

Timed Walk and Hand Grip Strength Protocol

Background and Purpose:

One goal of the MACS is to assess whether HIV and its treatments are associated with increased risks of certain chronic conditions. Chronic infection, inflammation and compromise of the immune system together with treatment-related comorbidities may increase the risk of frailty compared to uninfected individuals at the same chronological age. In addition, little is known about HIV in the aging population. Physical performance assessments, including strength and mobility, are components of the frailty syndrome and are standards in the determination of the physical effects of aging and are being used by other studies, including the Cardiovascular Health Study (CHS) and the Women's Interagency HIV Study (WIHS). The incorporation of timed walk and hand grip measurements in the MACS physical examination are proposed. Using these same measurements in MACS will allow comparative analyses with these other cohorts.

Definitions:

Orthosis: An orthopedic appliance or apparatus used to support, align, prevent or correct deformities or to improve the function of moveable parts of the body. In this exam we are specifically checking for lower extremity orthoses; plastic or metal leg braces at or above the ankle.

Prosthesis: An artificial substitute for a missing body part, such as an arm or leg, used for functional or cosmetic purposes, or both.

Equipment and Supplies:

- 4-meter measuring tape
- Jamar Dynamometer (to be supplied by CAMACS)
- Stop watch
- Tape, to mark measured walk course

Methods:

The performance-based measurements are to be administered by a certified technician or interviewer. They may be administered at any point during the visit. Interviewers or technicians are trained to administer the individual components of the exam in the following sequence (CD with demonstration of the timed walk will be distributed by CAMACS):

1. Explain the procedure to the study participant using a standardized script.
2. Demonstrate the procedure to the study participant.
3. Ask the participant if he has any questions.
4. Briefly explain the procedure once again.
5. Ask the study participant to perform the procedure.
6. All timed procedures are begun with the words, **“Ready? Go!”**

SECTION A: MEASURED WALK

Identify a walking course of 4 meters by marking the beginning and ending points on the floor with highly visible tape. The course should be free of obstacles. The participant will be asked to repeat the test two times. The preferable length for the walking course is 4 meters; however, if 4 meters are not available, a 3 meter course may be used instead. If a 3-meter course is not available, indicate in question that the measured walk was not attempted due to “other reason,” and specify the reason.

- A1. Indicate if the participant attempted to perform the measured walk. If “yes,” go to A2. If “no,” indicate the reason the measured walk was not attempted (e.g., space not available, etc.) and skip to Section B.
- A2. “Does the participant use an assistive device for walking?” If the response is “yes,” please record the type of assistive device used in question A2a. If the response is “no,” skip to question A3.
- a. Standard cane: A straight “stick” with a curved or straight handle that makes contact with the floor at one point.
 - b. Quad cane: A device that is similar to the standard cane at the proximal end, but branches out to four “legs” at the distal end, making contact with the floor at four points. A TRIPOD CANE should be placed in this category, as well.
 - c. Walker: A frame device upon which the user may support himself with both hands.
 - d. Other: If any device other than those listed above is used, please specify in the space provided. Reliance upon another person for support does not constitute a “device.”
- A3. “Does the participant use a lower extremity orthosis (plastic or metal leg brace at or above the ankle)?” This refers to the participant’s current use of such an aid. He should be wearing the device at the clinic for the exam. An orthosis used at other times (at night, for instance) should not be recorded here.

An orthosis worn below the ankle (for example, a device worn in the shoes for fallen arches) does not qualify in this definition. If you cannot determine whether the participant uses an orthosis ask him.

- A4. “Is the participant missing any limbs?” Major limbs only are considered here: arms (including hands) and legs (including feet). A missing finger or other digit does not constitute a missing limb. A limb is considered missing whether or not an artificial limb is replacing the natural body part. If “yes,” mark “yes” or “no” to indicate which limb(s) in questions A4a – A4d.
- A5. “Does the participant use a prosthesis?” If the participant is missing a limb, the use of an artificial limb or prosthesis is to be recorded here. This refers to the participant’s current use of such an aid. He should be wearing the device at the clinic for the exam. If the participant has mentioned owning a prosthesis but is not currently wearing it, it is not to be recorded here. If you cannot determine if the participant uses a prosthesis ask him. If “yes,” mark “yes” or “no” to indicate which limb(s) in questions A5a – A5d.

- A6. *“Does the participant have paralysis of an extremity of side of the body?”* If you cannot determine whether the participant has paralysis ask him. If “yes,” mark “yes” or “no” to indicate which side of the body is paralyzed in questions A6a and A6b.

MEASURED WALK ATTEMPT #1:

Script: “In this test, I would like you to walk from this line to the line at the end of the hall at your usual pace. Do you think you could do that? Good. Can you see the tape? Good. Let me demonstrate what I want you to do.”

Demonstration: Walk from the position behind the first line (with toes starting at the line) at your usual pace to and crossing the line 4 meters (as available) from the first.

Script: “To do this test, place your feet with your toes behind, but touching, the line where we start. I will be timing you. When I say, ‘Ready? Go!’ walk at your usual pace to the line at the end of the hall. I will walk with you.”

When the participant is properly at the line, say, “**Ready? Go!**”

Start the stopwatch as the participant begins walking. Walk with the participant and keep the stopwatch behind him so he can’t see it. Your arm can provide support if the participant loses balance. Stop the stopwatch when the participant’s first foot is completely across the finish line. If the participant fails to cross the finish line, explain the procedure again and repeat the process.

- A7. *“Did the participant complete the measured walk?”* For those men who attempted the measured walk, indicate whether or not they were able to complete it. If “yes,” indicate in A7a if the participant used an assistive device on the walk. If “no,” indicate why he was unable to complete the measured walk in A7.b and skip to Question A10.
- A8. *“What length course did the participant walk?”* Indicate whether the course length was 3 or 4 meters. The preferable length for the walking course is 4 meters; however, if 4 meters are not available, a 3 meter course may be used instead.
- A9. Record the number of seconds it took the participant to walk the course.

MEASURED WALK ATTEMPT #2:

Script: “Now, I’d like you to try this test a second time. When I say, ‘Ready? Go!’ walk at your usual pace to the line at the end of the hall. I will walk with you.”

When the participant is properly at the line, say, “**Ready? Go!**”

Start the stopwatch as the participant begins walking. Walk with the participant and keep the stopwatch so he can’t see it. Your arm can provide support if the participant loses balance. Stop the stopwatch when the participant’s first foot is completely across the finish line. If the participant fails to cross the finish line, explain the procedure again and repeat the process.

- A10. “Did the participant complete the measured walk?” For those men who attempted the measured walk, indicate whether or not they were able to complete it. If “yes,” indicate in A12a if the participant used an assistive device on the walk. If “no,” indicate why he was unable to complete the measured walk, and skip to Section B.
- A11. “*What length course did the participant walk?*” Indicate whether the course length was 3 or 4 meters. The preferable length for the walking course is 4 meters; however, if 4 meters are not available, a 3 meter course may be used instead.
- A12. Record the number of seconds it took the participant to walk the course.

SECTION B: GRIP STRENGTH

- B1. Indicate if the participant attempted to perform the grip strength assessment. If “yes,” continue with section B. If “no,” indicate the reason the grip strength assessment was not attempted and skip to question B9.
- B2. “*Can the participant lift his arm to the table independently?*” When administering the grip strength test, it is necessary to ask the participant to place his elbow onto the table in order to use the grip strength device. Record your observation of the participant’s ability to lift his arm/elbow onto the table independently on the form.

If the participant has lifted his arm/elbow as requested independently (without aid from the other hand), the answer is coded “yes,” and no questions need be asked.

If the participant has not lifted his arm or hand to the table independently, ask: “Are you able to place your elbow onto the table without assistance from (your other hand/whatever assistance was used)?” If the participant answers “yes,” but does not perform the action, ask him to demonstrate. Record the results for each arm individually. **NOTE:** The participant’s chair should be at the proper height so that his arm can rest comfortably on the table at a right angle. The dynamometer also should rest on the table. A towel or pad should be placed under the arm.

SPECIAL NOTE: The grip strength examination is used to test how strong the participant’s hands are.

Participants with one or more of the following conditions should not be tested:

- Acute flare-up of wrist/hand; for example, arthritis, tendonitis or carpal tunnel syndrome.
- Less than 13 weeks after surgery for fusion, arthroplasty, tendon repair or synovectomy of the upper extremity.
- If the technician has concerns that this test may exacerbate symptoms of heart disease (e.g., angina), the situation should be investigated. Ask the participant if he is currently having symptoms from heart problems. This does NOT exclude the participant from the grip strength test. Local procedures may be developed in this situation to assure safety for the participant.

Script: “In this exercise, I am going to use this instrument to measure the strength in your hands.”

- B3. “*Have you had a recent worsening of pain in your wrists?*” If participant responds “yes,” ask question B3a. If he responds “no,” proceed to question B4.
- a. “*Do you think you could safely squeeze this as hard as you can?*” If participant responds “no,” do not perform grip strength test and skip to question B5.
- B4. “*Have you had any surgery on your hands or arms during the last 13 weeks?*” If participant responds “yes,” do not perform grip strength test and skip to question B5.

Script: “I’d like you to take your dominant arm, place your forearm on the table, and grab the two pieces of metal together like this.” Examiner should demonstrate at this point. “When I say ‘squeeze,’ squeeze as hard as you can. The two pieces of metal will not move but I will be able to read the force of your grip on the dial. I will ask you to do this three times. If you feel any pain or discomfort, tell me and we will stop.”

Demonstration: Face the participant and squeeze the dynamometer so that the participant can see the dial rotate.

Script: “Now you should place your arm on the table at right angles to your body. Grip the two pieces of metal with your dominant hand. Your wrist should be straight. **Ready? Go!**” (Be sure to coach, “**Squeeze, squeeze, squeeze!**” Also be sure to tell the participant when to “stop.”)

Repeat the examination three times in the dominant hand. Record the results of each trial before the next attempt.

The dynamometer should be set at “2” strength for testing of all participants. The computer default for this item is “2.”

- B5. Record whether or not the grip strength test was completed. If the test was attempted but not completed, or if it was not attempted, skip to question B9.
- a. Record whether the participant performed the test using his left or right hand. The test should be performed using the participant’s dominant hand.
- B6. Record the strength for the first attempt in kilograms. The Dynamometer should be read at eye level. Round down to the nearest line on the dynamometer (will always be an even number). Be sure to set the dynamometer dial to zero prior to each attempt. A minimum of three attempts per hand must be made. Record “-9” for any attempts not made.
- B7. Record the strength for the second attempt in kilograms.
- B8. Record the strength for the third attempt in kilograms.