Reviewer ID: Jeff Tan, Kyle Diab, Joanne Chi			
Type of Outcome Measure: Grasp and Release Test (GRT)			**Total articles:** 3
Author ID Year	**Study Design**	**Setting**	**Population (sample size, age) and Group**
Wuolle et al. 1994	The GRT was developed and GRT scores were compared in 5 patients with and without a neuroprosthesis.	Case Western Reserve University – Veterans Administration Medical Center	N=5 individuals (4M, 1F) with tetraplegia who were outfitted with a portable hand neuroprosthesis Injury level: C5 (N=3) and C6 (N=2)
Mulcahey et al. 2004	Single group pre/post design. GRT was administered in 2 separate trials prior to any hand intervention; period between 2 GRT sessions ranged from 1-14 days (average=6.5 days). GRT was re-administered to each participant following rehabilitation of tendon transfer surgery or Freehand system implantation which ranged from 3-4 months postsurgery.	Shriners Hospitals for Children, Philadelphia, Pennsylvania	N=19 (21 hands) Age range: 7-20 years All had cervical level SCI. 3 participants (5 hands) had strong C6 or C7 function and underwent bilateral surgical tendon transfers; 16 had C5 or weak C6 level SCI and underwent unilateral surgical implantation of the Freehand System.
Post et al. 2006	Validation Study	Two specialized rehabilitation centres in The Netherlands	N = 55 Age = 42.1 +- 13.5 Time after injury = 11 years +- 8.5 83.6% males
1. RELIABILITY			
Author ID	**Internal Consistency**		**Test-retest, Inter-rater, Intra-rater**
Wuolle et al. 1994	No data available		The range of performance across trials and the range of the session medians can be quite large compared to the grand median. The ratio of half of the range of the session medians devided by the grand median (analogous to a coefficient of variation) ranges from 5% (patient 1, peg) to 133% (patient 4, can) for completions with the neuroprosthesis; 3% (patient 1, peg) to 100% (patient 4, block) for completions without the neuroprosthesis; and 8% (patient 4, block) to 83% (patient 1, can) for failures without the neuroprosthesis. Variability within a session (each object is tested 5 times each session) can also be significant even if the median performance is consistent across sessions. The number of completions by

		patient 1 with the peeg using the neuroprosthesis showed no significant variation in the medians across sessions (P>.05, Kruskall-Wallis test). However, the range of performance within a session was as much as 15-23 completions, suggesting that multiple trials are necessary to obtain reasonable estimates of those medians.
Mulcahey et al. 2004	No data available	Fork, paperweight & videotape: ICC = 1.0 Block: ICC=0.87 (P<.01) Peg: ICC=0.93 (P<.01) Can: ICC=0.99 (P<.01)

2. VALIDITY

Author ID	**Validity**
Wuolle et al. 1994	Injury-level differences between C5 and C6: With the easiest objects (blocks and pegs), one C5 patient (patient 4) had more completions with the neuroprosthesis than without the neuroprosthesis, one C5 patient (patient 3) had no difference, and the two C6 patients (patients 1&2) had fewer completions with the neuroprosthesis. All of the patients had significantly more completions with the four more difficult objects (with the exception of the fork for patient 2 and the tape for patient 4).
Mulcahey et al. 2004	<u>Relationship between GRT objects at post-rehabilitation and 12 month Functional Independence Measure (FIM) Scores</u> Relationships b/w 12-month FIM scores and the peg, block, paperweight and total number of objects successfully manipulated were nonsignificant. Fork & 12-month FIM: ρ = 0.624 (P<.01) Can & 12-month FIM: ρ = 0.700 (P<.01) Videotape & 12-month FIM: ρ = 0.503 (P<.05) Predictive validity coefficients: Can: r=0.88 Tap:r=0.79 Fork: r=0.90 All significant at P<.05. .
Post et al. 2006	Convergent Validity: Excellent convergent validity of GRT and Van Lieshout Test (Spearman correlation coefficient Left hand 0.87, right hand 0.90)

3. RESPONSIVENESS

Author ID	**Responsiveness**
Mulcahey et al. 2004	<u>Change between baseline and post-rehabilitation GRT scores</u> Fork: z=3.05 (P<.01) Paperweight:z=2.83 (P<.01) Can: z=2.66 (P<.01) Total GRT objects manipulated: z=3.40 (P<.05) z = Wilcoxin matched pairs signed-rank test

4. FLOOR/CEILING EFFECT – no data available

5. INTERPRETABILITY – no data available