



THE BEAUTY OF SCIENCE: EXPLORING NEUROTOXINS IN AESTHETIC MEDICINE

S A L L Y S A N T O S , P A - C
M A R Y R U G G E R I , P A - C

2024

Objective

At the conclusion of this session, participants should be able to:

Outline the properties, use, and safety considerations of neurotoxins in aesthetic medicine

HISTORY OF NEUROTOXIN

Discovered: 1895

Discovery of *Clostridium botulinum* by Professor Emile Van Ermengem

Isolated: 1928

Purified form of botulinum toxin type A by Dr. Herman Sommer

Isolated for medical and therapeutic use by Dr. Edward J. Chants

Injected: 1960s

1960s: First injected into rhesus monkeys to weaken ocular muscles

1979: Injected into humans to correct strabismus

Medical Approval by FDA: 1989

US FDA approved BoNT-A product for blepharospasm and strabismus

Aesthetic Approval by FDA: 2002

US FDA approved OnabotulinumtoxinA product for glabellar lines



Mechanism of Action

Blocks the presynaptic release of the acetylcholine at the neuromuscular junction

Results in chemical denervation of the muscle fiber = inducing partial paralysis and atrophy

Reversible!

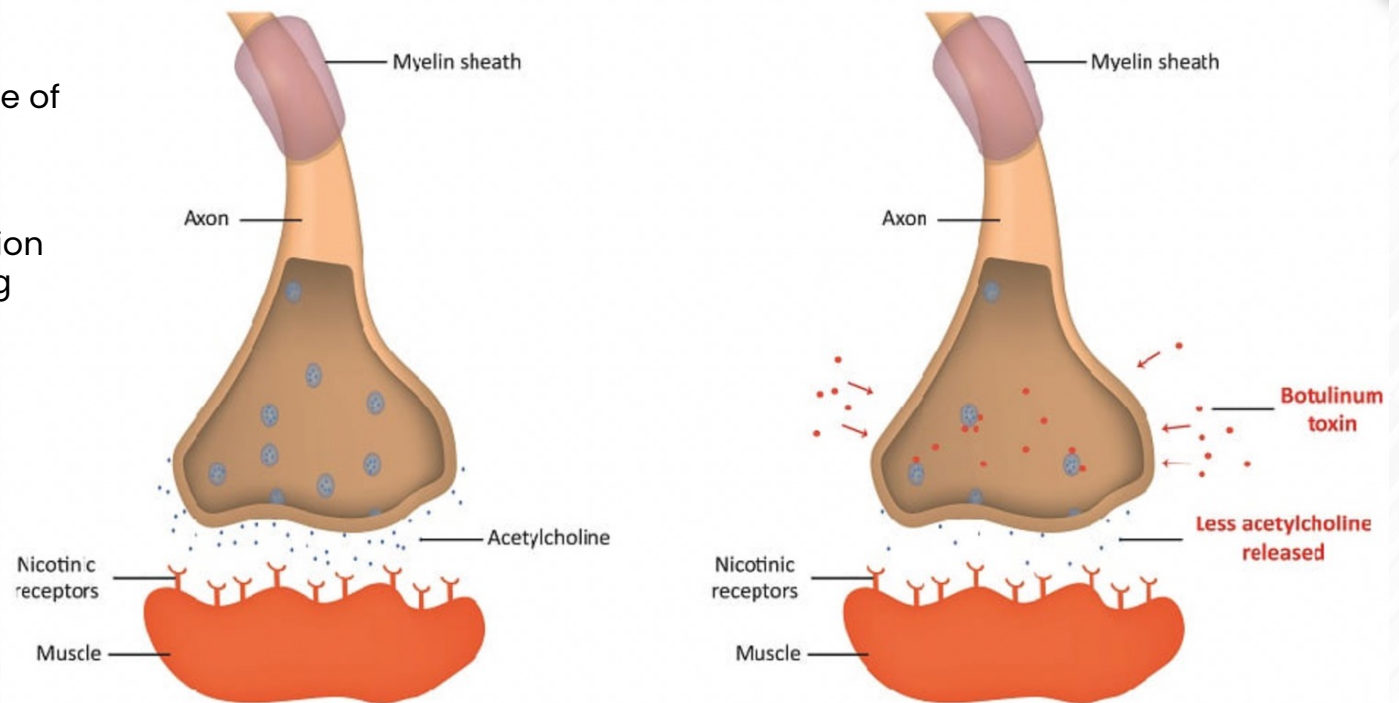
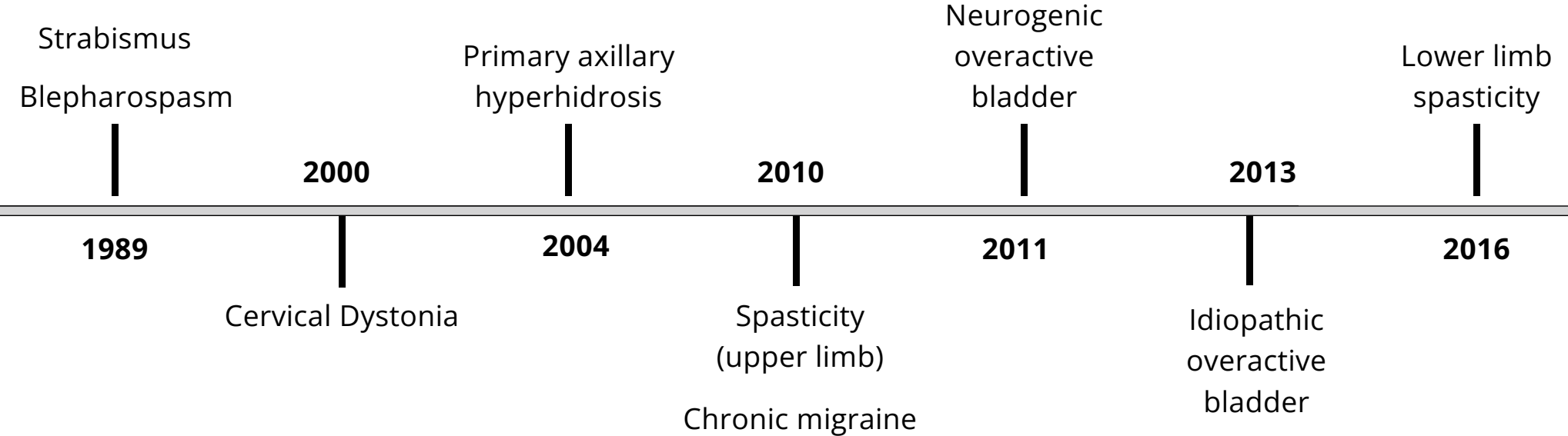


Image: <https://biologydictionary.net/botulinum-toxin/>

First Medical Indications



Aesthetic Indications



Glabella (corrugator supercilii,
depressor supercilii, procerus)



Forehead (frontalis)



Lateral Canthal Lines
(orbicularis oculi)

Aesthetic Indications



Glabella (corrugator supercilii,
depressor supercilii, procerus)



Forehead (frontalis)

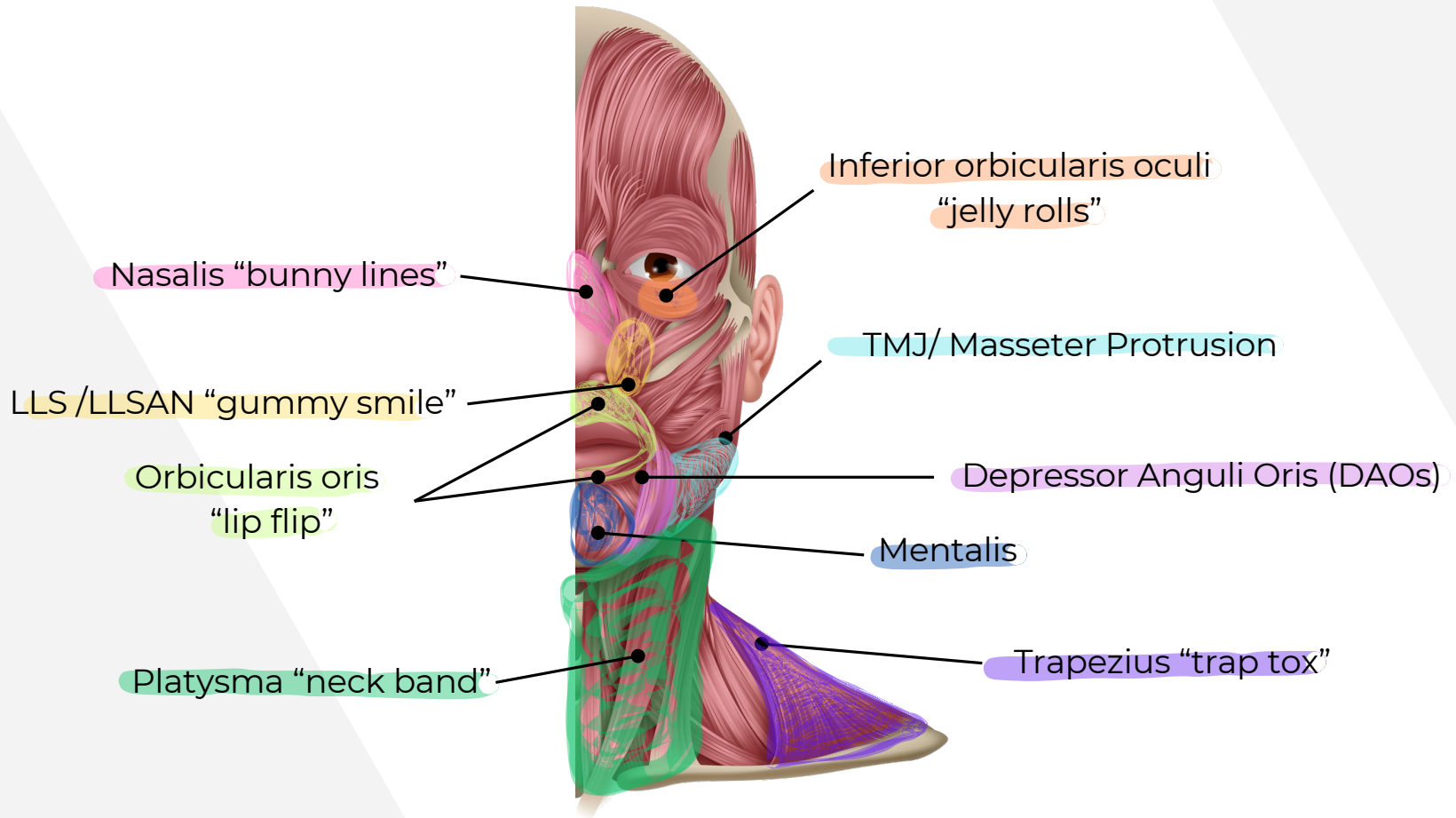


Lateral Canthal Lines
(orbicularis oculi)

FDA Approved Cosmetic Indications

	ONABOTULINUM TOXINA	ABOBOTULINUM TOXINA	INCOBOTULINUM TOXINA	DAXIBOTULINUM TOXIN A-LANM	PRABOTULINUM TOXINA
Onset of Action	7-9 Days	2-3 Days	7-9 Days	2-11 Days	2-3 Days
Duration	3-6 Months	3-6 Months	3-6 Months	24 Weeks	3-6 Months
Indication/ Unit	Glabellar Lines 20 units Lateral Canthal Lines 24 units Forehead Lines 24 units	Glabellar Lines 12 or 20 units	Glabellar Lines 20 units	Glabellar Lines 40 units	Glabellar Lines 20 units

OFF LABEL





Whitney Buha. PHOTO:
WHITNEY BUUHA/ INSTAGRAM

ADVERSE EVENTS

AEs of neurotoxin can happen and are often related to factors such as dosage used, injection technique, individual patient characteristics, and the specific are treated. Common adverse events associated with neurotoxin injections include:

Headache: Patients may experience mild to moderate headaches

Brow and/or Eyelidptosis: Temporary drooping eyelids if the neurotoxin spreads to unintended muscles.

Allergic Reactions: Patients may be hypersensitive or allergic to the neurotoxin or its components

Immune Resistance: Development of neutralizing antibody

Key References

- Levy LL, Emer JJ. Complications of minimally invasive cosmetic procedures: prevention and management. *J Cutan Aesthet Surg*. 2012 Apr;5(2):121-32. doi: 10.4103/0974-2077.99451. PMID: 23060707; PMCID: PMC3461789.
- Lewandowski M, Świerczewska Z, Barańska-Rybak W. Off-Label Use of Botulinum Toxin in Dermatology- Current State of the Art. *Molecules*. 2022 May 13;27(10):3143. doi: 10.3390/molecules27103143. PMID: 35630620; PMCID: PMC9147387.
- Padda IS, Tadi P. Botulinum Toxin. [Updated 2023 Nov 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK557387/>
- Spiegel LL, Ostrem JL, Bledsoe IO. FDA Approvals and Consensus Guidelines for Botulinum Toxins in the Treatment of Dystonia. *Toxins (Basel)*. 2020 May 17;12(5):332. doi: 10.3390/toxins12050332. PMID: 32429600; PMCID: PMC7290737.
- https://www.accessdata.fda.gov/drugsatfda_docs/label/2011/103000s5232lbl.pdf
https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/125274s107lbl.pdf
https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/761127s002lbl.pdf
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