

# SPASMODIC DYSPHONIA & OROMANDIBULAR/LINGUAL DYSTONIA

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## SPASMODIC DYSPHONIA History

Initially described by Traube 1871

Traube L. Spastische Form der Nervösen Helsekeit. In: Gesammelte zur Pathologie und Physiologie. Vol 2. Berlin: Hirschwald, 1871

Psychiatric Disorder

- aggravated by stress
- improved with alcohol
- sensory tricks

## Spasmodic Dysphonia History

### Terminologies

- Spastic Dysphonia
- Spastic Aphonia
- Phonic laryngeal spasms
- Mogiphonia
- Laryngeal Stuttering

### Blitzer 1985

Blitzer A, Lovelace RE, Brin MF, Fahn S, Fink ME. Electromyographic findings in focal laryngeal dystonia (spastic dysphonia). *Ann Otol Rhinol Laryngol* 1985;94:591-4

## Spasmodic Dysphonia Etiology

### Primary Dystonia

### 12% Family History

Botulinum Toxin Management of Spasmodic Dysphonia (Laryngeal Dystonia): A 12-year experience in more than 900 patients. Blitzer A, Brin MF, Stewart CF. *Laryngoscope* 108:1435-1441, 1998

35% abnormal ABR

47% abnormal parasympathetic vagal functioning

76% abnormal SPECT scans

## Spasmodic Dysphonia

Incidence is 1:100,000

Average Age of Onset: 40's – 50's

Female:Male 3:1

16% will have spread to other body parts

27% dystonic patient have laryngeal involvement

## Spasmodic Dysphonia Characteristics

Hyperfunctional spasms of the intrinsic laryngeal musculature

Task induced

Types:

Adductor – most common?

Abductor

Mixed

## Spasmodic Dysphonia Diagnosis

### 3 Tiered approach

- screening questions
- speech evaluation
  - “We eat eels every day” – Adductor
  - “He is hiding behind the house.” - Abductor
- laryngoscopy

#### Spasmodic Dysphonia Sentences

##### Adductor Sentences (words beginning w/vowels)

- Tom wants to be in the army.
- We eat eels every day.
- I hurt my arm on the iron bar.
- Are the olives large?
- John argued ardently about honesty.
- We mow our lawn all year.

##### Abductor Sentences (Voiceless consonants- h,s,p,t,k)

- He is hiding behind the house.
- Patty helped Kathy carve the turkey.
- A mahogany highboy isn't heavy.
- Boys were singing songs outside of our house.
- The puppy bit the tape.
- Sally fell asleep in the soft chair.
- The policy was suggested in an essay on peace.

## Spasmodic Dysphonia Diagnosis

Strain

Strangled

Pitch-breaks

Breathiness

Tremor

Glottal Fry



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## Spasmodic Dysphonia Diagnosis

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# LISTEN!!!



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## Spasmodic Dysphonia Diagnosis

Strain

Strangled

Pitch-breaks

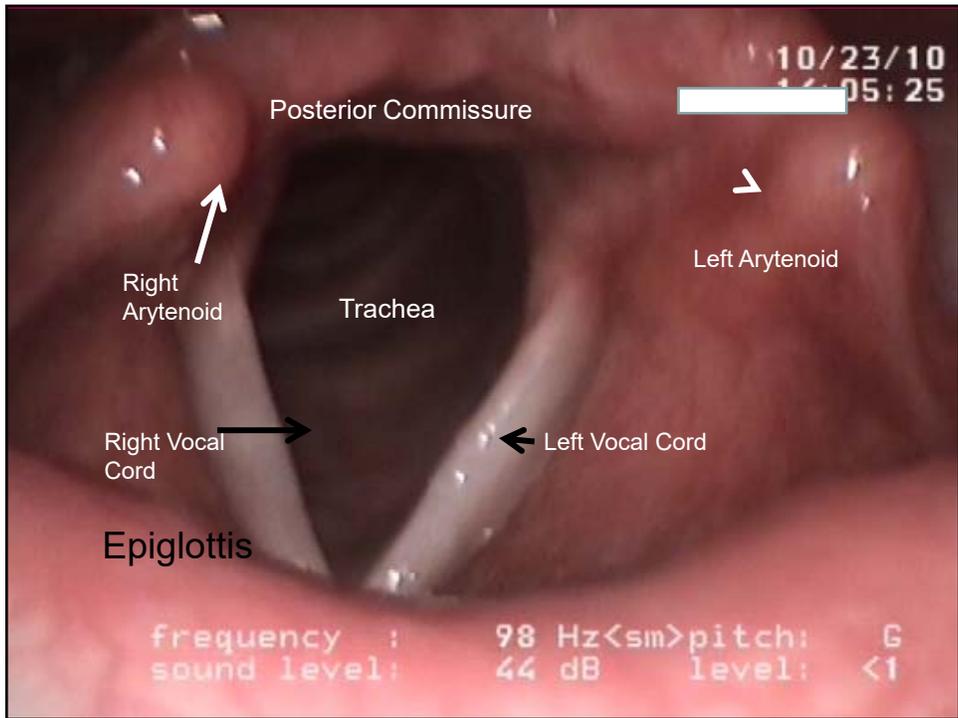
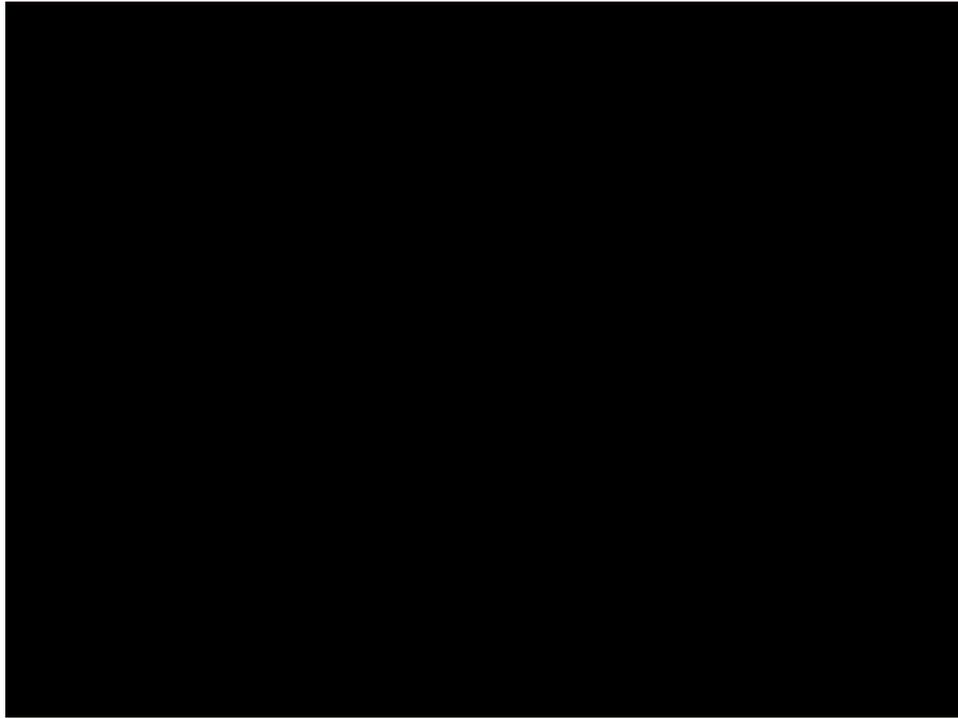
Breathiness

Tremor

Glottal Fry

# LISTEN!





ID NO.  
NAME  
SEX AGE  
D.O.BIRTH  
04/20/2012  
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COMMENT

NEXT FREEZ RELES VTR EXIT

02/22/11  
10:52:03



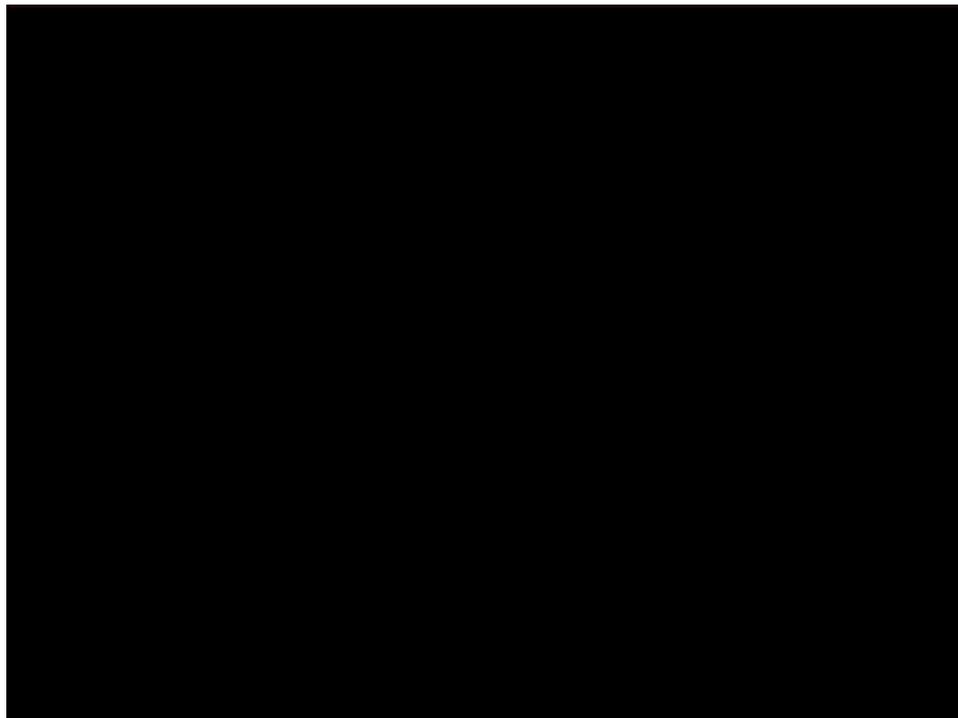
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NAME  
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D.O.BIRTH  
04/04/2012  
15:27:08



COMMENT

NEXT FREEZ RELES VTR EXIT



### Spasmodic Dysphonia Sentences

#### Adductor Sentences (words beginning w/vowels)

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## WHAT IS YOUR DIAGNOSIS?

66 year old female

- 2-3 year history of upper extremity tremors diagnosed as essential tremor
- 1 year history of hoarseness also described as a tremor
- No other significant PMH

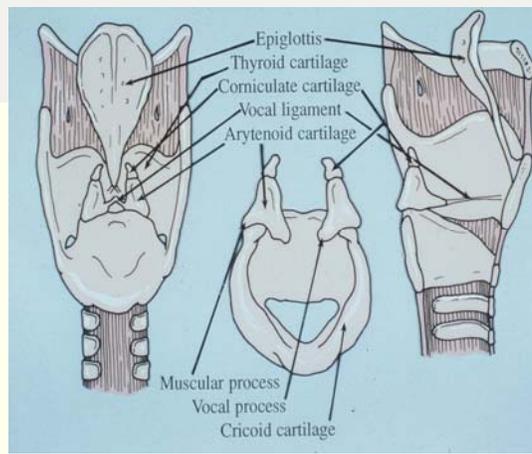


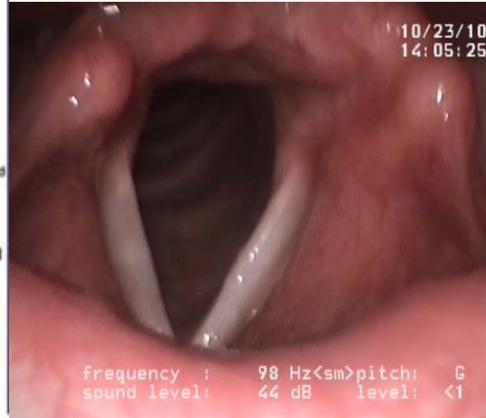
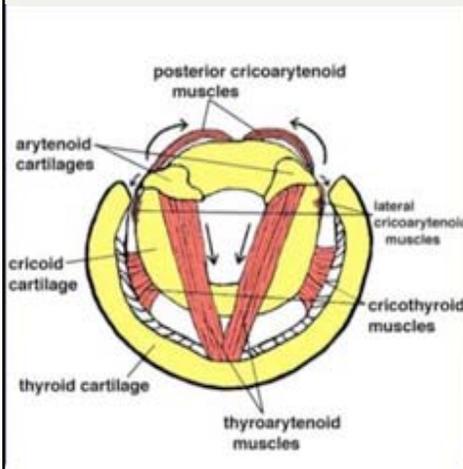
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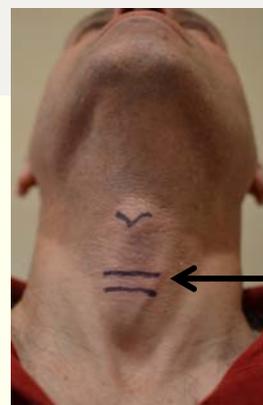
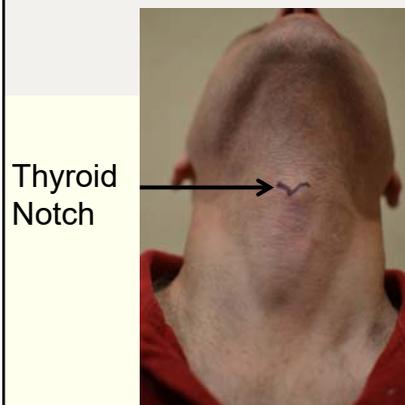
## Laryngeal Anatomy

- **Cartilages**
- Membranes
- Muscles
- Nerves

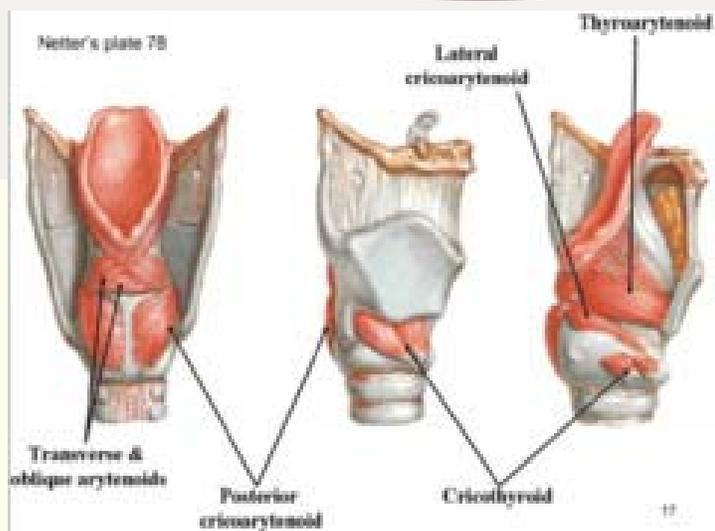
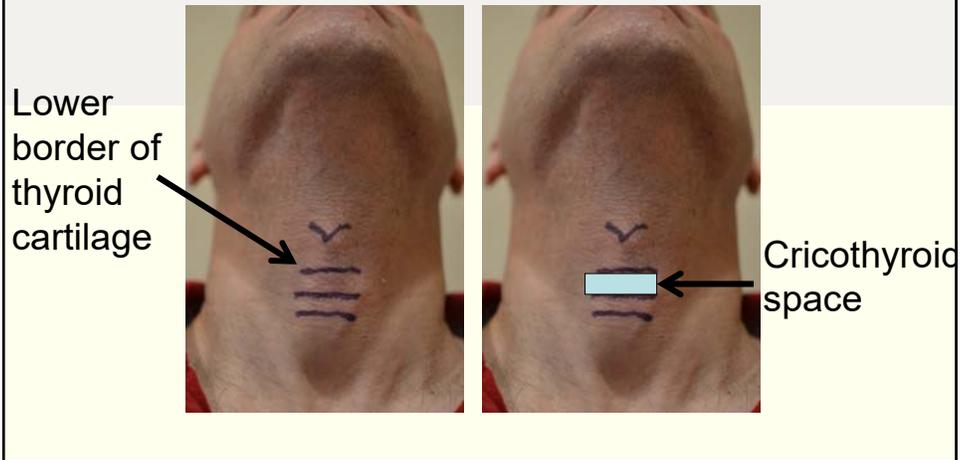




### Spasmodic Dysphonia Percutaneous Botox Injections



# Spasmodic Dysphonia Percutaneous Botox Injections

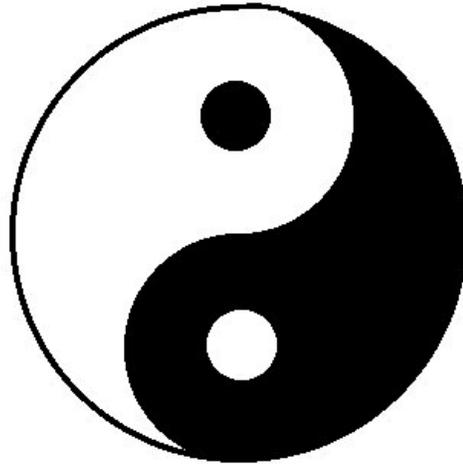




# Laryngeal Physiology

## 3 Functions of the Larynx

- Airway
- Deglutition
- Voice



## Spasmodic Dysphonia Treatment Options

1. Voice Therapy
2. Botulinum Toxin Injections
3. Surgery

## Spasmodic Dysphonia Botox Injections

### Routes of Injection

Percutaneous, Transoral, Endoscopic

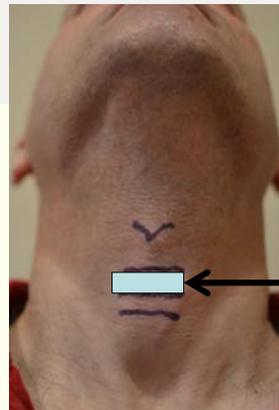


## Spasmodic Dysphonia Percutaneous Botox Injections

Lower  
border of  
thyroid  
cartilage



Cricothyroid  
space





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## Spasmodic Dysphonia Percutaneous Botox Injections



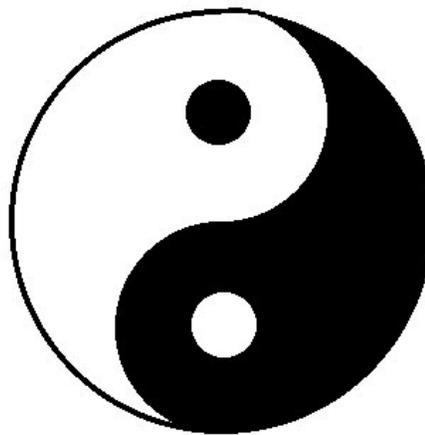
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## Unilateral or Bilateral Injections Adductor Spasmodic Dysphonia Side Effects

Initial Dosing: 2-2.5  
units

Functions of the  
Larynx

- Airway
- Deglutition
- Voice



## Spasmodic Dysphonia Botox Injections

### Routes of Injection

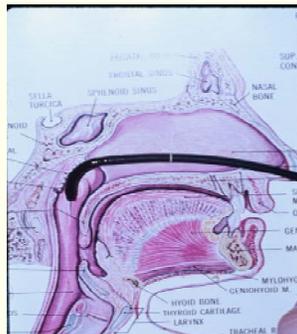
Percutaneous, **Transoral**, Endoscopic



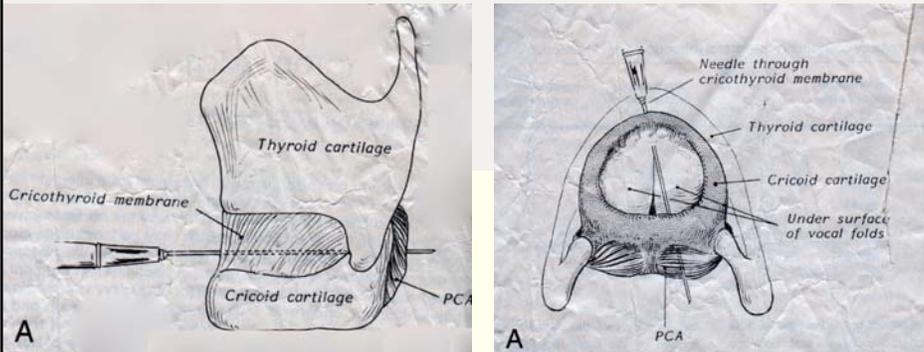
## Spasmodic Dysphonia Botox Injections

### Routes of Injection

Percutaneous, Transoral, **Endoscopic**



## Abductor Spasmodic Dysphonia Injection Technique



Meleca RJ, Hogikyan ND, Bastian RW: A comparison of methods of botulinum toxin injection for abductory spasmodic dysphonia. *Otolaryngol Head Neck Surg*, 117:487-192, 1997

## Spasmodic Dysphonia Treatment Options

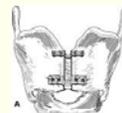
1. Voice Therapy

2. Botulinum Toxin Injections

3. Surgery

Selective Laryngeal Nerve Denervation

Thyroplasty Type II



Berke, GS, et. al. Laryngeal Adductor Denervation- Reinnervation: A New Surgical Treatment for Adductor Spasmodic Dysphonia. *Ann Otol Rhinol Laryngol*; Mar 108(3):227-231, 1999.



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# OROMANDIBULAR

# DYSTONIA



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## Oromandibular/Lingual Dystonia History

### Glowers, 1899

Glowers WR. Manual of diseases of the nervous system. 3rd ed. Vol. 2 London: Churchill, 1899:200.

### Meige, 1910

Meige H. Les convulsions de la face: une forme Clinique de convulsions facials, bilaterale et mediane.  
Rev Neurolo (Paris) 1910;21:437-43.

# Oromandibular/Lingual Dystonia

Average Age of Onset: 50

Female:Male: 2:1

Workup:

H & P  
MRI  
blood tests (ceruloplasmin)

## What do we know from the literature regarding swallowing problems associated with oromandibular dystonias?

- Not much....
- Study: 15% of oromandibular dystonic patients had “eating” issues
  - Chewing to swallowing transitional phase
  - Loss of rhythmicity of chewing
  - Excess duration of muscle activity during chewing
    - Mascia MM, Valls-Sole J, Marti MJ, Sanz S. Chewing pattern in patients with Meige’s syndrome. *Movement Disorders*, 20, 26-33, 2005.
- Study: 90% patients with blepharospasm had at least one swallowing abnormality
  - Premature spillage
  - Postswallow pharyngeal residue
    - Cersosimo MG, Juri S, Suarez de Chandler S, Clerici R, Micheli SE. Swallowing disorders in patients with blepharospasm. *Medicina* 65, 117-120, 2005.

## Oromandibular/Lingual Dystonia Treatment

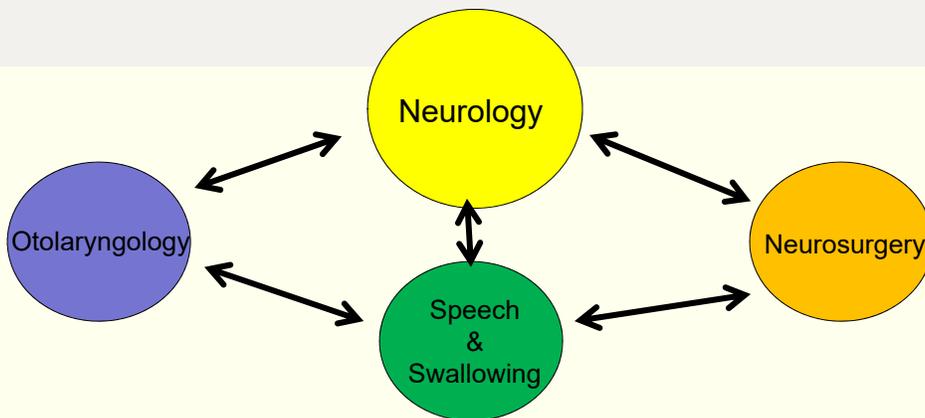
### Medications

Carbidopa/Levidopa  
Anticholinergics  
Benzodiazepines  
Baclofen  
Gabapentin  
Carbamazepine

Botulinum Toxin

Deep brain Stimulators

## Oromandibular/Lingual Dystonia Treatment



## Oromandibular Dystonia Subtypes

Jaw Opening

Jaw Closing

Jaw deviation

Mixed

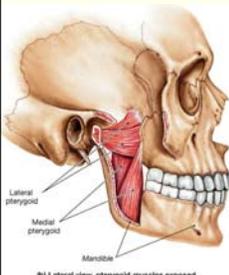
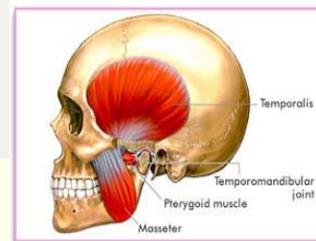
## Muscles of Mastication

Jaw Openers

Lateral Pterygoids

Digastric

Suprahyoids



81 Lateral view, pterygoid muscles exposed

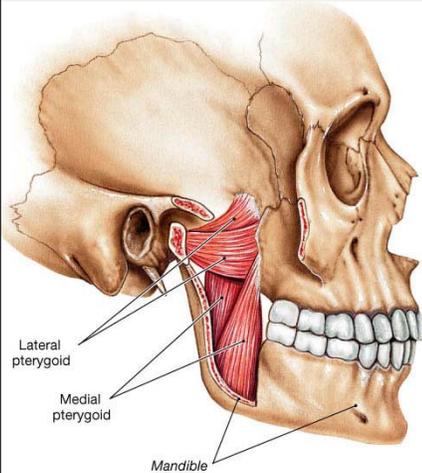
Jaw Closers

Masseter

Temporalis

Medial Pterygoids

# Muscles of Mastication



(b) Lateral view, pterygoid muscles exposed

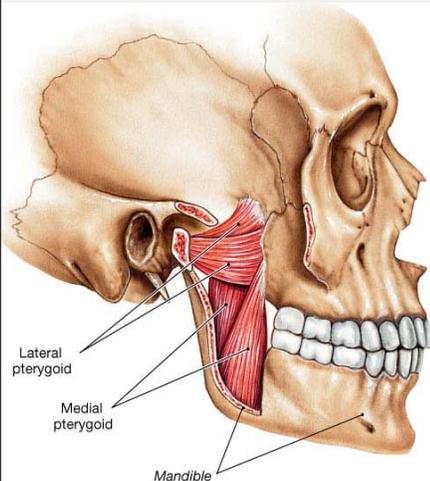
## Lateral Pterygoid Muscle

**Origin:** Lateral pterygoid plate

**Insertion:** TMJ and condyle

**Actions:** Jaw opening  
Lateral excursion  
Protraction

# Muscles of Mastication



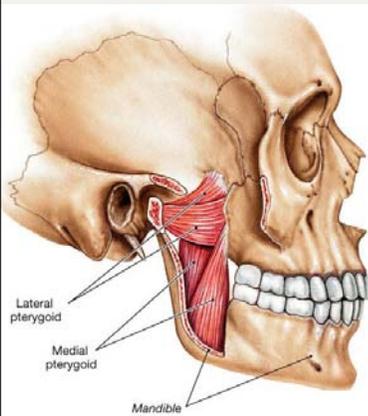
(b) Lateral view, pterygoid muscles exposed





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# Muscles of Mastication



(b) Lateral view, pterygoid muscles exposed



# Muscles of Mastication

## Jaw Openers

### Digastric

**Origin:** Mastoid

**Insertion:** Anterior mastoid

**Action:** Jaw opening, retraction

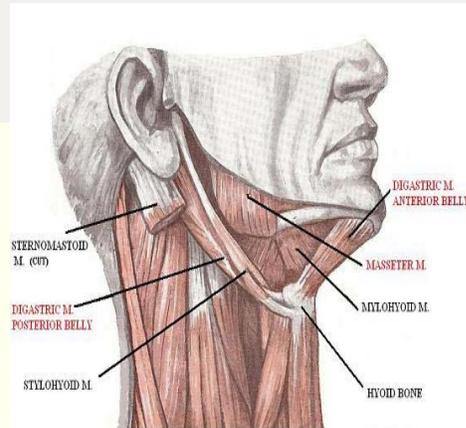
### Suprahyoid Muscles

Mylohyoid & Geniohyoid

**Origin:** Inner mandible

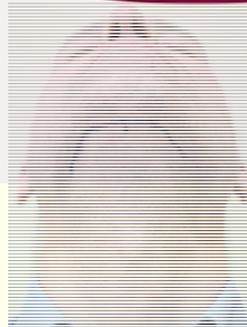
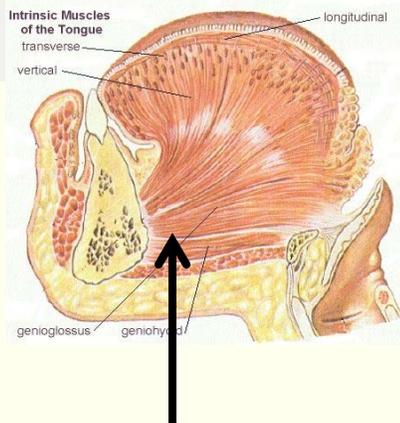
**Insertion:** Hyoid bone

**Action:** Jaw opening, food transfer

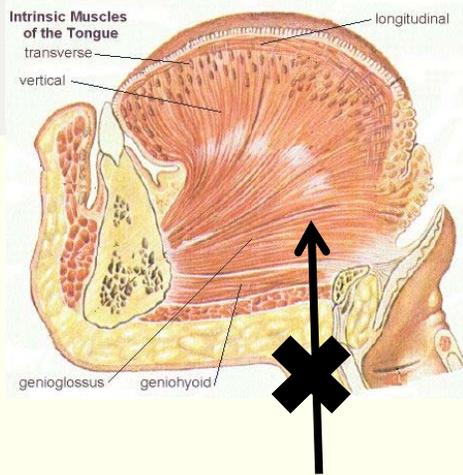


# Lingual Dystonia

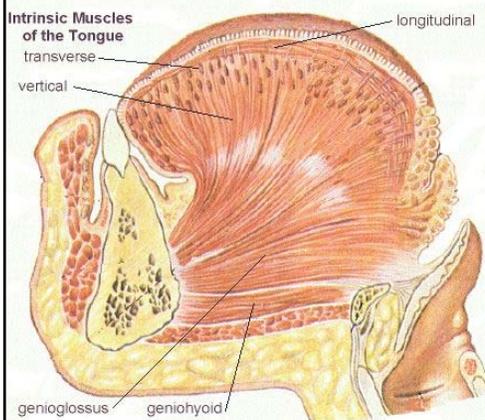
## Anatomy



# Lingual Dystonia Injection



# Lingual Dystonia Anatomy

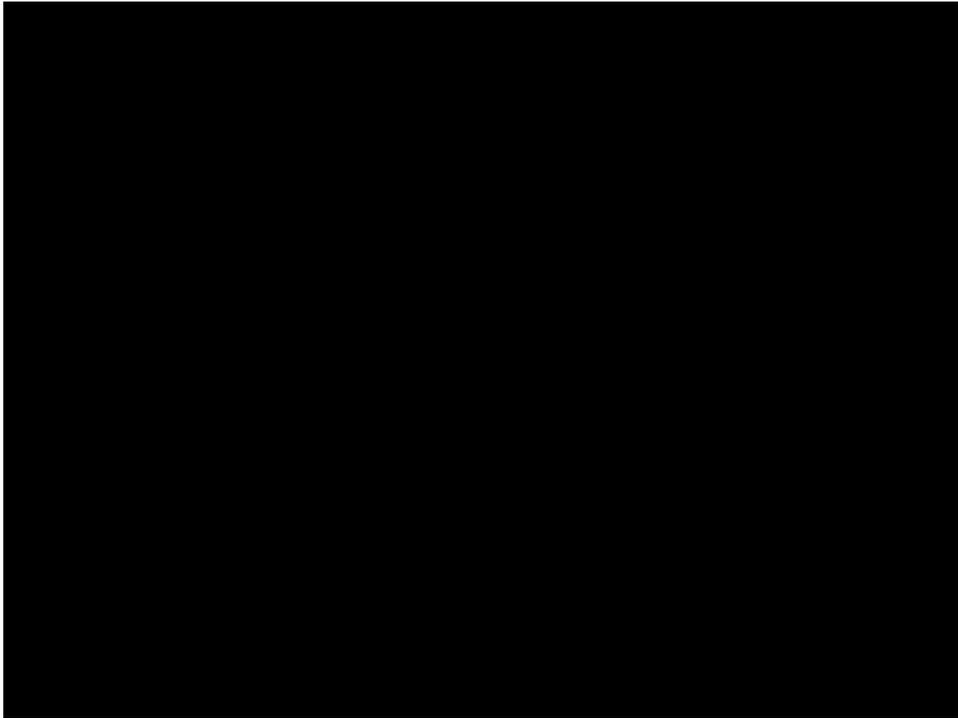


## Genioglossus

**Origin:** Inner surface mandible

**Insertion:** entire tongue  
undersurface

**Action:** protrusion



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## Jaw Closing Dystonia

### **Jaw Closing Muscles:**

Masseters  
Temporalis  
Medial Pterygoids

### **Dosing:**

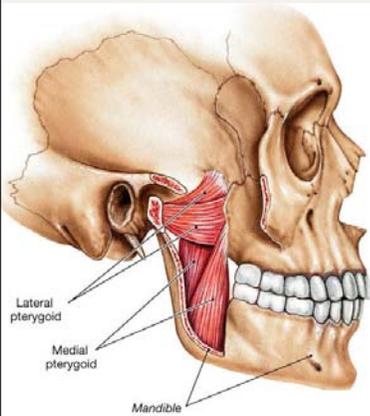
25 – 50 units per muscle starting dose  
Can increase to 75 or ? units per muscle

### **Order of Muscle Injection Trials:**

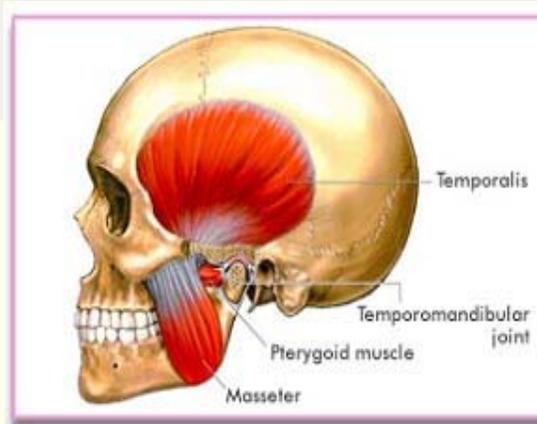
- 1) Masseter
- 2) Temporalis
- 3) Medial Pterygoid



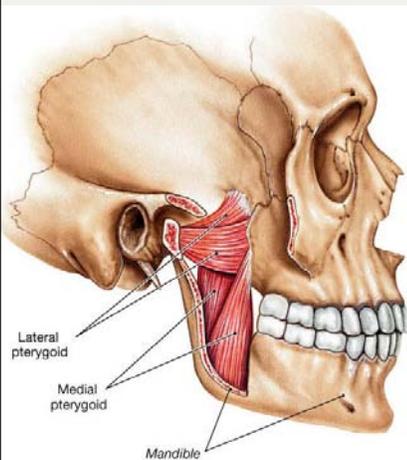
# Muscles of Mastication



(b) Lateral view, pterygoid muscles exposed



# Injection of the Medial Pterygoid



(b) Lateral view, pterygoid muscles exposed





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## Injecting for Mixed Oromandibular Dystonia

Difficult to Treat

Attempt the predominant symptoms first

Be flexible and consider alternate muscles and  
changing doses



## 63 yr old male

-50 yr history of facial tics, more recent years treated with botulinum toxin for blepharospasm

- 3 month history of breath holding and shortness of breath, denies neck/throat spasms

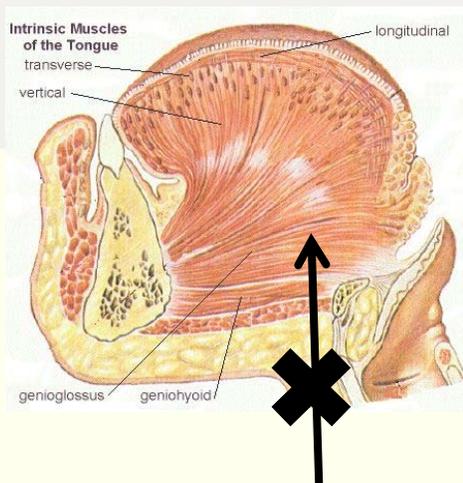
-treated with klonopin without relief



## Treatment

- 30 units Botulinum toxin to each lateral pterygoid
- 8 units to base of tongue
- 1 unit to thyroarytenoid muscles

## Lingual Dystonia Injection





## Conclusions

1. **Watch, Listen, and Palpate** your patient
2. Know your **Anatomy**
3. Know your **Physiology**
4. Work with a **Team**