

Why Do Some People with MS Fall?

Multiple sclerosis (MS) is one of the most common neurologic diseases. It affects more than 400,000 people in the United States and millions more worldwide. It is associated with a wide range of symptoms that affect all major body systems, many of which are involved in mobility.

As a result, people with MS are at significant risk of falling, as well as the medical and disability problems falls can cause. Studies have shown that approximately half of middle aged and older individuals with MS experienced at least one fall over a 6-month period. These falls are often life-changing, increasing the level of disability and dependence on mobility aids.

Risk Factors for Falling

Biological Risk Factors: Understanding MS Symptoms

In MS, damage to the myelin in the central nervous system—as well as to the nerve fibers themselves—interferes with the transmission of nerve signals between the brain and spinal cord and other parts of the body. This disruption of nerve signals produces the primary symptoms of MS, which vary depending on the specific areas of the nervous system in which damage has occurred.

Over the course of the disease, some symptoms will come and go, while others may be more lasting. The severity of the symptoms varies widely from person to person.

Walking (Gait), Balance, and Coordination Problems

Difficulties with walking are among the most common mobility limitations in MS. These problems are the result of several factors:

- **Weakness:** Muscle weakness is a common cause of gait difficulty. Weakness can cause problems such as toe drag, foot drop, “vaulting” (a compensatory technique that involves raising the heel on the stronger leg to make it easier to swing the weaker leg through), compensatory hip hiking, trunk leaning, or swinging a leg out to the side (circumduction). Weakness in one extremity, for instance within the quadriceps muscles, can lead to knee

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instability and cause a fall. Weakness can often be compensated for with the use of appropriate exercises and assistive devices, including braces, canes, or walkers.

- **Spasticity:** Muscle tightness or spasticity can also interfere with walking. Spasticity refers to feelings of stiffness and a wide range of involuntary muscle spasms. It is one of the most common symptoms of MS. Spasticity may be as mild as a feeling of tight muscles, or may be so severe as to produce painful, uncontrollable spasms in the extremities.

Spasticity may also produce feelings of pain or tightness in and around joints, and can cause low back pain. Although spasticity can occur in any limb, it is much more common in the legs. In addition, spasticity can also be experienced in the mid-section or chest area, limiting the range of twisting motions.

When spasticity is present, a great deal of energy must be expended in walking; minimizing it allows for greater mobility. Stretching exercises and antispasticity medications are generally effective in treating this symptom.

- **Loss of Balance:** Balance problems typically result in a swaying or “drunken” type of gait known as *ataxia*. Using an assistive device such as a cane or walker can be beneficial for those experiencing severe ataxia.
- **Dizziness and Vertigo:** Dizziness can also occur in MS. This may appear as the feeling of being off balance or lightheaded. Much less often, there is a sensation that your surroundings are spinning; this condition is known as vertigo.
- **Sensory Deficit:** Numbness and other sensory disturbances are often the first presenting symptoms of MS. Numbness can make it difficult to be aware of the position of your feet or other body parts in space, and it may be difficult to walk on uneven or unstable terrain.
- **Tremor:** Back and forth movements of the extremities and the head can occur with MS. It is often associated with problems of

balance and coordination.

Fatigue

Fatigue is one of the most common symptoms of MS, occurring in more than 80% of people with the disease. Fatigue can significantly interfere with your ability to function at home and at work, and may be the most common symptom for someone who otherwise has very few limitations in daily activities. MS fatigue is commonly described as a feeling of “exhaustion” or being “wiped out,” with reported worsening in the mid-to-late afternoon that is unrelated to your level of exertion. When present, it can worsen all of the other symptoms that contribute to walking difficulties.

Heat Intolerance

An increase in core body temperature caused by conditions such as hot weather, high humidity, hot baths, heated swimming pools, physical exertion, or fever can slow nerve conduction and temporarily worsen MS symptoms. When overheating causes a worsening of symptoms that last for a day or more, it may be referred to as a pseudoexacerbation. The symptoms return to baseline when the body’s temperature returns to normal. That usually takes only an hour or two, but sometimes symptoms may last for more than a day and may be confused with an MS exacerbation.

Vision Problems

Difficulty with vision is the first symptom of MS for many people. The sudden onset of double vision, blurring, poor contrast, loss of peripheral vision, or eye pain can be terrifying—and the knowledge that vision may be compromised can make people with MS anxious about the future.

Pain

Pain is common in MS. In one study, 55% of people with MS had occasional or episodic “clinically significant pain,” and almost half experienced chronic pain. Pain can result from damage to nerves in the central nervous system, which is referred to as *neurogenic* pain. This type of pain may be felt as tingling or burning. Pain may also result from altered gait patterns or the inappropriate use of assistive devices; this is referred to as *orthopedic* pain.

Cognitive Changes

The term *cognition* refers to a range of high-level brain functions. Cognitive changes are common in people with MS—approximately 50% will develop problems with cognition during the course of the disease. Cognition includes the ability to learn and remember information: organize, plan, and problem-solve; focus, maintain, and shift attention as necessary; understand and use language; accurately perceive the environment; and perform calculations. A person's ability to use mobility equipment correctly may also be compromised by cognitive problems, and many of these changes can lead to risk of falls.

Bowel and Bladder Dysfunction,

While they don't directly affect mobility, bowel and bladder dysfunction may cause an individual who has urgency and frequency issues to rush to the bathroom, to get up frequently during the night when drowsy, and otherwise be inattentive to fall hazards.

Medications

People with MS may be taking a number of medications to manage the MS disease process and their MS-related symptoms. A range of medications and drug interactions may increase the likelihood of a fall. It is important to recognize that *all* medications have side effects and that everyone responds differently to specific medications. Fatigue is a common side effect for many medications. Check the labels of your medications and talk to your doctor or pharmacist about how they might affect your mobility and safety.

Behavioral Risk Factors

Deconditioning and Inactivity

A sedentary lifestyle, for anyone, leads to deconditioning. Inactivity can result in the loss of muscle tone and disuse weakness that is not related to demyelination, poor postural alignment and trunk control, decreased bone density (and the resulting increased risk of fracture), and shallow, inefficient breathing. Exercise decreases your risk of heart disease, decreases your resting blood pressure, aids sleep, strengthens bones, increases flexibility, endurance, and energy, and can elevate your sense of wellbeing.

Although exercise does not appear to slow the progression of MS, it can help decrease the complications that arise from muscular fatigue, weakness,

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contractures, and spasticity. Additionally, a targeted exercise program and physical therapy can be effective in helping to help reduce falls and fall-related injuries.

Fear of Falls or Overconfidence

Falls and injuries caused by falls can be frightening. Fear is a natural, protective response that keeps us away from dangerous situations. The most common response to fear is avoidance, which can lead to severe activity curtailment and disengagement.

A person's level of confidence can decrease as MS progresses and, when activities become challenging, it can cause people to give up those activities all together. Conversely, some people with MS simply accept that falls are part of their lives and continue to perform activities as they always have, with a false confidence in their abilities that can be dangerous and lead to serious falls.

False confidence can also occur on a seemingly symptom-free day. Often on days where fatigue seems to be managed and good balance is experienced, many opt to leave their mobility devices behind. This can lead to dangerous situations where one might be forced to engage in risky maneuvering or to be stranded far away from assistance. It is best to plan ahead for worst-case scenarios rather than assuming how you feel at the start of the day will be the same at the end of the day.

Improper Mobility Device Use

Without the proper devices, your mobility problems are likely to interfere with your participation in home, work, family, social and leisure activities, and most importantly increase your risk of falls. Those individuals with MS requiring the use of a mobility device already have a higher risk of falls, but this risk increases dramatically when choosing the wrong device, or going without, and if the device is used improperly.

There are a large number of assistive and mobility devices currently available on the market. Your healthcare providers can evaluate and prescribe the device(s) that best meet your needs. Once you receive your device, it is important that you are trained and fitted for that device to ensure proper usage.

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Environmental Risk Factors

Home Safety

Many injuries happen at home. When you identify home or environmental hazards as a potential cause of falls, you should take steps to modify and eliminate them. Eliminating hazardous conditions such as clutter or poor lighting, and adding supportive features such as grab bars or handrails in locations such as stairs and bathrooms, are important strategies in fall prevention.

Staying Safe in Your Community

There are many situations in public places that can make it difficult to maintain your balance and that could cause slips, trips, and falls. Most falls can be prevented with general precautions and safety measures. The best way to prevent injuries is to have a greater awareness of the outdoor environment and to focus your attention on navigating situations that might lead to falls.

Managing the Risk of Falls

Although completely eliminating falls among people with MS is unrealistic, a significant number occur under predictable circumstances that could be prevented by identifying the key risk factors that contribute to an increased risk for falls and then implementing appropriate follow-up interventions. This program addresses falls through a multi-disciplinary, multi-factorial approach. It combines medical, behavioral, exercise, environmental, and educational components, as well as community resources, to support the needs of people living with MS.

Over the course of eight weeks the National MS Society's *Free From Falls* program strives to increase participants' knowledge of fall prevention and to help you adopt strategies that will decrease your risk of falling. Each week's 2-hour program will have two parts; a discussion component focused on awareness of issues related to falls and an exercise component directed to improving postural alignment, balance, endurance and mobility. These key issues include:

- Fall risk awareness
- Building confidence to manage falls
- Optimizing mobility

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- Managing energy
- Home and environmental changes