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R. Tyler Hamilton, Sandra J. Shultz, Randy J. Schmitz, David H. Perrin (2008) Triple-Hop Distance as a Valid Predictor of Lower Limb Strength and Power. *Journal of Athletic Training*: March/April 2008, Vol. 43, No. 2, pp. 144-151.

doi: 10.4085/1062-6050-43.2.144

### Original Research

## Triple-Hop Distance as a Valid Predictor of Lower Limb Strength and Power

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### Abstract

**Context:** Hop tests are functional tests that reportedly require strength, power, and postural stability to perform. The extent to which a triple-hop distance (THD) test measures each of these characteristics is relatively unknown.

**Objective:** To determine the extent to which the THD predicts performance on clinical measures of power, strength, and balance in athletic individuals.

**Design:** Within-subjects correlational study.

**Setting:** Station-based, preseason screening of athletes.

**Patients or Other Participants:** Forty National Collegiate Athletic Association Division I-AA men's and women's soccer student-athletes (20 women, 20 men; age = 20.0 ± 1.4 years, height = 172.8 ± 9.2 cm, mass = 71.9 ± 8.9 kg).

**Intervention(s):** As part of a comprehensive preseason screening of athletes, participants completed the Balance Error Scoring System (BESS) test, 3 trials each of the THD and vertical jump, and 5 repetitions each of concentric isokinetic quadriceps and hamstrings strength testing at 60°/s and 180°/s. Bivariate correlations and linear regression analyses determined the extent to which THD (cm) predicted each of the strength, power, and balance measures.

**Main Outcome Measure(s):** Maximal vertical jump height (cm), total BESS error scores, and quadriceps (Quad<sub>60</sub>, Quad<sub>180</sub>) and hamstrings (Ham<sub>60</sub>, Ham<sub>180</sub>) isokinetic maximum peak torque (Nm) at 60°/s and 180°/s, respectively.

**Results:** Triple-hop distance was a strong predictor of vertical jump height, explaining 69.5% of the variance ( $P < .01$ ). THD also predicted 56.7% of the variance in Ham<sub>60</sub> ( $P < .01$ ), 55.5% of the variance in Ham<sub>180</sub> ( $P < .01$ ), 49.0% of the variance in Quad<sub>60</sub> ( $P < .01$ ), and 58.8% of the variance in Quad<sub>180</sub> ( $P < .01$ ). No relationships between THD and BESS scores were noted.

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Athletic Training



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Print ISSN 1062-6050

eISSN 1938-162X

Frequency Bimonthly:

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March/April  
May/June  
July/August  
September/October  
November/December

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**Conclusions:** Triple-hop distance is a useful clinical test to predict an athlete's lower extremity strength and power. Although THD was not a predictor of static balance, further research is needed to examine its relationship with more dynamic balance tests.

**Keywords:** [functional performance tests](#), [peak torque](#), [balance](#), [postural stability](#), [open kinetic chain exercises](#)

R. Tyler Hamilton, MS, ATC, and Sandra J. Shultz, PhD, ATC, CSCS, contributed to conception and design; acquisition and analysis and interpretation of the data; and drafting, critical revision, and final approval of the article. Randy J. Schmitz, PhD, ATC, contributed to conception and design; acquisition and analysis and interpretation of the data; and critical revision and final approval of the article. David H. Perrin, PhD, ATC, FACSM, contributed to conception and design, analysis and interpretation of the data, and critical revision and final approval of the article.

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Randy J. Schmitz, Sandra J. Shultz, and Anh-Dung Nguyen. (2009) Dynamic Valgus Alignment and Functional Strength in Males and Females During Maturation. *Journal of Athletic Training* **44**:1, 26-32  
Online publication date: 1-Jan-2009.  
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