



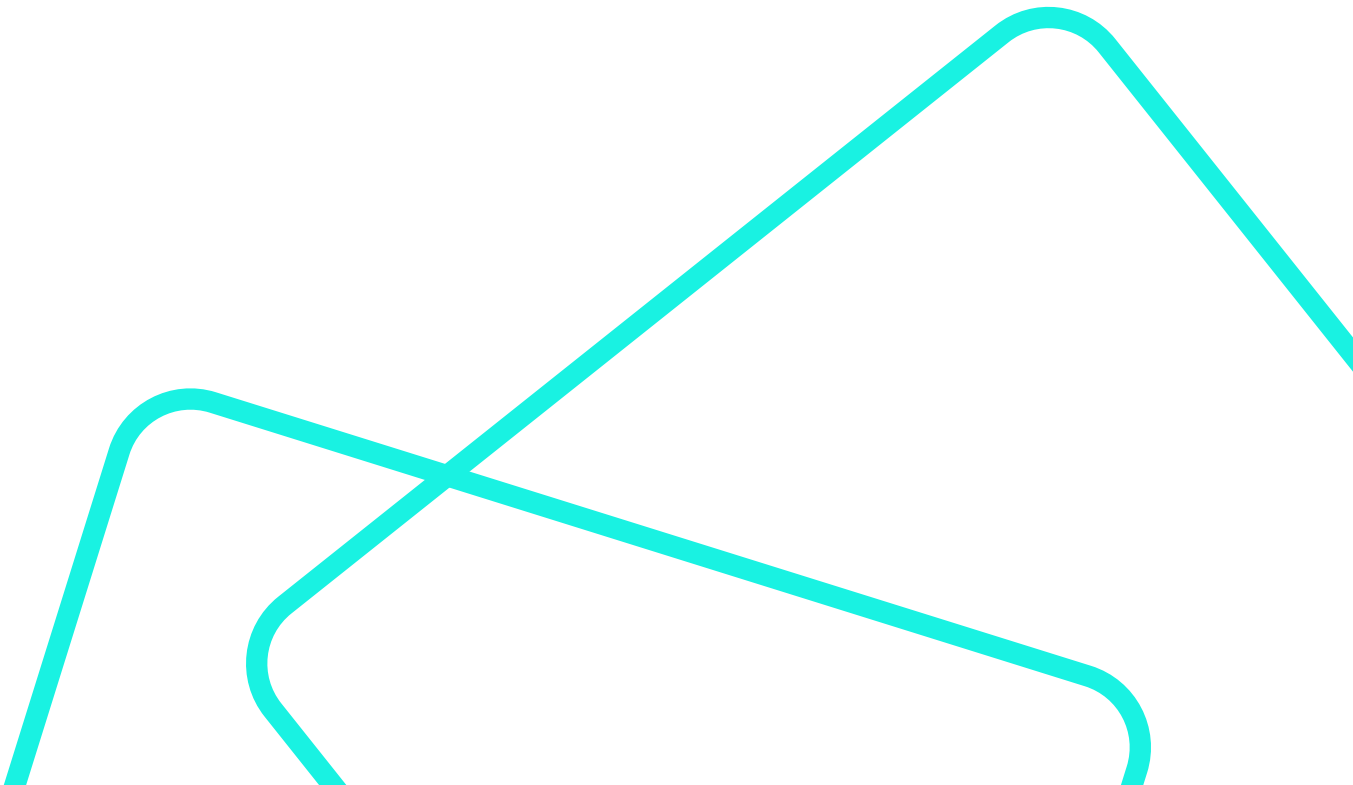
Reimagining Mobility Assessments in MS

Beyond paper and stopwatches – usability of Digitized Mobility Assessments for people with MS

2025

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Section 1

Executive Summary

Beats Medical conducted a usability study of a Multiple Sclerosis (MS) deployment of the **Colbolt® Platform**, a mobile application containing mobility, dexterity, and speech assessments. This study focused on evaluating the usability of two mobility assessments: the Timed Up and Go (TUG) and Timed 25 Foot Walk (T25FW) tests with individuals living with MS.

A mixed-methods approach combined quantitative data from the System Usability Scale (SUS) with qualitative insights from interviews and direct patient observations. 9 patients with MS with diverse demographics and symptom profiles participated, offering a broad perspective on user experience.

The study was conducted in collaboration with the **Portuguese Society for Multiple Sclerosis (SPEM)**, whose involvement ensured recruitment of participants under their care and strengthened the study's real-world relevance.

Findings show strong usability (**SUS score: TUG: 77.5pts / T25FWT: 82pts**), with participants finding the app intuitive and engaging. User Interviews highlighted some opportunities for improvement.

These findings support the general usability of digitized gait assessments in the **Colbolt® Platform app** in patients with MS and confirm its trans-diagnostic potential to offer engaging, intuitive digital assessments across varied patient populations and clinical conditions.

SUS scores exceed the benchmark

TUG 77.5 pts
Good

T25FWT 82 pts
Excellent



67%

Completed the TUG test
with limited assistance



78%

Completed T25FW test
with limited assistance



6 of 9

Participants willing to use
the app regularly

Section 2

Background

As of 2023, approximately **1.8 million people worldwide are living with Multiple Sclerosis (MS)**, a chronic autoimmune disease that affects the brain and spinal cord in highly individualized ways. While there is no cure, advances in disease-modifying therapies have significantly improved relapse management and extended remission periods, enhancing quality of life for many (World Health Organization, 2023)

Accurate and real-time assessment of physical function is therefore important—not only for clinical care but also to support the development and evaluation of novel treatments in pharmaceutical clinical trials, where timely and sensitive outcome measures can accelerate patient access to new treatments.

The **Timed 25-Foot Walk (T25FW)** and **Timed Up and Go (TUG)** tests are widely recognized, validated measures of mobility in people with multiple sclerosis (MS).

Timed 25-Foot Walk (T25FW) Test

Assesses walking speed. The person walks 25 feet as fast and safely as possible. The average time over two trials indicates their walking ability.



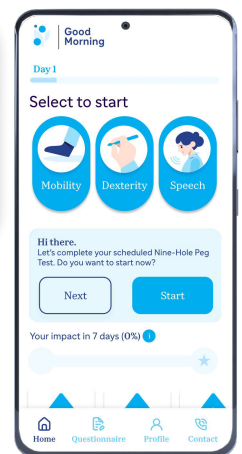
The T25FW in particular, is a core component of the MS Functional Composite (MSFC) and is qualified by both the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) as a clinically meaningful endpoint for disability progression (European Medicines Agency, 2020)

The TUG while less common in regulatory trials, is valued in rehabilitation and fall-risk research due to its ability to capture complex mobility tasks like transfers and turning (Podsiadlo & Richardson, 1991).

Both tests offer reliable, sensitive, and low-burden assessments that complement traditional clinical measures and enable patient monitoring and treatment evaluation in both clinical and real-world settings.

Colbolt® Platform app

Developed by Beats Medical, digitizes assessments of mobility, dexterity, and speech. Originally designed for continuous monitoring and clinical trials in rare disease, its flexible design allows for broader use across various health conditions.



Timed Up and Go (TUG) Test

Measures basic mobility and balance. A person stands up from a chair, walks 3 meters, turns, walks back, and sits down. The time taken reflects their functional mobility and fall risk.



Section 3

Methods

This study aimed to evaluate the usability of the Colbolt® Platform app's digitized mobility assessments—**Timed Up and Go (TUG)** and **Timed 25-Foot Walk (T25FW)**.

The assessments were self-guided by patients in a supervised clinical setting to simulate real-world use while allowing researchers to observe interactions and provide support if needed.

Portuguese Society for Multiple Sclerosis (SPEM) carried out patient selection, recruitment, and session's supervision.

9 participants, all active users of SPEM's care network, were selected to reflect a range of MS experiences. Inclusion criteria focused on age (20–60), confirmed MS diagnosis, independent mobility (with or without assistive devices), cognitive ability to follow instructions, and access to a smartphone.

Study Design

A mixed-methods approach was used to assess usability, accessibility, and user experience:

1

System Usability Scale (SUS)

A 10-item questionnaire scored from 0–100, with 68 as the standard benchmark for average usability. (Sauro, 2018).

2

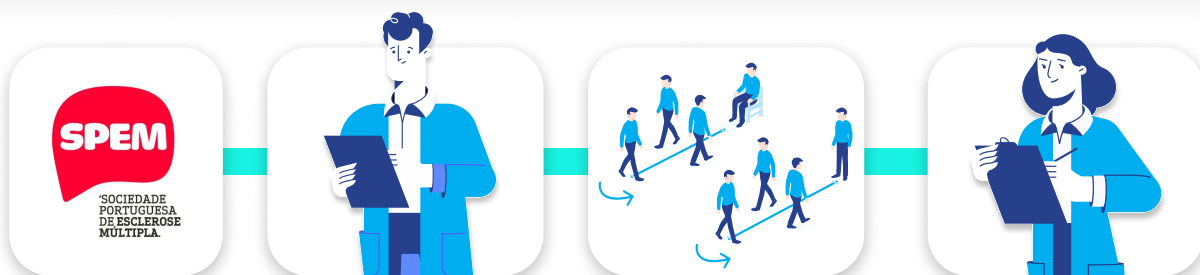
Patient Observations

Researchers observed participants completing key assessment tasks (instructions, setup, execution).

3

Structured Interviews

Participants shared feedback on six areas: first impressions, ease of use with MS symptoms, setup experience, accessibility suggestions, willingness to use the app regularly, and general reflections.



Scheduling

Sessions scheduled by SPEM took place at its headquarters.

Onboarding

After onboarding and informed consent, participants received a Beats Medical Android phone, a pre-measured rope, and tape to set up the assessments.

Assessments

Participants completed the TUG test followed by the T25FW. Researchers observed silently, intervening only when necessary.

SUS & Interview

After testing, participants completed the SUS and a structured interview. Sessions concluded with reimbursement.

Section 4

Learnings and Next Steps

Overall Usability

System Usability Scale (SUS)

1

Timed Up and Go (TUG) Test
Score 77.5, rated "Good" (Grade B)

Timed 25-Foot Walk (T25FW) Test
Score 82, rated "Excellent" (Grade A)

Both scores exceed the benchmark of 68 (Sauro, 2018), **indicating strong usability and intuitive use.**

Patient Observations

2

TUG

67% of participants completed the TUG test independently or with **limited assistance**. Most support was needed during setup.

T25FW

78% completed the T25FW test with **limited assistance**. Most support was needed during the execution phase.

Structured Interviews Key themes

3

Instruction Clarity & Feedback: Using real videos instead of animations may improve app clarity.

Accessibility & Design: Enhancements in visual clarity and design can improve accessibility including for patients with visual or motor impairments common in MS.

Engagement: Participants found the app engaging with most expressing willingness to use app regularly (6/9).

"My first impression was that I really liked it. I think it's going to be something useful for day-to-day use."

"I felt that the instructions were well given, I was prepared."

"I believe I would use it pretty much every day."

"It's simple, it's accessible."

Insights led to further optimization in:



New explainer videos and additional audio cues improving clarity and guidance



Enhanced visual design and interaction elements optimizing accessibility



Section 5

Get Involved

Beats Medical will expand real-world testing of the **Colbolt® Platform**, including home-based use and broader patient populations, including other neurological and chronic conditions.

Let's modernize mobility assessments together!

Are you a clinic, researcher, patient organization, or working in pharma?

Join us in piloting the next generation of digital mobility assessments and shaping the future of patient-centred care. By collaborating with us, you can help refine innovative digital tools that improve precision, accessibility, and efficiency in mobility tracking.

We're looking for forward-thinking partners to test and validate cutting-edge technology that enhances real-world clinical applications. Your insights and expertise will drive advancements in patient monitoring, rehabilitation strategies, and treatment optimization.

Be part of our research initiatives!



The SPEM Partnership

With SPEM's knowledge, the study ensured real-world relevance and elevated the patient voice throughout. **The collaboration highlights the importance of partnering with patient organizations—not just for recruitment, but to ground product design in lived experience and support inclusive, accessible digital health tools.**

World Health Organization. (2023, August 7). Multiple sclerosis. <https://www.who.int/news-room/fact-sheets/detail/multiple-sclerosis>

European Medicines Agency. (2020). Qualification opinion on Multiple Sclerosis Clinical Outcome Assessment (MSCOA). https://www.ema.europa.eu/en/documents/other/qualification-opinion-multiple-sclerosis-clinical-outcome-assessment-mscoa_en.pdf

Podsiadlo, D., & Richardson, S. (1991). The Timed "Up & Go": A test of basic functional mobility for frail elderly persons. *Journal of the American Geriatrics Society*, 39(2), 142–148. <https://doi.org/10.1111/j.1532-5415.1991.tb01616.x>

Sauro, J. (2018). 5 ways to interpret a SUS score. *MeasuringU*. <https://measuringu.com/interpret-sus-score/>

