

ACCURACY OF THE LEVER SIGN TO DIAGNOSE ANTERIOR CRUCIATE LIGAMENT TEAR: A SYSTEMATIC REVIEW WITH META-ANALYSIS

Michael P. Reiman, PT, DPT, SCS, ATC, FAAOMPT, CSCS^{1,2}

Carly K. Reiman³

Simon Décary, PT, PhD⁴

ABSTRACT

Background: The Lever sign has gained recent notoriety for its purported anterior cruciate ligament (ACL) diagnostics and simplicity of performance.

Purpose: The purpose of this systematic review with meta-analysis is to summarize the diagnostic accuracy of the Lever sign for use during assessment of the knee for an ACL tear in subjects with suspected acute and chronic knee injury.

Study Design: Systematic review with meta-analysis

Methods: A computer-assisted literature search of MEDLINE, CINAHL, and EMBASE databases using keywords related to diagnostic accuracy of the knee joint. The *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) guidelines were used for the search and reporting phases of the study. Quality assessment of bias and applicability was conducted using the Quality of Diagnostic Accuracy Studies (QUADAS). Mixed effects models were used to summarize accuracy.

Results: Eight articles, with only two demonstrating high quality, were included. Six of the articles were included in a meta-analysis. Diagnostic values, utilizing arthroscopy as a gold standard, were: pooled SN 0.55 (95% CI 0.22 to 0.84), pooled SP 0.89 (95% CI 0.44 to 0.99), positive likelihood ratio (+LR) 9.2 (95% CI 0.70 to 46.1), negative likelihood ratio (-LR) 0.58 (95% CI 0.18 to 1.28). Post-test probability with a positive finding (57% sampling prevalence) reached 92% (95% CI 83 to 97%). Post-test probability with a negative finding (57% sampling prevalence) reached 43% (95% CI 39 to 47%).

Conclusions: Based on limited evidence of heterogeneous methodological quality, the Lever sign can moderately change post-test probability to rule in an ACL tear. These results should be interpreted cautiously due to a limited number of studies, with small sample sizes and study quality affecting test accuracy. Future investigation should be expanded to include additional high-quality studies examining diverse clinical contexts, as they become available, to enable a more comprehensive clinical examination of this test.

Key words: anterior cruciate ligament, diagnostic accuracy, Lever Sign, knee, sensitivity, specificity

Level of evidence: 3a

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CORRESPONDING AUTHOR

Michael P. Reiman, PT, DPT, SCS, ATC,
FAAOMPT, CSCS

Duke University School of Medicine
Department of Orthopedic Surgery
Doctor of Physical Therapy Division
DUMC 104002

Durham, NC 27710

Phone: (919) 668-3014; Fax: (919) 684-1846

E-mail: reiman.michael@gmail.com

¹ Duke University Medical Center, Department of Orthopedic Surgery, Durham, NC, USA

² Duke University Orthopaedic Fellowship, Duke University Medical Center, Durham, NC, USA

³ Department of Biological Sciences, North Carolina State University, Raleigh, NC, USA

⁴ Université Laval, Faculty of Medicine, Québec, Canada.

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