

ASSESSMENT

The 4-Stage Balance Test

Purpose: To assess static balance

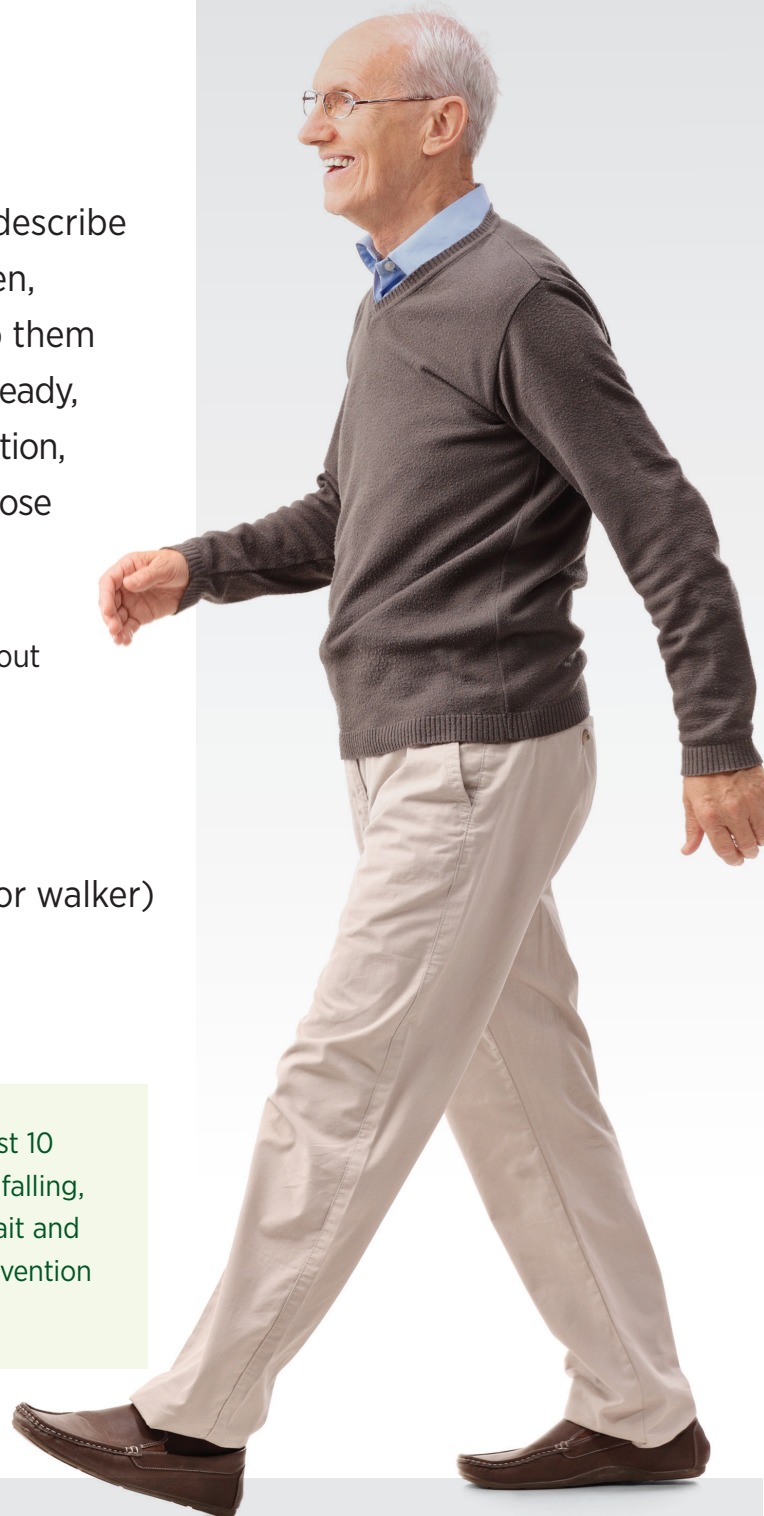
Equipment: A stopwatch

Directions: There are four standing positions that get progressively harder to maintain. You should describe and demonstrate each position to the patient. Then, stand next to the patient, hold their arm, and help them assume the correct position. When the patient is steady, let go, and time how long they can maintain the position, but remain ready to assist the patient if they should lose their balance.

- If the patient can hold a position for 10 seconds without moving their feet or needing support, go on to the next position.
- If not, **STOP** the test.

Patients should not use an assistive device (cane or walker) and they should keep their eyes open.

An older adult who cannot hold the tandem stand for at least 10 seconds is at increased risk of falling. To reduce their risk of falling, you might consider referring them to physical therapy for gait and balance exercises, or refer them to an evidence-based fall prevention program, such as Tai Chi.



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ASSESSMENT CONTINUED

The 4-Stage Balance Test

Patient _____

Date _____

Time _____ ☐ AM ☐ PM

Instructions to the patient:

- I'm going to show you four positions.
- Try to stand in each position for 10 seconds.
- You can hold your arms out, or move your body to help keep your balance, but don't move your feet.
- For each position I will say, **"Ready, begin."** Then, I will start timing. After 10 seconds, I will say, **"Stop."**

	① Stand with your feet side-by-side.	Time: _____ seconds
	② Place the instep of one foot so it is touching the big toe of the other foot.	Time: _____ seconds
	③ Tandem stand: Place one foot in front of the other, heel touching toe.	Time: _____ seconds
	④ Stand on one foot.	Time: _____ seconds

Notes:

CDC's STEADI tools and resources can help you screen, assess, and intervene to reduce your patient's fall risk.
For more information, visit www.cdc.gov/steady



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STEADI Stopping Elderly Accidents,
Deaths & Injuries

Core Measure: Five Times Sit-To-Stand (5TSTS)

Overview	The Five Times Sit to Stand Test measures one aspect of transfer skill. The test provides a method to quantify functional lower extremity strength and/or identify movement strategies a patient uses to complete transitional movements.
Number of Test Items	1
Scoring	The score is the amount of time (to the nearest decimal in seconds) it takes a patient to transfer from a seated to a standing position and back to sitting five times.
Equipment	- Standard height chair (43-45 cm, 17-18 inches) with a backrest. - Stopwatch
Time (new clinician) Time (experienced clinician)	- Less than 5 minutes - Less than 5 minutes
Cost	Free
Logistics-Setup	- The chair should be free-standing - Subjects are allowed to place their feet comfortably under them during testing.¹
Logistics-Administration	- One trial is administered. - A patient is instructed to sit with arms folded across their chest and with back against the chair. A patient with hemiplegia can have the impaired arm at his/her side or in a sling. - Instruct the patient: "I want you to stand up and sit down five times in a row, as quickly as you can, when I say 'Go'. Be sure to stand up fully and try not to let your back touch the chair back between each repetition. Do not use the back of your legs against the chair." - Time starts when the tester says "Go." - Time stops when the patient's body touches the chair following the fifth repetition. - If individuals are unable to complete the first sit to stand independently, without use of arms, the test is terminated.^{1,2}
Logistics-Scoring	Document the time in seconds (to the nearest decimal) required to complete the test. If the patient cannot perform five stands to complete the test without use of arms, a score of 0 seconds should be documented. When possible within the medical record it is also recommended to note the reason, such "unable to perform five repetitions." The tester can

	document the number of stands, time, or compensatory movements for baseline information, but this should not be considered a trial of the 5TSTS Test.
Additional Recommendations	• To track change, it is recommended that this measure is administered a minimum of two times (admission and discharge), and when feasible, between these periods, under the same test conditions for the patient. • Recommend review of this standardized procedure and, on an annual basis, establish consistency within and among raters using the tool.

Common Questions and Variations

1. "What if I don't have a chair that is 43-45 cm (17-18 inches) high?"
 - a. This is the recommended height for completing the test. If the chair used is a different height, the height should be measured, documented and reported as a deviation from this standardized procedure.
 - b. Using the same chair height is recommended for ongoing assessments to capture change in the patient.
 - c. Note that this recommended chair height is different from the recommended chair height in the Berg Balance Scale (18-20 inches).
2. "What if the individual's feet don't touch the floor when they have their back against the backrest?"
 - a. In this scenario, it is permissible to allow the individual to move forward in the chair until their feet are flat on the floor. It is recommended that the deviation from standardized protocol be documented as well.
3. "What if the individual is very tall?"
 - a. It would be appropriate to use a taller chair or apply a seat cushion to bring the hip flexion angle to 90 degrees when in the seated position.³ This condition should be documented as a variation of the standardized procedure.
4. "What if my patient cannot stand without using his/her hands?"
 - a. When following the standardized procedure, it would be appropriate to document 0 for the score. While 0 seconds would be the fastest possible time to complete the test, it is also impossible and therefore would be clear in any medical record that the patient was unable to perform the test. When possible within the medical record it is also recommended to note the reason, such as "unable; requires use of hands". At the point in time when the patient is able to complete 5 sit-to-stands without the use of upper extremities, a baseline 5TSTS score can be recorded.
 - b. Arm and hand position influence the momentum and strategy for the sit to stand transition and influence 5TSTS Test scores.³ If the patient cannot complete the assessment with arms folded, it is permissible to allow the individual to utilize his or her hands to assist. This deviation from standardized protocol should be documented. The standardized protocol score would still be "unable".

5. "What if my patient cannot complete five repetitions?"
 - a. If the patient does not complete *five repetitions*, a score of 0 seconds should be recorded. When possible within the medical record it is also recommended to note the reason, such as "unable to perform five repetitions". The clinician can, however, use his or her clinical judgement to record a time for fewer repetitions or provide physical assistance to help the patient complete the assessment, as this information may be valuable to explore change over time for the individual patient.
6. "What if my patient has a loss of balance and requires physical assistance to prevent a fall?"
 - a. Providing assistance during the test is a deviation from the standardized procedure, however, it may be necessary to prevent patient injury. If physical assistance is provided, the patient should be given a score of 0. When possible within the medical record it is also recommended to note the reason, such as "unable to complete test without assistance".
7. "Should my patient touch their back against the back rest between each repetition of sit to stand?"
 - a. No, the patient should be encouraged to avoid touching his/her trunk to the backrest between each repetition to minimize utilization of momentum to complete the sit to stand.
8. "Should I include a practice session or multiple trials?"
 - a. Yes, a practice session can ensure familiarization with the test.⁴ So, if a clinician feels a practice session is warranted then one may be performed.
 - b. If a patient has limited endurance, consider an abbreviated practice trial of 2 sit to stands to ensure that the patient understands all components of the test.⁵
9. "Does foot position matter?"
 - a. Yes, foot position can impact sit to stand time and has been found to be a limitation in some studies exploring the 5TSTS in neurologic populations.^{1,6} A posterior foot position has been shown to have faster sit to stand times in patients with chronic stroke.³
 - b. Foot position should be self-selected by the patient.

References

1. Whitney SL, Wrisley DM, Marchetti GF, Gee MA, Redfern MS, Furman JM. Clinical measurement of sit-to-stand performance in people with balance disorders: validity of data for the Five-Times-Sit-to-Stand Test. *Phys Ther.* 2005;85(10):1034-1045.
2. Duncan RP, Leddy AL, Earhart GM. Five times sit-to-stand test performance in Parkinson's disease. *Arch Phys Med Rehabil.* 2011;92:1431-6.
3. Kwong PWH, Ng SSM, Chung RCK, Ng CYF. Foot placement and arm position affect the Five Times Sit-to-Stand Test time of individuals with chronic stroke. *BioMed Research International.* 2014; 636530.
4. Møller, Andreas Buch, et al. Validity and variability of the 5-repetition sit-to-stand test in patients with multiple sclerosis. *Disabil Rehabil.* 2012;34(26):2251-2258.
5. Bohannon, Richard W., et al. Sit-to-stand test: performance and determinants across the age-span." *Isokinet Exerc Sci.* 2010;18:4235-240.
6. Mong Y, Teo TW, Ng SS. 5-repetition sit-to-stand test in subjects with chronic stroke: reliability and validity. *Arch Phys Med Rehabil.* 2010;91(3): 407-413.

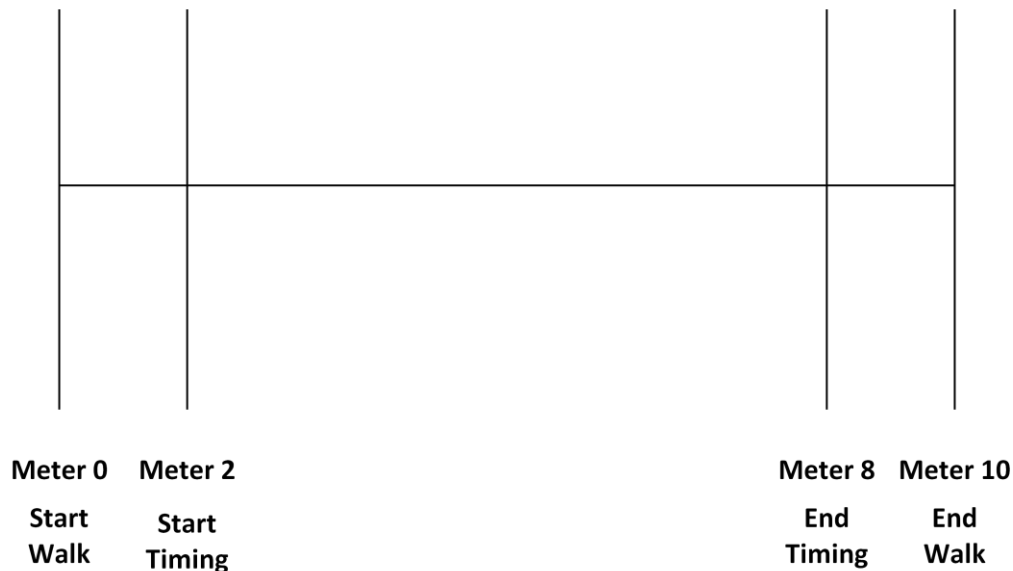
Timed 10-Meter Walk Test

General Information:

- individual walks without assistance 10 meters (32.8 feet) and the time is measured for the intermediate 6 meters (19.7 feet) to allow for acceleration and deceleration
 - start timing when the toes of the leading foot crosses the 2-meter mark
 - stop timing when the toes of the leading foot crosses the 8-meter mark
 - assistive devices can be used but should be kept consistent and documented from test to test
 - if physical assistance is required to walk, this should not be performed
- can be performed at preferred walking speed or fastest speed possible
 - documentation should include the speed tested (preferred vs. fast)
- collect three trials and calculate the average of the three trials

Set-up (derived from the reference articles):

- measure and mark a 10-meter walkway
- add a mark at 2-meters
- add a mark at 8-meters



Patient Instructions (derived from the reference articles):

- Normal comfortable speed: *"I will say ready, set, go. When I say go, walk at your normal comfortable speed until I say stop"*
- Maximum speed trials: *"I will say ready, set, go. When I say go, walk as fast as you safely can until I say stop"*

10 Meter Walk Testing Form

Name: _____

Assistive Device and/or Bracing Used: _____

Date: _____

Seconds to ambulate 10 meters (only the middle 6 meters are timed)

Self-Selected Velocity: Trial 1 _____ sec. Fast Velocity: Trial 1 _____ sec.

Self-Selected Velocity: Trial 2 _____ sec. Fast Velocity: Trial 2 _____ sec.

Self-Selected Velocity: Trial 3 _____ sec. Fast Velocity: Trial 3 _____ sec.

Self-Selected Velocity: Average time _____ sec. Fast Velocity: Average time _____ sec.

Actual velocity: Divide 6 by the average seconds

Average Self-Selected Velocity: _____ m/s

Average Fast-Velocity: _____ m/s

Date: _____

Seconds to ambulate 10 meters (only the middle 6 meters are timed)

Self-Selected Velocity: Trial 1 _____ sec. Fast Velocity: Trial 1 _____ sec.

Self-Selected Velocity: Trial 2 _____ sec. Fast Velocity: Trial 2 _____ sec.

Self-Selected Velocity: Trial 3 _____ sec. Fast Velocity: Trial 3 _____ sec.

Self-Selected Velocity: Average time _____ sec. Fast Velocity: Average time _____ sec.

Actual velocity: Divide 6 by the average seconds

Average Self-Selected Velocity: _____ m/s

Average Fast-Velocity: _____ m/s

References:

Bohannon, R. W. Comfortable and maximum walking speed of adults aged 20-79 years: reference values and determinants." *Age Ageing*. 1997;26(1): 15-9.

Bohannon RW, Andrews AW, Thomas MW. Walking speed: reference values and correlates for older adults. *J Orthop Sports Phys Ther*. 1996;24(2):86-90.

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BERG BALANCE SCALE

Patient Name: _____

Rater Name: _____

Date: _____

Balance Item	Score (0-4)
1. Sitting unsupported	_____
2. Change of position: sitting to standing	_____
3. Change of position" standing to sitting	_____
4. Transfers	_____
5. Standing unsupported	_____
6. Standing with eyes closed	_____
7. Standing with feet together	_____
8. Tandem standing	_____
9. Standing on one leg	_____
10. Turning trunk (feet fixed)	_____
11. Retrieving objects from floor	_____
12. Turning 360 degrees	_____
13. Stool stepping	_____
14. Reaching forward while standing	_____
TOTAL (0-56): _____	

Interpretation

0-20, wheelchair bound
21-40, walking with assistance
41-56, independent

References

Berg K, Wood-Dauphinee S, Williams JI, Maki, B: Measuring balance in the elderly: Validation of an instrument. **Can. J. Pub. Health, July/August supplement 2:S7-11, 1992.**

Berg K, Wood-Dauphinee S, Williams JI, Gayton D: Measuring balance in the elderly: Preliminary development of an instrument. *Physiotherapy Canada*, 41:304-311, 1989.

BERG BALANCE TESTS AND RATING SCALE

Patient Name _____

Date _____

Location _____

Rater _____

ITEM DESCRIPTION SCORE (0-4) Sitting to standing _____ Standing unsupported _____ Sitting unsupported _____ Standing to sitting _____ Transfers _____ Standing with eyes closed _____ Standing with feet together _____ Reaching forward with outstretched arm _____ Retrieving object from floor _____ Turning to look behind _____ Turning 360 degrees _____ Placing alternate foot on stool _____ Standing with one foot in front _____ Standing on one foot _____ TOTAL _____

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.

In most items, the subject is asked to maintain a given position for a specific time. Progressively more points are deducted if the time or distance requirements are not met, if the subject's performance warrants supervision, or if the subject touches an external support or receives assistance from the examiner. 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.

Equipment required for testing are a stopwatch or watch with a second hand, and a ruler or other indicator of 2, 5 and 10 inches (5, 12 and 25 cm). Chairs used during testing should be of reasonable height. Either a step or a stool (of average step height) may be used for item #12.

1. SITTING TO STANDING

INSTRUCTIONS: Please stand up. Try not to use your hands 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 to stabilize
- () 0 needs moderate or maximal assist to stand

2. STANDING UNSUPPORTED

INSTRUCTIONS: Please stand for two minutes without holding.

- () 4 able to stand safely 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.

3. 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 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

4. 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 assistance to sit

5. TRANSFERS

INSTRUCTIONS: Arrange chairs(s) for a 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 cueing and/or supervision
- () 1 needs one person to assist
- () 0 needs two people to assist or supervise to be safe

6. 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

7. STANDING UNSUPPORTED WITH FEET TOGETHER

INSTRUCTIONS: Place your feet together and stand without holding.

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

8. 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 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 finger reaches 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 safely (5 inches)
- () 2 can reach forward >5 cm safely (2 inches)
- () 1 reaches forward but needs supervision
- () 0 loses balance while trying/requires external support

9. PICK UP OBJECT FROM THE FLOOR FROM A STANDING POSITION

INSTRUCTIONS: Pick up the shoe/slipper which is placed 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 2-5cm (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

10. TURNING TO LOOK BEHIND OVER LEFT AND RIGHT SHOULDERS WHILE STANDING

INSTRUCTIONS: Turn to look directly behind you over toward 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

11. 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 in 4 seconds or less
- () 2 able to turn 360 degrees safely but slowly
- () 1 needs close supervision or verbal cueing
- () 0 needs assistance while turning

12. PLACING 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

13. STANDING UNSUPPORTED ONE FOOT IN FRONT

INSTRUCTIONS: (DEMONSTRATE TO SUBJECT) 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 of other 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

14. STANDING ON ONE LEG

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

- () 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 = or >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

TOTAL SCORE (Maximum = 56: _____

***References**

Wood-Dauphinee S, Berg K, Bravo G, Williams JI: The Balance Scale: Responding to clinically meaningful changes. Canadian Journal of Rehabilitation, 10: 35-50, 1997.

Berg K, Wood-Dauphinee S, Williams JI: The Balance Scale: Reliability assessment for elderly residents and patients with an acute stroke. Scand J Rehab Med, 27:27-36, 1995.

Berg K, Maki B, Williams JI, Holliday P, Wood-Dauphinee S: A comparison of clinical and laboratory measures of postural balance in an elderly population. Arch Phys Med Rehabil, 73: 1073-1083, 1992.

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Test Administration Instructions for the Fullerton Advanced Balance (FAB) Scale

1. Stand with feet together and eyes closed

Purpose: Assess ability to use somatosensory (i.e., ground and body position) cues to maintain upright balance while standing in a reduced base of support and vision unavailable.

Equipment: Stopwatch with lanyard (for placing around neck).

Safety Procedures: Position person being tested in a corner (If available) or close to a wall. Stand close to participant in case of loss of balance. Hold watch at eye level so participant and time can be monitored simultaneously.

Testing procedures: Demonstrate the correct test position and then instruct the participants to move the feet independently until they are together. If some participants are unable to achieve the correct position due to lower extremity joint problems, encourage them to bring their heels together even though the front of the feet are not touching. Have participants adopt a position that will ensure their safety as the arms are folded across the chest and they prepare to close the eyes. Begin timing as soon as the participant closes the eyes. (Instruct participants to open the eyes if they feel so unsteady that a loss of balance is imminent.)

Verbal instructions: “Bring your feet together, fold your arms across your chest, close your eyes when you are ready, and remain as steady as possible until I instruct you to open your eyes.”

2. Reach forward to retrieve an object (pencil) held at shoulder height with outstretched arm

Purpose: Assess ability to lean forward to retrieve an object without altering the base of support; measure of stability limits in a forward direction.

Equipment: Pencil and 12-inch ruler

Safety Procedures: Position person facing out from corner (If available) or close to wall. Position self to side of participant's outstretched hand. Use arm holding pencil in horizontal position to manually assist client if a loss of balance occurs.

Testing procedures: Provide participant with sagittal view of desired movement. Instruct the participant to raise the preferred arm to 90° and extend it with fingers outstretched. Use the ruler to measure a distance of 10 inches from the end of the fingers of the outstretched arm. Hold the object (pencil) horizontally and level with the height of the participant's shoulder. Be sure not to move the pencil once the instructions are provided. Instruct the participant to reach forward, grasp the pencil, and return to the initial starting position without moving the feet, if possible. (It is acceptable to raise the heels as long as the feet do not move while reaching for the pencil.) If the participant is unable to reach the pencil within 2-3 seconds of initiating the forward lean, indicate to the participant that it is okay to move the feet in order to reach the pencil. Record the number of steps taken by the participant in order to retrieve the pencil.

Verbal instructions: “Try to lean forward to take the pencil from my hand and return to your starting position without moving your feet.” After allowing 2-3 seconds of lean time: “You can move your feet in order to reach the pencil.”

3. Turn 360 degrees in right and left directions

Purpose: Assess ability to turn in a full circle in both directions in the fewest number of steps without loss of balance

Equipment: None

Safety Procedures: Position person being tested about one foot in front of a wall and facing you. Stand close enough during test to provide manual assistance if a loss of balance occurs.

Testing procedures: Verbally explain and then demonstrate the task to be performed, making sure to complete each circle in four steps or less and pause briefly between turns. Instruct the participant (who is facing you) to turn in a complete circle in one direction, pause, and then turn in a complete circle in the opposite direction. Count the number of full steps taken to complete each circle. Stop counting steps as soon as the participant is facing you after completing each turn. Allow for a small correction in foot position before a turn in the opposite direction is initiated.

Verbal instructions: "In place, turn around in a full circle, pause, and then turn in a second full circle in the opposite direction. Do not begin the full circle in the opposite direction until you are facing me."

4. Step up onto and over a 6-inch bench

Purpose: Assess ability to control body in dynamic task situations; also a measure of lower body strength and bilateral motor coordination.

Equipment: 6-inch-high bench (18- by 18-inch stepping surface)

Safety Procedures: Position bench close to a wall and self on opposite side of bench. Adopt close supervisory position and move with participant as she/he steps up and over the bench in each direction.

Testing procedures: Verbally explain the movement to be performed before demonstrating the step up onto and over the bench (at normal speed) in both directions. Instruct the participant to step onto the bench with the right foot, swing the left leg directly up and over the bench, and step off the other side, then repeat the movement in the opposite direction with the left leg leading the action. Encourage the participant not to touch the wall or you to maintain balance during the test. During performance of the test item, watch to see that the participant's trailing leg (a) does not make contact with the bench, or (b) swing around, as opposed to directly up and over, the bench. Verbally cue which leg should be leading the action just prior to the start of the movement in each direction.

Verbal instructions: "Step up onto the bench with your right leg, swing your left leg directly up and over the bench, and step off the other side. Repeat the movement in the opposite direction with your left leg as the leading leg."

5. Tandem walk

Purpose: Assess ability to dynamically control center of mass with an altered base of support

Equipment: Masking tape

Safety Procedures: Set the tandem walk line approximately 12 inches away from a wall. Monitor the participant closely during performance of the test item and walk forward with the client as he/she completes the test item. Be ready to provide manual assist if a loss of balance occurs.

Testing procedures: Verbally explain and demonstrate how to perform the test item correctly before the participant attempts to perform it. Instruct the participant to walk on the line in a tandem position (heel-to-toe) until you tell him/her to stop. Allow the participant to repeat the test item *one time* if unable to achieve a tandem stance position within the first two steps. The participant may elect to step forward with the opposite foot on the second attempt. Score as interruptions any instances where the participant (a) takes one or more steps away from the line when performing the tandem walk or (b) is unable to achieve correct heel-to-toe position during any step taken along the course. Do not ask the participant to stop until 10 steps have been completed.

Verbal instructions: "Walk forward along the line, placing one foot directly in front of the other such that the heel and toe are in contact on each step forward. I will tell you when to stop."

6. Stand on one leg

Purpose: Assess ability to maintain upright balance with a reduced base of support.

Equipment: Stopwatch and lanyard.

Safety Procedures: Position the person being tested in a corner (if one is available) or close to a wall. Stand in a close supervisory position and on the side of the raised leg.

Testing procedures: Instruct the participant to fold the arms across the chest, lift one leg off the floor, and maintain balance until instructed to return the foot to the floor. Begin timing as soon as the participant lifts the foot from the floor. Stop timing if the legs touch, the raised leg contacts the floor, or the participant lifts the arms off the chest before the 20 seconds has elapsed. Allow the participant to perform the test a second time with the other leg raised if they touch down quickly on the first attempt or are unsure as to which leg should be raised.

Verbal instructions: "Fold your arms across your chest, lift one leg off the floor (without touching your other leg), and stand with your eyes open until I ask you to put your foot down."

7. Stand on foam with eyes closed

Purpose: Assess ability to maintain upright balance while standing on a compliant surface with eyes closed

Equipment: Stopwatch and lanyard; two Airex® pads, with a length of nonslip material placed between the two pads and an additional length of nonslip material between the floor and first pad if the test is being performed on an uncarpeted surface.

Safety Procedures: Position person to be tested in a corner (if one is available) or close to a wall. After demonstrating the test item, place the Airex® pads in front of the person if standing in a corner. Adopt a close supervisory position and hold watch at a height that allows for simultaneous monitoring of the participant's arm position and eyes as well as the time. Instruct the participant to open the eyes if she/he feels so unsteady that a loss of balance is imminent. Manually assist the client off the foam pads if he/she appears unsteady.

Testing procedures: Following a demonstration of the task, instruct the participant to step up onto the foam pads without assistance, position the feet shoulder width apart, fold the arms across the chest, and close the eyes when ready. Begin timing as soon as the eyes close. Stop the trial if the participant (a) opens the eyes before the timing period has elapsed, (b) lifts the arms off the chest, or (c) loses balance and requires manual assistance to prevent falling. Instruct the participant to step forward off the foam at the completion of the test item. Provide manual assistance if needed.

Verbal instructions: "Step up onto the foam and stand with your feet shoulder-width apart. Fold your arms over your chest, and close your eyes when you are ready. I will tell you when to open your eyes."

8. Two-footed jump for distance (Do not introduce this test item if participant cannot perform test item 4 safely, has a diagnosis of osteoporosis, or complains of lower body joint pain. Score a zero on the test form and move immediately to test item #9.)

Purpose: Assess upper and lower body coordination and lower body power.

Equipment: 36-inch ruler; masking tape.

Safety Procedures: Position the person close to a wall and adopt a close supervisory position during the jump. Demonstrate the jump but do not jump more than twice the length of your own feet. Stand to the side of the participant and move forward as he or she jumps. Place your hand on the participant's back to steady him/her as soon as the feet contact the ground following the jump.

Testing procedures: Instruct the participant to jump as far but as safely as possible while performing a two-footed jump (i.e., leave the floor with two feet and land on two feet). Demonstrate the correct movement prior to the participant performing the jump. Use the ruler to measure the length of the foot and then multiply by two to determine the ideal distance to be jumped. Observe whether the participant leaves the floor with both feet and lands with both feet. Position the ruler on the floor and on the opposite side of the participant and close to the wall so that you can glance down and see how far the participant jumped.

Verbal instructions: “Jump as far *but* (emphasize) as safely as you can. Try and make sure that both feet leave the floor and land at the same time.”

9. Walk with head turns

Purpose: Assess ability to maintain dynamic balance while walking and turning the head from side-to-side.

Equipment: Metronome set at 100 beats per minute

Safety Procedures: Position yourself directly behind the participant during the standing portion of the test item so you can clearly see how far the head turns in either direction. Move to a position that is behind and slightly to the side of the participant during the walking portion of this test item. Stand close enough that you can provide manual assistance if the participant becomes unstable while walking.

Testing procedures: After first demonstrating the test item, ask the participant to practice turning the head in time with the metronome while standing in place. Watch to see that the participant is turning the head the required distance to both sides and at the required speed. Provide verbal cueing if the participant is not performing the head turns correctly. Once the participant appears to have the correct head turning rhythm (after no more than 4 to 6 head turns), instruct him/her to begin walking forward. The head turns should be to the beat of the metronome. Begin counting steps as soon as the participant begins to walk forward with head turns. Observe whether the participant deviates from a straight path while walking or is unable to turn the head the required distance (in one or both directions) and/or at the required speed. If the participant is unable to achieve the correct head turning rhythm while standing it is highly unlikely he/she will be able to achieve it while walking (making the scoring of the test item a little easier). Also, in most cases, the steps will be synchronized with the head turns, making the counting of 10 steps easier.

Verbal instructions: “Begin turning your head to the beat of the metronome while standing in place. Start walking forward while turning your head from side-to-side with each beat of the metronome. I will tell you when to stop.”

10. Reactive postural control

Purpose: Assess ability to efficiently restore balance following an unexpected perturbation

Equipment: None

Safety Procedures: Position the client approximately 3-4 feet in front of a wall. Stand immediately behind the participant and adopt a wide base of support during the leaning portion of the test. Be ready to move your feet quickly once you release your hand and the participant begins to lose balance. Flex the elbow and release your hand as soon as you determine that the participant is exerting sufficient pressure against your hand to require that he/she must step backwards one or more times to restore balance. This release should be unexpected, so do not prepare the participant for the moment of release or allow the participant to lean too far back onto your hand before releasing it.

Testing procedures: Instruct the participant to stand with his or her back to you. Extend your arm with the elbow locked and place the palm of your hand in the middle of the participant's back. Instruct the participant to lean back slowly against your hand until you tell him or her to stop. Quickly flex your elbow until your hand is no longer in contact with the participant's back at the moment you estimate that a sufficient amount of force has been applied to require a movement of the feet to restore balance. Try to quickly release your hand while you are still giving the verbal instructions.

Verbal instructions: “Slowly lean back into my hand until I ask you to stop.”

Scoring Form for Fullerton Advanced Balance (FAB) Scale

Name: _____

Date of Test: _____

1. Stand with feet together and eyes closed

- ☐ 0 Unable to obtain the correct standing position independently
- ☐ 1 Able to obtain the correct standing position independently but unable to maintain the position or keep the eyes closed for more than 10 seconds
- ☐ 2 Able to maintain the correct standing position with eyes closed for more than 10 seconds but less than 30 seconds
- ☐ 3 Able to maintain the correct standing position with eyes closed for 30 seconds but requires close supervision
- ☐ 4 Able to maintain the correct standing position safely with eyes closed for 30 seconds

2. Reach forward to retrieve an object (pencil) held at shoulder height with outstretched arm

- ☐ 0 Unable to reach the pencil without taking more than two steps
- ☐ 1 Able to reach the pencil but needs to take two steps
- ☐ 2 Able to reach the pencil but needs to take one step
- ☐ 3 Can reach the pencil without moving the feet but requires supervision
- ☐ 4 Can reach the pencil safely and independently without moving the feet

3. Turn 360 degrees in right and left directions

- ☐ 0 Needs manual assistance while turning
- ☐ 1 Needs close supervision or verbal cueing while turning
- ☐ 2 Able to turn 360 degrees but takes more than four steps in both directions
- ☐ 3 Able to turn 360 degrees but unable to complete in four steps or fewer in one direction
- ☐ 4 Able to turn 360 degrees safely taking four steps or fewer in both directions

*4. Step up onto and over a 6-inch bench

- ☐ 0 Unable to step up onto the bench without loss of balance or manual assistance
- ☐ 1 Able to step up onto the bench with leading leg, but trailing leg contacts the bench or leg swings around the bench during the swing-through phase in both directions
- ☐ 2 Able to step up onto the bench with leading leg, but trailing leg contacts the bench or swings around the bench during the swing-through phase in one direction
- ☐ 3 Able to correctly complete the step up and over in both directions but requires close supervision in one or both directions
- ☐ 4 Able to correctly complete the step up and over in both directions safely and independently

***5. Tandem walk**

- () 0 Unable to complete 10 steps independently
- () 1 Able to complete the 10 steps with more than five interruptions
- () 2 Able to complete the 10 steps with three to five interruptions
- () 3 Able to complete the 10 steps with one to two interruptions
- () 4 Able to complete the 10 steps independently and with no interruptions

***6. Stand on one leg**

- () 0 Unable to try or needs assistance to prevent falling
- () 1 Able to lift leg independently but unable to maintain position for more than 5 seconds
- () 2 Able to lift leg independently and maintain position for more than 5 but less than 12 seconds
- () 3 Able to lift leg independently and maintain position for 12 or more seconds but less than 20 seconds
- () 4 Able to lift leg independently and maintain position for the full 20 seconds

***7. Stand on foam with eyes closed**

- () 0 Unable to step onto foam or maintain standing position independently with eyes open
- () 1 Able to step onto foam independently and maintain standing position but unable or unwilling to close eyes
- () 2 Able to step onto foam independently and maintain standing position with eyes closed for 10 seconds or less
- () 3 Able to step onto foam independently and maintain standing position with eyes closed for more than 10 seconds but less than 20 seconds
- () 4 Able to step onto foam independently and maintain standing position with eyes closed for 20 seconds

Do not introduce test item #8 if test item #4 was not performed safely and/or it is contraindicated to perform this test item (review test administration instructions for contraindications). Score a zero and move to next test item.

8. Two-footed jump

- () 0 Unwilling or unable to attempt or attempts to initiate two-footed jump, but one or both feet do not leave the floor
- () 1 Able to initiate two-footed jump, but one foot either leaves the floor or lands before the other
- () 2 Able to perform two-footed jump, but unable to jump farther than the length of their own feet
- () 3 Able to perform two-footed jump and achieve a distance greater than the length of their own feet
- () 4 Able to perform two-footed jump and achieve a distance greater than twice the length of their own feet



9. Walk with head turns

- () 0 Unable to walk 10 steps independently while maintaining 30° head turns at an established pace
- () 1 Able to walk 10 steps independently but unable to complete required number of 30° head turns at an established pace
- () 2 Able to walk 10 steps but veers from a straight line while performing 30° head turns at an established pace
- () 3 Able to walk 10 steps in a straight line while performing 30° head turns at an established pace but head turns less than 30° in one or both directions
- () 4 Able to walk 10 steps in a straight line while performing required number of 30° head turns at established pace

10. Reactive postural control

- () 0 Unable to maintain upright balance; no observable attempt to step; requires manual assistance to restore balance
- () 1 Unable to maintain upright balance; takes two or more steps and requires manual assistance to restore balance
- () 2 Unable to maintain upright balance; takes more than two steps but is able to restore balance independently
- () 3 Unable to maintain upright balance; takes two steps but is able to restore balance independently
- () 4 Unable to maintain upright balance but able to restore balance independently with only one step

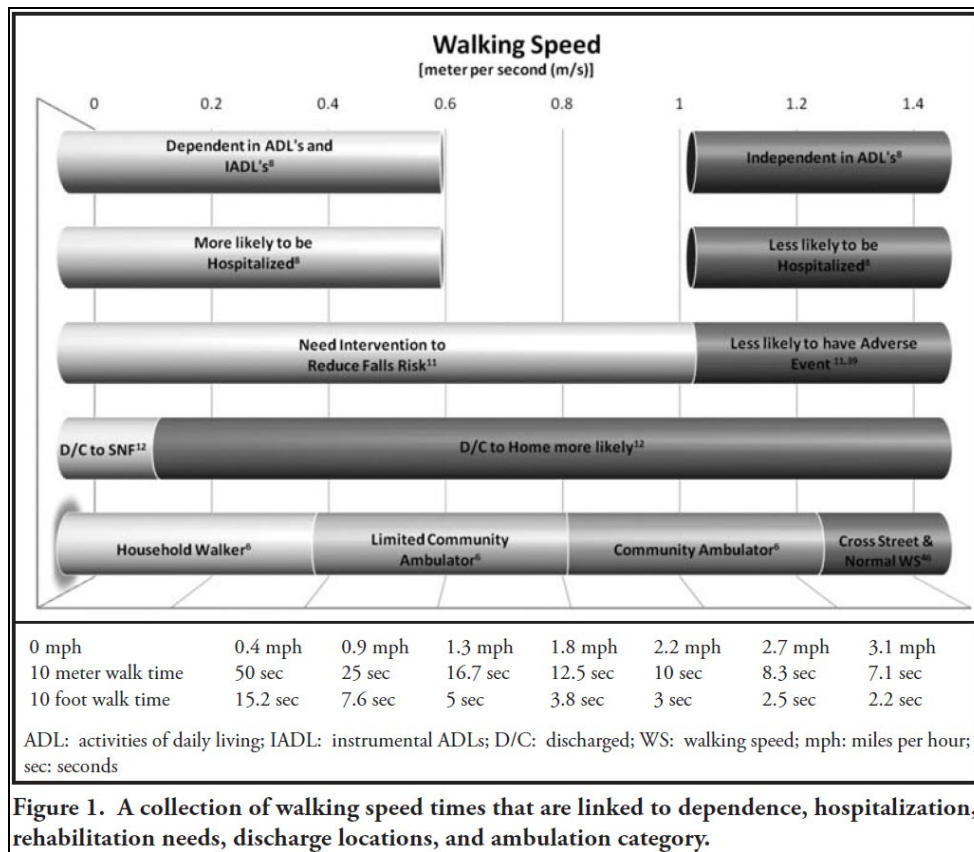
TOTAL: 40 POINTS

Evaluating Risk for Falls:

Long Form Fullerton Advanced Balance (FAB) scale Cut-Off Score: $\leq 25/40$ Points

Short-Form Fullerton Advanced Balance (FAB) scale Cut-Off Score: $\leq 9/16$ Points

Gait Speed (self-selected): Interpretation and Norms



Fritz S. Lusardi M. (2010). White Paper: Walking Speed: the Sixth Vital Sign. *Journal of Geriatric Physical Therapy* 32(2): 2-5. Figure 1.

Table 2. Comfortable Gait Speed: Means, Standard Deviations, and Confidence Intervals by Age, Gender, and Use of Assistive Device (in Meters per Second)

Age (y)	Group	N	Mean	SD	CI
60-69	Male	1	1.26	—	0.84 – 1.67
	Female	5	1.24	0.12	1.05 – 1.42
	Overall	6	1.24	0.10	1.13 – 1.35
70-79	Male	9	1.25	0.23	1.11 – 1.39
	Female	10	1.25	0.18	1.11 – 1.38
	Overall	19	1.25	0.20	1.15 – 1.34
80-89	Male	10	0.88	0.24	0.75 – 1.01
	Female	24	0.80	0.20	0.72 – 0.89
	No Device	24	0.91	0.16	0.84 – 0.98
	Device	10	0.63	0.17	0.52 – 0.74
	Overall	34	0.82	0.21	0.75 – 0.90
90-101	Male	2	0.72	0.14	0.43 – 1.02
	Female	15	0.71	0.23	0.60 – 0.82
	No Device	7	0.88	0.23	0.76 – 1.01
	Device	10	0.59	0.10	0.48 – 0.70
	Overall	17	0.71	0.22	0.60 – 0.82

Table 3. Fast Gait Speed: Means, Standard Deviations, and Confidence Intervals by Age, Gender, and Use of Assistive Device (in Meters per Second)

Age (y)	Group	N	Mean	SD	CI
60-69	Male	1	1.96	—	1.37 – 2.56
	Female	5	1.81	0.17	1.55 – 2.08
	Overall	6	1.84	0.17	1.67 – 2.02
70-79	Male	9	1.94	0.26	1.74 – 2.14
	Female	10	1.80	0.26	1.61 – 1.99
	Overall	19	1.86	0.27	1.73 – 1.99
80-89	Male	10	1.29	0.38	1.10 – 1.48
	Female	24	1.20	0.29	1.08 – 1.33
	No Device	24	1.38	0.22	1.28 – 1.47
	Device	10	0.88	0.23	0.73 – 1.03
	Overall	34	1.23	0.32	1.12 – 1.34
90-101	Male	2	1.27	0.13	0.85 – 1.69
	Female	15	1.05	0.32	0.90 – 1.21
	No Device	7	1.29	0.33	1.11 – 1.47
	Device	10	0.93	0.20	0.78 – 1.08
	Overall	17	1.08	0.31	0.92 – 1.24

Lusardi, M.M. (2003). Functional Performance in Community Living Older Adults. *Journal of Geriatric Physical Therapy*, 26(3), 14-22.

Gain of 0.1 m/s is predictor for well-being in those without normal WS. (Purser 2005; Hardy, Perera 2007).

Therefore could use a change of 0.1 m/s for patient goal.

Purser, J. L., M. Weinberger, et al. (2005). "Walking speed predicts health status and hospital costs for frail elderly male veterans." *J Rehabil Res Dev* 42(4): 535-46.
Hardy, S. E., S. Perera, et al. (2007). "Improvement in usual gait speed predicts better survival in older adults." *J Am Geriatr Soc* 55(11): 1727-34.

Interpretation:

- Less than 0.4 m/sec: Household ambulator
- 0.4 to 0.8 m/sec: Limited community ambulator
- 0.8 to 1.2 m/sec: Community ambulator
- 1.2 m/sec and above: Able to safely cross streets

Hand Grip Strength Testing for Older Adults

Equipment needed: Chair (preferably without arms), handgrip dynamometer

A simple handgrip strength test using a dynamometer is a quick screen for overall muscle strength as the two are highly correlated in older populations. A standardized positioning for this test has been recommended:

- Subject is seated with back, pelvis and knees as close to 90 degrees as possible
- Shoulder is adducted (arm by their side), elbow flexed at 90 degrees, forearm neutral
- The arm is not supported by the examiner or armrest and the dynamometer is presented vertically and in line with the forearm
- Maximum grip is the mean of three trials

According to the U.S. Centers for Disease Control criteria the following levels of muscle strength are in the chart below. However, a measurement below 30kg for men and 20kg for women are used to diagnose sarcopenia.

	Men	Women
Normal	>32 kg	>20 kg
Intermediate	26-31.9 kg	16-19.9 kg
Weak	< 26 kg	< 16 kg

Modified Clinical Test of Sensory Interaction in Balance (mCTSIB)

The modified Clinical Test of Sensory Interaction on Balance (mCTSIB) is a simplified derivative of the CTSIB, or “Foam and Dome” test which assesses the patient’s functional balance control during four sensory conditions. Although the mCTSIB data set can document the presence of sensory dysfunction, it cannot provide impairment information specific to an individual sensory system. The information provided is designed to help the clinician assess the need for further testing in patients with complaints related to balance dysfunction, and to establish objective baselines for treatment planning and outcome measurement.

1. Eyes open firm surface
2. Eyes closed firm surface
3. Eyes open unstable surface (foam)
4. Eyes closed unstable surface (foam)

Purpose of Test:

This test is designed to assess how well an older adult is using sensory inputs when one or more sensory systems are compromised. In condition one, all sensory systems (i.e., vision, somatosensory, and vestibular) are available for maintaining balance. In condition two, vision has been removed and the older adult must rely on the somatosensory and vestibular systems to balance. In condition three, the somatosensory system has been compromised and the older adults must use vision and the vestibular system to balance. In condition four, vision has been removed and the somatosensory system has been compromised so they must rely primarily on the vestibular inputs to balance.

Begin timing each trial using a stopwatch. The trial is over when (a) the participant opens his/her eyes in an eyes closed condition, (b) raises arms from sides, (c) loses balance and requires manual assistance to prevent a fall.

This test provides some insight into whether each of the sensory systems available for balance is being used effectively. Failure to maintain balance in condition two indicates that the older adult is visually dependent. They are not using somatosensory inputs to maintain balance when eyes are closed. Failure to maintain balance in conditions 3 and 4 indicate that the visual and/or vestibular system is not being used to maintain balance. Poor performance on this test would suggest the need for multisensory training if the medical history does not indicate that an actual problem(s) exists (e.g. peripheral neuropathy).

*Administer only one trial per condition if participant is able to complete first trial without loss of balance.

mCTSIB Scoring Form

Condition One: Eyes Open, Firm Surface

Trial One Total Time: _____ / 30 sec

Trial Two Total Time: _____ / 30 sec

Trial Three Total Time: _____ / 30 sec

Condition Three: Eyes Open, Foam Surface

Trial One Total Time: _____ / 30 sec

Trial Two Total Time: _____ / 30 sec

Trial Three Total Time: _____ / 30 sec

Condition Two: Eyes Closed, Firm Surface

Trial One Total Time: _____ / 30 sec

Trial Two Total Time: _____ / 30 sec

Trial Three Total Time: _____ / 30 sec

Condition Four: Eyes Closed, Foam Surface

Trial One Total Time: _____ / 30 sec

Trial Two Total Time: _____ / 30 sec

Trial Three Total Time: _____ / 30 sec

TOTAL: _____ / 120 sec

Condition	Possible Impairments	Recommended Exercises
1 – Eyes Open, Firm Surface (3/3 systems available)	- Poor gaze stabilization - Poor use of surface cues - Lower body weakness	Teach visual “spotting” Balance activities with reduced/occupied/absent vision
2 – Eyes Closed, Firm Surface (2/3 systems available)	- Poor use of surface cues - Lower body weakness - Fear of falling	Increased awareness of surface information through verbal cueing during standing exercises. Balance activities with reduced/occupied/absent vision Lower body activities against resistance Confidence-building activities
3 – Eyes Open, Foam Surface (2/3 systems available) Somatosensory information reduced	- Poor use of vision - Lower body weakness - Poor center-of-gravity control	Gaze stabilization techniques. Balance activities performed on compliant, or moving surfaces. Lower body exercises against resistance. Standing center-of-gravity activities on compliant surfaces of different thickness.
4 – Eyes Closed, Foam Surface (1/3 systems available) Somatosensory reduced and vision absent.	- Poor use of vestibular inputs - Fear of falling in high sway condition - Lower body weakness	Balance activities performed on compliant/moving surfaces with vision reduced/occupied/absent. Voluntary sway activities to build confidence. Lower body exercise against resistance.

Personal Medical History Survey

Name: _____

Local phone number: _____

Email: _____

Local address: _____

Today's date: _____

Birthdate: _____

Age: _____

1. Have you ever been diagnosed as having: (Check all that apply)

	Never	In past	Presently
A. Heart disease	_____	_____	_____
B. Rheumatic fever	_____	_____	_____
C. High blood pressure	_____	_____	_____
D. Other vascular disorders	_____	_____	_____
E. Diabetes or Low Blood Sugar	_____	_____	_____
F. Kidney disease	_____	_____	_____
G. Asthma	_____	_____	_____
H. Neurological Disorders (Parkinson's, MS, etc.)	_____	_____	_____
I. Chronic bronchitis	_____	_____	_____
J. Arthritis of the spine, hips, knees or ankles	_____	_____	_____
K. Osteoporosis	_____	_____	_____
L. Clinical depression	_____	_____	_____
M. Other:	_____	_____	_____

2. Please indicate any surgery that you have undergone and the approximate date(s):

3. Please indicate recent (past 12 months) illnesses or major injuries that you have had. Also list approximate dates:

4. Please list any and all medications (prescription and non-prescription) that you are presently taking:

	Medication	Dosage	Dosage per day
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____

6 _____

5. Do you smoke? _____ Packs per day? _____ Smokeless tobacco? _____

6. Describe your present exercise and/or physical activity program (the activity, amount per day, days per week, and the length of time you have been training at this level).

Activity	Minutes/day	Days/week	Weeks of participation
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

7. Do you have any other medical conditions or concerns which should be noted? If so, please describe: _____

Physician Name: _____

Physician Location: _____

TRAINER'S NOTES:

Step 1: Three Word Registration

Look directly at person and say, "Please listen carefully. I am going to say three words that I want you to repeat back to me now and try to remember. The words are [select a list of words from the versions below]. Please say them for me now." If the person is unable to repeat the words after three attempts, move on to Step 2 (clock drawing).

The following and other word lists have been used in one or more clinical studies.¹⁻³ For repeated administrations, use of an alternative word list is recommended.

Version 1	Version 2	Version 3	Version 4	Version 5	Version 6
Banana	Leader	Village	River	Captain	Daughter
Sunrise	Season	Kitchen	Nation	Garden	Heaven
Chair	Table	Baby	Finger	Picture	Mountain

Step 2: Clock Drawing

Say: "Next, I want you to draw a clock for me. First, put in all of the numbers where they go." When that is completed, say: "Now, set the hands to 10 past 11."

Use preprinted circle (see next page) for this exercise. Repeat instructions as needed as this is not a memory test. Move to Step 3 if the clock is not complete within three minutes.

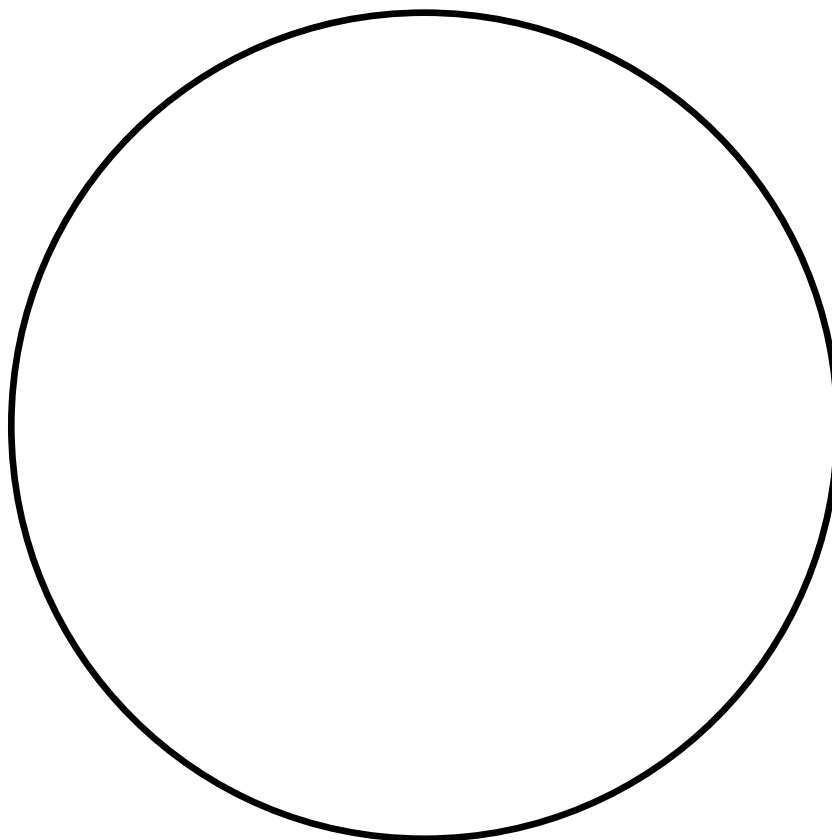
Step 3: Three Word Recall

Ask the person to recall the three words you stated in Step 1. Say: "What were the three words I asked you to remember?" Record the word list version number and the person's answers below.

Word List Version: _____ Person's Answers: _____

Scoring

Word Recall: _____ (0-3 points)	1 point for each word spontaneously recalled without cueing.
Clock Draw: _____ (0 or 2 points)	Normal clock = 2 points. A normal clock has all numbers placed in the correct sequence and approximately correct position (e.g., 12, 3, 6 and 9 are in anchor positions) with no missing or duplicate numbers. Hands are pointing to the 11 and 2 (11:10). Hand length is not scored. Inability or refusal to draw a clock (abnormal) = 0 points.
Total Score: _____ (0-5 points)	Total score = Word Recall score + Clock Draw score. A cut point of <3 on the Mini-Cog™ has been validated for dementia screening, but many individuals with clinically meaningful cognitive impairment will score higher. When greater sensitivity is desired, a cut point of <4 is recommended as it may indicate a need for further evaluation of cognitive status.



References

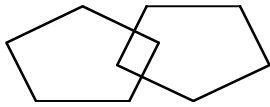
1. Borson S, Scanlan JM, Chen PJ et al. The Mini-Cog as a screen for dementia: Validation in a population based sample. *J Am Geriatr Soc* 2003;51:1451–1454.
2. Borson S, Scanlan JM, Watanabe J et al. Improving identification of cognitive impairment in primary care. *Int J Geriatr Psychiatry* 2006;21: 349–355.
3. Lessig M, Scanlan J et al. Time that tells: Critical clock-drawing errors for dementia screening. *Int Psychogeriatr*. 2008 June; 20(3): 459–470.
4. Tsoi K, Chan J et al. Cognitive tests to detect dementia: A systematic review and meta-analysis. *JAMA Intern Med*. 2015; E1-E9.
5. McCarten J, Anderson P et al. Screening for cognitive impairment in an elderly veteran population: Acceptability and results using different versions of the Mini-Cog. *J Am Geriatr Soc* 2011; 59: 309-213.
6. McCarten J, Anderson P et al. Finding dementia in primary care: The results of a clinical demonstration project. *J Am Geriatr Soc* 2012; 60: 210-217.
7. Scanlan J & Borson S. The Mini-Cog: Receiver operating characteristics with the expert and naive raters. *Int J Geriatr Psychiatry* 2001; 16: 216-222.

Mini-Mental State Examination (MMSE)

Patient's Name: _____

Date: _____

Instructions: Score one point for each correct response within each question or activity.

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day? Month?"
5		"Where are we now? State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then the instructor asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible.
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, ...) Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.) 
30		TOTAL

Interpretation of the MMSE:

Method	Score	Interpretation
Single Cutoff	<24	Abnormal
Range	<21	Increased odds of dementia
	>25	Decreased odds of dementia
Education	21	Abnormal for 8 th grade education
	<23	Abnormal for high school education
	<24	Abnormal for college education
Severity	24-30	No cognitive impairment
	18-23	Mild cognitive impairment
	0-17	Severe cognitive impairment

Interpretation of MMSE Scores:

Score	Degree of Impairment	Formal Psychometric Assessment	Day-to-Day Functioning
25-30	Questionably significant	If clinical signs of cognitive impairment are present, formal assessment of cognition may be valuable.	May have clinically significant but mild deficits. Likely to affect only most demanding activities of daily living.
20-25	Mild	Formal assessment may be helpful to better determine pattern and extent of deficits.	Significant effect. May require some supervision, support and assistance.
10-20	Moderate	Formal assessment may be helpful if there are specific clinical indications.	Clear impairment. May require 24-hour supervision.
0-10	Severe	Patient not likely to be testable.	Marked impairment. Likely to require 24-hour supervision and assistance with ADL.

Source:

- Folstein MF, Folstein SE, McHugh PR: "Mini-mental state: A practical method for grading the cognitive state of patients for the clinician." *J Psychiatr Res* 1975;12:189-198.

2020 PAR-Q+

The Physical Activity Readiness Questionnaire for Everyone

The health benefits of regular physical activity are clear; more people should engage in physical activity every day of the week. Participating in physical activity is very safe for MOST people. This questionnaire will tell you whether it is necessary for you to seek further advice from your doctor OR a qualified exercise professional before becoming more physically active.

GENERAL HEALTH QUESTIONS

Please read the 7 questions below carefully and answer each one honestly: check YES or NO.	YES	NO
1) Has your doctor ever said that you have a heart condition ☐ OR high blood pressure ☐ ?	☐	☐
2) Do you feel pain in your chest at rest, during your daily activities of living, OR when you do physical activity?	☐	☐
3) Do you lose balance because of dizziness OR have you lost consciousness in the last 12 months? Please answer NO if your dizziness was associated with over-breathing (including during vigorous exercise).	☐	☐
4) Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? PLEASE LIST CONDITION(S) HERE: _____	☐	☐
5) Are you currently taking prescribed medications for a chronic medical condition? PLEASE LIST CONDITION(S) AND MEDICATIONS HERE: _____	☐	☐
6) Do you currently have (or have had within the past 12 months) a bone, joint, or soft tissue (muscle, ligament, or tendon) problem that could be made worse by becoming more physically active? Please answer NO if you had a problem in the past, but it does not limit your current ability to be physically active. PLEASE LIST CONDITION(S) HERE: _____	☐	☐
7) Has your doctor ever said that you should only do medically supervised physical activity?	☐	☐



If you answered NO to all of the questions above, you are cleared for physical activity.

Please sign the PARTICIPANT DECLARATION. You do not need to complete Pages 2 and 3.



Start becoming much more physically active – start slowly and build up gradually.



Follow Global Physical Activity Guidelines for your age (<https://apps.who.int/iris/handle/10665/44399>).



You may take part in a health and fitness appraisal.



If you are over the age of 45 yr and NOT accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.



If you have any further questions, contact a qualified exercise professional.

PARTICIPANT DECLARATION

If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.

I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that the community/fitness center may retain a copy of this form for its records. In these instances, it will maintain the confidentiality of the same, complying with applicable law.

NAME _____ DATE _____

SIGNATURE _____ WITNESS _____

SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER _____

If you answered YES to one or more of the questions above, COMPLETE PAGES 2 AND 3.



Delay becoming more active if:



You have a temporary illness such as a cold or fever; it is best to wait until you feel better.



You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ at www.eparmedx.com before becoming more physically active.



Your health changes - answer the questions on Pages 2 and 3 of this document and/or talk to your doctor or a qualified exercise professional before continuing with any physical activity program.

2020 PAR-Q+

FOLLOW-UP QUESTIONS ABOUT YOUR MEDICAL CONDITION(S)

1. Do you have Arthritis, Osteoporosis, or Back Problems?

If the above condition(s) is/are present, answer questions 1a-1c

If **NO** ☐ go to question 2

- 1a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐
- 1b. Do you have joint problems causing pain, a recent fracture or fracture caused by osteoporosis or cancer, displaced vertebra (e.g., spondylolisthesis), and/or spondylolysis/pars defect (a crack in the bony ring on the back of the spinal column)? YES ☐ NO ☐
- 1c. Have you had steroid injections or taken steroid tablets regularly for more than 3 months? YES ☐ NO ☐

2. Do you currently have Cancer of any kind?

If the above condition(s) is/are present, answer questions 2a-2b

If **NO** ☐ go to question 3

- 2a. Does your cancer diagnosis include any of the following types: lung/bronchogenic, multiple myeloma (cancer of plasma cells), head, and/or neck? YES ☐ NO ☐
- 2b. Are you currently receiving cancer therapy (such as chemotherapy or radiotherapy)? YES ☐ NO ☐

3. Do you have a Heart or Cardiovascular Condition? This includes Coronary Artery Disease, Heart Failure, Diagnosed Abnormality of Heart Rhythm

If the above condition(s) is/are present, answer questions 3a-3d

If **NO** ☐ go to question 4

- 3a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐
- 3b. Do you have an irregular heart beat that requires medical management? (e.g., atrial fibrillation, premature ventricular contraction) YES ☐ NO ☐
- 3c. Do you have chronic heart failure? YES ☐ NO ☐
- 3d. Do you have diagnosed coronary artery (cardiovascular) disease and have not participated in regular physical activity in the last 2 months? YES ☐ NO ☐

4. Do you currently have High Blood Pressure?

If the above condition(s) is/are present, answer questions 4a-4b

If **NO** ☐ go to question 5

- 4a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐
- 4b. Do you have a resting blood pressure equal to or greater than 160/90 mmHg with or without medication? (Answer **YES** if you do not know your resting blood pressure) YES ☐ NO ☐

5. Do you have any Metabolic Conditions? This includes Type 1 Diabetes, Type 2 Diabetes, Pre-Diabetes

If the above condition(s) is/are present, answer questions 5a-5e

If **NO** ☐ go to question 6

- 5a. Do you often have difficulty controlling your blood sugar levels with foods, medications, or other physician-prescribed therapies? YES ☐ NO ☐
- 5b. Do you often suffer from signs and symptoms of low blood sugar (hypoglycemia) following exercise and/or during activities of daily living? Signs of hypoglycemia may include shakiness, nervousness, unusual irritability, abnormal sweating, dizziness or light-headedness, mental confusion, difficulty speaking, weakness, or sleepiness. YES ☐ NO ☐
- 5c. Do you have any signs or symptoms of diabetes complications such as heart or vascular disease and/or complications affecting your eyes, kidneys, **OR** the sensation in your toes and feet? YES ☐ NO ☐
- 5d. Do you have other metabolic conditions (such as current pregnancy-related diabetes, chronic kidney disease, or liver problems)? YES ☐ NO ☐
- 5e. Are you planning to engage in what for you is unusually high (or vigorous) intensity exercise in the near future? YES ☐ NO ☐

2020 PAR-Q+

6. **Do you have any Mental Health Problems or Learning Difficulties?** This includes Alzheimer's, Dementia, Depression, Anxiety Disorder, Eating Disorder, Psychotic Disorder, Intellectual Disability, Down Syndrome

If the above condition(s) is/are present, answer questions 6a-6b

If **NO** ☐ go to question 7

6a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐

6b. Do you have Down Syndrome **AND** back problems affecting nerves or muscles? YES ☐ NO ☐

7. **Do you have a Respiratory Disease?** This includes Chronic Obstructive Pulmonary Disease, Asthma, Pulmonary High Blood Pressure

If the above condition(s) is/are present, answer questions 7a-7d

If **NO** ☐ go to question 8

7a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐

7b. Has your doctor ever said your blood oxygen level is low at rest or during exercise and/or that you require supplemental oxygen therapy? YES ☐ NO ☐

7c. If asthmatic, do you currently have symptoms of chest tightness, wheezing, laboured breathing, consistent cough (more than 2 days/week), or have you used your rescue medication more than twice in the last week? YES ☐ NO ☐

7d. Has your doctor ever said you have high blood pressure in the blood vessels of your lungs? YES ☐ NO ☐

8. **Do you have a Spinal Cord Injury?** This includes Tetraplegia and Paraplegia

If the above condition(s) is/are present, answer questions 8a-8c

If **NO** ☐ go to question 9

8a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐

8b. Do you commonly exhibit low resting blood pressure significant enough to cause dizziness, light-headedness, and/or fainting? YES ☐ NO ☐

8c. Has your physician indicated that you exhibit sudden bouts of high blood pressure (known as Autonomic Dysreflexia)? YES ☐ NO ☐

9. **Have you had a Stroke?** This includes Transient Ischemic Attack (TIA) or Cerebrovascular Event

If the above condition(s) is/are present, answer questions 9a-9c

If **NO** ☐ go to question 10

9a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments) YES ☐ NO ☐

9b. Do you have any impairment in walking or mobility? YES ☐ NO ☐

9c. Have you experienced a stroke or impairment in nerves or muscles in the past 6 months? YES ☐ NO ☐

10. **Do you have any other medical condition not listed above or do you have two or more medical conditions?**

If you have other medical conditions, answer questions 10a-10c

If **NO** ☐ read the Page 4 recommendations

10a. Have you experienced a blackout, fainted, or lost consciousness as a result of a head injury within the last 12 months **OR** have you had a diagnosed concussion within the last 12 months? YES ☐ NO ☐

10b. Do you have a medical condition that is not listed (such as epilepsy, neurological conditions, kidney problems)? YES ☐ NO ☐

10c. Do you currently live with two or more medical conditions? YES ☐ NO ☐

**PLEASE LIST YOUR MEDICAL CONDITION(S)
AND ANY RELATED MEDICATIONS HERE:**

**GO to Page 4 for recommendations about your current
medical condition(s) and sign the PARTICIPANT DECLARATION.**

2020 PAR-Q+

 **If you answered NO to all of the FOLLOW-UP questions (pgs. 2-3) about your medical condition, you are ready to become more physically active - sign the PARTICIPANT DECLARATION below:**

-  It is advised that you consult a qualified exercise professional to help you develop a safe and effective physical activity plan to meet your health needs.
-  You are encouraged to start slowly and build up gradually - 20 to 60 minutes of low to moderate intensity exercise, 3-5 days per week including aerobic and muscle strengthening exercises.
-  As you progress, you should aim to accumulate 150 minutes or more of moderate intensity physical activity per week.
-  If you are over the age of 45 yr and **NOT** accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.

 **If you answered YES to one or more of the follow-up questions about your medical condition:**

You should seek further information before becoming more physically active or engaging in a fitness appraisal. You should complete the specially designed online screening and exercise recommendations program - the **ePARmed-X+** at **www.eparmedx.com** and/or visit a qualified exercise professional to work through the ePARmed-X+ and for further information.

 **Delay becoming more active if:**

-  You have a temporary illness such as a cold or fever; it is best to wait until you feel better.
-  You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ at **www.eparmedx.com** before becoming more physically active.
-  Your health changes - talk to your doctor or qualified exercise professional before continuing with any physical activity program.

- You are encouraged to photocopy the PAR-Q+. You must use the entire questionnaire and NO changes are permitted.
- The authors, the PAR-Q+ Collaboration, partner organizations, and their agents assume no liability for persons who undertake physical activity and/or make use of the PAR-Q+ or ePARmed-X+. If in doubt after completing the questionnaire, consult your doctor prior to physical activity.

PARTICIPANT DECLARATION

- All persons who have completed the PAR-Q+ please read and sign the declaration below.
- If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.

I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that the community/fitness center may retain a copy of this form for records. In these instances, it will maintain the confidentiality of the same, complying with applicable law.

NAME _____

DATE _____

SIGNATURE _____

WITNESS _____

SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER _____

For more information, please contact

www.eparmedx.com
Email: eparmedx@gmail.com

Citation for PAR-Q+

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Key References

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3. Chisholm DM, Collis ML, Kulak LL, Davenport W, and Gruber N. Physical activity readiness. British Columbia Medical Journal. 1975;17:375-378.
4. Thomas S, Reading J, and Shephard RJ. Revision of the Physical Activity Readiness Questionnaire (PAR-Q). Canadian Journal of Sport Science 1992;17:4 338-345.

The PAR-Q+ was created using the evidence-based AGREE process (1) by the PAR-Q+ Collaboration chaired by Dr. Darren E. R. Warburton with Dr. Norman Gledhill, Dr. Veronica Jamnik, and Dr. Donald C. McKenzie (2). Production of this document has been made possible through financial contributions from the Public Health Agency of Canada and the BC Ministry of Health Services. The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada or the BC Ministry of Health Services.

CARDIOVASCULAR

- Risk factors below are associated with heart disease, stroke, heart attacks and diabetes.

<i>Measure</i>	<i>Result</i>	<i>Goal</i>	<i>MET</i>	<i>UNMET</i>
Waist Circumference		F $\leq$ 35", M $\leq$ 40"		
Waist to Hip Ratio		F < .85 M < .90		
Blood Pressure		<140/<90mmHg		
Oxygen Sat	%	$\geq$ 95%	Not scored	Not scored
Heart Rate	bpm	60-100	Not scored	Not scored
At greater risk ☐ 0 points (met none) At some risk ☐ 1 point (met some) Low risk ☐ 2 points (met all)				

STRENGTH

-Risk factors below are associate with bone health and falls.

<i>Measure</i>	<i>Result</i>	<i>Goal</i>	<i>MET</i>	<i>UNMET</i>
Grip Strength	kg	From chart		
Chair Stand	sec	$\leq$ 8 seconds		
At greater risk ☐ 0 points (met none) At some risk ☐ 1 point (met some) Low risk ☐ 2 points (met all)				

WALKING SPEED

-Risk factors below are associated with overall health and fall risk.

<i>Measure</i>	<i>Result</i>	<i>Goal</i>	<i>MET</i>	<i>UNMET</i>
Usual Speed	m/s	$\geq$ 1.2 m/s		
Fast Speed	m/s	$\geq$ 1.7 m/s		
Reserve	m/s	$\geq$.60 m/s		
At greater risk ☐ 0 points (met none) At some risk ☐ 1 point (met some) Low risk ☐ 2 points (met all)				

FLEXIBILITY

- Risk factors below are associated with injury and falls.

<i>Measure</i>	<i>Result</i>		<i>Goal</i>	<i>MET</i>	<i>UNMET</i>
	<i>R</i>	<i>L</i>			
Shoulder			≥170 degrees		
Calf			≥5 degrees		
Hip Flexors (Pass/Fail)	P/F	P/F	Pass: Thigh rests flat on plinth.		
Posture (Pass/Fail)	P/F		Pass: No pillow needed.		
At greater risk ☐ 0 points (met none) At some risk ☐ 1 point (met some) Low risk ☐ 2 points (met all)					

BALANCE - Risk factors below are associated with falls.

Measure	Result	Goal	<i>MET</i>	<i>UNMET</i>
Single Leg Stance <i>Eyes Closed</i>	seconds	≥5 seconds		
Single Leg Stance <i>on Foam</i>	seconds	≥15 seconds		
At greater risk ☐ 0 points (met none) At some risk ☐ 1 point (met some) Low risk ☐ 2 points (met all)				

Overall Score: /10

The interpretation of your screen is based on your age and gender for competitive National Senior Games athletes and may not be meaningful for non-athletic individuals.

SHORT PHYSICAL PERFORMANCE BATTERY PROTOCOL AND SCORE SHEET

All of the tests should be performed in the same order as they are presented in this protocol. Instructions to the participants are shown in bold italic and should be given exactly as they are written in this script.

1. BALANCE TESTS

The participant must be able to stand unassisted without the use of a cane or walker. You may help the participant to get up.

Now let's begin the evaluation. I would now like you to try to move your body in different movements. I will first describe and show each movement to you. Then I'd like you to try to do it. If you cannot do a particular movement, or if you feel it would be unsafe to try to do it, tell me and we'll move on to the next one. Let me emphasize that I do not want you to try to do any exercise that you feel might be unsafe.

Do you have any questions before we begin?

A. Side-by-Side Stand

1. ***Now I will show you the first movement.***
2. (Demonstrate) ***I want you to try to stand with your feet together, side-by-side, for about 10 seconds.***
3. ***You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop.***
4. Stand next to the participant to help him/her into the side-by-side position.
5. Supply just enough support to the participant's arm to prevent loss of balance.
6. When the participant has his/her feet together, ask ***"Are you ready?"***
7. Then let go and begin timing as you say, ***"Ready, begin."***
8. Stop the stopwatch and say ***"Stop"*** after 10 seconds or when the participant steps out of position or grabs your arm.
9. If participant is unable to hold the position for 10 seconds, record result and go to the gait speed test.

B. Semi-Tandem Stand

1. ***Now I will show you the second movement.***
2. (Demonstrate) ***Now I want you to try to stand with the side of the heel of one foot touching the big toe of the other foot for about 10 seconds. You may put either foot in front, whichever is more comfortable for you.***
3. ***You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop.***
4. Stand next to the participant to help him/her into the semi-tandem position
5. Supply just enough support to the participant's arm to prevent loss of balance.
6. When the participant has his/her feet together, ask ***"Are you ready?"***
7. Then let go and begin timing as you say ***"Ready, begin."***
8. Stop the stopwatch and say ***"Stop"*** after 10 seconds or when the participant steps out of position or grabs your arm.
9. If participant is unable to hold the position for 10 seconds, record result and go to the gait speed test.

C. Tandem Stand

1. ***Now I will show you the third movement.***
2. (Demonstrate) ***Now I want you to try to stand with the heel of one foot in front of and touching the toes of the other foot for about 10 seconds. You may put either foot in front, whichever is more comfortable for you.***
3. ***You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop.***
4. Stand next to the participant to help him/her into the tandem position.
5. Supply just enough support to the participant's arm to prevent loss of balance.
6. When the participant has his/her feet together, ask ***"Are you ready?"***
7. Then let go and begin timing as you say, ***"Ready, begin."***
8. Stop the stopwatch and say ***"Stop"*** after 10 seconds or when the participant steps out of position or grabs your arm.

Study ID _____ Date _____ Tester Initials _____

SCORING:

A. Side-by-side-stand

Held for 10 sec ☐ 1 point

Not held for 10 sec ☐ 0 points

Not attempted ☐ 0 points

If 0 points, end Balance Tests

Number of seconds held if
less than 10 sec: _____.__ _sec

B. Semi-Tandem Stand

Held for 10 sec ☐ 1 point

Not held for 10 sec ☐ 0 points

Not attempted ☐ 0 points (*circle reason above*)

If 0 points, end Balance Tests

Number of seconds held if less than 10 sec: _____.__ _sec

C. Tandem Stand

Held for 10 sec ☐ 2 points

Held for 3 to 9.99 sec ☐ 1 point

Held for < than 3 sec ☐ 0 points

Not attempted ☐ 0 points (*circle reason above*)

Number of seconds held if less than 10 sec: _____.__ _sec

D. Total Balance Tests score_____ (sum points)

Comments: _____

If participant did not attempt test or failed, circle why:

Tried but unable 1

Participant could not hold position unassisted 2

Not attempted, you felt unsafe 3

Not attempted, participant felt unsafe 4

Participant unable to understand

instructions 5

Other (specify) _____ 6

Participant refused 7

2. GAIT SPEED TEST

Now I am going to observe how you normally walk. If you use a cane or other walking aid and you feel you need it to walk a short distance, then you may use it.

A. First Gait Speed Test

1. ***This is our walking course. I want you to walk to the other end of the course at your usual speed, just as if you were walking down the street to go to the store.***
2. Demonstrate the walk for the participant.
3. ***Walk all the way past the other end of the tape before you stop. I will walk with you. Do you feel this would be safe?***
4. Have the participant stand with both feet touching the starting line.
5. ***When I want you to start, I will say: "Ready, begin."*** When the participant acknowledges this instruction say: ***"Ready, begin."***
6. Press the start/stop button to start the stopwatch as the participant begins walking.
7. Walk behind and to the side of the participant.
8. Stop timing when one of the participant's feet is completely across the end line.

B. Second Gait Speed Test

1. ***Now I want you to repeat the walk. Remember to walk at your usual pace, and go all the way past the other end of the course.***
2. Have the participant stand with both feet touching the starting line.
3. ***When I want you to start, I will say: "Ready, begin."*** When the participant acknowledges this instruction say: ***"Ready, begin."***
4. Press the start/stop button to start the stopwatch as the participant begins walking.
5. Walk behind and to the side of the participant.
6. Stop timing when one of the participant's feet is completely across the end line.

GAIT SPEED TEST SCORING:

Length of walk test course: Four meters ☐ Three meters ☐

A. Time for First Gait Speed Test (sec)

1. Time for 3 or 4 meters _____.____sec
 2. If participant did not attempt test or failed, circle why:
 - Tried but unable 1
 - Participant could not walk unassisted 2
 - Not attempted, you felt unsafe 3
 - Not attempted, participant felt unsafe 4
 - Participant unable to understand instructions 5
 - Other (Specify) _____ 6
 - Participant refused 7
- Complete score sheet and go to chair stand test

3. Aids for first walk.....None ☐ Cane ☐ Other ☐

Comments: _____

B. Time for Second Gait Speed Test (sec)

1. Time for 3 or 4 meters _____.____ sec
2. If participant did not attempt test or failed, circle why:
 - Tried but unable 1
 - Participant could not walk unassisted 2
 - Not attempted, you felt unsafe 3
 - Not attempted, participant felt unsafe 4
 - Participant unable to understand instructions 5
 - Other (Specify) _____ 6
 - Participant refused 7

3. Aids for second walk..... None ☐ Cane ☐ Other ☐

What is the time for the faster of the two walks?

Record the shorter of the two times _____.____ sec

[If only 1 walk done, record that time] _____.____ sec

If the participant was unable to do the walk: ☐ 0 points

For 4-Meter Walk:

- If time is more than 8.70 sec: ☐ 1 point
- If time is 6.21 to 8.70 sec: ☐ 2 points
- If time is 4.82 to 6.20 sec: ☐ 3 points
- If time is less than 4.82 sec: ☐ 4 points

For 3-Meter Walk:

- If time is more than 6.52 sec: ☐ 1 point
- If time is 4.66 to 6.52 sec: ☐ 2 points
- If time is 3.62 to 4.65 sec: ☐ 3 points
- If time is less than 3.62 sec: ☐ 4 points

3. CHAIR STAND TEST

Single Chair Stand

1. ***Let's do the last movement test. Do you think it would be safe for you to try to stand up from a chair without using your arms?***
2. ***The next test measures the strength in your legs.***
3. (Demonstrate and explain the procedure.) ***First, fold your arms across your chest and sit so that your feet are on the floor; then stand up keeping your arms folded across your chest.***
4. ***Please stand up keeping your arms folded across your chest.*** (Record result).
5. If participant cannot rise without using arms, say ***"Okay, try to stand up using your arms."*** This is the end of their test. Record result and go to the scoring page.

Repeated Chair Stands

1. ***Do you think it would be safe for you to try to stand up from a chair five times without using your arms?***
2. (Demonstrate and explain the procedure): ***Please stand up straight as QUICKLY as you can five times, without stopping in between. After standing up each time, sit down and then stand up again. Keep your arms folded across your chest. I'll be timing you with a stopwatch.***
3. When the participant is properly seated, say: ***"Ready? Stand"*** and begin timing.
4. Count out loud as the participant arises each time, up to five times.
5. Stop if participant becomes tired or short of breath during repeated chair stands.
6. Stop the stopwatch when he/she has straightened up completely for the fifth time.
7. Also stop:
 - If participant uses his/her arms
 - After 1 minute, if participant has not completed rises
 - At your discretion, if concerned for participant's safety
8. If the participant stops and appears to be fatigued before completing the five stands, confirm this by asking ***"Can you continue?"***
9. If participant says "Yes," continue timing. If participant says "No," stop and reset the stopwatch.

SCORING

Single Chair Stand Test

- | | YES | NO |
|---|--------------------------|-----------------------------------|
| A. Safe to stand without help | ☐ | ☐ |
| B. Results: | | |
| Participant stood without using arms | ☐ | → Go to Repeated Chair Stand Test |
| Participant used arms to stand | ☐ | → End test; score as 0 points |
| Test not completed | ☐ | → End test; score as 0 points |
| C. If participant did not attempt test or failed, circle why: | | |
| Tried but unable | 1 | |
| Participant could not stand unassisted | 2 | |
| Not attempted, you felt unsafe | 3 | |
| Not attempted, participant felt unsafe | 4 | |
| Participant unable to understand instructions | 5 | |
| Other (Specify) _____ | 6 | |
| Participant refused | 7 | |

Repeated Chair Stand Test

- | | YES | NO |
|---|--------------------------|--------------------------|
| A. Safe to stand five times | ☐ | ☐ |
| B. If five stands done successfully, record time in seconds. | | |
| Time to complete five stands _____.____ sec | | |
| C. If participant did not attempt test or failed, circle why: | | |
| Tried but unable | 1 | |
| Participant could not stand unassisted | 2 | |
| Not attempted, you felt unsafe | 3 | |
| Not attempted, participant felt unsafe | 4 | |
| Participant unable to understand instructions | 5 | |
| Other (Specify) | 6 | |
| Participant refused | 7 | |

Scoring the Repeated Chair Test

- | | |
|---|-----------------------------------|
| Participant unable to complete 5 chair stands or completes stands in >60 sec: | ☐ 0 points |
| If chair stand time is 16.70 sec or more: | ☐ 1 points |
| If chair stand time is 13.70 to 16.69 sec: | ☐ 2 points |
| If chair stand time is 11.20 to 13.69 sec: | ☐ 3 points |
| If chair stand time is 11.19 sec or less: | ☐ 4 points |

Study ID _____ Date _____ Tester Initials _____

Scoring for Complete Short Physical Performance Battery

Test Scores

Total Balance Test score _____ **points**

Gait Speed Test score _____ **points**

Chair Stand Test score _____ **points**

Total Score _____ **points (sum of points above)**

Timed Up and Go Instructions

General Information (derived from Podsiadlo and Richardson, 1991):

- The patient should sit on a standard armchair, placing his/her back against the chair and resting his/her arms chair's arms. Any assistive device used for walking should be nearby.
- Regular footwear and customary walking aids should be used.
- The patient should walk to a line that is 3 meters (9.8 feet) away, turn around at the line, walk back to the chair, and sit down.
- The test ends when the patient's buttocks touch the seat.
- Patients should be instructed to use a comfortable and safe walking speed.
- A stopwatch should be used to time the test (in seconds).

Set-up:

- Measure and mark a 3 meter (9.8 feet) walkway
- Place a standard height chair (seat height 46cm, arm height 67cm) at the beginning of the walkway

Patient Instructions (derived from Podsiadlo and Richardson, 1991):

- Instruct the patient to sit on the chair and place his/her back against the chair and rest his/her arms chair's arms.
- The upper extremities should not be on the assistive device (if used for walking), but it should be nearby.
- Demonstrate the test to the patient.
- When the patient is ready, say "Go"
- The stopwatch should start when you say go, and should be stopped with the patient's buttocks touch the seat.

Timed Up and Go Testing Form

Name: _____

Assistive Device and/or Bracing Used: _____

Date: _____

TUG Time: _____

Date: _____

TUG Time: _____

Date: _____

TUG Time: _____

Date: _____

TUG Time: _____

Date: _____

TUG Time: _____

Reference:

Podsiadlo, D. and Richardson, S. (1991). "The timed "Up & Go": a test of basic functional mobility for frail elderly persons." J Am Geriatr Soc 39(2): 142-148.