

How long does the procedure take?

A typical in-office procedure will take approximately 45 to 60 minutes. This will depend upon how many muscles are being treated and other technical factors. A nerve stimulator or EMG machine may be used to guide the needle to the exact location within the muscle.

What can I expect after injection?

Pain and swelling at the injection site are possible. The amount of pain experienced may vary with each injection. We recommend icing the area of injection after the injection to prevent muscle pain or swelling. You may return to your normal activities following the treatment.

Botulinum toxin begins to take effect 5 days after the procedure and peak effect occurs approximately 6 weeks later.

What else can I do to treat spasticity?

Exercise, physical therapy and occupational therapy will commonly be prescribed. It is important to retrain muscles after chemodenervation is performed.

In addition, orthoses (braces) and stretching programs may be necessary to regain function.

Is botulinum toxin right for me?

Chemodenervation is not for everyone. Your doctor can answer questions you may have about botulinum toxin and discuss realistic goals. Some of the common conditions that may benefit from botulinum toxin are listed on the front of this brochure.

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Spasticity Management

Spasticity is abnormal muscle tone caused by damage to the brain or spinal cord. Spasticity is best managed by a team approach that may include injection techniques, physical and occupational therapy, bracing, exercise, medications, and surgery. Conditions that benefit from spasticity management include:

- *Stroke*
- *Traumatic brain injury*
- *Cerebral palsy*
- *Multiple sclerosis*
- *Cervical dystonia*

How do injections help spasticity?

Chemodenervation is an injection technique in which a medication or compound is used to disrupt the motor activity of a muscle or group of muscles. Unlike a normal muscle, when spastic muscles are stretched, they do not lengthen. The goal of chemodenervation is to reduce tightness (tone) and allow the muscle to relax (lengthen).

How does spasticity affect function?

Your doctor will examine you to determine which muscles are involved. The doctor will observe how you move, the control you have over your movements, how it affects your everyday activities, such as bathing, toileting, dressing, eating, walking, standing, and moving from bed to chair.

The goal of treating spasticity is to decrease pain, make it easier for you to move and function, assist caregivers with your care, and prevent problems that develop due to spasticity, such as skin breakdown.

What is injected?

Phenol, alcohol preparations and botulinum toxin are used to treat spasticity. Botulinum toxin is released by the bacterium *Clostridium botulinum* commonly found in the soil. It is the same bacterium that causes botulism. This toxin is manufactured and concentrated, and therefore no bacteria are actually injected.

The toxin inhibits the muscles from contracting by blocking the release of messenger chemicals called neurotransmitters. In addition, it blocks a

neurotransmitter responsible for causing pain. Botulinum toxin A or Botox® is the agent most commonly used with injection treatments in our office for a number of reasons related to safety and efficacy.

Phenol and alcohol solutions act directly on the nerve tissue which may be painful to the patient. Because a nerve may be responsible for the action of several muscles, these solutions are less selective than botulinum toxin. Also, alcohol/phenol produces a permanent effect whereas botulinum toxin's effect lasts only for several months.

Will the injections hurt?

As with all procedures, a variation in the discomfort level will be experienced by patients receiving chemodenervation. Some muscle soreness may persist for several hours after the injection but should not last more than a day or two.

If you are interested in having botulinum toxin injections but are very nervous or concerned about the pain, medications can be prescribed that can be taken before your appointment to help ease some of the discomfort and anxiety.

Are there any risks involved?

All procedures have possible risks. The type of risk often depends on the location of the body part that is being treated.

Any time an injection occurs, the risks include: no improvement, bleeding under the skin, infection, increased pain or swelling at the injection site and temporary or permanent nerve damage.

Risks that are more specific to botulinum toxin include: weakness of the muscle, allergic reaction, trouble swallowing, breathing difficulties, vision impairment, change in voice or loss of bladder control.

The most serious risks include severe allergic reaction and respiratory problems. While these are quite rare, there have been deaths reported in the literature.

Great care is taken so that these do not happen, and in fact the more serious risks are very rare. However, it's important for you to be aware of these risks. If you don't feel that the possible benefits of this treatment are worth the risks, then chemodenervation might not be right for you. Your doctor will explain to you, in detail, the risks involved at each visit, and your questions will be answered before any treatment is performed.

How often are treatments required?

The response to treatment varies from person to person, and the dose and/or schedule of treatment may require adjustment. In general, chemodenervation with botulinum toxin is a management technique that requires treatment every 12 weeks. Spasticity and patient needs change and therefore our management and dosing plans may change as well. This is another advantage of botulinum toxin over some of the other chemodenervation compounds.