**Balance Assessment Handbook**

**A Component of the Falls Toolkit**

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May 2014

**PREFACE**

The purpose of this guide is to provide Rehabilitation therapists with a **sample** gait and balance assessment to evaluate fall risk in ambulatory community-dwelling older adults (>65 years of age). It is intended that this comprehensive assessment could be completed in about 1 hour. This module includes an assessment template (**Part A**) and a compendium of instructions for each test/element with the interpretation of the assessment findings (**Part B**).

The assessment provided is an example of an evaluation protocol that has been successfully integrated into clinical practice at the James A. Haley Veterans’ Medical Center, Tampa, Florida by the VISN 8 Patient Safety Center of Inquiry. This tool has been modified based on recommendations from a workgroup of national experts to further assist with the objective measurement of gait and balance dysfunction for the management of patients presenting with a history of falls.

This fall assessment tool is a MODEL for use in community dwelling older adults (> 65 years of age). This assessment should be tailored based on patient diagnosis, presentation/function, practice location (e.g. outpatient, home care) and the specific needs, goals and resources of your clinic.

With this in mind, it is recommended that a comprehensive assessment should include standardized functional outcome measures that span the entire spectrum of the International Classification of Functioning, Disability and Health (ICF). Additionally, it is highly encouraged that principles of evidence based practice be used to customize the assessment. These derived principles include research findings, clinical expertise and patient preference. ([American Speech Language Hearing Association](http://www.asha.org/)).

**Helpful links to assist with outcome measure selection and performance include:**

* [Rehabilitation Measures Database](http://www.rehabmeasures.org/default.aspx)
* [Registry of Outcome Measures](file:///C%3A%5CUsers%5Cvhav11murphj%5CDesktop%5C%E2%80%A2%09http%3A%5Cwww.sph.sc.edu%5Cdpt%5Cdpt-rehab%5Cpdf%5CRegistry_of_Outcome_Measures_with_MDC_2010.pdf)
* [Stroke Engine Access](http://strokengine.ca/assess/index.html)
* [Neurology Section](http://www.neuropt.org/professional-resources/neurology-section-outcome-measures-recommendations)
* *Please note that the 8-ft Up-and-Go Test, Chair Stand Test and Arm Curl Test are part of the Senior Fitness Test developed by Roberta E. Rikli and C. Jessie Jones (Rikli & Jones, 2001).* ***It is strongly recommended that this Senior Fitness Test manual be referred to for specific test administration instructions and norm-referenced data tables.*** *The manual can be purchased at* [http://www.humankinetics.com*.*](http://www.humankinetics.com/) *The backward release maneuver is used with permission of Dr. Deborah Rose.*\*

Table of Contents

[Part A: Assessment Form 5](#_Toc379871032)

[1. Fall History/SPLATT: 5](#_Toc379871033)

[2. Home Living Environment: 5](#_Toc379871034)

[3. Activities-Specific Balance Confidence (ABC) Scale: 5](#_Toc379871035)

[4. Observation/Deformities: 5](#_Toc379871036)

[5. Shoe Assessment: 6](#_Toc379871037)

[6. Motor Status: 6](#_Toc379871038)

[7. Coordination: 6](#_Toc379871039)

[8. Functional Strength Tests: 6](#_Toc379871040)

[9. 8 Ft Up and GO Test: (time in seconds) 6](#_Toc379871041)

[10. Modified CTSIB 6](#_Toc379871042)

[11. Multi-Directional Reach Test (MDRT): 7](#_Toc379871043)

[12. Four-Square Step Test: 7](#_Toc379871044)

[13. Gait speed: (time in seconds over 15 foot distance) 7](#_Toc379871045)

[14. Observational gait: 7](#_Toc379871046)

[15. Backwards release: 8](#_Toc379871047)

[16. Clinical Impression: 8](#_Toc379871048)

[17. Physical Therapy Recommendations: 8](#_Toc379871049)

[PART B: Description of Functional Assessment Sub-Tests 9](#_Toc379871050)

[1. Fall History/SPLATT: 9](#_Toc379871051)

[2. Home Living Assessment 9](#_Toc379871052)

[3. Activities-Specific Balance Confidence (ABC) Scale: 9](#_Toc379871053)

[4. Observations/Deformities 9](#_Toc379871054)

[5. Shoe Assessment 9](#_Toc379871055)

[6. Motor Assessment 10](#_Toc379871056)

[7. Coordination 10](#_Toc379871057)

[8. Functional Strength Test 10](#_Toc379871058)

[9. 8 ft Up and Go Test 19](#_Toc379871059)

[10. mCTSIB: Modified Clinical Test of Sensory Integration on Balance (Rose, 2003; Shumway-Cook & Horak, 1986) 20](#_Toc379871060)

[11. Multi-Directional Reach Test (MDRT) (Newton, 1997a; Newton, 1997b) 20](#_Toc379871061)

[12. Four-Square Step Test (Dite & Temple, 2002) 21](#_Toc379871062)

[13. Gait Speed Test (Guralnik, et al., 1994) 22](#_Toc379871063)

[14. Observational Gait 22](#_Toc379871064)

[15. Backwards Release 22](#_Toc379871065)

[16. Clinical Impression 23](#_Toc379871066)

[17. Physical Therapy Recommendations 23](#_Toc379871067)

[References 24](#_Toc379871068)

# Part A: Assessment Form

## Fall History/SPLATT:

**S**ymptoms experienced at time of fall (s):

**P**revious number of falls or near-falls (in past 3 months):

**L**ocation of fall (s):

**A**ctivity engaged in at time of fall (s):

**T**ime (hour of the day):

**T**rauma associated with fall (s):

## Home Living Environment:

a. Physical Layout

\_\_\_\_\_ Stairs inside home \_\_\_\_\_Stairs to get into home \_\_\_\_\_ Clutter

\_\_\_\_\_ Grab bars in bathroom \_\_\_\_\_ Throw rugs \_\_\_\_\_ Bright lighting

\_\_\_\_\_ Bath chair or bench \_\_\_\_\_ Non-skid bath mats \_\_\_\_\_ Bathtub

\_\_\_\_\_ Shower stall \_\_\_\_\_ Hand held showerhead \_\_\_\_\_ Nightlights

\_\_\_\_\_ Raised toilet seat \_\_\_\_\_ Slick/slippery floors \_\_\_\_\_ Uneven ground

\_\_\_\_\_ Electric cords in floor \_\_\_\_\_ Hills around yard/grounds \_\_\_\_\_ Ramps

\_\_\_\_\_ Other:

b. Current Social Supports/Activity Level:

c. ADL independence:

## Activities-Specific Balance Confidence (ABC) Scale:

For each of the following activities, please indicate your level of self-confidence by choosing a corresponding number from the following rating scale:

0% 10 20 30 40 50 60 70 80 90 100%

no confidence\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_completely confident

“How confident are you that you will not lose your balance or become unsteady when you…

1. …walk around the house? \_\_\_\_%
2. …walk up or down stairs? \_\_\_\_%
3. …bend over and pick up a slipper from the front of a closet floor \_\_\_\_%
4. …reach for a small can off a shelf at eye level? \_\_\_\_%
5. …stand on your tiptoes and reach for something above your head? \_\_\_\_%
6. …stand on a chair and reach for something? \_\_\_\_%
7. …sweep the floor? \_\_\_\_%
8. …walk outside the house to a car parked in the driveway? \_\_\_\_%
9. …get into or out of a car? \_\_\_\_%
10. …walk across a parking lot to the mall? \_\_\_\_%
11. …walk up or down a ramp? \_\_\_\_%
12. …walk in a crowded mall where people rapidly walk past you? \_\_\_\_%
13. …are bumped into by people as you walk through the mall?\_\_\_\_%
14. … step onto or off an escalator while you are holding onto a railing? \_\_\_\_%
15. … step onto or off an escalator while holding onto parcels such that you cannot hold onto the railing? \_\_\_\_%
16. …walk outside on icy sidewalks? \_\_\_\_%

Total score: \_\_\_\_\_\_\_\_/16 = \_\_\_\_\_\_\_\_\_\_%

## Observation/Deformities:

## Shoe Assessment:

## Motor Status:

## Coordination:

 a. Finger/Nose Test: (IT = intact, IM = impaired)

Right:

Left:

b. Heel Shin Test: (IT=intact, IM=impaired)

Right:

Left:

## Functional Strength Tests:

 a. L/E (Chair Stand Test):

* + - Use of hands required? YES NO
		- Number of repetitions completed in 30 seconds:

b. U/E (Arm Curl Test):

* + - Arm used: Left Right
		- Weight:

5lbs (Female): \_8lbs (Male):\_\_

Number of repetitions completed in 30 seconds:

## 8 Ft Up and GO Test: (time in seconds)

Assistive Device and/or Bracing Used:

Trial 1\_\_\_\_\_\_\_sec.

Trial 2\_\_\_\_\_\_\_sec.

Final Score (best timed trial):\_\_\_\_\_\_\_\_\_sec

## Modified CTSIB

Proceed to next condition when one, 30-second trial is completed or all 3 trials are performed.

* Condition 1: Eyes open, firm surface
	+ Total time: \_\_\_\_\_/30 sec
	+ Total time: \_\_\_\_\_/30 sec
	+ Total time: \_\_\_\_\_/30 sec Mean score \_\_\_\_\_
* Condition 2: Eyes closed, firm surface
	+ Total time: \_\_\_\_\_/30 sec
	+ Total time: \_\_\_\_\_/30 sec
	+ Total time: \_\_\_\_\_/30 sec Mean score \_\_\_\_\_
* Condition 3: Eyes open, foam surface
	+ Total time: \_\_\_\_\_/30 sec
	+ Total time: \_\_\_\_\_/30 sec
	+ Total time: \_\_\_\_\_/30 sec Mean score \_\_\_\_\_
* Condition 4: Eyes closed, foam surface
	+ Total time: \_\_\_\_\_/30 sec
	+ Total time: \_\_\_\_\_/30 sec
	+ Total time: \_\_\_\_\_/30 sec Mean score \_\_\_\_\_

TOTAL SCORE: \_\_\_\_\_/120 sec (mean score used for each condition if > 1 trial is performed)

## Multi-Directional Reach Test (MDRT):

* Forward Reach:
* Backward Reach:
* Lateral Reach Right:
* Lateral Reach Left:

## Four-Square Step Test:

Assistive Device and/or Bracing Used:

Trial 1\_\_\_\_\_\_\_sec.

Trial 2\_\_\_\_\_\_\_sec.

FSST Score (best timed trial):\_\_\_\_\_\_\_\_\_sec

## Gait speed: (time in seconds over 15 foot distance)

## Observational gait:

 Deviations observed

( ) No significant deviations

( ) Trunk lateral lean

( ) Forward trunk flexion

 ( ) Hip hiking

( ) Hip circumduction ( ) Scissoring

( ) Trendelenburg R L \_\_( ) Knee hyperextension R L\_\_\_\_ ( ) Foot drop R L\_\_\_\_\_ ( ) Ataxic gait pattern

( ) Antalgic gait pattern ( ) Festinating

( ) Shuffling

( ) Decreased gait speed

( ) Widened base of support ( ) OTHER:

Current use of assistive device(s):

| **EQUIPMENT**  | **INDOORS** | **OUTDOORS** | **ON BUS** | **SHOPPING** |
| --- | --- | --- | --- | --- |
|  **\_\_\_\_\_Orthotics/Shoes** |  |  |  |  |
|  **\_\_\_\_\_Cane** |  |  |  |  |
|  **\_\_\_\_\_Walker-Wheels** |  |  |  |  |
|  **\_\_\_\_\_Brace** |  |  |  |  |
|  **\_\_\_\_\_W/C** |  |  |  |  |
|  **\_\_\_\_\_Elec. W/C-Scooter** |  |  |  |  |
|  **\_\_\_\_\_Prosthesis** |  |  |  |  |
|  **\_\_\_\_\_“Cruise Furniture”** |  |  |  |  |

## Backwards release:

 : Steadies self independently

* Number of steps taken:

 : Requires physical assistance not to fall

 : Unable to perform

## Clinical Impression:

## Physical Therapy Recommendations:

# PART B: Description of Functional Assessment Sub-Tests

## Fall History/SPLATT:

The goal of a fall history is to uncover the potential cause(s) or risk factors associated with the fall event(s) in order to develop a customized plan of care. The acronym “SPLATT” has been widely used by clinicians to remember the important components of a fall history (Tideikssar, 2002).

## Home Living Assessment

This information may be obtained from direct patient/caregiver interview or a questionnaire that is sent prior to the appointment to optimize time. The patient is questioned about the physical layout of their home and presence of safety equipment, general activity level, social supports and ADL independence. If a pre-sent questionnaire is used, quickly verify all reported data with the patient during the interview to ensure its accuracy.

## Activities-Specific Balance Confidence (ABC) Scale:

The Activities-Specific Balance Confidence (ABC) Scale is a tool that will evaluate a patient’s confidence to perform various activities without losing balance. It can be self-administered or administered via personal or telephone interview. As with all tools of this nature, each respondent should be questioned regarding their understanding of the instructions, and any difficulties they incurred answering specific items.

Patients are instructed to indicate their level of confidence, on a scale from 0 % (no confidence) to 100% (completely confident), in doing each activity without losing balance or becoming unsteady. If they do not currently perform the activity in question they are instructed to imagine how confident they would be should they have to do the task. Additionally, patients are advised to rate their confidence in doing the activity while using their habitual walking aid.

The ABC is a 16-point scale and ratings should consist of whole numbers only (0-100) for each item. The sub-score for each activity is then totaled (possible range = 0 – 1600) and divided by 16 to obtain each participant’s final score. If a subject qualifies his/her response to items #2, #9, #11, #14 or #15 differently within the subtask (i.e. different ratings for “up” vs. “down” or “onto” vs. “off”), obtain separate ratings for each situation and use the lowest confidence score of the two ) (Myers, Fletcher, Myers & Sherk, 1998; Lajoie & Gallagher, 2004).

SCORE INTERPRETATION:
80% = high level of physical functioning(Myers et al. 1998)

* + - 50-80% = moderate level of physical functioning(Myers et al. 1998)
		- < 50% = low level of physical functioning (Myers et al. 1998)
* < 67% = older adults at risk for falling; can accurately classify people who fall 84% of the time (LaJoie & Gallagher, 2004).

### Observations/Deformities

This section may be used to chart any significant observations that may impact the patient’s balance, gait and resulting function. Examples of information that may be included are posture, tremors, swelling, bruising, deformities or demonstration of pain behaviors.

### Shoe Assessment

Evaluate the patient’s footwear for support, wearing of treads, etc. Be especially mindful of footwear in patients with diabetes (need for pressure-relieving insoles, presence of sharp edges and restrictive elastic).

 Request information on use of footwear in their home and provide education if this may be increasing their fall risk.

### Motor Assessment

Quick evaluation performed with note of any impairment in ROM and strength that may impact functional mobility.

If any significant deficits are discovered, take the time to investigate further (e.g., manual muscle test if prominent ankle dorsiflexion weakness is noted).

### Coordination

* Finger/Nose Test: Note movement quality, action tremors or targeting programs.
* Heel Shin Test: Note movement quality or targeting problems.

### Functional Strength Test

1. **L/E: Chair Stand Test**(Rikli & Jones, 2001; Jones, Rikli & Beam, 1999)

**Equipment/set-up:** Straight backed chair without arms (seat height approximately 17”). Chair is placed against wall or heavy object (plinth) to prevent it from moving during test. A stopwatch is also required.

**Starting Position:** Patient sitting in middle of chair with back straight and feet on floor. Arms are crossed over chest.

**Test Protocol:** The participant is instructed to rise to a full stand and return back to a fully seated position after the signal “go” is given. They are encouraged to complete as many full stands as possible within a 30-second time limit.

The examiner demonstrates the test for the patient and allows a practice trial of 1 to 2 repetitions to ensure correct form.

One 30-second trial is performed and recorded.

**Scoring:** The score is the total number of stands executed correctly within 30 seconds. If the patient is more than half way up at the end of 30 seconds it is counted as a full stand.

Results obtained with this test may be compared to age-related normative values listed in the Senior Fitness Test manual.1

**Adaptations if Hand Use is Required:** If the participant is unable to perform the task with- out use of hands during the practice trial, check “YES” for the “Use of hands required?” question on the assessment form.

The test continues with the patient using the chair or their thighs to push off. If the participant uses their hands,.

 Their score **cannot** be compared with age-related normative values published in the Senior Fitness Test manual (Rikli & Jones, 2001).

**Chair Stand Test (Number of Stands)\*\***

| **Age (to the right)** | **60-64** | **65-69** | **70-74** | **75-79** | **80-84** | **85-89** | **90-94** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Normal Range ofScores for **Men** | 14-19 | 12-18 | 12-17 | 11-17 | 10-15 | 8-14 | 7-12 |
| Normal Range ofScores for **Women** | 12-17 | 11-16 | 10-15 | 10-15 | 9-14 | 8-13 | 4-11 |

\*\* Normal range of scores is defined as the middle 50 percent of each age group. Scores above the range would be considered “above average” for the age group and those below the range would be “below average.” Scores reprinted with permission of the authors (Rikli & Jones, 2001).

1. **U/E: Arm Curl Test**(Rikli & Jones, 2001)

**Equipment/set-up:** Straight backed chair without arms (seat height approximately 17”). Dumbbells: 8 lbs for men and 5 lbs for women. A stopwatch is also required.

**Starting Position:** Patient sitting in middle of chair with back straight and feet on floor. The weight is held in their dominant hand (use other side if dominant hand is impaired and unable to maintain grasp). The arm is positioned with the elbow in extension by the side of the patient’s torso, perpendicular with the floor.

The wrist is initially positioned in neutral.

**Test Protocol:** The participant is requested to turn palm upwards (supinate forearm) while curling the arm through full range of motion and then return to full extension. In the down- ward position, the hand should have returned to the original starting position (wrist in neutral).

The participant is encouraged to perform as many curls as possible within 30 seconds.

The examiner demonstrates the test for the patient and allows a practice trial for 1 to 2 repetitions to ensure correct form. A 30-second trial is performed and recorded.

Examiner positioning can be adjusted if the participant is unable to maintain their upper arm still against their body during the trial.

If patient form is problematic, the therapist may either kneel or sit next to the patient (the side which they are holding the weight) and place their fingers on the anterior aspect of the participant’s upper arm to stabilize it from moving and ensure full range of motion is achieved (patient’s forearm should squeeze examiner’s fingers).

**Scoring:** The score is the total number of curls executed correctly within 30 seconds. If the arm is more than half way up at the end of 30 seconds, it is counted as a curl.

Results obtained with this test may be compared to age-related normative values listed in the Senior Fitness Test manual (Rikli & Jones, 2001).

**Adaptations:** If the patient is unable to hold the dumbbell due to a medical condition affecting the hand or wrist, a Velcro wrist weight may be used. If the patient is unable to perform one (1) repetition with the appropriate weight, a lighter one may be substituted (ensure you note the change on the assessment form).

 Remember, comparison with age- related normative values is only possible if the standard testing protocol is followed.

**Arm Curl Test (Number of Curls)\***

| **Age (to the right)**  | **60-64** | **65-69** | **70-74** | **75-79** | **80-84** | **85-89** | **90-94** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Normal Range ofScores for **Men** | 16-22 | 15-21 | 14-21 | 13-19 | 13-19 | 11-17 | 10-14 |
| Normal Range of Scores for **Women** | 13-19 | 12-18 | 12-17 | 11-17 | 10-16 | 10-15 | 8-13 |

\*Normal range of scores is defined as the middle 50 percent of each age group. Scores above the range would be considered “above average” for the age group and those below the range would be “below average.” (Rikli & Jones, 2001).

### 8 ft Up and Go Test

(Rikli & Jones, 2001; Rose, Jones, & Lucchese, 2002)

**Equipment/set-up:** Place a chair (approximately 17 inches in height) against a wall or firm object for safety to prevent it from sliding backwards. Place a cone on the floor exactly 8 ft away (distance measured is from the front edge of the chair to the back edge of the cone). Ensure a minimum of 4 ft of clearance beyond the cone to allow for turning room. A stopwatch is also required.

**Starting Position:** Patient is seated in the chair with hands on thighs and feet flat on the floor. Protocol: Patient is instructed that on the signal “go,” they are to rise from the chair (pushing off of thighs or chair is permitted), walk “as quickly as possible” around the cone and return to a seated position in the chair.

The participant is told that they will be timed and should therefore walk as quickly as possible but not to run. Following a demonstration, the patient is allowed one practice trial followed by two test trials.

**Scoring:** The clinician begins the timer when the “go” signal is given (even if the patient has not begun to move) and stops the time at the exact instant that the participant’s buttocks contacts the chair following the walk segment.

Note the scores of both test trials to the 1/10th second yet the faster of the two times is recorded on the assessment form for evaluation purposes. Results obtained with this test may be compared to age-related normative values listed in the Senior Fitness Test manual (Rikli & Jones, 2001).

**Adaptation:** Use of an assistive device is permitted if required (remember to mark what type of device the patient used on the evaluation form) yet does not allow for comparison with age related, normative values from the Senior Fitness Test.

Be sure to retest the patient using the same device on following visits. Additional trials can be administered without a device or a different type of device if appropriate.

\*Score > 8.5 seconds is associated with high fall-risk in community-dwelling older adults

\*\*The 8Ft Up and Go Test was derived from the well-known Up and Go Test (Podsiadlo & Richardson, 1991) in order to increase the feasibility of the administration of the test in a home setting and to decrease the confusion pertaining to the turning task.

The original Timed Up and Go Test differs from the test presented above by overall distance (9.84 ft/3 meters vs 8 ft) and the use of a line instead of a cone at the turn around point. As a result, the cut-off score to classify an individual as a faller for the Timed Up and Go Test is 13.5 seconds or longer (Shumway-Cook, Brauer & Woollacott, 2000). Use of either version of this test is based on clinician preference, patient population, clinical setting and desired generalizability of results.

 **8 Feet Up & Go (in Seconds)\*\***

| **Sex (below) and Age (right)**  | **60-64** | **65-69** | **70-74** | **75-79** | **80-84** | **85-89** | **90-94** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Normal Range of Scoresfor Men | 5.6 - 3.8 | 5.9 - 4.3 | 6.2 - 4.4 | 7.2 - 4.6 | 7.6 - 5.2 | 8.9 - 5.5 | 10.0 - 6.2 |
| Normal Range of Scoresfor Women | 6.0 - 4.4 | 6.4 - 4.8 | 7.1 - 4.9 | 7.4 - 5.2 | 8.7 -5.7 | 9.6 - 6.2 | 11.5 - 7.3 |

\*Normal range of scores is defined as the middle 50 percent of each age group. Scores above the range would be considered “above average” for the age group and those below the range would be “below average.” (Rikli & Jones, 2001). Scores reprinted with permission of the authors.

### mCTSB:

**Modified Clinical Teat of Sensory Integration on Balance**

(Rose, 2003; Shumway-Cook & Horak, 1986)

This test allows for preliminary assessment of how well a patient can integrate various senses with respect to balance and compensate when one or more of those senses are compromised.

Sensory system involvement is modulated within various conditions as follows:

Condition 1: Three sensory systems available for balance (vision, vestibular, somatosensory).

Condition 2: Vestibular and somatosensory available. Vision absent.

Condition 3: Vestibular and vision available. Somatosensory compromised.

Condition 4: Vestibular available. Vision absent, somatosensory compromised. Equipment/set-up: Foam pad (dense enough to avoid bottoming out) and a stopwatch required.

Starting Position: Patient stands with feet shoulder width apart and arms crossed over chest.

**Protocol:** A 30-second trial is timed using a stopwatch. Time is stopped during a trial and recorded if: a) patient deviates from initial crossed arm position, b) patient opens eyes during an “eyes closed” trial condition, or c) patient moves feet (takes a step) or requires manual assistance to prevent loss of balance.

 A trial is successful if the patient is capable of maintaining the starting position independently for a period of 30 seconds.

A maximum of three (3) trials are performed for all conditions. Trials are performed until the patient either: a) successfully maintains the starting position for an entire 30-seconds, or completes three, 30-second trials to the best of their ability.

**Scoring:**

Conditions 1 thru 4: Record the time (in seconds) the patient was able to maintain the starting position (maximum of 30 seconds). Remember to record the times for all trials.

Total Score =

Average Time Cond 1 + Average time Cond 2 + Average Time Cond 3 + Average Time Cond

 (if > 1 trial required) (if > 1 trial required) (if > 1 trial required) (if > 1 trial required)

### Multi-Directional Reach Test (MDRT)(Newton, 1997a; Newton, 1997b)

This test allows for analysis of the patient’s voluntary postural control. It is used to evaluate how far patients are able and/or willing to lean away from a stable base of support in multiple directions.

Equipment/set-up: Yardstick

**Starting Position:** Position a yardstick at the level of the patient’s acromion process. This may be achieved by affixing the yardstick to the wall. Placing the yardstick on a rolling IV pole with height adjustable clamp or a rolling mirror with Velcro is also an option that may facilitate test administration. Participant stands with feet shoulder width apart and arm raised to 90 degrees (parallel to floor, palm facing medially).

**Protocol:** The patient is instructed to reach as far forward as possible without letting their feet raise off the floor or their hand touch the yardstick. Location of the middle finger (in inches) is recorded. Trial distance (in inches) is obtained by subtracting the end number from the starting position number. Perform one (1) practice trial to ensure patient understanding of instructions followed by 1 trial that is recorded. Repeat similar protocol for reach backwards, left and right.

**NOTE:** True standardized test involves performance of one (1) practice attempt and three (3) trials. The mean of the three trials is recorded as the “distance reached” and the movement strategy that the participant used for each attempt is noted. Practically, some clinicians choose to perform only one practice and one trial due to time constraints and patient fatiguability.

### Four-Square Step Test (Dite & Temple, 2002)

Test of dynamic balance that assesses a person’s ability to step in multiple directions over low lying objects.

**Equipment and Set-up:** Four straight canes and a stop watch. Canes are set-up like a cross on the floor with the tips of the canes facing together.

****

**Starting Position:** The patient stands in square “1” facing the forward direction.

 **Protocol:** The patient is instructed to step forward, right, backward and left then reverse the sequence and return to the starting square. They are advised to avoid making contact with the canes on the floor and to ensure that both feet make contact with the floor in each of the four squares. Additionally, they are encouraged to face forward during the entire testing sequence. The test procedure may be demonstrated and one practice trial is completed to ensure patient understanding. Two testing sequences are performed with the fastest time being recorded as the final score.

**Scoring:** Timing begins at first foot contact with the floor in square two and ends when the last foot comes back to touch the floor in square one. The trial is repeated if the patient: fails to complete the sequence successfully, loses balance or makes contact with a cane. A score is still given if the patient is unable to remain facing forward during the entire stepping procedure.

A cut off score of > 15 seconds has been identified to classify multiple fallers in a group of community dwelling older adults with a positive predictive value of 86% and a negative predictive value of 94%.

**Adaptation:** Use of an assistive device is permitted if required.

### Gait Speed Test (Guralnik, et al., 1994)

**Equipment/Set-up:** Mark off a 15 ft (4.57m), unobstructed course on the ground with the use of black carpenter’s tape. An additional 2 ft is marked at either end of the course to allow for subject acceleration/deceleration. A stopwatch is also required.

**Starting Position:** Patient is set-up in a standing position at the beginning of the course. **Protocol:** Patients are asked to walk across the course at their “usual, comfortable speed.”

Time is started and stopped when the subject’s foot crosses the corresponding black tape lines.

One practice trial is performed prior to testing to ensure patient understanding of the task. Two timed walks are performed with the fastest of both trials recorded on the sheet.

**Scoring:** The fastest of both trials is recorded on the score sheet. Gait speed may be calculated by dividing the patient’s timed score in seconds by 4.57.

Van Swearingen noted 72% sensitivity and 74% specificity of gait speed for recognizing the risk of recurrent falls in frail older adults, including a cutoff score of 0.56 m/s for risk of recurrent falls.

**Adaptation:** Use of the patient’s habitual assistive device is permitted.

### Observational Gait

Gait Deviations:

Use the check-off list to record any gait deviations observed. Deviations not listed may be entered in the “other” section.

Current use of Assistive Devices:

Question the patient regarding what assistive devices they have and use. Obtain detail about which device they use in which environment. Record use of devices in check boxes provided.

### Backwards Release

(Rose, 2003)

This maneuver enables the therapist to obtain preliminary information on the client’s protective postural control.

**Equipment/set-up:** No specific equipment required.

**Starting Position:** Patient is asked to stand with feet shoulder width apart.

**Protocol:** Clinician places their hand between the patient’s scapulae. Client is asked to “lean back against my hand.” Once the patient is leaning backwards into the therapist’s hand, the therapist unexpectedly removes the support. The amount of force created by the patient’s lean should be sufficient to invoke a loss of balance that requires a change in the base of support (i.e., at least one backward step).

**Scoring:** Check on appropriate line if the patient is able to regain balance independently or requires physical assistance to do so. Note the number of steps taken by the patient if they are able to self-correct for the imbalance created. “Unable to perform” option is available if the therapist feels that the maneuver is inappropriate (e.g., extreme anxiety) or unsafe (e.g., obesity) to be performed on a specific patient.

\*\*\*Consider using an overhead harness system to ensure both patient and therapist safety during this maneuver.

### Clinical Impression

Allows for narrative to hypothesize on etiology of falls according to physical evaluation performed.

### Physical Therapy Recommendations

List any recommendations that arise from your evaluation (exercise program, equipment, etc.).

Several evidence-based exercise interventions exist to treat falls. The following are helpful links to several widely used exercise programs.

[**OTAGO Exercise Program**](http://www.chfwcny.org/Tools/BroadCaster/Upload/Project13/Docs/Otago_Exercise_Programme.pdf)**:** An individually prescribed, provider facilitated home exercise program for community dwelling older adults. The program consists of progressive leg strengthening and balance retraining exercises in addition to a walking plan.

[**STEPPING ON:**](http://www.steppingon.com/) A weekly community-based workshop delivered in a group setting to older adults who have fallen or are fearful of falling. Multiple topics are covered to include fall-risk, strength and balance exercises, home hazards, safe footwear, visual impairment, post-fall coping strategies and medication education.

[**TAI CHI: MOVING FOR BETTER BALANCE**](http://www.cdc.gov/HomeandRecreationalSafety/Falls/compendium/1.4_tai_chi.html)**:** A community-based Tai Chi group exercise class delivered to older adults 3x/week over a 26 week period. The program includes 24 Tai Chi forms that emphasize weight shifting, postural alignment, and coordinated movements.

**OTHER HELPFUL SITES TO EVIDENCE\_BASED EXERCISE INTERVENTIONS:**

[CDC Home Recreation Safety](http://www.cdc.gov/HomeandRecreationalSafety/Falls/compendium/1.0_exercise.html)

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