

Controlling Spasticity in MS



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Society

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Introduction

Spasticity is one of the most challenging of all MS symptoms. It comes and goes. It feels different to different people — and even to the same person at different times. There are even occasions when a healthcare practitioner finds spasticity, but the person affected has no symptoms.

What is spasticity?

The word spasticity refers to involuntary muscle stiffness or spasms (sudden muscle contractions).

In any coordinated movement, some muscles relax while others contract. Spasticity occurs when this coordination is impaired and too many muscles contract at the same time. MS-related spasticity can occur with active movement or be present at rest. It can cause a leg to lock up and refuse to bend. Though not completely understood, spasticity is thought to be caused by increased sensitivity in the parts of muscles responsible for tightening, relaxing and stretching. In MS, this likely occurs as a result of demyelination of the nerves in the central nervous system that control impulses to the muscles.

In mild cases, the condition is noticeable only as a feeling of tight or stiff muscles. When the condition is severe, the person can experience painful spasms or twisted limbs, which can impede mobility and other physical functions.

There are two types of MS-related spasms: flexor and extensor. Flexor spasticity is defined as an involuntary

bending of the hips or knees up toward the chest (mostly involving the hamstring muscles on the back of the upper leg). Extensor spasticity is an involuntary straightening of the legs, mostly involving the quadricep muscles (front of the upper leg), the adductors (inner thigh muscles) and trunk. In extensor spasticity, hips and knees remain straight with the legs very close together or crossed over at the ankles. MS-related spasms can interfere with walking, climbing stairs, transfers, and balance and coordination.

Spasticity may affect the upper extremities, but is more common in the lower extremities. Shoulder musculature, elbows, wrists and hands may be impaired in some people with MS. Any upper extremity spasticity may greatly interfere with normal functioning and activities of daily living including bathing, eating, handwriting, dressing and typing.

How common is spasticity?

Spasticity is one of the more common symptoms of MS. If all degrees of spasticity are taken together, it occurs in an estimated 80 percent of people with the disease. The question of degree is important. For one person, spasticity may cause a stiff leg, while in another, it makes walking impossible. For many people, the extra effort needed to move around – when muscles are spastic – contributes significantly to fatigue. On the other hand, spasticity can also compensate for muscle weakness, making it easier to stand, walk and move.

Treatment

The treatment partnership

Because the condition is so individual, successful treatment of spasticity demands a true partnership between you and your healthcare team (doctor, nurse, physical therapist and/or occupational therapist). Your family also plays an important role. The first step in building a good treatment partnership is learning about the range of available treatment strategies.

“Treating spasticity is not a matter of the doctor writing out a prescription for pills and saying come back in three months,” said Charles R. Smith, MD, director of the MS program, Scripps Clinic, La Jolla, CA.

The presence and degree of spasticity can be determined by your healthcare practitioner. He or she will stretch your legs to check for involuntary resistance. For example, if your leg is spastic, your muscles will automatically resist when it is moved quickly. If spasticity is mild, there will be minimal resistance; if the spasticity is severe, your leg may be so stiff that it cannot be bent at all. Overactive reflexes are also an indication of spasticity.

Treatment begins with your physician recommending ways to relieve the symptoms. Strategies may include exercise, medication and/or changes in daily activities. To individualize your plan and adjust the dosage of any medication to its most effective level, your doctor will

need to follow your progress. He or she may also make referrals to other healthcare professionals, such as a physical therapist (PT) or occupational therapist (OT).

Nurses, who normally have responsibility for health education and for learning in detail how patients’ daily lives are affected by their symptoms, are an important part of this process. Take the time to ask your nurse questions and provide personal information. Both your doctor and nurse will guide you through the sometimes tricky process of medication adjustment. In addition, the PT and OT can provide individualized training with specific exercises and ways to make daily activities easier.

Self-help

Spasticity, like other aspects of your MS, is unique to you. As with other MS symptoms, spasticity tends to come and go and to be worse under certain conditions. Typical triggers include cold temperatures, high humidity, tight clothing, tight shoes, constipation, poor posture, viral infection such as a cold or the flu, or bacterial infection including skin sores or bladder infections. Sometimes women will notice changes in spasticity related to their menstrual cycles.

In time, you will become aware of the triggers that affect you most. Some, like tight shoes, can be avoided. Other triggers merit an intervention.

Effective self-help means:

- Don't assume that nothing can be done! Spasticity does not have to be tolerated and improvement is usually possible.
- Make sure that an appropriate exercise program is a regular part of your routine. The National MS Society's illustrated booklets, **Stretching for People with MS** and **Stretching with a Helper for People with MS** include exercises specifically for spasticity. Ask your physical therapist, nurse or doctor for recommendations to meet your individual needs.
- Explore complementary relaxation techniques such as progressive muscle relaxation, yoga, meditation or deep-breathing exercises. None of these is a cure, but they can make it easier to sleep at night and face the next day's problems with a clearer head and reduced spasticity.
- If your healthcare provider agrees, explore massage. You may even receive some insurance reimbursement depending on your plan. Massage can help relax muscles and enhance range of motion and may be helpful in preventing pressure sores. Massage should not be used if pressure sores or reddened areas of skin are present. The American Massage Therapy Association has a national locator service and can supply names of qualified therapists. Call 877-905-0577 or visit amtamassage.org.
- Be patient but persistent through the adjustments in daily activities, the types and doses of medication, the type and timing of exercise, and the use of devices, gadgets and adaptations.

Treatment goals

Spasticity interferes with daily activities, so the primary goal of treatment is to reduce the negative effects as much as possible. Sections of this booklet detail what can be accomplished by physical therapy, medication, orthotic devices (splints or braces) and occupational therapy. Some strategies seek to relieve the affected muscles; others involve learning to work around spasticity by adopting new ways of doing things.

Treatment also aims to prevent the serious complications of spasticity. These include contractures (frozen or immobilized joints) and pressure sores. Since these complications also act as spasticity triggers, they can set off a dangerous escalation of symptoms. Surgical measures are considered for those rare cases of spasticity that defy all other treatments.

Contractures are not only painful and disabling, but can become permanent if left untreated, resulting in upper or lower extremities that may not regain full range of motion or may experience limited joint mobility. Treatment (and prevention) of contractures usually combines medication to relieve spasticity with physical and occupational therapy.

Pressure Sores

Pressure sores, sometimes called bed sores or pressure ulcers, occur in people who spend much of their day sitting or lying down. The term “bed sore” is misleading. One does not need to be in bed all the time to be at risk for a pressure sore. MS reduces the thousands of small movements people ordinarily make both in sleep and while sitting down. MS can dull sensation in the buttocks or legs, eliminating the usual sensory cues to change one’s position.

Spasticity contributes to pressure sores by making normal movement more difficult and by causing posture changes that create pressure points. Another cause of pressure sores is “shearing,” which occurs when the person is receiving positioning assistance from someone, and the movement is more sliding or dragging than lifting.

Pressure sores begin innocently enough, as small reddened areas. The spot may not even feel painful or tender. However, there may already be significant damage to the soft tissues underneath reddened areas of skin. If pressure on the area is not relieved, the skin will break down, forming a sore. These sores can deepen quickly. They are prone to infection, and they can eventually destroy large areas of underlying tissue and even bone. Your healthcare practitioner can provide instruction in prevention and early detection.

Controlling spasticity is part of good pressure sore prevention. Complicated, infected pressure sores are a contributing factor in some MS-related deaths.

Rehabilitation

Physical therapy

A physical therapist (PT) recommends and teaches specific exercises and movements that can increase flexibility and relieve or decrease spasticity. They may also use bracing and assistive devices for spasticity treatment.

First, you will have several tests that measure muscle tone, resistance, strength, balance and coordination. You’ll also be asked about your general functioning in routine daily activities. Your ambulation or mobility will most likely be assessed.

In addition to stretching exercises you do yourself, PTs also relieve spasticity with specific exercises (done with the help of another person) to stretch and relax shortened muscle fibers, increase joint movement, extend contracted muscles and improve circulation. Some of these techniques may be taught to a family member or helper so that they can be performed on a routine basis at home. Physical therapy can also help maintain range of motion to prevent contractures.

Strengthening exercises prescribed by the PT are important because a muscle that is spastic is not necessarily strong.

And strengthening the spastic muscles, as well as the muscles that oppose the spastic ones, may be particularly beneficial. This is like making sure that both the “push” and the “pull” of the muscles are in good condition.

Hydrotherapy (therapy done in the water) may also be recommended as well as local application of cold packs. Hydrotherapy is a very effective way to temporarily relax spastic limbs, especially when used in combination with gentle stretching.

For those who are unable to stand independently, a standing frame allows for stretching of leg muscles, as well as pressure on the leg bones, which helps limit bone mineral loss (osteoporosis).

Orthotic devices

Orthotic devices (such as braces and splints) maintain the leg in a more normal position, which makes it easier to move around or get into a more comfortable position. These devices should be fitted by a professional. A common example is the ankle-foot orthosis (AFO), which places the ankle in a better alignment. Although many drugstores and catalogs offer them over-the-counter, ill-fitting devices can aggravate spasticity and cause pressure sores or pain. Therapists can direct you to the best options and teach you how to use orthotics.

Occupational therapy

Occupational therapists (OTs) are experts in modifications that make daily life with spasticity more comfortable and enhance independence. Individualized training can be very helpful in making daily activities such as dressing and showering easier and more energy efficient. Home modifications might include replacing small drawer pulls with large knobs, spraying drawer tracks with silicone to make the drawers glide, or lowering the clothes bar in your closets. Your OT may recommend assistive devices and will often have samples to let you try in order to determine what works best. You may be amazed at the ingenuity of the available devices.

Here is a small sample:

- Dressing aids: These include stocking aids, long-handled shoehorns and shoe/boot removers, which allow you to dress with a minimum of bending if you are experiencing stiffness in your trunk or legs; elastic shoelaces that let you slip in and out of shoes without having to retie them; zipper pulls and more.
- Toiletry and grooming aids: In addition to electric shavers and electric toothbrushes, there are easy-grip handles for shaving-cream cans, combs or brushes, long-handled brushes for washing your feet, and other tools to help you extend your reach while bathing.

For people who use wheelchairs, OTs may also recommend positioning changes that minimize spasticity. Sometimes

simple adjustments in the height of a footrest or the width of a seat along with an appropriate seat cushion can make a world of difference.

OTs can also develop exercise programs for your hands and arms, and may recommend splints that position the hands to enhance function and preserve joint mobility.

Medications

There are two medications that are FDA approved for the treatment of spasticity, and other medications used “off label” that can serve well in certain situations. The two approved medications are baclofen and tizanidine. The most effective dosage will depend on striking a balance between the medication’s good and bad effects. An effective dosage tends to vary from time to time. An infection, cold weather, an ingrown toenail — whatever triggers your spasticity — will also influence the amount of medication needed to manage the muscle stiffness.

Typically, the doctor will increase the dose of medication gradually until the full benefit is evident, and reduce the dose if side effects occur. In addition, your healthcare team can suggest timing your medication in specific situations. For example, taking an antispasticity medication an hour before sexual activity can prevent painful spasms during orgasm.

Baclofen

Baclofen (Lioresal®) is a muscle relaxant that works in the spinal cord. It is most often taken three or four times a day, and common side effects are drowsiness and muscle weakness. Baclofen relaxes normal as well as spastic muscles. Nausea, a less common side effect, can usually be avoided by taking baclofen with food. The medication has a good safety record with long-term use. The side effects don’t build up or become worse over time. At high doses, this medication reduces concentration and contributes to fatigue.

Because it usually restores flexibility within a short period, baclofen may allow other treatments, such as physical therapy, to be more effective. Baclofen does not cure spasticity or improve coordination or strength. A gradual increase in dosing often allows for higher and more effective doses to be taken. Baclofen should not be greatly reduced or stopped suddenly without consulting with your physician because seizures and other problems can result.

“Intrathecal” baclofen

Some people require a higher dose of baclofen but cannot tolerate the increased side effects. A surgically-implanted pump can deliver very small amounts of the medication directly into the fluid that surrounds the spinal cord. The baclofen pump has been extremely successful. The pump can improve (or at least maintain) a person’s level of functioning and may even help some people remain ambulatory. Furthermore, the pump permits people with very limited mobility to be positioned to minimize pain and the risk of pressure sores.

The computer-controlled, battery-operated pump, which weighs about six ounces, is surgically implanted under the skin of the abdomen. A tube runs from the pump to the spinal canal. The pump is programmed to release a pre-set dose specific for the individual. People who use the pump are seen by their physician or nurse for a new supply of medication and a check of the computer program every one to three months. New medication is injected into the pump through the skin. The little computer can be reprogrammed painlessly by radio signals. When the battery wears out (in five to seven years) the pump itself is surgically removed and replaced. The tube remains in place.

Tizanidine

Tizanidine (Zanaflex®) works quickly to calm spasms and relax tightened muscles, but may cause greater sedation than other medications. Tizanidine is typically taken three times a day. In addition to drowsiness, dry mouth is a common and usually temporary side effect. Hypotension (low blood pressure) is another potential, but less frequent, side effect.

This medication also has a good safety record with long-term use. It does not cure spasticity or improve muscle coordination or strength. A combination of baclofen and tizanidine may give the best results. Tizanidine should be used with caution with ciprofloxacin HCl (Cipro®), which is used to prevent or treat urinary tract infections, since increased drowsiness or sleepiness can occur.

Diazepam

In small doses, diazepam (Valium®) may also be used in spasticity treatment. This medication is not as effective as those mentioned above, but it has the benefit of relieving anxiety, which makes it easier for someone who is restless or has disturbing night-time spasms to relax and get a good night's sleep.

Drowsiness and potential dependency with long-term use make diazepam a less desirable choice. However, in some circumstances, diazepam and another antispasticity drug may be prescribed together. People for whom this works say that they would rather be a bit sluggish and fully flexible than wide awake and spastic. Because they cause drowsiness, diazepam and clonazepam (Klonopin®), a similar medication, are generally prescribed to help control spasms at night.

Gabapentin

Gabapentin (Neurontin®) is used to control some types of seizures in epilepsy. In MS, gabapentin controls certain types of pain and can reduce spasms caused by spasticity. The most common side effects include blurred or double vision, dizziness and drowsiness. Once you've started on it, gabapentin should not be stopped without consulting your physician.

Dantrolene

Dantrolene sodium (Dantrium[®]) is generally used only if other medications (alone or in combination) have been ineffective. It works by weakening muscles, making it a poor choice for people who walk. Dantrolene can produce serious side effects, including liver damage and blood abnormalities. The longer a person takes this medication, the more these problems are likely to develop. People taking dantrolene must have periodic blood tests.

Levetiracetam

Levetiracetam (Keppra[®]) is another medication used for seizure control in some forms of epilepsy. In MS, it can sometimes be helpful in improving spasticity and spasms. Side effects and treatment considerations are similar to those seen with gabapentin.

Botulinum toxin

Injection of botulinum toxin (Botox[®]) has been shown to relieve spasticity in small muscles such as those around joints in the arms and legs. However, the benefit is limited to the specific muscles that are injected, which means that this medication is not the appropriate treatment for generalized spasticity or spasticity in large muscle groups. In order to avoid the spread of the medication to neighboring muscles, only small amounts of the medication can be injected at a time. The effects of each treatment last approximately three months and then must

be repeated. Treatment is not given more frequently than every three months in order to reduce the risk of antibodies developing that would block its effectiveness. Side effects include weakness of the injected muscle and some nearby muscles, and a brief “flu-like” syndrome. In March 2010, the U.S. Food and Drug Administration approved botulinum toxin for treatment of spasticity in the flexor muscles of the elbow, wrist, and fingers in adults with MS.

Phenol

Another treatment is the injection of a nerve block called phenol. This treatment also needs to be repeated every three to six months, and is often effective when oral agents have had unsatisfactory results.

A Final Option

Severe Spasticity

Enormous progress has been made in controlling spasticity in the past two decades. If none of the treatments discussed above have helped, surgery might be recommended for relief. The relief is permanent, but so is the resulting disability. The techniques include severing tendons (tenotomy) or nerve roots (rhizotomy) in order to relax cramped-up muscles. These measures are only undertaken after serious consideration and for the most difficult cases of spasticity.

The National MS Society's mission is for people affected by MS to live their best lives as we stop MS in its tracks, restore what has been lost and end MS forever. To fulfill this mission, the Society funds cutting-edge research, drives change through advocacy, facilitates professional education, collaborates with MS organizations around the world, and provides services designed to help people with MS and their families move their lives forward.



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