

SPASTICITY AND MOVEMENT DISORDERS

What is spasticity?

Spasticity is an increase in muscle tone with uncontrolled, repeated spasms (involuntary flexing of the skeletal muscles). These spasms occur when the muscles resist being stretched. Spasms are common in children with brain or spinal cord injury. There are many ways to treat spastic muscles, including physical therapy, oral medications, botox injections, and surgery. **Our Spasticity Team will evaluate your child and offer recommendations.**

Types of hypertonia other than spasticity include:

Dystonia: involuntary, sustained muscle contractions which result in a stereotypic pattern of movement (builds as the limb is moved)

Athetosis: worm-like or writhing movements

Chorea: (dance-like movements) abrupt, spontaneous, irregular movements of the body

Rigidity: resistance to movement that does not build through range of motion

Mixed: any of the above hypertonic states can occur together

What is baclofen?

Baclofen is a muscle relaxant medication, commonly used in adults to decrease spasticity related to spinal cord injuries or multiple sclerosis, Baclofen is also used to treat children who have cerebral palsy and increased tone.

How does baclofen work?

Spasticity is caused by an imbalance of excitatory and inhibitory input in the spinal cord. This imbalance causes hyperactive muscle stretch reflexes. These reflexes result in involuntary spasms and increased muscle tone.

Baclofen works by blocking the release of excitatory neurotransmitters in the spinal cord. By doing this, baclofen restores the balance of excitatory and inhibitory input to reduce muscle hyperactivity. In this way, it also allows more normal motor movements.

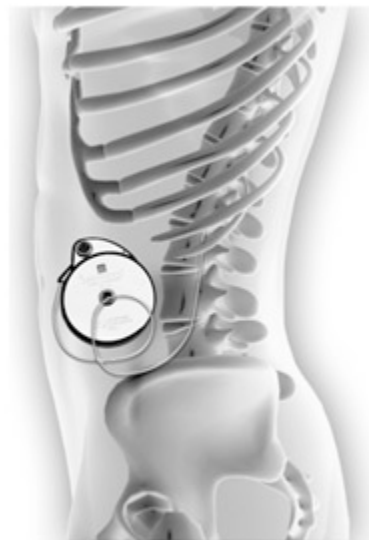
What is the baclofen pump system?

The baclofen pump system is the intrathecal (directly into the spinal fluid) method of delivering the medication. The system consists of a catheter (a small, flexible tube) and a pump. The pump, a round metal disc, about one inch thick and three inches in diameter, is surgically placed under the skin in the abdomen.

Who is a candidate for the pump system?

Anyone who has spasticity and weighs over 30 pounds can be considered for the baclofen pump system. The pump system is appropriate when adjustable and potentially reversible treatment is desired, but cannot be achieved with oral medication. Your child may benefit from a baclofen pump if he or she has:

- Severe spasms which affect the arms, legs or both
- Spasms which interfere with personal care, diapering, bathing, or sleep
- Painful spasms
- A good response to a trial dose of baclofen
- Enough strength in the neck and trunk



How is the pump system implanted?

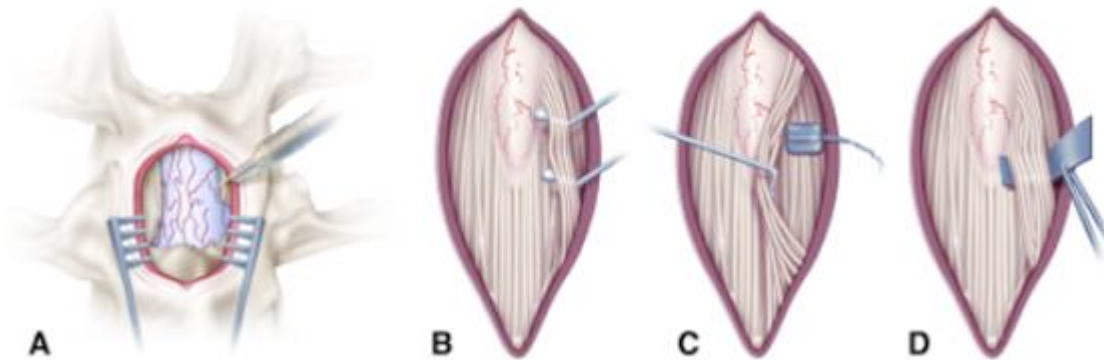
The pump is surgically placed just underneath the skin, usually in the lower abdominal area. A spinal tap (lumbar Puncture) is performed through a small incision in the lower back. A small tube is threaded into the spinal column while the other end of the catheter is guided towards the abdomen where it is connected to the pump. The procedure to place the pump lasts from 2 to 3 hours.

Baclofen flows freely through the spinal fluid, affecting the nerves to control muscle hyperactivity. Adjustments in the dose, rate, and timing of the medication can be made by your doctor, using an external programmer. The pump system can be set to dispense medication continuously or at certain times of the day. The pump can also be easily reprogrammed if necessary.

Patients must return to the Neurosurgery office for pump refills and medication adjustments, typically every 2 to 3 months. The pump system is taken out and replaced at the end of the battery's life span (several years depending on usage).

SELECTIVE DORSAL RHIZOTOMY

Selective dorsal rhizotomy is a treatment for spasticity that involves the sectioning of certain nerve rootlets to reduce tone (see below). Monitoring of the responses to stimulation is performed in the operating room and the operation can improve ambulatory potential in certain children. A team approach is utilized involving the input of orthopedic surgeons, neurologists, physical and occupational therapists with an interest in spasticity and movement disorders.



What can be done for increased tone in one limb?

Focal increased tone can be treated with therapy and with botox injections, depending on the functionality of the limb in question. **SMF, or selective motor fasciculotomy, allows denervation of the spastic limb by carefully sectioning certain nerve fibers causing increased tone.** Our results have been presented nationally at peer-reviewed meetings. Our experience with this technique, and our team of neurosurgeons, orthopedic surgeons, rehab and therapy specialists, makes our team a leader in the field of spasticity in children.

Our Spasticity and Movement Disorder Team includes Dr. Katrina Lesher, Pediatric Physical Medicine and Rehabilitation Specialist. She works with children with cerebral palsy, brain injury, spinal cord injury, muscular dystrophy, spina bifida, neuromuscular disorders, and spasticity.