

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.

A. Side-by-Side Stand

1. I want you to try to stand with your feet together, side-by-side, for about 10 seconds. Demonstrate.
2. 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.

B. Semi-Tandem Stand

1. 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. Demonstrate.
2. 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.

C. Tandem Stand

1. 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. Demonstrate.
2. 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.

A. Side-by-side-stand	B. Semi-Tandem Stand	C. Tandem Stand
Held for 10 sec <input type="checkbox"/> 1 point	Held for 10 sec <input type="checkbox"/> 1 point	Held for 10 sec <input type="checkbox"/> 2 points
Not held for 10 sec <input type="checkbox"/> 0 points	Not held for 10 sec <input type="checkbox"/> 0 points	Held for 3 to 9.99 sec <input type="checkbox"/> 1 point
Not attempted <input type="checkbox"/> 0 points	Not attempted <input type="checkbox"/> 0 points	Held for < than 3 sec <input type="checkbox"/> 0 points
If 0 points, end Balance Tests	If 0 points, end Balance Tests	Not attempted <input type="checkbox"/> 0 points

SCORING: ____/4 Number of seconds held if less than 10 sec: _____ Circle Level A B C

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

1. Tried but unable
2. Could not hold position unassisted
3. Tester felt unsafe
4. Participant Felt Unsafe
5. Unable to understand instructions
6. Other (specify) _____
7. Participant refused

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- 2. GAIT SPEED TEST:** Set up course of 4 meters (13 ft 1 in) with deceleration zone. Can use 3 meters (9 ft 10 in) if space limited

"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. Gait Speed Test—TWO Trials (same directions)

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.

GAIT SPEED TEST SCORING: Use fastest of 2 trials. If only one trial completed, use that time to score.

Length of walk test course: Four meters (13 ft 1 in) Three meters (9 ft 10 in)

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

For 4-Meter Walk:

- | | |
|--------------------------------|--|
| If time is more than 8.70 sec: | <input type="checkbox"/> 1 point |
| If time is 6.21 to 8.70 sec: | <input type="checkbox"/> 2 points |
| If time is 4.82 to 6.20 sec: | <input type="checkbox"/> 3 points |
| If time is less than 4.82 sec: | <input type="checkbox"/> 4 points |

For 3-Meter Walk:

- | | |
|-------------------|-----------------|
| >6.52 sec: | 1 point |
| 4.66 to 6.52 sec: | 2 points |
| 3.62 to 4.65 sec: | 3 points |
| <3.62 sec: | 4 points |

A. 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: _____

4. CHAIR STAND TEST

Single Chair Stand (to test for ability to perform test)

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

Repeated Chair Stand Test

	YES	NO
A. Safe to stand five times	<input type="checkbox"/>	<input type="checkbox"/>
B. If five stands done successfully, record time in seconds. Time to complete five stands_ sec		

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

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 for complete SPPB

Balance _____/4

Gait Speed _____/4

Chair Stands _____/4

Total _____/12

Short Physical Performance Battery

1.

Balance Tests



Side-by-Side Stand
Feet together side-by-side for 10 sec

10 sec (1 pt)

< 10 sec (0 pt)

Go to 4-Meter Gait Speed Test



Semi-Tandem Stand
Heel of one foot against side of big toe of the other for 10 sec

10 sec (+1 pt)

< 10 sec (+0 pt)

Go to 4-Meter Gait Speed Test



Tandem Stand
Feet aligned heel to toe for 10 sec

10 sec (+2 pt)
3-9.99 sec (+1 pt)
<3 sec (+0 pt)

2.

Gait Speed Test

Measures the time required to walk 4 meters at a normal pace (use best of 2 times)

4 Meters

<4.82 sec=4 pt
4.82-6.20 sec =3 pt
6.21-8.70 sec =2 pt
>8.70 sec:=1pt
Unable = 0 pt

3 Meters

<3.62=4 pt
3.62-4.65 sec=3 pt
4.66-6.52 sec=2 pt
>6.52 sec=1 pt
Unable= 0 pt



|

1m

2m

3m

4m

↓

3.

Chair Stand Test



Pre-test

Participants fold their arms across their chest and try to stand up once from a chair

able

unable

Stop (0 pt)



5 repeats
Measures the time required to perform five rises from a chair to an upright position as fast as possible without the use of the arms

≤11.19 sec	4 pt
11.20-13.69 sec	3 pt
13.70-16.69 sec	2 pt
>16.7 sec	1 pt
>60 sec or unable	0 pt

Clinimetrics

In a systematic review of instruments to measure performance based physical function in older adults, the SPPB was recommended most highly in terms of validity, reliability, and responsiveness. (Freiberger et al, 2012)

SPPB score <10 predictive of all cause mortality (Pavasini et al 2016)

1 point change has predictive validity showing a gradient of risk for mortality, nursing home admission, disability, and future disability in currently non-disabled appearing individuals. A 1 point change is significant

A score of "0" in any single domain:

- *places individual at significantly heightened risk for further decline in other domains*
- *and in function, increased risk of nursing home admission, self care needs and mortality risk*

4 Year follow up of those reporting no disability at baseline (able to walk ¼ mile, negotiate stairs)

SPPB Score	4	5	6	7	8	9	10	11	12
ADL + mobility disabled	50%	30%	25%	10%	10%	8%	7%	6%	5%
Mobility Disabled	80%	60%	60%	45%	35%	30%	20%	15%	13%
No disability	20%	40%	40%	55%	65%	75%	80%	85%	87%

SPPB and Hospitalization:

- Higher SPPB score at discharge inversely correlated with ADL decline
- SPPB 0-4 higher risk of hospitalization and death compared to SPPB score 8-12
- Early decline in score after discharge had steeper ADL decline, rehospitalization, and death (trajectory)
- A 1-point increase at discharge was associated with a 14% reduction of the risk of hospitalizations + death combined.

SPPB and Falls (*Association Between Short Physical Performance Battery and Falls in Older People* 2014)

Scores 0-6/12 → 3 x risk of scores 10-12/12

Males with Sit to Stand >16.7 sec (1/4) were at increased risk for falls

Females with Gait Speed <.75 m/s (2/4) were at increased risk for falls

SPPB and Community Walking (*Use of the SPPB to Predict Loss of Ability to Walk 400 Meters*. 2009)

65% of SPPB score 7/12 were no longer able to ambulate 400m in 3 years

30% of SPPB score 8-9/12 were no longer able to ambulate 400m in 3 years

20% of SPPB score 10/12 were no longer able to ambulate 400m in 3 years

10% of SPPB score 11-12/12 were no longer able to ambulate 400m in 3 years