

# Reliability and validity of a weightbearing measure of ankle dorsiflexion range of motion

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**Purpose:** To determine the reliability and validity of the Lunge Test Difference Score for measuring weightbearing (WB) ankle dorsiflexion range of motion (DF-ROM).

**Relevance:** Restoring ankle DF-ROM is important to physiotherapists because of its importance in lower-extremity function. The Lunge Test Difference Score measures WB DF-ROM; however, its reliability and validity have not been evaluated in an orthopaedic setting.

**Materials & Methods:** 53 participants (mean  $\pm$  SD age,  $34.6 \pm 13.9$  years; 29 male, 24 female) with ankle injuries were recruited from four physiotherapy clinics. The Lunge Test Difference Score, the Lower Extremity Functional Scale, and the American Academy of Orthopaedic Surgeons Global Foot and Ankle Scale were recorded at initial assessment (Time 1), after 4 to 8 weeks of physiotherapy (Time 2), and within 72 hours of the second session (Time 3). The Global Rating of Change (GRC) was completed by both the participant and physiotherapist.

**Analysis:** Test-retest reliability was determined from the results of the final two testing sessions. A process of construct validation was performed to estimate cross-sectional validity (Time 1 and Time 2) and longitudinally (Time 1 to Time 2). Correlation between the GRC and change in Lunge Test Difference Scores quantified sensitivity to change. Effect size (ES) and standardized response means (SRM) were calculated.

**Results:** The Lunge Test Difference Score possessed high test-retest reliability ( $ICC_{2,1} = 0.94$ ;  $SEM = 5.01$  mm). The  $MDC_{90}$  was 11.79 mm. The measure was also found to have very good known-groups validity. Cross-sectional correlations between the self-report functional measures and the Lunge Test Difference Score varied from -0.42 to -0.49. Change scores had a correlation of 0.59 to 0.63. Sensitivity to change was established with a Pearson  $r = 0.40$ . The ES was 0.72 and the SRM was 0.99.

**Conclusions:** The Lunge Test Difference Score has excellent test-retest reliability properties in a clinical setting on individuals with orthopaedic conditions affecting the ankle. Validity of the test is supported by known-groups construct validity analysis, and moderate correlations between the performance-based measure and self-report functional measures.