



INSTRUCTIONS FOR THE PHYSICAL FUNCTION (PFX) FORM

I. General Instructions

This form is completed at the clinic visit. The form is also collected at home and abbreviated visits. The 4M walk is collected in abbreviated visits and can be collected in the home visit, if the participant's home is safe for the participant to complete the 4M walk. Grip strength is collected at home and abbreviated visits. The PFX is collected in its entirety at the ARIC clinic visit for the non-ACHIEVE participants and at the ACHIEVE/BHFU annual visits for the ARIC/ACHIEVE shared participants. A special case exists for ARIC/ACHIEVE shared participants who are not seen in the ARIC clinic for their non-shared components on the same day as the ACHIEVE exam. If the ARIC/ACHIEVE participant is participating in the two-minute walk, the 4M walk assessment must precede two-minute walk. See Sections C and D for CDART instructions for recording the 4M walk in ARIC PFX on shared cohort participants.

This form should be completed for all participants, even those who do not undergo a physical function assessment.

Prior to training for the "Physical Function" Exam form, all examiners should complete the online training module for the National Institute on Aging Short Physical Performance Battery (SPPB) as described in ARIC Manual 32. Note that the video does not include training on grip strength. The video should be reviewed prior to initial training session and every 6 months. Download the video at this NIA website by clicking "CD (Download)." The video material is automatically downloaded.

In general, 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. Do not provide additional description or encouragement beyond the key points provided by the standard scripts.

Allow the participant to rest between tests if out of breath or fatigued during the assessment.

II. Detailed Instructions for each Item

- 0a.** Enter the date on which the participant was seen in the clinic.
- 0b.** Enter the staff ID for the person who completed this form.
- 0c.** Item 0c and accompanying instructions only apply to the ARIC visit form. Enter the type of visit: full clinic visit, abbreviated clinic visit, or home visit. If it is a full clinic visit, go to question 1 and begin chair stands. If it is an abbreviated clinic visit or a home visit, go to question 7 and begin the 4-meter walk. In the abbreviated clinic visits and home visits, the chair stands and balance tests will not be offered. **See Section C: SPPB 4 Meter Walk for special considerations for home visits.**

A. SPPB Chair Stands

Walking aids are not allowed. This task is only offered in the full clinic visit.

Single chair stand:

Question 1: A demonstration of this test is not required. Record completion status of the single chair stand. If the participant refuses to do the test, probe for the reason to determine if it is due

to a physical problem with weakness or balance. "Participant refused or technical problems" should be reserved for reasons that have no relationship to what is being measured; for example, lack of interest or time, technical, staffing, and environmental problems are included in the category with refusals. If the participant stands without using arms, go to question 2. If the participant does not attempt the chair stand, continue to 1a. Otherwise, go to question 3.

Question 1a and 1b. Record the reason the chair stand was not attempted. "Participant unable due to weakness or balance" can be selected if the participant or proxy tells the examiner they are unable to stand without pushing or without assistance from another person or an aid. It may be necessary to demonstrate the chair stand once. Even if the participant can do the task, ask the participant if they think it would be safe to try the chair stand. If they say no, or if the examiner has concerns after asking the participant if they think it would be safe, skip the test and record the response as "Safety concerns". If Other problem is selected, describe the problem in 1b. Examples of other problems include: fracture, sprains, amputation, cognitive problems e.g. could not understand the instructions.

Repeated Chair Stands

Question 2: This test should be demonstrated. Participants will have successfully performed the single chair stand. Record completion status. If the participant refuses to do the test, probe for the reason to determine if it is due to a physical problem with weakness or balance. "Participant refused or technical problems" should be reserved for reasons unrelated to chair stand ability, such as lack of interest or time, technical, staffing, and environmental problems. If the participant says the single chair stand was difficult and they cannot do 5 more, offer a one-minute break. Assure them that the number they can do is important to record, even if it is less than five. If they do not want to do the repeated chair stands due to difficulty, record "Not attempted" and go to 2c and select "Unable due to weakness or balance." If the participant did not attempt because of safety concerns expressed by the participant, proxy, or examiner, select "Not attempted" in question 2 then "Safety concerns in question 2c then go to question 3. If the participant attempted but was unable to complete 5 stands, record the number completed in question 2a. If the participant completed 5 chair stands, record the time in seconds and hundredths of seconds (00.00) in question 2b. If the participant does not attempt the repeated chair stand, skip to item 2c.

Question 2c and 2d. Record the reason the repeated chair stand was not attempted. If Other problem is selected, describe the problem in 2d. Examples of other problems include: a fracture, sprains, amputation, cognitive problems e.g. could not understand the instructions.

B. SPPB Standing Balance

Walking aids are not allowed. This is only offered in the full clinic visit. Read the script and demonstrate each task. Start timing when the participant lets go of your arm or the wall. Stop the stopwatch if they take a step or grab for support. Record to 0.01 second how long participant is able to hold this position. Say, "STOP" after 10 seconds.

For all balance tests in this section, if the participant refuses to do the test, probe for the reason to determine if it is due to a physical problem with weakness or balance. "Participant refused or technical problems" should be reserved for reasons unrelated to standing balance, such as lack of interest or time, technical, staffing, and environmental problems. If the test was not attempted, record "Not attempted" and go to the subquestion to record the reason the test was not done. If the participant, proxy, or the examiner thinks the participant was physically unable due to observed or reported experiences of unsteady gait or poor balance, record "Unable due

to balance". The "Safety Concerns" option for balance tests is primarily used when it is less obvious if the participant can do the test, but participant, proxy or examiner have concerns about safety with the task.

Question 3: Record completion status of the semi-tandem stance. If the participant held the stance for 1 second or more but less than 10 seconds, record the time in seconds and hundredths of a second (0.00) in question 3a, then go to question 4. If the position was held for the full 10 seconds, record "Holds position for 10 seconds", skip question 4 and go to question 5. If the participant held the semi-tandem stand for 10 seconds, also score the side-by-side stand as "held for 10 seconds".

If the participant feels it would be unsafe to try, probe for the reason, and reassure the participant that you will help them into the position. If they still feel they should not attempt it, record, "Participant refused or technical problems" or "Not attempted" (whichever is appropriate) for this and the more difficult stands. If "Not attempted" is selected, skip to 3b.

Question 3b and 3c. Record the reason the semi tandem stand was not attempted. If Other problem is selected, describe the problem in 3c. Examples of other problems include: fracture, sprains, amputation, cognitive problems e.g. could not understand the instructions,

Question 4: This question is skipped if the participant held the position in question 3 for 10 seconds. Record the completion status of the side-side-by stance then go to question 7. If the participant held the stance for 1 second or more but less than 10 seconds, record the time in seconds and hundredths of a second (0.00) in 4a, then go to question 7. If the participant did not attempt the side-by-side stand, continue to 4b.

Question 4b and 4c. Record the reason the side-by-side stand was not attempted. If Other problem is selected, describe the problem in 4c and then skip to item 7. Examples of other problems include: fracture, sprains, amputation, cognitive problems e.g. could not understand the instructions

Question 5: If the participant is unable to hold the semi-tandem stand for at least 10 seconds, do not attempt the tandem stand in question 5. For those who held the semi-tandem stance in question 3 for 10 seconds, continue with question 5. Record the completion status of the tandem stand. If the participant held the stance for 1 second or more but less than 10 seconds, record the time in seconds and hundredths of a second (0.00) in 5a, then offer a second attempt. (Question 6). If the position was held for the full 10 seconds, record "Holds position for 10 seconds", skip question 6 and go to question 7. If the participant does not attempt the tandem stand, skip to 5b.

Question 5b and 5c. Record the reason the tandem stand was not attempted. If Other problem is selected, describe the problem in 5c, and then skip to item 7. Examples of other problems include: fracture, sprains, amputation, cognitive problems e.g. could not understand the instructions

Question 6: This is a second attempt at the tandem stand if the time holding the tandem stand was 1 second or more but less than 10 seconds. Record completion status. If the participant holds the position for 1 second or more but less than 10 seconds, record the time for holding the position in 6a, then go to question 7. If the participant did not attempt the second tandem stand, skip to item 6b.

Question 6b and 6c. Record the reason the second tandem stand was not attempted. If Other problem is selected, describe the problem in 6c. Examples of other problems

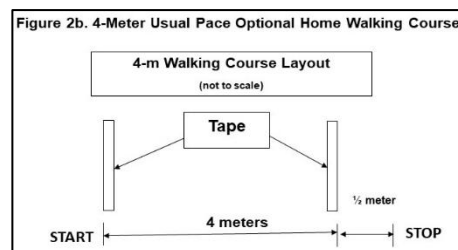
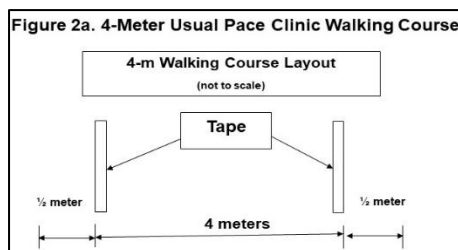
include: fracture, sprains, amputation, cognitive problems e.g. could not understand the instructions

C. SPPB Four Meter Walk

Two timed walks measure the time taken to walk 4 meters on a pre-marked course at the participant's usual pace. Make certain participants begin the walk with toes at the start line and that they walk past the finish line before slowing or stopping. If necessary, participants may use walking aids, such as a walker, rollator, or cane. Ask participants who arrive with walking aids if they think they can do this short walk without the device, as many with aids will be both comfortable and capable of doing the walks without a walking aid. This applies for home visits as well. The examiner can ask the participant if they have a walking aid and if they feel safe performing the walk without it. The participant should know, however, that the walking test can be done with or without the walking aid.

For home or clinic exams, read the script, demonstrate, then have the participant perform the task. Start timing with the participant's first movement. Follow along a few paces behind and a little to the side of the participant. Stop timing when the first foot completely crosses an imaginary plane extending vertically up from the ending line/tape.

The home assessment of walking speed requires a space of 4 meters to walk and an additional $\frac{1}{2}$ meter on one end, or, if space allows, on both ends of the course. If $\frac{1}{2}$ meter is only available on one end, the participant will perform the first trial, walking past the tape on the end with the additional $\frac{1}{2}$ meter space, then walk back to the beginning to do the 2nd trial. Allow up to a minute to rest between the two trials, if needed. The section for the 4-meter walk on the PFX form should be completed for all participants, including those who do not complete it. The course should be marked with paper or masking tape that does not leave residue. Two options for the course are shown below:



Question 7: Record completion status of the first 4-meter walk. For those who complete the task, record the time to the nearest 0.01 second in the appropriate line (7a or 7b), either “Completes with walking aid” or “Completes without walking aid”. If the participant did not attempt the 4-meter walk, select “2” in item 7 and skip to item 7c. If the participant refused the 4M walk or there were technical problems with the testing set-up (see list below for examples), select “1” in item 7 and skip to item 9.

For participants whose mobility is unclear or limited, ask questions to determine if participants can walk across a small room, as this usually indicates the participant is a good candidate for the 4-meter walk (specific questions are provided in the operations manual).

For those with limited or unclear mobility, show the length of the course using a tape measure, pre-measured rope, lightweight chain or other measuring tool, and ask the participant and/or proxy “Do you think you can walk this distance?” Let the participant know that assistive devices

(e.g. cane, walker, rollator) are allowed. If the participant or proxy describes an inability to walk this far, the participant response should be “Not attempted” and then “Participant unable to walk short distance”. If they think they can walk the 4-meters, the examiner should ask “Do you think it would be safe to walk this distance at your usual pace?” If the participant thinks it is safe, and the technician agrees, attempt the test.

Do not assess walking speed in the home in the following situations:

I. Participant Refused or Technical Problem (Q7)

- a. There are home environment hazards in the only space available that would prevent the participant from being able to safely complete the walk. Question 7 should be marked “Participant refused or technical problem”. Examples of potential hazards include:
 - i. High pile or shag carpeting
 - ii. Clutter or other fall hazards on the floor
 - iii. Loose carpet or tile
 - iv. Lack of adequate space
 - v. Pets that impede a clear walking path
 - vi. Inappropriate participant clothing or footwear (e.g., long housecoats/robes, slippers or sandals)
 - vii. Poor lighting

II. Not Attempted (Q7) – Participant Unable to Walk Short Distance (Q7c)

- a. Participants who are bedbound. Question 7 should be completed as “Not attempted”, and the response for 7c should be “Participant unable to walk short distance”.

III. Not Attempted (Q7) – Safety Concerns (Q7c)

- a. Participants who hold onto walls or furniture for balance while walking in the home AND who do not have or will not use an assistive device. Score “Not attempted” and “Safety concerns” in 7 and 7a respectively.
- b. If the participant, proxy, or examiner is concerned that participant is a fall risk or has other safety concerns, do not attempt the 4-meter walk. Score the form “Not attempted” in question 7 and “Safety concerns” in 7c.

Question 7c and 7d. Record the reason the 4 meter walk was not attempted. If Other problem is selected, describe the problem in 7d and then skip to item 9 (full visit) or end the form (abbreviated or home visit). Examples of other problems include: fracture, sprains, amputation, or cognitive problems.

Question 8. Now repeat the usual pace walk and record the completion status. For those who completed the walk, record the time to the nearest 0.01 second in the appropriate area (8a or 8b), depending on whether or not they used a walking aid. If the participant did not attempt the second trial of the usual pace walk, skip to item 8c.

Question 8c and 8d. Record the reason the second trial was not attempted. If Other problem is selected, describe the problem in 8d, and then continue to item 9. Examples of other problems include: fracture, sprains, amputation, or cognitive problems.

Special PFX 4M Walk for Shared ARIC/ACHIEVE Participants

If the ARIC/ACHIEVE participant is participating in the two-minute walk, the 4M walk assessment must precede the two-minute walk. For this special use case, select the “Abbreviated” option in item 0c. Proceed to collect the 4M walk and record the results. See

section D for instructions. The grip strength assessment will not be collected. Those items should be marked as “Missing.”

D. Grip Strength

Read the script to the participant. Assess fit of the dynamometer and adjust if necessary. Position the participant, demonstrate use and allow one submaximal practice trial. Ask each question in questions 9-10. The only exclusion criteria is surgery in both hands in the past 3 months.

Shared ARIC/ACHIEVE Participants who Require the 4M Walk

In the special case when the 4M walk measurement is needed for the shared ARIC/ACHIEVE participants who will be tested on the two-minute walk, mark all the enabled grip strength items to “Missing” to avoid having the missing field report list the non-relevant grip strength items.

Question 9: Ask about pain or arthritis in either hand or wrist; if “Yes”, go to question 9a. If “No”, go to question 10.

Questions 9a, 9b, and 9c query the participant on affected side, recent exacerbation, and perception of effect it may have on grip strength.

Question 10: Ask the participant about surgery on the hands or wrists in the past three months. If s/he has not had surgery, go to question 11. If s/he has had surgery, go to question 10a (determine laterality).

Question 11a. Record which hand the participant is using to obtain maximum strength. This is typically the dominant hand.

Question 11b. Record the kilograms from the first trial, rounding to the nearest 2 kg. If exactly between two even numbers on dynamometer, round up. For a successful trial, the measurement should be >0 kg. If the participant attempts the grip strength test but is unable to squeeze the device, record “Unable to do” in item 11d. If you record 0 in item 11b, a CDART query will be triggered.

Question 11c. Reset dynamometer to zero. Record the kilograms from the second trial. For a successful trial, the measurement should be >0 kg. If the participant attempts the grip strength test after a successful trial 1 but is unable to squeeze the device, record “Did 1 trial” in item 11d. If you record 0 in item 11c, a CDART query will be triggered.

Question 11d. Record the completion status. See instructions on items 11b and 11c regarding a completion response in item 11d when the participant attempts the grip strength trials and is unable to complete one or both trials.