

Appendix. Construct, reliability, and validity of measurement tools.

Scale	Construct	Evidence for reliability	Evidence for validity
MiniBESTest¹⁻⁴	Performance-based balance test across four domains (anticipatory postural control, reactive postural control, sensory orientation, dynamic gait).	Excellent test-retest (ICC=0.92) and inter-rater reliability (ICC=0.91) in PD ⁴	Good to excellent concurrent validity with the Berg Balance Test in PD ($r_s \geq 0.79$) ^{2,5}
Functional Reach Test⁶	Measurement of the maximum distance one can reach forward while standing in a fixed position.	Excellent test-retest reliability in PD (ICC=0.84) ⁷ and adequate intra-rater reliability (ICC=0.74) ⁸	Good predictive validity for future falls in PD ^{9,10}
Timed Up and Go Test (TUGT)¹¹	Timed completion of rising from a chair, walking three meters, turning around, walking back to the chair, and sitting down.	Good test-retest reliability in PD (ICCs ≥ 0.80) ^{12,13} and excellent interrater reliability ($r=0.99$) in PD ¹⁴	Moderate to good convergent validity evidence in PD (correlated with the BBS ($r=-0.78$), fast gait speed ($r=-0.69$), and comfortable gait speed ($r=-0.67$) ¹⁵
Computerized dynamic posturography – motor control and sensory organization	Computerized assessment of one's ability to use visual, proprioceptive and vestibular cues to maintain static postural stability	Adequate composite score reliability (ICC = 0.66) in older adults ¹⁶ and excellent reliability in multiple sclerosis (ICC = .90) ¹⁷	Good discriminant validity with self-reported falls history in individuals with vestibulopathy ¹⁸ and with high and low disability in multiple sclerosis ¹⁷
Instrumented walkway - Protokinetics Zeno Walking Mat	Quantitative analysis of spatial and temporal gait measurements using an instrumented walkway	Excellent test-retest reliability (ICCs ≥ 0.92) in healthy adults ¹⁹ and older adults (ICCs $\geq .82$) ²⁰	Excellent concurrent validity with paper-and-pencil analysis and video (ICCs $\geq .93$) ²¹ and good discriminative validity in people with and without Parkinson's disease ²²

REFERENCES

1. King L, Horak F. On the mini-BESTest: scoring and the reporting of total scores. *Phys Ther.* 2013;93(4):571-575.
2. King LA, Priest KC, Salarian A, Pierce D, Horak FB. Comparing the Mini-BESTest with the Berg Balance Scale to Evaluate Balance Disorders in Parkinson's Disease. *Parkinson's disease.* 2012;2012:375419.
3. Franchignoni F, Horak F, Godi M, Nardone A, Giordano A. Using psychometric techniques to improve the Balance Evaluation Systems Test: the mini-BESTest. *Journal of rehabilitation medicine : official journal of the UEMS European Board of Physical and Rehabilitation Medicine.* 2010;42(4):323-331.
4. Leddy AL, Crouner BE, Earhart GM. Utility of the Mini-BESTest, BESTest, and BESTest sections for balance assessments in individuals with Parkinson disease. *J Neurol Phys Ther.* 2011;35(2):90-97.
5. McNeely ME, Duncan RP, Earhart GM. Medication improves balance and complex gait performance in Parkinson disease. *Gait & posture.* 2012;36(1):144-148.
6. Weiner DK, Duncan PW, Chandler J, Studenski SA. Functional reach: a marker of physical frailty. *J Am Geriatr Soc.* 1992;40(3):203-207.

7. Schenkman M, Cutson TM, Kuchibhatla M, Chandler J, Pieper C. Reliability of impairment and physical performance measures for persons with Parkinson's disease. *Phys Ther.* 1997;77(1):19-27.
8. Lim LI, van Wegen EE, de Goede CJ, et al. Measuring gait and gait-related activities in Parkinson's patients own home environment: a reliability, responsiveness and feasibility study. *Parkinsonism Relat Disord.* 2005;11(1):19-24.
9. Dibble LE, Lange M. Predicting falls in individuals with Parkinson disease: a reconsideration of clinical balance measures. *J Neurol Phys Ther.* 2006;30(2):60-67.
10. Behrman AL, Light KE, Flynn SM, Thigpen MT. Is the functional reach test useful for identifying falls risk among individuals with Parkinson's disease? *Arch Phys Med Rehabil.* 2002;83(4):538-542.
11. Podsiadlo D, Richardson S. The timed "Up & Go": a test of basic functional mobility for frail elderly persons. *J Am Geriatr Soc.* 1991;39(2):142-148.
12. Steffen T, Seney M. Test-retest reliability and minimal detectable change on balance and ambulation tests, the 36-item short-form health survey, and the unified Parkinson disease rating scale in people with parkinsonism. *Phys Ther.* 2008;88(6):733-746.
13. Huang SL, Hsieh CL, Wu RM, Tai CH, Lin CH, Lu WS. Minimal detectable change of the timed "up & go" test and the dynamic gait index in people with Parkinson disease. *Phys Ther.* 2011;91(1):114-121.
14. Morris S, Morris ME, Iansek R. Reliability of measurements obtained with the Timed "Up & Go" test in people with Parkinson disease. *Phys Ther.* 2001;81(2):810-818.
15. Brusse KJ, Zimdars S, Zalewski KR, Steffen TM. Testing functional performance in people with Parkinson disease. *Phys Ther.* 2005;85(2):134-141.
16. Ford-Smith CD, Wyman JF, Elswick RK, Jr., Fernandez T, Newton RA. Test-retest reliability of the sensory organization test in noninstitutionalized older adults. *Arch Phys Med Rehabil.* 1995;76(1):77-81.
17. Hebert JR, Manago MM. Reliability and Validity of the Computerized Dynamic Posturography Sensory Organization Test in People with Multiple Sclerosis. *Int J MS Care.* 2017;19(3):151-157.
18. Whitney SL, Marchetti GF, Schade AI. The relationship between falls history and computerized dynamic posturography in persons with balance and vestibular disorders. *Arch Phys Med Rehabil.* 2006;87(3):402-407.
19. van Uden CJ, Besser MP. Test-retest reliability of temporal and spatial gait characteristics measured with an instrumented walkway system (GAITRite). *BMC Musculoskelet Disord.* 2004;5:13.
20. Menz HB, Latt MD, Tiedemann A, Mun San Kwan M, Lord SR. Reliability of the GAITRite walkway system for the quantification of temporo-spatial parameters of gait in young and older people. *Gait & posture.* 2004;20(1):20-25.
21. McDonough AL, Batavia M, Chen FC, Kwon S, Ziai J. The validity and reliability of the GAITRite system's measurements: A preliminary evaluation. *Arch Phys Med Rehabil.* 2001;82(3):419-425.
22. Nelson AJ, Zwick D, Brody S, et al. The validity of the GaitRite and the Functional Ambulation Performance scoring system in the analysis of Parkinson gait. *NeuroRehabilitation.* 2002;17(3):255-262.