

ORGANIZATION NEWS

Highlights From the Rehabilitation Measures Database

This content is provided as a service by the American Congress of Rehabilitation Medicine and is not peer reviewed by the Archives.

Measurement Characteristics and Clinical Utility of the 12-Item Multiple Sclerosis Walking Scale

Diane D. Allen, PT, PhD, Kirsten Potter, PT, DPT, NCS

Mobility impairments are among the most common symptoms reported by individuals with multiple sclerosis (MS),¹ with prevalence rates ranging from about 50% to >90%.² Fewer than 50% of people with MS walk unaided.³ Gait abnormalities are found in individuals with early MS⁴ and those minimally affected by the disease⁵; yet, people with MS can remain ambulatory for 10 to 20 years and more.⁶ Those with more disability (Expanded Disability Status Scale scores 3–5) are at moderate risk of developing gait limitations in 10 years, with half requiring an assistive device.⁶ Thus, measuring mobility is a common component of the examination of patients with MS. The 12-Item MS Walking Scale⁷ (MSWS-12) is a self-report measure of the impact of MS on walking ability. Two versions exist; this summary pertains to the original version. The MSWS-12 can be administered in less than 10 minutes; each item is rated on a 1–5 point scale (1 = no limitation and 5 = extreme limitation) and the score is transformed to a 0–100 point scale. Data support its reliability, validity, and responsiveness.

This abbreviated summary provides a review of the psychometric properties of the MSWS-12. A full review of the MSWS-12 and 62 other measures for patients with MS can be found at <http://neuopt.org/go/healthcare-professionals/neurology-section-outcome-measures-recommendations/multiple-sclerosis>. Reviews of nearly 200 other instruments for patients with various health conditions can be found at www.rehabilitationmeasures.org.


Please address all correspondence to Diane Allen, PhD, at University of California San Francisco/San Francisco State University (ddallen@sfsu.edu) or Kirsten Potter, PT, DPT, MS, NCS at Rockhurst University (kirsten.potter@rockhurst.edu).

BIBLIOGRAPHY

1. Peterson EW, Cho CC, Koch L, et al. Injurious falls among middle aged and older adults with multiple sclerosis. *Arch Phys Med Rehabil* 2008;89:1031-7.
2. Sutliff MH. Contribution of impaired mobility to patient burden in multiple sclerosis. *Curr Med Res Opin* 2010;28:109-19.
3. Swingler RJ, Compston DAS. The morbidity of multiple sclerosis. *QJM* 1992;83:325-37.
4. Martin CL, Phillips BA, Kilpatrick TJ, et al. Gait and balance impairment in early multiple sclerosis in the absence of clinical disability. *Multiple Sclerosis* 2006;12:620-8.
5. Benedetti MG, Piperno R, Simoncini L, et al. Gait abnormalities in minimally impaired multiple sclerosis patients. *Multiple Sclerosis* 1999;5:363-38.
6. Pittock SJ, Mayr WT, McClelland RL, et al. Change in MS-related disability in a population-based cohort. *Neurology* 2004;62:51-9.
7. Hobart JC, Riazi A, Lamping DL, Fitzpatrick R, Thompson AJ. Measuring the impact of MS on walking ability: the 12-item MS Walking Scale (MSWS-12). *Neurol* 2003;60:31-6.
8. McGuigan C, Hutchinson M. Confirming the validity and responsiveness of the Multiple Sclerosis Walking Scale-12 (MSWS-12). *Neurol* 2004;62:2103-5.
9. Cavanaugh JT, Gappmaier VO, Dibble LE, Gappmaier E. Ambulatory activity in individuals with multiple sclerosis. *J Neurol Phys Ther* 2011;35:26-33.
10. Goldman MD, Marrie RA, Cohen JA. Evaluation of the six-minute walk in multiple sclerosis subjects and healthy controls. *Mult Scler* 2008;14:383-90.
11. Motl RW, Dlugonski D, Suh Y, et al. Multiple Sclerosis Walking Scale-12 and oxygen cost of walking. *Gait Posture* 2010;31:506-10.
12. Motl RW, Snook EM. Confirmation and extension of the validity of the Multiple Sclerosis Walking Scale-12 (MSWS-12). *J Neurol Sci* 2008;268:69-73.
13. Sosnoff JJ, Weikert M, Dlugonski D, Smith DC, Motl RW. Quantifying gait impairment in multiple sclerosis using GAITRite™ technology. *Gait Posture* 2011;34:145-7.
14. Nilsagard Y, Lundholm C, Denison E, Gunnarsson LG. Predicting accidental falls in people with multiple sclerosis—a longitudinal study. *Clin Rehabil*. 2009;23:259-69.
15. Motl RW, McAuley E, Mullen S. Longitudinal measurement invariance of the Multiple Sclerosis Walking Scale-12. *J Neurol Sci* 2011;305:75-9.
16. Riazi A, Thompson AJ, Hobart JC. Self-efficacy predicts self-reported health status in multiple sclerosis. *Mult Scler* 2004;10:61-6.

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*, or the United States Department of Education. 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 (H133B090024).

	Measure Name:	Acronym:	Summary Authors:												
	The 12 – Item Multiple Sclerosis Walking Scale	MSWS-12	Allen D, Potter K												
Population Reviewed:	Admin Time:	Items:	Score:												
Multiple Sclerosis	< 10 minutes	12	0/100 (min / max)**												
Purpose and Administration Instructions:			Training Requirements:												
Self-report measure of the impact of MS on the individual's walking ability			None required												
Scoring Instructions:		Scoring Interpretation:													
<ul style="list-style-type: none"> Each item is rated on a 1 to 5 point scale (1 = no limitation and 5 = extreme limitation); the score is then transformed to a 0 to 100 point scale If the individual cannot walk, the requested box should be checked and no items should be completed 		<ul style="list-style-type: none"> Higher score indicates greater impact of MS on walking ability 													
Reliability:		Validity:													
<ul style="list-style-type: none"> Test-retest Reliability: Excellent in MS^{7,15} Internal Consistency: Excellent in MS⁷⁻⁸ 		<ul style="list-style-type: none"> Concurrent Validity: Adequate to excellent correlations to gait measures in MS: T25FW,⁷⁻⁹ 6MWT,⁹⁻¹⁰ oxygen cost of walking,¹¹ accelerometer counts,¹² daily step count,⁹ gait velocity measured by instrumented gait mat.¹³ Excellent correlations with MSIS-29^{7-8,12} Predictive Validity: At cut off of ≥ 75, sensitivity = 0.52 and specificity = 0.82 in predicting fallers vs. non-fallers¹⁴ 													
Responsiveness:		Normative Data:													
<ul style="list-style-type: none"> In 54 patients with MS undergoing steroid treatment, an effect size of 0.93 was noted, compared to an effect size of 0.45 for EDSS and 0.36 for T25FW⁷ The MSWS-12 changed more (mean = 19.3) in people with MS who had a change ≥ 1 in EDSS scores compared to people who had no change in EDSS scores in a 6-24 month period⁸ In 43 patients receiving rehabilitation for MS, the MSWS-12 showed an effect size of 0.89; in 46 patients receiving steroid treatment, the effect size on the MSWS-12 was 0.85¹⁶ MCID and MDC not yet reported in MS 		<ul style="list-style-type: none"> Mean MSWS-12 for 40 people living with MS = 28.2 (25); in contrast, scores for 20 healthy controls were 2.2 (5.6)¹⁰ 													
Considerations:		Floor / Ceiling:													
<ul style="list-style-type: none"> The MSWS-12 is recommended as a good indicator of actual walking behavior in people with MS at EDSS 3.5-7.59⁹ Two versions exist; this summary pertains to the original version. The later version converts scoring for 3 items to 1-3 instead of 1-5; scoring for the rest of the items remains the same 		<ul style="list-style-type: none"> No significant effects in community dwelling MS patients who are ambulatory⁷ 													
		Abbreviations:													
		EDSS: Expanded Disability Status Scale T25FW: Timed 25 Foot Walk MCID: Minimal Clinical Important Difference MDC: Minimal Detectable Change 6MWT: 6 Minute Walk Test													
		Cut-off Criteria:													
		<table border="1"> <thead> <tr> <th></th> <th><i>r</i></th> <th>ICC</th> </tr> </thead> <tbody> <tr> <td>Excellent</td> <td>≥ 0.6</td> <td>≥ 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>≤ 0.3</td> <td>< 0.4</td> </tr> </tbody> </table>			<i>r</i>	ICC	Excellent	≥ 0.6	≥ 0.75	Adequate	0.31-0.59	0.40-0.74	Poor	≤ 0.3	< 0.4
	<i>r</i>	ICC													
Excellent	≥ 0.6	≥ 0.75													
Adequate	0.31-0.59	0.40-0.74													
Poor	≤ 0.3	< 0.4													