

---

# ORIGINAL RESEARCH

## VALIDATION OF TWO CLINICAL MEASURES OF CORE STABILITY

Courtney M. Butowicz, MEd, CSCS<sup>1</sup>  
D. David Ebaugh, PhD, PT<sup>1,2</sup>  
Brian Noehren, PhD, PT<sup>3</sup>  
Sheri P. Silfies, PhD, PT<sup>1</sup>

---

### ABSTRACT

**Background:** Emerging evidence suggests poor core stability is a risk factor for low back and lower extremity injuries in athletes. Recently the trunk stability test (TST) and unilateral hip bridge endurance test (UHBE) were developed to clinically assess core stability. Although these and other clinical tests of core stability exist, how well they assess core stability when compared to biomechanical measures of isolated core stability has not been thoroughly evaluated.

**Purpose/Hypothesis:** The purposes of this study were to 1) determine concurrent validity of two novel clinical core stability assessments (TST and UHBE), and 2) assess relationships between these assessments and the trunk endurance and Y-Balance tests. The authors' hypothesized that the TST and UHBE would be highly correlated to the lab-based biomechanical measure of isolated core stability. Also, the TST and UHBE would be moderately correlated with each other, but not with the trunk extensor endurance and Y-Balance.

**Study Design:** Cross-Sectional design

**Methods:** Twenty healthy active individuals completed the TST (recorded number of errors), UHBE (s), trunk extensor endurance (s), Y-Balance (% leg length) test (YBT), and biomechanical test of core stability.

**Results:** Correlational analyses revealed a small, non-significant association between TST and biomechanical measures ( $r_s = 0.2 - 0.22$ ), while a moderate, significant relationship existed between UHBE and biomechanical measures ( $r_s = -0.49$  to  $-0.56$ ,  $p < 0.05$ ). There was little to no relationship between TST and UHBE ( $r = -0.07$  to  $-0.21$ ), or TST and extensor endurance ( $r = -0.18$  to  $-0.24$ ). A moderate, significant association existed between TST and two reach directions of the YBT ( $r = -0.41$  to  $-0.43$ ,  $p < 0.05$ ).

**Conclusions:** Study data support the utility of UHBE as a clinical measure of core stability. The poor relationship between the TST and biomechanical measures, combined with observation of most control faults occurring in the lower extremity (LE) suggest the TST may not be an appropriate clinical test of core stability.

**Levels of Evidence:** Level 3

**Keywords:** athletic injuries, neuromuscular control, core stability

---

### CORRESPONDING AUTHOR

Sheri P. Silfies, PT, PhD  
Drexel University, Rehabilitation Sciences  
Spine Research Laboratory  
Three Parkway, Mail Stop 7-502,  
Philadelphia, PA 19102-1192, USA.  
Tel: 267-359-5580; Fax: (267) 359-5576.  
E-mail: silfies@drexel.edu

---

<sup>1</sup> Physical Therapy & Rehabilitation Sciences Department, Drexel University, Philadelphia, PA, USA

<sup>2</sup> Health Sciences Department, Drexel University, Philadelphia, PA, USA

<sup>3</sup> Division of Physical Therapy, University of Kentucky, Lexington, Kentucky, USA

Statement of Support: This work was not supported by any granting or funding agency and was approved by the Institutional Review Board of Drexel University.