

**NINDS CDE Notice of Copyright
Nine-Hole Peg Test (9-HPT)**

Availability:	<p>Freely available: Rehabilitation Measures Database Website.</p> <p>Freely Available on the NMSS Website: National Multiple Sclerosis Society Website.</p>
Classification:	<p>Core: Friedreich's Ataxia (FA)</p> <p>Supplemental: Multiple Sclerosis (MS), Myotonic Muscular Dystrophy (DM)</p> <p>Exploratory: Cerebral Palsy (CP), Congenital Muscular Dystrophy (CMD), Duchenne/Becker Muscular Dystrophy (DMD), Neuromuscular Disease (NMD), Spinal Cord Injury (SCI) and SCI-Pediatric (age 4 years and over)</p>
Short Description of Instrument:	<p>Construct measured: Upper extremity motor function</p> <p>Generic vs. disease specific: Generic</p> <p>Means of administration: In person by a trained examiner</p> <p>Intended respondent: Patient</p> <p># of items: N/A</p> <p># of subscales and names of sub-scales: N/A</p> <p># of items per sub-scale: N/A</p> <p>Administered by asking the client to take the pegs from a container, one by one, and place them into the holes on the board, as quickly as possible. Participants must then remove the pegs from the holes, one by one, and replace them back into the container. The board should be placed at the client's midline, with the container holding the pegs oriented towards the hand being tested.</p>

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<p>Comments/Special instructions:</p>	<p>Scoring: Both the dominant and non-dominant hands are tested twice within a single testing session. The total time to complete the task is recorded. The score for the 9-HPT is an average of the four trials. The two trials for each hand are averaged, converted to the reciprocals of the mean times for each hand and then the two reciprocals are averaged.</p> <p>Scores are based on the time taken to complete the test activity, recorded in seconds. Alternative scoring - the number of pegs placed in 50 or 100 seconds can be recorded. In this case, results are expressed as the number of pegs placed per second.</p> <p>This score can also be used as part of the Multiple Sclerosis Functional Composite (MSFC) composite score.</p> <p>Background: The 9-HPT is a brief, standardized, quantitative test of upper extremity function.</p> <p>In MSFC, it is the second component to be administered at each visit. Both the dominant and non-dominant hands are tested twice. Two consecutive trials with the dominant hand are immediately followed by two consecutive trials with the non-dominant hand.</p>
<p>Rationale/Justification:</p>	<p>Strengths/Weaknesses: There has been increasing recognition of the usefulness of measuring arm and hand function in clinical studies. The 9-HPT is one of the most frequently used measures of upper extremity function in MS. It is responsive to changes at the upper level of performance but not when impairment is severe.</p> <p>SCI-Pediatric-specific:</p> <p>Normative data and validation complete to 4 years old.</p> <p>Psychometric Properties: The 9-HPT has high inter-rater reliability and good test-retest reliability. There is evidence for concurrent and convergent validity as well as sensitivity to detect minor impairments of hand function. Performance on the 9-HPT may be sensitive to practice effects, that is, patients often display poorer performance when first tested due to lack of familiarity with the task. It is recommended that three or four administrations be given prior to a baseline assessment if accurate (rather than comparative) assessments of change over time are needed.</p> <p>Administration: The 9HPT is administered in person by a trained examiner, who need not be a physician or nurse. Administration time varies depending upon the ability of the patient, but typically total administration time is approximately 10 minutes or less.</p>

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References:	<p>Cohen JA, Fischer JS, Bolibrush DM, Jak AJ, Kniker JE, Mertz LA, Skaramagas TT, Cutter GR. Intrarater and interrater reliability of the MS functional composite outcome measure. <i>Neurol.</i> 2000;54(4):802–806.</p> <p>Demeurisse G, Demol O, Robaye E. Motor evaluation in vascular hemiplegia. <i>Eur Neurol.</i> 1980;19(6):382–389.</p> <p>Erasmus LP, Sarno S, Albrecht H, Schwecht M, Pollmann W, Konig N. Measurement of ataxic symptoms with a graphic tablet: standard values in controls and validity in Multiple Sclerosis patients. <i>J Neurosci Methods.</i> 2001;108(1), 25–37.</p> <p>Mathiowetz V, Kashman N, Volland G, Weber K, Dowe M, Rogers S. Grip and pinch strength: normative data for adults. <i>Arch Phys Med Rehabil.</i> 1985;66(2):69–74.</p> <p>Oxford Grice K, Vogel KA, Le V, Mitchell A, Muniz S, Vollmer MA. Adult norms for a commercially available Nine Hole Peg Test for finger dexterity. <i>Am J Occup Ther.</i> 2003;57(5):570–573.</p> <p>Wang YC, Magasi SR, Bohannon RW, Reuben DB, McCreath HE, Bubela DJ, Gershon RC, Rymer WZ. Assessing dexterity function: a comparison of two alternatives for the NIH Toolbox. <i>J Hand Ther.</i> 2011;24(4):313-20; quiz 321.</p> <p>SCI-Pediatrics:</p> <p>Poole JL, Burtner PA, Torres TA, McMullen CK, Markham A, Marcum ML, Anderson JB, Qualls C. Measuring dexterity in children using the Nine-hole Peg Test. <i>J Hand Ther.</i> 2005;18(3):348–351.</p> <p>Smith YA, Hong E, Presson C. Normative and validation studies of the Nine-hole Peg Test with children. <i>Percept Mot Skills.</i> 2000;90(3 Pt 1):823–843.</p>
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