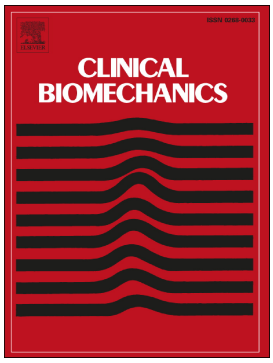

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PII: S0268-0033(17)30173-0
DOI: doi: 10.1016/j.clinbiomech.2017.08.003
Reference: JCLB 4365

To appear in: *Clinical Biomechanics*

Received date: 10 November 2016
Revised date: ###REVISEDDATE###
Accepted date: 13 August 2017

Please cite this article as: Courtney E. Shell, Ava D. Segal, Glenn K. Klute, Richard R. Neptune , The effects of prosthetic foot stiffness on transtibial amputee walking mechanics and balance control during turning, *Clinical Biomechanics* (2017), doi: 10.1016/j.clinbiomech.2017.08.003

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

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Abstract Word Count: 250 (including section headings)

Main Text Word Count: 4179

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