Spasticity Education

What is Spasticity?

Tone is the normal state of tension in a muscle. Spasticity is an abnormal increase in muscle tension. Spasticity is an exaggeration in muscular tension and reflexes typically in an arm or leg that may cause pain and abnormal movement.

- Normal tension is needed for sitting up and standing straight.
- High muscle tone is an abnormal increase in muscle tension. Muscles are so tight (spastic) that movement is hard.

Spasticity is part of the Upper Motor Neuron Syndrome (UMS), which results when there is any injury or damage to the central nervous system (spinal cord or brain). Some common diseases that could result in UMS include **stroke, multiple sclerosis, spinal and brain injuries, cerebral palsy and Parkinson's disease.**

What are some other symptoms due to spasticity?

The reflex in the muscle does not obey the nervous system's order to relax, and remains contracted. The injury to the central nervous system causes the reflex arc to consistently stimulate the muscles.

The positive symptoms include: **spasticity, clonus/hyperexcitable reflexes, stiffness and abnormal posture/reflexes**. Negative symptoms include: **muscle weakness, decreased coordination, and fatigability**. **Remember some degree of paralysis/weakness is almost always present is spastic limbs**. There is varying amount of loss of motor control, so that a muscle maybe overpowered by its antagonist (opposing muscles) before any movement has occurred. Long periods of muscle contractions could also cause pain similar to athletic cramping.

If not managed, what could happen?

The involuntary muscle contraction of spasticity is a common physical response to damage to the central nervous system. If the injury resolves and voluntary movement returns, spasticity may diminish, restoring the usefulness of the limb. However, for many people who do not achieve full recovery, spasticity remains a chronic complication.

Not everyone with spasticity needs treatment. For some people, some degree of abnormal tone maybe useful for postural function, such as during transfer. Spasticity ranges from mild to severe. Spasticity may lead to joint tightness, contracture, skin breakdown, trouble moving, pain, and difficulty with wearing your splints/braces.

What are some areas that I should think about before treatment?

Is spasticity limiting your function? Are there things that spasticity keeps you from doing for yourself? Is the job of your attendants made harder because of spasticity? Are you requiring more personal assistance-to keep you positioned in your chair, to pick you up when a spasm throws you on the floor? Is there other safety risks-losing control while driving your power wheelchair, car, van?

Is the treatment you are using as bad the problem itself? Are the medications affecting your memory, attention, concentration, or energy level?

Are your spasms becoming harder to cope with? Does the pain make it harder to cope with? Are they frustrating your caretaker also? Does someone always have to be around to reposition you in the chair? Are you not able to sleep well at night?

Some of the potential goals for treatment are: increased range of motion (ROM), hygiene, fitting of orthotic device, postpone or avoid surgery, pain or spasm frequency reduction, decrease burden of care on caregiver, and improve function.

What are some warning signs with changing level of spasticity?

Spasticity may change over time for many people without any neurological or medical underlying causes. For children, it may also change with growth and development. However, for patients with spina bifida or congenital spinal cord malformations, changing spasticity may be due to hydrocephalus or tethering of the spinal cord. Other types of problems can also make spasticity increase, such as urinary tract infection, an over full bladder, or a decubitus ulcer. For people with traumatic spinal cord injuries, perhaps the most serious complication is a cyst or cavity within the spinal cord (called syringomyelia). Increased spasticity is a common symptom of this complication. Patients with hydrocephalus (abnormal flow of cerebral spinal fluid in the brain) who have shunt failure could also exhibit changing level of spasticity.

Spasticity is also commonly influenced by the time of day, climate/temperature, level of stress, and certain positions/postures. **Don't ignore SIGNIFICANT change in your spasticity.**

How you do manage spasticity?

There is no cure for this complication. A combination of physical and occupational therapy, home exercise, splinting, medications and injections may be used to achieve the best function possible. You need to work with your therapist(s), doctor(s), and family member(s). **Treatment of spasticity should be customized for the patient, taking into consideration the extent of the problems, individual symptoms and the patient personal lifestyle goals**. Some treatments include: range **of motion exercises, positioning programs, cast/splints, using body weight through exercise.** A muscle stretching program performed at least one or two times per day is

considered basic treatment. Regular stretching can prevent muscle shortening. Basic care includes prompt treatment for your infections. Physical and occupational therapists can provide instructions for home treatment programs. If stretching is not sufficient, casts and splints maybe helpful in improving ROM.

Antispasticity medications are also used to treat more severe and generalized spasticity. **Because of the wide range of problems caused by spasticity, it is doubtful that any one medication will help all effects of spasticity.** These medications will need to be adjusted overtime to control your spasticity. The common medications include baclofen, valium, zanaflex, dantrolene, and most recently neurontin. They often can cause daytime grogginess, especially at the beginning. Please keep your therapist and doctor informed of your response to the treatment-and also seek advice before changing the dosage. **Certain medications such as baclofen and zanaflex (Tizanidine) can cause life-threatening withdrawal if stopped abruptly.**

For certain patients with focal or local spasticity (affecting small muscles or localized to 1 limb), chemodenervation with **botulinum toxins** or a nerve block may be helpful. Please keep in mind that in the US, the use of botulinum toxins is not approved by the FDA at this time for use in spasticity. However, it has been found useful in certain patients who are treated for this condition.

If medications and conservative treatments prove inadequate, what are the more aggressive options for treatments?

In the past, surgical treatment options have been limited to destructive procedures: such as **dorsal rhizotomy**, wherein the surgeons interrupted the reflex arcs /sensory inputs to the spinal cord. Nerves are severed as they leave or enter the spinal cord. **Nerve blocks** chemically injure peripheral nerves or nerve roots. More recently, the availability of **baclofen pumps,** has allowed for pharmacologic treatment without destruction to the nervous tissue. For patients who have severe spasticity and could NOT tolerate the effects of oral medications, they need to talk to their doctors about the use of the baclofen pump device. In this form of treatment, a pump is implanted and a catheter system infuses liquid baclofen into the spinal canal at the lower end of the spinal cord. This treatment is typically much more effective than the oral medications, but does require the surgical procedure for implantation of the pump and scheduled pump refills by trained individuals. Replacement of the pump takes place every 6-7 years.

Certain patients may need other neurosurgical or orthopedic surgeries to treat spasticity with muscle contractures. Surgery on specific affected muscles can improve isolated tasks. Surgeries to cut and transfer tendons is also performed tom improve comfort, positioning, and active function.

Where can I go to learn more about spasticity and treatments?

Some useful websites include **www.*spasticity.com, www.wemove.org, and www.stroke.org***. Please contact your Kaiser Permanente provider if you have more concerns.

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