CONDITION

Spasticity

Spasticity is involuntary muscle tightness caused by damage to movement pathways in the brain or spinal cord.

WHAT IT IS
Abnormal muscle tightening from disrupted brain or spinal cord signals

BODY SYSTEM
Nervous system and muscles

MAIN SYMPTOMS
Muscle tightness, spasms, stiffness, reduced movement

WHAT CAUSES IT
Brain or spinal cord damage

HOW IT IS DIAGNOSED
Neurological examination; tests identify the underlying injury

MAIN TREATMENT
Physical therapy, medicines, injections, or procedures

CAN IT BE CURED?
Sometimes - recovery from the underlying injury may resolve it

IS IT AN EMERGENCY?
Sometimes - sudden onset with stroke symptoms needs emergency care

LONG-TERM OUTLOOK
Often manageable; function reflects the underlying nervous system condition

Overview

Spasticity is abnormal muscle tightness caused by damage to movement pathways in the brain or spinal cord. It is a condition linked to an underlying neurological problem, rather than a disease by itself.

Normally, the brain and spinal cord balance signals that tighten and relax muscles. When these pathways are damaged, muscles may receive too many tightening signals. A joint can then feel especially resistant when someone tries to move it quickly.

Spasticity may affect one muscle, one side of the body, both legs, or several limbs. It can be mild and noticeable only during certain activities. More severe spasticity can interfere with walking, sleep, hygiene, dressing, positioning, or the use of a wheelchair.

Not all spasticity needs to be removed. Some people use a certain amount of muscle tone to stand, transfer, or support a weak limb. Treatment therefore focuses on pain, movement, care, and personal goals-not simply making every muscle as relaxed as possible.

Symptoms

Spasticity can feel different depending on which muscles are affected and how much voluntary control you have.

Common features include:

Symptoms often become more obvious when a limb is moved quickly. They may also increase during movement, stress, or physical effort.

Spasticity can worsen temporarily even when the underlying neurological condition has not changed. Common triggers include pain, constipation, a full bladder, urinary infection, skin irritation, pressure injuries, tight clothing, poor positioning, heat, or an ingrown toenail.

A joint that has become fixed in one position may have a contracture . This is a lasting shortening of muscles and other tissues around the joint. Unlike spasticity, a contracture does not disappear when the muscle relaxes.

- Tight or stiff muscles
- Sudden, involuntary muscle spasms
- Legs crossing or pulling together
- Toes pointing, fists closing, or elbows bending
- Repeated rhythmic jerking, called clonus
- Pain or difficulty moving a joint
- Trouble walking, dressing, washing, sleeping, or changing position

Causes and risk factors

Spasticity results from damage to the parts of the brain or spinal cord that control voluntary movement. Conditions associated with it include:

Spasticity may begin soon after an injury, or it may appear over the following weeks or months. In conditions such as multiple sclerosis, it may change over time or become worse during a relapse.

The location and extent of nervous system damage affect which muscles are involved.

Reduced movement, pain, poor positioning, and untreated spasms can add to stiffness and increase the risk of contractures, but they are not the original cause of spasticity.

- Stroke
- Cerebral palsy
- Multiple sclerosis
- Spinal cord injury
- Traumatic brain injury
- Brain or spinal cord tumours
- Reduced oxygen supply to the brain
- Certain inherited or degenerative nervous system conditions

Diagnosis

Spasticity is diagnosed through a physical and neurological examination. There is no single blood test or scan that confirms it.

During the examination, a healthcare professional may move your joints at different speeds. Spasticity typically causes greater resistance during faster movement. They may also assess muscle strength, reflexes, sensation, joint movement, walking, pain, and how symptoms affect daily activities.

Clinical rating tools can help track muscle tone and movement over time. These measurements are only part of the assessment because a score does not show how well you can walk, sleep, dress, or complete transfers.

Tests may be used to find or review the underlying cause. These can include MRI or CT scans of the brain or spinal cord, depending on your symptoms and medical history. Blood or urine tests may be appropriate when a sudden increase could be related to infection or another trigger.

The assessment also helps distinguish spasticity from contractures, joint disease, muscle cramps, dystonia, or rigidity. These problems can look similar but may need different treatment.

Treatment and management

Treatment is based on how spasticity affects comfort, movement, care, and independence. A

plan may involve rehabilitation specialists, physiotherapists, occupational therapists, neurologists, rehabilitation doctors, or other members of your healthcare team.

Physical and occupational therapy may include gentle stretching, strengthening, supported standing, movement practice, and work on walking or transfers. Splints, braces, seating changes, or positioning equipment may help maintain joint alignment and make daily care easier.

Regular movement may reduce discomfort and help protect joint range. Forceful stretching can cause pain or injury, so exercises should match your abilities and the condition of your joints.

Possible medical treatments include:

Treatment can sometimes uncover weakness that spasticity was helping to compensate for. For example, reducing leg tone may make standing harder even though the leg feels looser. Goals and results should therefore be reviewed after each treatment change.

Baclofen should not be stopped suddenly without medical guidance. Abrupt interruption-especially from an implanted pump-can cause dangerous withdrawal.

- Oral medicines: Medicines such as baclofen or tizanidine can reduce widespread spasticity. Other medicines are used in selected situations. Sleepiness, dizziness, weakness, or low blood pressure may limit their usefulness.
- Botulinum toxin injections: These temporarily weaken selected overactive muscles. They are often used for focal spasticity affecting a limited area. Therapy or splinting may be used alongside the injections.
- Intrathecal baclofen: A surgically implanted pump delivers baclofen into the fluid around the spinal cord. It may be considered for severe, widespread spasticity when other treatments have not provided enough benefit.
- Nerve procedures or surgery: Selected people may be offered nerve-blocking procedures, tendon or bone surgery, or operations targeting spinal nerve pathways.

Complications

Ongoing spasticity can contribute to pain, sleep disruption, fatigue, and difficulty with movement or personal care. It can also make it harder to fit braces, sit comfortably, or use mobility equipment.

Over time, limited movement may lead to contractures and changes in joint position. Tight muscles can increase friction or pressure on the skin, raising the risk of skin breakdown.

Severe spasms may interfere with balance and contribute to falls.

Spasticity can also affect confidence, relationships, work, and caregiving needs. These effects are valid treatment concerns even if muscle tone measurements have not changed.

Prevention

Spasticity often cannot be prevented because it results from an existing brain or spinal cord injury or condition. Preventing stroke and avoiding head or spinal injuries can reduce some causes, but not every cause is preventable.

Once spasticity is present, regular movement, suitable positioning, skin care, and timely treatment may help prevent secondary problems such as pain, pressure injuries, and contractures. Managing constipation, bladder problems, infections, and poorly fitting equipment may reduce temporary flare-ups.

These measures manage the effects of spasticity; they do not repair the damaged nerve pathways.

Living with it and what to expect

The course of spasticity follows the underlying condition. After a stroke, brain injury, or spinal cord injury, muscle tone may change for months as the nervous system recovers and adapts. Some people improve, while others continue to need long-term management.

With multiple sclerosis, spasticity may fluctuate with illness, temperature, fatigue, or disease activity. Cerebral palsy is lifelong, although the practical effects of spasticity can change with growth, ageing, activity, and joint health.

Symptoms may be easier to manage once you learn your triggers. Keeping track of spasms, pain, sleep, bladder and bowel symptoms, and daily activities can help show whether a treatment is useful.

Follow-up is usually focused on function. Your plan may need review if walking changes, a brace stops fitting, care becomes harder, or treatment causes too much weakness or sleepiness. Many people use a combination of self-management, rehabilitation, equipment, and medical treatment over the years.

When to get medical help

Arrange a routine review if spasticity is increasingly painful, interrupts sleep, limits daily activities, or makes washing, dressing, walking, transfers, or positioning harder. New skin redness, equipment problems, or gradually reduced joint movement also deserve assessment.

Seek prompt medical advice for a sudden unexplained increase in spasms. Infection, constipation, bladder retention, a skin injury, a fracture, or another painful problem may be responsible, especially if you have reduced sensation.

Call emergency services if sudden stiffness or weakness occurs with signs of stroke, such as facial drooping, trouble speaking, loss of balance, vision changes, or a severe new headache.

Emergency care is also needed for:

Do not stop baclofen suddenly unless an emergency clinician specifically directs you to do so.

- Rapidly worsening spasms with fever, confusion, seizures, or severe illness
- A suspected interruption of an intrathecal baclofen pump, particularly with itching, fever, marked stiffness, or confusion
- A pounding headache, sweating or flushing, and sudden worsening spasms after a high spinal cord injury, which may indicate autonomic dysreflexia

Common questions

Is spasticity the same as ordinary muscle stiffness?

No. Ordinary stiffness can follow inactivity, exercise, or joint problems. Spasticity comes from disrupted signals in the brain or spinal cord and usually becomes more noticeable when a limb is moved quickly.

Can spasticity go away?

It can improve if the nervous system recovers after an injury, but this cannot be predicted for an individual person. In many long-term neurological conditions, spasticity is managed rather than permanently removed.

Why has my spasticity suddenly become worse?

A flare can be triggered by pain, infection, constipation, a full bladder, skin damage, poor positioning, heat, or tight equipment. A sudden change does not always mean the neurological condition has progressed, but the cause should be checked.

Does stretching help spasticity?

Gentle, regular stretching may ease discomfort and help preserve movement. Its effect on muscle tone may be temporary, and it cannot repair damaged nerve pathways. A

physiotherapist can help identify safe techniques.

Are botulinum toxin injections permanent?

No. Their effect is temporary and gradually wears off. Repeat treatment may be considered if the injections improve comfort, movement, hygiene, or another agreed goal.

Can exercise make spasticity worse?

Exercise may briefly increase muscle tone or trigger spasms, but appropriately planned activity is generally an important part of management. Painful, forceful, or poorly supported movement may cause problems, so activities may need to be adapted.

Sources

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