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Visual Estimation of ACL Injury Risk: Efficient Assessment Method, Group Differences, and Expertise Mechanisms

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Introduction

Impact
• Over 2 million ACL injuries occur worldwide annually.
• Approximately 1 in 30 female athletes participating in landing and cutting sports (basketball, soccer) will tear their ACL within one season of play.
• Annual costs in U.S. likely exceed $3 billion (majority pursue surgery).
• Osteoarthritis occurs at 10 times the normal rate.

Methods

Aim
b.) Ensure biomechanical feedback during prevention programs is accurate
a.) Reduce screening time and cost

Potential Solutions

• Osteoarthritis occurs at 10 times the normal rate.
• Annual costs in U.S. likely exceed $3 billion (majority pursue surgery).
• Sports (basketball, soccer) will tear their ACL within one season of play.
• Approximately 1 in 30 female athletes participating in landing and cutting sports (basketball, soccer) will tear their ACL within one season of play.
• Over 2 million ACL injuries occur worldwide annually.

Impact

Re-evaluate the preventative technique to “High-risk”

Musculoskeletal Injury Prevention

Identify injury mechanisms

Develop efficient screening method

Skilled Movement Analysis

Efficiently Assess Observational Skill

Group Differences

Skill Mechanisms

Discussion

• It will be important to target parents, athletes, coaches, and physicians for improving risk assessment performance or to adopt the ACL nomogram to aid their injury risk assessment in practice.
• The ACL-IQ is an assessment technology and feedback system for ACL injury risk prediction ability.
• Individuals can assess their ACL injury risk prediction ability with a short, free, and online (www.ACL-IQ.org) tool.

Moving Forward

• Future research will focus on developing efficient methods to improve visual risk prediction performance (e.g., see Decision Tree to the right) and establishing predictive evidence that individuals with high ACL-IQ can reduce ACL injuries.

Figure 2: Sample ACL-IQ item (snapshot of video sequence)

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