## ORGANIZATION NEWS

### Highlights From the Rehabilitation Measures Database

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# Measurement Characteristics and Clinical Utility of the Van Lieshout Test-Short Version Among Persons With Cervical Spinal Cord Injury

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Researchers need a reliable and valid method of assessing arm and hand function in individuals who have sustained a cervical spinal cord injury (SCI). The Van Lieshout Hand Function Test for Tetraplegia-Short Version (VLT-SV) reduces administrative burden when testing components of hand function such as positioning and stabilizing the arms, development of the opening and closing of the "function hand," grasp and release, and manipulation using the thumb and fingers.[1] The test contains 10 of the original 19 tasks and decreases the administration time from 60 to 90 minutes down to 25 to 35 minutes.[1] The 10 items are scored from 0 (worst function) to 5 (best function), and the sum of these scores measures the most functional hand's ability to perform basic activities.[1] Rasch analysis suggests rescoring certain items to better equate related items, with a maximum score of 3 per item.[2] A training course can be purchased through the instrument's website along with required items.[1] The instrument has excellent test-retest reliability (0.90), internal consistency (0.88-0.95), inter-rater reliability (0.98-0.99), and excellent construct validity with the original VLT (0.90-0.93).[1,3] SCI-EDGE, a taskforce of the Neurology Section of the American Physical Therapy Association that uses the Evidence Database to Guide Effectiveness, recommends the VLT-SV for use in intervention research studies in populations with cervical SCI. With the potential to reduce administration time by more than an hour,[1] the VLT-SV is a reliable and valid option for researchers to accurately assess important aspects of hand function.

This abbreviated summary provides a review of the psychometric properties of the Van Lieshout Test-Short Version (VLT-SV) in cervical spinal cord injury populations. A full review of the VLT-SV and reviews of more than 460 other instruments for patients with various health conditions can be found at: www.sralab.org/Rehabilitation-Measures.

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This instrument summary is designed to facilitate the selection of outcome measures by clinicians. The information contained in this summary represents a sample of the peer-reviewed research available at the time of this summary's publication. The information contained in this summary does not constitute an endorsement of this instrument for clinical practice. The views expressed are those of the summary authors and do not represent those of authors' employers, instrument owner(s), the *Archives of Physical Medicine and Rehabilitation*, the Rehabilitation Measures Database, or the United States Department of Health and Human Services. The information contained in this summary has not been reviewed externally.

BIBLIOGRAPHY

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| Rehabilitation MEASURES | **Measure Name:** Van Lieshout Test-Short Version | **Acronym:** VLT-SV | **Summary Authors:** Samuel Curry, BA Nicholas McCombs, BS Edeth Engel, BS Linda Ehrlich-Jones, PhD, RN |
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| **Populations Reviewed:** Cervical Spinal Cord Injury | **Administration Time:** 25-35 minutes | **Items:** 10 |
|---|---|---|

**Cost**

$1230.00 for full kit and training CD

**Training Required:**

Training course by order at www.adelante-zorggroep.nl

**Purpose and Administration Instructions:**

Provides an assessment of arm and hand function in individuals that have sustained a cervical SCI. The total score is the mean of the 10 item scores. Item scores range from 0 (worst arm/hand function) up to 5 (best arm/hand function)[1,3]

**Required Equipment:**

Administration form, Vertical semicircular plastic tube, bottle, cylindrical objects of different sizes, small and large tin, coin, jug with water, cup, pen and paper, bottle with crown cork, bottle opener, matches [1]

**Scoring Information:**

Original measure summed all scores,[1,3] however some research suggests weighting scores to equate functioning levels to corresponding difficulty scores.[2] Higher scores indicate better arm/hand function[1-3]

**Validity:**

**Construct Validity**
*Convergent Validity*
*Adequate* correlation between total score* and the Level of Injury (r=0.51)[3]
*Poor* correlation between total score* and AIS (r=0.18) and Italian SCIM III (r=0.07)[3]
*Adequate* to *excellent* correlation with motor level of injury (r=0.58-0.65)[1] and AIS (r=0.35-0.69)[1]
*Excellent* correlation with ICSoHT (motor) (r=0.67-0.85)[1], FIM-self-care (r=0.61-0.69)[1], FIM-transfers (r=0.71-0.72)[1] and VLT (r=.90 - .93)[1]

**Criterion Validity**
*Concurrent Validity*
*Excellent* correlation between the VLT-SV and the GRT (r=0.87-0.90)[1]
*Poor to excellent* correlation between dynamometer and individual items (r=0.29-0.66)[3]
*Poor to excellent* item correlation with the JTHFT (r= -0.96 – -0.138) with many of the fine motor items showing high correlation with the fine motor items of the JTHFT.[3]

**Reliability:**

*Excellent* test-retest reliability (ICC=.90)[3]
*Excellent* inter-rater reliability for the total score (ICC=0.98-0.99)[1]
*Excellent* inter-rater agreement of 9 out of 10 item scores (weighted kappa= 0.74-0.99)[1]
*Adequate* inter-rater agreement for "writing" item score (weighted kappa= 0.47-0.48)[1]

**Cut-off Criteria:**

|  | *r* | ICC |
|---|---|---|
| **Excellent** | $\geq .6$ | $\geq .75$ |
| **Adequate** | .31-.59 | .40 -.74 |
| **Poor** | $\leq .3$ | < .4 |

**Internal Consistency**

*Excellent* internal consistency (Cronbach's α=.88-.95)[1,2,3] and Pearson's Separation Index = 0.91)[2]

**Abbreviations:**

* = Van Lieshout Test-Short Version-Italian Version
VLT-SV= Van Lieshout Test-Short Version
GRT= Grasp-Release Test
AIS= American Spinal Cord Injury Association Impairment Scale
SCIM III= Spinal Cord Injury Independence Measure
ICSoHT= International Classification for Surgery of the Hand in Tetraplegia
FIM= Functional Independence Measure
JTHFT= Jebsen Taylor Hand Function Test
ICC= Intraclass Correlation Coefficient

**Standard Error of Measurement:**

Standard error for each item ranged from 0.208-0.317[2]

**Floor / Ceiling Effects:**

Floor effect (4% of sample) and ceiling effect (11% of sample) were found when transformed using Rasch Analysis[2]

**Considerations:**

VLT original version has 19 items
Also available in English, German, Dutch, Italian