

# Berg Balance Scale

## Introduction:

This manual includes the original BBS instructions combined with customized modifications, to transfer the reliability of the BBS from a research environment to the clinical setting.

## Equipment needed:

- Ruler
- Two standard chairs 16 inches in height (one with arm rests, one without)
- 8 inch footstool or step
- Stopwatch
- Rolled up towel

## Completion Time:

06-30 minutes <sup>26</sup>

## General Instructions:

- Please demonstrate each task and/or give instructions as written. When scoring, please record the lowest response category that applies for each item. <sup>1</sup>
- Subjects should understand that they must maintain their balance while attempting the tasks. The choices of which leg to stand on or how far to reach are left to the subject. Poor judgment will adversely influence the performance and the scoring. <sup>1</sup>

## UDE Operational Instructions:

- The best score will be selected only if poor performance was secondary to decreased understanding of instructions.
- If more verbal cues are required once task item has started, performance will be scored as supervision.
- If the therapist supervises the patient during a task item, but deems the patient safe in the task, the patient's score should reflect performance, not supervision.
- The items are to be performed without an assistive device. If an assistive device is used, the examiner must document and be aware that standard normative data will not apply.
- For timed items, please inform patients of the maximum time they are expected to hold the position

## Definitions/Terms:

**Supervision:** Supervision is defined as:

Verbal cues as required for balance safety

Patient requires the examiner to stand within arms reach to ensure balance safety

**Contact Guard Assist:** Contact Guard Assistance is defined as

Examiner physically touches the patient, but does not assist with maintaining balance. For the purpose of this examination, Contact Guard Assist is combined with Minimum assistance.

## EXAMINATION

### 1. BBS Instructions: SITTING TO STANDING

INSTRUCTIONS: "Please stand up. Try not to use your hand for support."

- ( ) 4 able to stand without using hands and stabilize independently
- ( ) 3 able to stand independently using hands
- ( ) 2 able to stand using hands after several tries
- ( ) 1 needs minimal aid to stand or stabilize
- ( ) 0 needs moderate or maximal assist to stand

#### UDE Operational Instructions:

Chair Height: 16 inches.

For a score of 1, "needs minimal aid" includes supervision.

For a score of a 0, "needs moderate or maximal assist" includes equal to or greater than contact guard.

### 2. BBS Instructions: STANDING UNSUPPORTED

INSTRUCTIONS: "Please stand for two minutes without holding on."

- ( ) 4 able to stand safely for 2 minutes
- ( ) 3 able to stand 2 minutes with supervision
- ( ) 2 able to stand 30 seconds unsupported
- ( ) 1 needs several tries to stand 30 seconds unsupported
- ( ) 0 unable to stand 30 seconds unassisted

*If a subject is able to stand 2 minutes unsupported, score full points for sitting unsupported. Proceed to item #4.*

#### UDE Operational Instructions:

Patients may stand with feet hip distance apart or their self-selected preferred stance.

Patients must stand for two minutes without holding and/or using stepping strategies to maintain balance.

A score of a 1 indicates "several tries" - please allow a maximum of 3 attempts.

### 3. BBS Instructions: SITTING WITH BACK UNSUPPORTED BUT FEET SUPPORTED ON FLOOR OR ON A STOOL

INSTRUCTIONS: "Please sit with arms folded for 2 minutes."

- ( ) 4 able to sit safely and securely for 2 minutes
- ( ) 3 able to sit 2 minutes under supervision
- ( ) 2 able to sit 30 seconds
- ( ) 1 able to sit 10 seconds
- ( ) 0 unable to sit without support 10 seconds

No Additional UDE Operational Instructions

### 4. BBS Instructions: STANDING TO SITTING

INSTRUCTIONS: "Please sit down."

- ( ) 4 sits safely with minimal use of hands
- ( ) 3 controls descent by using hands
- ( ) 2 uses back of legs against chair to control descent
- ( ) 1 sits independently but has uncontrolled descent
- ( ) 0 needs assist to sit

#### UDE Operational Instructions:

For a score of 4, "minimal use of hands" is defined as seeking chair location, but not weight bearing through upper extremities.

For a score of 0, "needs assist" is equal to or greater than supervision.

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### 5. BBS Instructions: TRANSFERS

INSTRUCTIONS: Arrange chair(s) for pivot transfer. Ask subject to transfer one way toward a seat with armrests and one way toward a seat without armrests. You may use two chairs (one with and one without armrests) or a bed and a chair.

- ( ) 4 able to transfer safely with minor use of hands
- ( ) 3 able to transfer safely definite need of hands
- ( ) 2 able to transfer with verbal cuing and/or supervision
- ( ) 1 needs one person to assist
- ( ) 0 needs two people to assist or supervise to be safe

#### UDE Operational Instructions:

Verbal instructions can be modified to include "Please sit in this chair.

You may use your hands if you need to, but I would like you to try to sit down without using your hands."

A score of 4, "minor use of hands" is defined as seeking chair location, but not weight bearing through upper extremities.

A score of 1, "assist" is equal to or greater than contact guard assist.

### 6. BBS Instructions: STANDING UNSUPPORTED WITH EYES CLOSED

INSTRUCTIONS: "Please close your eyes and stand still for 10 seconds."

- ( ) 4 able to stand 10 seconds safely
- ( ) 3 able to stand 10 seconds with supervision
- ( ) 2 able to stand 3 seconds
- ( ) 1 unable to keep eyes closed 3 seconds but stays steady
- ( ) 0 needs help to keep from falling

#### UDE Operational Instructions:

Patients may stand with feet hip distance apart and/or their self-selected preferred stance.

For a score of 0, "needs help" is equal to or greater than supervision.

### 7. BBS Instructions: STANDING UNSUPPORTED WITH FEET TOGETHER

INSTRUCTIONS: "Place your feet together and stand without holding on."

- ( ) 4 able to place feet together independently and stand 1 minute safely
- ( ) 3 able to place feet together independently and stand 1 minute with supervision
- ( ) 2 able to place feet together independently but unable to hold for 30 seconds
- ( ) 1 needs help to attain position but able to stand 15 seconds feet together
- ( ) 0 needs help to attain position and unable to hold for 15 seconds

#### UDE Operational Instructions:

Instructions: "Place your feet together and stand without holding on for 1 minute."

For a score of 4, "feet together" includes placing the feet as close together as anatomically possible (taking into consideration soft tissue, bony abnormalities, knee valgus, etc).

For a score of 1, "needs help" is equal to or greater than supervision.

### 8. BBS Instructions: REACHING FORWARD WITH OUTSTRETCHED ARM WHILE STANDING

INSTRUCTIONS: "Lift arm to 90 degrees. Stretch out your fingers and reach forward as far as you can."

(Examiner places a ruler at the end of fingertips when arm is at 90 degrees. Fingers should not touch the ruler while reaching forward. The recorded measure is the distance forward that the fingers reach while the subject is in the most forward lean position. When possible, ask subject to use both arms when reaching to avoid rotation of the trunk.)

- ( ) 4 can reach forward confidently 25 cm (10 inches)
- ( ) 3 can reach forward 12 cm (5 inches)
- ( ) 2 can reach forward 5 cm (2 inches)
- ( ) 1 reaches forward but needs supervision
- ( ) 0 loses balance while trying/requires external support

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### UDE Operational Instructions:

Verbal instructions can be modified to include "Please lift both arms to 90 degrees."

Examiner should record measurements from the patient's longest finger.

For a score of 4, "confidently" is defined as no hesitation.

If the patient requires verbal cue to reach farther, and the patient is able to reach farther, take lowest score, but consider performing Activities Balance Confidence Scale for additional assessment.

For a score of 0, "external support" is equal to or greater than contact guard assist.

### 9. BBS Instructions: PICK UP OBJECT FROM THE FLOOR FROM A STANDING POSITION

INSTRUCTIONS: "Pick up the shoe/slipper, which is in front of your feet."

- ( ) 4 able to pick up slipper safely and easily
- ( ) 3 able to pick up slipper but needs supervision
- ( ) 2 unable to pick up but reaches 2-5 cm(1-2 inches) from slipper and keeps balance independently
- ( ) 1 unable to pick up and needs supervision while trying
- ( ) 0 unable to try/needs assist to keep from losing balance or falling

### UDE Operational Instructions:

Object to be picked up should be standardized within each clinic.

The authors recommend using rolled up towel.

Towel should be placed at patient's midline, 6 inches away from patient.

Verbal cues can be modified to include "please pick up towel."

A score of a 0, "needs assist" is equal to or greater than contact guard assist.

### 10. BBS Instructions: TURNING TO LOOK BEHIND OVER LEFT AND RIGHT SHOULDERS WHILE STANDING

INSTRUCTIONS: "Turn to look directly behind you over toward the left shoulder. Repeat to the right." (Examiner may pick an object to look at directly behind the subject to encourage a better twist turn.)

- ( ) 4 looks behind from both sides and weight shifts well
- ( ) 3 looks behind one side only other side shows less weight shift
- ( ) 2 turns sideways only but maintains balance
- ( ) 1 needs supervision when turning
- ( ) 0 needs assist to keep from losing balance or falling

### UDE Operational Instructions:

Verbal cues can be modified to include "I want you to look over your left shoulder.

Please tell me when you see the X on the wall." "Try looking over your right shoulder, you may see it from that direction."

Once patient returns to center, tell patient that there was no X on the wall.

A score of a 3, "less weight shift" is defined as a difference between sides.

A score of a 0, "needs assist" is equal to or greater than contact guard assist.

### 11. BBS Instructions: TURN 360 DEGREES

INSTRUCTIONS: "Turn completely around in a full circle. Pause. Then turn a full circle in the other direction."

- ( ) 4 able to turn 360 degrees safely in 4 seconds or less
- ( ) 3 able to turn 360 degrees safely one side only 4 seconds or less
- ( ) 2 able to turn 360 degrees safely but slowly
- ( ) 1 needs close supervision or verbal cuing
- ( ) 0 needs assistance while turning

### UDE Operational Instructions:

Verbal instructions can be modified to include "Turn completely around, in place, in a full circle. Good, now turn the other way."

The patient should turn within base of support.

The patient should be given enough time between turns to regain center of mass within base of support.

For a score of 0, "needs assistance" is equal to or greater than contact guard assist.

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### 12. BBS Instructions: PLACE ALTERNATE FOOT ON STEP OR STOOL WHILE STANDING UNSUPPORTED

INSTRUCTIONS: "Place each foot alternately on the step/stool. Continue until each foot has touched the step/stool four times."

- 4 able to stand independently and safely and complete 8 steps in 20 seconds
- 3 able to stand independently and complete 8 steps in > 20 seconds
- 2 able to complete 4 steps without aid with supervision
- 1 able to complete > 2 steps needs minimal assist
- 0 needs assistance to keep from falling/unable to try

#### UDE Operational Instructions:

Step stool of 8 inches in height.

For a score of 2, "without aid with supervision" means supervision only.

For a score of 1, "needs minimal assist" includes contact guard assist and minimum assist.

For a score of 0, "assistance" includes equal to or greater than moderate assistance.

### 13. BBS Instructions: STANDING UNSUPPORTED ONE FOOT IN FRONT

INSTRUCTIONS: "Place one foot directly in front of the other. If you feel that you cannot place your foot directly in front, try to step far enough ahead that the heel of your forward foot is ahead of the toes of the other foot."

(To score 3 points, the length of the step should exceed the length of the other foot and the width of the stance should approximate the subject's normal stride width.)

- 4 able to place foot tandem independently and hold 30 seconds
- 3 able to place foot ahead independently and hold 30 seconds
- 2 able to take small step independently and hold 30 seconds
- 1 needs help to step but can hold 15 seconds
- 0 loses balance while stepping or standing

#### UDE Operational Instructions:

Modify instructions to: "Place one foot directly in front of the other. If you feel that you cannot place your foot directly in front, try to step far enough ahead that the heel of your forward foot is ahead of the toes of the other foot and hold for 30 seconds."

For a score of 2, the length of the step should clear the arch of the opposite foot.

For a score of 1, "needs help" is supervision.

For a score of 0, "loses balance" is equal to or greater than contact guard assist.

### 14. BBS Instructions: STANDING ON ONE LEG

INSTRUCTIONS: "Stand on one leg as long as you can without holding on."

- 4 able to lift leg independently and hold > 10 seconds
- 3 able to lift leg independently and hold 5-10 seconds
- 2 able to lift leg independently and hold  $\geq$  3 seconds
- 1 tries to lift leg unable to hold 3 seconds but remains standing independently
- 0 unable to try or needs assist to prevent fall

#### UDE Operational Instructions:

Verbal cues should be modified to include "Stand on one leg without holding on, for a maximum of 15 seconds.

Please do not rest one leg against the other."

A score of a 0, "needs assist" is equal to or greater than supervision.

Patient allowed a maximum of three attempts to perform task.

**TOTAL SCORE:**     \_\_\_\_\_ / 56

**Standardized Error of Measure, Minimal Detectable Change, Norms, etc.**

**Older Adults Standard Error of Measure (Donoghue)**

BBS Initial Score	SEM
0-24	1.7
25-34	2.3
35-44	1.8
45-56	1.2

**Older Adults Minimal Detectable Change (Donoghue)**

BBS Initial Score	MDC
0-24	4.6
25-34	6.3
35-44	4.9
45-56	3.3

**Older Adults Falls Cut Off Scores (Lewis)**

BBS Initial Score	Fall Risk
48-56	Low
40-47	Medium
39 or less	High

**Older Adults Norms (Steffan 2002)**

Age/Gender	Norms (SD)	n
60-69 Men	55 (1)	15
60-69 Women	55 (2)	22
70-79 Men	54 (3)	14
70-79 Women	53 (4)	22
80-89 Men	53 (2)	8
80-89 Women	50 (3)	15

**Parkinson's Disease**

Minimal Detectable Change (Steffen)	5 points
PD can stand/walk unassisted with mild to mod disability (Qutubuddin)	Mean BBS Score=40.2 pts
Community Dwelling with PD (Brusse)	Mean 46 (7) pts

**Stroke**

Ambulatory with assist (Stevensen)	MDC 8.1
Ambulatory with SBA (Stevensen)	MDC 6.0
Independent in Ambulation (Stevensen)	MDC 6.3
Chronic Stroke (Liston, Hiengkaew, Flansbjer)	MDC 2.5-4.6

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## **Interpretation of Individual Test Item Results on the Berg Balance Scale (BBS)**

<b>Item</b>	<b>Possible Impairment</b>	<b>Recommended Exercise</b>
1. Sit to Stand	1. Lower and/or upper body weakness  2. Poor dynamic COG control  3. Abnormal weight distribution	Wall sits; UB and LB exercises with resistance (quadriceps, biceps/triceps, hip abductors/adductors)  Seated/standing balance activities emphasizing forward weight shifts  Standing balance activities with eyes closed (controlled sway in A-P and lateral directions)
2. Stand for 2 minutes	1. Poor gaze stabilization  2. Lower body weakness  3. Abnormal weight distribution in standing	Teach gaze fixation and stabilization techniques  Wall sits; LB exercises with resistance  COG standing balance activities
3. Sit for 2 minutes	1. Poor trunk stabilization and/or UB weakness  2. Abnormal perception of true vertical	UB exercises with resistance (own body); seated balance activities on compliant surfaces  Standing against wall with eyes closed; somatosensory cues
4. Stand to sit	1. Poor dynamic COG control  2. Lower and/or upper body weakness  3. Poor trunk flexibility	Seated/standing balance activities emphasizing backward weight shifts  UB and LB exercises with resistance (own body/resistance band; emphasize eccentric component)  Flexibility exercises emphasizing trunk rotation/flexion; seated and standing
5. Transfer (chair to chair)	1. Poor dynamic COG control  2. Lower and/or upper body weakness	Seated/standing balance activities emphasizing multi-directional weight shifts  UB and LB exercises with resistance
6. Stand with eyes closed (10 sec)	1. Poor use of somatosensory input; visual dependency and/or fear of falling  2. Lower body weakness	Seated/standing balance activities with eyes closed. Verbally emphasizing use of surface cues  Wall sits; LB exercises with resistance
7. Stand with feet together (1 min)	1. Poor COG control  2. Weak hip abductors/adductors	Standing balance activities with reduced BOS  Lateral leg raises/weight shifts against resistance
8. Standing forward reach	1. Poor dynamic COG control (reduced limits of stability)  2. Lower body weakness	Seated/standing COG activities emphasizing leaning away from and back to midline  LB exercises with resistance (body/resistance band); emphasize dorsiflexors; gastrocnemius /soleus muscles



	3. Reduced ankle ROM	Flexibility exercises (emphasize dorsiflexion)
9. Pick up object	1. Poor dynamic COG control 2. Poor upper and lower body flexibility 3. Lower body weakness 4. Vestibular impairment	Seated/standing COG activities emphasizing leaning away from and back to midline Selected exercises to improve UB and LB flexion LB exercises with resistance (body/resistance band) Head and eye movements: habituation exercises
10. Turn to look behind	1. Poor dynamic COG control 2. Poor neck and/or trunk flexibility 3. Lower body weakness	Standing weight shifts in lateral direction Selected exercises emphasizing rotation of neck, shoulders, and hips LB exercises with resistance; ball movement exercises in standing position
11. Turn in a circle	1. Poor dynamic COG control 2. Possible Vestibular impairment (e.g., dizziness) 3. Lower body weakness	Standing weight transfer activities; gait pattern enhancement (turns, directional changes) Head and eye movement coordination exercises LB exercises with resistance emphasize hip and knee
12. Dynamic toe touch	1. Poor dynamic COG control 2. Lower body weakness	Standing weight shifts in lateral/A-P directions LB exercises with resistance; emphasize hip and knee flexion; hip abduction/adduction
13. Tandem stance	1. Poor static and dynamic COG control 2. Lower body weakness 3. Poor gaze stabilization	Standing A-P weight shifts and transfers; reduced BOS activities LB exercises with resistance (body/resistance band); emphasize hip abductors/adductors Practice focusing on visual targets in front of and at head height during standing and moving activities
14. Stand on one leg	1. Poor static and dynamic COG control 2. Lower body weakness 3. Poor gaze stabilization	Standing 1-p weight shifts and transfers; reduced BOS activities LB exercises with resistance (body/resistance band) emphasize hip abductors/adductors Practice focusing on visual targets during standing and moving activities