

CHAIR STANDS

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CHAIR STANDS

1. Background and rationale

Direct assessments of physical performance have become standard measurements in epidemiological studies in the elderly. These assessments generally tap multiple domains of physiological performance, including lower extremity strength, balance, coordination, and flexibility. The assessment techniques used in MOST have been derived from several previous studies, are reliable when performed in a standardized fashion, and are well tolerated by older participants. Single and multiple chair stands will be assessed in MOST.

2. Equipment and supplies

- Digital stopwatch
- Standard chair: straight back, flat, level, firm seat; seat height 45 cm at front

2.1 Use of the stopwatch



The stopwatch will be used to measure the time it takes to complete a task from the beginning of the activity until the conclusion. Press the middle (mode) button to make sure you are in stopwatch mode. The display should read **0:0000**. To time the task, just press the right-hand button (labeled STA/STP) at the top of the stopwatch to begin, and press again when the task is completed. The time is digitally displayed on the stopwatch. To get the display to read **0:0000** again, press the left (lap) button. Time is displayed as minutes:seconds.hundredths of a second.

3. Safety issues and exclusions

Walking aids may not be used in the chair stand tests. The vast majority of participants should be able to attempt this test. Exclusion from the chair stands test will be based on an individualized assessment of impairments and safety concerns. The examiner will describe the chair stand test, and then discuss with the participant whether they should attempt that test given any physical problems or disabilities present. Refusal or inability to perform the test will be recorded on the data form. If the examiner or participant determines that it is not safe to perform the test, record “not attempted/unable.”

4. Participant and exam room preparations

- Footwear: To eliminate the effect of different footwear on test performance, these tests should be performed in tennis shoes or comfortable walking shoes with minimal or no heels. The participant may perform the tests in stocking or bare feet if appropriate footwear is not available.
- The standard chair should be placed on a nonslip surface (low pile carpeting works well) with the back of the chair against a wall for stability. There should be adequate room in front and on the sides of the chair for the examiner and the participant to maneuver freely.

5. Detailed measurement procedures

5.1 Approach to standardization

The chair stand test is administered by a certified examiner. Since motivation and level of understanding can have a significant impact on performance, each component of the exam should be administered strictly according to the protocol and in the following sequence:

- Explain the procedure to the study participant making sure that key points from the suggested script are conveyed.
- Demonstrate the procedure using suggested script.
- Ask the participant if they have any questions.
- Re-explain the procedure briefly using suggested script.
- Ask the participant to perform the procedure.
- Begin all timed procedures with the words, "Ready? Go!"

5.1.1 Instructions and encouragement

Use the script provided to make sure that all key points are covered when you describe the test and how to perform it properly. You should not provide additional description or encouragement beyond the key points provided by the standard scripts.

If a participant questions the need for detailed verbal instruction, respond that you explain each test in detail since this is the best way to make sure that everyone does the test in a similar manner.

5.1.2 Demonstration

Demonstrate the chair stand for the participant. Remind the participant not to begin to do the maneuver until after you have demonstrated it.

It is very important that the examiner demonstrate each exercise correctly. Experience has shown that participants follow more closely what the examiner does rather than what they say. If the position or exercise is demonstrated incorrectly, the participant following the example will do the exercise incorrectly and be scored as “Unable” even though they may actually have been able to perform it correctly.

If the participant indicates that they do not understand the test, demonstrate it again rather than relying on repeated verbal instructions. Repeat the demonstration only once. If the participant still does not understand, go on to the next component of the test.

5.2 General scoring issues

5.2.1 Not attempted/refused

If a test is not attempted because the participant refuses or cannot understand the instructions, record “Participant refused.” If the examiner deems the test unsafe for the participant, for whatever reason, record “Not attempted/unable” on the scoring form. Record a reason why the test was not attempted on the Clinic Visit Procedure Checklist (page 1 of the Clinic Visit Workbook).

5.2.2 Attempted/unable

If a test is attempted but cannot be completed or scored, record “Attempted, unable” on the data collection form where appropriate.

5.3 Single chair stand: administration

This is a test of ability to stand up from a standard chair without using arms. This task is also used to screen for the ability to do repeated chair stands. Walking aids such as canes, walker, or crutches may not be used.

1) A straight-backed chair without arms, with seat height of 45 cm, should be used for this test and placed against a wall for added stability. The participant's feet should be placed squarely on the floor in front of them. The participant should be seated in a position which allows them to place their feet on the floor with knees flexed to slightly greater than 90 degrees so that their heels are somewhat closer to the chair than the back of the knees.

During the test, the examiner may stand in front of the participant (with arms extended, if appropriate) for the participant's safety during the chair stands.

2) Describe the test.

Script: "This is a test of strength in your legs in which you stand up without using your arms."

3) Demonstrate the procedure.

Script: "Fold your arms across your chest, like this, and stand when I say 'Go,' keeping your arms in this position. OK?"

4) Ask the participant to stand.

Script: "Ready, Go!"

If the arms unfold, or the participant puts one or both hands down on the chair to push up, remind them to keep their arms folded snugly across their chest and ask them to repeat the chair stand.

It is OK for the participant to move part-way forward in the chair before standing, but knees and hips should be flexed to approximately 90 degrees before standing.

5) If the participant cannot rise without using arms, say.

Script: "OK. Try to stand up using your arms to push off."

6) Score as follows:

If the participant refuses to do the test or cannot understand the instructions, score "Participant refused."

If the participant attempted but was unable to arise even using their arms, score as "Attempted, unable to stand."

If the participant uses arms to stand up, score as "Rises using arms."

If they stood up all the way without using arms, score as "Stands without using arms." Go on to Repeated Chair Stands.

5.4 Repeated chair stands: administration

This is a test of lower extremity strength in which the participant stands up from a seated position five times as quickly as possible. The time it takes to stand five times is recorded.

1) If the participant can arise from the chair without using arms, attempt the five stands.

Script: "This time, I want you to stand up five times as quickly as you can keeping your arms folded across your chest."

2) Demonstrate the test.

Cross your arms over your chest and then rise while emphasizing "full standing position," and sit while emphasizing "all the way down."

Script: "When you stand up, come to a full standing position each time, and when you sit down, sit all the way down each time. I will demonstrate two chair stands to show you how it is done."

Rise two times as quickly as you can, counting as you stand up each time.

3) Begin the test

Script: "When I say 'Go,' stand five times in a row, as quickly as you can, without stopping. Stand up all the way, and sit all the way down each time."

Ready, Go!"

Start timing as soon as the participant begins to stand from the chair. Count: "1, 2, 3, 4, 5" as the participant stands up each time. Stop timing at the fifth stand.

4) If the participant is unable to complete the chair stands correctly (e.g., is not coming to a full stand), stop the procedure, repeat the demonstration, wait 1 minute, and begin the procedure again.

5) If the participant stops before completing five stands, confirm that they cannot continue by asking:

Optional script: "Can you continue?"

If they say yes, continue timing. Otherwise, stop the stopwatch.

6) Score as follows:

Record score under the Trial 1 category. Trial 2 will not be done. Leave the Trial 2 portion of the data collection form blank. Note: Trial 2 was only done at baseline. Follow-up chair stand exams included only one trial for the repeat chair stands.

If the participant refuses to do the test or cannot understand the instructions, score "Participant refused."

If the procedure was not attempted because the participant was unable to perform the test, score "Not attempted/unable."

If participant attempted but was unable to complete five stands without using their arms, score as “Attempted, unable to complete,” and record the number completed without using arms.

If all five chair stands were completed, record:

- the number of seconds, to a hundredth of a second, required to complete five stands

6. Alert values/Follow-up/Reporting to participants

These test results have no alert values and are not reported to the participant or physician.

7. Quality assurance

7.1 Training and certification

The examiner requires no special qualifications or experience to perform this assessment. Training should include:

- Read and study manual
- Attend MOST training session on techniques (or observe administration by experienced examiner)
- Practice on other staff or volunteers
- Discuss problems and questions with local expert or QC officer

7.2 Certification requirements

- Complete training requirements
- Recite exclusions
- Conduct exam on two volunteers:
 - According to protocol, as demonstrated by completed QC checklist

7.3 Quality assurance checklist

- Back of chair against a wall
- Script correctly and clearly delivered for each test
- Correctly demonstrates single stand, emphasizing keeping arms tight across chest
- Correctly demonstrates two stands, emphasizing full stand and return to complete sit
- Says “ready, go” for each test
- Counts each chair stand, and stops timing after participant stands up on fifth stand
- Records and explains unusual values
- If task was not performed, codes and explains reasons
- Reviews form for completeness
- Correctly completes form

8. Data collection forms

Baseline:

Single Chair Stand

Directions:

"This is a test of strength in your legs in which you stand up without using your arms."

(Examiner Note: Demonstrate and say:) "Fold your arms across your chest, like this, and stand when I say 'Go,' keeping your arms in this position. OK?"

"Ready, Go!"

① Single Chair Stand

- Stands without using arms → Go to Repeated Chair Stands on the next page.
- Rises using arms → Stop test. Go to next exam.
- Participant refused → Stop test. Go to next exam.
- Not attempted, unable → Stop test. Go to next exam.
- Attempted, unable to stand → Stop test. Go to next exam.

Repeated Chair Stands

Directions: **(Examiner Note: Demonstrate and say:)**

"This time, I want you to stand up five times as quickly as you can keeping your arms folded across your chest. When you stand up, come to a full standing position each time, and when you sit down, sit all the way down each time.

I will demonstrate two chair stands to show you how it is done."

(Examiner Note: Rise two times as quickly as you can, counting as you stand up each time.)

"When I say 'Go' stand five times in a row, as quickly as you can, without stopping. Stand up all the way, and sit all the way down each time."

"Ready, Go!"

(Examiner Note: Start timing as soon as participant begins to stand. Count aloud: "1, 2, 3, 4, 5" as the participant stands up each time.)

② Trial 1

- Completes 5 stands without using arms → . Seconds (Time on stopwatch)
- Rises using arms → Stop test. Go to next exam.
- Participant refused → Stop test. Go to next exam.
- Not attempted, unable → Stop test. Go to next exam.
- Attempted, unable to complete → Number completed without using arms

③ "OK. I'd like you to rest a couple of minutes and we will try to do that one more time. Can you do that?"

(Examiner Note: Wait 2 minutes and then repeat the Repeated Chair Stands.)

"Ready, Go!"

Trial 2

- Completes 5 stands without using arms → . Seconds (Time on stopwatch)
- Rises using arms → Stop test. Go to next exam.
- Participant refused → Stop test. Go to next exam.
- Not attempted, unable → Stop test. Go to next exam.
- Attempted, unable to complete → Number completed without using arms

Follow-up:

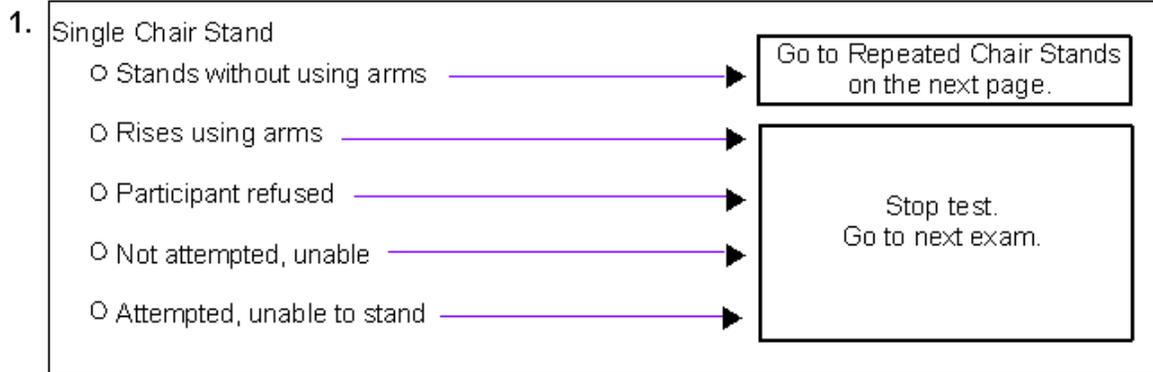
Single Chair Stand

Directions:

"This is a test of strength in your legs in which you stand up without using your arms."

(Examiner Note: Demonstrate and say:) "Fold your arms across your chest, like this, and stand when I say 'Go,' keeping your arms in this position. OK?"

"Ready, Go!"



Repeated Chair Stands

Directions: **(Examiner Note: Demonstrate and say:)**

"This time, I want you to stand up five times as quickly as you can keeping your arms folded across your chest. When you stand up, come to a full standing position each time, and when you sit down, sit all the way down each time.

I will demonstrate two chair stands to show you how it is done."

(Examiner Note: Rise two times as quickly as you can, counting as you stand up each time.)

"When I say 'Go' stand five times in a row, as quickly as you can, without stopping. Stand up all the way, and sit all the way down each time."

"Ready, Go!"

(Examiner Note: Start timing as soon as participant begins to stand. Count aloud: "1, 2, 3, 4, 5" as the participant stands up each time.)

