



# Outcome Measurement in Balance Problems: Berg Balance Scale

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Balance has been recognized as a crucial factor, as it involves maintaining posture during static stance and transitioning between movements, and it plays a significant role in performing daily activities. Consequently, numerous studies have been conducted to evaluate balance ability over the years [1].

The Berg Balance Scale (BBS) is the best-known balance measure that assesses balance and fall risk in adults. The BBS consists of 14 items with an ordinal scale of 0 to 4 for a total of 56 points (a lower score indicates higher fall risk). Zero score indicates the lowest level of function and 4 score the highest level of function and it takes approximately 20 minutes to complete. The items evaluate from the static position with increasing difficulty by decreasing the base of support to dynamic activities. The BBS is designed with content closely resembling real-life daily activities, making it easy to learn and allowing for repetitive evaluations. It requires minimal cost, time, and simple equipment [2-4]. Additionally, even patients in the acute phase of stroke, many of whom may be unable to sit or stand, can undergo the assessment, highlighting its advantages [4].

The clinical utility of the BBS includes the ability to estimate rehabilitation outcomes using the total score of the scale. Research on estimating rehabilitation outcomes suggests that scores measured at admission using the BBS are inversely related to the length of hospitalization and can predict the duration of hospitalization and eventual discharge decisions [5]. Additionally, studies have categorized functional levels based on scores; for instance, scores ranging from 0 to 20 indicate the ability to walk with a walking aid, scores from 21 to 40 suggest the ability to walk with assistance, and scores from 41 to 56 indicate independent walking capability [6]. The BBS also serves as a predictor of fall risk, with scores of 41–56 indicating low risk, 21–40 indicating medium risk, and 0–20 indicating high risk [7].

Berg et al. [3,4] reported that the reliability of the BBS was 0.83 as measured by Cronbach's alpha coefficient in a study involving the general elderly population, and 0.97 in a study involving stroke patients, indicating high reliability (Table 1). This suggests that the BBS may be particularly useful for assessing balance in stroke patients, showing higher reliability in this population compared to its original purpose of assessing fall risk in the elderly. The BBS has been validated for use in individuals with spinal cord injury and has the advantage of being valuable for other neurologic populations [8]. The Korean version of BBS has also been verified for validity and reliability [9].

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**Table 1.** Characteristics of Berg Balance Scale

Characteristic	Value
Number of items	14 items
Total score	56
Time to complete	20 min
Reliability (inter-rater)	0.83–0.97
Reliability (internal consistency)	0.97
Validity (predictive)	0.67
Minimal clinically important difference	13.5

The minimal clinically important difference (MCID) for balance improvement was 13.5 points in stroke patients, indicating that the BBS MCID does clinically detect changes in balance abilities in persons with stroke [10].

There are limitations in the BBS. The BBS doesn't measure the quality of gait and the speed of walking, therefore, may be less useful than other tools where motor control is a bigger contributor to poor balance than muscle weakness. It also has a ceiling effect in younger people (<75) who have balance problems even if they have an increased risk of falling. [11].

In conclusion, the BBS is a useful outcome measure in predicting the risk of falls, assessing balance deficits, providing a numerical score that can be tracked for improvement over time, and even assessing the length of stay at inpatient rehabilitation.

## CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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## REFERENCES

1. Blum L, Korner-Bitensky N. Usefulness of the Berg Balance Scale in stroke rehabilitation: a systematic review. *Phys Ther* 2008;88:559-66.
2. Berg KO, Maki BE, Williams JI, Holliday PJ, Wood-Dauphinee SL. Clinical and laboratory measures of postural balance in an elderly population. *Arch Phys Med Rehabil* 1992;73:1073-80.
3. Berg K, Wood-Dauphinee S, Williams JI, Gayton D. Measuring balance in the elderly: preliminary development of an instrument. *Physiother Can* 1989;41:304-11.
4. Berg K, Wood-Dauphinee S, Williams JI. The Balance Scale: reliability assessment with elderly residents and patients with an acute stroke. *Scand J Rehabil Med* 1995;27:27-36.
5. Wee JY, Bagg SD, Palepu A. The Berg Balance Scale as a predictor of length of stay and discharge destination in an acute stroke rehabilitation setting. *Arch Phys Med Rehabil* 1999;80:448-52.
6. Elliott J. The clinical uses of the Berg Balance Scale. *Physiotherapy* 1997;83:363.
7. Lima CA, Ricci NA, Nogueira EC, Perracini MR. The Berg Balance Scale as a clinical screening tool to predict fall risk in older adults: a systematic review. *Physiotherapy* 2018;104:383-94.
8. Wirz M, Müller R, Bastiaenen C. Falls in persons with spinal cord injury: validity and reliability of the Berg Balance Scale. *Neurorehabil Neural Repair* 2010;24:70-7.
9. Jung HY, Park JH, Shim JJ, Kim MJ, Hwang MR, Kim SH. Reliability test of Korean version of Berg Balance Scale. *J Korean Acad Rehabil Med* 2006;30:611-8.
10. Song MJ, Lee JH, Shin WS. Minimal clinically important difference of Berg Balance Scale scores in people with acute stroke. *Phys Ther Rehabil Sci* 2018;7:102-8.
11. Downs S. The Berg Balance Scale. *J Physiother* 2015;61:46.