### Berg Balance Scale (BBS)

#### Assessment Overview

**Assessment Area**

<table>
<thead>
<tr>
<th>ICF Domain:</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcategory:</td>
<td>Mobility</td>
</tr>
</tbody>
</table>

#### Summary

The Berg Balance Scale (BBS) is a performance-based measure of balance with 14 tasks. Tasks progress in difficulty and include functional activities related to balance while reaching, bending, transferring, and standing. Originally developed for use with seniors, the scale has been used in a variety of populations including stroke, Parkinson’s, multiple sclerosis, and recently SCI. The BBS is generally well received among clinicians and researchers who specialize in the area of gait and balance training. It has been found to be an appropriate assessment of standing balance for these individuals as shown by its strong associations with various clinical walking evaluations. The tool is only applicable to individuals with incomplete SCI who retain some ability to stand and walk.

#### Availability

- Video: [https://www.scireproject.com/outcome-measures/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 (post-SCI +1 day to 10 years))

**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-
Measurement Properties

Validity – Low to High

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

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

*High* correlation with FIM Locomotor Score:
Correlation = 0.86-0.89

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

*Low* to *Moderate* 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)*

Number of studies reporting validity data: 7

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)*

Number of studies reporting reliability data: 3

Responsiveness

Floor/Ceiling Effect:
Significant ceiling effect; 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)*

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: 2