

**NINDS CDE Notice of Copyright
Grasp and Release Test (GRT)**

Availability:	This instrument is freely available at Grasp and Release Test Link
Classification:	Exploratory: Spinal Cord Injury (SCI) and SCI-Pediatric (age 7 years and over)
Short Description of Instrument:	<p>Construct measured: Upper Extremity Function</p> <p>Generic vs. disease specific: Tetraplegia-specific</p> <p>Means of administration: Paper/pencil</p> <p>Intended respondent: Participant</p> <p># of items: 6 tasks</p> <p># of subscales and names of sub-scales: N/A</p> <p># of items per sub-scale: N/A</p>
Comments/Special instructions:	<p>Scoring: Scored by mean number of successful completions and number of failures performed in 30 seconds, for each object. The mean of three trials grasp and lateral pinch is used for grasp and pinch strength, respectively.</p> <p>Background: This is a performance measure. The GRT was originally developed to evaluate hand function (strength, grasp and release) with a neuroprostheses. Three measures of palmar grasp and lateral pinch are obtained; the mean is used as the measure of pinch and grasp force. The test items are designed to evaluate a gross grasp and a lateral pinch and represent six functional objects encountered in everyday activities. The test requires the unilateral acquisition, movement and release of 6 objects of various sizes and weights. During a single test session, five 30-second trials are performed with each object and the number of completions and failures are recorded for each trial.</p> <p>Equipment: Required equipment includes: a block, can, videotape, peg, paperweight, fork, and test board.</p>
Rationale/Justification:	<p>Strengths/Weaknesses: This test has mostly been applied to individuals with SCI following implantation of a neuroprosthetic or after tendon transfer as it is an assessment of lateral prehension and palmar grasp. Tolerance for sitting upright required, thus recommended for subacute and chronic studies.</p> <p>Psychometric Properties: Test-retest reliability in sample of subjects with mid-cervical injuries (C5-C6) was high with ICC values ranging from 0.87–0.99. The three most difficult items (can, videotape and fork) showed discriminative validity with scores significantly different between functional electrical stimulation assisted function and tenodesis and between pre- and post-tendon transfer hand function. The three most difficult items also predictive scores on 12 month functional independence measure.</p>

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References:	<p>Wuolle, K. S., Van Doren, C. L., Thrope, G. B., Keith, M. W., & Peckham, P. H. (1994). Development of a quantitative hand grasp and release test for patients with tetraplegia using a hand neuroprosthesis. <i>J Hand Surg Am</i>, 19(2), 209–218.</p> <p>SCI-Pediatric:</p> <p>Mulcahey, M. J., Betz, R. R., Smith, B. T., & Weiss, A. A. (1999). A prospective evaluation of upper extremity tendon transfers in children with cervical spinal cord injury. <i>J Pediatr Orthop</i>, 19(3), 319–328.</p> <p>Mulcahey, M. J., Smith, B. T., & Betz, R. R. (2004). Psychometric rigor of the Grasp and Release Test for measuring functional limitation of persons with tetraplegia: a preliminary analysis. <i>J Spinal Cord Med</i>, 27(1), 41–46.</p> <p>Velstra, I. M., Ballert, C. S., & Cieza, A. (2011). A systematic literature review of outcome measures for upper extremity function using the international classification of functioning, disability, and health as reference. <i>Pm r</i>, 3(9), 846–860.</p>
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