

TITLE: The Relationship between the Landing Error Scoring System and the Biomechanics of Walking and Running

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RESEARCH PROJECT DESCRIPTION: Injuries from running and walking during recreation and occupational endeavors (e.g. military) have a very high annual incidence and result in significant economic and health burden. The ability to easily screen for those individuals at high risk is important for targeting those at risk with injury prevention protocols. Recent studies indicate that the Landing Error Scoring System (LESS) may have some power for predicting those at risk for developing a stress fracture of the tibia. However, we do not have an understand for how this biomechanical screening tool that was designed for assessing anterior cruciate ligament injury risk correlates with biomechanical risk factors for walking/running related injury. The purpose of this study is to assess for correlations between individual aspects of the LESS and different biomechanical variables during walking and running that are considered important for injury risk. Using both two and three dimensional motion analysis techniques, we hypothesize that frontal plane LESS assessment items (knee valgus, medial knee displacement) will correlate with frontal plane walking/running biomechanical variables (knee adduction moment, knee adduction excursion), and that sagittal plane LESS assessment items (initial knee flexion and displacement) will correlate with sagittal plane walking/running biomechanical variables (knee flexion angle and excursion) as well as ground reaction forces and loading rates. The medical student will be responsible for subject recruitment, obtaining subject consent, data collection, assisting with data analysis, and writing resulting manuscript(s) with the guidance of the mentors. Additional opportunities within the laboratory may be available for exception mentees on an as time-allows basis.

References:

Padua DP, et. al. The Landing Error Scoring System (LESS) Is a valid and reliable clinical assessment tool of jump-landing biomechanics: The JUMP-ACL study. Am J Sports Med. 2009 Oct;37(10):1996-2002

Cameron KL, et. al. Landing Error Scoring System (LESS) Items Are Predictive Of Lower Extremity Stress Fracture. Journal of Athletic Training. 2014 June;49(3): S79-80