# Annual Mobility Screen for Older Adults

# Protocol

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**PURPOSE OF THIS MANUAL**

The Annual Mobility Screening Protocol Manual is designed to facilitate the incorporation of a routine screening older adults as a standard component of clinical practice. The goals of annual mobility screening by a physical therapist are to:

1. quickly and accurately identify community living older persons with preclinical and overt mobility limitation
2. quickly and accurately identify those at risk for functional decline, falls, and other adverse health outcomes, and,
3. provide individualized interpretation of test results and recommendations for follow-up care based on normative data by gender and age.

This mobility screening protocol includes four functional measures validated for use with older adults having strong psychometric properties:(1)

1. **Timed 5-meter Walk** over the center 5 m of a 10-meter walkway for two conditions:
   - **a.** self-selected (comfortable/usual) walking speed as an indicator of overall functional capacity,
   - **b.** fast walking speed as an indicator of functional reserve.
2. **30-second Chair Stand** Test as an indicator of lower extremity muscle performance (strength, power, and endurance)
3. **Four-Square Step Test** as an indicator of ability to move in multiple directions, manage obstacle clearance, balance capacity, and risk of falls.
4. **Timed Up and Go Tests** for two conditions:

**a.** The original TUG protocol as a baseline of mobility performance

**b.** TUG dual task cognitive to assess the capacity to divide attention while multitasking (dual task cost).

These measures represent tasks and activities meaningful to older adults. They require little equipment or space, can be completed quickly, have normative data for interpretation, and are responsive to changes in performance over time. Based on time, distance, or repetitions, they have minimal measurement error and greater accuracy than ordinal scales. They are also associated with physical frailty and difficulty with activities of daily living (ADLs), as well as other negative health outcomes. (2,3)

Physical Therapists, as movement specialists, are uniquely qualified to screen for early indicators of mobility difficulties. (4,5) The Annual Mobility Screen protocol assists physical therapists in taking a leadership role in assessing mobility and risk of functional decline. (1) Functional decline is clearly associated with difficulty performing ADLs, impaired mobility, and risk of falls.(6,7) Such decline also impacts the quality of life, mental health, risk of isolation, comorbidity burden, and risk of cognitive decline. (6,7) Early identification of a decline in mobility is likely to allow interventions to improve function and reduce the rate of decline and risk of negative health outcomes.

**DEFINING PRECLINICAL MOBILITY LIMITATION**

Mobility limitation has traditionally been described as having difficulty walking several blocks (1/4 mile) or managing one flight of stairs. (8) A recent consensus conference and scoping review defined preclinical mobility limitation (PCML) as transitional stage and early indicator that disablement has begun. (9) Signs of PCML include subtle changes in functional performance (e.g., taking longer to complete tasks, minor almost imperceptible modifications of task completion strategies, greater effort

and fatigue during task performance, among others). Many factors contribute to difficulty moving around and engaging in functional activities in later life: the cumulative and interactive impact of age-related physiological changes and habitual level of activity over one's lifetime (10), environmental characteristics and demands (complexity, accessibility, etc.)(11), and the impact of both acute and chronic health conditions. (12) Research suggests that, for persons with PCML, interventions to improve mobility and increase activity level will sustain function and slow rate of functional decline . (13) Identification of those with PCML is an important and necessary endeavor. (9)

**STRATEGY FOR INTERPRETING PERFORMANCE**

The AMS interpretation tables (available in a separate document) provide "cut scores" reported in the research literature indicating the risk of negative health outcomes (e.g., falls, functional decline). These single values are derived from receiver operating curves (ROC) and area under the curve (AUC) values derived from the relationship of a measure's sensitivity (true positive rate) and inverse of its specificity (false positive rate). (14) While cut scores aid in the general interpretation of performance, they are applied independently of age- and gender-normative data or reference values. Performance on most functional measures tends to decline with advanced age, but little is known about the accuracy of general cut score values for those 80 years and older.(15) Interpreting the risk of adverse outcomes is likely more accurate if both "cut-off" scores and age and gender reference values are considered.

The Task Force (TF) defined three levels of participant performance, modeled on the STEADI guidelines. (16) See Figure 1 for a visualization of this rating system

**1. PCML Unlikely**

Performance at or above -0.5 standard deviation (SD) below the mean (30% percentile or higher (17)) on all measures with no falls in the previous month. These performance values are consistent with

known prevalence of falls as well as pre-frailty/frailty in community living older adults, which range from 25-33%. (18,19) It is important to note that the possibility of an adverse health outcome is always present and increases with advancing age. Being classified in this risk category does not eliminate risk. Performance in this category will trigger discussion about the importance of remaining active to sustain functional ability (and that risk for adverse health events is never "0"), and provision of a list of community resources to facilitate continued activity.

**2. Preclinical Mobility Limitation Likely**:

Performance between -0.5 SD and -1 SD below the mean (between 16%ile and 30%ile (17)) on any of the screen's functional measures and/or a single non-injurious fall in the previous 6 months (16). The TF anticipates this level of performance might indicate pre-clinical mobility limitation. Performance in this category is interpreted as vulnerability, and triggers counseling to pursue either community-based or clinic-based programs to improve function and reduce risk of further decline.

**3. Overt Mobility Limitation Likely:**

Performance one full standard deviation below the mean (below the 16%ile on any of the functional measures, and/or two of more falls or a single injurious fall in the previous six months. (16) The TF anticipates that this level of performance is an indicator of overt clinical mobility limitation. Performance in this category will trigger immediate referral for in-depth evaluation and intervention to address impairments contributing to risk.

Ideally, mobility screening will occur on an annual basis, whether as a component of a typical Physical Therapy visit or during a community event. The protocols for each mobility test are the same, whether for one-on-one assessment or community event formats. Specific protocol and narrations for each of the AMS' performance measures begin pg. 16 Use of minimal detectable change (MDC) and

values will determine if the change in function over time is beyond measurement error, indicating decline (or improvement) and need for intervention. (20)

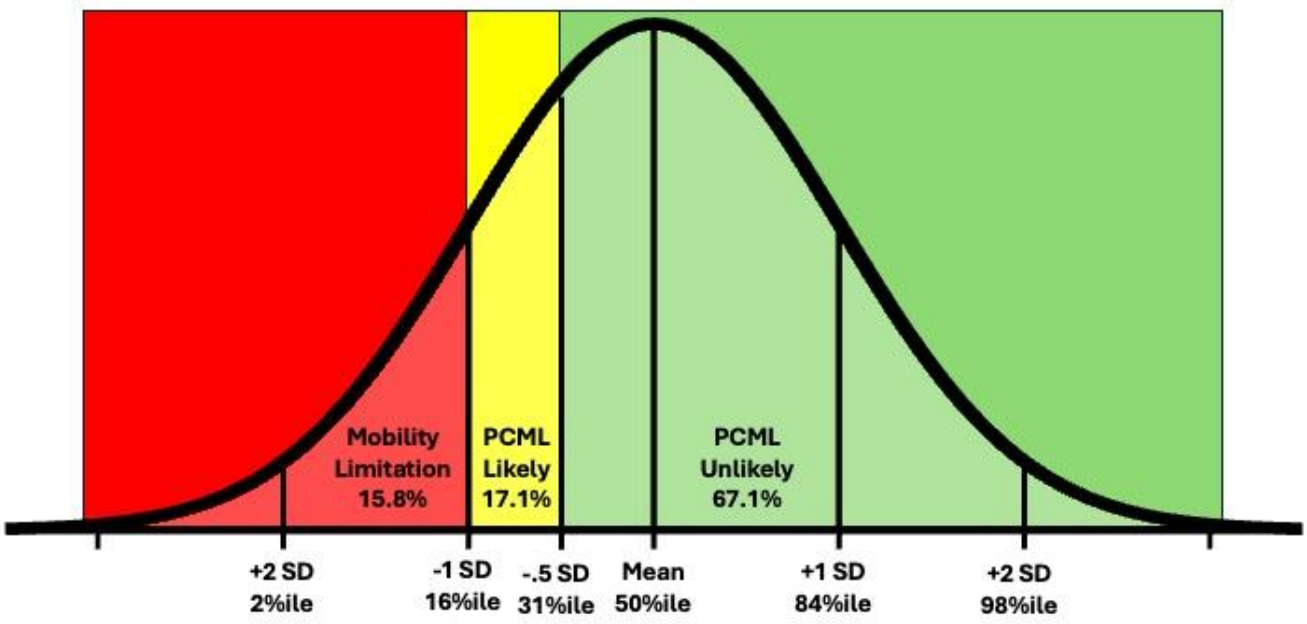


**Figure 1**: Histogram informing interpretation of participants' performance and theoretical likelihood of preclinical mobility limitation (PCML). The percentage in each colored box (under the curve )indicates the percentage of the population likely to fall into each category. Standard deviation (SD) and corresponding percentile rank (%ile) of a normal distribution are also provided to illustrate the underlying performance categorization. Green = PCML unlikely, Yellow = PCML likely, and Red = overt mobility limitation likely. Adapted from Bensken WP, Pieracci FM, Ho VP. Basic Introduction to Statistics in Medicine, Part 1: Describing Data. Surg Infect. 2021;22(6):590-596.

PCML=preclinical mobility limitation. SD=Standard Deviation. %ile=Percentile

**INTEGRATION OF THE MOBILITY SCREEN INTO CLINICAL PRACTICE**

This mobility screen is designed to be used within existing physical therapy offices/practices or as a community-based event. The one-to-one screening is designed to be completed in 10-15 minutes in any setting where physical therapy care is provided. It can be implemented as a part of the standard examination process of all older adults across multiple medical diagnoses, for periodic and discharge evaluation during an episode of care, or as a community-based event.

Community Screening events with multiple participants being screened simultaneously will likely require more time and a larger space. Such events increase public and medical community awareness of physical therapy's role in health promotion/disease prevention. Educational programs may be interested in having students participate in community screening clinics as an opportunity for service learning. Large physical therapy out-patient practices may find the idea intriguing as an opportunity for community service and incorporation into their routine practice. The specific mobility screening protocol has been pilot-tested in several locations across the United States and appears effective and efficient.

The TF has developed resources (Table 1), available as separate documents on the Annual Mobility Screen webpage:

**Table 1: Additional Resources for Annual Mobility Screen**

- **Interpretation Tables** by age and gender to make actionable recommendations
- An **Intake Form** collects demographic data and recent health and mobility history. This can be completed by the participant before screening or administered as a questionnaire by the tester.
- The **Data Form** records the participant's performance on the tests and measures during the screening.

- An example of an **Excel spreadsheet** coding strategy to categorize likelihood of PCML.
- The **"Report Card"** given to each participant provides individualized feedback about his/her mobility status and any action steps should be taken.
- The **Referral Form** directs the older person to additional services from healthcare providers in the community.
- The **Community Resources Handout** contains information about resources for increasing activity.

The information gathered during the mobility screen should be included in the older person's medical record to track potential changes in performance over time. A simple Excel file will be available to APTA Geriatrics members on the AMS website so that those hosting community screenings can record and quickly evaluate participants' results.

**Incorporating Screening into a Physical Therapy Visit**

The four measures in the mobility screen are already frequently used in routine physical therapy care. To implement the mobility screen in the private practice setting, physical therapists will need to:

a) ensure necessary equipment is readily available (Table 2),

b) delineate and mark space for the TUG and gait speed testing,

c) train staff for consistency in applying the protocol (to address inter-rater reliability), and

d) include the importance of screening in the practice's mission statement and other documents.

**Table 2**: Equipment and Supplies for One-on-One Mobility Screening in the Clinic

- A dedicated, marked area for a 10 meter gait speed walkway (with center 5 meters marked for steady state timing) with chairs at either end.

- A dedicated, marked area for 3m TUG walkway (can be superimposed on gait walkway) and a chair with armrest and a 17-inch seat height.
- A dedicated, marked area for the modified Four Square Step Test and a set of 4 canes or PVC piping with a 4-way coupler or L attachment for stability.
- Space to anchor an armless chair with 17 inch seat height against a wall or heavy table for the 30 sec. Chair Stand.
- Smartphones or stopwatches for timing performance and for calculating results.

Depending on the client's abilities, a one-on-one mobility screening can be completed in 10 to 15 minutes. Practices using an electronic medical record system need to incorporate screening results and recommendations that categorize performance and provide a summary of mobility ability. The screening's evidence-based strategy for interpreting mobility status (based on age and gender norms) and the ability to evaluate change over time (based on known MDC and MCID values) will assist communication and enhance documentation. Practices can also choose to use the other resources developed by the TF as well.

While the protocols can certainly be used for one-on-one assessment in other clinical settings (e.g., acute care, inpatient and skilled nursing rehabilitation, home care, and long-term care), the interpretation strategy is based on performance-based norms for community-dwelling older adults. At the time that this document was prepared, there was little to no evidence for typical performance in other physical therapy settings.

**Hosting a "Round Robin" Community Screening Event**

A community mobility screen should occur indoors, in a temperature-controlled space with even flooring (preferably tile or vinyl, or low pile rug). During community-based screening, participants rotate through testing stations, accompanied by their tester. During pilot projects hosted by Task Force Members, feedback from participants indicated they valued and enjoyed having a single tester accompany them through the screening process. A second "assistant" tester (such as a PT student or PTA) may be assigned to record findings as the participant is tested. This strategy allows the development of rapport such that discussions of findings and recommendations are enhanced.

The number of participants screened in each appointment is limited by the space available in the room where the screening will take place and the number of testers available to screen. The following protocol describes a 4-participant per-hour strategy. If space and personnel permit, additional stations can be set up by multiples of 4.

Participants are welcomed to the event at a registration table, where they receive their testing documents and meet their tester/s. As many participants may be accompanied by a spouse/partner, friend, or caregiver, a waiting area with 4-6 chairs should be set up near the Registration table, if space is available. Testing time is influenced by an individual's functional level and may be completed at different rates. Space requirements for testing stations are presented in Table 3. Participants move from the welcome area to one of four testing stations and then "rotate" to subsequent stations until all testing is completed (Figure 2). The screening event procedures are summarized in Table 4. An example of a community screening schedule is provided in Table 5.

**Table 3:** Space Requirements for Testing Stations:

- Welcome/Registration Area with name tags and clipboards with necessary documentation packets.
- Waiting Area with 4-6 chairs
- Gait Speed Walkway: A rectangular that is 12 meters (39 ft) to 15 meters (50 ft) long by 1-2 meters (3-6 ft) wide for the 10 m walkway. The walkway itself marked area for a 10m (33 ft) walkway (with center 5m (16.5 ft) marked for steady state timing) and chairs at either end.This allows for acceleration, steady state, and deceleration during testing. A chair should be set up at each end of the walkway as "targets" during the testing.
- Timed Up and Go Test (TUG): A chair with arms set against a wall and a 5-6 meter (15-20 ft.) clear distance as a walkway for testing. A small traffic cone or visible target 3 meters (9.8) in front of the chair's front edge
- Four Square Step Test (FSST): a 9 to 12 ft. square area as testing space. The PVC pipe testing frame (with painter's tape underneath if necessary for a modified test) delineates where to step during testing.
- 30-second Chair Rise) Area: A 4-5 ft. square area, preferably against a wall, and an armless chair.

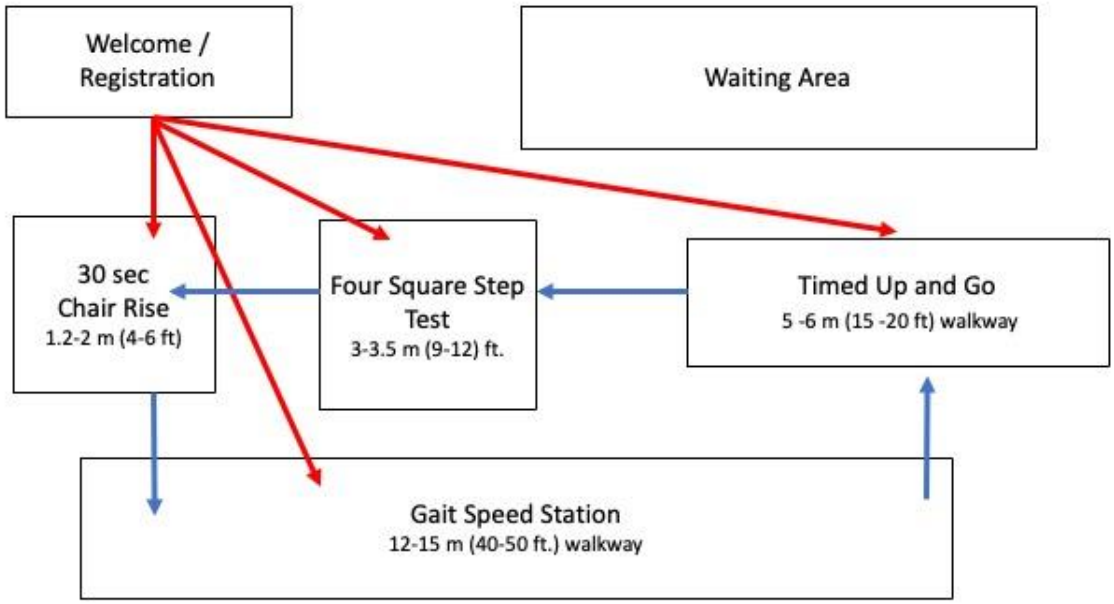


**Figure 2**: Example of stations for Mobility Wellness Screening space requirements for a "round robin" community event. Red arrows indicate the initial stations for participants and their testers. Blue arrows indicate rotation stations during a given clinic session. Each station must have two chairs, one for the participant and one for the tester.

**Table 4** Community Screening Multi-Participant Procedure

1. All Participants "sign in" at the Welcome/Registration Table, receive their documentation packet and are introduced to their tester (5 min)
2. The tester escorts participants to one of the stations, takes vital signs, and helps participants complete their intake/health history forms and sign appropriate consent documents (15 minutes)
3. The tester explains and demonstrates the test at the first assigned station, checks the participant's understanding of the activity, performs the test, provides a one-minute rest, and repeats the test

per protocol. The tester records the performance on the data sheet and “report card” and marks the test as green/yellow/red on the participant’s report card using the interpretation handout.

4. The tester and participant proceed to the next station as above. Testers and participants eventually move through all four of the stations (approximately 6 minutes per station) (25 minutes total)
5. After completing the last test, the tester interprets the participants' “report card” and makes appropriate follow-up care recommendations. The tester thanks the participant and encourages them to return for retesting the following in 6 months or 1 year as appropriate. (Scores of yellow and red should return in 6 months, scores of all green should return in 1 year) (10 min)

**Staffing:**

- Two “clinic supervisors” are recommended for the welcome table, and to float and problem-solve during sessions
- At least 1 “tester” per participant (or pairs of students)

**Participants**:

- Four participants per hour.
- If staffing and room size permits, the number of stations and participants can be increased by multiples of 4.

**Table 4**: Mobility Wellness Check Community Event Schedule--4 appointments per hour. In this example 32 participants complete testing 9 am to 5:30 pm (excluding set up and clean up)

| | |
|---|---|
| 8:15 am | Staff set up & Clinic preparation. |
| 9:00 | **Group 1 arrives.** |
| 9:05 | Testers and participants move to assigned stations, complete consent and intake forms. |
| 9:20 | Functional testing begins, with rotation through four stations. |
| 9:45 | Tester interprets the performance and makes recommendations. |
| 9:55 | Group 1 departs, a short break for staff. |
| 10:00 | **Group 2 arrives.** |
| 10:05 | Testers and participants move to assigned stations, complete consent and intake forms. |
| 10:20 | Functional testing begins, with rotation through four stations. |
| 10:45 | Tester interprets the performance and makes recommendations. |
| 10:55 | Group 2 departs. Short break for Staff. |
| 11:00 | **Group 3 arrives.** |
| 11:05 | Testers and participants move to assigned stations, complete consent and intake forms. |
| 11:20 | Functional testing begins, with rotation through four stations. |
| 11:45 | Tester interprets the performance and makes recommendations. |
| 11:55 | Group 3 departs. |
| 12:00 pm | Lunch Break for Staff (a bag lunch, or a lunch provided with the testing site) |
| 12:30 | **Group 4 arrives.** |
| 12:35 | Testers and participants move to assigned stations, complete consent and intake forms. |
| 12:50 | Functional testing begins, with rotation through four stations. |
| 1:15 | The tester interprets the performance and makes recommendations. |
| 1:25 | Group 4 departs, a short break for staff. |
| 1:30 | **Group 5 arrives.** |
| 1:35 | Testers and participants move to assigned stations, complete consent and intake forms. |
| 1:50 | Functional testing begins, with rotation through four stations. |
| 2:15 | The tester interprets the performance and makes recommendations. |
| 2:25 | Group 5 departs, a short break for staff. |
| 2:30 | **Group 6 arrives.** |
| 2:35 | Testers and participants move to assigned stations, complete consent andintake forms. |

| | |
|---|---|
| 2:50 | Functional testing begins, with rotation through four stations. |
| 3:15 | The tester interprets the performance and makes recommendations. |
| 3:25 | Group 6 departs, a short break for staff. |
| 3:30 | **Group 7 arrives.** |
| 3:35 | Testers and participants move to assigned stations, complete consent and intake forms. |
| 3:50 | Functional testing begins, with rotation through four stations. |
| 4:15 | The tester interprets the performance and makes recommendations. |
| 4:25 | Group 7 departs, a short break for staff. |
| 4:30 | **Group 8 arrives.** |
| 4:35 | Testers and participants move to assigned stations, complete consent and intake forms. |
| 4:50 | Functional testing begins, with rotation through four stations. |
| 5:15 | The tester interprets the performance and makes recommendations. |
| 5:25 | Group 8 departs. |
| 5:25 | Staff dismantles site/stores equipment. |
| 6:00 | Staff Departs |

## **VITAL SIGNS** (21)

**Purpose**: to determine if participants are stable enough to participate in testing.

**Equipment:** Each station requires a pulse oximeter and a manual or automatic sphygmomanometer. Stethoscopes should be available if using manual cuffs. Alcohol swabs should be used to clean the stethoscopes before use.

**Participant: Instruction script measuring vitals**

- May I take your blood pressure? Please sit in this chair with your feet flat on the ground, and don't cross your legs. Before I take your blood pressure, I'd like you to rest here for 1 minute. Have you had a mastectomy or lumpectomy? [If yes, ask which arm, if no, use left arm].
- I'm going to support your arm to keep it level with your shoulder while I take your blood pressure.
- Now I will measure your blood oxygen level using this pulse oximeter. I need to put it on your warmest finger. May I touch your hand to figure out which finger is best?

**Tester Instructions:**

- Participants are seated comfortably on a chair, feet flat on the ground (no crossed legs)
- Allow a 1-minute rest before taking the blood pressure (BP). BP cuffs are applied to the left arm during the rest period. (Note: If they have a history of Mastectomy or Lumpectomy, use the arm opposite the surgical side.)
- The tester positions the pulse oximeter on the participant's warmest finger and records heart rate and oxygen ($O_2$) saturation on the intake form.
- The tester supports the participant's arm (in elbow extension) at 90 degrees shoulder flexion, inflates the BP cuff, slowly deflates it to determine systolic and diastolic pressure, and records the results on the intake form and report card. If using an automated cuff, follow the manufacturer's instructions.

**EXCLUSION CRITERIA:**

Participants with the following vital sign findings on vital sign testing may not tolerate the intensity of functional testing. Instead of proceeding, thank them for coming to screening, and refer to their primary care provider, cardiologist, or emergency department for follow-up care.

**Pulse >100,**

**O2 Sat < 90,**

**Resting blood pressure higher than 180/110 mm Hg**

**Resting blood pressure lower than 90/60 mm Hg**

**FIVE METER WALK** (22)

**Purpose:** Usual/Self-selected Walking speed is a "vital sign" for mobility and predicts many adverse health outcomes (23). Fast walking speed is an indicator of functional reserve.

**Equipment:** 2 chairs, stopwatch or cellphone, Painters tape

**Set-up:** Measure a 10-15 m (32-49 ft) long by 1 m (39 in.) wide space for the walkway, placing a chair at either end as a target. Mark the tester's start and stop times with painter's tape (the middle 5 m (16 ft, 4 in) when the participant will be walking at a steady state). Complete two trials of each (comfortable and fast) walking speed. Record the best score for each walk type.

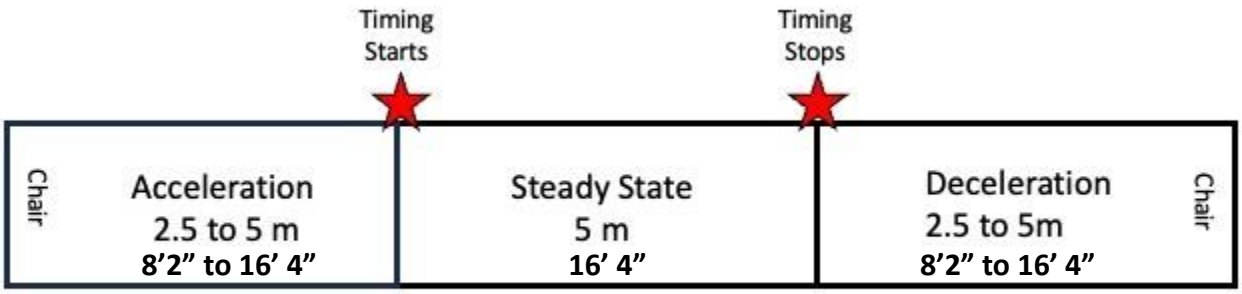


**Figure 3**: Diagram of the walkway set up for self-selected (comfortable) and fast gait speed.

**Participant: Instruction Script for Self-Selected Walking Speed**

1. At this station, I will measure your typical walking speed and your ability to walk faster if necessary.
2. You'll stand in front of this chair, and when I say "Go," you'll start walking all the way to the far chair. Walk at the pace that you usually walk and are most comfortable with. You can use your walking aid if you wish. I'll be walking close to you all the way.
3. Do you have any questions? The tester clarifies the task as necessary.
4. Are you ready? Ready, Set, Go
5. Sit down and rest for a moment, and when you are ready, walk back to where you started.
6. Repeat the test for a second trial, same instructions

**Participant Instruction Script for the Fast walking speed condition**

2. This time, when I say "Go," I'd like you to walk back to the other chair as quickly as you safely can. Walk as if you were in a hurry, but don't run.
3. Do you have any questions? The tester clarifies the task as necessary.
4. Are you ready? Ready, Set, Go
5. Sit down and rest for a moment and when you are ready, we'll walk back to where you started.
6. Repeat the test for a second trial, same instructions

**Tester Instructions**

- After providing instruction, clarify that the participant understands he/she should walk all the way to the target chair.
- Walk slightly behind and next to the participant through the entire test.
- Start timing as soon as any part of the participant's body crosses the plane into the center 5 meters of the walkway, as marked by the tape (participant should be unaware of the tape)
- Stop timing as soon as the participant crosses the plane out of the center 5 meters of the walkway.
- Complete 2 trials.
- Allow the participant to rest (standing or sitting as they prefer) for 30-45 sec.
- Record the time in seconds on the data sheet and calculate gait speed (5/#seconds). Record gait speed on the participant's report card.
- Provide feedback to the participant about his/her gait speed as compared to referent values and risk indicators.

## **30 sec. CHAIR STAND** (24).

**Purpose:** Screening for lower extremity muscle function, strength, power, and endurance.

**Equipment:** Sturdy chair without armrests, seat height 17", Stopwatch/Cell Phone for timing 30 sec.

**Set-up:** Place the chair against the wall for stability**; complete** one trial only.

**Participant Instruction Script: 30s Chair Stand Test (as tester demonstrates):**

1. This test evaluates the strength and endurance of your hip, thigh, and lower leg muscles.
2. You'll sit in the middle of the chair, like this, with your hands resting on the opposite shoulder, crossed at the wrists.
3. Keep your feet flat on the floor and your knees bent at 90 degrees while sitting.
4. Keep your back straight and your arms against your chest.
5 When I say "Go," stand up all the way, then sit back down again as many times as you can until I tell you to stop. It will be about 30 seconds
6. Do you have any questions? (Tester clarifies the task as necessary)
7. Please do one sit-to-stand-to-sit cycle so I make sure you do it correctly. (Tester suggests corrections if necessary)
8. Are you ready? Ready, Set, Go

**Tester Instructions:**

- Stand next to the participant to guard in case of instability during testing.
- After giving instructions (and demonstration), begin timing as you say "Go".
- Stop the test if the participant must use his/her arms to stand - record "0" for the score.
- If the participant stands without using arms, count and record the number of times he/she comes to a full standing in 30 seconds. If more than halfway to a stand at end of test, count it as a stand.

## **FOUR SQUARE STEP TEST PROTOCOL** (25,26)

**Purpose:** Screening for balance while stepping in different directions and avoiding low obstacles

**Equipment:** 2 chairs, (4-) 2.5 length, ¾ in diameter PVC pipes with L-attachments or a 4-way coupler, and a stopwatch or smartphone to time performance.

**Set-up:** Mark the squares with painter's tape (for modified FSST). Place PVC on top of the marked squares. Place each chair in the corner of the allotted space. Complete 2 trials, record the best time.

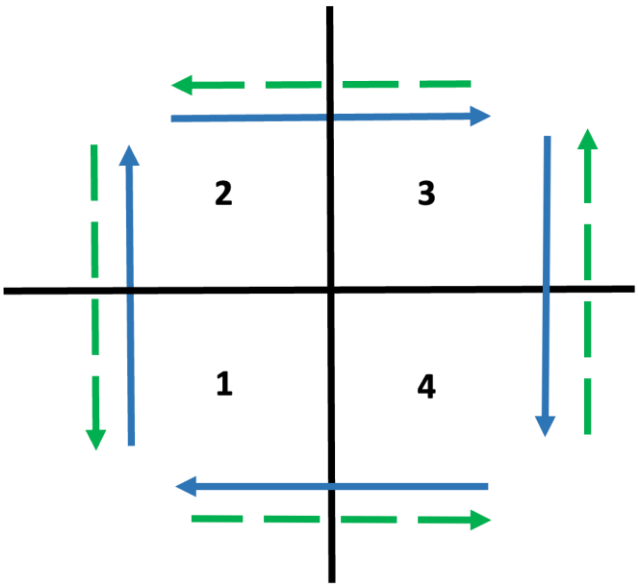


**Figure 4:** Progression through the Four Square Step Test: Solid black lines represent the PVC pipe apparatus and underlying painters' tape. The participant starts in the center of square 1. Solid blue lines represent forward progression 1-2-3-4-1, while green dashed lines represent a return to starting position 1-4-3-2-1

- NOTE: The test can be performed with a straight cane. If the participant shifts the apparatus or cannot clear the PVC pipes during testing, remove the PVC apparatus and use the underlying tape to complete a modified 4SST. Use the modified protocol if the participant typically uses a quad cane, hemi-walker, or any type of walker. Note that the m4SST was used on the intake form and report card.

**Participant Instruction Script: FSST**

1. This test measures your balance as you move and step over obstacles
2. You will start standing in this "square", and when I say "Go" step forward into the next one, then sideways to the right, then back, then sideways to the left, and then reverse direction until you get back to the "square" you started in. It's like moving in a circle and then back again.
3. I'll demonstrate the test now. (tester demonstrates). I face forward the whole time I'm stepping over the pipes, and both my feet touch down in each "square" as I go. I move as quickly as I safely can.
4. I'd like you to do a practice trial.
5. Do you have any questions? (Tester clarifies the task procedure as necessary)
6. Are you ready? Ready, Set, Go.
7. Sit down to take a brief rest.
8. Are you ready to try again? Ready, Set, Go.

**Tester Instructions**

- Begin timing as soon as you say "Go."
- Give directional cues as necessary as the participant moves around the squares.
- Stand near the participant (but do not impede their progression) in case of unsteadiness.
- A trial is invalid if participants move the PVC apparatus out of position or if both feet do not land in each square. Provide feedback and start the test again.
- Stop timing when both feet return to the starting "square" after reversing direction.
- Record the number of seconds on the intake form.
- Provide 30-45 sec "rest" (standing or sitting as the participant prefers) and repeat.

## **TIMED UP AND GO PROTOCOL** (Single Task and Cognitive Dual Task) (27,28))

**Purpose**: To screen general mobility, ability to change direction, and impact of a cognitive task on performance

**Equipment**: An armchair with a 42 cm (17 inch) seat height, Pillows to correctly position participant if feet don't touch the floor. Stopwatch/cell phone, Small cone or other marker to indicate where to turn.

**Set up**: For stability, the armchair should be placed against a wall, column, or heavy piece of furniture. The cone or marker (see star) should be positioned 3 m (9 ft 8 inches) from the front edge of the chair. (Figure 5)

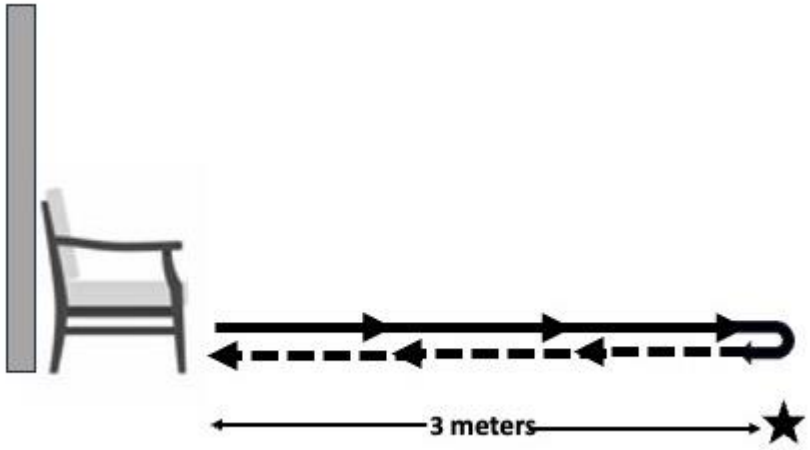


**Figure 5**. **Timed Up and Go Test**- Participants are seated in a standard armchair with their back against the backrest and feet flat on the ground. If the participant's feet cannot reach the floor, place a pillow behind their back so that their feet are flat on the ground , arms on the chair's armrests. Any assistive device used for walking should be provided for them to use during testing. Regular footwear and customary walking aids should be used. Participants are instructed to walk at a brisk pace or as quickly as safely possible.

**Participant Instruction Script For TUG**

1. This mobility test measures how well you can stand up, walk 3 meters (about 10 feet), turn around, return to the chair, and sit back down again, all things we do during our typical day.
2. You'll start by sitting here with your back touching the back of the chair, your feet on the floor, and your arms resting on the armrests. [If your back can't reach the back of the chair with your feet on the ground, I'll put a pillow behind you.]
3. When I say go, stand up, walk at your as quickly as safely possible **to the target**, turn around, walk back to the chair, and sit completely down again. I'll demonstrate the test now. If you need your [name assistive device] it will be right here for you to use once you are standing.
4. Do you have any questions? (Tester clarifies the task procedure as necessary)
5. Are you ready? Ready, Set, Go!

**Participant Instruction Script for Cognitive Dual Task:**

1. This time, you'll repeat the test, but do it while you do some subtraction!
2. I'll give you a number, and you will need to keep subtracting 3 from that number while you move, like this 79, 76, 73, 70, 67, 64, 61, 59….
3. When I say go, stand up, walk as quickly as safely possible **to the target**, turn around, walk back to the chair, and sit entirely down again, all the while subtracting your 3s!
4. Do you have any questions? (Tester clarifies the task procedure as necessary)
5. The number I'd like you to start subtracting from is 51.
6. Ready, Set, Go!

**Tester Instructions for TUG and TUG-Dual Task**

- Stand next to the participant to guard in case of instability during testing.
- After giving instructions (and demonstration), begin timing as you say "Go."
- Walk next to the participant during testing in case of instability.
- Stop timing as soon as the participant's buttocks are on the seat.
- Document the time taken to complete the test on the intake and report card form.

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