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# ORIGINAL RESEARCH

## RELIABILITY OF STRENGTH AND PERFORMANCE TESTING MEASURES AND THEIR ABILITY TO DIFFERENTIATE PERSONS WITH AND WITHOUT SHOULDER SYMPTOMS

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### ABSTRACT

**Background:** Upper extremity physical performance measures exist but none have been universally accepted as the primary means of gauging readiness to return to activity following rehabilitation. Few reports have described reliability and/or differences in outcome with physical performance measures between individuals with and without shoulder symptoms.

**Hypotheses/Purpose:** The purpose of this study was to establish the reliability of traditional upper extremity strength testing and the CKCUEST in persons with and without shoulder symptoms as well as to determine if the testing maneuvers could discriminate between individuals with and without shoulder symptoms. The authors hypothesized that strength and physical performance testing would have excellent test/re-test reliability for individuals with and without shoulder symptoms and that the physical performance maneuver would be able to discriminate between individuals with and without shoulder symptoms.

**Methods:** Male and female subjects 18-50 years of age were recruited for testing. Subjects were screened and placed into groups based on the presence (Symptomatic Group) or absence of shoulder symptoms (Asymptomatic Group). Each subject performed an isometric strength task, a task designed to estimate 1-repetition maximum (RM) lifting in the plane of the scapula, and the closed kinetic chain upper extremity stability test (CKCUEST) during two sessions 7-10 days apart. Test/re-test reliability was calculated for all three tasks. Independent t-tests were utilized for between group comparisons to determine if a performance task could discriminate between persons with and without shoulder symptoms.

**Results:** Thirty-six subjects (18/group) completed both sessions. Test/re-test reliability for each task was excellent for both groups (intraclass correlations  $\geq .85$  for all tasks). Neither strength task could discriminate between subjects in either group. Subjects with shoulder symptoms had 3% less touches per kilogram of body weight on the CKCUEST compared to subjects without shoulder symptoms but this was not statistically significantly different ( $p = .064$ ).

**Conclusions:** The excellent test/re-test reliability has now been expanded to include individuals with various reasons for shoulder symptoms. Traditional strength testing does not appear to be the ideal assessment method for making discharge and/or return to activity decisions due to the inability to discriminate between the groups. The CKCUEST could be utilized to determine readiness for activity as it was trending towards being discriminatory between known groups.

**Level of Evidence:** Basic Science Reliability Study, Level 3

**Keywords:** CKCUEST, Physical Performance Testing, Reliability, Strength Testing

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