

Basic Science of Botox

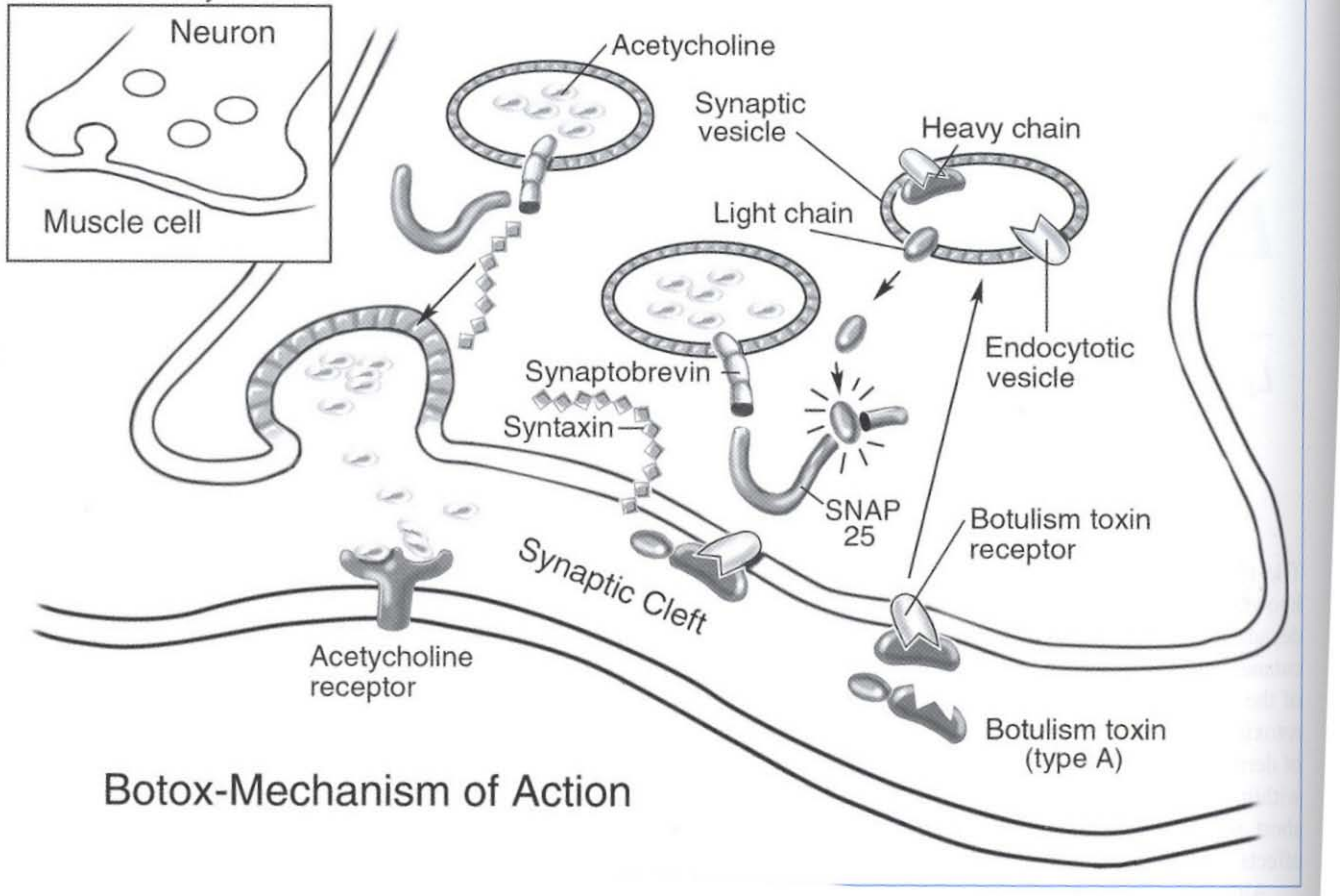
Background

- 8 distinct subtypes of botulinum neurotoxin
 - A, B, C, alpha, C beta, D, E, F, and G
- botox induces chemical denervation of striated muscle by cleaving proteins required for release of acetylcholine
- results in temporary flaccid paralysis of the injected muscles for 3-5 months

Basic Science of Botox

- Botox type A (BOTOX) is most common type used
- it cleaves the SNAP-25 protein (a component of the SNARE complex)
- an intact SNARE complex is necessary for release of Ach
- Botox B (Myobloc) cleaves synaptobrevin, another component of SNARE

Neuromuscular junction



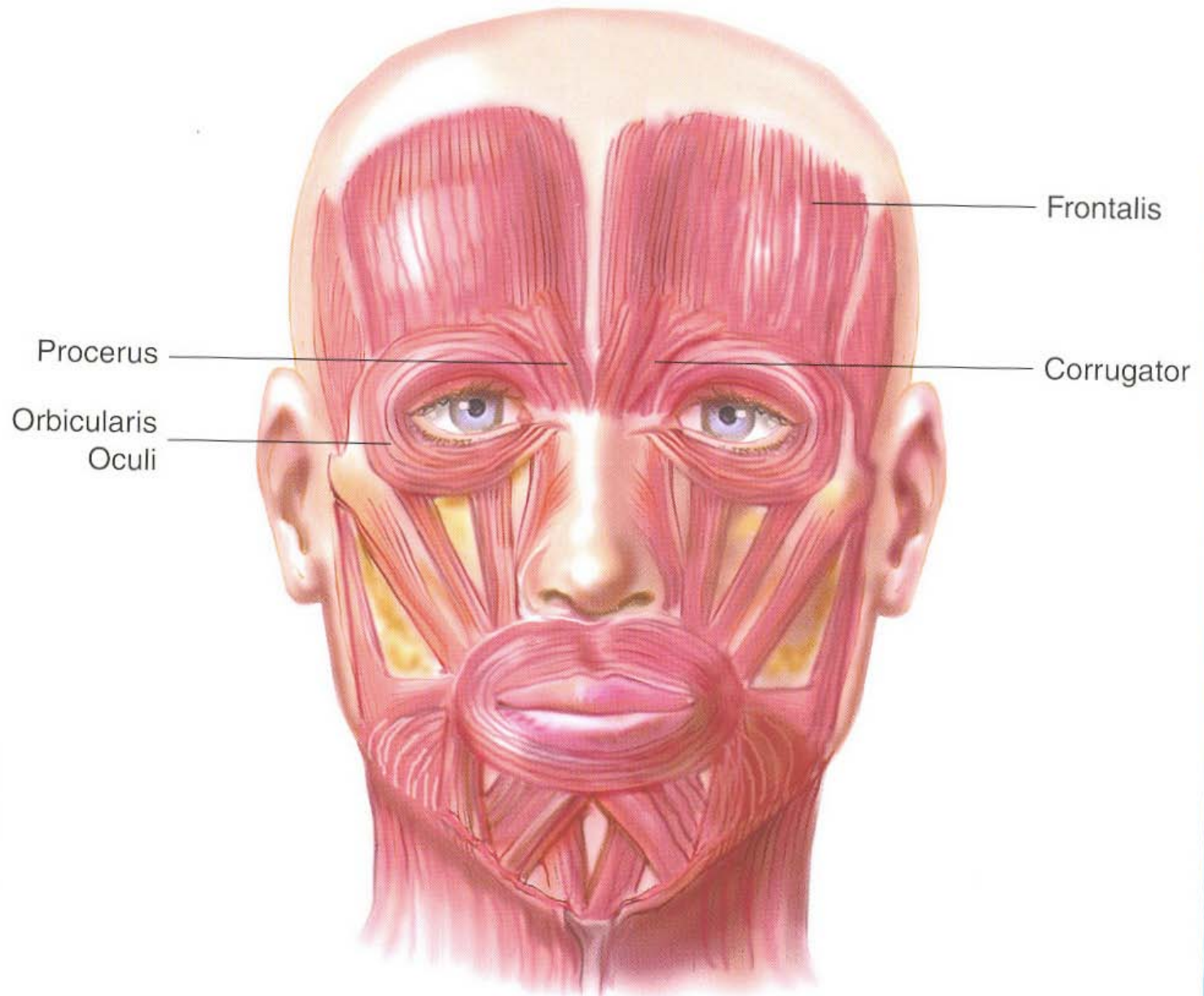
Botox-Mechanism of Action

Clinical Indications

- Prevention and amelioration of dynamic wrinkles (“wrinkles in motion”) and cessation of hyperhidrosis
- Not useful for static wrinkles (“wrinkles at rest”)

Storage and Handling

- One vial of BOTOX contains 100 units of vacuum dried type A toxin, human albumin, and sodium chloride
- reconstitution procedures vary, but recommended is:
 - 2.5 mL of 0.9% saline per vial
 - results in 4.0 units per 0.1 mL
- use by 48 hrs to up to 6 weeks, keep refrigerated



Glabellar Frown Lines

- Muscles involved include frontalis, procerus, corrugator supercilli, and medial fibers of orbicularis oculi
- contraction results in elevation of the brow and wrinkles of the forehead
- corrugator contraction results in adduction of the eyebrow inferiorly and medially

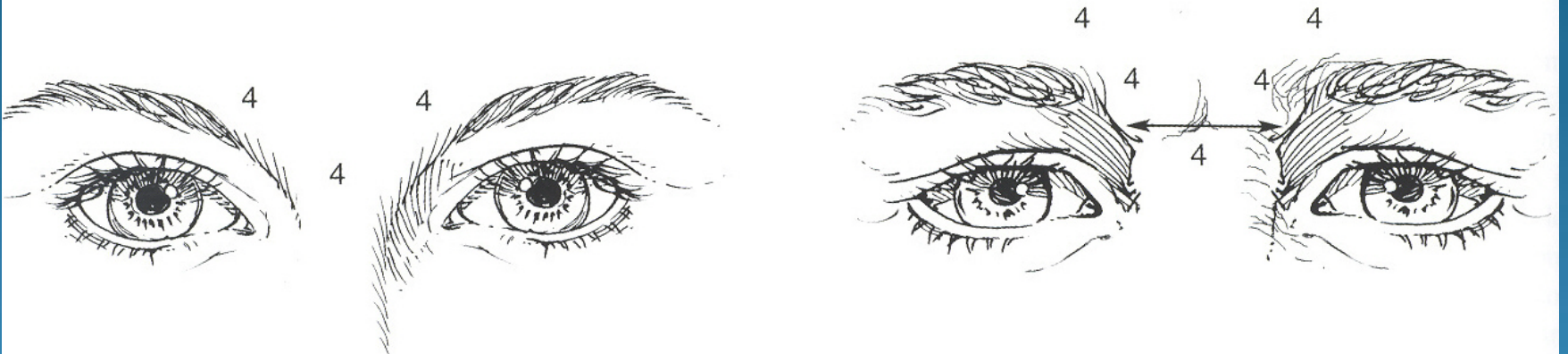


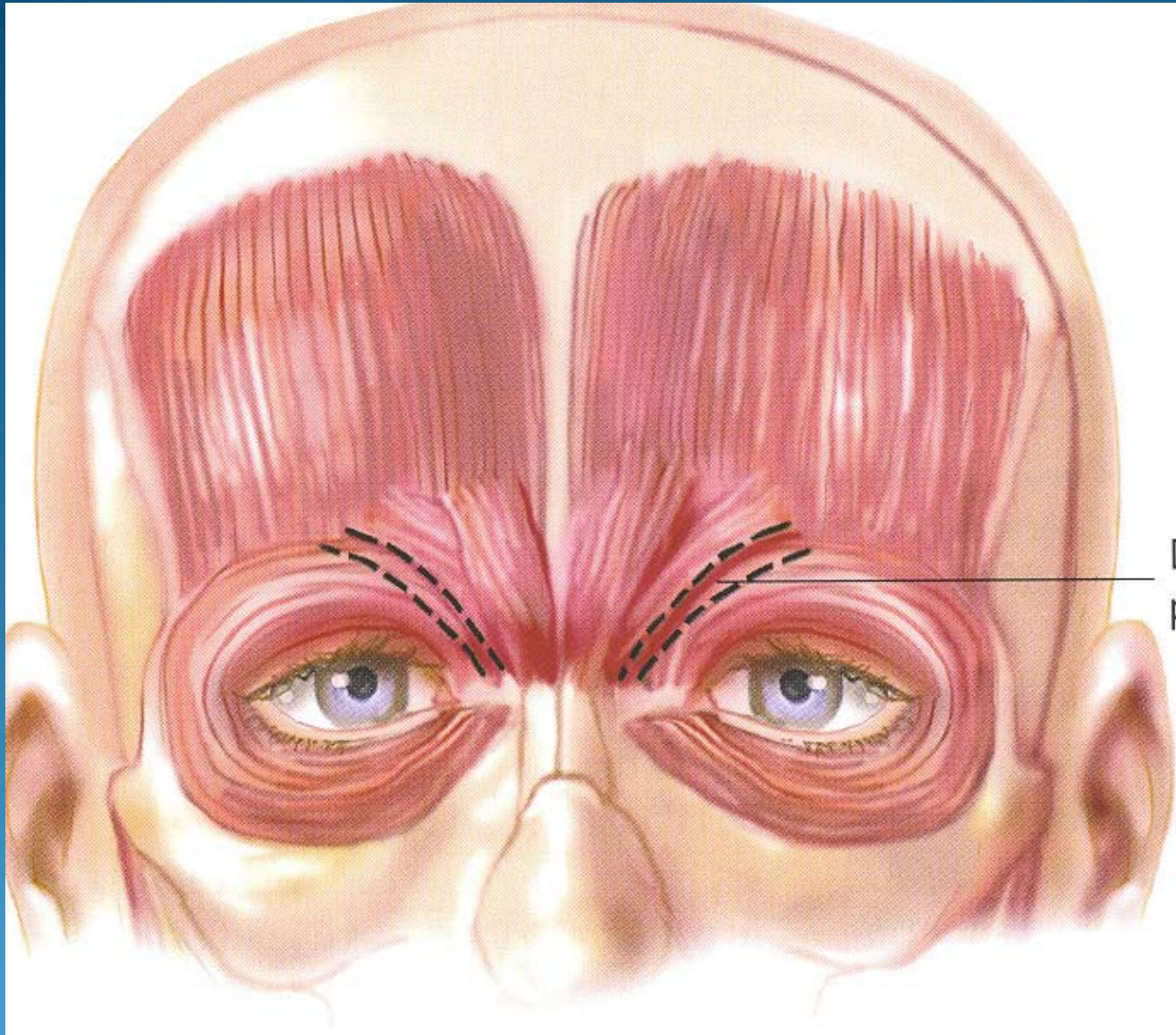
Glabellar region

- Inject 4 units (0.1cc) into each corrugator and the procerus muscle (**IM injections**)
- avoid hitting the periosteum
- after injection of the procerus, massage laterally to ensure diffusion into the depressor supercillii portion of the corrugator

Female

Male





Depressor supercilli
portion of the corrugator

Side Effects of Treating the Glabellar Region

- Blepharoptosis- occurs when toxin diffuses into upper eyelid levator muscle

Avoiding Side Effects

- Patient should remain vertical for 2-3 hours postop
- encourage patient to frown frequently, but not manipulate the area
- avoid injection of the levator palpebrae superioris muscle
- corrugator injection should be at least 1 cm above supraorbital ridge
- do not inject closer than 1 cm above the central brow

Post Procedure Care

- Patients should remain vertical for 2-4 hours
- avoidance of touching or rubbing of the treated sites for 24 hours
- results take 12-96 hours to appear
- optimal effect develops within 7 days
- effectiveness declines after 3-4 months

Contraindications to Botox

- Presence of neuromuscular disorders such as myasthenia gravis or ALS
- Pregnant or lactating women
- Patients taking aminoglycosides, penicillamine, quinine, or CCB's
- Evidence of active infection at injection site

General Complications

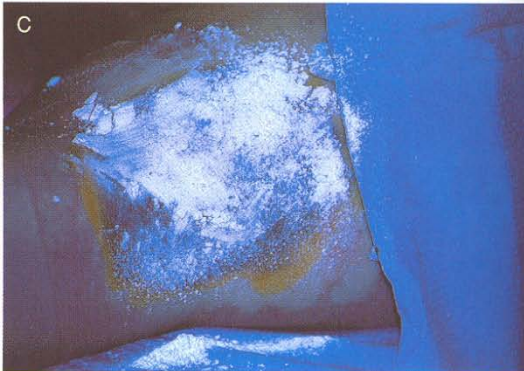
- Bruising (esp. in patients taking ASA or Vitamin E)
- acute Type I allergic reactions
- nausea, headache, fatigue, malaise, flu-like symptoms, and rashes at sites distant from injection have all been reported

Hyperhidrosis

- Can treat axillary, palmar, and plantar areas
- reconstitute one 100 unit vial with 5 cc NS
 - 2 units per 0.1 cc
- injections are intradermally (vs. IM for facial lines)
- nerve blocks are needed for anesthesia
- inject 0.05 cc at 1.5 cm intervals

Hyperhidrosis

- Perform Minor's starch-iodine test
 - iodine solution (9 parts iodine with 1 part castor oil) applied to affected area
 - cover with starch powder
 - areas producing sweat will turn blue-black
 - provides map for injection sites



Hyperhidrosis

- 100 Botox units (5 cc) needed per palm or sole
- 50 Botox units needed per axilla
- effects last approx. 4 months
- side effects:
 - hematomas
 - transient weakness of hand muscles