



# Botulinum Toxin: Essential Facts for Patients

## WHAT IS IT?

Botulinum NeuroToxin (BoNT) is a naturally occurring protein made by the bacterium clostridium botulinum. In the past, people only knew BoNT as a dangerous and feared poison. When BoNT contaminates food, it can cause botulism: a severe and potentially deadly illness. In the last 40 years, however, researchers have transformed this poison into an effective and safe drug to treat many medical conditions, when used at the correct dosages.

## HOW DOES IT WORK?

During treatment, BoNT must be injected into a muscle or gland. Nerve endings take up the BoNT and it blocks the connection between the nerve and muscle or the nerve and gland. This causes the muscle to weaken or the gland to reduce saliva or sweating.

Patients currently have two types of BoNT treatments available: Types A and B. Depending on what country you live in, there may be a different option available:

### Type A

- onabotulinumtoxinA
- abobotulinumtoxinA
- incobotulinumtoxinA

### Type B

- rimabotulinumtoxinB

The BoNT treatments may have different strengths and ability to spread in the tissue after injection. They generally work the same way and have the same effect on the muscle or gland. However, the drugs are not completely interchangeable. The doses differ for each drug, so doctors need to use the correct dosage for that toxin.

After an injection, it takes two to seven days to start to work. The drug reaches a full effect after about two weeks and then gradually wears off. Because the effect is temporary, BoNT injections need to be repeated approximately every three to six months. Injections are given no more than every 3 months to prevent the body from rejecting the treatment.

## WHAT DISEASES CAN BOTULINUM TOXIN TREAT?

Ophthalmologists first used BoNT as an alternative to surgery for treating eye misalignment known as strabismus. Neurologists then began using BoNT for patients with excessive muscle contractions from movement disorders, such as dystonia. For many conditions, there were no other treatments available.

BoNT is effective for treating:

1. **Dystonia:** Involuntary muscle spasms or contractions that cause twisting, jerking movements or unusual body positions:
  - Cervical dystonia (torticollis), where neck muscle contractions cause abnormal head turning, tilting or twisting
  - Excessive blinking or eye spasms (blepharospasm)
  - Abnormal jaw and lower face movements (oromandibular dystonia)
  - Vocal cord spasms (laryngeal dystonia or spasmodic dysphonia)
  - Hand or arm dystonia, such as writer's cramp
2. **Hemifacial spasm:** Muscle twitching around one eye or one side of the face.
3. **Spasticity:** This condition causes muscle spasms and increased muscle tone in: cerebral palsy, after a stroke, spinal cord injury or with multiple sclerosis
4. **Excessive sweating or hyperhidrosis:** Affects the palms or armpits and may improve with injections into the skin.
5. **Other conditions:** May improve after BoNT injections.
  - Head, hands or voice tremors
  - Tics
  - Increased drooling (sialorrhea) in patients with Parkinson's disease or amyotrophic lateral sclerosis
  - Overactive bladder
  - Chronic migraine headaches

## IS IT SAFE?

Even though BoNT is a poison, proper doses given in the correct locations are safe and effective. The most common side effect is muscle weakness near the injection site. For example, eyelid drooping or double vision when injected around the eye. Other side effects may include pain, bruising or bleeding at the injection site. Very rarely, BoNT injections can cause generalized weakness or flu-like symptoms. BoNT injections must be given by experienced, trained doctors.

## WHAT CAN I EXPECT WITH BoNT TREATMENTS?

BoNT is a very effective drug, and a 50-90% improvement can be expected for at least 2 to 3 months. If the injections are not effective then one of the following may be considered: changing the dose or the injection site.