

Document title

Closed kinetic chain (linear) isokinetic testing: Relationships to functional testing

Auteur(s) / Author(s)

MANSKE Robert C. ⁽¹⁾ ; SMITH Barbara S. ⁽²⁾ ; ROGERS Michael E. ⁽³⁾ ; WYATT Frank B. ⁽⁴⁾ ;

Affiliation(s) du ou des auteurs / Author(s) Affiliation(s)

⁽¹⁾ Department of Physical Therapy, Wichita State University, Wichita, KS 67260, ETATS-UNIS

⁽²⁾ Via Christi Sports and Orthopedic Physical Therapy, Wichita, KS 67212, ETATS-UNIS

⁽³⁾ Department of Kinesiology and Sport Studies, Wichita State University, Wichita, KS 67260, ETATS-UNIS

⁽⁴⁾ Department of Health, Human Performance, and Recreation, Baylor University, Waco, TX 76798, ETATS-UNIS

Résumé / Abstract

Study design: A correlation study to determine the relationship of the results of linear isokinetic testing and various functional tests. **Objectives:** To determine the relationship of scores on a linear isokinetic test to scores on a variety of lower extremity functional tests. **Background:** Both isokinetic testing and functional tests are commonly used during the rehabilitation of individuals with sports and orthopedic injuries. Limited information exists regarding the relationships of scores on a linear isokinetic test and scores on functional tests. **Methods and measures:** Twenty-nine healthy subjects performed a velocity spectrum linear isokinetic test consisting of 3 sets in a bilateral reciprocal mode, followed by three sets in a bilateral coupled mode. Testing velocities were 25.4, 50.8 and 76.2 cm per second. Six maximal volitional linear isokinetic repetitions were performed at each testing velocity. Following linear isokinetic testing, subjects performed 5 functional tests: bilateral leg vertical jump, unilateral leg vertical jump, double leg jump for distance, single-leg hop for distance, and single-leg timed 6-meter hop. Functional testing entailed 3 maximal volitional attempts of the 5 procedures for both the dominant and non-dominant lower extremity. The mean of the 3 attempts was used for calculations. Means and standard deviations of the functional test scores and isokinetic test scores were determined using standard statistical procedures. Pearson product moment correlation coefficients were used to determine the relationship between the mean scores on the linear isokinetic test scores and functional tests for both the dominant and non-dominant limbs. **Results:** Twenty-three out of 36 correlation coefficients were significant at the $p < 0.01$ level, while 12 out of 36 were significant at the $p < 0.05$ level. Only 1 out of 36 was non-significant when comparing bilateral reciprocal scores to single-leg functional test scores. The bilateral reciprocal correlation coefficients ranged from -0.36 to 0.65. Six out of 12 bilateral coupled correlation coefficients were significant at $p < 0.01$, while 3 out of 12 were significant at the $p < 0.05$ level and only 3 were considered non-significant. The bilateral coupled correlation coefficients ranged from 0.11 to 0.64. **Conclusions:** Results from this study indicate a significant relationship exists between the results of linear isokinetic testing and various functional tests. Despite the significant relationship, the majority of Pearson Product moment correlation coefficients were in the low to moderate range. Therefore, the use of either a linear isokinetic test or a functional test in isolation to determine strength and performance is strongly discouraged. Linear isokinetic testing should be used for testing lower extremity strength, while functional tests should be used to determine performance levels. The authors recommend utilizing both testing methods since strength does not always correlate strongly with physical performance.

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