Berg Balance Scale (BBS)

Assessment Overview

Assessment Area

ICF Domain:
Activity
Subcategory:
Mobility

You Will Need

Length:
Approximately 20 minutes
Equipment:
- 2 standard chairs (1 with arms and 1 without)
- Stopwatch
- Step or stepstool
- Ruler

Scoring:
Each task is rated on a 5-point scale from 0 (cannot perform) to 4 (normal performance). Task scores are summed to yield a total score (0-56).

Summary

The Berg Balance Scale (BBS) is a performance-based measure of balance with a number of clinical walking evaluations. Tasks progress in difficulty and include functional activities related to balance while reaching, bending, transferring, and standing.
The BBS is has been found to be an appropriate assessment of standing balance as shown by its strong associations with various clinical walking evaluations. The tool is applicable to people with incomplete SCI.

Availability

Available for free here:
http://scireproject.com/wp-content/uploads/worksheet_berg_balance_scale_bbs-1.doc

Video: https://www.scireproject.com/outcome-measures/video

Languages: English, Italian, Turkish, Brazilian-Portuguese, German, Korean, and Dutch.

Assessment Interpretability

Minimal Clinically Important Difference

Not established in SCI

Statistical Error

Standard Error of Measurement:
0.66

(Srism et al. 2015; n=83, chronic SCI, mixed injury types, mean time since injury (multiple and non-multiple fallers) = 46.72-58.70 months)

Minimal Detectable Change:
%MDC = 17.2%

MDC$_{95}$ = 5.74

(Lemay & Nadeau 2010; N=32, 25 male, AIS D mixed injury types, mean time since injury (SD) = 77.2 (44.3) days)

Typical Values

Mean (SD) Admission-Discharge Scores:
All individuals: 11(16)-17(20)
AIS-A/B: 3(2)-4(2)
AIS-C: 5(6)-13(15)
AIS-D: 26(19)-36(20)

(Post locomotor training; Harkema et al. 2016; N=152, 123 male; mixed injury type; median (range) time post-SCI = 0.9 (0.1-45.2) years)

Threshold Values:
No effective threshold for distinguishing fallers from non-fallers

(Wirz et al 2010; N=42, 33 male, 35 AIS-C, mixed injury type, mean 66.5(66.2) months post-SCI)

Measurement Properties

Validity – **Low** to **High**

High correlation with Walking Index for SCI:
r = 0.89-0.92

High correlation with Functional Independence Measure (FIM):
r = 0.72-0.77

High correlation with FIM Locomotor Score:
r = 0.86-0.89

(Ditunno et al. 2007; n=146, 114 males, inpatient, incomplete SCI, within 1 year post-injury)

Low to **High** correlation with ASIA Motor Scale:
UEMS = 0.30
LEMS = 0.79
ASIA Motor Score = 0.75

(Harkema et al. 2016; N=152, 123 male; mixed injury type; median (range) time post-SCI = 0.9 (0.1-45.2) years)

High correlation with Mini-BESTest scale:
r = 0.899 (P<0.001)

High correlation with Timed Up and Go (TUG) assessment:
r = -0.75 (P<0.001)

High correlation with Spinal Cord Independence Measure version III (SCIM):
r = 0.88 (P<0.001)

High correlation with Walking Index for Spinal Cord Injury version II (WISCI):
r = 0.63 (P<0.001)

High correlation with Fall Efficiency Scale – International (FES-I):

Reliability – **High**

High Inter-rater Reliability:
ICC = 0.998

(Srism et al. 2015; n=83, chronic SCI, mixed injury types, mean time since injury (multiple and non-multiple fallers) = 46.72-58.70 months)

High Intra-rater Reliability:
ICC = 0.97

(Tamburella et al. 2014; n=23, 14 males, AIS D, time Since Injury (SD): 16.43 (19.03) months)

High Internal Consistency:
IC = 0.94

(Jørgensen et al. 2017; n=46 (32 males); AIS D=85%, duration of injury (range): 6.5 years (1-41))

Number of studies reporting reliability data: 4

r = -0.68 (P<0.001)

***Low* correlation with participants' fear of falling:**
r = -0.32 (P=0.83)

***Low* correlation with Quality of Life (QOL) questionnaire:**
r = -0.75 (P=0.20)

(Jørgensen et al. 2017; n=46 (32 males); AIS D=85%, duration of injury (range): 6.5 years (1-41))

Number of studies reporting validity data: 8

Responsiveness

Floor/Ceiling Effect:
Significant ceiling effect; 28.3%-37.5% of subjects reached maximal score

(Lemay & Nadeau 2010; N=32, 25 male, AIS D mixed injury types, mean time since injury (SD) = 77.2 (44.3) days)

(Jørgensen et al. 2017; n=46 (32 males); AIS D=85%, duration of injury (range): 6.5 years (1-41))

Effect Size:
Standardized Response Mean:
All individuals: 0.59
AIS-A/B: 0.52
AIS-C: 0.65
AIS-D: 0.91

(Post locomotor training; Harkema et al. 2016; N=152, 123 male; mixed injury type; median (range) time post-SCI = 0.9 (0.1-45.2) years)

Number of studies reporting responsiveness data: 3