

STUDY OF OSTEOPOROTIC FRACTURES (V5)

Protocol for Neuromuscular Performance Tests

I. INTRODUCTION:

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. Clinics may want to purchase a few sizes of inexpensive tennis shoes to have available.

Instructions to participants: To some participants, the detailed verbal instructions (especially for the third or fourth time) may seem pedantic or unnecessary. It may help to say that you are going to explain each test to the participant in detail since this is the best way to make sure that everyone does the test in a similar manner and in the same fashion as they did at previous visits. The detailed protocols indicate which scripts are required and which are optional. The individual examiner must determine whether a participant understands what is required and provide the appropriate level of instruction.

Screening: Ask each participant:

"Do you have any problems from recent surgery, injury, or other health conditions that might prevent you from standing up from a chair, walking quickly, or stepping up one step?"

If the answer is yes, record on the scoring form. Tell the respondent who says yes that after you describe each test, you will discuss with her whether she should attempt that test given the physical problems or disabilities present.

Refused/unable: If a test is not attempted because the participant refuses, for whatever reason, record "refused" on the scoring form. If possible, record a reason for the refusal (record in the margins as well as in the space provided on the last page of the exam form).

If a test is attempted but cannot be completed or scored, record "unable" on the scoring form. Again write explanatory notes in the margins and on the last page.

Valid yet unusual data: If the participant receives valid yet "unusual" (high or low) values, please write a brief explanation on the last page of the form. If there were any possible equipment problems that may have affected the score, please record them.

Walking Aids: Walking aids should not be used for the tandem stance, step ups, or chair stand tests. Walking aids may be used for the timed walking tests, but should be discouraged. If aids are used for any test, this should be recorded on the scoring form.

Demonstrations: Demonstrate each maneuver for the participant.

Practice trial: Practice trials for each test should be limited to that described in the individual protocols.

Rest: The participant should be allowed to rest between tasks if out of breath or fatigued during the assessments.

I. STAND UP FROM CHAIR 5 TIMES

1. Description:

This tests the subject's ability to stand up from a standard chair without using arms for support and the time required to stand up from a chair five times, measured with a stopwatch.

2. Equipment:

A straight-backed, armless, hard seated chair (such as plastic molded chair) approximately 45 centimeters high at the front edge. The seat should incline no more than a few degrees from front to back. Whenever possible, use the chair that was used in previous visits.

Place the back of the chair against a wall to steady it. Stand next to the participant to provide assistance if she loses her balance.

Stopwatch.

3. Measurement Procedures:

a) Have the participant sit in the chair, assuming the position from which she would normally stand up from a chair (but no more than half-way forward on the seat of the chair) with the feet resting on the floor and the arms folded across the chest. Say:

"The next test measures the strength in your legs. Please fold your arms across your chest. When I say 'Ready? Stand!,' please stand up straight as rapidly as you can five times without stopping in between and without using your arms to push off. After standing up each time, sit down and then stand again without stopping. Now watch while I demonstrate the correct way and the incorrect way to stand." (*Demonstrate both for the participant, exaggerating the incorrect way*).

"When you stand up, you want to make sure that your knees are straight and your body is straight."

Then ask her to stand up one time for practice.

If a participant can not stand up one time unassisted (she may use her arms), then do not test the 5 rapid chair stands. Record her as unable.

b) When the subject is properly seated after practicing say

" Okay, now I'll be timing you with the stopwatch as you stand up 5 times. Please try to do this as fast as you can while still feeling safe. Ready! Stand."

Count out loud as she arises each time, up to 5. Stop the stopwatch when she has straightened up completely the fifth time.

c) If she is unable to arise without using her arms say:

"O.K., try to stand up using your arms to push off."

Be sure to record arm use on the form.

d) If the participant fatigues before completing 5 stand-ups, confirm that she can't do any more by asking:

"Can you continue?"

If she says yes, keep timing. If she says no, record that she could not complete five stand-ups and do not record a time for her.

e) For ALL participants who completed all 5 stands, ask:

"Do you think that was as fast as you can do it while still feeling safe?"

If participant says no - then ask her to repeat the test emphasizing that she should stand *as fast as she can while still feeling safe*.

Record the time for the second trial.

f) Record:

i) whether she can stand up five times without help,

ii) arm use (none, some stands, all stands),

iii) the time to complete five stands to the nearest tenth of a second.

II. TIMED GAIT

1. Description:

This part of the exam measures two things: the time (in seconds) required to walk a six meter course and the average step length (centimeters).

2. Equipment:

Stopwatch. Gait course.

3. Subject Preparation:

The participant should be wearing comfortable walking shoes. She may use a walking aid, but should be encouraged to walk without one if she is comfortable doing so.

"Now I am going to observe how you normally walk. If you use a cane or other walking aid and would feel more comfortable with it, then you may use it. However, if possible I would like you to walk without using any aids."

4. Measurement Procedures:

A. WALKING SPEED AND STEP LENGTH, USUAL PACE

a) Ask the subject to stand behind the line at one end of the course, at the red center mark.

"When I say 'begin,' I would like you to walk to the X at the other end of the course at your usual speed, just as if you were walking down the street to go to the store. Walk all the way past the line at the other end, to the X, before you stop."

b) Ask the subject to begin the usual walk.

"Remember, walk at your usual pace all the way past the line at the other end before you stop. "Ready? Begin."

Start the stopwatch at the word "Begin" and stop timing when one of her feet is all the way across the end line. Count the number of steps taken to cover the course. One step is counted when either foot is placed down on the floor, including the first step and the step which first takes a participant's foot completely across the end line.

c) When the participant crosses the end line, ask her to turn around and stand at the end line as before.

"Now do the same thing in the other direction. Walk at your usual pace and go all the way to the X, past the line at the other end. Ready? Begin."

d) Record time and steps for the two trials.

Record on the form whether or not the participant used any aids when performing this gait test. Also record whether she attempted the test but was unable or whether she did not even attempt the test.

B. RAPID PACE

a) For the third trial, ask the participant to walk at a rapid but safe pace.

"This time I would like you to walk at a rapid, but safe, pace. Walk as fast as you can, while still feeling safe, past the line to the X at the other end".

b) Record the time and number of steps.

C. For home visit participants, also record the length of the gait course and the type of surface.

III. STEP-UPS ON A SINGLE STEP

1. Description:

This tests the subject's ability to step up and down a single step without arm support.

2. Equipment:

Step stool with single step (9 inches (23 cm) from ground) and handrail. Stopwatch.

3. Measurement Procedures:

A. STEPPING UP AND DOWN ONCE WITHOUT SUPPORT

a) Place the step stool about 3 feet from the wall, facing the wall. Have the participant stand in front of the stool. Stand on the side of the step stool, ready to assist. Say:

"I would like you to step up onto the stool with both feet without holding on to anything."

If she cannot do it without holding on, say:

"OK, try to step up holding my hand or arm (or the railing) for support."

Hold your arm steady, but do not provide lift. If she cannot step up holding examiner for support, actively assist her onto step.

b)"OK, good. Now I would like you to step down by stepping forward, again without holding on to anything."

If the participant is unable without support, say:

"OK, try to step down using my hand (or the railing) for support."

If she cannot step down with passive support, actively assist her in stepping down.

c) Record:

i) whether she steps up without holding on, by holding on, or with active assistance,

ii) whether she steps down without holding on, by holding on, or with active assistance.

B. RAPID STEP-UPS

NOTE: if the participant cannot step up without active assistance from the examiner, do not attempt the rapid step-ups.

For greater safety, position the step stool facing a wall. The base should be about twelve inches from the wall.

a) Tell the participant:

"This is another test of the strength and coordination in your legs. I would like you to step up on this step as many times as you can in ten seconds."

Demonstrate by stepping up and down rapidly, saying:

"You must hold onto the railing. Step up on the stool with either foot and step back down so that both feet are on the ground. Then step up again and keep going. Step up and down rapidly as many times as you can safely do it in the time I give you. I'll tell you when to stop."

b) The examiner stands to the side of the step stool, providing support with one hand and holding the stopwatch with the other. When the participant is properly positioned, say:

"Ready? Begin."

The stopwatch should be started at "Begin.". Count aloud: "one" when both feet are on the stool, "two" when both feet are back on the floor, etc. If the time expires when the subject has only one foot on the stool or the floor, a half step should be added to the score. After ten seconds have elapsed, make a mental note of the number of complete step-ups, and then say:

"Okay. Stop."

c) Record the number of step-ups to the nearest one-half step. (Note: the half-steps are more important for the participants who are very slow on this test. In this case, the half steps are also easy to count.)

d) For ALL participants who completed 10 seconds of stepups, ask:

"Do you think that was as many as you can do while still feeling safe?"

If participant says no - then ask her to repeat the test emphasizing that she should step up *as fast as she can while still feeling safe.*

Record the time for the second trial.