Function in Sitting Test (FIST)

Training and Instruction Manual

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Developed & created by
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# Function In Sitting Test (FIST) Training & Instruction Manual

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**FIST Overview**

**Purpose**
The Function in Sitting Test, or FIST, is a 14 item, performance-based, clinical examination of sitting balance. The FIST was designed to be administered at the hospital bedside by a physical therapist or other health care provider. It should take approximately five to ten minutes to administer. This may vary depending on the need to reposition the patient and the patient’s needs for redirection or rest breaks. Patients are asked to perform basic, everyday activities in a seated position with an examiner scoring their performance using a 0-4 point ordinal scale. For ease of scoring, the scoring scale is the same for each test item. A template “Function In Sitting Test Scores” patient documentation sheet, where FIST scores can be recorded over time, is included in this manual for use in your clinic/facility.

The purpose of the FIST is to quantify patient performance for specific functional sitting tasks. The FIST can be used to track changes in sitting balance over time. The FIST bridges the gaps between simple observations about sitting balance/trunk control and balance measures more heavily weighted towards standing balance or gait ability.

Other sitting balance measures or clinical scales have little documented statistical characteristics or validation of their psychometric properties. The majority of current valid and reliable balance tests or outcome scales do not focus solely on sitting balance and have limited sensitivity to detect smaller changes needed to justify continued rehabilitation. No widely accepted or standardized measurement of seated function existed when the FIST was under development. The FIST incorporates a variety of steady state, proactive, and reactive postural control conditions, rather than heavy reliance on proactive, motor system activation assessment, which may help clinicians better describe and quantify sitting balance abilities.
Who may benefit from testing with the FIST?
Patients with known or suspected sitting balance deficits who cannot tolerate balance tests involving standing or gait tasks may benefit from testing with the FIST. Patients who experience problems because they are too low functioning for some tests and their progress isn’t adequately reflected with an increased score (i.e., floor effect) on other balance measures may be appropriate for testing with the FIST. Patients with problems related to impulsivity or safety while in seated positions may benefit from the FIST, as these are components of the scoring criteria. Patients whose treatment programs are working on speed, safety, and motor control while seated may benefit from the FIST, as results may determine specific interventions to address the patient’s problems or develop accurate hypotheses about the nature of the patient’s balance dysfunction.

Who may not benefit from testing with the FIST?
The FIST may be too simple, inadequate, or not sensitive enough to provide useful information for patients who do not have a problem moving in sitting or who can tolerate standing or walking. This test has an upper scoring limit where patients who can successfully perform higher level activities, such as standing, walking, and other activities of daily living may achieve the maximum score quite easily (i.e., ceiling effect). Additionally, patients who are not medically stable to tolerate sitting for the time required to complete the FIST or patients whose medical condition(s) do not allow for the movements required to complete the test items (e.g., forward reach with hip flexion greater than 90°, bilateral lower extremity weight bearing in seated position) will not be suitable for testing using the FIST.

FIST Creation
The FIST was created as a dissertation project by Sharon Gorman, PT, DPTSc, GCS at the UCSF/SFSU Doctor of Physical Therapy Science (DPTSc) program in an effort to help clinicians working with lower level patients who could not successfully perform other existing balance measures without great difficulty.1-9 The FIST was created as a clinical measure using an ordinal scale to describe
patient’s abilities. The items and scoring on the FIST were created and selected using survey results from clinicians, physical therapists specializing in test creation/validation and/or balance, and existing measures of balance and trunk control. A validation study of the FIST was conducted in persons with sitting balance deficits after acute stroke to select the final set of test items included on this version of the FIST.\textsuperscript{10} Internal consistency and reliability of the test items was found to be high (Cronbach’s alpha = 0.98, person separation index = 0.978).\textsuperscript{10} Additional reliability and validity studies on the FIST are currently underway. Should your facility be interested in serving as a data collection center on current FIST studies, please contact Dr. Gorman (sgorman@samuelmerritt.edu) for more details and to discuss research collaboration.

**Online Training Available**

Please visit our website at [www.samuelmerritt.edu/fist](http://www.samuelmerritt.edu/fist) to view, complete, and access our online training module. It contains much of the same information as this manual, but also has photos and video clip examples of patients performing FIST items at a variety of scoring levels and an online quiz to assess learning.

**Disclaimer**

The Function in Sitting Test (FIST) was created to allow healthcare providers to better describe and document patient/client abilities to move and perform functional tasks in a seated position. Administration of the FIST was intended for persons who do not have any contraindications to sitting or moving in the prescribed manner for the individual test items. Determination of a patient’s ability to safely perform the FIST lies solely with the healthcare provider administering the FIST. Additionally, as a test of balance in a seated position, it is the healthcare provider’s responsibility to guard and supervise the patient/client at all times during the administration of the FIST to prevent falls or other unwanted or unexpected outcomes.
General Instructions and Patient Set-Up

Items needed for test administration:
- Step stool or riser (for foot positioning, dependent on patient height)
- Stopwatch or watch with second hand, for timing
- Tape measure
- Small, light weight object (can use small, retractable tape measure or stopwatch for this)
- FIST Scoring sheet or directions from this manual

Standard Patient Position:
This position should be maintained throughout the test. The examiner should realign the patient as needed before each test item to ensure that the patient starts in this standard position.
- Patient seated at edge of standard hospital bed (no overlay or specialized air mattresses), with bed flat
- ½ of femur length supported by mattress while sitting
- Hips and knees flexed to 90°
- Feet flat in support on the floor (or on a step or stool, as needed) to ensure proper hip and knee position
- Thighs should be positioned in neutral hip abduction/adduction and hip internal/external rotation (or as close as the patient’s hip range of motion will allow)
- Hands in lap, unless needed for balance support (see scoring if subject uses upper extremities or hands for support)
Standard Examiner Position:
The therapist should be positioned to guard the patient at all times to both prevent falls and to provide any assistance with the tasks as may be required. The examiner may be positioned either to the side of the patient or in front of the patient, or both, during the test. The primary goal of the examiner’s position should be to ensure patient safety and to assist as needed for scoring purposes.

Administration of the FIST:
Read all directions, described below in quotation marks, to the patient. Additional information is included to help the therapist set up or score the test. All of the directions, including the overall test description and each individual FIST item directions, use simple English directions at no higher than a 6th grade level. The FIST test items should be delivered in the order described in this manual or on the score sheet, with the exception of the 3 nudge items which are randomly interspersed throughout the testing. This order reflects the item difficulty (easiest to hardest) as determined during test validation, while the random insertion of the nudges best examines the patient’s reactive balance control abilities.10
NOTE: For the 3 nudges, you should intersperse these throughout the test. Subjects should not be warned other than at the start of the FIST when the examiner is describing the overall test protocol. The patient should be guarded very closely by the examiner throughout the test, and especially during these nudges.

Overall Test Description:

“I will be conducting a test with you today to see how well you balance yourself in a sitting position. It will involve you sitting with your best posture and balance, as well as moving in a seated position to reach and scoot. I might lightly push you to see how well your balance reactions work. I will be right here next to you to make sure you are safe if you lose your balance. I would prefer if you could perform the test without using your hands for balance, but if you need to use your hands, you can. I will remind you to try to not use your hands during the test. If you need a break, just let me know and I can pause to let you rest. Do you have any questions? [Pause, answer questions] Let’s start.”
FIST Scoring Instructions

The FIST uses a consistent scoring scale for each test item. The FIST was designed this way to make it easier for the examiner to score items and to reduce the need to refer to the scoring scale while administering the test once familiar with the test items.

4 Independent
Completes the task independently and successfully

*Comments:* This would be the reaction, speed, and safety you would expect in someone without any sitting balance problems.

3 Verbal cues or increased time
Completes the task independently and successfully but may need verbal cues or excessive time

*Comments:* The performance of the activity is normal, but the patient needs more than necessary time or more cues than normally expected to complete the activity.

2 Upper extremity support
Unable to complete the task without using upper extremities for support or assistance

*Comments:* The patient must use their hands to successfully complete the task or for maintenance of balance during the task. It does not matter if the patient uses one or both upper extremities; any use as a requirement results in a score of 2

1 Needs assistance
Unable to complete task successfully without physical assistance (document level of physical assist required: min, mod, or max assist)

*Comments:* If the therapist doesn’t provide physical assistance, the patient cannot complete the task or may lose balance or fall. Document the amount physical assistance required for safe performance of the task to track patient progress: min = 25% or less, mod = 26-74%, max = 75% or more.

0 Dependent
Requires complete physical assistance to perform task successfully, is unable to complete task successfully even with physical assistance, or dependent

*Comments:* Without the therapist’s assistance, the patient could not complete any of the task successfully or safely.
### Individual FIST Item Instructions

Remember, the patient should be repositioned as needed throughout the test so they are in the standard patient position before attempting each test item.

1. **Anterior nudge**
   
   (light pressure x 1 time, at sternum)

   Without warning, push participant with light pressure, once.

2. **Posterior nudge**

   (light pressure x 1 time, between scapular spines)

   Without warning, push participant with light pressure, once.

3. **Lateral nudge**

   (light pressure 1 time to dominant/stronger side, at acromion)

   Without warning, push participant with light pressure, once only, at dominant/stronger side’s acromion.

4. **Static sitting**

   “Sit with your hands in your lap.”

   Examiner times for 30 seconds.

5. **Sitting, move head side to side (nod ‘no’)**

   “Remain sitting steady and tall without using your hands unless you need them to help you balance. When I tell you to ‘look right,’ keep sitting straight, but turn your head to the right. Keep looking to the right until I tell you ‘look left,’ then keep sitting straight and turn your head to the left. Keep your head to the left until I tell you, ‘look straight,’ then keep sitting straight but return your head to the center.”

   Patient needs to move head through full available ROM. Examiner scores entire sequence.
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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>6. Sitting, eyes closed</strong></td>
<td>“Close your eyes and remain sitting still with your hands in your lap.” Examiner times for 30 seconds.</td>
<td></td>
</tr>
<tr>
<td><strong>7. Sitting, lift feet</strong></td>
<td>(dominant side, stronger side, least involved side only; do two repetitions)</td>
<td>“Sit with your hands in your lap; lift your [uninvolved side] foot 1 inch off the floor, like this. [Demonstrate] Now do it one more time.” Repeat so the subject lifts uninvolved, stronger, or dominant side twice.</td>
</tr>
<tr>
<td><strong>8. Turn and pick up object from behind in preferred direction</strong></td>
<td>“Turn around and pick up the object that I’ve placed behind you.” Patient may turn to their preferred direction and use their stronger/dominant/least involved hand. Examiner places object in midline, one hand’s breadth [fingertip to base of palm] posterior to hips.</td>
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<tr>
<td><strong>9. Reach forward with uninvolved hand outstretched at shoulder height</strong></td>
<td>“Reach with your stronger/least involved/less painful arm as far as you can while staying balanced, like this. [Demonstrate] Keep your other hand remaining in your lap.” Examiner first performs movement passively to assess ROM. Patient must move through full available ROM or until abdomen contacts anterior thighs for highest score. Use available pain free ROM. If patient has pain, and make notation in Notes/Comments box.</td>
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<tr>
<td><strong>10. Lateral reach with hand at shoulder height</strong></td>
<td>(lifts and moves towards the dominant or stronger side)</td>
<td>“Reach out to the side as far as you can. Be sure to get all your weight off the opposite side of your bottom keeping your feet on the floor, like this. [Demonstrate]” Patient must complete full, available ROM maintaining upright upper trunk and upper extremity position, with contralateral trunk shortening and clearance of contralateral ischial tuberosity and return to midline for full score. Should move to preferred side, stronger side, or least affected side.</td>
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</table>
### 11. Pick object up off floor

“Pick this object up off the floor.”

Examiner places object between patient’s feet at level of 1\textsuperscript{st} MTP joint. Patient can use whatever hand they prefer to pick up the object.

### 12. Posterior scooting (2”)

“Now, move backward 2 inches. Try not to use your hands, if you can.”

Patient needs to move full 2 inches. Use tape measure to verify 2 inches.

### 13. Anterior scooting (2”)

“Move forward 2 inches towards the edge of the bed without using your hands, if possible.”

Use tape measure to verify 2 inches. Patient needs to move full 2 inches.

### 14. Lateral scooting (2”)

(scored once to preferred direction)

“Move sideways 2 inches without your hands, and remember to try not to use your hands.”

Patient needs to move the full 2 inches; use the tape measure to verify.
References


### Function in Sitting Test (FIST) Results

<table>
<thead>
<tr>
<th>FIST Test Item</th>
<th>Date:</th>
<th>Date:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>½ femur on surface; hips &amp; knees flexed to 90°</td>
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<td></td>
<td></td>
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<tr>
<td>Used step/stool for positioning &amp; foot support</td>
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<tr>
<td><strong>Randomly Administered Once</strong></td>
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<td></td>
<td></td>
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<tr>
<td><strong>Anterior Nudge:</strong> superior sternum</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Posterior Nudge:</strong> between scapular spines</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lateral Nudge:</strong> to dominant side at acromion</td>
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<td></td>
</tr>
<tr>
<td><strong>Static sitting:</strong> 30 seconds</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sitting, shake ‘no’:</strong> left and right</td>
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<tr>
<td><strong>Sitting, eyes closed:</strong> 30 seconds</td>
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<tr>
<td><strong>Sitting, lift foot:</strong> dominant side, lift foot 1 inch twice</td>
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<tr>
<td><strong>Pick up object from behind:</strong> object at midline, hands breadth posterior</td>
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<tr>
<td><strong>Forward reach:</strong> use dominant arm, must complete full motion</td>
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<td></td>
</tr>
<tr>
<td><strong>Lateral reach:</strong> use dominant arm, clear opposite ischial tuberosity</td>
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<td></td>
</tr>
<tr>
<td><strong>Pick up object from floor:</strong> from between feet</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Posterior scooting:</strong> move backwards 2 inches</td>
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<td></td>
</tr>
<tr>
<td><strong>Anterior scooting:</strong> move forward 2 inches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lateral scooting:</strong> move to dominant side 2 inches</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>/ 56</td>
<td>/ 56</td>
<td>/ 56</td>
</tr>
<tr>
<td><strong>Administered by:</strong></td>
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<tr>
<td><strong>Notes/comments:</strong></td>
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</table>

**Scoring Key:**

4 = **Independent** (completes task independently & successfully)
3 = **Verbal cues/increased time** (completes task independently & successfully and only needs more time/cues)
2 = **Upper extremity support** (must use UE for support or assistance to complete successfully)
1 = **Needs assistance** (unable to complete w/o physical assist; document level: min, mod, max)
0 = **Dependent** (requires complete physical assist; unable to complete successfully even w/physical assist)