

## Task - Sit-to-Stand Frailty Test Project

### Task 1: Research Task

**Goal:** Improve how the test results are interpreted and used.

What to do:

- Review CDC STEADI guidance and related sources for the 30-second chair stand test.

When running the project, the system correctly asks for the patient's age and gender and uses this information to compare the number of chair stands against CDC STEADI reference values, helping decide whether the result is below average or acceptable for that age group. This means the score interpretation is already aligned with CDC guidance in terms of age- and gender-based thresholds. However, according to the CDC, the 30-second chair stand test should not be used by itself to assess fall risk. In real clinical use, the result is usually combined with other information such as balance, walking stability, or history of falls, which the current project does not yet capture or use.

- Look specifically at how scores are interpreted across age groups.

The age of the individual affects how the 30-second chair stand test results are read. This is because the number of predicted stands naturally goes down as people become older. The CDC STEADI says that a score that is typical for someone in their late 80s may not be normal for someone in their early 60s. This implies that the same chair-stand count might signify various degrees of risk for different age groups. So, you should always compare scores to age-specific reference ranges instead than adopting one cutoff for all people.

- Identify limitations of using this test alone and what signals are commonly used alongside it.

The 30-second chair stand test has limitations when used by itself because it only measures leg strength and does not fully reflect a person's overall fall risk. For example, two people of the same age may both complete 12 chair stands in 30 seconds, but one person may have good balance and steady walking while the other may be unsteady and have a history of falls. Even though their chair stand scores are the same, their actual risk of falling is very different. This is why CDC STEADI guidance recommends using the chair stand test together with other signals such as balance, walking stability, or past falls, instead of relying on this test alone.

Deliverable:

- A short markdown or document file that we could add to the repo, for example:
- Clear score ranges by age

The **official CDC STEADI cut-offs** for the 30-second chair stand test, in simple form([reference 1](#), [reference 2](#))

Age (years)	Men: below average	Women: below average
60–64	less than 14 stands	less than 12 stands
65–69	less than 12 stands	less than 11 stands

Age (years)	Men: below average	Women: below average
70–74	less than 12 stands	less than 10 stands
75–79	less than 11 stands	less than 10 stands
80–84	less than 10 stands	less than 9 stands
85–89	less than 8 stands	less than 8 stands
90–94	less than 7 stands	less than 4 stands

- Notes on when results should be treated with caution

When the test was not done in the standard way (chair not stable or against a wall, very different seat height, cluttered or slippery floor, use of hands to push up, not reaching full stand, or stopping before 30 seconds), when there are safety or medical concerns (dizziness, fear of falling, visible frailty, recent serious falls, or the patient/helper feels it is unsafe), when key context is missing (age not between 60–94, sex at birth unknown, or major health problems clearly affecting movement), or when the test is done over video but the camera view or environment is poor (cannot see the whole body, bad lighting, lag, or unsafe home setup); CDC’s original chair-stand form, STEADI algorithm, and Tele-Med guide all stress correct technique, safety overrides, and the need to interpret scores together with falls history, comorbidities, medications, and home hazards rather than using the number alone.( [reference1](#), [reference 2](#))

- Suggestions for additional data points we may want to store later

We can add what kind of chair they used and its height, whether the space around the chair was clear and safe, what they had on their feet (shoes, socks, slippers), whether they used their hands or a walker to stand, whether they finished all 30 seconds or stopped early (and if they stopped because of pain, dizziness, or fear), any wobbling or near-falls was observed, and a few simple answers about how many times they fell in the last year, whether they normally use a walking aid, any big health problems that affect balance or strength, and whether they take lots of medicines or medicines that can cause dizziness; these match the extra risk factors STEADI says to check along with the 30-second chair stand so you can interpret the score more safely and accurately

This should be concrete and usable, not academic.

## Task 2: Improvement Task

**Goal:** Make the test output more useful beyond the live screen.

- Generate a simple, plain-language summary of results after a completed test.

You do not need to refactor the whole codebase. A clean, minimal change is enough.

## Expectations

- Focus on clarity and usefulness, not volume of code

After each completed test, show a short, plain summary like: “You completed X stands in 30 seconds. For your age and sex, this is [within/below] the expected range. A below-average score means weaker leg strength and may increase your chance of falls, especially if you’ve had falls, feel unsteady, or use a cane or walker, so consider sharing this result with a healthcare professional and repeating the test over time to track changes; this is a screening result, not a diagnosis.”([example](#))

- Focus on having the code run irrespective of platform used

The test code can return a plain text string like ‘You did X stands. This is [within/below] typical for your age and sex’. If the score is below average, they could be at a greater risk of falling. Talk to a doctor. The CDC age cut-offs were used to make this, so no matter whether someone runs it as a web page, mobile app, or even command line, they just receive this one clear message to display the user. The platform takes care of how it appears, but the words remain the same and function everywhere.

- Include a short note explaining what you did and why it helps the project

For this task, I reviewed CDC STEADI guidance and other available government health resources to understand how the 30-second chair stand test results should be interpreted across different age groups and sexes, as well as what factors can affect or limit the results. I focused on identifying how performance expectations change with age, why results should be treated with caution in certain cases, and what additional signals are typically considered alongside this test. While searching, I also looked for research papers and official clinical studies but found that most practical guidance is summarized in CDC and public health documents rather than a single definitive research paper. This review helped clarify what the current project already handles well (age- and gender-based interpretation) and what is still missing, such as incorporating balance, gait, or fall history to better align with real-world clinical use.

This work helps the project by making the test results easier to understand and more accurate in real-world use. By clarifying how scores should be interpreted based on age and sex, and by highlighting the limitations of using the chair stand test alone, the system reduces the risk of misinterpreting results. It also aligns the project more closely with CDC STEADI guidance, which improves credibility and makes the tool more useful for clinicians, caregivers, and future feature development, such as adding balance or fall-history data later.

## SUMMARY:

In order to clarify how the results of the 30-second chair stand test should be evaluated and applied appropriately, this publication examines CDC STEADI guidelines. It demonstrates that although the study currently compares findings using CDC guidelines based on age and sex, scores need to be interpreted differently for each age group and shouldn't be used only to determine fall risk. In order to increase accuracy in the future, the document recommends additional data points including balance, fall history, and usage of walking aids. It also identifies circumstances in which results should be interpreted cautiously, such as hazardous test conditions or missing context. It also suggests a tiny modification to the project by providing a plain-language summary of results after each test, making the output easier to comprehend across platforms and more helpful for real-world.