

This TelAbility handout provides an overview of spasticity and its treatment.

WHAT IS SPASTICITY?

Spasticity is a combination of increased 1) **muscle tone**, 2) over active **deep tendon reflexes** and 3) **clonus**.

Muscle Tone is the resistance to muscle stretching. If you stretch a normal muscle you feel a natural amount of resistance much like stretching a stiff rubber band. A quick stretch causes more resistance (stiffness) than a slow stretch. Some muscles of children with an injury to the brain or the nerves to the muscles may have an increased amount of stiffness (hypertonicity or increased tone) or a decreased amount of stiffness (hypotonicity or decreased tone). Sometimes a muscle with very little tone is called flaccid.

Deep Tendon Reflexes (DTR) : The tendon connects the muscle to the bone. If a tendon is tapped (like with a reflex hammer) the muscle quickly contracts. When there is a problem with the brain or the nerve to the muscle the muscle might react more strongly to a tendon tap (increased DTR) or have no response or a sluggish response (decreased DTR).

Clonus: When the ankle is quickly stretched upward you might see several alternating up and down movements of the ankle. Clonus is a sign of a problem with the brain and nerve to the muscles.

WHAT CAUSES SPASTICITY?

Spasticity is caused by damage to the nerves of the brain or spinal cord. Problems with the nerves of the brain or spinal cord can result in altered patterns of muscle coordination and increased sensitivity to sensory stimulation commonly seen with **spasticity**.

WHEN DOES SPASTICITY OCCUR?

Spasticity is commonly seen in children with cerebral palsy, spina bifida, spinal cord injuries, brain injuries, stroke, or other conditions that affect the brain and/or spinal cord.

When a child has **spasticity** we usually also see poor muscle coordination, more reflexive reactions, muscle weakness, muscle spasms, delays in normal automatic reactions and delayed achievement of motor milestones.

HOW CAN SPASTICITY BE TREATED?

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| Limiting Discomfort | Since anything that can cause discomfort (like being hungry, tired, constipated or in pain) it is important to help your child stay well fed, well rested, and without pain or irritations. |
| Positioning | Positioning is often used to decrease the effects of spasticity by providing a slow gentle stretch to spastic muscles or by blocking automatic movements. Often times adapted equipment, splints, or orthotics will be used to help with positioning. (See TelAbility handout on orthotics) |

Heat/Cold	Sometimes heat or ice can be used to temporarily relax a spastic muscle. Warm baths or swimming pools can also help to relax a spastic muscle. Check with your physician or therapist before using heat or cold with your child.
Medications	Sometimes the effects of spasticity can be improved by medication. Check TelAbility Medication of the Month archives for more information on medicines like diazepam, dantrolene sodium, tizanidine, botulinum toxins A & B, baclofen, and more. (http://www.telability.org/search.pl?page=1&feature=4) Botulinum toxin and phenol shots are given to treat spasticity in a certain area of the body. Baclofen can also be given directly into the spinal fluid through an implantable pump called an intrathecal baclofen (ITB) pump.
Surgery	Surgery is also sometime used to reduce the effects of spasticity . Orthopedic surgery to lengthen muscles and tendons can temporarily improve spasticity. Selective Doral Rhizotomy is a procedure in which some of the nerve fibers entering the spinal cord are cut in order to decrease the nerve stimulation to the spastic muscles of the legs.
Electrical Stimulation	Neuromuscular electrical stimulation (NMES) and threshold electrical stimulation (TES) are sometimes used with exercise therapy in special circumstances but are still considered experimental treatments.

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Reference:

Bjornson KF. *Role of the physical therapist in the management of children with spasticity*. Topics in Physical Therapy – Pediatrics. 2001. American Physical Therapy Association. Alexandria, VA, pp. 8-1 to 8-16.

For more information:

Kids Move <http://www.wemove.org/kidsmove/spa.html>

E-medicine: Spasticity <http://www.emedicine.com/neuro/topic706.htm>