Measurement Characteristics and Clinical Utility of the 10-Meter Walk Test Among Individuals With Spinal Cord Injury

Jennifer Kahn, PT, DPT, NCS, Candy Tefertiller, PT, DPT, ATP, NCS

The 10-meter walk test (10MWT) has been shown to be a highly valid and reliable outcome measure to assess walking speed over a short distance in individuals who have sustained a spinal cord injury (SCI).1-3 This tool is able to detect changes in walking speed in individuals less than 6 months postinjury, but responsiveness appears to diminish after 6 months and once individuals reach normal walking speeds.4 It has excellent clinical utility because it requires very little time and resources to complete. Excellent correlation with other timed walk tests has been demonstrated, and experts suggest using the 10MWT in combination with the Walking Index for Spinal Cord Injury II to provide the most valid measure of improved walking ability.5,6 The 10MWT is recommended for use in all patients who ambulate without physical assistance, and psychometric data diminish when used with individuals requiring assistance for ambulation.7 The 10MWT has been most commonly used with individuals who sustained a motor incomplete SCI but may also be appropriate to use with ambulatory individuals who sustained a motor complete SCI. No significant differences were demonstrated in results when comparing static and dynamic starts in individuals with chronic motor incomplete SCIs.3 Reference norms are available for comfortable and maximum walking speeds and may be a beneficial comparison.

A full review of the 10MWT and reviews of nearly 200 other instruments can be found at www.rehabmeasures.org.

Please address correspondence to rehabmeasures@ric.org.

BIBLIOGRAPHY


This instrument summary is designed to facilitate the selection of outcome measures by trained 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, the United States Department of Education, or the Retirement Research Foundation. The information contained in this summary has not been reviewed externally.

The Rehabilitation Measures Database and Instrument Summary Tear-sheets are funded by the National Institute on Disability and Rehabilitation Research, United States Department of Education through the Rehabilitation Research and Training Center on Improving Measurement of Medical Rehabilitation Outcomes (grant no. H133B090024) and the Retirement Research Foundation (grant no. 2011-027).
# Measurement Characteristics and Clinical Utility of the 10-Meter Walk Test Among Individuals With Spinal Cord Injury

**Measure Name:** 10 Meter Walk Test  
**Acronym:** 10MWT  
**Summary Author:** Kahn J, Tefertiller C

<table>
<thead>
<tr>
<th>Population Reviewed:</th>
<th>Admin Time:</th>
<th>Items:</th>
<th>Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI, others reviewed at <a href="http://www.rehabmeasures.org">www.rehabmeasures.org</a></td>
<td>&lt; 5 minutes</td>
<td>1</td>
<td>Time (m/s)</td>
</tr>
</tbody>
</table>

**Purpose and Administration Instructions:**

- Assesses walking speed in meters per second over a short duration.
- Method 1: The individual walks 10 meters without assistance and the time is measured for the intermediate 6 meters to allow for acceleration and deceleration.
- Method 2: The individual walks a total of 14 meters. A “flying start” is used where the individual may accelerate 2 meters before entering the 10-meter distance and 2 meters to decelerate afterwards. Speed is only calculated for the 10 meter distance between the end zones.
- Collect three trials and calculate the average

**Required Equipment:**  
Stopwatch, clear pathway of at least 14 meters in length

**Validity:**

**Convergent Validity:**
- *Excellent* correlation with the TUG\(^3\), 6MWT\(^3\), BBS\(^5\), 2MWT\(^4\), WISCI\(^6\), and SCI-FAI (parameter, assistive devices, and mobility)\(^6\)
- *Poor to adequate* correlation with the WISCI when testing individuals who are lower level walkers; Improved correlation noted with individuals who are less impaired\(^5\)

**Content Validity:** 60% of expert raters categorized the 10MWT as valid or useful; 38% as useful but requires validation or changes/improvements\(^9\)

**Minimal Detectable Change (MDC):**

\[ \text{MDC} = \text{A change of} \ 0.13 \text{ m/s was found to detect significant clinical change for 10MWT}\(^2\) \]

**Minimally Clinically Important Difference (MCID):**

\[ \text{MCID} = 0.06 \text{ m/s}\(^7\) \]

**Considerations:**

- No significant difference is noted when comparing static and dynamic starts in chronic incomplete SCI\(^1\)
- Demonstrates questionable responsiveness in individuals with Chronic SCI who reach normal walking speeds\(^4\)
- The 10MWT and WISCI were recommended by the National Institute of Disability and Rehabilitation Research to provide the most valid measure of improvement\(^5\)
- Assistive devices can be used but should be documented and consistent
- Assessment can be performed at preferred and/or fastest possible speeds; documented accordingly

**Reliability:**

**Test-retest Reliability:** Excellent  
**Interrater Reliability:** Excellent

**Training:** None required

**Floor/Ceiling Effects:**

10MWT did not demonstrate a ceiling effect in a sample of subjects with AIS D in inpatient rehabilitation\(^6\)

**Abbreviations:**

AIS D: ASIA Impairment Scale D (motor incomplete)  
BBS: Berg Balance Scale  
2MWT: 2 Minute Walk Test  
6MWT: 6 Minute Walk Test  
SCI: Spinal Cord Injury  
SCI-FAI: Spinal Cord Injury Functional Ambulation Inventory  
TUG: Timed Up and Go  
WISCI: Walking Index for Spinal Cord Injury

<table>
<thead>
<tr>
<th>Cut-off Criteria</th>
<th>( r )</th>
<th>ICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>( \geq 0.6 )</td>
<td>( \geq 0.75 )</td>
</tr>
<tr>
<td>Adequate</td>
<td>0.31-0.59</td>
<td>0.40-0.74</td>
</tr>
<tr>
<td>Poor</td>
<td>( \leq 0.3 )</td>
<td>&lt; 0.4</td>
</tr>
</tbody>
</table>