics during walking.

Methods
Two hundred and eighty participants randomly selected from the Danish Civil Registration System were included in the study (age 43 ± 14, BMI 24.2 ± 3.1). Their foot type was determined using the FPI model. A Video Sequence Analysis (VSA) system was used to quantify midfoot kinematics during walking.

The navicular drop (ΔNH) and minimal navicula height (NHL) were extracted from the stance phase. FPI data were collected as in Redmond et al. [2] Correlations and multiple regression techniques were applied for statistical analysis.

Results
The FPI model predicted 45% of the variation in NHL (p < 0.001) and 13.2% of the variation in ΔNH (p < 0.001) during walking.

Only few of the individual tests constituting the FPI were significantly correlated with dynamic measures. The significant items were the medial longitudinal arch (MLA) and inversion/eversion of the calcaneus. Some combinations of these measures showed a significant regression (Table 1).

Conclusion
The FPI score is a poor predictor of dynamic navicula drop, as it predicts just above 40% of the variation in minimal navicula height during walking. The visual assessment of medial longitudinal arch and inversion/ever-sion of the calcaneus are similar compared to the FPI model itself. Other tests such as the Longitudinal Arch Angle [3]

Table 1: Predictive values of different tests on ∆NH and NHL (only significant relationships)

Test	P-value	Determination coefficient, r^2
FPI vs. ∆NH	p < 0.001	0.132
Inversion/eversion vs. ∆NH	p < 0.001	0.127
FPI vs. NHL	p < 0.001	0.450
MLA + inversion/eversion vs. NHL	p < 0.001	0.451
MLA vs. NHL	p < 0.001	0.415
Inversion/eversion vs. NHL	p < 0.001	0.261

were shown to predict midfoot kinematics by explaining over 80% of the variance.

Our results indicate that the FPI as well as its components are relatively poor predictors of midfoot movement during walking. Alternative measures are better predictors of dynamic midfoot function.

References

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3.   McPoil TG, *et al.: Journal of the American Podiatric Medical Association* 2007, **97:**102-107.