

# NON-CONTACT ANTERIOR CRUCIATE LIGAMENT AND LOWER EXTREMITY INJURY RISK PREDICTION USING FUNCTIONAL MOVEMENT SCREEN AND KNEE ABDUCTION MOMENT: AN EPIDEMIOLOGICAL OBSERVATION OF FEMALE INTERCOLLEGIATE ATHLETES

Scott E. Landis, DAT, LAT, ATC, LMT<sup>1</sup>

Russell T. Baker, PhD, DAT, LAT, ATC<sup>2</sup>

Jeffrey G. Seegmiller, EdD, LAT, ATC<sup>2</sup>

## ABSTRACT

**Background:** Modifiable risk factors associated with non-contact anterior cruciate ligament (ACL) injuries are highly debated, yet the incidence rate of ACL injury continues to increase. Measures of movement quality may be an effective method for identifying individuals who are at a high risk of injury.

**Purpose:** The purpose of this study was to investigate whether a movement screen and/or a drop-jump landing (DJL) task identifies female individuals at a higher risk for sustaining non-contact lower extremity (LE) injuries, particularly ACL injuries.

**Study Design:** Cohort study

**Methods:** 187 women (mean age  $19.5 \pm 1.21$  years) who played collegiate soccer, volleyball, or basketball completed the Functional Movement Screen (FMS™) and a drop-jump landing task. Weekly injury reports of participants who sustained a non-contact LE injury were collected. FMS™ scores (both total score and individual screens) and Knee Abduction Moment (KAM) values from the DJL task, were compared between injured and uninjured sample populations.

**Results:** A statistically significant difference ( $t = 1.98, p = 0.049$ ) was observed in the FMS™ scores between the injured (ACL and LE injury) and uninjured groups. Prior ACL injury was also a significant predictor of LE injury ( $OR = 4.4, p = 0.01$ ).

**Conclusions:** The FMS™ can be used to identify collegiate female athletes who are at an increased risk of sustaining a non-contact ACL or LE injury. Female collegiate athletes that score 14 or less on the FMS™ have a greater chance of sustaining a non-contact LE injury than those who score above 14.

**Level of Evidence:** 3b

**Key Words:** anterior cruciate ligament, functional movement screen, knee abduction moment

## CORRESPONDING AUTHOR

Scott Landis, DAT, LAT, ATC, LMT

Program Director, Athletic Training Education  
King University

1350 King College Road

Bristol, TN 37620

Telephone: 423-652-6035

E-mail: selandis@king.edu

<sup>1</sup> King University, Bristol, TN, USA

<sup>2</sup> University of Idaho, Moscow, ID, USA

Conflict of Interest: The authors have no conflict of interest to report.