ORGANIZATION NEWS

Highlights From the Rehabilitation Measures Database
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Measurement Characteristics and Clinical Utility of the 10-Meter Walk Test Among Individuals With Spinal Cord Injury

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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.

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BIBLIOGRAPHY

1. Scivoletto G, Tamburella F, Laurenza L, Foti C, Ditunno JF, Molinari M. Validity and reliability of the 10-m walk test and the 6-min walk test in spinal cord injury patients. Spinal Cord 2011;49:736-40.
2. Lam T, Noonan VK, Eng JJ, SCIRE Research Team. A systematic review of functional ambulation outcome measures in spinal cord injury. Spinal Cord 2008;46:246-54.
3. van Hedel HJ, Wirz M, Dietz V. Assessing walking ability in subjects with spinal cord injury: validity and reliability of 3 walking tests. Arch Phys Med Rehabil 2005;86:190-6.
4. van Hedel HJ, Wirz M, Curt A. Improving walking assessment in subjects with an incomplete spinal cord injury: responsiveness. Spinal Cord 2006;44:352-6.
5. Jackson AB, Carnel CT, Ditunno JF, et al. Outcome measures for gait and ambulation in the spinal cord injury population. J Spinal Cord Med 2008;31:487-99.
6. Lemay JF, Nadeau S. Standing balance assessment in ASIA D paraplegic and tetraplegic participants: concurrent validity of the Berg Balance Scale. Spinal Cord 2010;48:245-50.
7. Musselman K. Clinical significance testing in rehabilitation research: what, why, and how? Phys Ther Rev 2007;12:287-96.
8. Bowden MG, Behrman AL. Step Activity Monitor: accuracy and test-retest reliability in persons with incomplete spinal cord injury. J Rehabil Res Dev 2007;44:355-62.

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

Population Reviewed:		**Admin Time:**	**Items:**	**Score:**
SCI, others reviewed at www.rehabmeasures.org		< 5 minutes	1	Time (m/s)

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:	**Training:**
Stopwatch, clear pathway of at least 14 meters in length	None required

Validity:

Convergent Validity:
- _Excellent_ correlation with the TUG[3], 6MWT[3], BBS[6], 2MWT[6], WIS-CI[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[3]

Content Validity: 60% of expert raters categorized the 10MWT as valid or useful; 38% as useful but requires validation or changes/improvements[5]

Reliability:

Test-retest Reliability: Excellent test-retest reliability[2,8]
Interrater Reliability: Excellent interrater reliability[1,3]
Intrarater Reliability: Excellent intrarater reliability[1,3]

Minimal Detectable Change (MDC):

MDC = A change of 0.13 m/s was found to detect significant clinical change for 10MWT[2]

Minimally Clinically Important Difference (MCID):

MCID = 0.06 m/s[7]

Standard Error of Measurement (SEM):

SEM = 0.05 m/s[3,7]

Floor/Ceiling Effects:

10MWT did not demonstrate a ceiling effect in a sample of subjects with AIS D in inpatient rehabilitation [6]

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

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

Cut-off Criteria:		
	_r_	ICC
Excellent	≥ 0.6	≥ 0.75
Adequate	0.31-0.59	0.40-0.74
Poor	≤ 0.3	< 0.4