Mechanism of action: Prevents

**Botox**

Abb. + word
- **Mechanism of action:** Prevents **ACh release**
● Mechanism of action: Prevents ACh release

● Where does the toxin ‘go’ to do its work? It is bound and internalized within local motor nerve terminals.
Mechanism of action: Prevents ACh release

Where does the toxin ‘go’ to do its work?
It is bound and internalized within local motor nerve terminals
Mechanism of action: Prevents ACh release
Where does the toxin ‘go’ to do its work?
It is bound and internalized within local motor nerve terminals
Time to onset of action is about # -# (unit of time)
Mechanism of action: Prevents ACh release

Where does the toxin ‘go’ to do its work? It is bound and internalized within local motor nerve terminals

Time to onset of action is about 2 – 4 days
Mechanism of action: Prevents ACh release

Where does the toxin ‘go’ to do its work?
It is bound and internalized within local motor nerve terminals

Time to onset of action is about 2 – 4 days

Duration of action:
- About # - # (unit of time) in extraocular muscles
A

- **Mechanism of action:** Prevents ACh release
- **Where does the toxin ‘go’ to do its work?** It is bound and internalized within local motor nerve terminals
- **Time to onset of action** is about 2 – 4 days
- **Duration of action:**
  - About 5 - 8 weeks in extraocular muscles

*Botox*
**Mechanism of action:** Prevents ACh release

**Where does the toxin ‘go’ to do its work?**
It is bound and internalized within local motor nerve terminals

**Time to onset of action** is about 2 – 4 days

**Duration of action:**
- About 5 - 8 weeks in extraocular muscles
- About # - # (unit of time) in facial muscles
Mechanism of action: Prevents ACh release

Where does the toxin ‘go’ to do its work?
It is bound and internalized within local motor nerve terminals

Time to onset of action is about 2 – 4 days

Duration of action:
- About 5 - 8 weeks in extraocular muscles
- About 3 - 4 months in facial muscles
**Q**

- **Mechanism of action:** Prevents ACh release
- **Where does the toxin ‘go’ to do its work?** It is bound and internalized within local motor nerve terminals
- **Time to onset of action** is about 2 – 4 days
- **Duration of action:**
  - About 5 - 8 weeks in extraocular muscles
  - About 3 - 4 months in facial muscles
- **Paralyzed muscle** a change; antagonist a different change
Mechanism of action: Prevents ACh release

Where does the toxin ‘go’ to do its work? It is bound and internalized within local motor nerve terminals

Time to onset of action is about 2 – 4 days

Duration of action:
- About 5 - 8 weeks in extraocular muscles
- About 3 - 4 months in facial muscles

Paralyzed muscle lengthens; antagonist contracts
Three general classes of ophthalmic indications for Botox use:

- Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

- Neuro-related
- CN7 overactivity disorders

- Plastic/cosmesis-related
- Glabellar area
- Lateral canthal lines
- Forehead
Three general classes of ophthalmic indications for Botox use:

- **Strabismus-related**
- **Neuro-related**
- **Plastics/cosmesis-related**
Two well-established uses for Botox in strab management

- **Strabismus-related**
  - ?
  - ?

- **Neuro-related**

- **Plastics/cosmesis-related**
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related

Plastics/cosmesis-related
How keen is the Peds book on Botox as a primary intervention in ET?

- Strabismus-related
  - Primary tx for ET
- Plastics/cosmesis-related

Botox
How keen is the Peds book on Botox as a primary intervention in ET? Not very. It emphasizes that Botox-only intervention is associated with higher failure and re-op rates.
Strabismus-related

- Primary tx for ET

**Augmentation of large-angle ET surgery**

*How large does at ET need to be to warrant Botox augmentation?*
Strabismus-related

- Primary tx for ET
- **Augmentation of large-angle ET surgery**

*How large does at ET need to be to warrant Botox augmentation?*
Really large—we’re talking at least 60∆ or so
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

How large does at ET need to be to warrant Botox augmentation?
Really large—we’re talking at least 60° or so

In strab surgery, chemodenervation with Botox produces a ‘chemical recession.’
What agent can be injected into the antagonist muscle to produce a chemical resection effect, thereby improving the Botox’s efficacy?
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

How large does ET need to be to warrant Botox augmentation? Really large—we’re talking at least 60Δ or so

In strab surgery, chemodenervation with Botox produces a ‘chemical recession.’ What agent can be injected into the antagonist muscle to produce a chemical resection effect, thereby improving the Botox’s efficacy? Bupivicaine
**Q**

- **Strabismus-related**

  Botox therapy is likely to yield **poor** results in which strabismus scenarios?

- **Plastics/cosmesis-related**
Botox therapy is likely to yield poor results in which strabismus scenarios?
---Large angle restrictive strabismus
---A/V patterns
---Dissociated vertical deviations
---Disorders of the oblique muscles
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery
- **Neuro-related**
  - A group of neuro conditions for which Botox is commonly employed as tx
- **Plastics/cosmesis-related**
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related
What three CN7 overactivity disorders are discussed at length in the Neuro book (and to a lesser extent in the Plastics book)?
What three CN7 overactivity disorders are discussed at length in the Neuro book (and to a lesser extent in the Plastics book)?
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - CN7 overactivity disorders

- **Plastics/cosmesis-related**
  - Benign essential blepharospasm (BEB)
  - Hemifacial spasm
  - Facial myokymia
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - CN7 overactivity disorders

- **Plastics/cosmesis-related**
  - Benign essential blepharospasm (BEB)
    - Bilateral orbicularis spasms

  Facial myokymia

  Hemifacial spasm
*Strabismus-related*
- Primary tx for ET
- Augmentation of large-angle ET surgery

*Neuro-related*
- CN7 overactivity disorders

*Plastics/cosmesis-related*
- Benign essential blepharospasm (BEB)
  - Bilateral orbicularis spasms
  - Onset after age #

Facial myokymia
Hemifacial spasm
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related
- Benign essential blepharospasm (BEB)
  -- Bilateral orbicularis spasms
  -- Onset after age 40
- Strabismus-related
  - Primary tx for ET
  - Augmentation of large-angle ET surgery
- Neuro-related
  - CN7 overactivity disorders
- Plastics/cosmesis-related
  - Benign essential blepharospasm (BEB)
    - Bilateral orbicularis spasms
    - Onset after age 40
    - F > M

Facial myokymia
Hemifacial spasm
Botox
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - CN7 overactivity disorders

- **Plastics/cosmesis-related**

  - Benign essential blepharospasm (BEB)
    - Bilateral orbicularis spasms
    - Onset after age 40
    - F > M

- Facial myokymia
- Hemifacial spasm
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - CN7 overactivity disorders

- **Plastics/cosmesis-related**

  - **Benign essential blepharospasm (BEB)**
    - Bilateral orbicularis spasms
    - Onset after age 40
    - F > M
    - Initially mild/infrequent; can progress to be incapacitating

- **Botox**

- Facial myokymia
- Hemifacial spasm

**Factoid:** No Q
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

Benign essential blepharospasm (BEB)
- Bilateral orbicularis spasms
- Onset after age 40
- F > M
- Initially mild/infrequent; can progress to be incapacitating
- does vs doesn't

Facial myokymia

Hemifacial spasm

Botox
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery
- **Neuro-related**
  - CN7 overactivity disorders
- **Plastics/cosmesis-related**

**Benign essential blepharospasm (BEB)**
- Bilateral orbicularis spasms
- Onset after age 40
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- Initially mild/infrequent; can progress to be incapacitating
- Doesn’t occur during sleep

**Botox**

Facial myokymia

Hemifacial spasm
- Strabismus-related
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- Neuro-related
  - CN7 overactivity disorders

- Plastics/cosmesis-related

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  - Bilateral orbicularis spasms
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  - Doesn’t occur during sleep
  - Probably 2ndry to basal ganglia dysfunction

Botox

Facial myokymia

Hemifacial spasm
Strabismus-related
- Primary tx for ET
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Facial myokymia
Hemifacial spasm

Should neuroimaging be performed for BEB?
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

Benign essential blepharospasm (BEB)
- Bilateral orbicularis spasms
- Onset after age 40
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Facial myokymia
Hemifacial spasm

Should neuroimaging be performed for BEB?
No—it is generally unrevealing, and unnecessary
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - CN7 overactivity disorders

- **Plastics/cosmesis-related**

  **Benign essential blepharospasm (BEB)**
  - Bilateral orbicularis spasms
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  - Probably 2ndry to basal ganglia dysfunction
  - Tx: 4-8 Botox injections ringing both periorbital regions

**Factoid:** No Q
Typical Botox injection sites for BEB
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

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Facial myokymia
Hemifacial spasm

What is Meige syndrome?
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

Benign essential blepharospasm (BEB)
- Bilateral orbicularis spasms
- Onset after age 40
- F > M
- Initially mild/infrequent; can progress to be incapacitating
- Doesn’t occur during sleep
- Probably secondary to basal ganglia dysfunction
- Tx: 4-8 Botox injections

What is Meige syndrome?
BEB + involuntary facial grimacing
Meige syndrome (and rosacea, it seems)
Strabismus-related
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

Neuro-related
  - CN7 overactivity disorders

Plastics/cosmesis-related

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  - Bilateral orbicularis spasms
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  - Tx: 4-8 Botox injections ringing both periorbital regions

What must one rule out prior to making a diagnosis of BEB?
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

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- Tx: 4-8 Botox injections ringing both periorbital regions

What must one rule out prior to making a diagnosis of BEB?
Reflex blepharospasm 2ndry to dry eyes or other issues
Strabismus-related

- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related

- CN7 overactivity disorders

Plastics/cosmesis-related

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Hemifacial spasm
- uni-v bilat
- hemifacial spasms

Facial myokymia

Q

Botox
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery
- **Neuro-related**
  - CN7 overactivity disorders
- **Plastics/cosmesis-related**

### Benign essential blepharospasm (BEB)
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- Tx: 4-8 Botox injections
- Ringing both periorbital regions

### Hemifacial spasm
- Unilateral hemifacial spasms
- Onset after age 40
- F > M
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- Doesn’t occur during sleep
- Probably 2ndry to basal ganglia dysfunction
- Tx: 4-8 Botox injections
- Ringing both periorbital regions
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

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Hemifacial spasm
- Unilateral hemifacial spasms
- Initially involves only orbicularis muscle, progresses to hemiface

Facial myokymia

Botox
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

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Hemifacial spasm
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Facial myokymia
Botox

Hemifacial spasm
**Strabismus-related**
- Primary tx for ET
- Augmentation of large-angle ET surgery

**Neuro-related**
- CN7 overactivity disorders

**Plastics/cosmesis-related**

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- Unilateral hemifacial spasms
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**Facial myokymia**
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - CN7 overactivity disorders

- **Plastics/cosmesis-related**

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Facial myokymia
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Hemifacial spasm
- Unilateral hemifacial spasms
- Initially involves only orbicularis muscle, progresses to hemiface
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Facial myokymia

Take note of this distinguishing feature!
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - **CN7 overactivity disorders**

- **Plastics/cosmesis-related**

---

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- Bilateral orbicularis spasms
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- $F > M$
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**Hemifacial spasm**
- Unilateral hemifacial spasms
- Initially involves only orbicularis muscle, progresses to hemiface
- Doesn’t occur during sleep
- Usually 2ndry to

**Facial myokymia**

*Note: Botox is a brand name for botulinum toxin, which is used in the treatment of some neurological disorders.*
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

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Hemifacial spasm
- Unilateral hemifacial spasms
- Initially involves only orbicularis muscle, progresses to hemiface
- Doesn’t occur during sleep
- Usually 2ndry to nerve-root compression

Botox

Facial myokymia
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
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Plastics/cosmesis-related

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Facial myokymia

What is the classic compressive lesion?

Botox
- Strabismus-related
  - Primary tx for ET
  - Augmentation of large-angle ET surgery
- Neuro-related
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- Plastics/cosmesis-related

Benign essential blepharospasm (BEB)
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Hemifacial spasm
- Unilateral hemifacial spasms
- Initially involves only orbicularis muscle, progresses to hemiface
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What is the classic compressive lesion?
A dolichoectatic vessel

Facial myokymia

A
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

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Hemifacial spasm
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- Initially involves only orbicularis muscle, progresses to hemiface
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What is the classic compressive lesion?
A dolichoectatic vessel

Should neuroimaging be performed?
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - CN7 overactivity disorders

- **Plastics/cosmesis-related**

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  **Hemifacial spasm**
  - Unilateral hemifacial spasms
  - Initially involves only orbicularis muscle, progresses to hemiface
  - Doesn’t occur during sleep
  - Usually 2ndry to nerve-root compression

**What is the classic compressive lesion?**
A dolichoectatic vessel

**Should neuroimaging be performed?**
Yes, to confirm the vascular nature of the compressive lesion, and to rule out a mass
**Strabismus-related**
- Primary tx for ET
- Augmentation of large-angle ET surgery

**Neuro-related**
- **CN7 overactivity disorders**

**Plastics/cosmesis-related**

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**Hemifacial spasm**
- Unilateral hemifacial spasms
- Initially involves only orbicularis muscle, progresses to hemiface
- Does occur during sleep
- Usually 2ndry to nerve-root compression
- First line tx: Botox injections

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**Factoid: No Q**
Typical Botox injection sites for hemifacial spasm
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
- CN7 overactivity disorders

Plastics/cosmesis-related

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Hemifacial spasm
- Unilateral hemifacial spasms
- Initially involves only orbicularis muscle, progresses to hemiface
- Doesn’t occur during sleep
- Usually 2ndry to nerve-root compression
- First line tx: Botox injections
- May be required in select cases

Botox
Strabismus-related
- Primary tx for ET
- Augmentation of large-angle ET surgery

Neuro-related
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Plastics/cosmesis-related

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Hemifacial spasm
- Unilateral hemifacial spasms
- Initially involves only orbicularis muscle, progresses to hemiface
- Does not occur during sleep
- Usually 2ndry to nerve-root compression
- First line tx: Botox injections
- Surgical decompression may be required in select cases

Facial myokymia
**Strabismus-related**
- Primary tx for ET
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**Neuro-related**
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**Plastics/cosmesis-related**

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- Unilateral hemifacial spasms
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- First line tx: Botox injections
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**How is decompression typically achieved?**

A sponge is placed between the offending vessel and nerve.

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**Botox**
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- First line tx: Botox injections

**Surgical decompression**
- How is decompression typically achieved? A sponge is placed between the offending vessel and nerve
Surgical decompression
**Q**

- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery

- **Neuro-related**
  - CN7 overactivity disorders

- **Plastics/cosmesis-related**

  **Benign essential blepharospasm (BEB)**
  - Bilateral orbicularis spasms
  - Onset after age 40
  - F > M
  - Initially mild/infrequent; can progress to be incapacitating
  - Doesn’t occur during sleep
  - Probably 2ndry to basal ganglia dysfunction
  - Tx: 4-8 Botox injections ringing both periorbital regions

  **Hemifacial spasm**
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**Botox**

- **Facial myokymia**
  - uni- v bilat
  - Rippling movements of facial musculature
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Neuro-related
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Plastics/cosmesis-related

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Facial myokymia
- Unilateral rippling movements of facial musculature

Botox
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**Facial myokymia**
- Unilateral rippling movements of facial musculature
- May involves only muscle initially, then progress to hemiface

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**Botox**
Strabismus-related
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- **Facial myokymia**
  -- Unilateral rippling movements of facial musculature
  -- May involves only orbicularis muscle initially, then progress to hemiface
  -- 2ndry to CNS area lesion
**Strabismus-related**
- Primary tx for ET
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- May involves only orbicularis muscle initially, then progress to hemiface
- 2ndry to pontine lesion

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- May involves only orbicularis muscle initially, then progress to hemiface
- 2ndry to pontine lesion (lesion in kids; in adults)

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**Botox**
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Facial myokymia
- Unilateral rippling movements of facial musculature
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- 2ndry to pontine lesion (glioma in kids; MS in adults)
Neuro-related

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Three words
Intermittent orbicularis flutter

Strabismus-related

Primary tx for ET

Augmentation of large-angle ET surgery
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Facial myokymia
- Unilateral rippling movements of facial musculature
- May involves only orbicularis muscle initially, then progress to hemiface
- 2ndry to pontine lesion (glioma in kids; MS in adults)
- Benign eyelid myokymia: Intermittent orbicularis flutter
- Can be treated with Botox if persistent (= ongoing x months)

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Botox

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  - CN7 overactivity disorders
- Plastics/cosmesis-related
  - ?
  - ?
  - ?
  - ?

Locations commonly Botox’d for cosmesis
- **Strabismus-related**
  - Primary tx for ET
  - Augmentation of large-angle ET surgery
- **Neuro-related**
  - CN7 overactivity disorders
- **Plastics/cosmesis-related**
  - Glabellar area
  - Lateral canthal lines
  - Forehead
  - Perioral rhytids
  - Platysmal bands

Locations commonly Botox’d for cosmesis