

# Fighting fatigue



**Researchers are studying various treatments and ways to manage this common MS symptom.**

**by Brandie Jefferson**

Fatigue is one of the most common symptoms of multiple sclerosis, and it's a prominent focus of a variety of research studies aimed at treatment and management, as well.

Fatigue can be a primary or secondary symptom — either caused by the disease directly or the result of other symptoms, such as spasms — leading to people tiring more easily from minimal physical activity.

There are a variety of ways to try to manage fatigue, although no medication has been approved by the U.S. Food and Drug Administration (FDA) to treat MS fatigue, specifically.

“There is a major unmet need for treatment options,” says Leigh Charvet, MD, professor of neurology at the New York University Grossman School of Medicine.

## **Bringing the fatigue fight home**

Nora Fritz, PhD, associate professor of healthcare sciences, physical therapy and neurology at Wayne State University in Detroit, is researching causes of and solutions to fatigue and fatigability in the home.

Most people with MS have an all-too-familiar understanding of fatigue. But what about fatigability?



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Fritz says fatigability refers to how easily someone becomes fatigued after doing a certain activity, and it has a unique significance for people with MS.

MS is one of the only chronic disease states where we differentiate fatigue and fatigability, she says. “Trying to measure it is one of the biggest problems we face before targeted treatments can be developed.”

Fatigability is a measure of performance rather than subjective reporting; it can be measured in a lab using a walking test where a person’s pace is measured over a set amount of time. As they become fatigued, their pace slows — an objective measure of how walking affects fatigue.

But fatigue can be the result of any number of different activities, be they physical, cognitive or even emotional. Rarely in a person’s day-to-day life is it the result of a six-minute walk around a lab. “This study will develop a new way to measure fatigability in a person’s home, in their daily lives,” Fritz says. Only with a way to measure fatigability that more accurately reflects the real world can researchers begin to develop methods to combat it in the real world.

For this study, a joint project with Anna Kratz, PhD, associate professor, physical medicine and rehabilitation and a health psychologist at the University of Michigan, participants visited the lab for a single session of walking and survey tests followed by one week in which they wore accelerometers, (devices that captured their motion every 15 seconds). They were also asked to report their level of fatigue four times throughout the day.

That’s 28 self-reported measures of fatigue instead of the one captured by a traditional survey measure of fatigue.

The researchers will analyze the data to understand how different activities and intensities relate to fatigue. If a person reports a lot of fatigue after going for a long walk, “we can look at the effects of that activity on fatigue,” Fritz says, breaking it down into intricate details to truly capture how that walk affected the rest of the participant’s day.

## 6 tips to manage fatigue

1. Learn ways to manage stress, including relaxation training, joining a support group or psychotherapy
2. Avoid overheating
3. Develop a regular exercise program
4. Learn energy-saving ways of walking (with or without assistive devices) and performing other daily tasks
5. Regulate sleep habits
6. Simplify tasks at work and home and conserve energy use

Since fatigability is a measure of performance, not of feeling, a more accurate and nuanced measure could have surprising benefits for some. Aside from combating that knock-you-over-the-head, limb-dragging fatigue that can come from running around the grocery store or a stressful day at work, it could also catch changes in performance that an individual might not be aware of.

“We may be able to find people who wouldn’t really rate themselves as fatigued, but who demonstrate qualities of fatiguability in their day-to-day life,” Fritz says.

An accurate measurement tool could also be used as a new metric by which pharmaceutical interventions can be judged — for example, how well they reduce fatigability. But it can also be a way to further test other types of interventions, such as physical activity and psychological interventions, all of which have already shown efficacy when it comes to treating fatigue, something Fritz reiterates.

### **To meet or not to meet (in person)**

Before the pandemic hit, Matthew Plow, associate professor at Case Western Reserve University in the School of Nursing, was conducting a research study looking at interventions for fatigue. Specifically, he wanted to know if receiving occupational therapy remotely worked as well as one-on-one, in-person sessions for helping people with MS manage fatigue.

He was optimistic that the results would show that the two were equally successful for reducing fatigue. This might lead to more insurance companies reimbursing patients for remote therapy the same way they did for in-person care.

“Then the pandemic came, and insurance began reimbursing for remote care left and right,” says Plow. So, the research team pivoted. The study, funded by Patient-Centered Outcomes Research Institute (PCORI), now has a loftier goal.

“We want to know what fatigue intervention works best for whom, and why,” Plow says.

The study recruited the last of about 600 participants in late June 2022.

During the six-week intervention, people will work with occupational therapists in one of three ways: over the phone, using online video conferencing or using an asynchronous internet platform. Regardless of the format, they'll all be learning the same lessons about ways to self-manage their fatigue and reduce its impact.

For example, "The first topic is all about resting," Plow says. "How to rest. When to rest. Experimenting with rest. What kind of rest is best?" For one person, it might be meditation. For another, it might be bobbing their head to their favorite music.

Participants were asked which intervention they'd prefer ahead of time, then randomly assigned to a group. When it comes to which method is most successful for any individual, "I think preference will be a very strong predictor," he says. That is, he thinks people will see better results if they are in the group that they wanted to be in.

Once the results have been analyzed, Plow hopes to be able to understand which intervention will work best for any individual. Is it a one-to-one format or a group format? Or maybe a person would be more successful checking in on an internet platform weekly, whenever their schedule allows.

That's the beauty of working with an occupational therapist. "They help people figure out the trial-and-error process," Plow says. "It's empowering people to do their own experiments and figure out what works for them."

## **The future of fatigue management**

Despite having an air of science fiction, transcranial direct current stimulation (tDCS) has been shown to have benefits across a range of health issues, including fatigue.

The technology uses a device to deliver a low-amplitude electric current to the brain through electrodes placed on the scalp. It's noninvasive and, using modified designs developed collaboratively with feedback from people with MS, it can be used at home, as Charvet discovered in a 2016 feasibility study. Home-based tDCS devices are handheld and use a headset to hold the electrodes in place.

People really want access, though. "People were coming out of our studies and wanting continued treatment," she says. In her research, she's seen impressive adherence — her most recent study recruited 120 participants in under two years, and 92% completed at least 25 of the planned daily sessions.

And that person even asked if they could continue treatment after the study ended.

Charvet has heard from patients in more than one study that the use of tDCS has lessened their fatigue. Currently, her lab is analyzing the results of a Society-funded study that looked at the technology's ability to affect fatigue, as well as to boost the efficacy of brain-training games.

The fatigue data has yet to be fully analyzed, but Charvet says, “everyone had a decrease in fatigue.”

“Fatigue is an interesting, complicated symptom to study,” Charvet adds. “It acts on so many pathways that are influencing someone’s fatigue. Maybe tDCS was activating on its own. Or maybe it worked by improving mood, or something else.”

Charvet began to hear from her patients in her early studies that the use of tDCS has lessened their fatigue and found tDCS to have a significant benefit in her 2016 study. “We don’t know that it’s targeting the source of fatigue, but people were definitely reporting less fatigue when they were doing it.”

It’s been so successful that, thanks to patient lobbying, Charvet is now able to offer a tDCS clinical service through NYU Langone Health’s innovative care guidance that offers home-based access via telehealth. Ultimately, she wants to see tDCS approved by the FDA for medical use, which would provide more clinical access. When that day comes, Charvet will be ready, thanks in large part to the participants who allowed her team to come into their homes so that they could design a technology together that would work for a wide spectrum of people.

“This is all driven by people living with MS. I don’t want to study something that people don’t want to do or won’t use,” Charvet says. “All I want is more tools to allow for people to have a better quality of life.”

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