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# The Effects of Prosthetic Foot Stiffness on Transtibial Amputee Walking Mechanics and Balance Control during Turning

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## Abstract

*Background:* Little evidence exists of how prosthesis design characteristics affect performance in tasks that challenge mediolateral balance such as turning. This study assesses the influence of prosthetic foot stiffness on amputee walking mechanics and balance control during a continuous turning task.

*Methods:* Three-dimensional kinematic and kinetic data were collected from eight unilateral transtibial amputees as they walked overground at self-selected speed clockwise and counterclockwise around a 1-meter circle and along a straight line. Subjects performed the walking tasks wearing three different ankle-foot prostheses that spanned a range of sagittal- and coronal-plane stiffness levels.

*Findings:* A decrease in stiffness increased residual ankle dorsiflexion (10-13°), caused smaller adaptations (<5°) in proximal joint angles, decreased residual and increased intact limb body

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