

NEUROTOXINS AND AESTHETICS

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DISCLOSURES

- No affiliation with Allergan - Juvederm/Botox[®], Upneeq[®], Lumify[®], Babe Lash, Latisse, Lash Boost.
- Owner of Optometric Aesthetics, LLC
 - Neurotoxin trainings, iLight IPL machine, electrosurgery machine

OVERVIEW

- Beauty and the aging face
- Neurotoxins – Therapeutic & Cosmetic
- Dermal Fillers
- IPL – Intense Pulsed Light
- Pharmaceuticals for aesthetics
- Lumps and bumps removal
- Other facial treatments



BEAUTY AND AESTHETICS

- The beauty industry is a 500 billion industry
- Optometrists have opportunities to take a piece of the pie doing aesthetics
- Merriam-Webster definition for Aesthetics - Relating to art or beauty; done or made to improve a person's appearance or to correct defects in a person's appearance
- Why do aesthetics?
 - Its fun, it pays well, and no billing to insurance
 - Your patients are doing this anyway, why not help them?



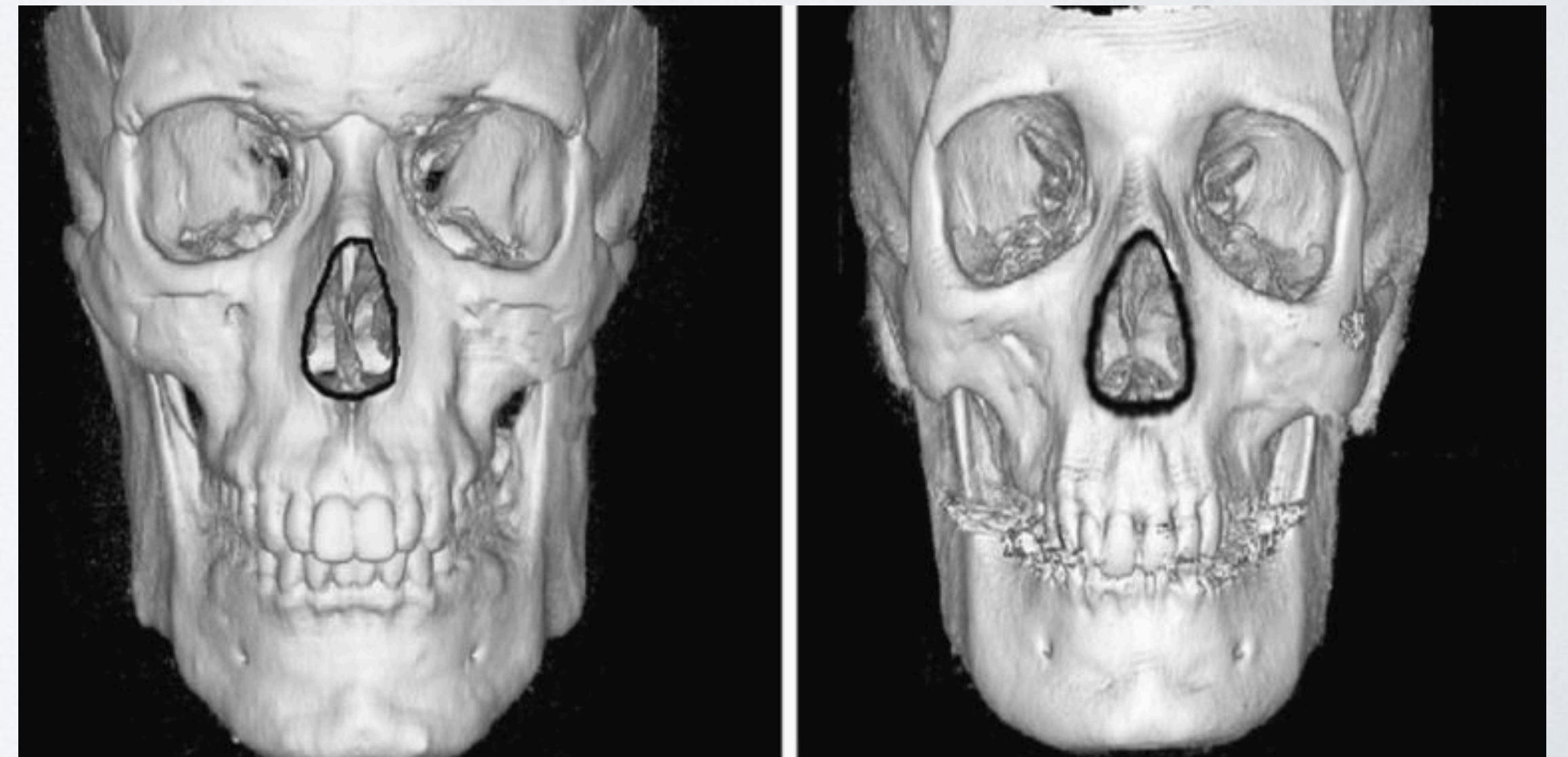
THE AGING FACE

- With age there is wisdom and experience but it also comes with other changes
- Deep creases are formed from facial expressions
- Fines lines formed by sun damage, smoking and natural degeneration
- Looser skin from loss of collagen and elastin
- Puffy or dark circles under eyes



THE AGING FACE

- Fat pads shrink and migrate downward
- Decrease in bone density





20s

30s

40s

50s

60s

THE AGING FACE



RHYTIDS “WRINKLES”

- Dynamic vs. static
- Dynamic rhytids are lines when expressions are made
- Static rhytids are lines when face is at rest



NEUROTOXINS FOR COSMETICS

Botox, Dysport, Xeomin, Jeuveau



NEUROTOXINS

- Onabotulinumtoxin-A (Botox)
- Incobotulinumtoxin-A (Xeomin)
- Abobotulinumtoxin-A (Dysport)
- Prabotulinumtoxin-A (Jeuveau)

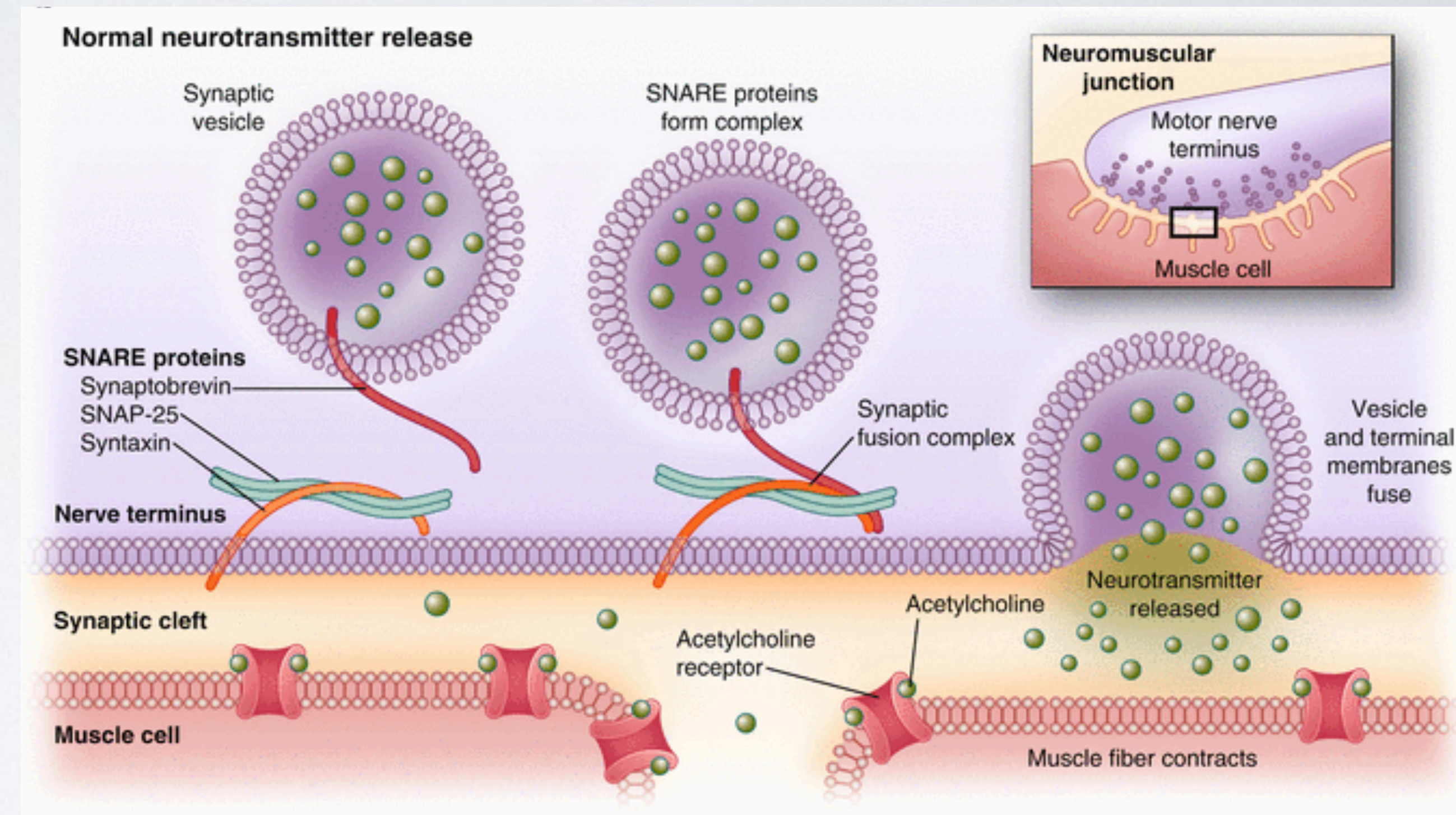
NEUROTOXIN HISTORY

- 1895 Botulinum toxin first identified
- 1978 FDA approved Type “A” for testing in humans
- 1989 First Botox FDA approval for Strabismus and Blepharospasm
- 2000 Botox FDA approval for Cervical Dystonia
- 2002 Botox FDA approval for Glabella Lines
- 2012 Botox FDA approval for Chronic Migraines
- 2013 Botox FDA approval for lateral Canthal Folds (Crows Feet)
- 2015 Botox FDA approval for Overactive Bladder
- 2017 Botox FDA approval Forehead Rhytids, Dysport FDA approved for glabella
- 2019 Jeuveau FDA approved for glabella



MECHANISM OF ACTION

- Derived from Clostridium Botulinum
 - 8 serotypes (A, B, C, D, E, F, G, H)
- Botox cleaves SNAP-25 on motor neuron
- Blocks release of Acetylcholine at NM junction
- Prevents release of ACh and muscle contraction

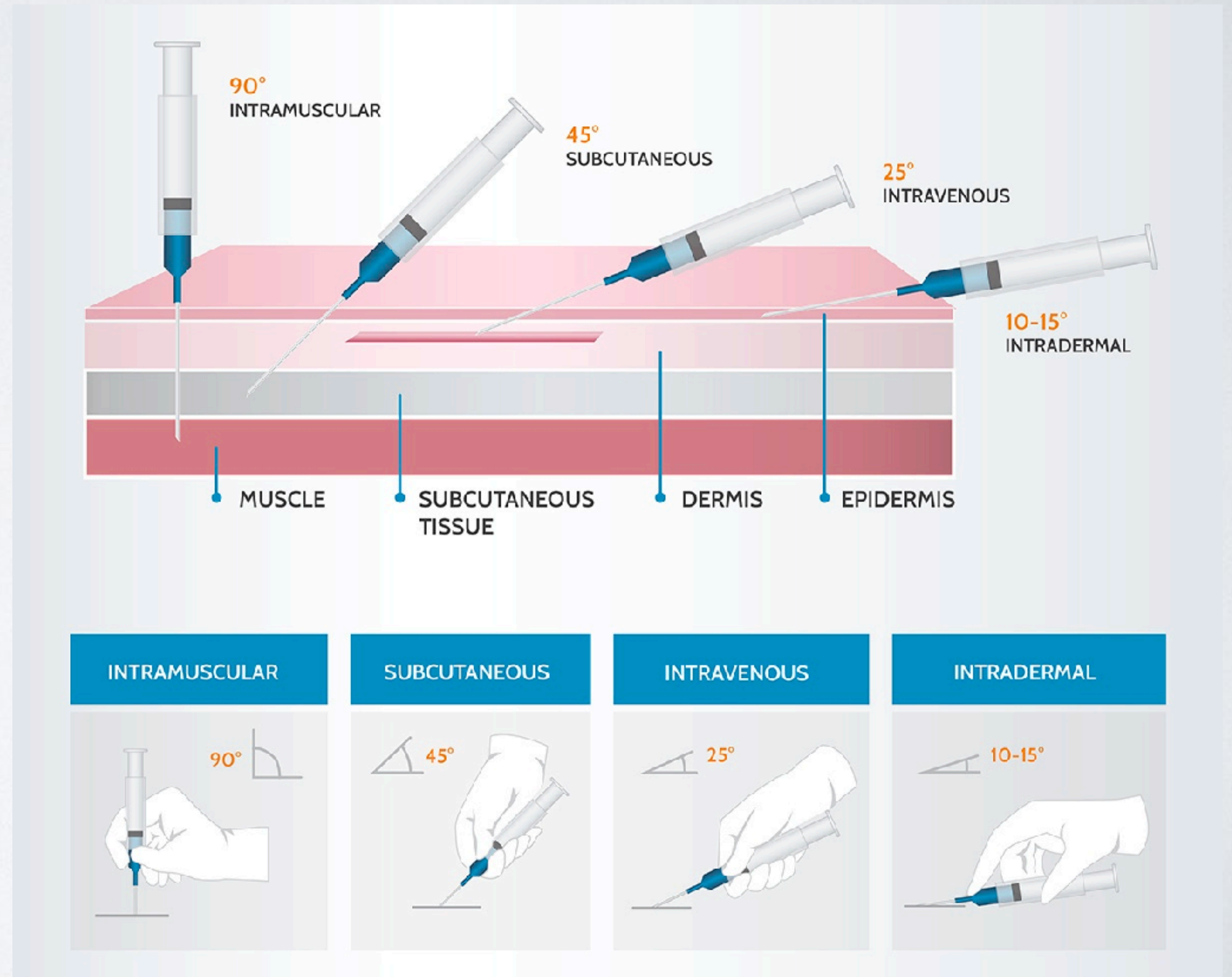


NEUROTOXIN COSMETIC

- NOT good candidates:
 - Allergy to botulinum toxin
 - Pregnant or nursing (category C)
 - Skin infections at target site
 - Neuromuscular conditions (myasthenia gravis, muscular dystrophy, ALS)

INJECTION DEPTHS

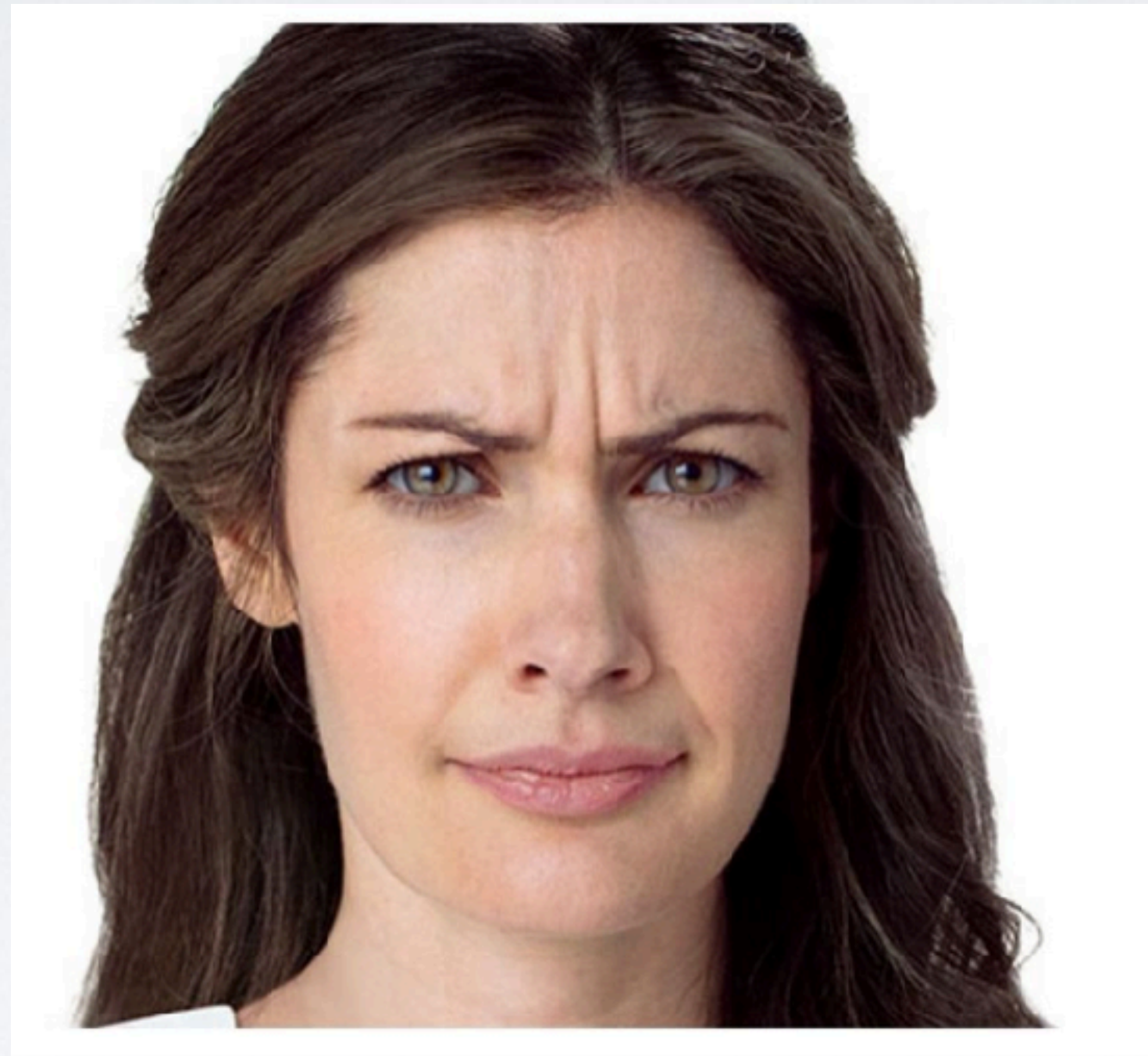
- The angle of insertion will determine the depth of the needle



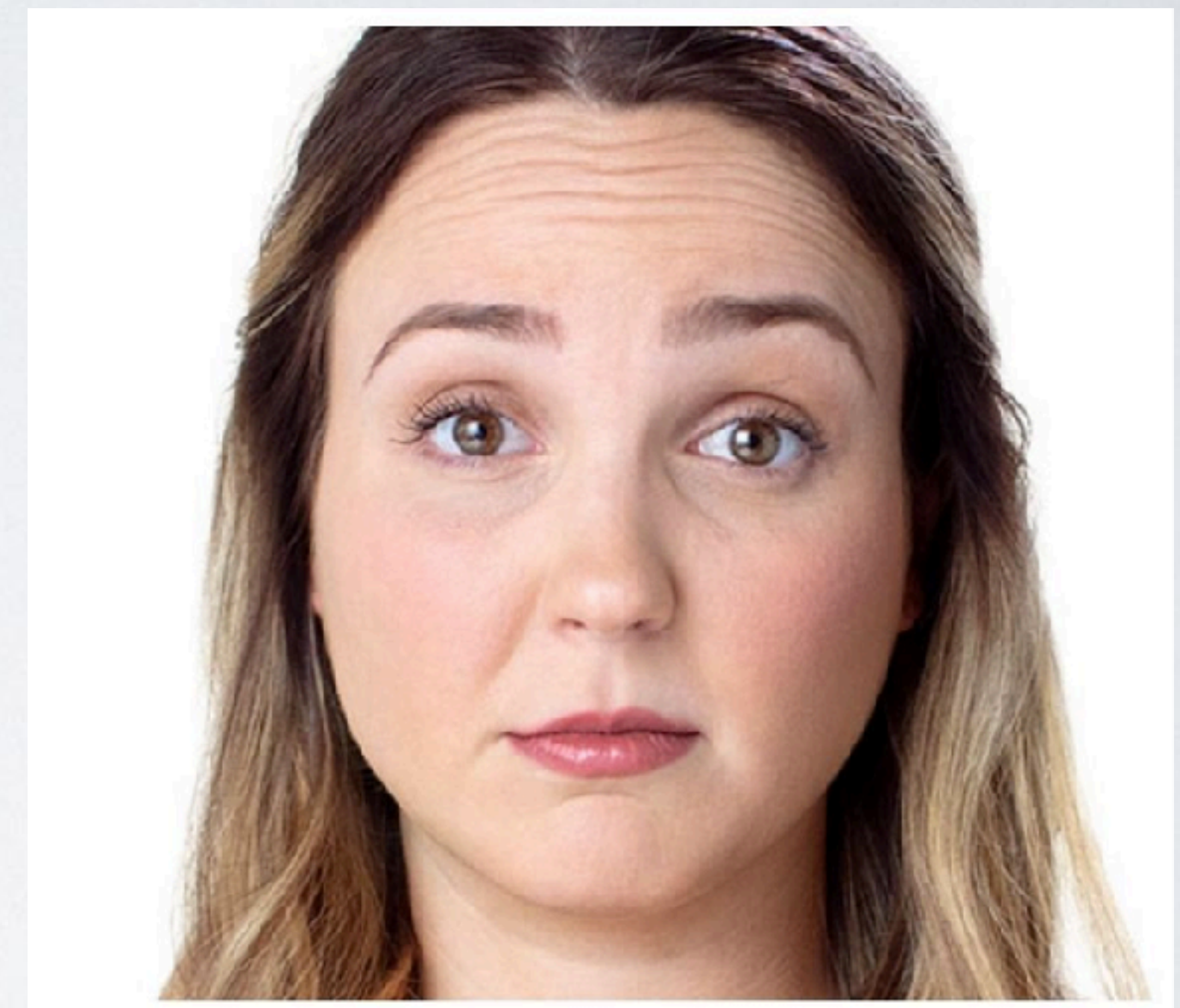
NEUROTOXIN COSMETIC



Lateral canthid rhytids
“Crows feet”



Glabella complex rhytids
“11's”



Frontalis rhytids
“Forehead wrinkles”

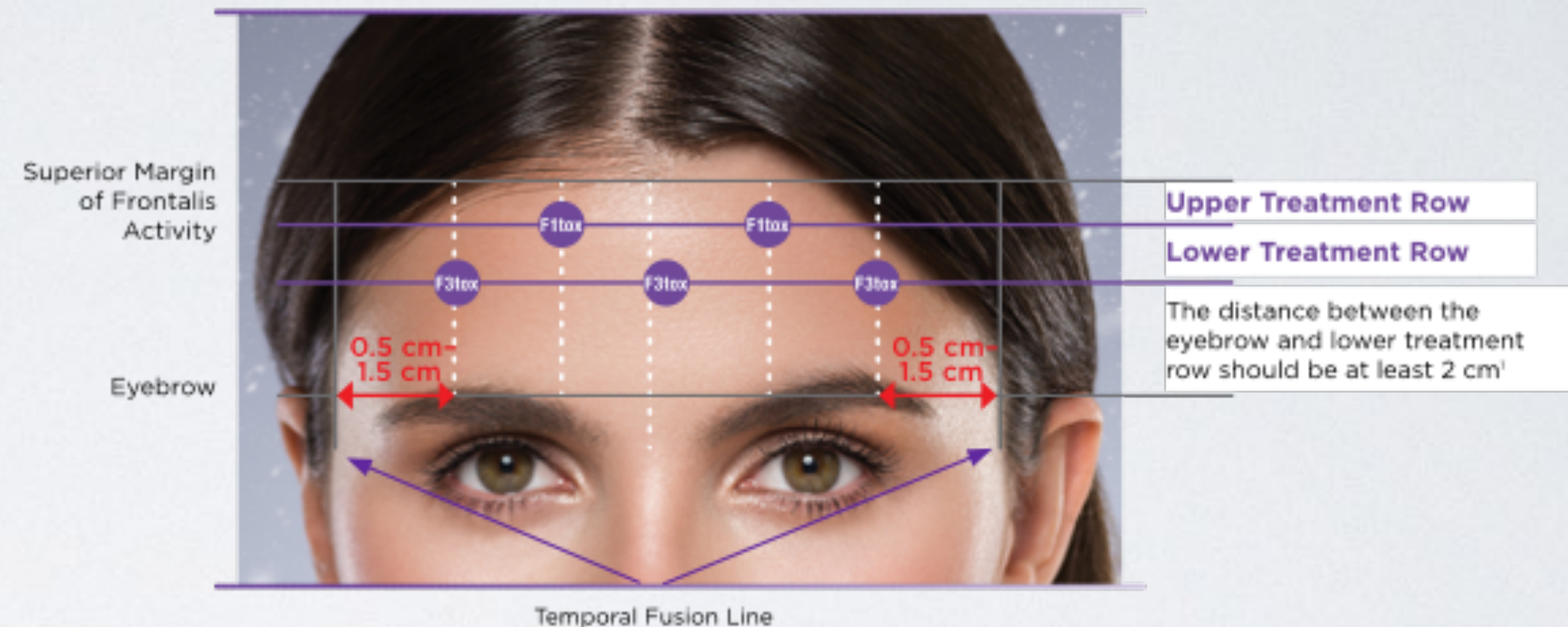
BOTOX COSMETIC - ON-LABEL



The following injection sites are recommended for on-label treatment with BOTOX® Cosmetic (onabotulinumtoxinA):

BOTOX® Cosmetic is indicated in adult patients for the temporary improvement in the appearance of:

- Moderate to severe **forehead lines** associated with frontalis muscle activity
- Moderate to severe **lateral canthal lines** associated with orbicularis oculi activity
- Moderate to severe **glabellar lines** associated with corrugator and/or procerus muscle activity



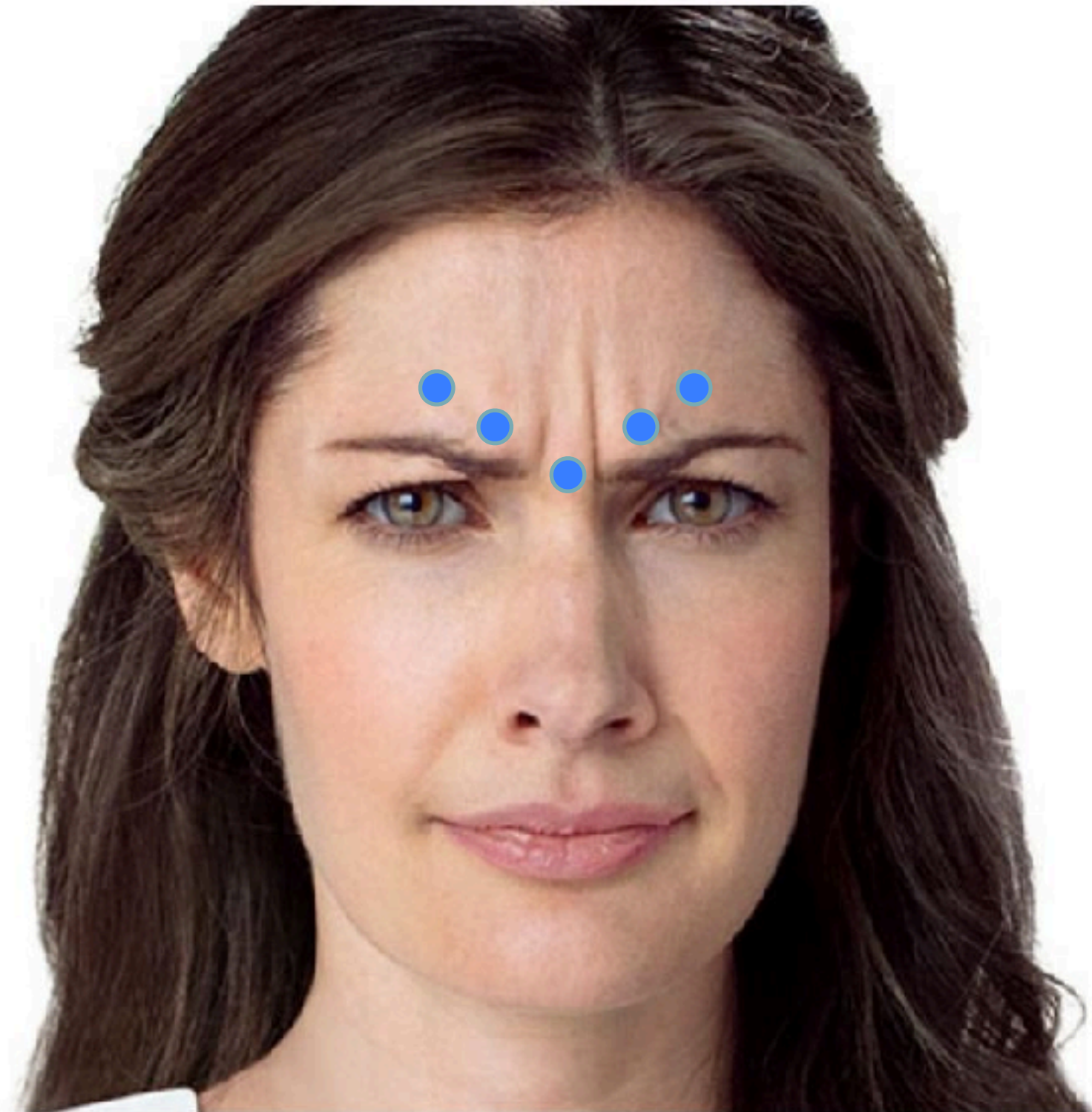
Injection Pattern 1



Injection Pattern 2

GLABELLA COMPLEX “11’S”

BEFORE



AFTER **BOTOX**
COSMETIC



FRONTALIS RHYTIDS

BEFORE



AFTER **BOTOX**
COSMETIC



LATERAL CANTHID RHYTIDS

BEFORE



AFTER **BOTOX**
COSMETIC



BOTOX THERAPEUTIC

100 and 200 unit bottles

For blepharospasm, strabismus, hemi-facial
spasms



BLEPHAROSPASM

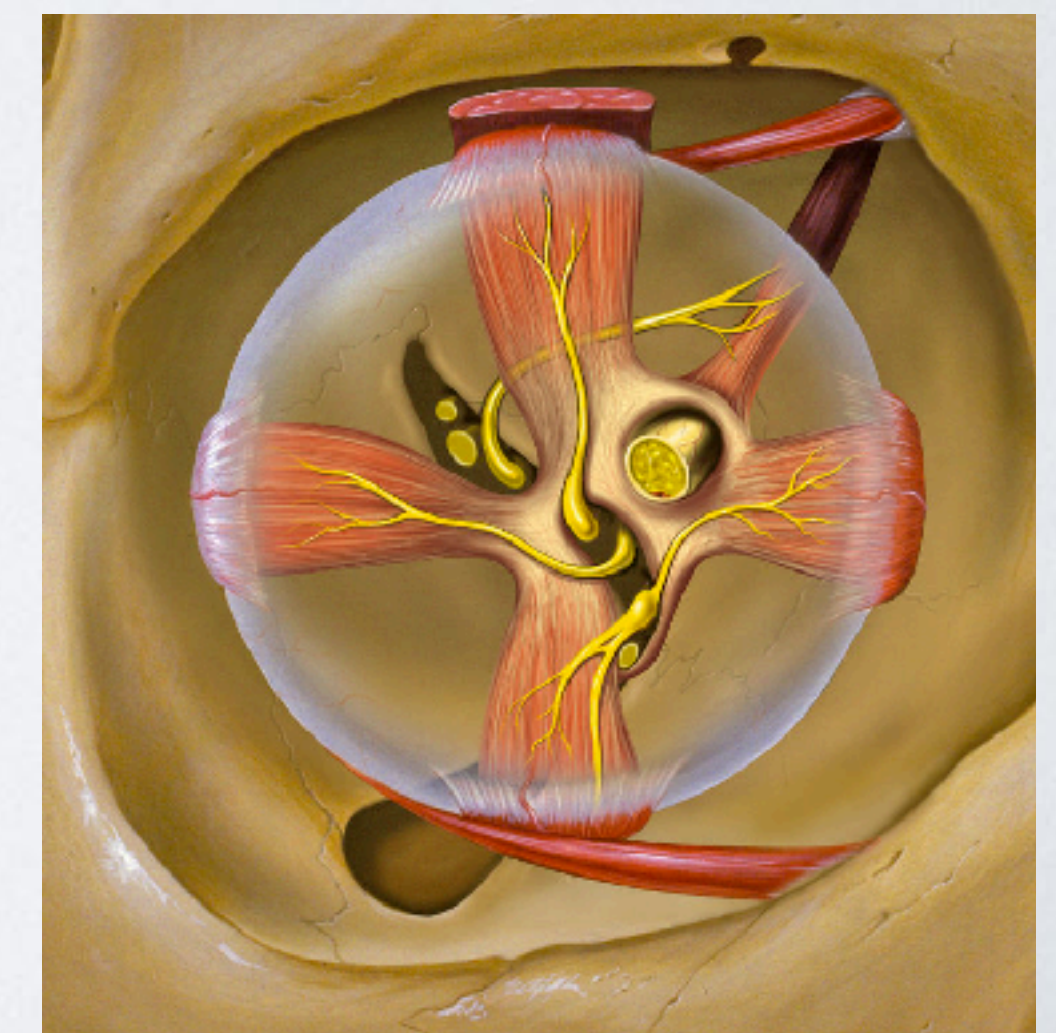
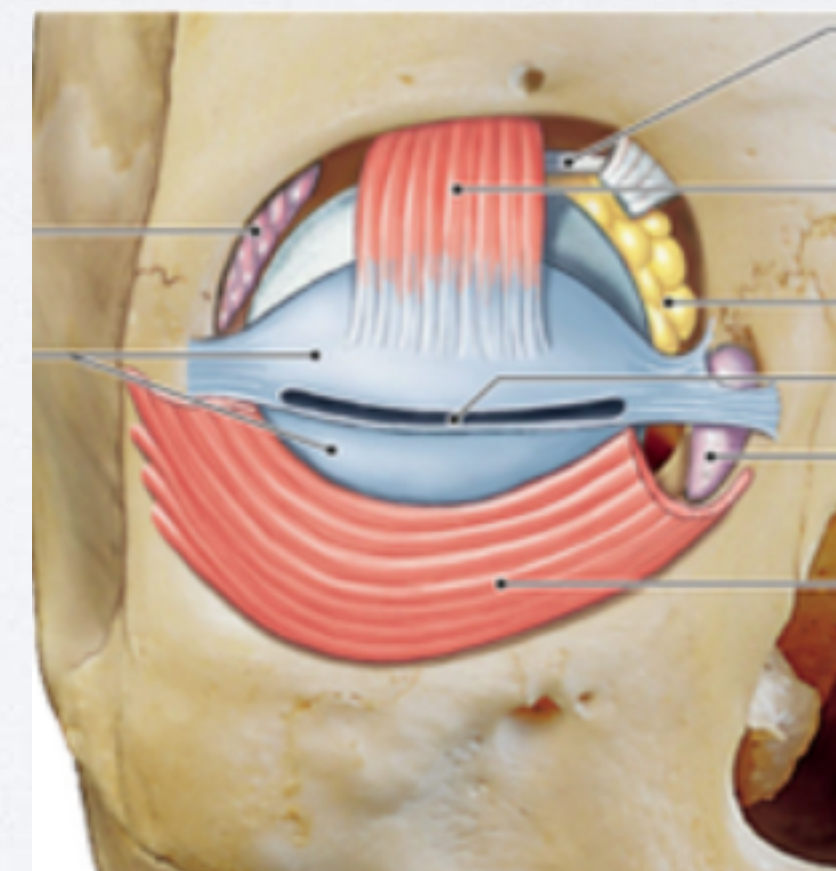
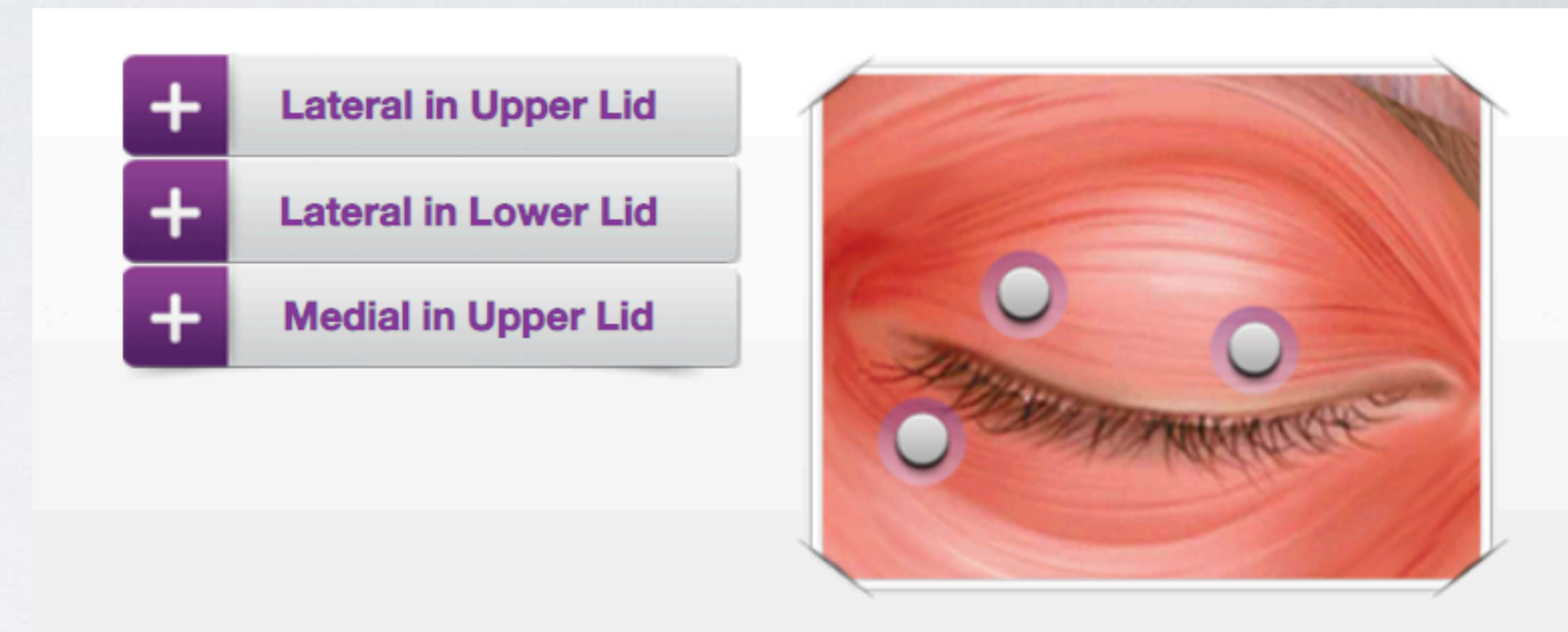
- Blepharospasm - focal dystonia of the orbicularis oculi
 - Involuntary repetitive blinking or sustained closed lids
- Onset usually between 5th and 7th decade of life*Brin et al
- Symptoms include: Excessive blinking, dry eyes, light sensitivity, ocular pain

BLEPHAROSPASM CONT.

- Treatments:
 - Dry eye - artificial tears, Restasis, Xiidra
 - Neurotoxins

BLEPHAROSPASM CONT.

- Botox for blepharospasm
- Three FDA approved injection sites
 - 1.25 to 2.5 units each site, then add more in 2 weeks if necessary
- Avoid levator palpebrae superioris to prevent ptosis
- Avoid medial LL to prevent diplopia (inferior oblique muscle paresis)
- Adverse reactions: Ptosis (21%), SPK (6%), dry eyes (6%)



STRABISMUS

- Misaligned eyes - occurs in approximately 1-3% in children*Gunton et al
- Abducen nerve palsy (microvascular disease, trauma, idiopathic, etc)
- Treatment options - glasses, glasses with prism, vision therapy, surgery, and botulinum toxin (FDA approved more than 30 years ago)



STRABISMUS CONT.

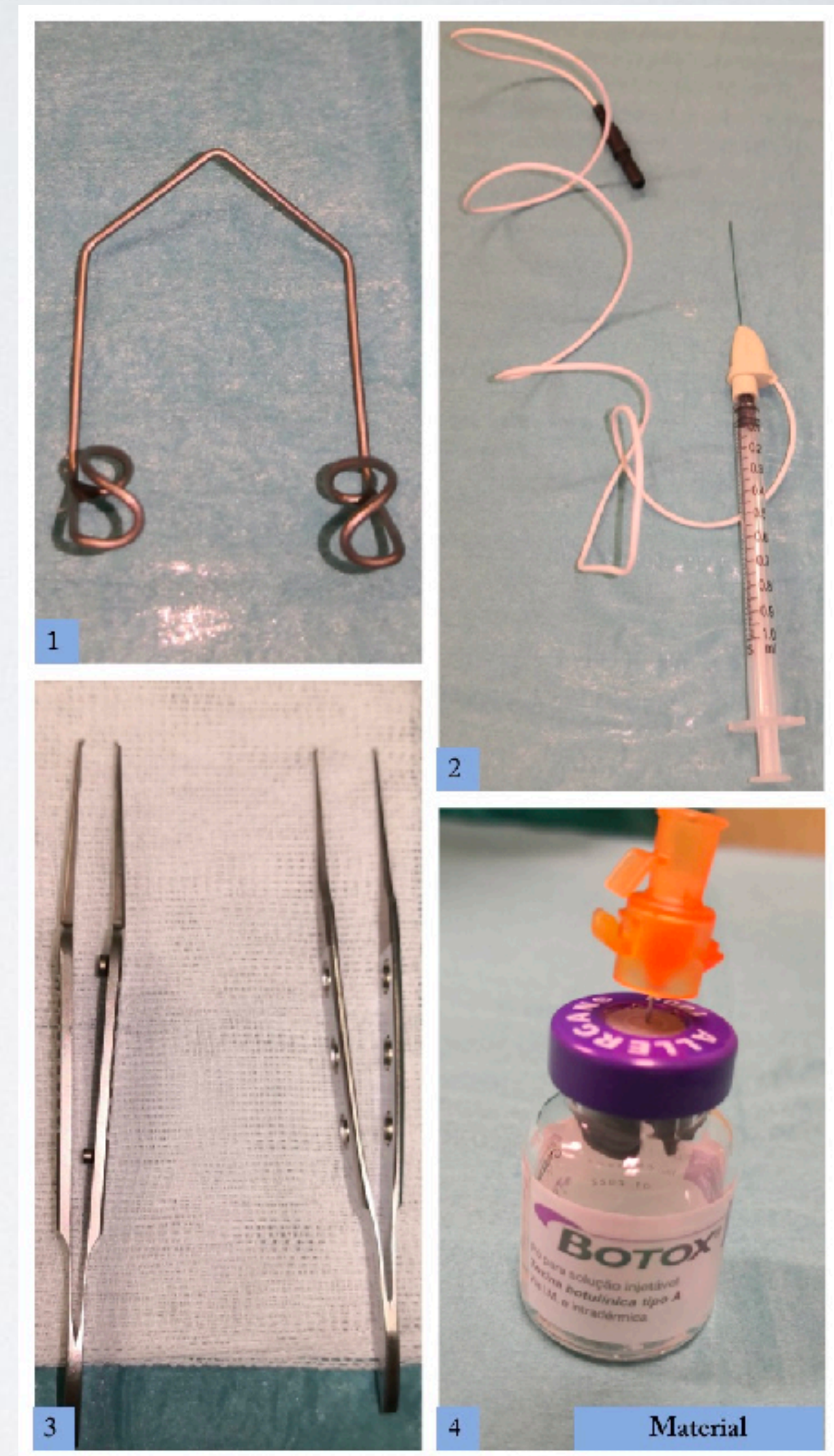
- Botulinum toxin used on overacting muscle for temporary fix (3-4 months)
- Indications:
 - Esotropia/Exotropia $<40D$
 - Acute paralytic strabismus (6th nerves palsies)
 - Adjunct to surgery for large ET, XT or 6th nerve palsy
 - TED when surgery not recommended (actively inflamed)

STRABISMUS CONT.

- Botulinum toxin LEAST effective
 - Large deviations
 - Restrictive/mechanical (trauma, chronic TED)
 - Alphabetical patterns (A, V, X syndromes)

STRABISMUS CONT.

- Technique:
 - Apply electromyogram (EMG) electrodes
 - Anesthetize area
 - Apply lid speculum
 - Needle placed into the muscle while looking away, then advanced looking toward needle until EMG sounds
 - 1.5 to 5 U injected in the muscle, and slowly removed





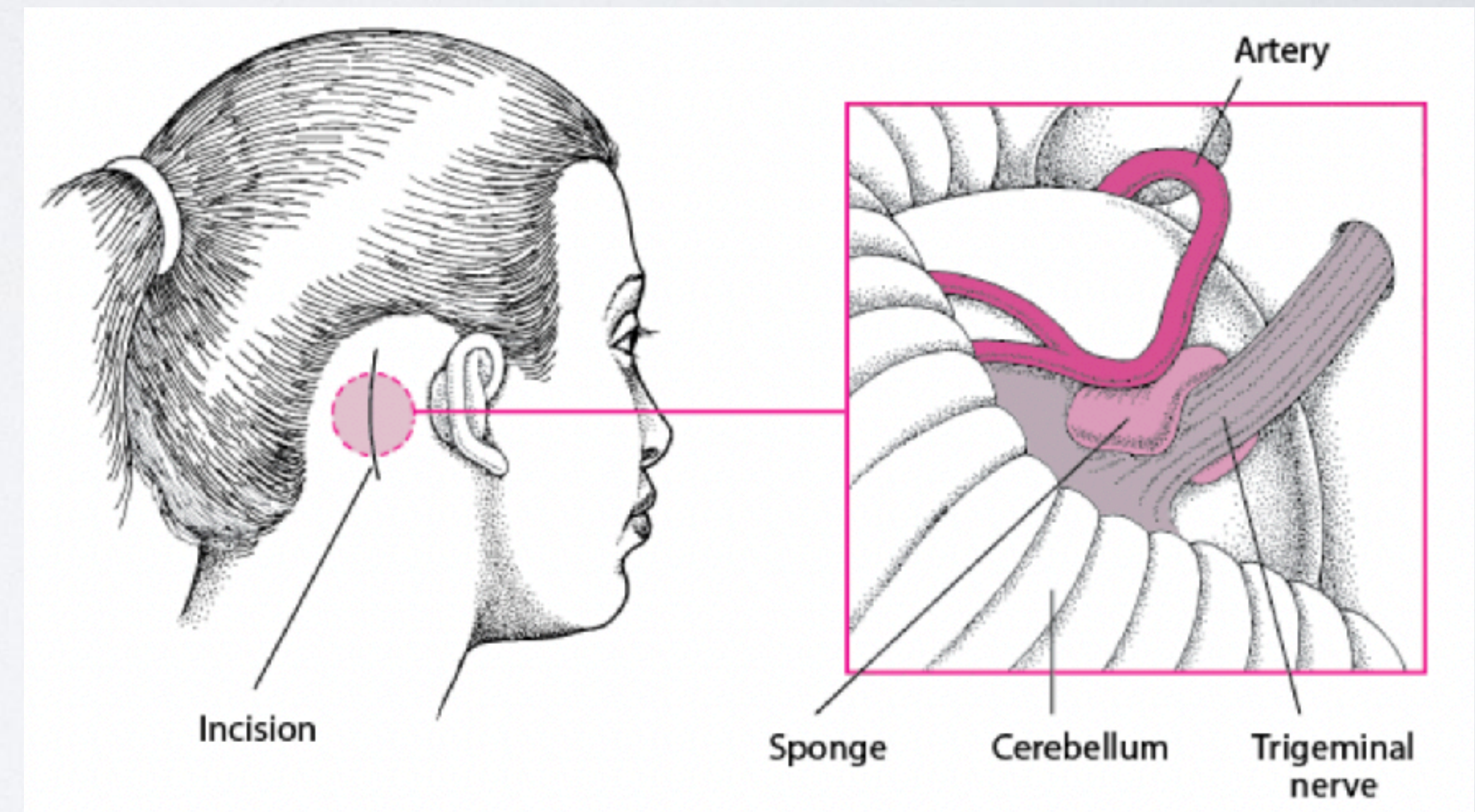
11.1 Botox Lateral Rectus

HEMIFACIAL SPASM

- Involuntary twitching of facial muscles due to pressure against the facial nerve, often near brain stem
- Diagnosis by MRI - May be from malpositioned artery, artery loop or tumor
- Treatments
 - Microvascular decompression surgery (MVD)
 - Neurotoxins (off-label)

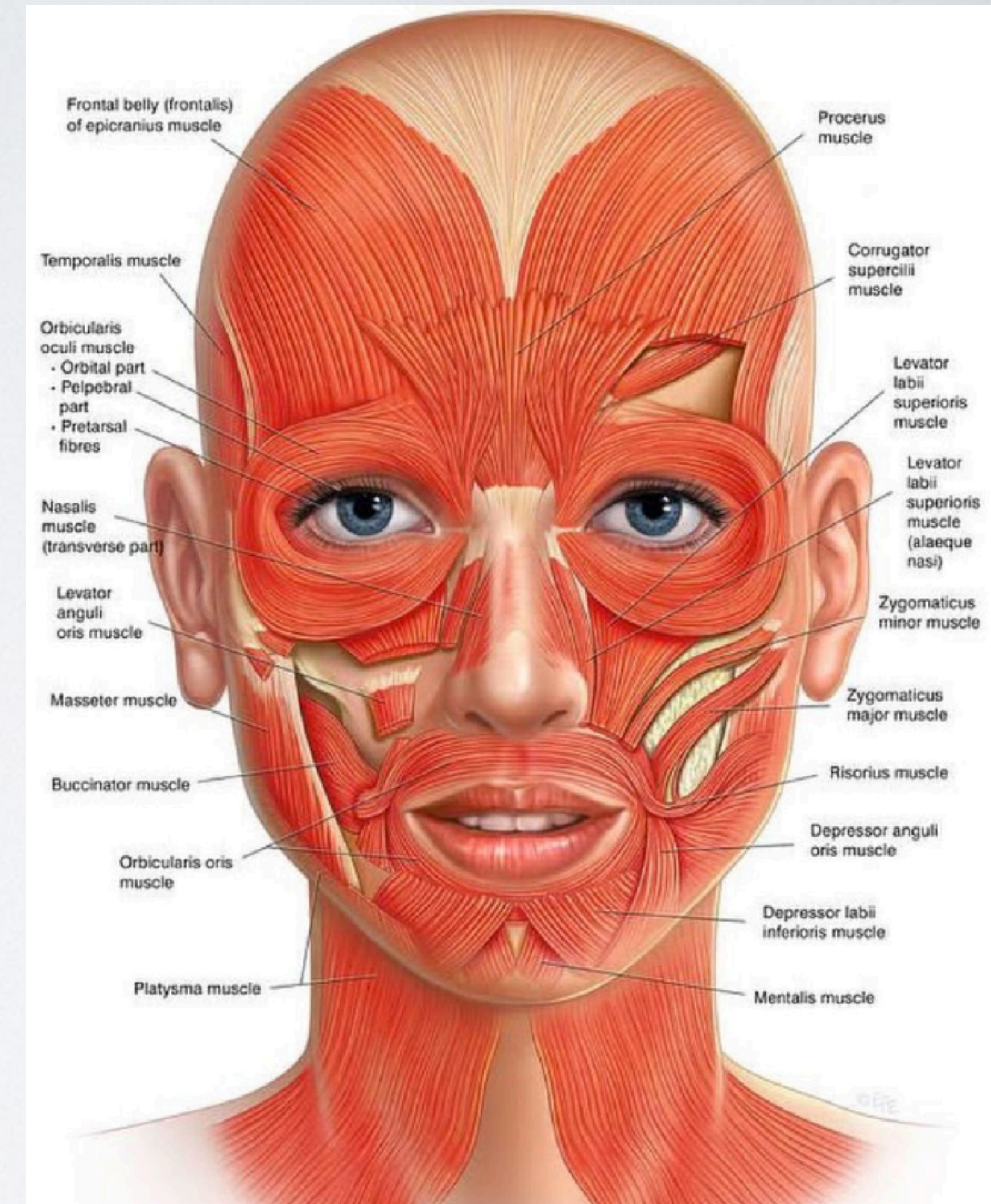
HEMIFACIAL SPASM CONT.

- Treatment
 - Microvascular decompression surgery (MVD)
 - Sponge is placed between the artery and the facial nerve
 - Possible side effects (low risk) - facial numbness, diplopia, infection, bleeding, hearing and balance issues, paralysis
 - 15% chance of recurrence



HEMIFACIAL SPASM CONT.

- Treatment with Neurotoxin
 - 2 - 10 U Neurotoxin injected in the twitching muscles
 - Discuss possible side effects (ptosis, change in smile, etc)
- Myokymia? Treat it like we normally would... (reduce stress, more sleep, less caffeine, maybe glasses)
- Chronic? MRI to rule out hemifacial spasm
- Quinine (found in tonic water), beta blocker (timolol)

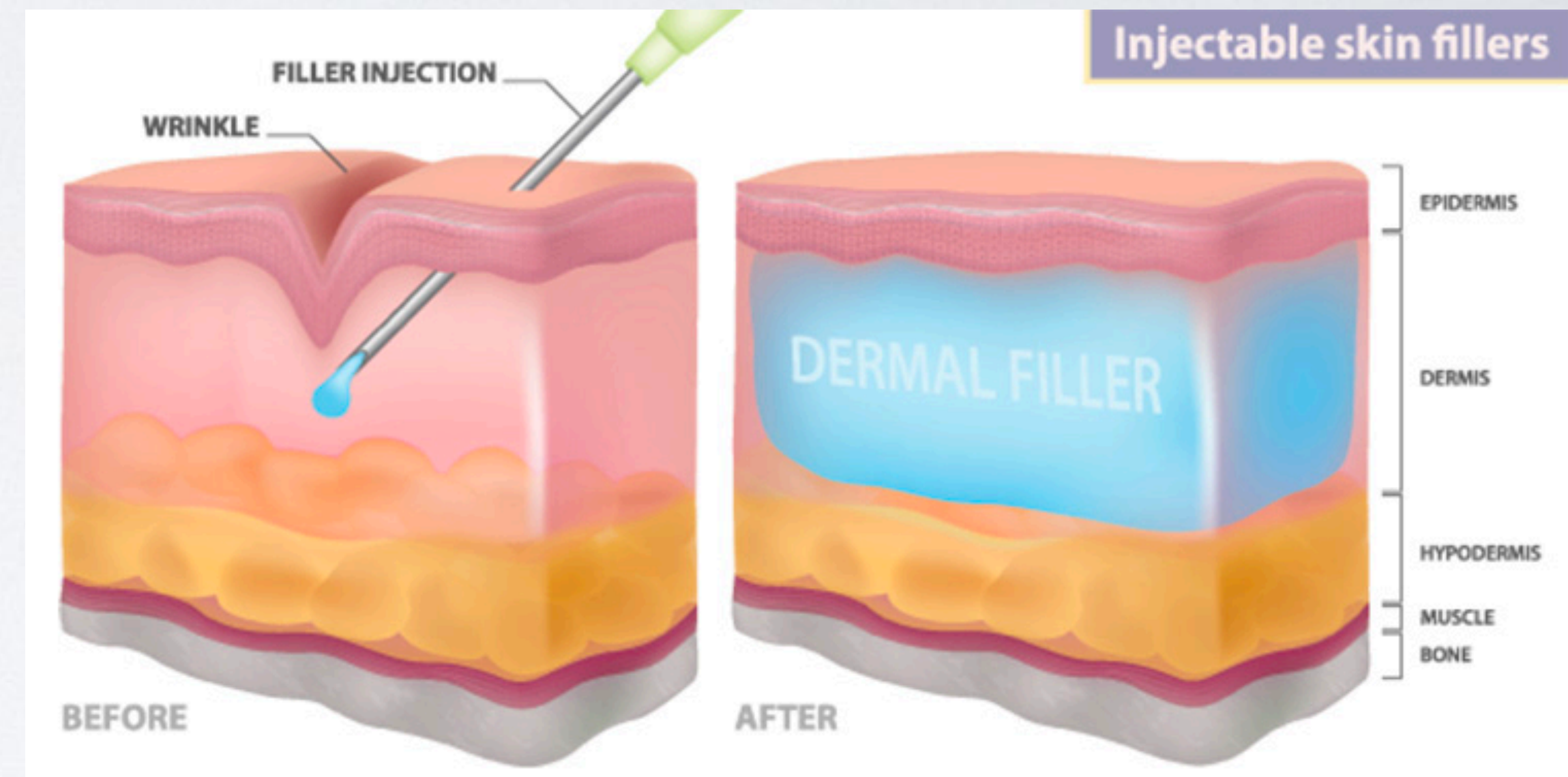


DERMAL FILLERS



WHAT ARE DERMAL FILLERS

- Dermal Fillers are used to fill in volume loss due to natural loss of fat and bone density
- Most are made of hyaluronic acid
 - Dissolvable by hyaluronidase
- Sculptra - Poly-L-Lactic acid (PLLA) stimulates collagen, but not dissolvable
- Good for deep wrinkles and restore volume loss



WHERE ARE DERMAL FILLERS USED

- Dermal fillers are used almost everywhere in the face and can be used all over the body
- Upper face - Temples, hollowing of eyes, glabella
- Mid face - Cheeks, under eye (tear trough), nose
- Lower face - jawline, nasolabial folds, marionette, *LIPS

DERMAL FILLERS CONT.

- Dermal fillers can have a bad rep...



DERMAL FILLERS CONT



DERMAL FILLERS CONT.

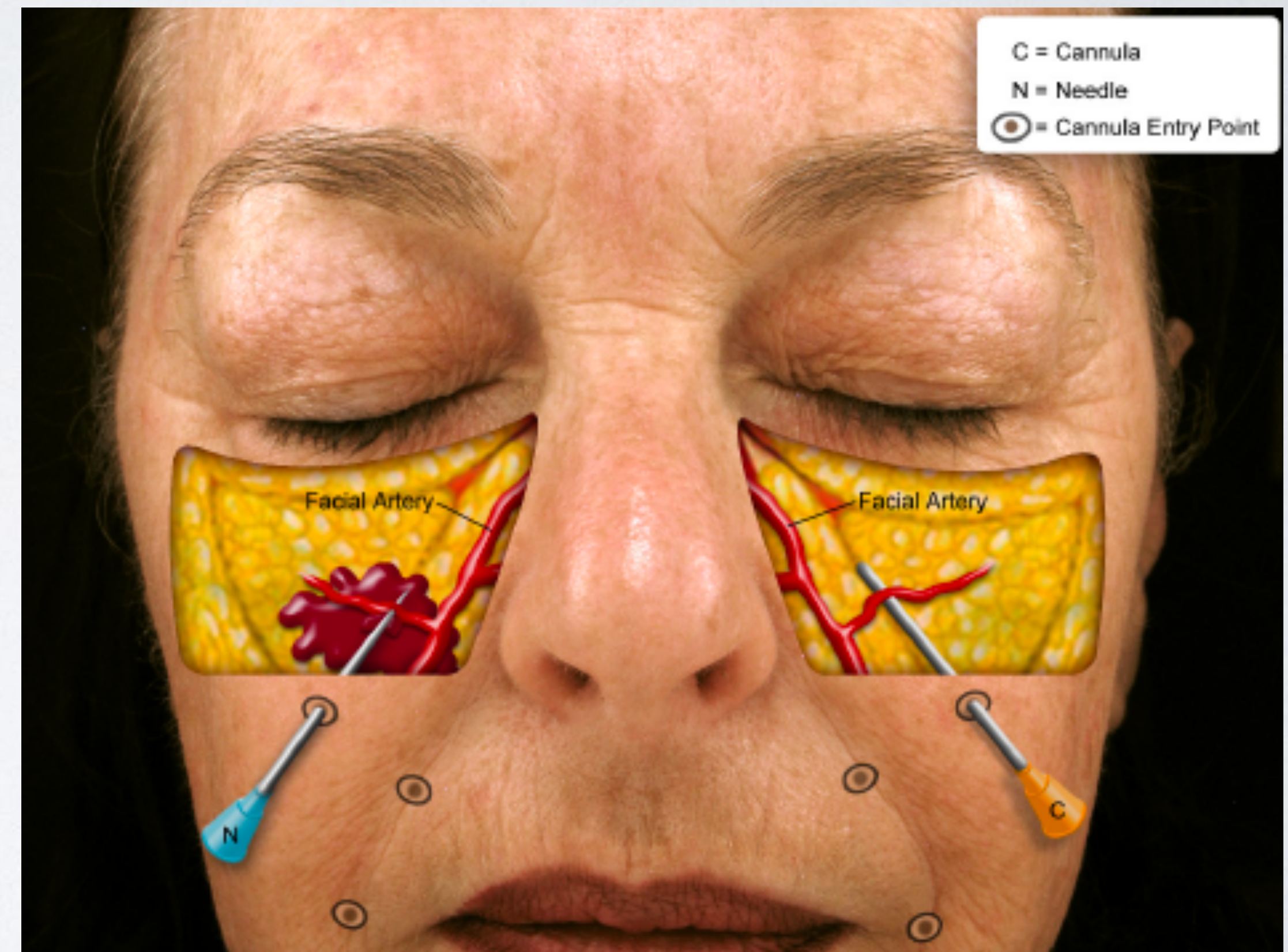


DERMAL FILLERS CONT.



DERMAL FILLERS CONT.

- Possible complications:
 - Vascular occlusion - occlusion of any vessel including CRAO
 - Bruising/edema - face is highly vascularized
 - Lumps and bumps - often from injection is in wrong location



DERMAL FILLERS CONT.

- Safer alternative to dermal fillers
 - PRP (platelet-rich plasma) therapy - inject patients own platelets, growth factors, and cytokines to build new collagen and soft tissue growth
 - Also used for injuries/pain, hair growth, post surgical healing, etc
 - PRF (platelet-rich fibrin) - blood centrifuged at lower speeds to retain white blood cells, stem cells, up to 10x the amount of platelets
 - Coagulates within 10-15 minutes, thickens under skin and stays there longer



Figure 2 (A) Before and (B) after PRF for dark circles in combination with filler. Images courtesy of Anil Rajani, MD

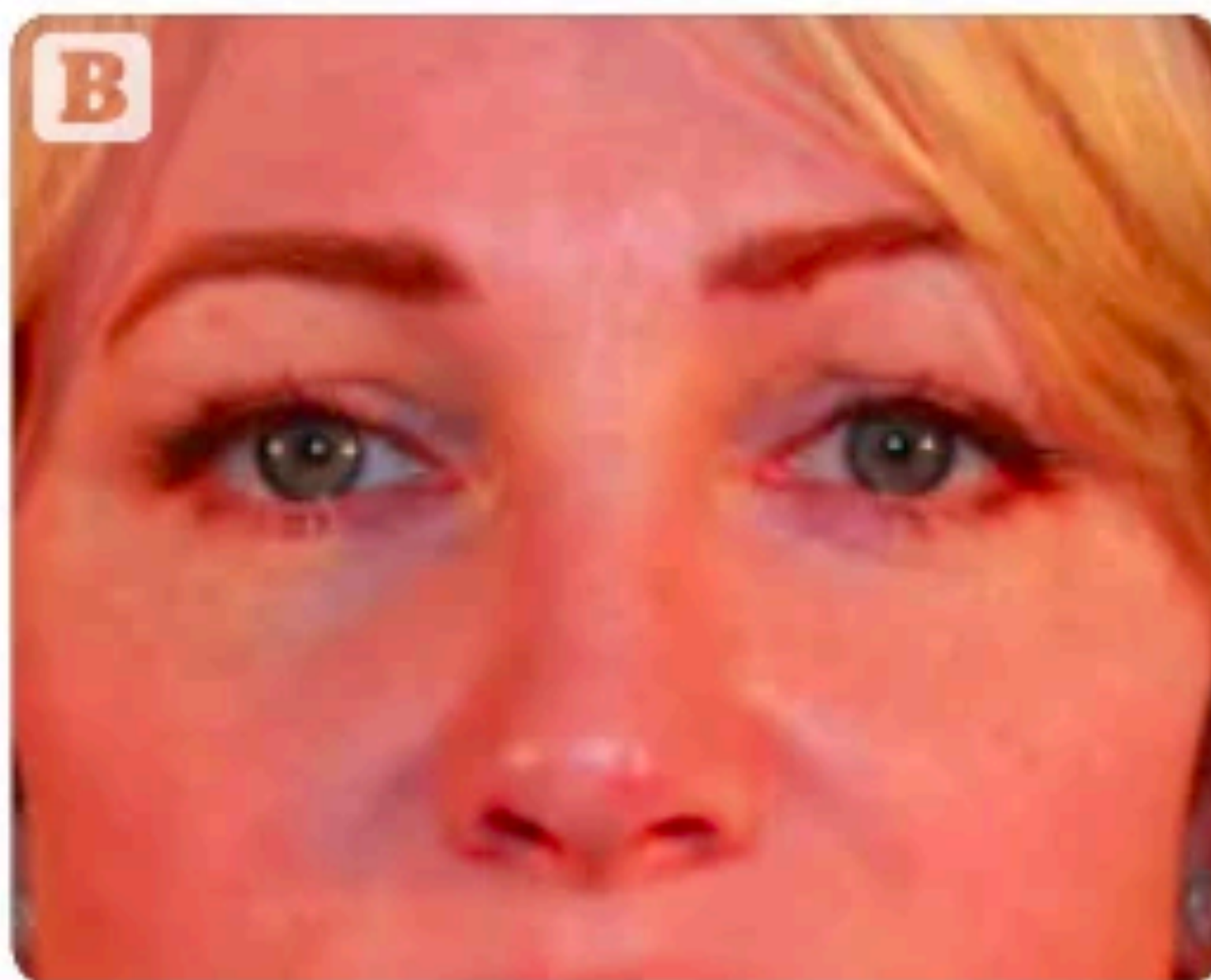
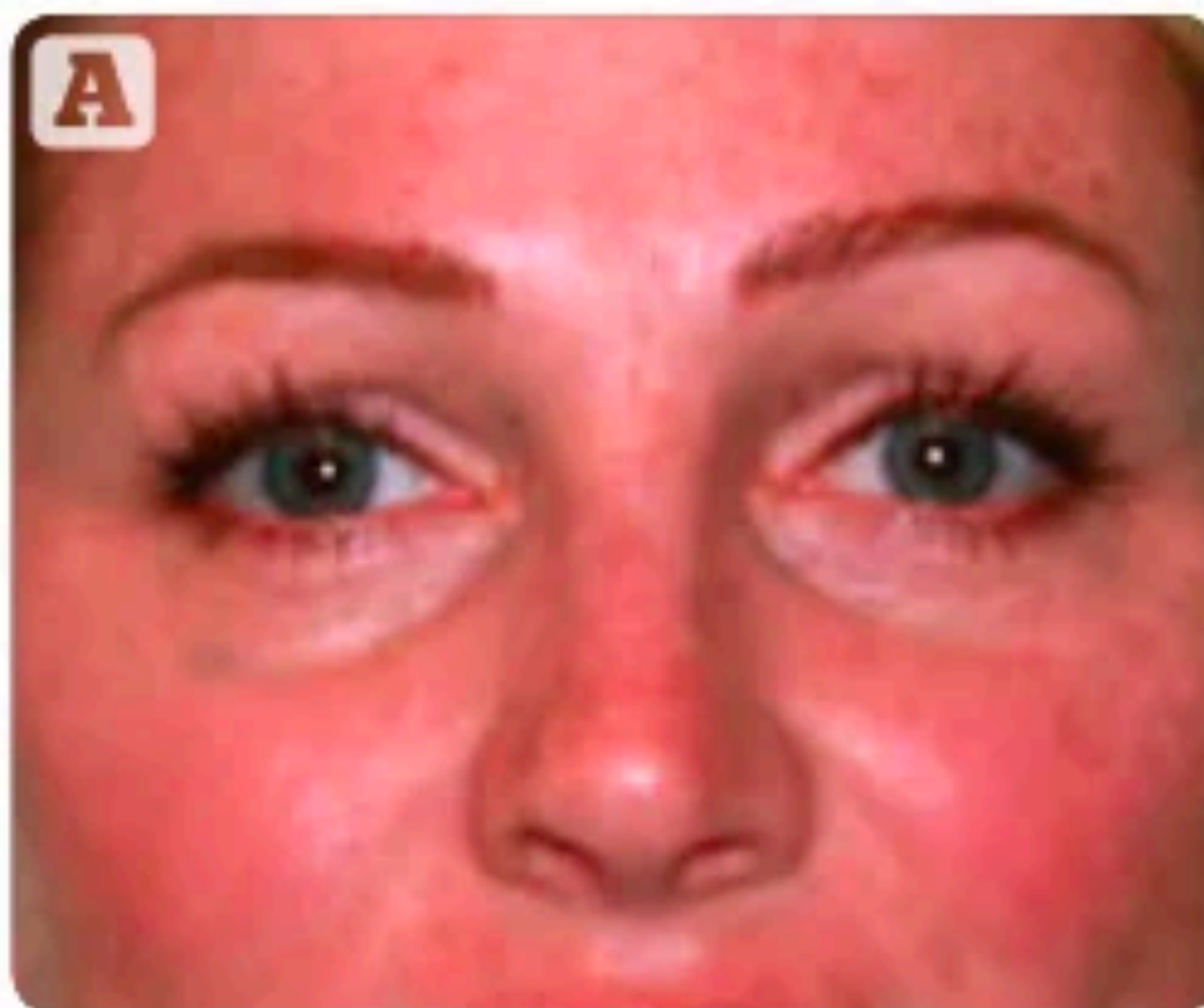


Figure 3 (A) Before and (B) after treatment for brown spots and the tear trough. Images courtesy of Anil Rajani, MD

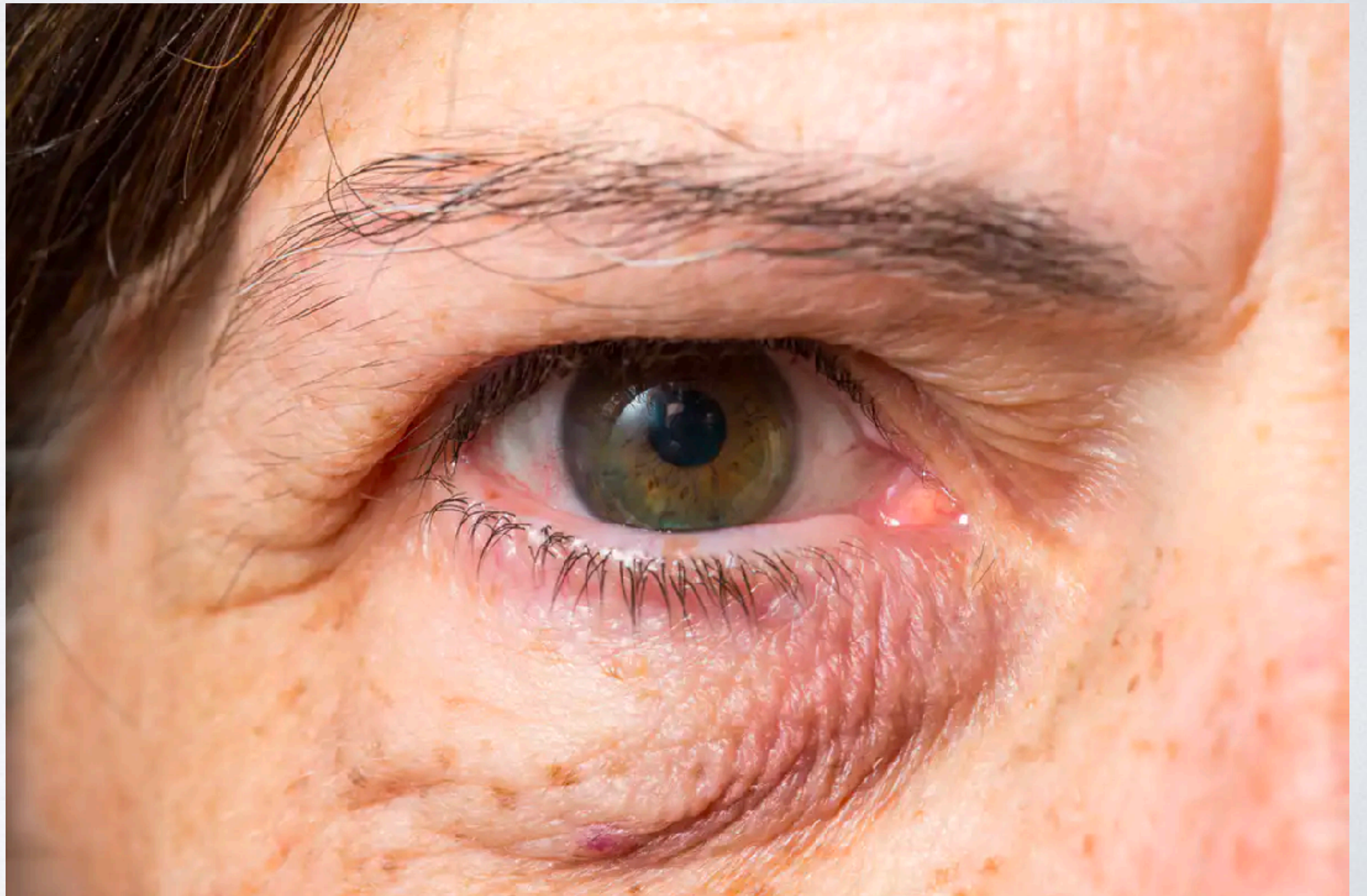
UNDER EYES

Dark circles, wrinkles, puffy



UNDER EYES

- Hyperpigmentation
- Wrinkles
- Puffiness



CONDITION	CHALLENGE	SOLUTION
Under-Eye Darkness	Melanin banding (natural pigmentation patterning)	Gentle lighteners, including low-concentration hydroquinone products
	Hemoglobin deposits under the eye	Products that chelate the hemoglobin
	Sun damage	Skin lighteners with DNA-reparation properties
	Thin skin, which allows blood vessels to become visible	Products to improve the skin's tone and texture; makeup
Fine Lines, Sagging, and Wrinkles	Muscle contraction	Neuromuscular inhibitors, which are medical-grade products that contain collagen- and elastin-building properties
	Loss of volume (fat)	Injectable fillers, which are medical-grade products that promote dermal tissue building
	Collagen and elastin loss	Medical-grade products that contain collagen- and elastin-building properties
Puffiness	Water accumulation in the capillaries	Teach clients the proper effleurage technique; to clients, used medical-grade products to seal capillary leakage
	Fat accumulation	Teach clients the proper effleurage technique to clients
	Fat pad migration (movement)	Blepharoplasty

IPL

Intense Pulsed Light



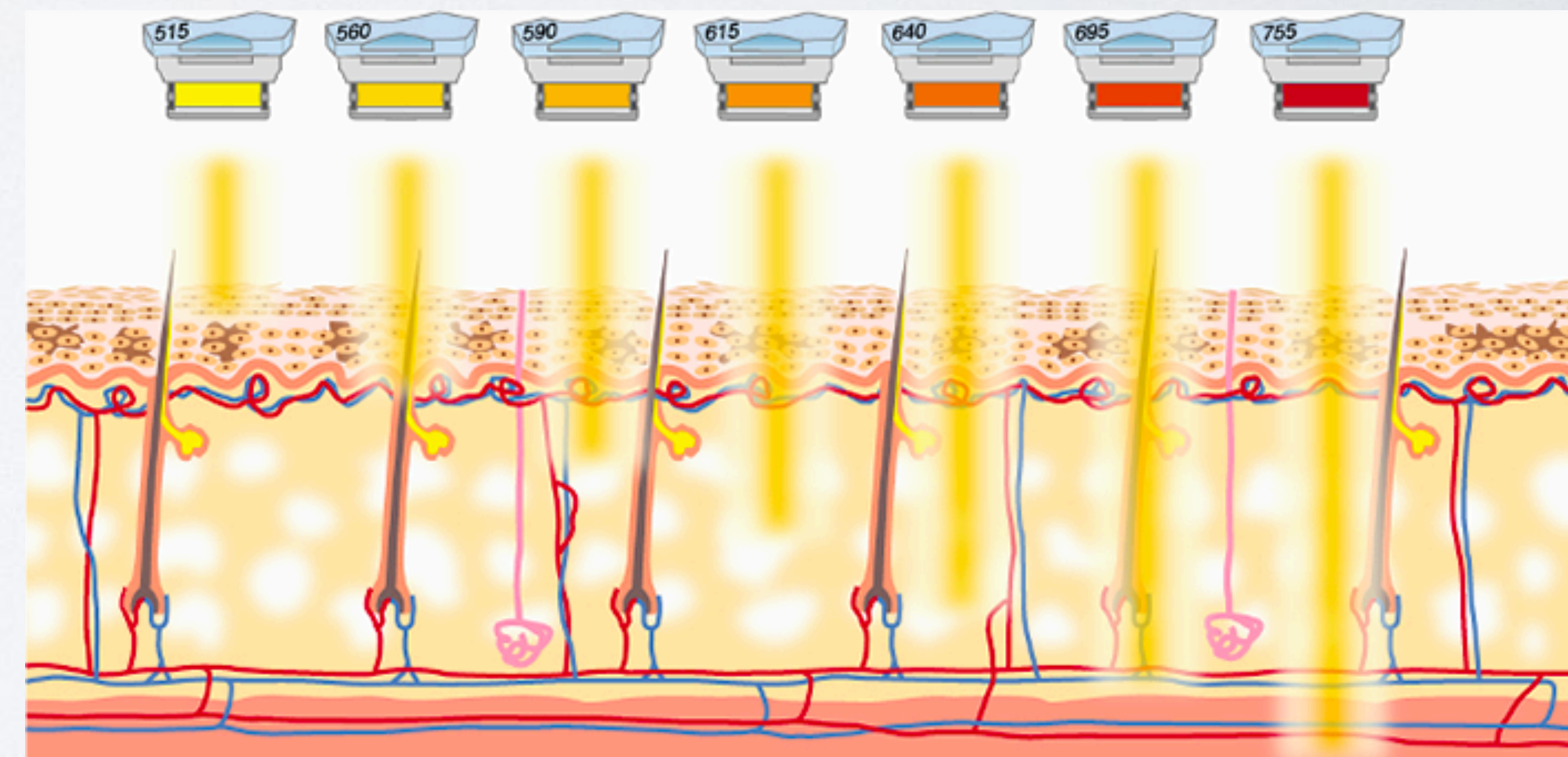
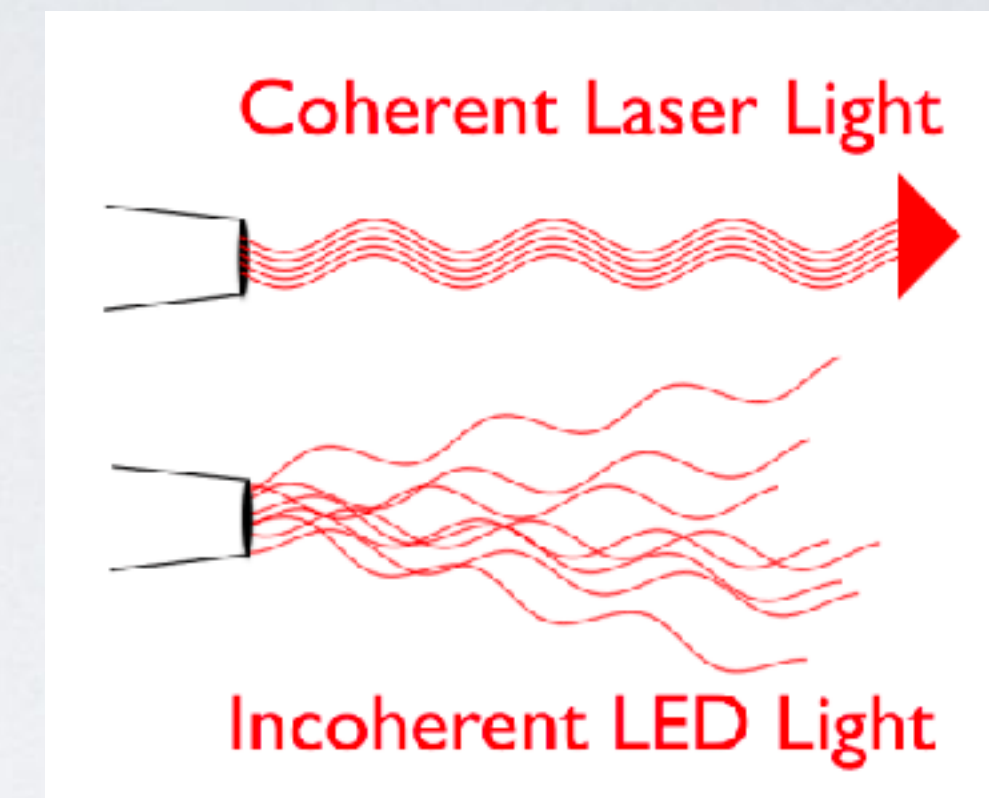
IPL - INTENSE PULSED LIGHT

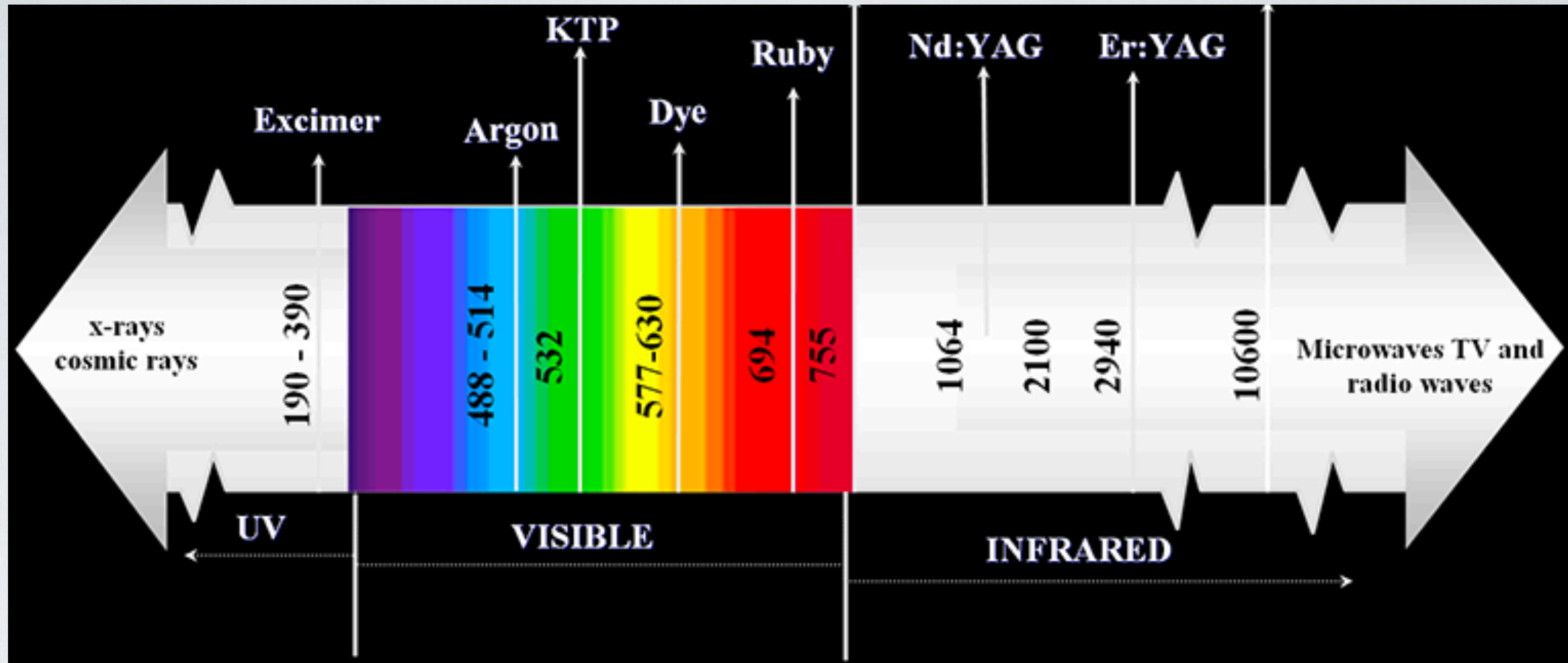
- First FDA approved for telangiectasia in 1995
- Used for many aesthetic and therapeutic purposes including: hair removal, photorejuvenation, hyperpigmentation, acne, and....
- Dry eye disease



IPL - INTENSE PULSED LIGHT

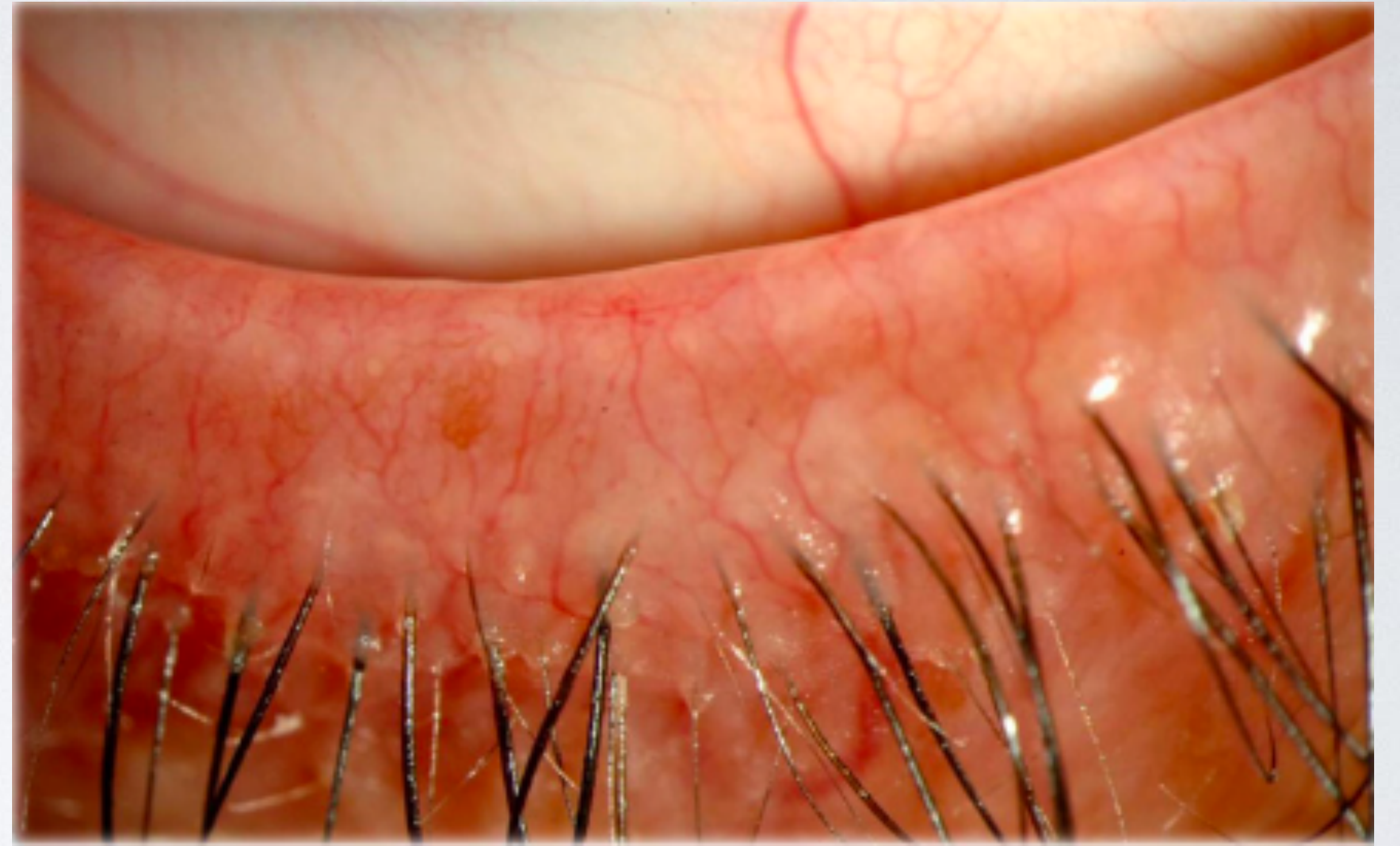
- Light source from xenon lamp
- Not a laser - Broad spectrum non-coherent light vs coherent single wavelength light
- Light produced in range of about 400 nm to 1200 nm
- Cutoff filters are used to cut out shorter wavelengths of light to prevent potential damage to the skin and target specific depths if skin.





WAVELENGTH OF LIGHT

DRY EYE



IPL - DRY EYE

- IPL - Indicated for both evaporative and aqueous deficient dry eye
 - Restores form and function of meibomian glands*Yin et al.
 - Destroys telangiectasia vessels on lid that perpetuate inflammation*Kassir et al.
 - Reduces Demodex load*Prieto et al
 - Decreases inflammatory markers IL6 and IL7 in tear film*Liu et al
 - Reduces tear osmolarity*Toyos et al
 - Increases TBUT *Yin et al.

IPL - DRY EYE

- Photobiomodulation - “Stimulates the body’s cells/meibomian glands to start working,” “jump start for glands in the eyes that produce tears”
- Cytochrome C within the mitochondria absorbs the IPL light which is an active part in the electron transport chain (ETC)
- This improves adenosine triphosphate (ATP) production which facilitates collagen synthesis in fibroblasts and motility in immunoregulatory cells

IPL - DRY EYE

- Technique - Toyos protocol
 - Clean face
 - Place eye shields
 - Ultrasound gel
 - 2 passes from tragus to tragus along lower eye lid
 - 1% Proparacaine with meibomian expression UL and LL cotton swab
 - Steroid drop, (Lumify drop)
 - (Post treatment cream - IS clinical recovery shield and SPF cream)





LOOK LIKE
FEWER L

BOTOX® Cosmetic is a
to temporarily make
feet lines, and frown li

forehead
20 Un

Crow's feet li
24 Uni

12 Units each side

InShO

TELANGIECTASIA



IPL - TELANGIECTASIA

- Telangiectasia - small dilated blood vessels near surface of skin and eye lid borders
- Genetic and acquired factors
- Most often treated with lasers and IPL
 - Lasers - Argon 532 nm or frequency-doubled yag laser
 - IPL - using filters with shorter wavelengths

IPL - TELANGIECTASIA

- Tips for treating telangiectasia
 - 480/530 nm smaller vessels that are more superficial
 - 530/590 nm with longer Pulse Duration for larger vessels
 - Longer durations pulse helps coagulate blood, shorter wavelengths more ablative

HYPERPIGMENTATION



IPL - HYPERPIGMENTATION

- Excess production of melanin from sun damage, inflammation, or trauma to skin (acne scarring)
- Melanin produced by melanocytes in lower epidermis
- Stimulated by UV light

HYPERPIGMENTATION CONT.

- Treatments -
 - Sunscreen - Prevention is best
 - Chemical Peels - 5 Berry, Jessner, Skinmedica
 - Laser Peels - Pico Yag laser, CO2
 - Topical depigmenting agents - Hydroquinone 2%-12%, azelaic acid, kojic acid
 - IPL - shorter wavelengths 480/530 nm

HYPERPIGMENTATION CONT.

- Hyperpigmentation tips
 - Shorter wavelengths target melanin more
 - Darker the pigment - easier to remove, can use either 530nm or 590nm
 - Lighter the pigment - harder to remove most likely will need 480 nm or 530 nm if skin type possible
 - Skin types 3-5 typically have more pigmented spots but more difficult to treat - skin can burn easier with shorter wavelengths.
 - Must use cooling head at the maximum

ACNE



IPL FOR ACNE

- Non-invasive and effective way to treat acne vulgaris
- 480 nm filter to target more superficial
- 85% of the individuals had a >50% improvement in their acne vulgaris lesions following twice weekly therapy for 4 weeks**Elman et al*

CHALAZION



CHALAZION

- Causes
 - Acne rosacea
 - Chronic blepharitis
 - Seborrhea
 - Tuberculosis
 - Viral infection

CHALAZION

- Treatment
 - Warm compresses, massage, steroid/antibiotic drop/ung, (**IPL**)
 - Oral antibiotic (Keflex, z-pak, doxycycline), Kennalog injections
 - Incision and curettage

IPL - CHALAZION

- IPL's mechanism of action match quite well the underlying causes of chalazia
- Along with photobiomodulation to promote healthy cell function, IPL kills demodex and bacteria, removes telangiectasia, and reduces inflammation
- Great option to speed along the recovery

PHARMACEUTICALS

Used for aesthetics

UPNEEQ®
(oxymetazoline hydrochloride
ophthalmic solution), 0.1%

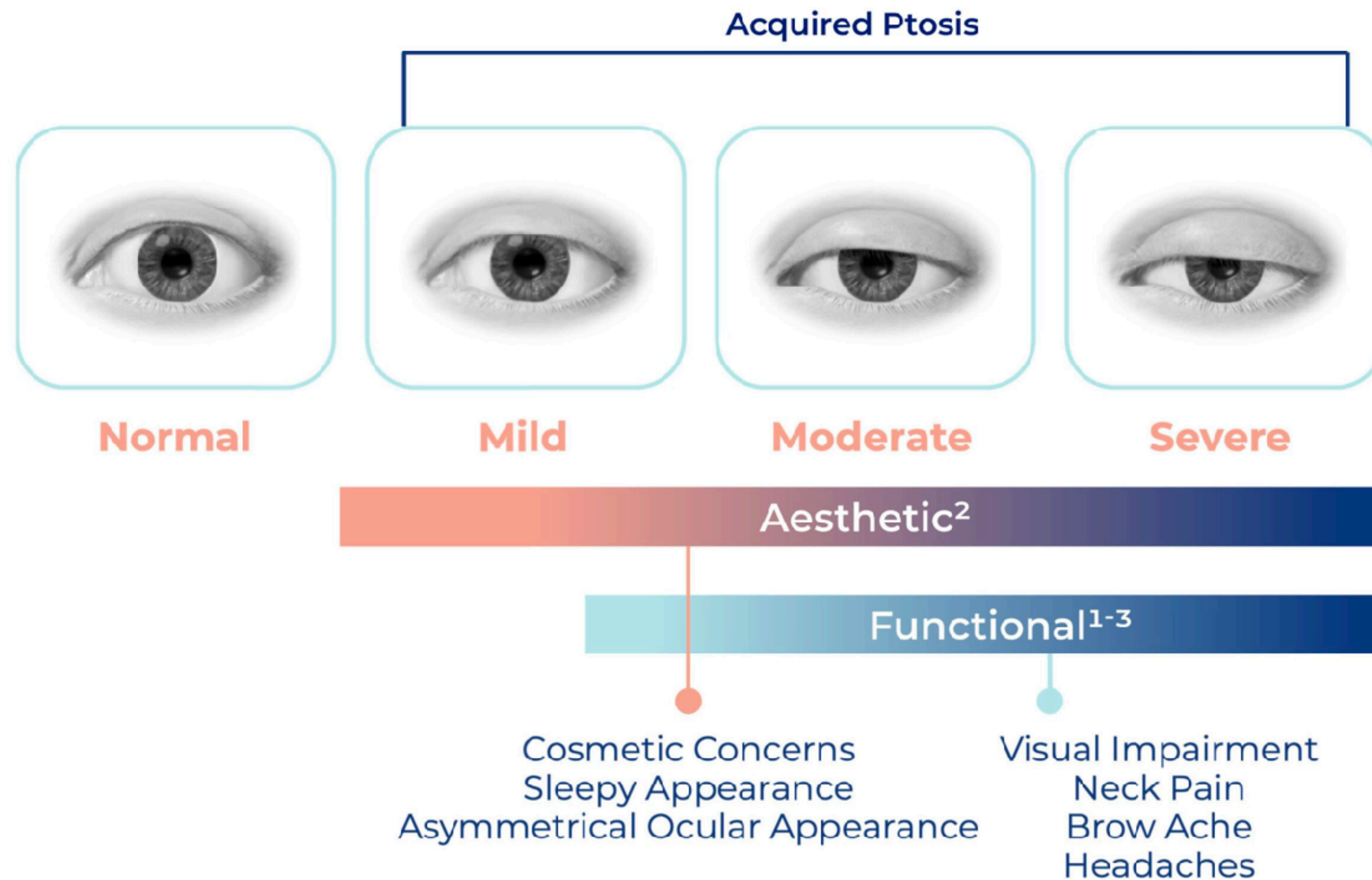


UPNEEQ - BLEPHAROPTOSIS

UPNEEQ®
(oxymetazoline hydrochloride
ophthalmic solution), 0.1%

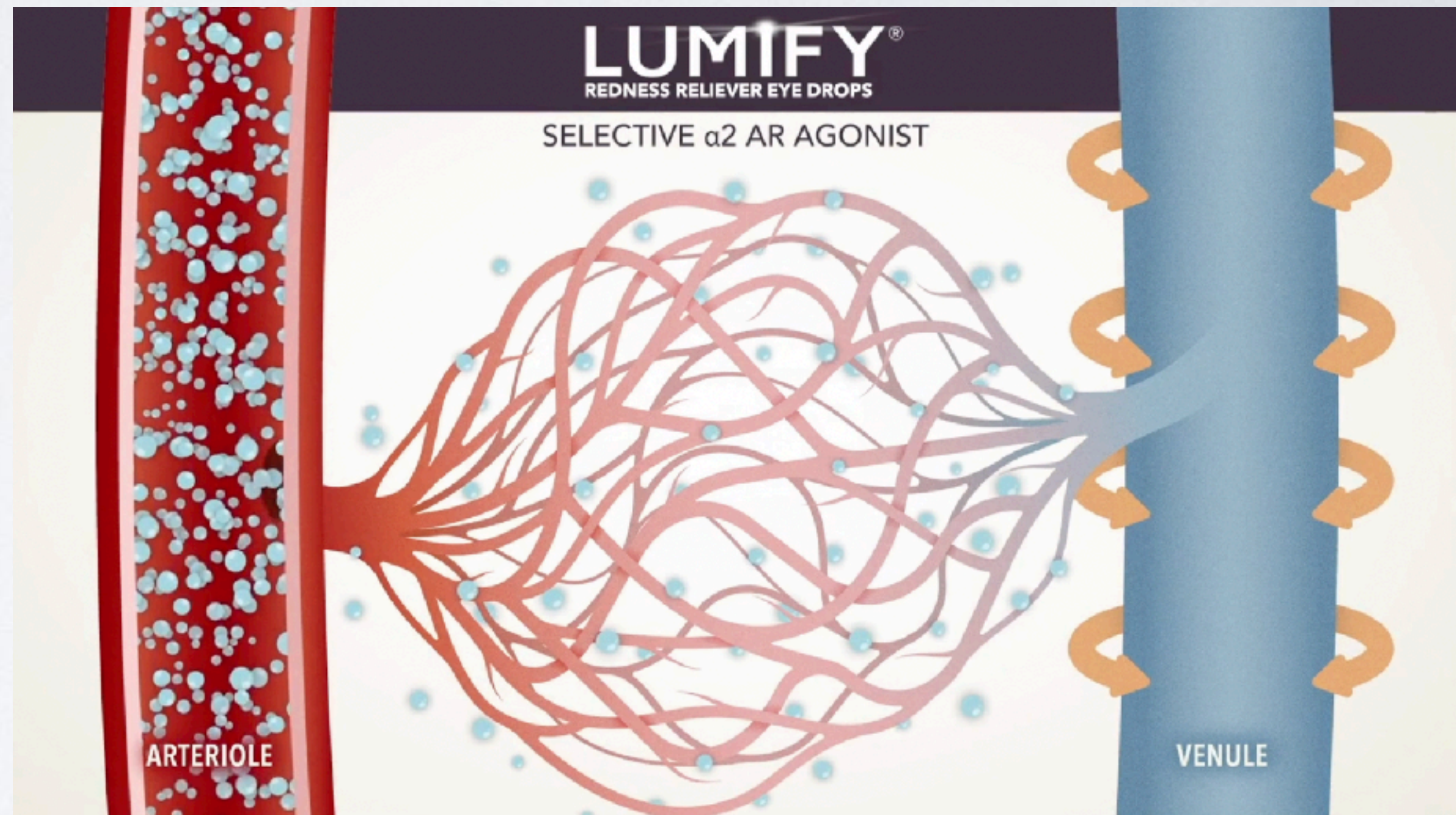
- Alpha-adrenergic agonist
- Works similar to phenylephrine in that it targets Müller's muscle and elevate eye lid but with less dilation effects
- Peak affects from 5 min to 2 hours, duration 6 -14 hours
- Side effects: 1-5% SPK, hyperemia, dry eye, blurred vision, instillation site pain, eye irritation and headache
- Retail?

UPNEEQ - BLEPHAROPTOSIS



LUMIFY

- Selective Alpha 2 agonist - mainly constricts venules
- Provides redness relief for up to 8 hours
- Maintains oxygen availability to surrounding tissue



PROSTAGLANDIN ANALOGS FOR LASH GROWTH

- Babe Lash, Latisse, Lash Boost
(Methyamido Dihydro Noralfaprostal (MDN),
Bimatoprost, isopropyl cloprostenate)
- Possible side affects: eye redness, skin/
iris discoloration

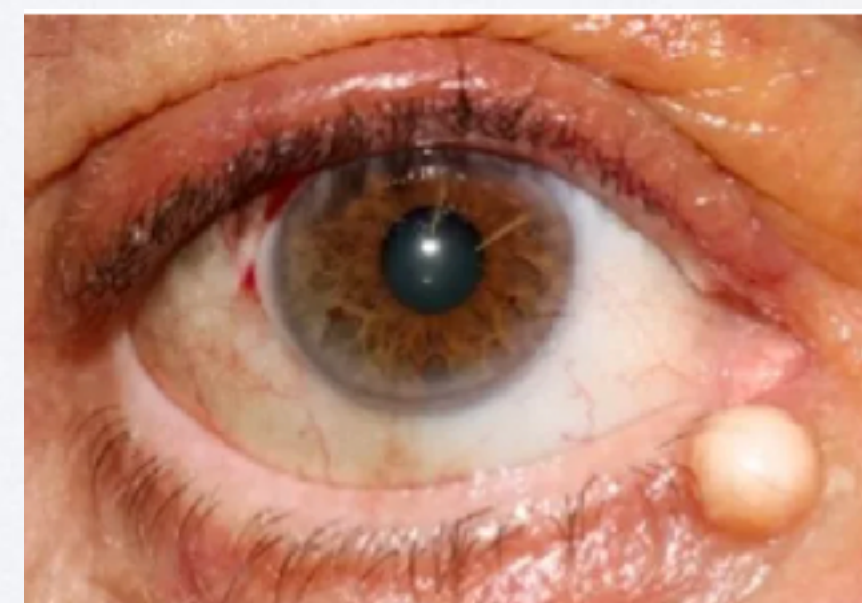


BUMP REMOVAL



BUMP REMOVAL

- Indications:
 - Skin papillomas/skin tags
 - Seborrheic keratoses
 - Verruca
 - Chalazion
 - Sebaceous cysts
 - Benign Nevi
 - Cyst of Moll
 - Pyogenic Granulomas
 - Xanthelasma



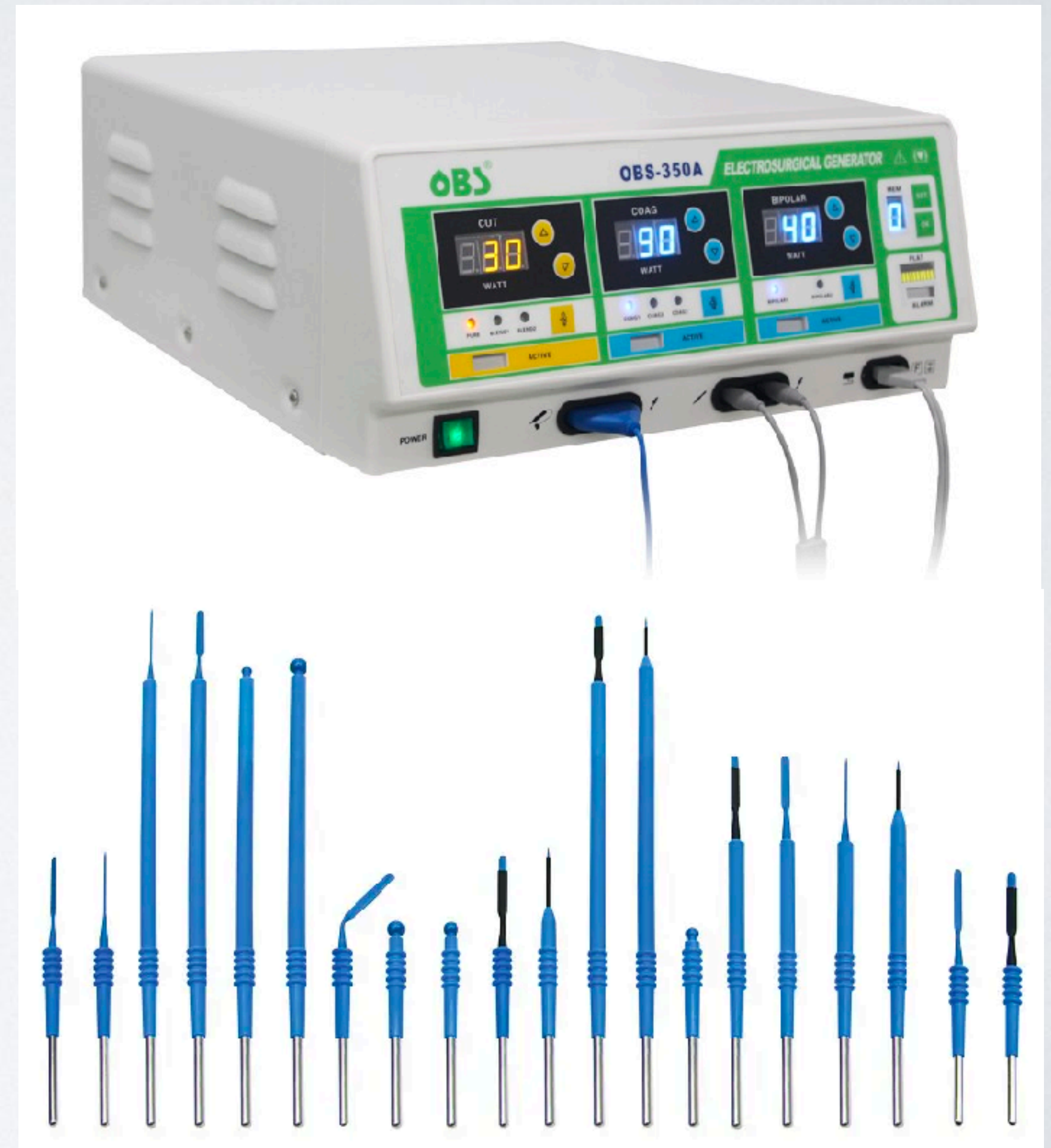
BUMP REMOVAL CONT.

- Electrosurgery – passes high frequency current through tissue, using the tissue as the heating element
 - AKA Radiofrequency Surgery
- Chemical cautery - dichloroacetic acid
- Wescott scissors
- Scalpel #15 blade



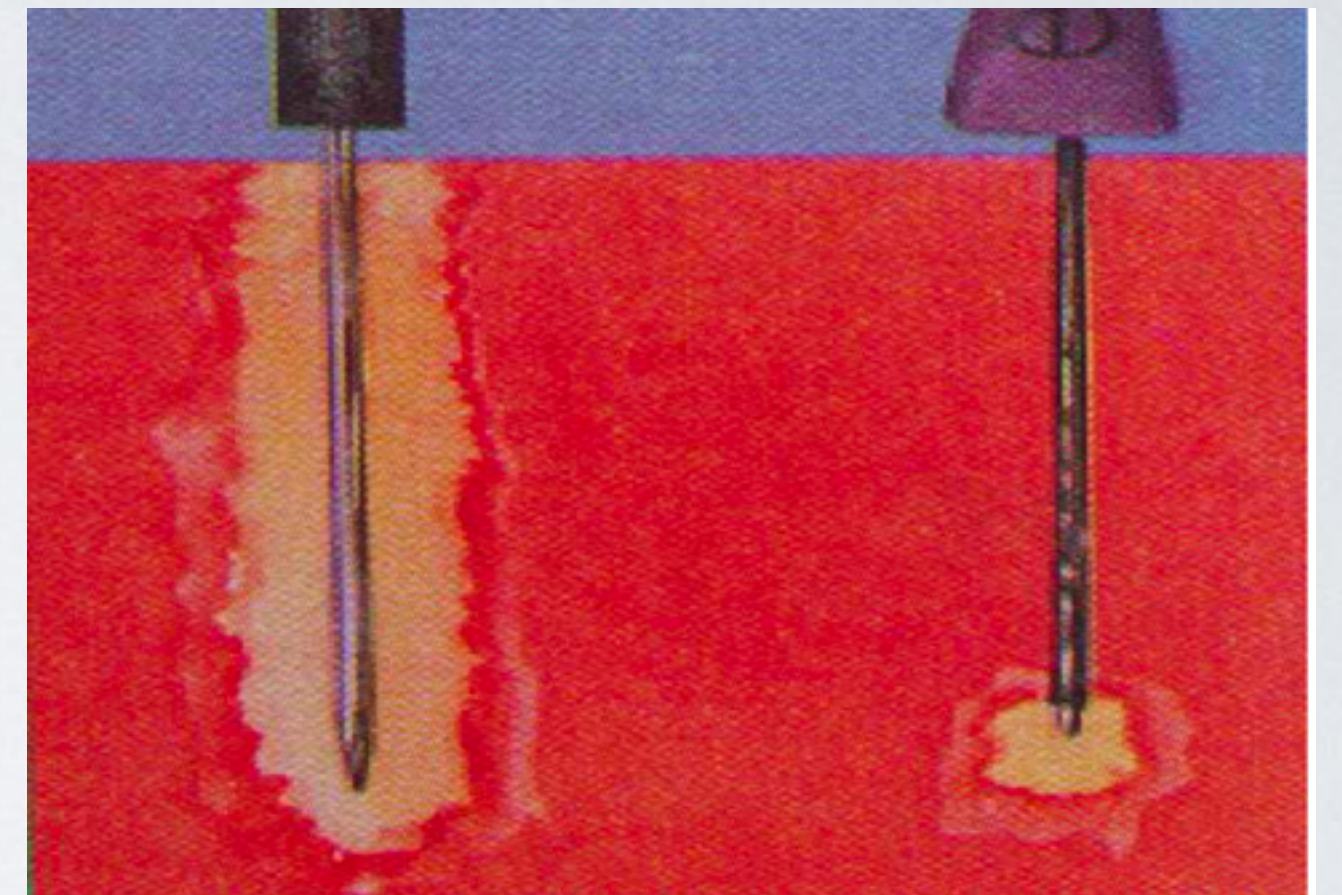
BUMP REMOVAL CONT.

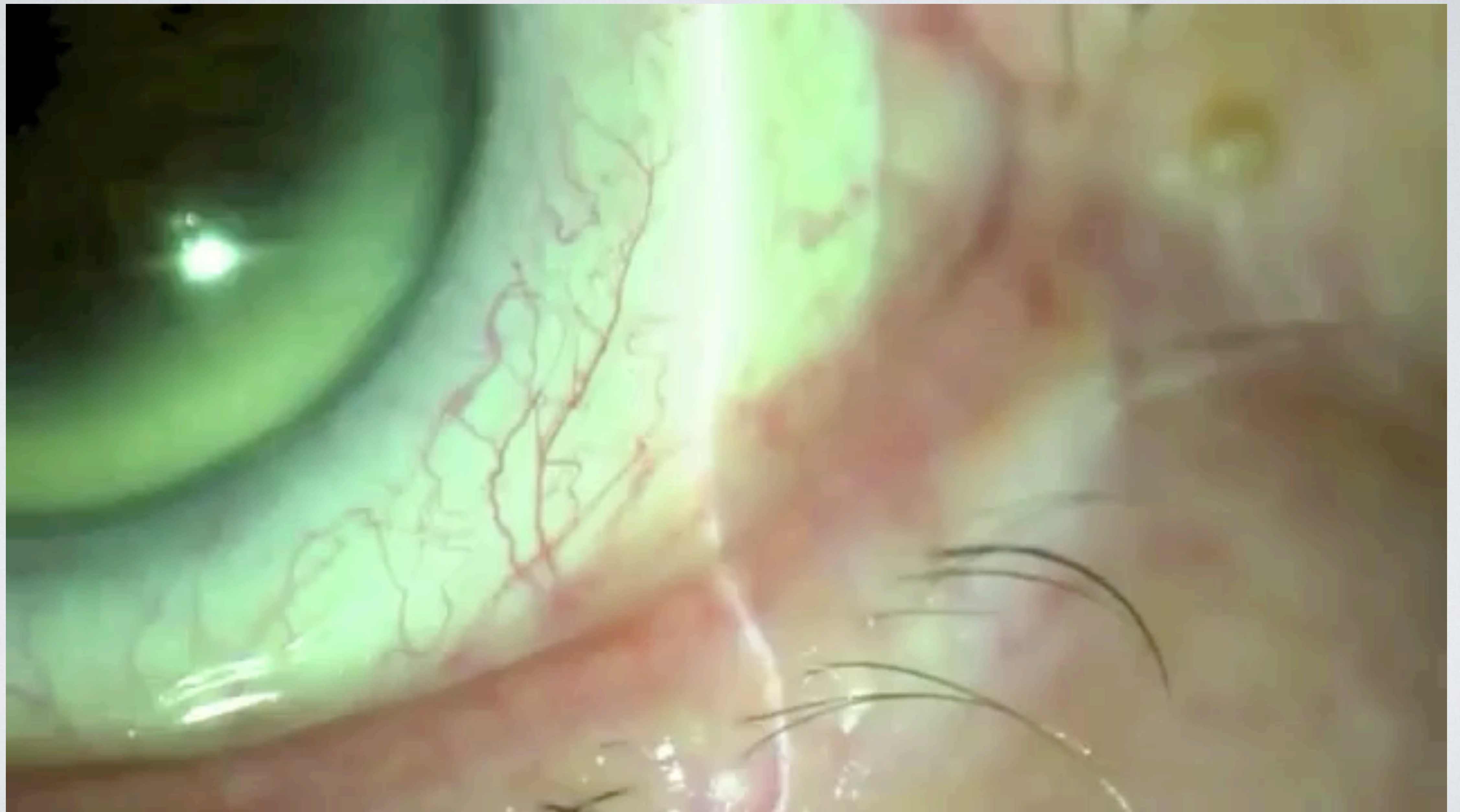
- Electrosurgery
 - Uses electricity to cause thermal destruction of tissue by coagulation or vaporization
 - Anesthetize with lidocaine
 - Cuts and coagulates at the same time to prevent bleeding
 - Pure cut, pure coagulate, and blend settings



BUMP REMOVAL CONT.

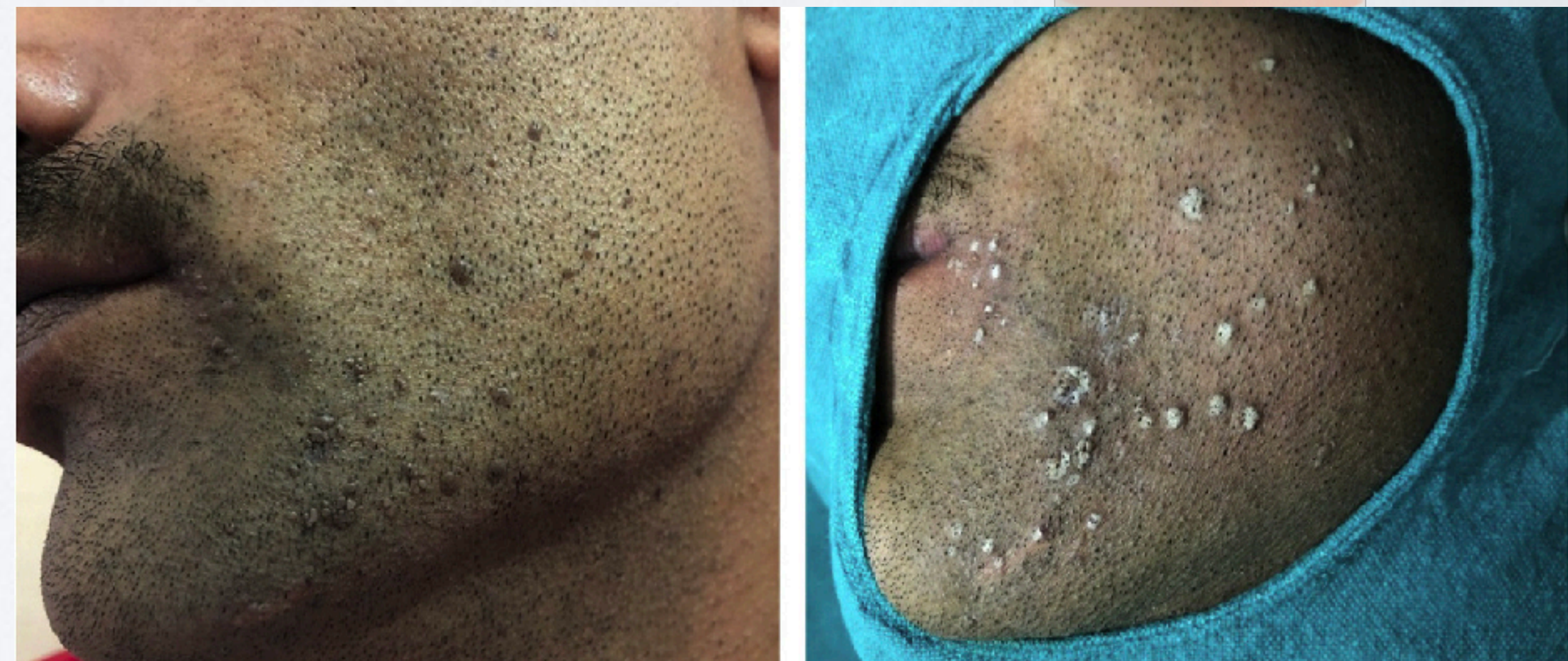
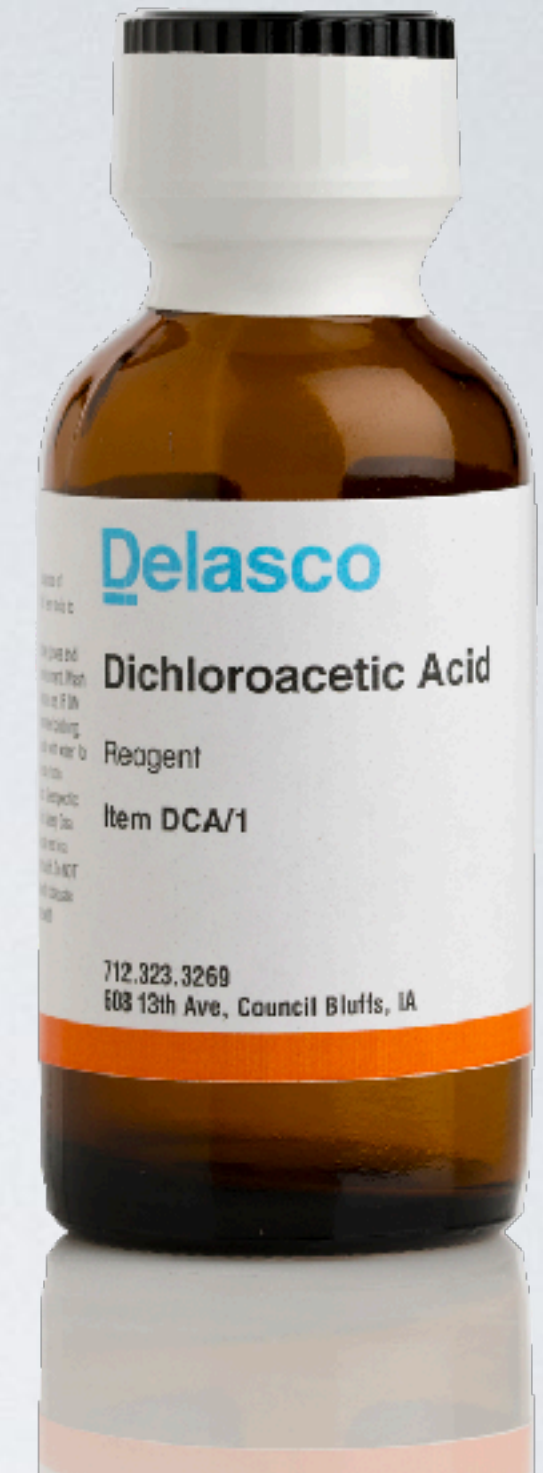
- Advantages and capabilities of electrosurgery
 - Remove bumps quick and very precise
 - Treat trichiasis
 - Punctual cautery - coag mode
 - Conjunctival chalasis surgery (video)- using capsulorhexis forceps and coag blend mode with low energy





BUMP REMOVAL CONT.

- Chemical cautery - fast, easy, safe
 - Wear gloves, use cotton swab or toothpick to dip in acid and touch the lesion
 - Turns white immediately after, then darkens over the next couple days
 - Keep out of sun, use erythromycin ung TID x 1 week



CHEMICAL CAUTERY



OTHER AESTHETICS

Most common treatments done



OTHER AESTHETIC TREATMENTS

- Chemical peels - Each peel targets specific skin concerns and can address more than one concern at a time
- Facials - Treats common skin concerns; aging, hyper pigmentation, dryness
- Microneedling - Tightens and firms skin, helps reverse sun damage and pigmentations
- RF skin tightening - Reduce the appearance of fine lines and wrinkles
- CO2 resurfacing - More aggressive way to reduce wrinkles and improve skin texture
- Microdermabrasion - Exfoliates and removes dead skin cells
- Hydrofacial. - Exfoliates and removes dead skin cells

QUESTIONS?

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