

Effect of Ankle Bracing on Postural Sway During Single Limb Landing from a Controlled Height

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The purpose of this study was to determine if the application of a prophylactic ankle brace would decrease postural sway stabilization time during landing. It was theorized that the application of a prophylactic ankle brace would decrease postural sway resulting in a decreased stabilization time. A counterbalanced design was used. The independent variable was condition (Unbraced, DonJoy RocketSoc, Active Ankle). The dependent variables were stabilization time (sec) in the anterior posterior and medial-lateral directions. A 1 within factor (test condition) repeated measures analysis of variance (ANOVA) was used for data analysis. A Bonferroni-Holm post hoc procedure was used to determine significant comparisons.

Twenty-five normal subjects, fourteen males and eleven females (Age = 21.2 ± 1.7 yrs, Ht = 171.53 ± 11.39 cm, Mass = 78.4 ± 19.31 kg) participated in the study.

A Kistler force platform system (Kistler Instruments AG, Amherst, NY) was used to measure postural sway at 960Hz along the anteroposterior and mediolateral axes at the interface of the subject's foot and the force platform. Each subject performed a total of 15 7-second landings from a box 40.64cm tall, with 5 landings in an unbraced condition and 5 landings in each of two braced conditions. Data were analyzed from the point of contact until forces stabilized. Stabilization time was defined as the point in time where the sequential average for center of pressure remained within one-quarter standard deviation of the overall series mean.

There was no significant difference in time to stabilize for COP in the anterior-posterior plane.

There was a significant difference in time to stabilize for COP in the medial-lateral plane.

Stabilization of COP in the medial-lateral plane was significantly slower in the unbraced condition ($.856 \pm .28$ s) than when wearing the DonJoy brace ($.56 \pm .34$ s) ($p=.009$), and slower than when wearing the Active Ankle brace ($.68 \pm .22$ s) ($p=.058$).

It took less time for standard deviation of center of pressure (sway) in the medial-lateral direction to stabilize when subjects wore a brace than when not wearing a brace. The application of the brace helped subjects to regain medial-lateral control more quickly.