

# Spasticity

## **WHAT IS SPASTICITY?**

Spasticity is a neurological condition characterized by an abnormal increase, or hyperactivity, in muscle tone. The condition causes affected muscles to continuously contract (stay flexed, or shortened) for long periods of time. They remain stiff and tight, and resist the normal stretching that should occur during use.

Symptoms may include hypertonicity (increased muscle tone), clonus (a series of rapid muscle contractions), exaggerated deep tendon reflexes, muscle spasms, scissoring (involuntary crossing of the legs), and fixed joints. Symptoms of spasticity can vary from mild stiffness to severe, uncontrollable muscle spasms that can be very painful, especially if joints are pulled into abnormal positions or otherwise prevent normal range of motion. The condition can interfere with movement, balance, walking and other mobility, and the ability to perform a range of daily activities.

Left untreated, affected muscles are subject to “contracture,” a condition that leaves the muscles and tendons permanently shortened and can result in a permanent, often painful abnormal posture.

## **WHAT CAUSES SPASTICITY?**

Spasticity occurs when the brain sends incorrect nerve signals to the muscles, causing them to contract when they should relax. It is usually the result of neurological disorders that damage parts of the nervous system that control voluntary movements. The most common disorders associated with spasticity include stroke, cerebral palsy, multiple sclerosis, spinal cord injury, and traumatic brain injuries due to lack of oxygen, physical trauma, hemorrhage, or infection.

## **HOW IS SPASTICITY TREATED?**

Patients with symptoms of spasticity are often treated by a multi-disciplinary team of healthcare professionals that may include neurologists, orthopedic surgeons and physiatrists (doctors specializing in physical rehabilitation), physiotherapists, occupational therapists, or other specialists depending on the cause of the underlying disorder. There are several ways to treat spasticity depending on the severity of the condition and the patient’s goals for treatment.

BOTOX<sup>®</sup> (botulinum toxin type A) was approved by Health Canada for the treatment of focal spasticity, including the treatment of upper limb spasticity associated with stroke in adults in 2001.<sup>1</sup> It is a minimally invasive treatment for spasticity that can help reduce stiffness, muscle spasms and other symptoms that reduce disability and promote more function independence.<sup>2</sup> BOTOX<sup>®</sup> therapy involves the injection of therapeutic doses of purified botulinum toxin protein directly into the affected muscles. Derived from the bacterium *Clostridium botulinum*, BOTOX<sup>®</sup> inhibits the release of a neurotransmitter, acetylcholine, from nerve cells, blocking the signals that induce involuntary muscle contractions. The effect is temporary and the treatment needs to be administered approximately every three to four months depending on the individual patient.

Treatment for spasticity is also likely to include physical therapy including regular stretching and “range of motion” exercises to help prevent shrinkage or shortening of the muscles and reduce the severity of symptoms. Muscle relaxing drugs, taken orally or pumped into the spinal fluid, may also be helpful for spasticity affecting several regions of the body. If the spasticity is severe and does not respond to less invasive treatments, surgery may be recommended to release tendons or to destroy overactive nerves in the spine. Patients should speak to a physician to fully understand their treatment options.

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**REFERENCES:**

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<sup>1</sup> BOTOX<sup>®</sup> Canadian Product Monograph

<sup>2</sup> Esquenazi A. Botulinum neurotoxins in the management of spasticity. Neurotoxin Institute. Available at <http://www.neurotoxininstitute.com>. Accessed on January 2010.