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Original Research

# Eccentric Plantar-Flexor Torque Deficits in Participants With Functional Ankle Instability

**Jason Fox, MS, LAT, ATC, Carrie L. Docherty, PhD, LAT, ATC, John Schrader, HSD, LAT, ATC, and Trent Applegate, HSD, MPH**

Indiana University, Bloomington, IN

## Abstract

***Context:*** Inversion ankle sprains can lead to a chronic condition called functional ankle instability (FAI). Limited research has been reported regarding isokinetic measures for the plantar flexors and dorsiflexors of the ankle.

***Objective:*** To examine the isokinetic eccentric torque measures of the ankle musculature in participants with stable ankles and participants with functionally unstable ankles during inversion, eversion, plantar flexion, and dorsiflexion.

***Design:*** Case-control study.

***Setting:*** Athletic training research laboratory.

***Patients or Other Participants:*** Twenty participants with a history of "giving way" were included in the FAI group. Inclusion criteria for the FAI group included a history of at least 1 ankle sprain and repeated episodes of giving way. Twenty participants with no prior history of ankle injury were included in the control group.

***Intervention(s):*** Isokinetic eccentric torque was assessed in each participant.

***Main Outcome Measure(s):*** Isokinetic eccentric testing was conducted for inversion-eversion and plantar-flexion–dorsiflexion movements. Peak torque values were standardized to each participant's body weight. The average of the 3 trials for each direction was used for statistical analysis.

***Results:*** A significant side-by-group interaction was noted for eccentric plantar flexion torque ($P < .01$). Follow-up *t* tests revealed a significant difference between the FAI limb in the FAI group and the matched limb in the control group. Additionally, a significant difference was seen between the sides of the control group ($P = .03$). No significant interactions were identified for eccentric inversion, eversion, or dorsiflexion torques ($P > .05$).

Volume 43, Issue 1 (January/February 2008)

Next >


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***Conclusions:*** A deficit in plantar flexion torque was identified in the functionally unstable ankles. No deficits were identified for inversion, eversion, or dorsiflexion torque. Therefore, eccentric plantar flexion strength may be an important contributing factor to functional ankle instability.

**Keywords:** isokinetic dynamometer, strength, inversion, eversion, dorsiflexion

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Address correspondence to Carrie L. Docherty PhD, LAT, ATC, University Gymnasium, 2805 East 10th Street, Indiana University, Bloomington, IN 47408. Address e-mail to cdochert@indiana.edu

top