

BOTOX® Injections

BOTOX or Botulinum Toxin Type A, is a purified neurotoxin complex grown from culture. When injected intramuscularly or subcutaneously at therapeutic doses, BOTOX produces a localized chemical denervation muscle paralysis. This results in a temporary, reversible paralysis. BOTOX was developed for use in strabismus (lazy eye) and blepharospasm. Uses for diminishing facial wrinkling by reducing facial muscle contractions was considered off-label but it is now approved by the Food and Drug Administration (FDA)

Botulinum neurotoxin (BTX) is produced by an anaerobic bacterium *Clostridium botulinum*. Serotype A (BTX-A) is the most potent in producing muscular paralysis. A serotype B has been recently introduced (Myoblock®) and early studies show it is also effective, though of shorter duration. BTX-B may also be effective if you develop antibodies to BTX-A making BOTOX no longer effective.

BTX-A produces paralysis by binding to pre-synaptic cholinergic nerve terminals and blocking the release of acetylcholine at the neuromuscular junction (NMJ). This results in atrophy of the muscle. BTX-A produces permanent deactivation of exposed cholinergic terminals but muscle function can occur through turnover, repair, axonal sprouting, and production of new NMJ's. Within approximately 2-4 months, power is restored to the muscle providing normal response and power resulting in muscle contractions and wrinkling.

Initial effects usually occur within 4-5 days post-injection. Maximal weakness occurs approximately 1-2 weeks postinjection, when the treated muscles atrophy. In general, the smaller the dose of BTX-A, the longer it takes to produce its effects. The actions of the toxin can range from slight weakening to complete paralysis. Toxin dilution, total solution volume, and the number and location of injection sites will determine this effect.

BOTOX can be potentiated by those who are taking aminoglycoside antibiotics or other medications that interfere with neuromuscular transmission and should not be used in these patients. It should also not be used in anyone pregnant as the potential effects on the fetus are unknown. It should also not be used in nursing mothers, children below the age of 12 years, or if open sores or infection are present in the area being injected.

Possible complications include drooping of the upper lid (ptosis), a heavy sensation to the brow and forehead, numbness, bruising, and transient headache. This also includes any potential problems from the simple act of injecting a substance into the skin such as vascular injection and nerve injury. There may also be unintentional or undesired paralysis or weakening of adjacent muscle groups. Complications can be minimized by not manipulating or massaging the injected area for several hours. In addition, you may obtain an asymmetrical effect or undesired appearance that may require additional injections at additional costs.

Botox has recently been shown to be effective in diminishing migraine headaches and excessive sweating.