

Spasticity

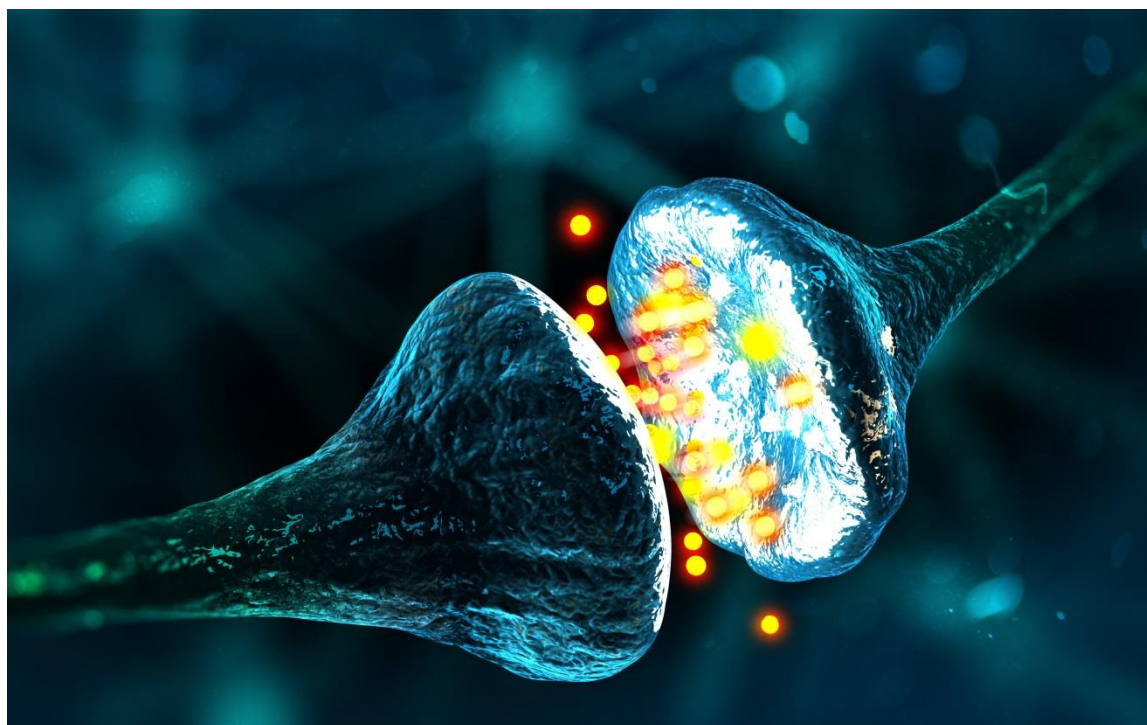


Figure 1: Photo: Synapse and neuron cells sending electrical chemical signals.

Spasticity is a side effect of paralysis that varies from mild muscle stiffness to severe, uncontrollable leg movements. Symptoms may include increased muscle tone, rapid muscle contractions, exaggerated deep tendon reflexes, muscle spasms, scissoring (involuntary crossing of the legs), and fixed joints.

Spasticity is usually caused by damage to the portion of the brain or spinal cord that controls voluntary movement. It may occur in association with spinal cord injury, multiple sclerosis, cerebral palsy, anoxic brain damage, brain trauma, severe head injury, or certain metabolic diseases. Spasticity can interfere with rehabilitation or daily living activities.

When individuals are first injured, their muscles are weak and flexible because of what's called spinal shock: the body's reflexes are absent below the level of injury; this usually

lasts for a few weeks or several months. Once the spinal shock is over, reflex activity returns.

Since the normal flow of nerve messages below the level of injury is interrupted, those messages may not reach the reflex center of the brain. The spinal cord then attempts to moderate the body's response. Because the spinal cord is not as efficient as the brain, the signals that are sent back to the site of the sensation are often over exaggerated. This is an overactive muscle response referred to by doctors as spastic hypertonia (SH): uncontrollable "jerking" movement, stiffening or straightening out of muscles, shock-like contractions of a muscle or group of muscles, and abnormal tone in the muscles.

Most individuals with SCI experience spastic hypertonia in some form. Persons with cervical injuries and those with incomplete injuries are more likely than those with paraplegia and/or complete injuries to experience SH. The most common muscles that spasm is those that bend the elbow (flexor) or extend the leg (extensor). These usually occur as a result of an automatic response to painful sensations.

Spasticity also defines a condition in which certain muscles are continuously contracted. This stiffness or tightness may interfere with gait, movement, and speech.

Spasticity is not necessarily a bad thing. Some people use their spasms for function, to empty their bladders, to transfer, to dress. Others use it to keep their muscles toned and improve circulation. It may help maintain bone strength.

Changing Spasticity

According to researchers at Craig Hospital in Denver, a change in a person's spasticity can be a symptom itself. For example, a cyst or cavity in the spinal cord (sometimes called post-traumatic syringomyelia) could lead to more spasticity. Also, decreasing or disappearing spasticity can also be a sign of a cyst.

Other diseases that may develop in the spinal cord -- tumors, Guillain-Barre syndrome, transverse myelitis, a spinal cord stroke, etc. -- may also cause spasticity to change. And problems outside your nervous system, such as bladder infections or skin sores can make spasticity increase.

Treatment for spasticity may include medications such as baclofen, diazepam, or Zanaflex. Some people with severe spasms utilize baclofen pumps, which are small, surgically implanted reservoirs that apply the drug directly to the area of spinal cord dysfunction. This allows for a higher concentration of drug without the mind-dulling side effects of high oral dosage.

In recent years some doctors have treated spasticity in children with Botox[®], the muscle-relaxing agent used cosmetically for wrinkles.

Physical therapy, including muscle stretching, range of motion exercises, and other physical therapy regimens, can help to prevent joint contractures (shrinkage or shortening of a muscle) and reduce the severity of symptoms.

Sometimes, surgery is recommended for tendon release or to sever the nerve-muscle pathway in children with cerebral palsy. Selective dorsal rhizotomy may be considered if spasms interfere with sitting, bathing or general caretaking.

Spasticity comes with the territory for many people who are paralyzed. Treatment strategy should be based on your function: is the spasticity keeping you from doing certain things? Are there safety risks -- losing control while driving your power wheelchair or automobile? Are anti-spasm drugs worse than the symptom, affecting concentration and/or energy level? Are spasms becoming more than your caregivers can deal with? If the answer to any of the above is yes, check with your physician to discuss your options.

Sources: National Multiple Sclerosis Society, United Cerebral Palsy Associations, The National Spinal Cord Injury Statistical Center, Craig Hospital, The University of Alabama at Birmingham/Spain Rehabilitation Center

The above excerpt is from the Christopher & Dana Reeve Foundation Paralysis Resource Center website.

<https://www.christopherreeve.org/living-with-paralysis/health/secondary-conditions/spasticity>

Web Sites

Medscape: Spasticity

<http://emedicine.medscape.com/article/2207448-overview>

This page has clinical information on spasticity and treatments including oral medications, surgery, and physical and occupational therapy.

Medtronic

<http://www.medtronic.com>

Phone: 763-514-4000 or 800-633-8766 (Toll-free)

Medtronic manufactures implantable pumps for delivery of drugs to control spasticity.

MSKTC: Spasticity and Spinal Cord Injury

<http://www.msktc.org/sci/factsheets/spasticity>

MSKTC is a national center that works to put research into practice to serve the needs of people with traumatic brain injuries, spinal cord injuries, and burn injuries.

National Institute of Neurological Disorders and Stroke (NINDS): Spasticity

<https://www.ninds.nih.gov/Disorders/All-Disorders/Spasticity-Information-Page>

NINDS' page on spasticity includes information on treatments, prognosis, research, and links to other resources.

National Multiple Sclerosis Society (NMSS)

<http://www.nationalmssociety.org>

Phone: 800-344-4867

The National Multiple Sclerosis Society offers information and resources on all medical issues related to MS. Searching for spasticity will pull up a range of related articles, including the 2010 manual *Controlling Spasticity in MS*, which can be downloaded for free.

National Organization for Rare Disorders (NORD)

<http://www.rarediseases.org>

1900 Crown Colony Drive, Suite 310

Quincy, MA 02169

Phone: 617-249-7300

1779 Massachusetts Avenue

Suite 500

Washington, DC 20036

Phone: 202-588-5700

NORD lists numerous diseases that are accompanied by spasticity.

Northwest Regional Spinal Cord Injury System: Spasticity and Spinal Cord Injury

<http://sci.washington.edu/info/forums/reports/spasticity.asp>

This 2003 SCI Forum Report describes some of the basic workings of the spinal cord, how spinal cord injury affects spasticity and treatment options for the condition.

United Cerebral Palsy (UCP)

<http://www.ucp.org>

1825 K Street NW, Suite 600

Washington, DC 20006

Phone: 202-776-0406, 800-872-5827 (Toll-free)

E-mail: info@ucp.org

United Cerebral Palsy has numerous information resources on spasticity and its treatment options.

Craig Hospital: Spasticity

<https://craighospital.org/resources/spasticity>

The following video can be streamed online or downloaded from <http://www.uab.edu/medicine/sci/daily-living/managing-personal-health/secondary-medical-conditions/spasticity>

- **Spastic Hypertonia.** University of Alabama at Birmingham. (27 minutes)
This video defines spastic hypertonia (aka spasticity), explaining the advantages versus disadvantages of spasticity, and general treatment options if desired. It offers a general understanding of sensation and reflex.

The information contained in this message is presented for the purpose of educating and informing you about paralysis and its effects. Nothing contained in this message should be construed nor is intended to be used for medical diagnosis or treatment. It should not be used in place of the advice of your physician or other qualified health care provider. Should you have any health care related questions, please call or see your physician or other qualified health care provider promptly. Always consult with your physician or other qualified health care provider before embarking on a new treatment, diet or fitness program. You should never disregard medical advice or delay in seeking it because of something you have read in this message.

This publication is supported by the Administration for Community Living (ACL), U.S. Department of Health and Human Services (HHS) as part of a financial assistance award totaling \$9,447,037 with 100 percent funding by ACL/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by ACL/HHS, or the U.S. Government.