



[Journal List](#) > [HSS J](#) > [v.4\(2\)](#); Sep 2008

HSS J. 2008 September; 4(2): 188–190.

PMCID: PMC2553173

Published online 2008 August 19. doi: 10.1007/s11420-008-9090-7.

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Hospital for Special Surgery 2008 Resident and Fellow Research Presentations Award-Winning Abstracts

The Lewis Clark Wagner Award Recognizes Outstanding Resident's Paper

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The Effect of the Shoe–Surface Interface in the Development of Anterior Cruciate Ligament Strain

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Introduction The shoe–surface interface has been implicated as a possible risk factor for anterior cruciate ligament (ACL) injuries; however, the relationship between ACL strain and the shoe–surface interface has yet to be quantified. The purpose of this study is to develop a biomechanical cadaveric model to evaluate the effect of various shoe–surface interfaces on ACL strain. We hypothesize that there will be a significant difference in ACL strain between different shoe–surface combinations when a standardized rotational moment (a simulated cutting movement) is applied to an axially loaded lower extremity.

Materials and methods Eight fresh-frozen cadaveric lower extremities were thawed, and the femurs were potted with the knee in 30° of flexion. Each specimen was placed in a custom-made testing apparatus, which allowed axial loading and tibial rotation but prevented femoral rotation. A strain gauge (Microstrain Inc., Williston, VT, USA) was then placed in the anteromedial bundle of the ACL.