



THE OCULOPLASTIC OD

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All financial relationships have been mitigated.



NEUROTOXIN



NEUROMODULATOR

Originally approved for the treatment of eye muscle disorders like *blepharospasm* and *strabismus*, Botox has become an increasingly popular cosmetic procedure. According to the American Society of Plastic Surgeons (ASPS), botox injections were the single most popular minimally invasive cosmetic procedure performed in the United States and continues to increase each year in injections performed.



NEUROMODULATOR

- **Neurotoxin** for Dynamic wrinkles
(seen with facial movement)
 - Forms during contraction of
their underlying muscles



IS THIS DYNAMIC OR ADYNAMIC?











NEUROMODULATOR

Reduces / eliminates fine lines & wrinkles by temporarily preventing muscle contractions through blocking the release of acetylcholine

Serotype A (Botox, Dysport, Xeomin, Jeuveau, Daxxia) is the commercially available form with emerging use of other serotypes (Myobloc – Serotype B, indicated for cervical dystonia)



FDA APPROVED

1989-Blepharospasm & Strabismus

2002-Glabella

2013-Lateral Canthul Rhytids

2018-Frontalis

Common Off Label Uses

- Bunny lines
- Lower Eyelid (Jelly Roll)



BOTULINUM TOXIN, TYPE A

Normal Diffusion (Aesthetics)

- Onabotulinumtoxin A, Incobotulinumtoxin A, Abobotulinum Toxin A (Equivalent)
 - Dime=2 unit injection
 - Nickel=4 unit injection

Peak effect 5-7 days



TYPICAL DOSING

Men

- 40-60 units

Women

- 12-50 units

Estimated lethal dose is 3,000 units in a 100kg human (1200 units is the largest documented dose utilized therapeutically)

APPROVED PACKAGING

Abobotulinumtoxin-A supplied in vials of 300 units

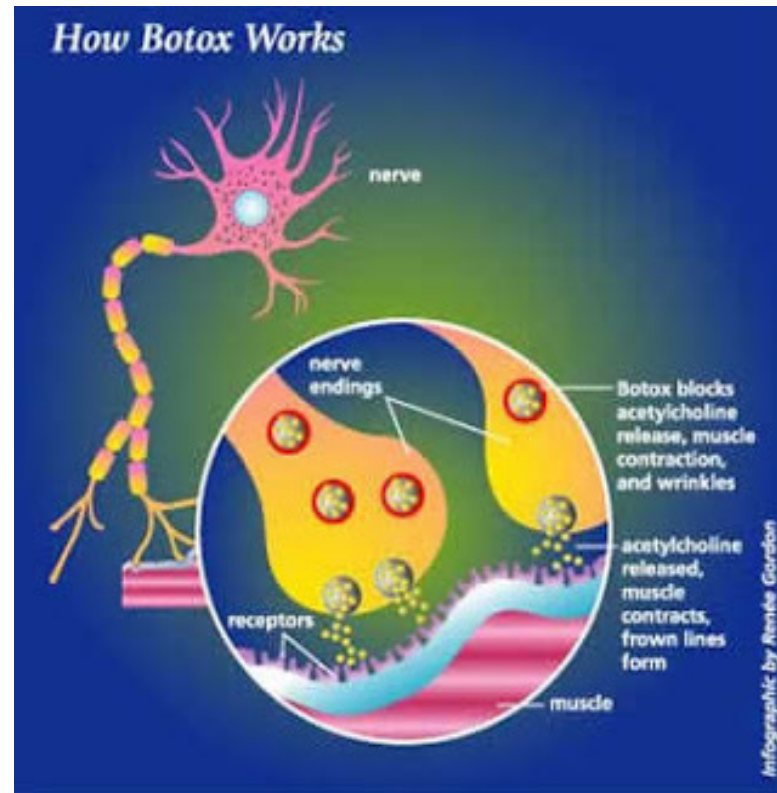
- Conversion factor is 2.5 units=1.0 units of onabotulinum-A and/or incobotulinumtoxin-A

Onabotulinumtoxin-A in vials of 50 or 100 units

Incobotulinumtoxin-A in vials of 50 or 100 units

Prabotulinumtoxin-A- in vials of 100 units

HOW IT WORKS



WHO IS NOT A CANDIDATE?

Any “at risk” medical conditions (myasthenia gravis, lambert-eaton syndrome)

Pregnancy, Breast feeding, or Planned Pregnancy

Serious pre-existing disease: DM 1 or DM 2 (Not controlled), CHF, Uncompensated CAD, RA, SLE etc

Prior allergy or prior sensitivity to Botulinum Toxin, Type A.

Marked facial asymmetry, ptosis, or anatomic defects

Infections or skin problem at injection site

History of facial nerve palsy

POSSIBLE DRUG INTERACTIONS

Aminoglycoside antibiotics or other agents that may interfere with neuromuscular function that may increase potency

Anticoagulents

Amnioquinolones-antagonize onset

Cyclosporine-neuromuscular blockage

D-Penicillamine-ACh receptor antibodies in immunologically predisposed

DILUTION TABLES

Manufacturer's and FDA recommended dilution

Onabotulinumtoxin-A, Incobotulinumtoxin-A, and Prabotulinumtoxin-A

- 2.5 mL of 0.9% sodium chloride results in 4.0 units per 0.1 mL dose

Abobotulinumtoxin-A

- 3.0 mL of 0.9% sodium chloride diluent added results in 10.0 units per 0.1 mL dose

Toxin-A

- 1.1 mL of 0.9% sodium chloride results in 1 unit per 1 unit with BD TB syringe



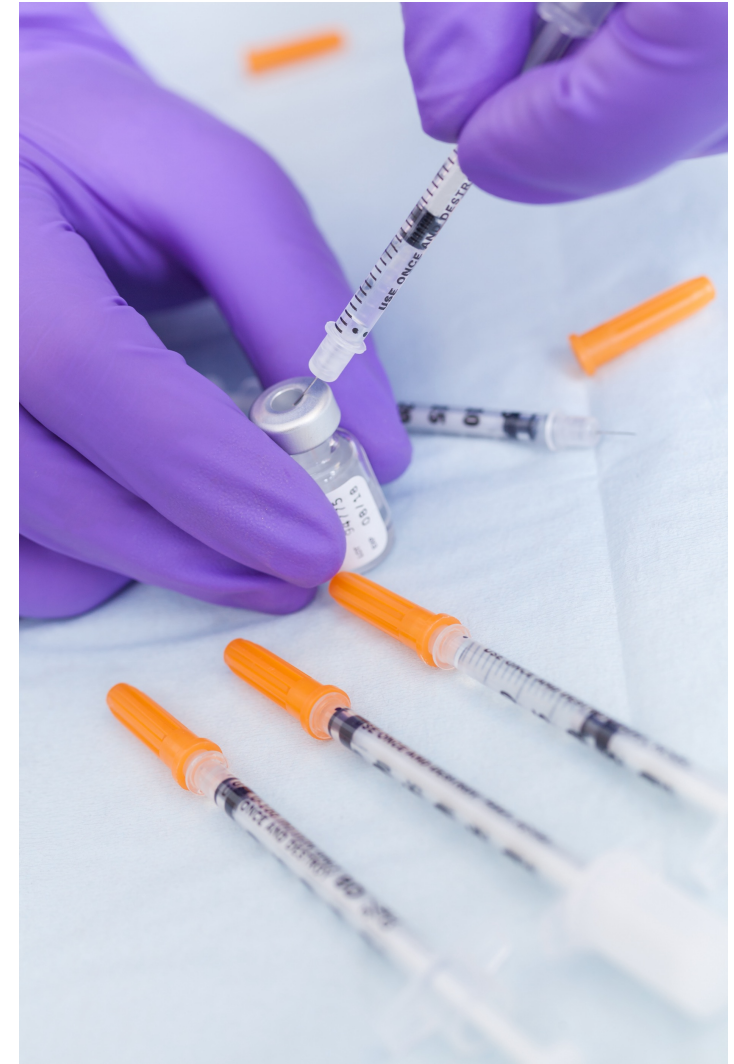
NEEDLES AND SYRINGES

Utilize 20 gauge needle and larger syringe to draw up saline

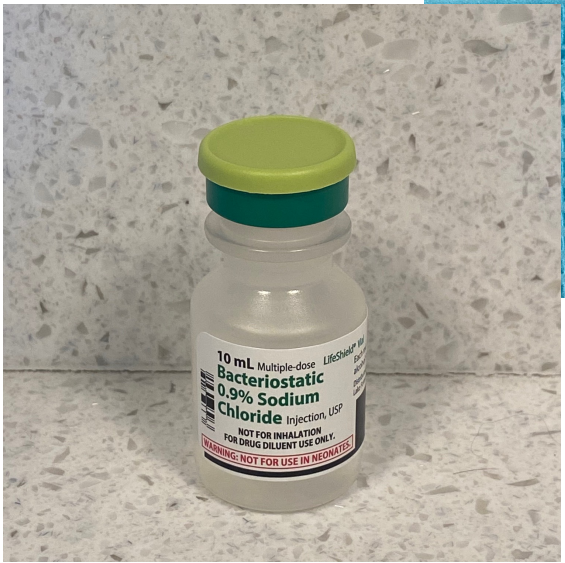
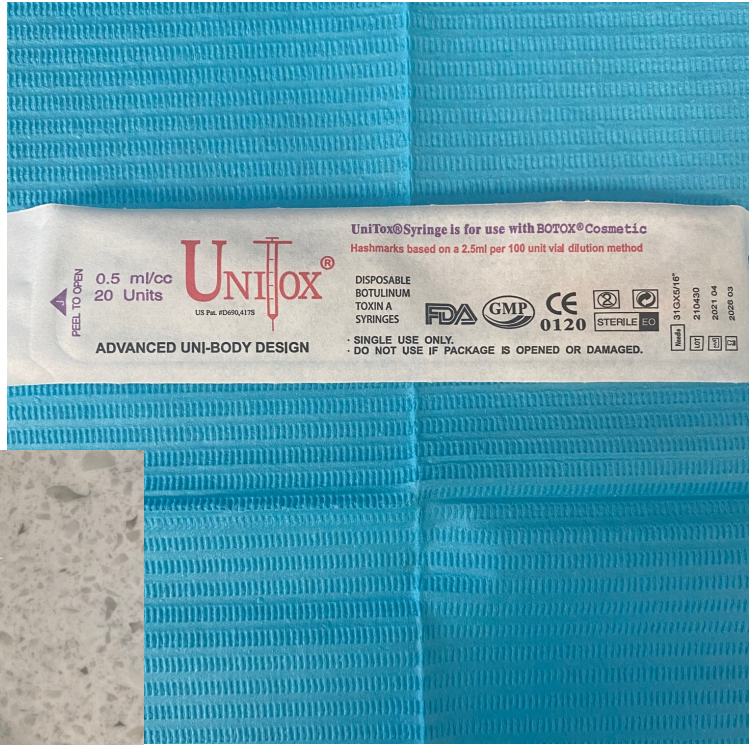
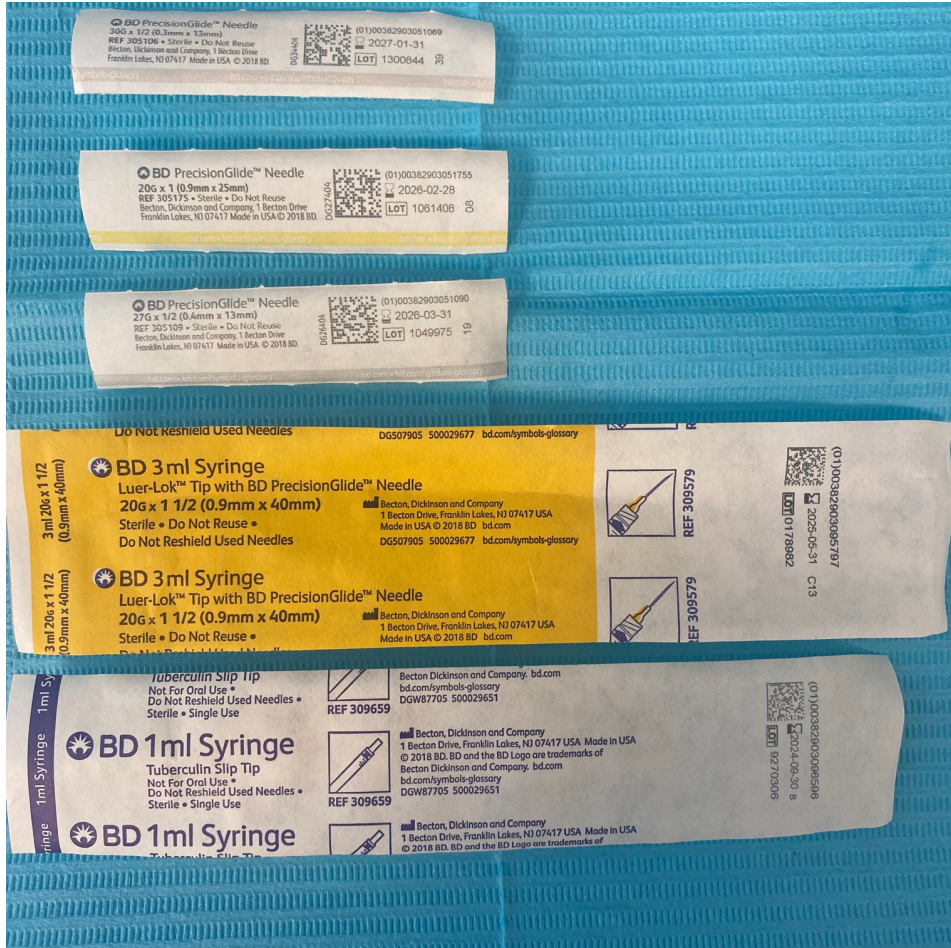
Utilize 27 gauge to reconstitute and draw up in smaller syringe

- Go SLOW!!
- There should be a vacuum seal if not then do not use.
- Do not shake to agitate
- Let alcohol completely dry so as not to denature

Utilize 30 gauge and above to inject for patient comfort







STORAGE

Store in refrigerator between 2-8 degrees C

- Can be stored for (4) weeks (87% potency)
- Preserved or Bacteriostatic saline preferred
- Should be clear, colorless, and free of particulate matter

Consensus Recommendations on the Use of Botulinum Toxin Type A in Facial Aesthetics

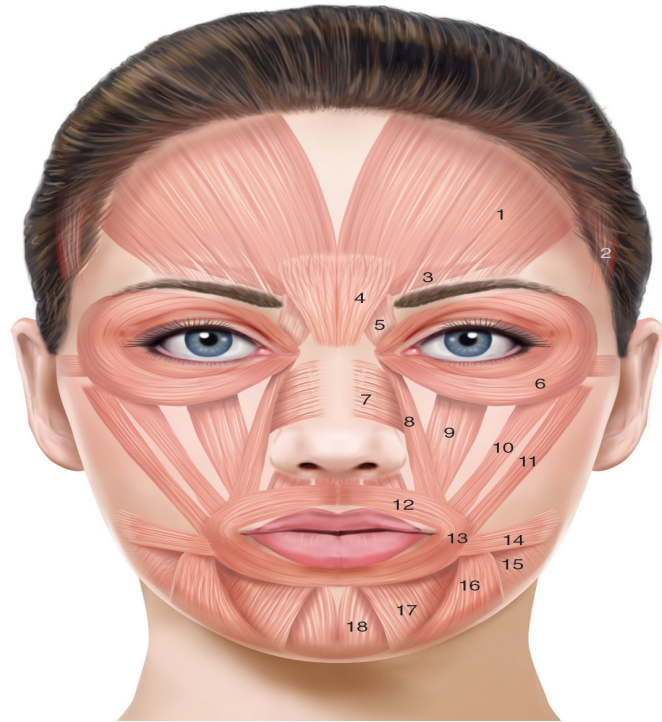
Carruthers, Jean M.D.; Fagien, Steven M.D.; Matarasso, Seth L. M.D. theBotox Consensus Group

Plastic and Reconstructive Surgery: [November 2004 - Volume 114 - Issue 6 - p 1S-22S](#)

doi: [10.1097/01.PRS.0000144795.76040.D3](#)

CONSENSUS STATEMENT

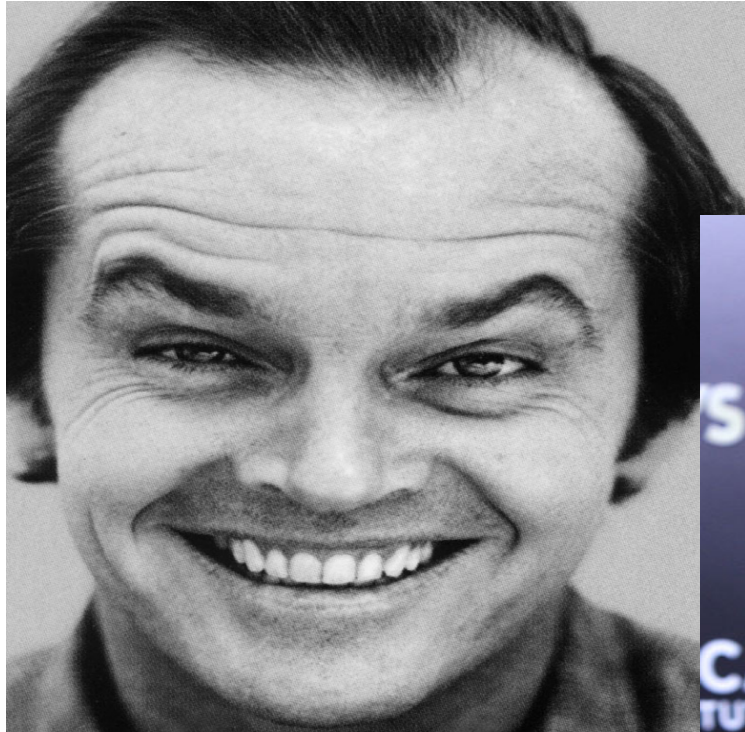
ANATOMY



MUSCLE ACTION



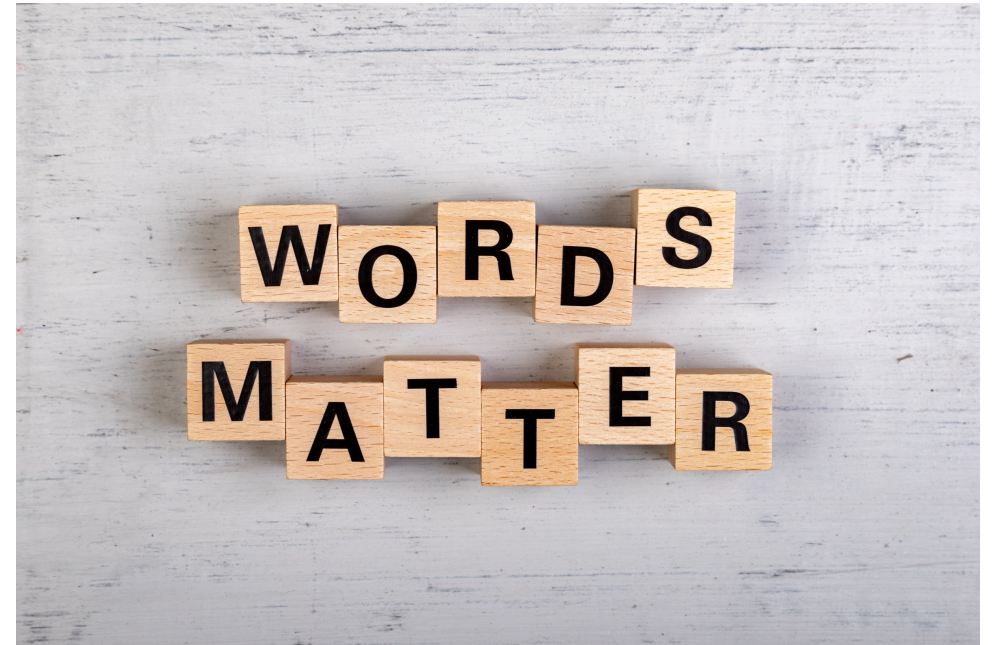
WHAT MUSCLES ARE THEY USING?



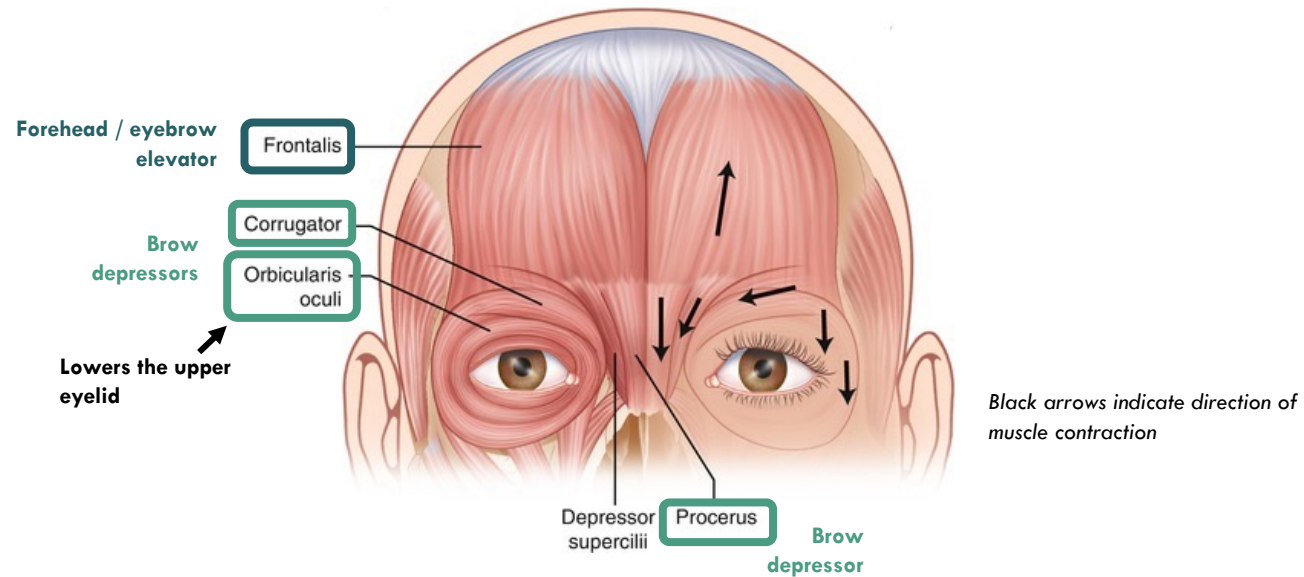
WORDS MATTER

Consultation Process

- Address Brow Asymmetry
- Analyze Frown Lines
- Patient vs Physician's Preference: Compromise
- Needs vs Wants-**Concentrate on Needs**
 - **Needs:** I'm sick of this...tired of this...
 - **Wants:** Would love to have...
- Relax vs Paralyze
- Soften vs Fix



FOREHEAD & EYEBROW MUSCULATURE



1. Masry GG. Pearls and Pitfalls in Cosmetic Oculoplastic Surgery. 2015. 2. Finsterer et al. Aesth Plast Surg. 2003; 27:193-204.

Notice how fibers of the Frontalis extend above the Corrugator muscle. This is why a brow may drop if the injections are too superficial. NO injection 1 cm above the supraorbital ridge (not the eyebrow) starting at mid-pupil

GLABELLAR COMPLEX MUSCLES

There is significant variation in individuals in the strength and size of the glabellar complex muscles

Men have a larger glabellar complex than women

Glabellar complex muscles are used almost solely for facial expression



STATIC VS DYNAMIC RHYTIDS

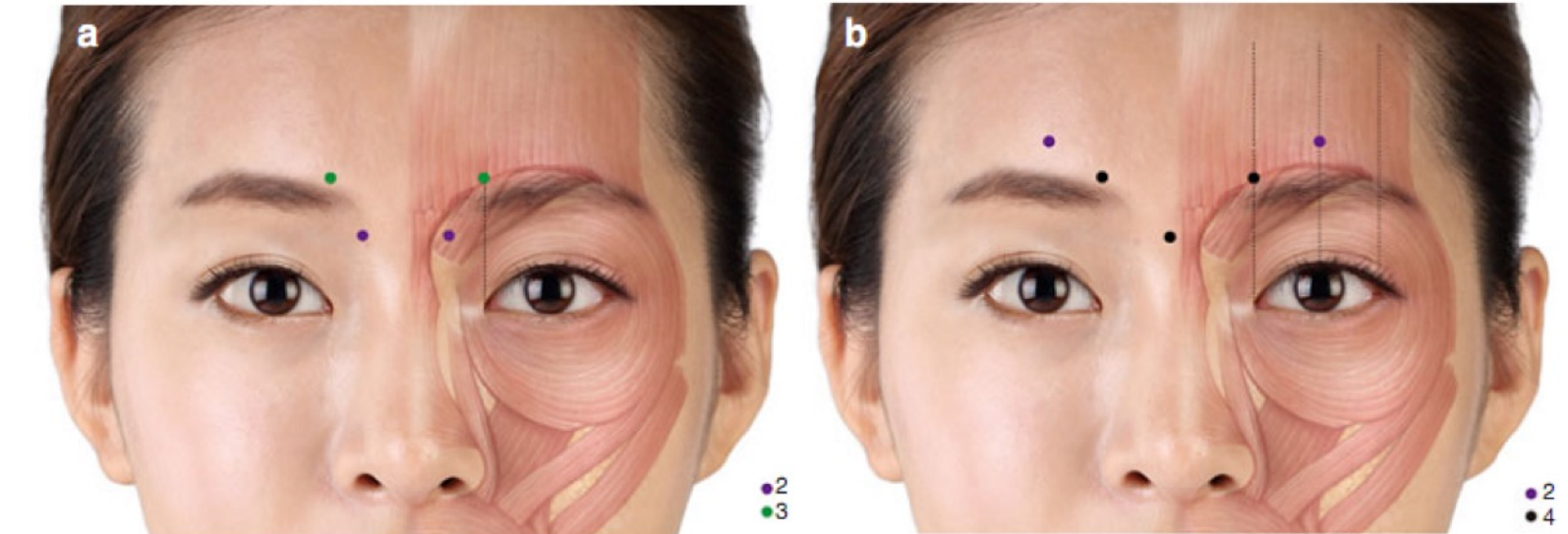
In older patients we talk about 'softening' lines rather than eliminating them completely. Do not overpromise.



Facial Area	OnabotulinumtoxinA, Incobotulinumtoxin A Women/Men # of Units	Abobotulinumtoxin A Women/Men # of Units
Glabellar Lines	4-6/6-8 (each site)	10-13/10-15 (each site)
# of injections	5-7 sites/3-5 sites	5-7 sites/3-5 sites
Type of injection	Intramuscular	Intramuscular
Total # of Units	20-40 units	50-105 units

- Muscles
 - Corrugator, Procerus, Orbicularis Oculi, Depressor Supercilli
- Pearls
 - Pinch technique/intramuscular
 - 4 units per injection (typical)
 - Injection can be as little as 3 sites and as little as 2 u for smaller muscles

GLABELLA











ORBICULARIS OCULI

Very superficial muscle

Immediately subdermal on many portions within periorbita

Strong brow depressor especially laterally (largest part of the muscle)

Lateral inferior orbicularis is active in:

- Squinting and smiling

Typical smile involves both lateral orbicularis **and** zygomaticus major.

LATERAL RHYTIDS



LATERAL CANTHAL RHYTIDS



Full-fan Pattern: Lines that project from the lateral canthal area and extend into both the superior malar area and the tail of the brow



Lower-fan Pattern: Lines predominantly confined to the lateral canthal area and the superior malar area



Central-fan Pattern: Lines predominantly confined to the lateral canthal area and not extending into the superior malar area or lateral third of the brow



Upper-fan Pattern: Lines predominantly confined to the lateral canthal area and extending toward or into the lateral third of the brow

Figure 1. Classification of CFL patterns. Four patterns (full fan, lower fan, central fan, and upper fan) were identified in this study.

LATERAL CANTHUS RHYTIDS

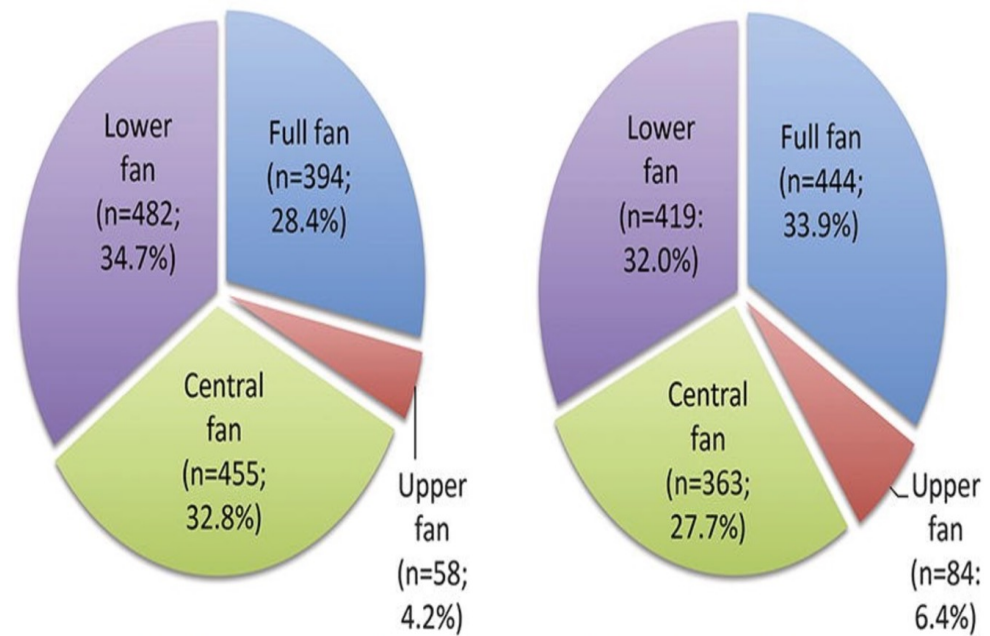


Figure 2. Distribution of CFL fan patterns at maximum smile and at rest. Full fan, lower fan, and central fan were the most commonly observed patterns at almost equal proportions.

Injections should be given with the needle bevel tip up and oriented away from the eye. Inject 4 Units/0.1 mL of reconstituted BOTOX Cosmetic into 3 sites per side (6 total injection points) in the lateral orbicularis oculi muscle for a total of 24 Units/0.6 mL (12 Units per side). The first injection (A) should be approximately 1.5-2.0 cm temporal to the lateral canthus and just temporal to the orbital rim. If the lines in the lateral canthal region are above and below the lateral canthus, inject per Figure 2. Alternatively, if the lines in the lateral canthal region are primarily below the lateral canthus, inject per Figure 3.

Figure 2:

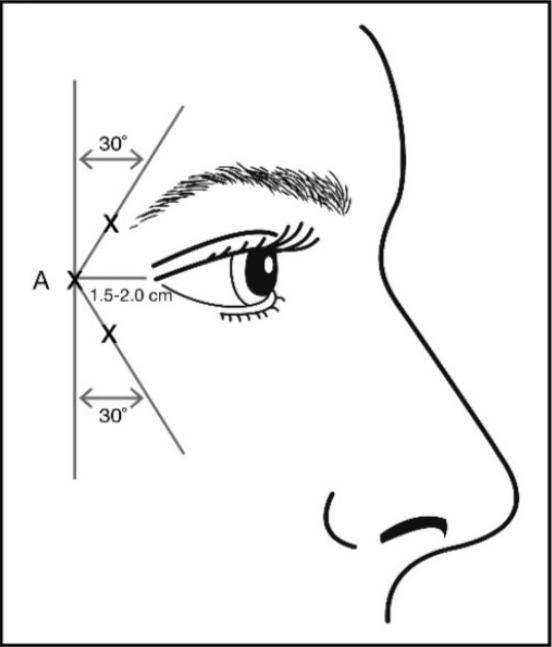
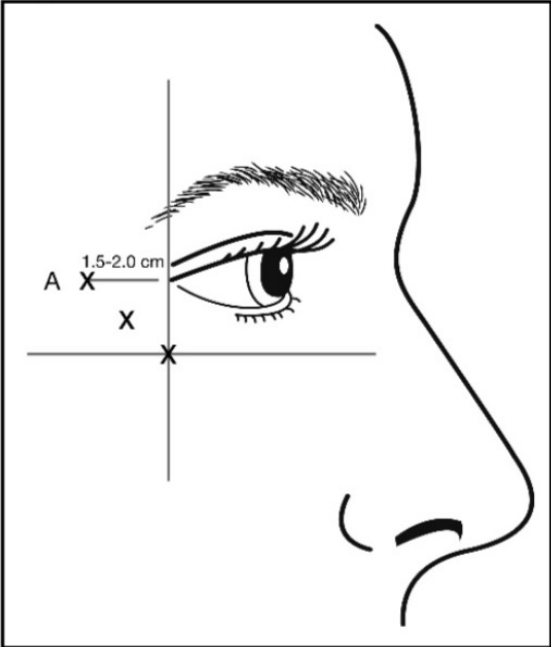


Figure 3:



SYMMETRY

However you treat just make sure and match both sides!





Facial Area	OnabotulinumtoxinA, Incobotulinumtoxin A Women/Men # of Units	Abobotulinumtoxin A Women/Men # of Units
Crow's Feet	2-4(each site)	5-10(each site)
# of injections	2-5 on each side	2-5 each side
Type of injection	Intradermal	Intradermal
Total # of Units	8-30 units	20-100units

- Muscles
 - Lateral portion of the Orbicularis Oculi
- Pearls
 - 2 unit injections with symmetry
 - Needle always pointing away from orbital rim
 - Look for vasculature before injection and AVOID
 - Injection pattern is discretionary, placement is where rhytids are

FOREHEAD SHAPING TREATMENT PEARLS

High concentration, low volume

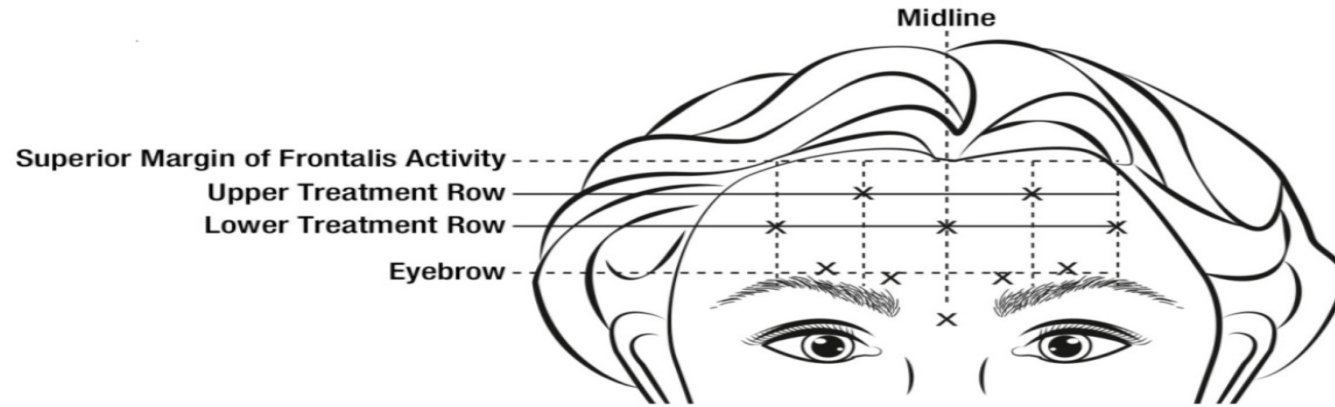
Intradermal Injections: Multiple sites (patterns)

Aesthetic brow shaping, try to avoid placement above medial or lateral eyebrow unless high on forehead.

Spare frontal branch (1 finger breath above supraorbital ridge)

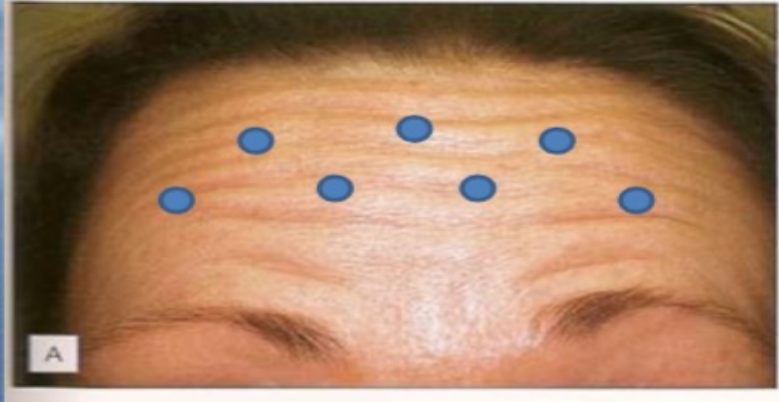
Higher location and placement to avoid possible eyebrow lowering.

FRONTALIS











6 YEARS AGO

AND NOW



timehop

Facial Area	OnabotulinumtoxinA, Incobotulinumtoxin A Women/Men # of Units	Abobotulinumtoxin A Women/Men # of Units
Traverse Rhytids	2-4(each site)	5-10(each site)
# of injections	Varies	Varies
Type of injection	Intradermal	Intradermal
Total # of Units	10-40 units	25-100units

- Muscles
 - Frontalis Muscle
- Pearls
 - 2 unit injections with symmetry-multiple injections
 - Look for vasculature before injection and AVOID
 - Injection pattern is discretionary, placement is where rhytids are









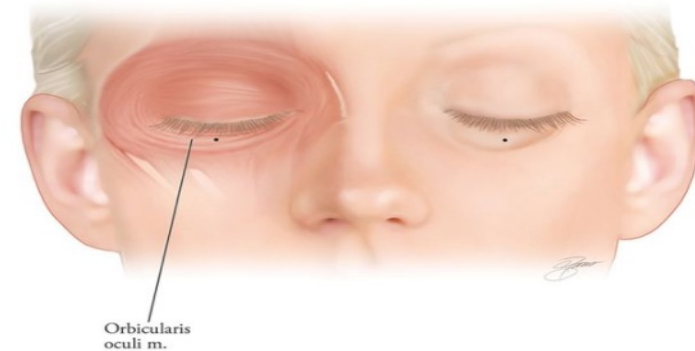


INFRAORBITAL HYPERTROPHIC ORBICULARIS

- “Jelly Roll”
- Very conservative treatment (2U)-Perform Snap Test First!
 - Can induce ectropion or lagophthalmos if not performed properly and on the right patients
 - Higher risk of bruising in this area due to superficial
 - vessels



Slide courtesy of Dr. Chad Chamberlain



MEN AND WOMEN



NORMAL FEMALE EYEBROW VERSUS MALE EYEBROW

FEMALE EYEBROW-TYPICALLY MEDIAL PART DIRECTLY OR SLIGHTLY ABOVE SUPERIOR ORBITAL RIM

LATERAL PART ABOVE SUPERIOR ORBITAL RIM

PLUCKING AND DIFFERENT IDEAL EYEBROW SHAPES VARY THROUGH HISTORY (SUBJECT ALL TO ITSELF!)

WOMEN'S EYESHAPES AND IDENTITY IS LINKED TO EYEBROW SHAPE

MALE EYEBROW

BROW TENDS TO BE LOWER AND MORE STRAIGHT WITH THE OUTER PORTION OF BROW ON SUPERIOR ORBITAL RIM, NOT ABOVE IT AS IS IDEAL IN WOMEN

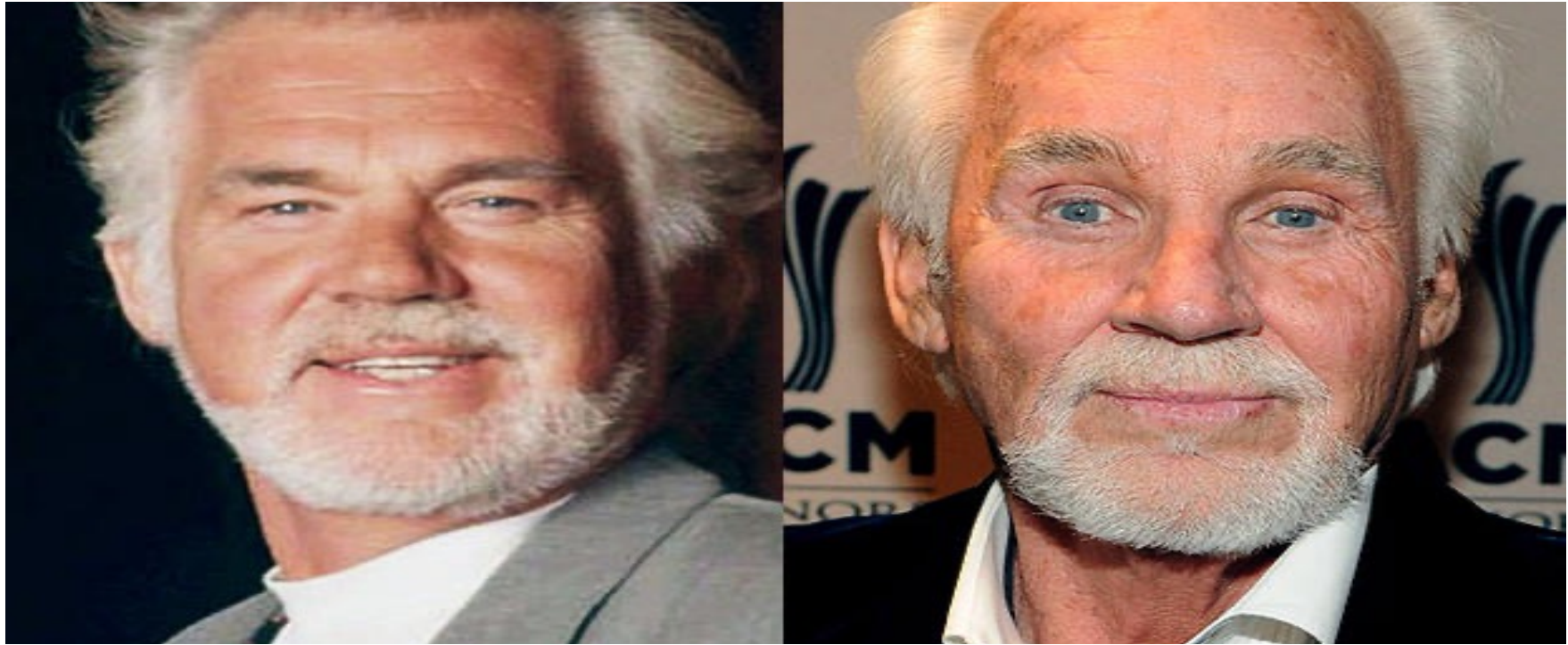
BROW THICKER THAN WOMEN AND THE SUPERIOR ORBITAL RIM IN MEN IS MORE PRONOUNCED AS WELL

CRUZ SIBLINGS

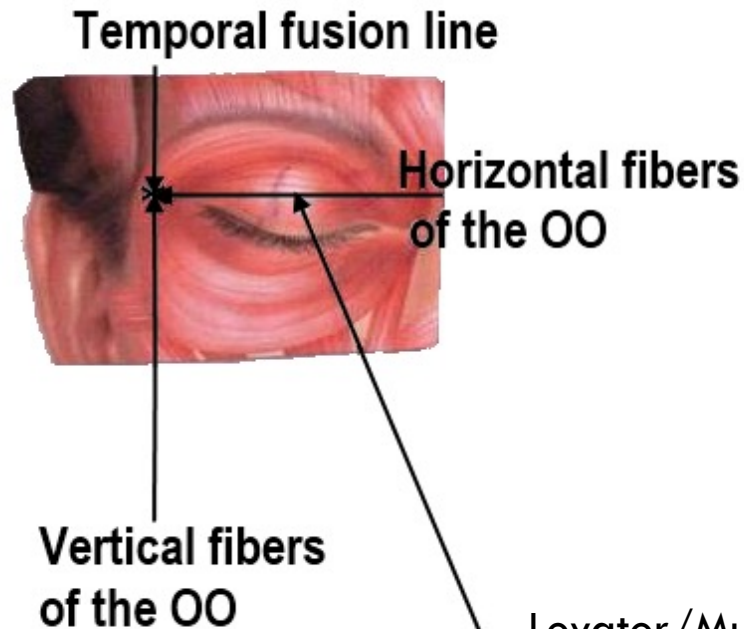


DON'T FEMINIZE MEN





LATERAL CHEMICAL BROW LIFT



Target muscle:
Orbicularis Oculi (OO)

Most depressive point on OO is where
muscle fibers change directions
(horizontal to vertical)

To locate, have patient wink very tightly
and look for where the lines start to
change orientation (horizontal to vertical)

Levator/Mueller's muscles become very
superficial in mid pupillary line

MEDIAL BROW LIFT

Assess for medial brow depression (“sinister” brow)

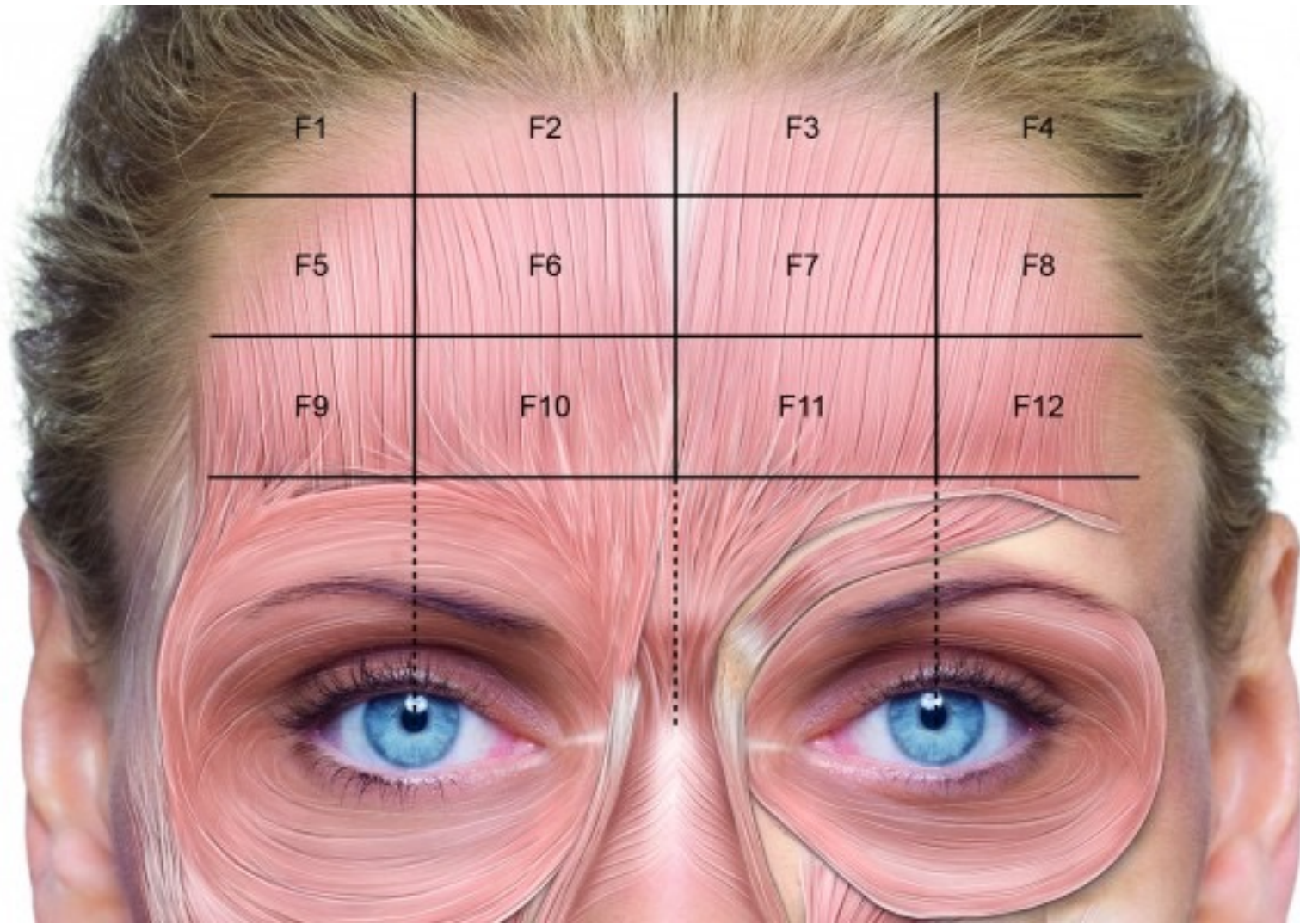
Target: medial brow depressor muscles

- Primary: procerus
- Secondary: corrugator supercilli, depressor supercilli
- Dose and technique as for glabellar frown lines

GLASSES RECHECK 😊







EYEBROW ASYMMETRY

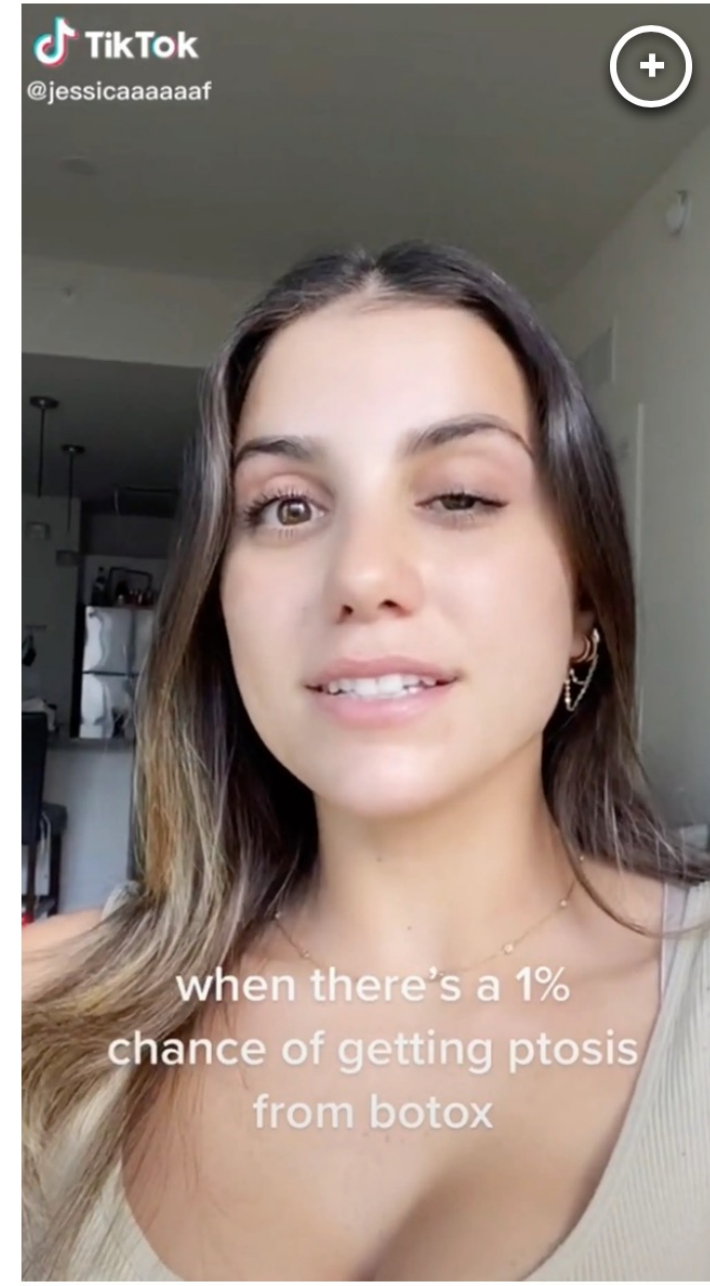
Decide if you are going to raise or lower or leave asymmetric?



POSSIBLE COMPLICATIONS

Blepharoptosis

- Almost always due to patient rubbing
- Typically only lasts 1-2 weeks
- Can utilize Aproclonidine 0.5% Eye Drops



MEPHISTO'S SIGN



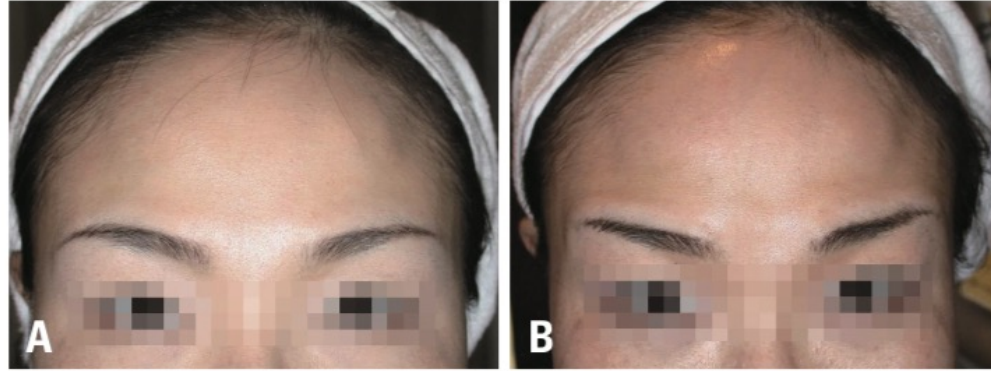


Fig. 1. (A) Before BoNT-A injection, (B) 2 weeks after BoNT-A injection. BoNT-A, botulinum toxin type A.

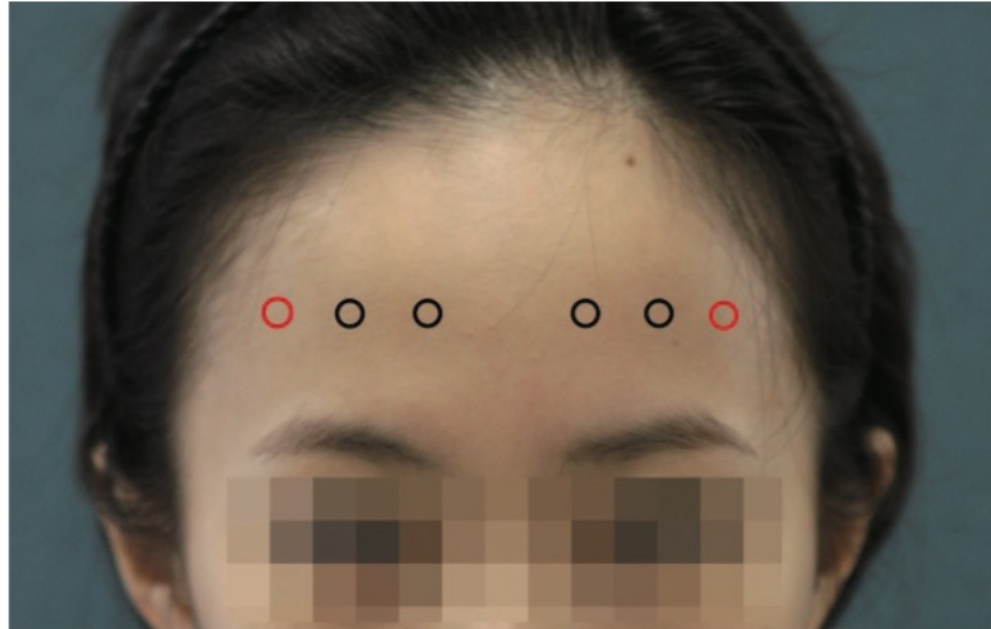


Fig. 2. Proposed injection points of BoNT-A on the frontalis muscle in chronic migraine, with additional injection points marked in red. BoNT-A, botulinum toxin type A.







LATERAL CANTHAL RHYTIDS

Bruising

Diplopia

Ectropian



CONSULTATION

Look at Asymmetry

Look at Face in Motion

- Frowny face
- Smile ear to ear
- Raise eyebrows in surprise

Motion? Where? How Many Units?

Glabella

- Procerus
- Corrugators

Frontalis

- Lateral Canthal Rhytids
 - Fan Pattern



PHOTOGRAPHY

Take at least 3 pictures before at rest and in motion

- Straight on
- Right side
- Left side

Utilize the same background

Blue or Black backdrop

Photography Consent





CONSENT FORM

Patient must sign each and every time injection.

Product specific





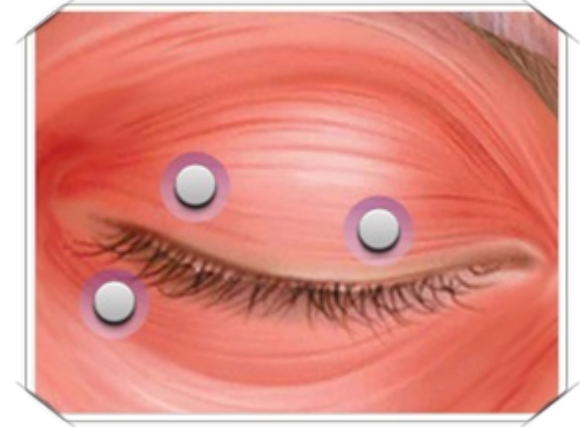
BENIGN ESSENTIAL BLEPHAROSPASM

Injection site and technique

- 1.25-2.5 units at each injection site

Billing insurance

- Bill how many units you utilize and then the rest must be “wasted.” Cannot use any of the rest of the bottle on any other patient.



Please see important BOTOX® safety information, including Boxed Warning.

Common Blepharospasm Injection Sites of BOTOX® Neurotoxin^{1,10-12}



Medial and lateral in upper lid

Lateral in lower lid

● **Common blepharospasm injection sites in the orbicularis oculi muscle. Only the orbicularis oculi is approved for the treatment of blepharospasm with BOTOX®.**¹

1. BOTOX® Prescribing Information; 10. Netter. *Atlas of Human Anatomy*. 2006; 11. Kendall et al. In: *Muscles: Testing and Function With Posture and Pain*. 2005; 12. Sommer and Lowe. In: *Handbook of Botulinum Toxin Treatment*. 2003.

A comparative crossover study on the treatment of hemifacial spasm and blepharospasm: preseptal and pretarsal botulinum toxin injection techniques

Praween Lolekha, Arthita Choolam, Kongkiat Kulkantrakorn · Published in Neurological Sciences 2017 · DOI: [10.1007/s10072-017-3107-2](https://doi.org/10.1007/s10072-017-3107-2)

Hemifacial spasm (HFS) and benign essential blepharospasm (BEB) are chronic and disabling abnormal craniofacial movements that produce involuntary eyelid twitching and closure. The efficacy and safety of botulinum toxin type A (BoNT-A) injections have been accepted and widely used for the treatment of HFS and BEB. However, different injection sites may influence the effectiveness, doses, and side effects. The aim of this study is to compare the efficacy, patient satisfaction, and complications of low-dose BoNT-A injections between injection at the preseptal (PS) and the pretarsal (PT) portion of the orbicularis oculi muscle. A total of 40 patients, 31 patients with HFS and 9 patients with BEB, participated in this study. Each patient received both PS and PT BoNT-A injections in a crossover design study. Latency to response, duration of improvement, the Jankovic Rating Scale (JRS), self-response scale, patient satisfaction scale, and complications were compared. Low-dose injections of BoNT-A at the PT portion produced a significantly higher response rate in terms of latency to response, duration of improvement, JRS, self-response scale, and patient satisfaction scale than the PS injections. Major side effects including ptosis and droopy eyelid were observed only after the PS injections. These findings confirmed that low-dose injections of BoNT-A at the PT portion provide more efficacy, patient satisfaction, and fewer complications than the PS injections for the treatment of involuntary eyelid twitching and closure in patients with HFS and BEB. [LESS](#)

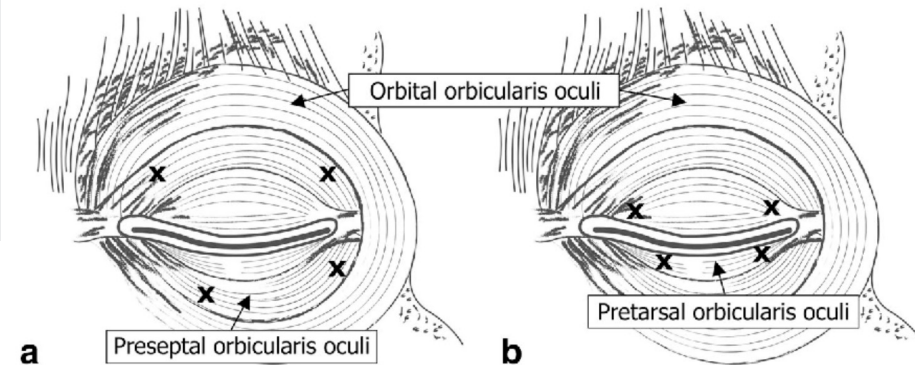


Fig. 1 a Preseptal injection sites. b Pretarsal injection sites

Preseptal Portion of Orbicularis Oculi Injection Sites





**Pretarsal Portion of
Orbicularis Oculi
Injection Sites**

X

X

X

X

FAVORITE BOOK

