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# 5 tips for managing foot drop

Strategies to cope with this common MS symptom.

by Vicky Uhlend

**E**llie Tillotson has long been an avid runner, but in 2014, she found she couldn't complete a 5K race without repeatedly tripping over her feet. Alarmed, she visited her doctor and was diagnosed with multiple sclerosis.

One of Tillotson's symptoms is mild foot drop in her left foot. This common MS symptom occurs when the front part of one or both feet point downward instead of upward when you're taking a step. As Tillotson discovered, foot drop can lead to tripping, stumbling or even falls.

Foot drop has several causes. Spasticity or weak muscles in your calves and ankles can be a significant contributor. MS-related damage to the nerves that control the muscles used to flex your foot can also cause foot drop. Fatigue and heat sensitivity also make it harder for your muscles and nerves to fire correctly and lift your toes.

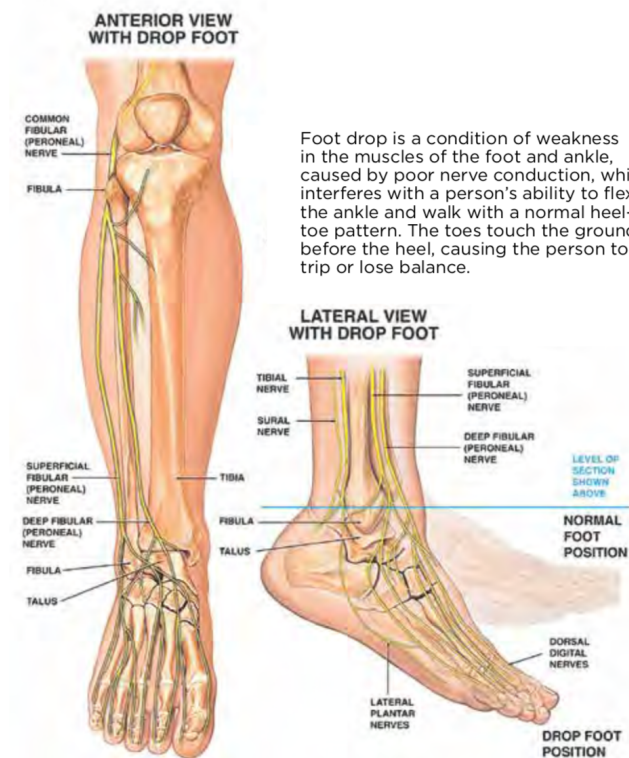
MS-related foot drop is not easily cured, but it can be successfully managed. Below are the top five strategies that physical therapists and people with MS say are the most effective.

**1 Stretch and strengthen.** It sounds a bit counterintuitive, but the ankle is just as important as the foot when managing foot drop. Muscles that cross our ankle joints help control how we use our feet, says Sara Migliarese, a physical therapist and associate professor at Winston-Salem State University in North Carolina. "It's essential to maintain both strength and standard range of motion in each ankle," she says.

A physical therapist can help you determine ankle exercises that work best for your form of foot drop. There are also some simple stretching and strengthening



Ellie Tillotson, an avid runner, was diagnosed with MS after experiencing foot drop as a symptom during her races.



Foot drop is a condition of weakness in the muscles of the foot and ankle, caused by poor nerve conduction, which interferes with a person's ability to flex the ankle and walk with a normal heel-toe pattern. The toes touch the ground before the heel, causing the person to trip or lose balance.

techniques you can do at home every day. Migliarese recommends the following stretching exercises: Stand facing a wall. Place one foot about 18 inches in front of the other, then lean into the front foot while keeping the back foot on the ground. She also suggests walking on your heels for 10 steps, using a wall or railing to help you balance. Then turn around and walk 10 steps back.

Meredith Drake, a physical therapist at The Johns Hopkins Hospital in Baltimore, says exercises that stretch the calf muscle can give you the flexibility to pick up your toes. She recommends runners' stretches

in which you lunge forward with your front knee straight or bent. Another good stretching exercise is to let your heel hang down off the edge of a step, while gripping something stable to maintain your balance.

Drake also recommends strengthening the front muscles in the calf. Research shows that for neurological conditions, it's best to do these types of exercises while completing a task, like walking or biking.

For people who need something less challenging to their balance, Migliarese suggests strengthening and stretching exercises that can be done while seated. From your chair, place a towel or resistance

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band under your foot with your knee straight, then pull your foot toward your body using the ends of the towel or bands. Or you can sit and tap your toes to the rhythm of a song.

Balance exercises are also important. Drake says activities like standing on foam or walking heel to toe challenge the foot, strengthen the ankle and improve proprioception — your awareness of where your body is in space.

**2 Slow the pace.** Like Tillotson, Heather Goodrich is an avid runner. In the middle of preparing for a race in 2012, she lost the use of her left leg. After she was diagnosed with MS, Goodrich regained functionality in her leg, but her foot drop didn't improve. Later she developed foot drop on her right side. She also has fatigue and heat-sensitivity issues.

"I've learned that when I'm too tired or too hot, the most vulnerable part of my body is foot drop — that's what goes first," she says.

Foot drop hasn't stopped Goodrich from running, but she's learned to pace herself. She now runs marathons in 5-kilometer increments, stopping every 30 to 35 minutes to cool down, get a drink and rest.

Even if you don't run marathons, taking steps to prevent exhaustion and overheating while exercising can help lessen foot drop.

Physical therapists say the quality of movements is more important than the quantity when performing stretching and strengthening exercises. Three to five reps of runners' stretches a few times a day is less strenuous than 20 to 30 repetitions once a day. So is both low- and moderate-intensity interval training while walking or biking.

Migliarese says on a fatigue scale of one to 10, you should stop and rest as soon as you feel like you've hit a level that is two to three points above your level when starting exercise. Stop when you first notice signs of fatigue affecting movement, either while performing exercises or going about your

daily activities. Cooling neck towels, scarves or vests are a good option when you're exercising or even just sitting outside on a hot day. Or you can try Goodrich's unorthodox but effective solution — tucking ice packs in her bra. She also recommends walking or running in a swimming pool to stay naturally cool while still getting a workout.

**3 Adjust your gait.** Foot drop extends the foot, making the affected leg feel longer than the other. To compensate, people may walk less efficiently, says Travis Gawler, a physical therapist with Prisma Health

in Columbia, South Carolina. Someone with foot drop can develop a "steppage gait," raising their knee higher or relying more on their hip flexors to help pick up their feet. A steppage gait uses more energy overall, creating a vicious cycle in which the walking pattern used to overcome foot drop generates the fatigue that can worsen foot drop and affect the overall safety and quality of mobility-related activities of daily living.

"It's like you're moving from being a nice, efficient Prius to a gas-guzzling Expedition," Gawler says.

To counter this, he suggests slowing down when you walk. The faster you walk, the more you work and tire your muscles, resulting in more foot drop.

Diane Meyer, a physical therapist in Cary, North Carolina, says another option is to add no larger than a three-eighths-inch shoe lift to the stronger side. "This allows more space for clearance of the dropped foot when advancing the more affected or weaker leg forward," she says.

Gawler recommends snug-fitting shoes — slip-ons may slide off the feet while walking. He cautions against heavier shoes with rubber soles, which can fatigue muscles faster. He says any heel higher than a normal tennis shoe can make walking less stable and require more force from lower leg muscles. And consider shoes with higher tops to help stabilize the ankle.

**4 Brace yourself.** Goodrich wears a special kind of brace called an ankle-foot orthosis, or AFO, on both legs most of the time. AFOs reach down into the shoe and are designed to keep the ankle in place and help control its movement. Depending on how high the brace goes up your leg, it can also help stabilize the calf or knee. And AFOs can reduce high-stepping walking patterns.

Dozens of AFOs are available, with varying degrees of quality and construction. Some are made of molded plastic, which offers more stability but can get hot and bulky. Others are constructed from carbon fiber, which is lighter and has fewer contact points on your leg — a plus if you're sensitive to touch.

There are rigid braces designed to keep the ankle from rolling for people with spasticity in their ankles. "You need to explore, especially if you've

had bad experiences with bracing before," Gawler says. "No one size fits all."

While you can buy braces off the shelf, most physical therapists recommend having a prescription brace custom made or custom fitted by an orthotist. These types of AFOs can cost around \$500 or more, Migliarese says. Tillotson says her private insurance company paid for 90% of her custom-designed, carbon-fiber brace, which she recently got to replace an off-the-shelf AFO.

"I've run five marathons in my AFO," she says. "It helps with tripping, but it's not 100% effective."

**5 Get stimulated.** In essence, braces do the work for you, which doesn't help strengthen your leg or ankle muscles, Migliarese says. But functional electrical stimulators (FES) cycle on and off with each step, creating muscle activation, reducing spasticity and promoting a more normal gait.

FES devices, marketed under brand names like Bioness and WalkAide, deliver an electric current from a cuff below your knee to a sensor on the nerve that directs your muscle to lift your foot. Because an FES doesn't fit inside your shoe like a brace, you can use it when barefoot or wearing sandals. It's also less bulky and more discreet than a brace.

FES sensors need to be fitted to your nerve endings by a physical therapist. Because they deliver an electrical zap every time you take a step, they can take some getting used to. "You need to build up a tolerance," Drake says.

FES devices are not cheap, ranging from \$5,000 to \$8,000 per leg. And because they're considered experimental, they're usually not covered by insurance. But Goodrich swears by her bilateral Bioness FES devices and is even running marathons in them.

"I have no doubt in my mind that exercise has kept my MS from progressing," she says. "My left foot is completely dropped, and I don't trust my right foot. But I've found that foot drop is not a reason not to be active." ■

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Care to comment? Email us at [editor@nmss.org](mailto:editor@nmss.org).



Heather Goodrich still runs marathons with her foot drop by pacing herself in 5k increments.