

STUDY OF OSTEOPOROTIC FRACTURES (V4)

Functional Reach Assessment

1. Introduction

The functional reach test measures balance. It tests how far the subject can lean forward while keeping her feet flat on the floor without losing her balance. Balance represents a key component of physical performance and therefore, physical frailty. This procedure was developed by Pamela Duncan, Debra Weiner, and Stephanie Studenski of Duke University Medical Center (Weiner, J Am Ger Soc; 40:203, 1992).

2. Equipment

1) Equipment for the functional reach test consists of two strips of velcro approximately two feet long, and a yardstick with velcro attached to both ends.

The velcro strips should be attached securely to a wall exactly 36 inches apart (or the width of the yardstick you are using) measuring from the outer edge of each strip, and they should be perpendicular to the floor and parallel to each other. There should be plenty of unobstructed wall space on either side of the strips to perform the test. The yardstick will hang horizontally across the wall by attaching the velcroed ends of the yardstick to the strips on the wall, exactly at shoulder height of the participant performing the measure. By using velcro, the yardstick can be easily adjusted to the participant's height.

When hanging the yardstick, it is very important that it be exactly (as close as possible) horizontal. Put inch markings (or smaller) right on the velcro with a marker or other means to help ensure that the ruler is placed square each time it is moved. In addition, the velcro attachments on the ends of the yardstick should be the exact same width as the velcro strips on the wall. As long as the velcro strips on the wall are hung exactly square, then by matching the velcro strips on the yardstick to those on the wall, the yardstick should hang square (horizontal).

2) Stopwatch to test ability to stand for 30 seconds in subjects who have exhibited evidence of impaired balance on other tests.

No aids are permitted at any time.

3. Measurement Procedures

A. If subject has demonstrated ability to stand for 30 seconds, skip this test and mark "yes" on form under subject's ability to stand for 30 seconds.

If subject has had difficulty standing unaided, or uses a cane or walker during other tests, determine her ability to stand for 30 seconds.

"I want you to stand like this, with your feet side by side, for 30 seconds. I will let you know when 30 seconds has passed. Ready? Start."

If subject can stand for 30 seconds, continue with functional reach test. Otherwise proceed to next performance test.

B. Determine which side to test.

Test on dominant side. If ambidextrous, test on right side.

C. For all subjects, determine her ability to reach her arm straight over her head.

"Please raise your arm over your head like this."

Note whether or not participant can reach her arm over her head. If she can't raise her dominant arm over her head, note this on form and proceed with the test, marking starting and stopping points from as far as participant can reach with her dominant arm.

D. Measurement of functional reach.

Subject must be in bare feet or flat shoes that will not slip - not in socks or stockings. Have the subject stand with the side to be tested next to the wall and measuring board.

DEMONSTRATION

"Now I want to see how far you can reach forward. Please watch while I demonstrate. First, line up your feet behind this mark on the floor. Stand with your right (left) side to the wall and with your feet comfortably apart and your back straight, the way you usually stand. Raise your right (left) arm to horizontal, like this, keeping your shoulders square and extend your fingers. I will record where your fingers line up on this chart. Then I want you to reach forward along the ruler as far as you can without moving your feet or losing your balance. Keep your hand in line with the ruler and keep your feet flat on the floor. Do not touch the wall or ruler. I want to see what the farthest number is that you can reach on the ruler (*we hope that by saying this, the participants will be more likely to keep their arms and hands in line with the ruler rather than the arm falling down below the ruler*). I will record this value."

Make sure the participant reaches forward in a plane parallel with the measuring stick. Telling her that you want to see the farthest number she can reach may help keep her reach in line with the ruler. If the participant steps out or leans against the wall during the trial, then the trial is invalid. In this case, repeat the instructions and have the participant try again. If she steps out or leans against the wall 2 consecutive times, then code her as "unable" for that trial.

SUBJECT TRIAL

“Okay, now you try it. First we’ll do one practice reach .”

“Line your feet up behind this line and stand comfortably with your back straight. Raise your arm to horizontal and extend your hand and fingers, but do not lean forward yet.”

Make sure the participant is not leaning forward and have her adjust her feet if necessary so that her extended fingers line up with an inch mark. All participants should start with their shoulder square and relaxed (not extended or retracted).

Use an index card (or stiff card of similar size) to hold up to the ruler and align with the participant's fingers. Use this card to determine both the starting point and the stopping point. Record the starting point on the form.

Take the index card away while the participant reaches forward. When you sense she's reaching her maximum point, get the index card ready to align with her fingers again when she reaches her peak. This will determine the furthest point reached. Using the index card allows you to continue marking the furthest point reached while the participant returns to starting position. Using the index card allows you to continue marking the furthest point reached while the participant returns to starting position. Record the furthest point reached, to the nearest inch, on the form.

Rounding: When determining the furthest point reached, round to the nearest inch using conventional rounding. If the participant's reach is between two inch marks, then apply conventional rounding. If the participant reaches halfway or more to the next inch mark, then round to the inch mark that is just beyond the end of her fingers. If her fingers do not reach halfway between the two inches, then round down. For example, if the numbers are increasing as she reaches forward and she reaches to 27.5 or greater, then record 28 inches. However, if she reaches to 27.3, then record 27. This follows the rules of conventional rounding. If the numbers are decreasing as she reaches forward and she reaches to 27.5 or greater, then record 27. The direction of the rounding will depend on how the ruler is placed in relation to the direction that the participant is reaching. It doesn't matter whether the numbers end up smaller or larger, just as long as everyone consistently applies conventional rounding rules. Do not have the subject hold the position while you determine the value.

“Now reach forward as far as you can without moving your feet. Keep your feet flat on the floor. Once you’ve reached as far as you can, you can return to standing position.”

If the interviewer must intervene in any way to restore balance or catch the participant, discontinue and go to the next procedure. However, if the subject steps out during any trial, the trial may be repeated, but not more than twice (see above).

“Now let’s try it three more times and see how you do.”

Repeat the test three times, recording the starting value and maximum value for each of the three trials. Repeat instructions as necessary.