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Exp. 3/31/2014

PHYSICAL FUNCTION TESTS

ID NUMBER:

FORM CODE: P F X

DATE: 05/18/2011
Version 1.1

ADMINISTRATIVE INFORMATION

0a. Completion Date: / /
Month Day Year

0b. Staff ID:

A. CHAIR STANDS

Single Chair Stand

“This is a test of strength and stability in your legs in which you stand up from a chair without using your arms. Fold your arms across your chest, like this, and stand when I say GO, keeping your arms in this position. Any questions? Ready, Go!”

- 1. Participant Refused → Go to item 3
- Not attempted, unable → Go to item 3
- Attempted, unable to stand → Go to item 3
- Rises using arms → Go to item 3
- Stands without using arms

Repeated Chair Stands

“This time I want you to stand up five times as quickly as you can, keeping your arms folded across your chest.” With the next instruction, cross your arms over your chest and then rise while emphasizing “full standing position,” and sit while emphasizing “all the way down: “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.” Do two chair stands quickly; count as you stand each time. Then begin the test. “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 with “Go” and stop with the last stand or maximum of 1 minute.

- 2. Participant Refused → Go to item 3
 - Not attempted, unable → Go to item 3
 - Attempted, unable to complete 5 stands → Number completed:
 - 0
 - 1
 - 2
 - 3
 - 4
- Completes 5 stands → Enter time for 5 stands: .
Seconds Hundredths

B. STANDING BALANCE

“I’m going to ask you to stand in several different positions that test your balance. I’ll demonstrate each position and then ask you to try to stand in each position for 10 seconds. I’ll stand next to you to provide support if you lose your balance. Do you have any questions?” For the balance tests, begin timing when (s)he lets go of your arm. Stop timing if (s)he takes a step, touches something for support, or reaches 10 seconds.

Semi Tandem Stand

“First, I would like you to try to stand with the side of the heel of one foot touching the big toe of the other foot for 10 seconds. Please watch while I demonstrate. You may put either foot in front. You can use your arms, bend your knees or move your body to maintain your balance. Try to hold your feet in position until I say stop. If you lose your balance, take a step like this. Hold onto my arm while you get in position.” Allow the participant to hold onto your arm to get balanced. “When you are ready, let go.”

3. Participant Refused
- Not attempted, unable
- Unable to attain position or hold for one second
- Holds position ≥ 1 but less than 10 seconds → Enter time: .
Seconds Hundredths
- Holds position for 10 seconds → Go to item 5

Side-by-side Stand (only if could not do Semi-Tandem for 10 seconds)

“Now, I would like you to try to stand with your feet together, side-by-side, for 10 seconds. You can 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. Hold on to my arm while you get in position. When you are ready, let go.”

4. Participant Refused → Go to item 7
- Not attempted, unable → Go to item 7
- Unable to attain position or hold for one second → Go to item 7
- Holds for ≥ 1 but less than 10 seconds → Enter time: .
Seconds Hundredths
- Holds for 10 seconds → Go to item 7

Tandem Stand

“Now I would like you to try to stand with the heel of one foot in front of and touching the toes of the other foot for 10 seconds. Please watch while I demonstrate. You may put either foot in front. You can use your arms, bend your knees or move your body to maintain your balance. Try to hold your feet in position until I say stop. If you lose your balance, take a step like this. Hold onto my arm while you get in position. When you are ready, let go.”

Trial 1

5. Participant Refused → Go to item 7
- Not attempted, unable → Go to item 7
- Unable to attain position or hold for one second → Go to item 7
- Holds position ≥ 1 but less than 10 seconds → Enter time: .
Seconds Hundredths
- Holds position for 10 seconds → Go to item 7

Trial 2, "Let's try this one more time."

- 6. Participant Refused
- Not attempted, unable
- Unable to attain position or hold for one second
- Holds position ≥ 1 but less than 10 seconds → Enter time: .

Seconds Hundredths
- Holds position for 10 seconds

C. 4 METER WALK

Ask participants who arrive with walking aids if they think they can do this short walk without the device. **"I'm going to ask you to do a short walk over this 4 meter course two times. You will walk at your normal or usual pace for both trials. I will demonstrate. Place your feet with your toes behind, but just touching the starting line, like this. Walk a few steps past the finish line."** Walk to the other end of the course at your usual pace, making certain you walk past the finish line before slowing or stopping. Start timing with participant's first movement, and stop timing when the first foot completely crosses an imaginary plane extending vertically up from the finish line/tape.

Normal Pace Walk

"Do you have any questions? When I say "Go", please walk at your normal pace. Remember to walk a few steps past the finish line. Ready? Go."

Trial 1

- 7. Participant Refused → Go to item 9
- Not attempted, unable to walk → Go to item 9
- Completes with walking aid → .

Seconds Hundredths
- Completes without walking aid → .

Seconds Hundredths

Trial 2

- 8. Participant Refused → Go to item 9
- Not attempted, unable to walk → Go to item 9
- Completes with walking aid → .

Seconds Hundredths
- Completes without walking aid → .

Seconds Hundredths

D. GRIP STRENGTH

"The next test I'll ask you to do is the grip strength test. This device is used to measure the strength in your hand. Before starting, I will ask you a few questions to make sure it is safe for you to do this test."

9. Do you have any pain or arthritis in either hand or wrist?

- Yes
- No → Go to item 10

a. In which hand or wrist is the pain or arthritis?

- Right.....
- Left
- Both.....

b. Has the pain or arthritis in your hand(s) or wrist(s) gotten worse recently?

Yes

No.....

c. Will the pain or arthritis in your hand(s) or wrist(s) keep you from squeezing as hard as you can?

Yes

No.....

10. Have you had any surgery on either hand or wrist in the past 3 months?

Yes

No → Go to Test

a. Was the surgery on your right, left or both hands or wrists?

Right..... → Test left side only

Left → Test right side only

Both..... → Do not test

“Which hand is your preferred or best hand to test for maximum strength?” This response determines which hand is tested unless this side was excluded in the previous screening questions. Record response. **“Please extend that arm in front of your body and rest it on the table with your arm straight and wrist on the mouse pad.”** Demonstrate proper positioning of the dynamometer then place wrist strap around the participant’s wrist and position participant. (S)he should be seated facing a table at shoulder level with arm extended in front of participant approximately 90° and resting on the table with the elbow held straight (180°). The dynamometer must be perpendicular to the table and hanging off the table edge during testing. Adjust the grip until correct position attained. Allow one submaximal practice trial to determine if the participant understands the procedure and that the grip size is appropriate. **“Are the bars the right distance apart for a comfortable grip? Now try it once just to get the feel of it. For this practice, just squeeze gently. It won’t feel like the bars are moving, but your strength will be recorded.”** Show dial to participant then reset to zero. **“You’ll do this two times. When I say “squeeze”, squeeze as hard as you can. Ready? Squeeze! Squeeze! Squeeze! Now, stop.”**

11a. Hand used: Right Left

11b. Trial 1 kg Allow 15 to 20 sec rest in between trials

Reset to zero. **“Now, one more time. Squeeze as hard as you can. Ready. Squeeze! Squeeze! Squeeze! Now, stop.”**

11c. Trial 2 kg

11d. Completion Status:

Did 1 trial

Did 2 trials

Excluded

Unable to do.....



INSTRUCTIONS FOR THE PHYSICAL FUNCTION (PFX) FORM

I. General Instructions

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) at <http://www.grc.nia.nih.gov/branches/ledb/sppb/index.htm>. Note that the video does not include training on grip strength. This video should be reviewed prior to initial training session and every 6 months. Details on downloading the video can be found at this website by clicking “Instructions - pdf”. “CD (Download and Execute) – (exe)” contains the video material to be 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 and in the following sequence:

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

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

Demonstrate each maneuver correctly. Experience has shown that participants follow more closely what the examiner does rather than what he/she says. If the participant indicates they do not understand the test maneuver, demonstrate it again rather than solely relying on repeating the verbal instructions.

Limit practice trials for each test to those described in the individual measurement procedures.

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

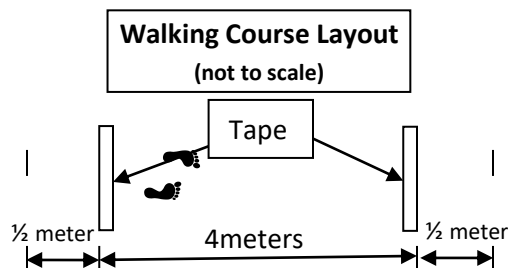
If a test is not attempted because the participant refuses or cannot understand the instructions, record “Participant refused”. If you or the participant considers the test unsafe, record “Not attempted/unable” on the scoring form. If a test is attempted, but cannot be completed or scored, record “Attempted, unable” on the scoring form.

For the walking and balance tests, the examiner should stand next to and slightly behind the participant and position his/her hands very close to either side of the participant’s trunk at the hip or waist level without touching the participant. The examiner should be ready to place both hands on the participant to stabilize them if necessary. If the participant loses balance, the examiner should grab/catch the participant with both hands at the trunk to stabilize them. If the participant begins to fall, the examiner should reach under the participant’s shoulders from

behind and slowly ease them down to the floor, rather than try to catch the participant while standing still. This strategy should protect both the participant and examiner from injury.

If the participant falls and is not injured, the examiner should have the participant get on their knees or on all fours, place a chair next to the participant, and have the participant support themselves on the chair as he/she helps lift the participant under the shoulders. The examiner should not try to lift the participant from the floor by him/herself.

- Footwear: To reduce effects of different footwear on test performance, the participant should wear 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 chair should be a straight-backed chair without arms, with seat height of 45 cm. It should be placed on a non-skid surface (e.g., low pile carpeting if available) 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 participant to move freely.
- The standing balance test should be performed with the participant standing a little less than an arm's length from a wall to provide an additional source of support should loss of balance occur.
- Walking course: The short walks should be conducted on a 4-meter path (3-meter path allowed for in-home assessments) laid-out in an uncarpeted, unobstructed, low traffic corridor at least 122 cm (about 4 feet) wide. The start and finish lines will be marked by tape on the floor. Allow an additional $\frac{1}{2}$ meter on each end of the walking course.



- For grip strength, the participant should be seated at a standard height table or on a seat with a moveable tray table attached.

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.

A. SPPB Chair Stands

Single chair stand:

This is a test of ability to stand up from a standard chair without using one's arms. This task is also used to screen for the ability to do repeated chair stands. Walking aids including canes may not be used. Although you should demonstrate the repeated chair stands, it is not

necessary to demonstrate the single chair stand. You should, however, show the participant how to cross their arms on their chest.

Make sure the participant's feet are 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 slightly more than 90 degrees so that their heels are somewhat closer to the chair than the back of their knees. Feet should remain on the floor during testing. Stand in front of the participant (with arms extended, if appropriate) for the participant's safety when performing the chair stands. Say to the participant "This is a test of strength and stability in your legs in which you stand up from a chair without using your arms. Fold your arms across your chest, like this, and stand when I say GO, keeping your arms in this position. Any questions? Ready, Go!"

If the participant's arms unfold, or they put one or both hands down on the chair to push up, or their feet come off the floor during testing, 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 a little forward in the chair before standing, but knees and hips should be flexed to approximately 90 degrees before standing. If the participant cannot rise without using arms, say "OK. Try to stand up using your arms to push off."

Score as follows: 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 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. Skip repeated chair stand for all other responses.

Repeated Chair Stands

This is a test of lower extremity strength in which the participant stands up from a seated position five times as quickly as possible. Record the time it takes to stand five times. Say to the participant, "This time I want you to stand up five times as quickly as you can, keeping your arms folded across your chest." With the next instructions, cross your arms over your chest and then rise while emphasizing "full standing position," and sit while emphasizing "all the way down": "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." Cross your arms over your chest and demonstrate two chair stands. Make sure you do them as quickly as you can. Count as you stand each time. Then begin the test. "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 you say "Go." Count: "1, 2, 3, 4, 5" as the participant straightens to standing position each time. Stop timing when the participant stands the final time.

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. If the participant stops before completing five stands, confirm that they cannot continue by asking: "Can you continue?" If they say yes, continue timing for up to 1 minute. Otherwise, stop the stopwatch and record the number of chair stands that were completed. If 5 stands have not been completed by 1 minute, stop the test and record "Attempted, unable to complete 5 stands" as well as the number completed.

Score as follows: If the participant refuses to do the test or cannot understand the instructions, score "Participant refused." It is acceptable to question the participant to determine if the participant refused because they thought they would have difficulty, be unable to do, or it would be unsafe due to inability to perform well; these should be coded "Not attempted/unable".

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 five stands" and record the number completed without using arms.

If five chair stands were completed, record the number of seconds, to a hundredth of a second, required to complete five stands.

B. SPPB Standing Balance

This is a series of timed, progressively more difficult, static balance tests. The level of difficulty increases as the lateral base of support decreases. The time (up to 10 seconds) the participant can hold each position, semi-tandem, tandem, and single-leg stands) is recorded. Walking aids such as a cane may not be used.

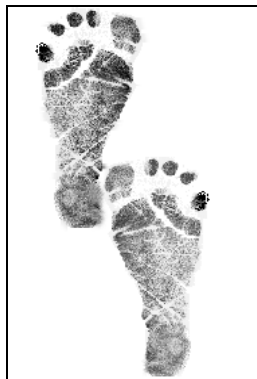
For each stand, describe the position to the participant and then demonstrate it while facing the participant. After demonstrating, approach the participant from the front and off to the side away from the wall. Offer them your arm (the one away from the wall) for support while they get in position.

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 "Not attempted, unable" (whichever is appropriate) for this and the more difficult stands and go on to the next test.

If the participant attempts the stand incorrectly, demonstrate it again. Time each stand. After 10 seconds for each stand, tell the participant to stop. If the participant loses balance before 10 seconds, stop the timer and record the number of seconds for which the stand was held. See figures for placement of feet for each type of stand.

Begin by saying, "I'm going to ask you to stand in several different positions that test your balance. I'll demonstrate each position and then ask you to try to stand in each position for 10 seconds. I'll stand next to you to provide support if you lose your balance. Do you have any questions?"

1) Semi-tandem stand



Then say, "First, I would like you to try to stand with the side of the heel of one foot touching the big toe of the other foot for 10 seconds. Please watch while I demonstrate. You may put either foot in front. You can use your arms, bend your knees or move your body to maintain your balance. Try to hold your feet in position until I say stop. If you lose your balance, take a step like this. Hold onto my arm while you get in position." Allow the participant to hold onto your arm to get balanced. "When you are ready, let go." If you or the participant feels this stand may be too difficult, you may start with the side-by-side stand instead.

Start timing when the participant lets go of your arm. 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.

If the participant is unable to hold the semi-tandem stand for at least 10 seconds, do not attempt the tandem stand. Instead, score tandem stand as "Not attempted/unable." Attempt the side-by-side stand, which is less difficult, and then go to the walking tests.

Score as follows: if the participant refuses 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.". Based on the results from the semi-tandem stand, if you reason it would be unsafe for the participant to proceed to the more difficult positions, also record "not attempted" on the form for the more difficult stands and continue to the walking test.

If the participant held the semi-tandem stand for 10 seconds, score as such and also score the side-by-side stand as "held for 10 seconds". Then go to the Tandem stand.

2) Side-by-side stand (If unable to hold Semi-Tandem stand for 10 seconds)

"Now, I would like you to try to stand with your feet together, side-by-side, for 10 seconds. You can 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. Hold on to my arm while you get in position." Allow the participant to hold onto your arm to get balanced. Say: "When you are ready, let go."

Start timing when the participant lets go. Stop the stopwatch if they take a step or grab for support. Record to 0.01 second the time the participant could hold this position. Say, "STOP" after 10 seconds.

Score as follows: if the participant refuses 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 the participant attempted the test but could not hold the position for at least 1 second, score as "Unable to attain position or hold for one second." If the participant held the position for 10 seconds, score as "Holds for 10 seconds".

3) Tandem stand

"Now I would like you to try to stand with the heel of one foot in front of and touching the toes of the other foot for 10 seconds. Please watch while I demonstrate. You may put either foot in front. You can use your arms, bend your knees or move your body to maintain your balance. Try to hold your feet in position until I say stop. If you lose your balance, take a step like this. Hold onto my arm while you get in position. When you are ready, let go."



Begin the test. Start timing when the participant lets go. 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.

If the participant holds the position for 10 seconds, go to the walking test. If the participant attempts the Tandem Stand and is unable or cannot hold it for at least one second, go to the walking test. If the participant held the position for at least 1 second but less than 10 seconds, perform a second trial of the Tandem Stand. Say "Now, let's do the same thing one more time. Hold onto my arm while you get into position. When you are ready, let go."

Score as follows: if the participant refuses 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 the participant attempted the test but could not hold the position for at least 1 second, score as "Unable to attain position or hold for one second." If the participant held the position for 10 seconds, score as "Holds for 10 seconds".

C. SPPB Four Meter Walk

These timed walks measure the time taken to walk 4 meters at the participant's usual pace. If 4 meter space is not available, such as in a participant's home, use a 3-meter course and indicate on data collection form which distance was used in testing.

The walking course must be free of obstacles. See General Information for course layout.

Allow an additional ½ meter on each end of the walking course. If necessary, participants may use walking aids, such as a walker 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.

Say to the participant: "I'm going to ask you to do a short walk over this 4 meter course two times. You will walk at your normal or usual pace for both trials. I will demonstrate. Place your feet with your toes behind, but just touching the starting line, like this.



Walk a few steps past the finish line.” Walk to the other end of the course at your usual pace, making certain you walk past the finish line before slowing or stopping.

1. Usual Pace Walk

“Do you have any questions? When I say “Go”, please walk at your normal pace. Remember to walk a few steps past the finish line. Ready, Go.” 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. Record the time to the nearest 0.01 second on the data collection form. Now repeat the usual pace walk, saying “Let’s try this one more time.” Make certain feet and toes are in the correct position before beginning second trial.

2. Scoring the Walk

Start timing with the participant’s first movement, rather than when the tester says, “Go”, and stop timing when the first foot crosses an imaginary plane extending vertically up from the ending line/tape. Record the time to the nearest 0.01 second. If the participant refuses or cannot understand the instructions, score “Participant refused.” If the procedure was not attempted because the participant was unable to walk, score “Not attempted/unable to walk”. If the participant completed the walk, record the time required in either the response section “Completes with walking aid” or “Completes without walking aid.”

D. Grip Strength

"The next test I'll ask you to do is the grip strength test. This device is used to measure the strength in your hand. Before starting, I will ask you a few questions to make sure it is safe for you to do this test."

Determine if the participant has an acute or recent flare of arthritis in the hand that will be tested. Ask, “Do you have any pain or arthritis in either hand or wrist?” if participant answers “Yes”, ask, “In which hand or wrist is the pain or arthritis?” Record response. Next ask, “Has the pain or arthritis in your hand(s) or wrist(s) gotten worse recently?” Record response. “Will the pain or arthritis in your hand(s) or wrist(s) keep you from squeezing as hard as you can?” Record response. Pain or arthritis that has gotten worse recently is not an exclusion for this test.

“Have you had any surgery on your hands or wrists in the past three months?” Record response. If the participant says “No”, proceed with test; if they answer “Yes,” ask them which hand or wrist was operated on, record response, and do not test that hand.

The examination is done with the participant seated facing a table at shoulder level with arm to be tested extended in front of participant approximately 90° and resting on the table with the elbow held straight (180°). The dynamometer is held perpendicular to the table in the hand to be tested, just off the table edge. The wrist should be resting on a mouse pad or rolled towel if mouse pad is not available. Correct grip and participant positions are shown below. Demonstrate the correct grip and arm position while seated at the table, if necessary.



Figure 1. Grip position



Figure 2. Arm Position



Figure 3. Arm Position



Figure 4. Mouse pad for wrist support

Next ask “Which hand is your preferred or best hand to test for maximum strength?” This response determines which hand is tested unless this side was excluded in the previous screening questions. Record response on form. “Please extend that arm in front of your body and rest it on the table with your arm straight and wrist on the mouse pad.”

Demonstrate proper positioning then place wrist strap around the participant’s wrist as you position the participant. Adjust the grip size until the participant is holding the dynamometer comfortably (this will almost always be the second setting). If the handle hits the participant’s hand distal to the second knuckle the grip size should be smaller. If the participant’s natural finger nails are hitting their palm the grip size needs to be larger. “Are the bars the right distance apart for a comfortable grip?” Readjust as needed prior to starting the test until a comfortable position is attained. Allow one submaximal practice trial to determine if the participant understands the procedure and that the grip size is appropriate. Say, “Now try it once just to get the feel of it. For this practice, just squeeze gently. It won’t feel like the bars are moving, but your strength will be recorded.” Show dial to participant after squeezing then reset to zero. “You’ll do this two times. When I say “squeeze”, squeeze as hard as you can. Ready? Squeeze! Squeeze! Squeeze! Now, stop.”

Set the dynamometer to zero prior to each attempt. Record the kilograms from the dial to the nearest 2 kilograms onto the form. If the reading is exactly between two readings on the scale, round up to the next higher even number. Reset the dial to “0” after each trial.

Perform two trials with 15 to 20 sec rest in between. After the first trial, say “Now, one more time. Squeeze as hard as you can. Ready. Squeeze! Squeeze! Squeeze! Now, stop.”

Score as follows: if the participant refuses or cannot understand the instructions, score “Participant refused.” If the participant was unable to perform the test, score “Unable to do.” If the participant was excluded due to recent surgery, record “Excluded”. If the participant completed only 1 trial, record, “Did 1 trial” and if he/she completed both trials, record “Did 2 trials”.