Title: Identification and risk estimation of movement strategies during cutting maneuvers

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Identification and risk estimation of movement strategies during cutting maneuvers

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Abstract

Objectives

Approximately 70% of anterior cruciate ligament (ACL) injuries occur in non-contact situations during cutting and landing maneuvers. Parameters such as footstrike patterns and trunk orientation were found to influence ACL relevant knee loading, however, the relationship between the whole body movement and injury risk is debated. This study identifies whole body movement strategies that increase injury risk, and provides training recommendations to reduce this risk or enable a save return to sports after injury.

Design

Experimental cross-sectional study design.

Methods

Three dimensional movement analysis was used to investigate 50 participants performing anticipated 90° cutting maneuvers. To identify and characterize movement strategies, footstrike pattern, knee valgus moment, knee internal rotation moment, angle of attack, shoulder and pelvis axis were calculated and analyzed using statistical parametric mapping.