THE USE OF BOTULINUM TOXIN IN DYSTONIA

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DISCLOSURES

Dr Truong has conducted studies with botulinum toxin A Botox®, Dysport® and Xeomin® and botulinum toxin B (Myobloc®). He has been consultant for Ipsen, UCB, Merz. He has received honorarium from consultant activities with Merz and Ipsen and for speaking engagements.

The speaker tried to use non-proprietary name in the presentation but at the advise of the FDA due to the nature of botulinum toxin where one brand can not be used interchangeable with others, commercial name will be used when specify the dosis.

LEARNING OBJECTIVE

- The usefulness of botulinum toxin in the treatment of dystonia
- Methods of botulinum toxin application

DYSTONIA

- Dystonia is characterized by sustained muscle contractions that frequently cause twisting and repetitive movements, and can be classified according to three parameters: etiology, age at symptom onset, and distribution of affected body regions
  - Cervical dystonia
  - Oromandibular dystonia
  - Blepharospasm
  - Spasmodic dysphonia
  - Focal upper extremity dystonia

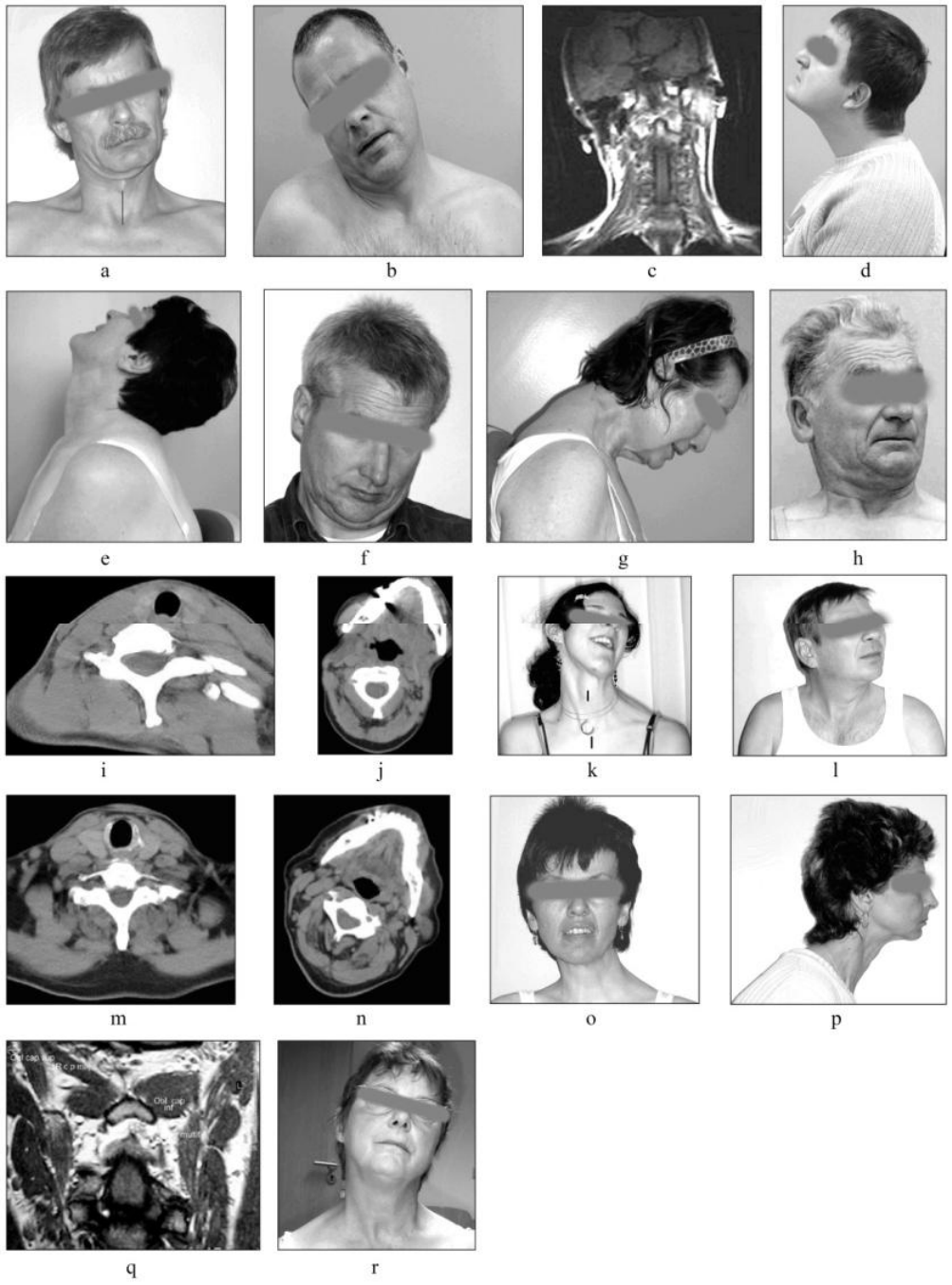
CERVICAL DYSTONIA

- Cervical dystonia (CD), is a neurological syndrome characterized by abnormal head and neck posture due to tonic involuntary contractions in a set of cervical muscles (Foltz et al., 1959).
- Myoclonic or tremulous movements are often superimposed in CD, producing a “tremor like” appearance – especially early in the disease state.

CERVICAL DYSTONIA CLASSIFICATION

- Torticollis
- Laterocollis
- Antecollis and retrocollis
- Shifting

CERVICAL DYSTONIA



CERVICAL DYSTONIA

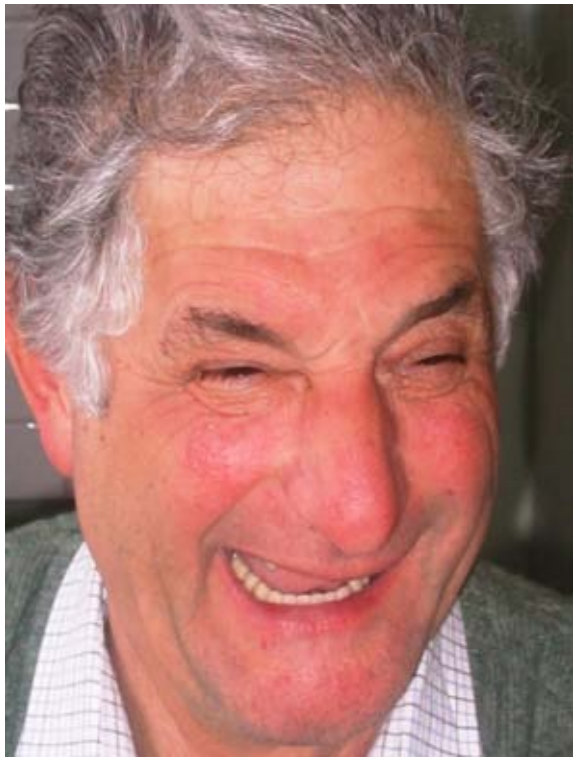
Score	Botox®	Xeomin®	Dysport®	NeuroBloc®
12-15	200	200	800	10.000
9-12	150-200	150-200	600-800	7.500-10.000
6- 9	100-150	100-150	400-600	5.000- 7.500
3- 6	80-120	80-120	320-480	4.000- 6.000

Recommendations for total doses (units) based on CD severity measured by the Tsui-Score

BLEPHAROSPASM

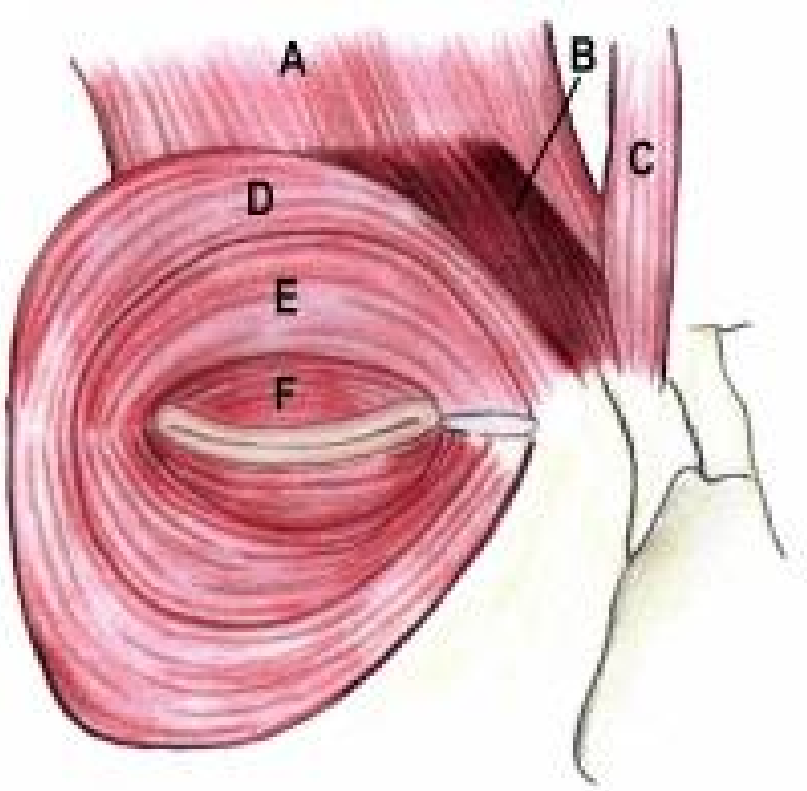
Blepharospasm

- Blepharospasm can be caused by tonic or phasic contractions of the orbicularis oculi muscles and may also be associated with levator palpebrae muscle inhibition (apraxia of eyelid opening) or involuntary movements in the lower face or jaw muscles (Meige syndrome).
- In most cases blepharospasm is considered primary and is only occasionally secondary to structural brain lesions or drug induced



ORBICULARIS OCULI

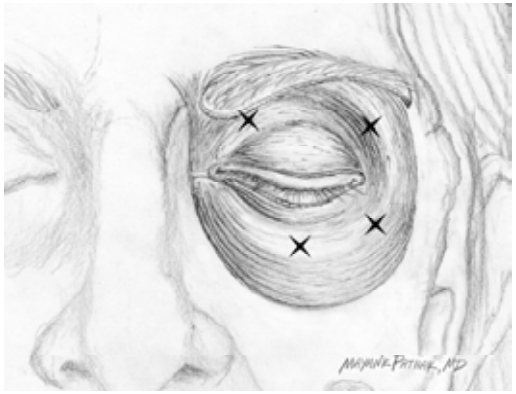
- The orbicularis oculi, a sphincter muscle around the eye, consists of an orbital and palpebral part. The palpebral is further divided into preseptal and pretarsal portions.
- The orbital part originates in the medial part of the orbit and runs around the eye via the upper eye cover fold and lid and returns in the lower eyelid to the palpebral ligament.
- The preseptal or palpebral part originates in the palpebral ligament and runs above and below the eye to the lateral angle of the eye.
- The orbital and the preseptal muscles form concentric circles around the eye.
- The pretarsal part lies just around the palpebral margin.
- The palpebral portion is used in blinking and voluntary winking, while the orbital portion is used in forced closure.

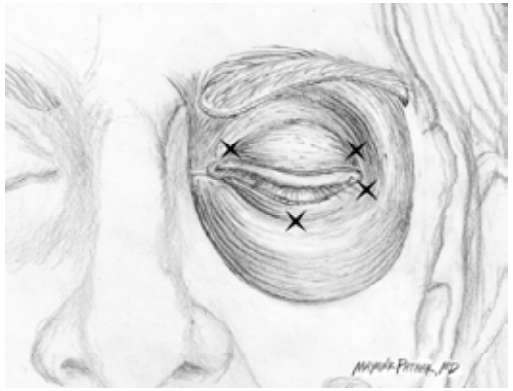


(A) Frontalis, (B) corrugator superciliaris, (C) procerus, (D) orbital orbicularis, (E) preseptal orbicularis, (F) pretarsal orbicularis.

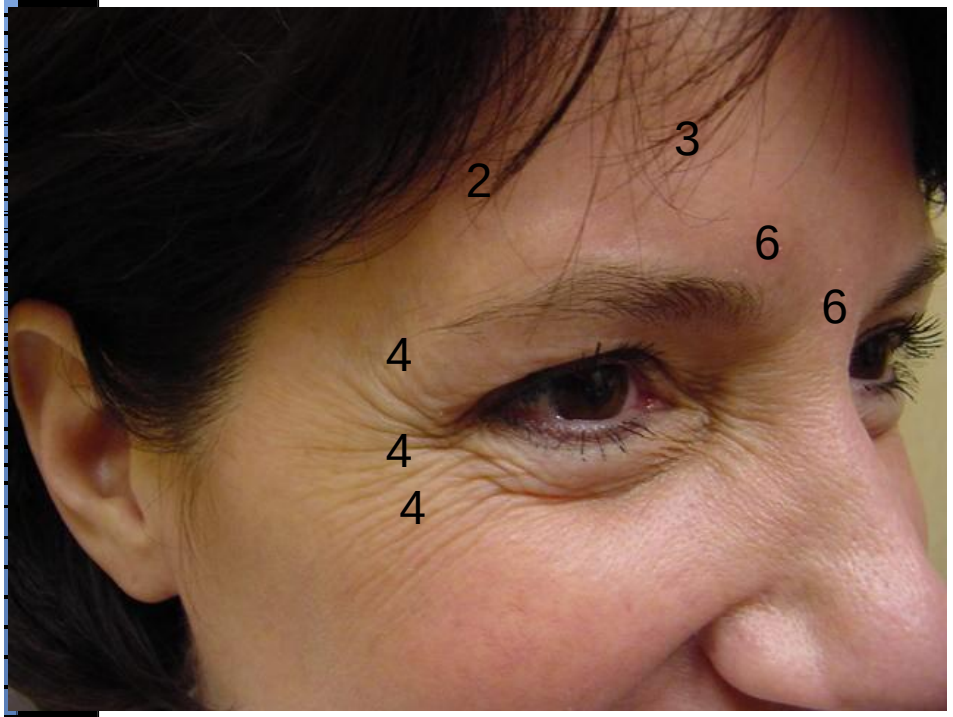
BLEPHAROSPASM INJECTION TECHNIQUES

- Pretarsal treatment: significantly higher response rate and longer-lasting
- Injection into the pretarsal part is more painful but produces fewer side effects.
- Pretarsal injection: best method for treating involuntary eyelid closure and apraxia of eyelid opening.
- Botox® or Xeomin®: 25 to 50 mU or Dysport® 100 to 200 mU
- The corrugator, procerus and frontalis, can also be injected.
- Other botulinum toxin serotypes have proved substantially unhelpful.





Treatment of the crow's feet with 10 units total into the vertical fibers of the orbicularis oculi.



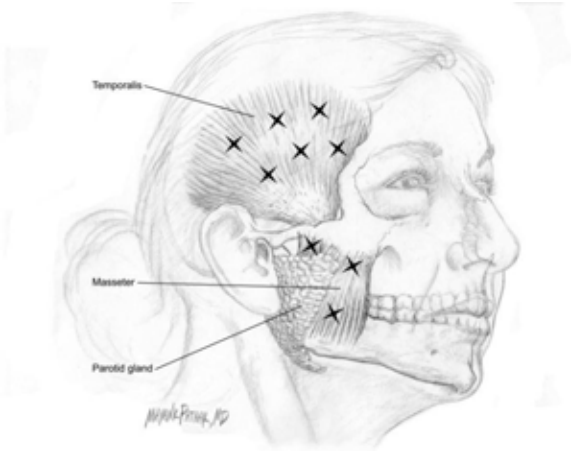
Injection pattern to compensate t
avoid “the surprising effect”.

OROMANDIBULAR DYSTONIA

- a form of focal dystonia that involves masticatory, lower facial, labial, and lingual musculature.
- affects women more than men
- Prevalence 68.9 cases per 1 million Americans
- mean age at onset is between 50 and 60 years.

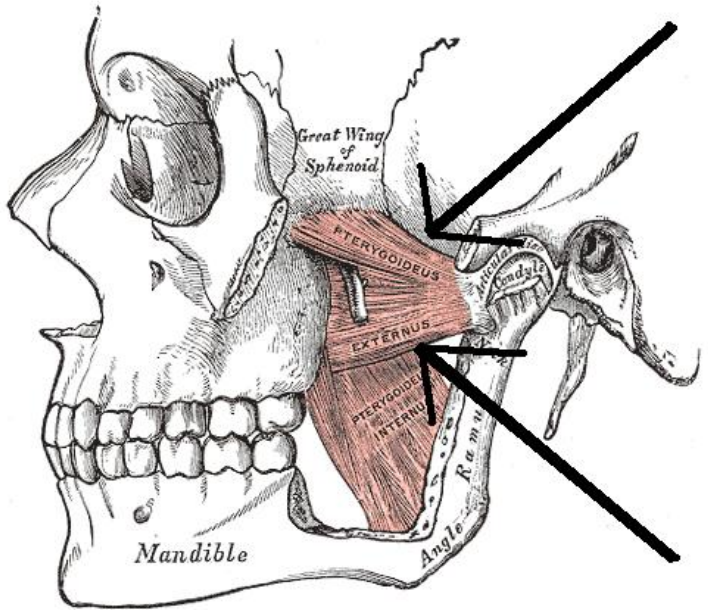
OROMANDIBULAR DYSTONIA

- The involvement of masticatory muscles may cause jaw-closing or –opening, lateral deviation, protrusion, retraction, or as a combination.



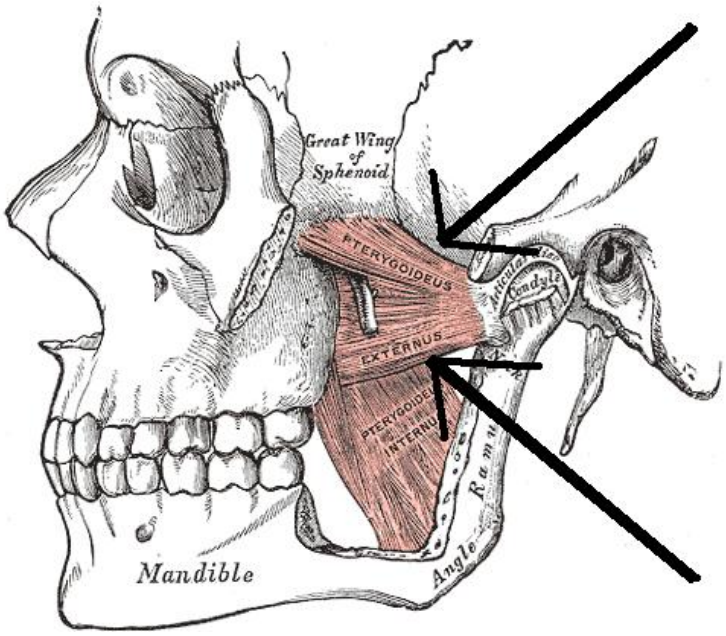
OROMANDIBULAR DYSTONIA LATERAL PTRYGOID

- The lateral pterygoid muscle pulls the head of the condyle out of the mandibular fossa along the articular eminence to protrude the mandible.
- the only muscle of mastication that assists in depressing the mandible (opening the jaw).
- At the beginning of this action it is assisted by the digastric, mylohyoid and geniohyoid muscles.



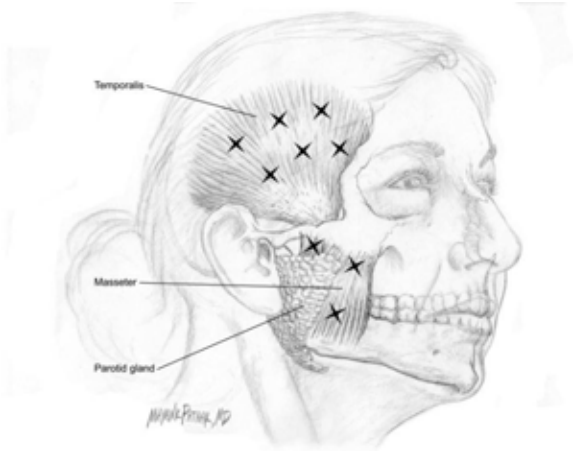
OROMANDIBULAR DYSTONIA MEDIAL PETRYGOID

- Elevation of the mandible (closes the jaw)
- Minor contribution to protrusion of the mandible
- Assistance in mastication
- Excursion of the mandible; contralateral excursion occurs with unilateral contraction.



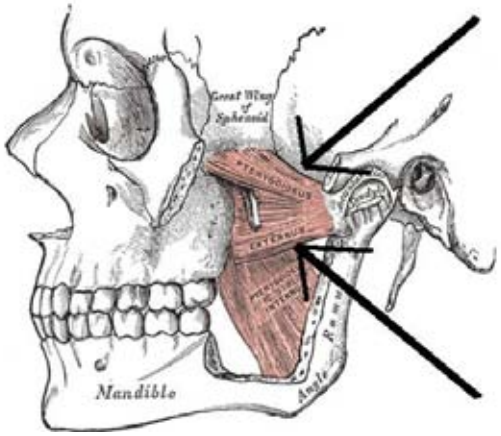
OROMANDIBULAR DYSTONIA

Subtype	Muscle Involved
Jaw Closing	Temporalis
	Masseter
	Medial pterygoid
Jaw Opening	Lateral pterygoid
	Mylohyoid
	Digastric
	Geniohyoid
Jaw Deviation	contralateral lateral pterygoid
	Ipsilateral medial pterygoid
	ipsilateral temporalis



OROMANDIBULAR DYSTONIA JAW PROTRUSION

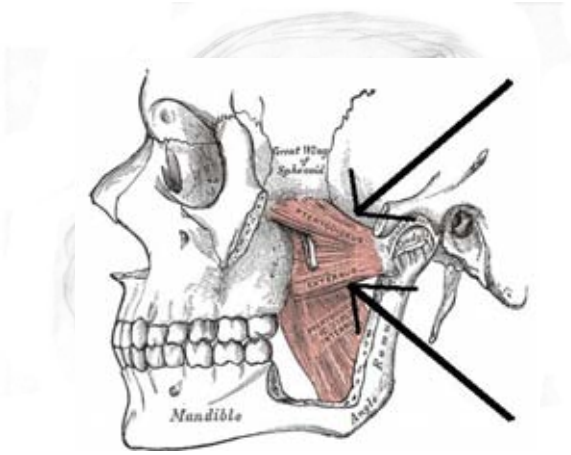
- Lateral pterygoid
- Medial pterygoid



Charles II of Spain with Habsburger jaws

OROMANDIBULAR DYSTONIA

Subtype	Muscle Involved
Jaw Closing	Medial pterygoid
	Lateral pterygoid



Small doses of BoNT-A to treat perioral lines which can be accentuated with puckering. Initially start with low doses, avoiding the lateral portions

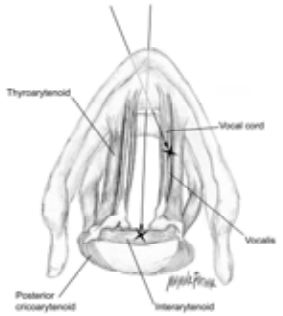
FOCAL DYSTONIA

BEFORE

AFTER

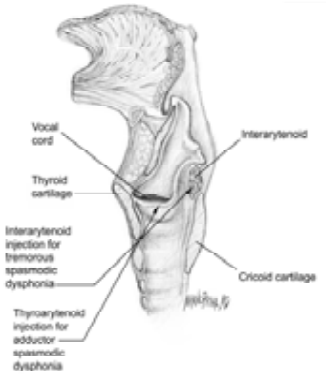
SPASMODIC DYSPHONIA

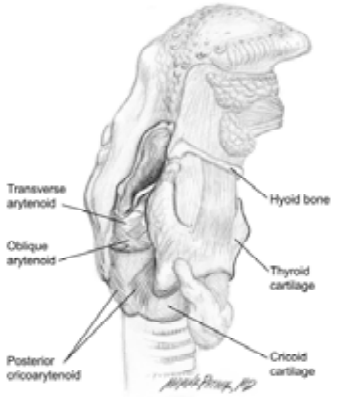
- Focal dystonia characterized by task-specific, action-induced spasm of the vocal cords.
- It can occur independently, as part of cranial dystonia (Meige's syndrome), or in other disorders such as in tardive dyskinesia.

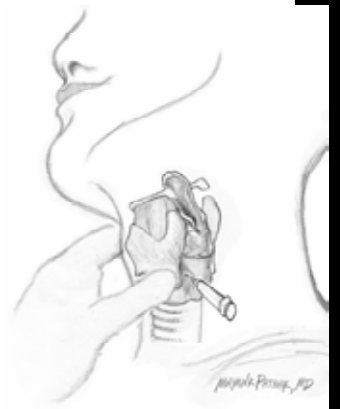


SPASMODIC DYSPHONIA

- There are three types of spasmodic dysphonia: the adductor type, the abductor type and the mixed type.
  - Adductor spasmodic dysphonia (ADSD)
  - Abductor spasmodic dysphonia (ABSD)
  - Mixed type







LIMB DYSTONIA

OCCUPATIONAL DYSTONIAS

- Dystonic contractions are often aggravated by purposeful actions and may be specific to a particular task.
- A patient may have dystonia when using the hand for writing but not for other tasks such as eating or typing.
- Occupational dystonias are those that occur in individuals with a particular occupation requiring repetitive and excessive fine motor activity.

OCCUPATIONAL CRAMPS

WRITER'S CRAMPS

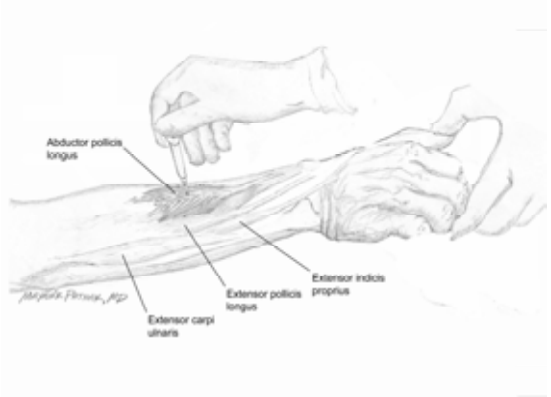
The most common subtypes are listed below:

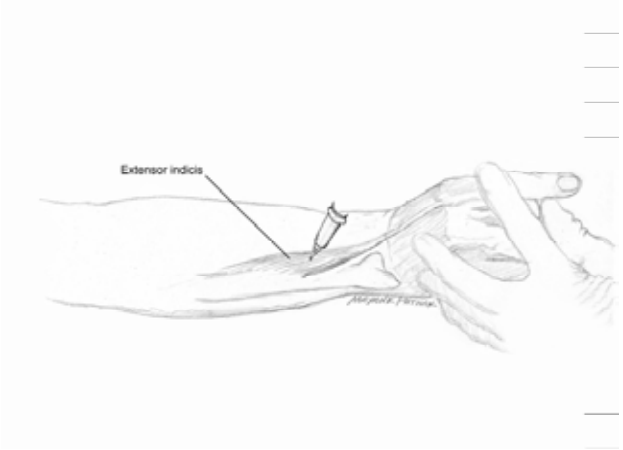
- Focal Flexor (finger) subtype
- Generalized Flexor (finger) subtype
- Focal Extensor (finger) subtype
- Generalized Extensor (wrist) subtype
- Generalized Flexor (wrist) subtype (with / without fin flexion)

WRITER'S CRAMPS

Focal extensor subtype

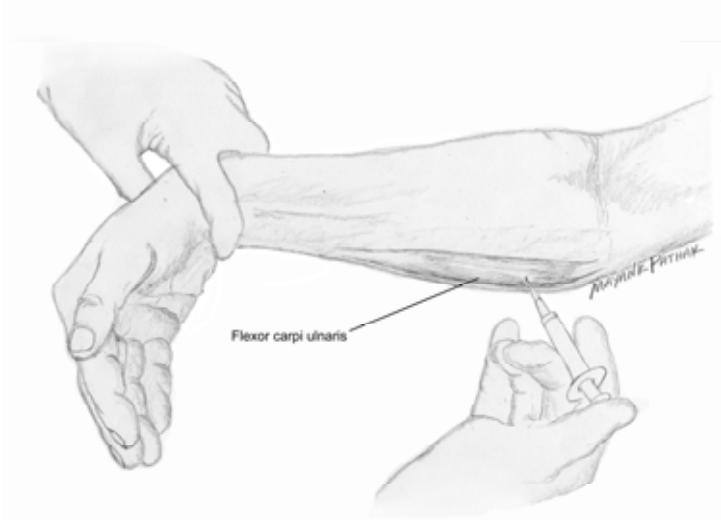
In the focal extensor subtype often only the EPL and EIP are involved. With continuous use of the dystonic hand, further worsening may lead to the generalized extensor subtype.



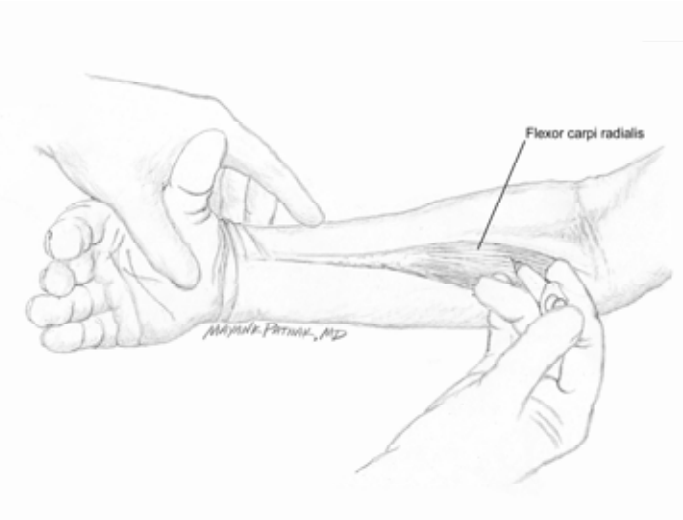


FLEXOR TYPE

FCU

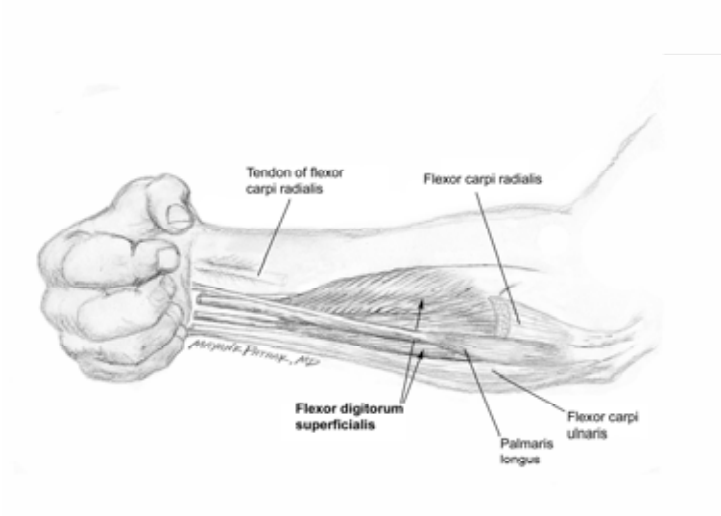


FCR

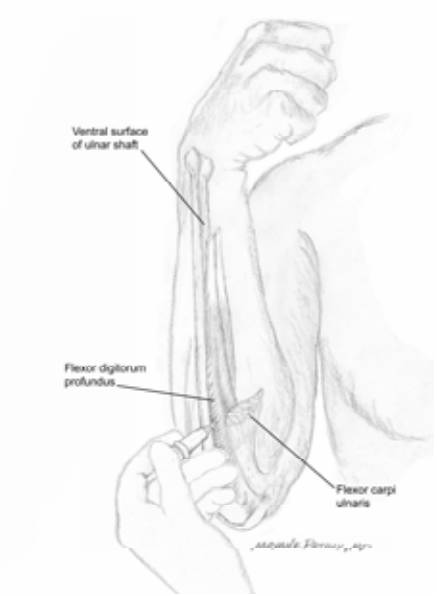


FLEXOR SUBTYPE

FDS

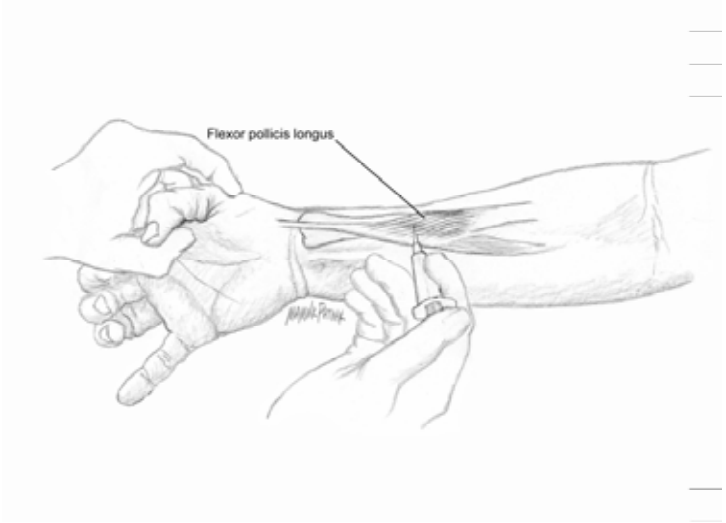


FDP



FLEXOR TYPE

FPL



PALMARIS LONGUS