Rachel Straub
University of Southern California

Development of the Movement Performance Assessment to Predict ACL Re-Injury

ABSTRACT

Injuries to the anterior cruciate ligament (ACL) of the knee can be particularly devasting to the athlete, leading to an early onset of osteoarthritis and chronic knee pain. To make matters worse, the risk of ACL re-injury is up to 40 times higher compared to initial injury risk in athletes participating in high-risk sports. Interestingly, 70% of ACL tears occur as a result of non-contact mechanisms, or without direct contact to the knee. Given that movement impairments can predict both initial and subsequent ACL injury, suggests there is a need for clinically based assessments to identify movement impairments related to ACL injury. This led our group to initiate the development of a 2D video-based Movement Performance Assessment (MPA). Therefore, the purpose of this dissertation is to fully develop and validate the proposed MPA tool by 1) identifying the 2D variables within the MPA that best represent 3D laboratory-based measures of "at risk" movement behavior for ACL injury across a wide range of sport-specific tasks; and 2) determining the ability of these 2D variables to predict ACL re-injury. To achieve these objectives, we will use 1) a cross-sectional design to assess the concurrent validity of the MPA and 2) a retrospective, case-control design to determine the ability of the MPA to predict ACL re-injury. Successful completion of this dissertation will have the potential to improve return to sport outcomes following ACL reconstruction by identifying those who may be at risk for re-injury. It can be argued that if movement impairments inherent to the athlete are able to predict ACL re -injury, then such deficits are likely predictive of initial injury. The development of a clinically feasible movement impairment screen will lead to better identification of those at risk for ACL injury across multiple sports and improved outcomes for ACL injury prevention programs.