Tongue and submandibular region

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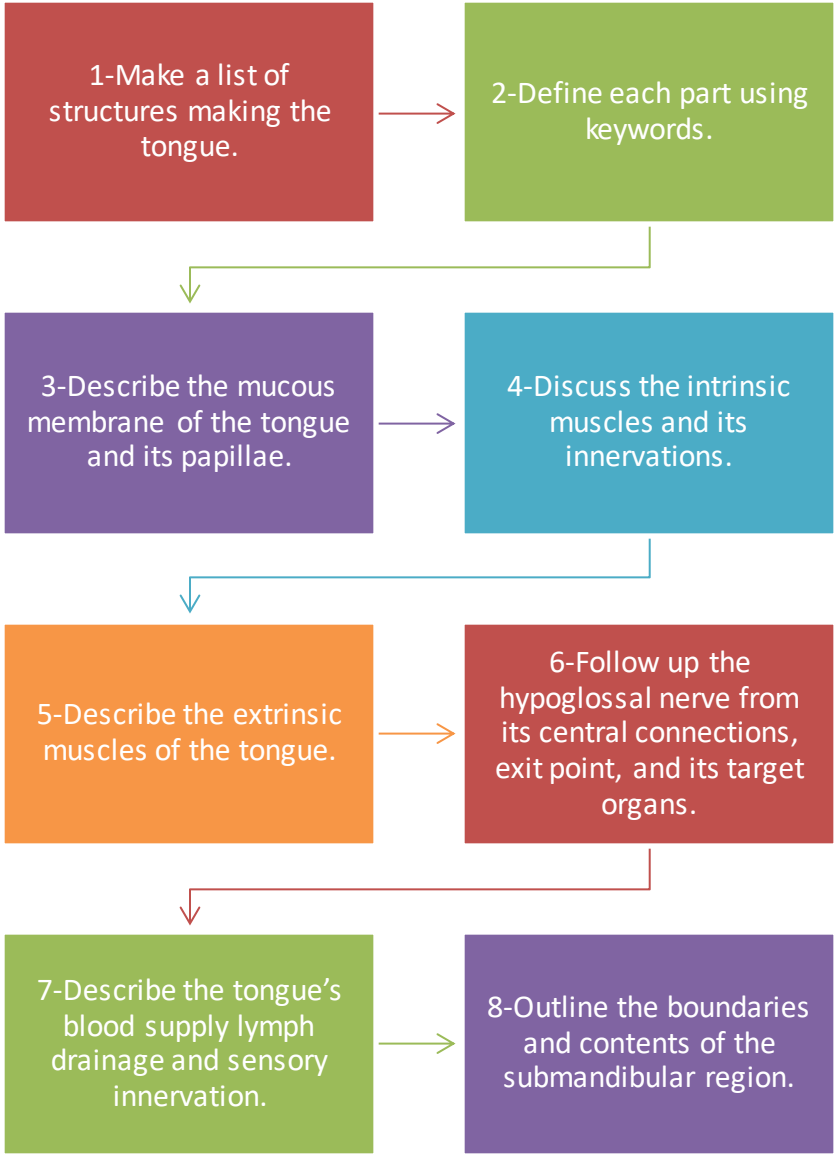
objects


1-Make a list of structures making the tongue.
2-Define each part using keywords.
3-Describe the mucous membrane of the tongue and its papillae.
4-Discuss the intrinsic muscles and its innervations.
5-Describe the extrinsic muscles of the tongue.
6-Follow up the hypoglossal nerve from its central connections, exit point, and its target organs.
7-Describe the tongue's blood supply lymph drainage and sensory innervation.
8-Outline the boundaries and contents of the submandibular region.

ONGUE

Muscular organ lying in oral cavity used in:

1. Tasting
2. Swallowing (deglutition)
3. Speech

Tongue has:

1. Root: posterior end, attached to mandible & hyoid bone by muscles.
2. Tip: free anterior end of tongue
3. Dorsum of tongue: divided by sulcus terminalis into:

a) Anterior 2/3 (oral part)
b) Posterior 1/3 (pharyngeal part)

* At apex of V shaped sulcus terminalis lies a pit called foramen caecum

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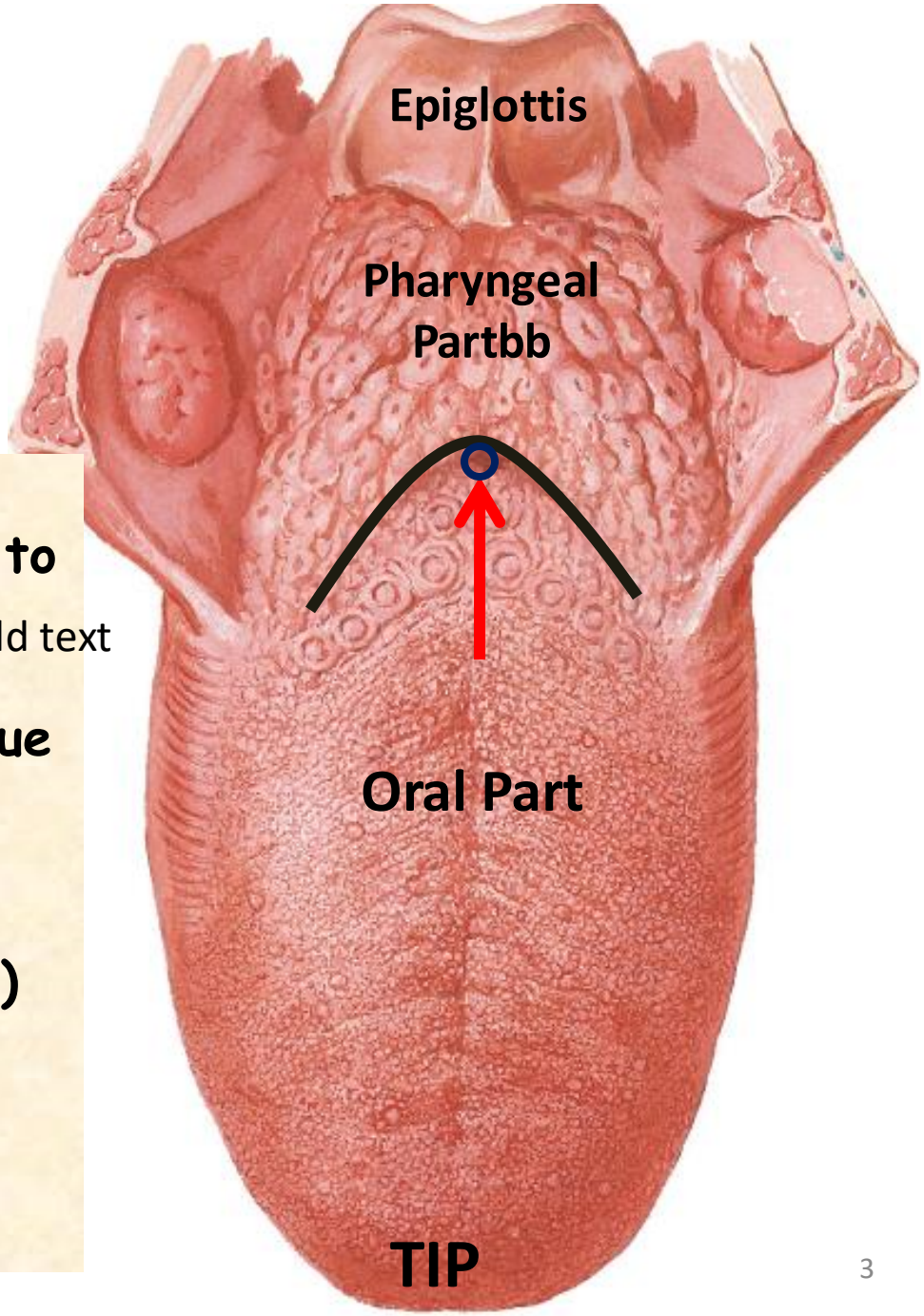
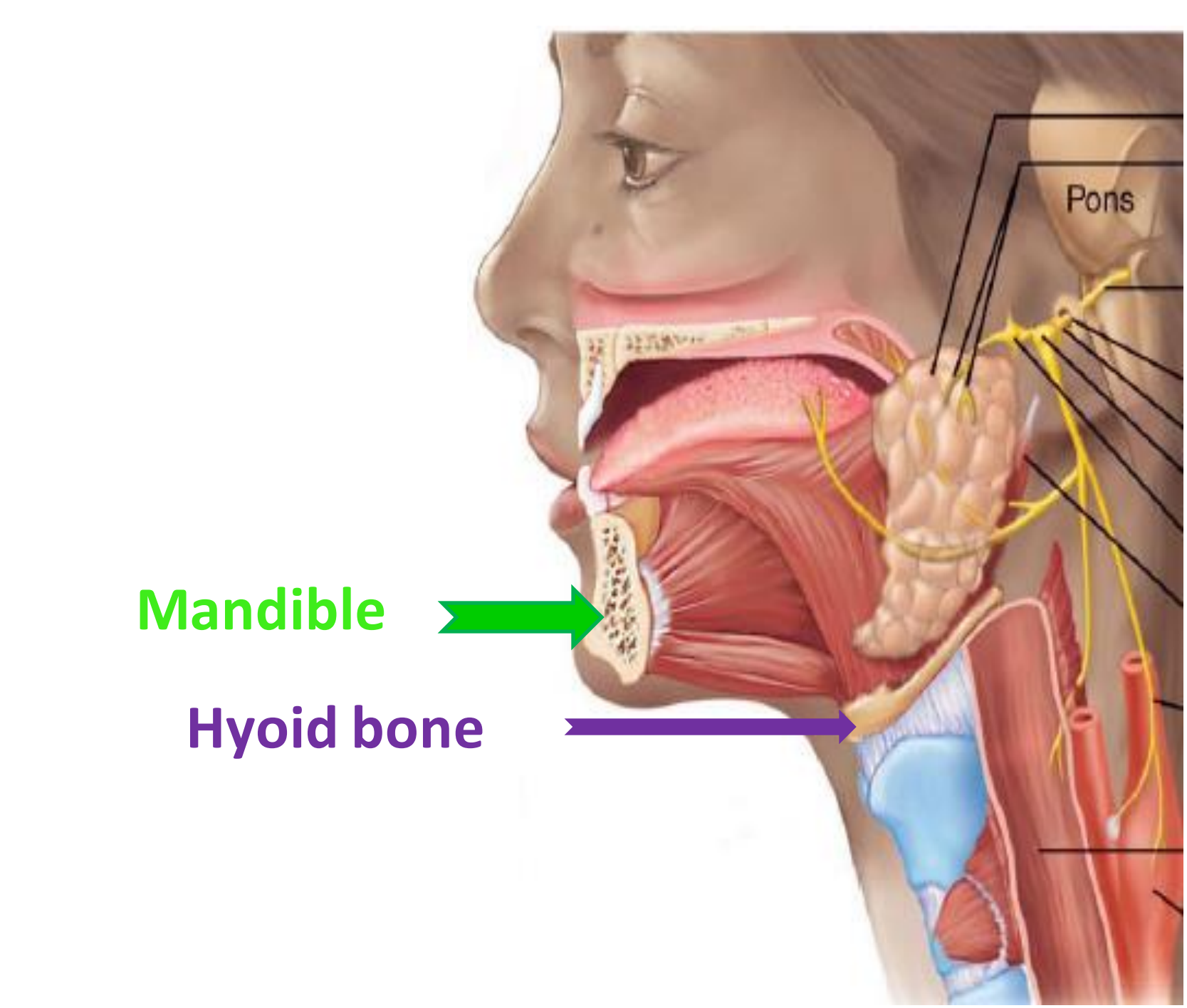
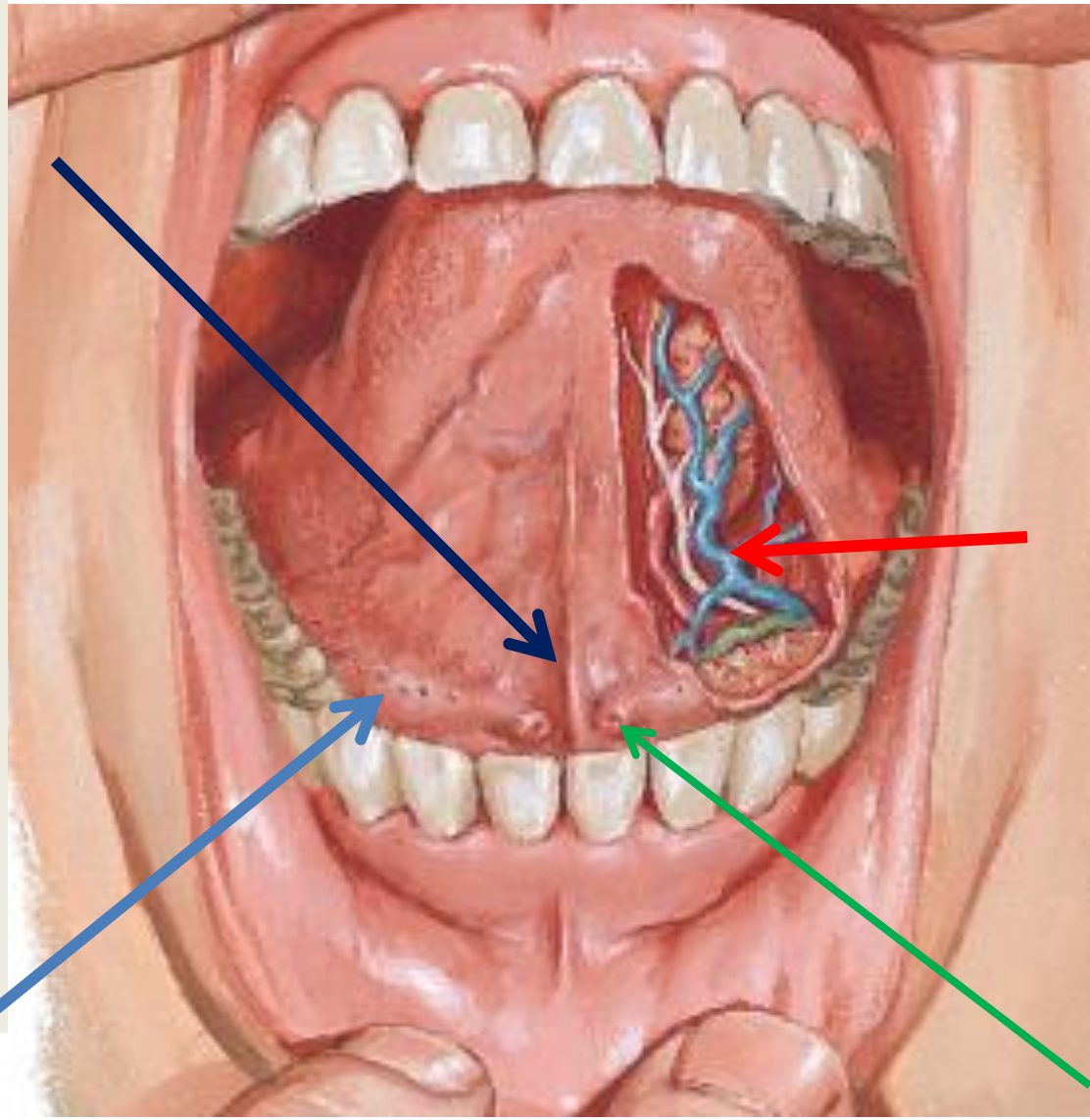


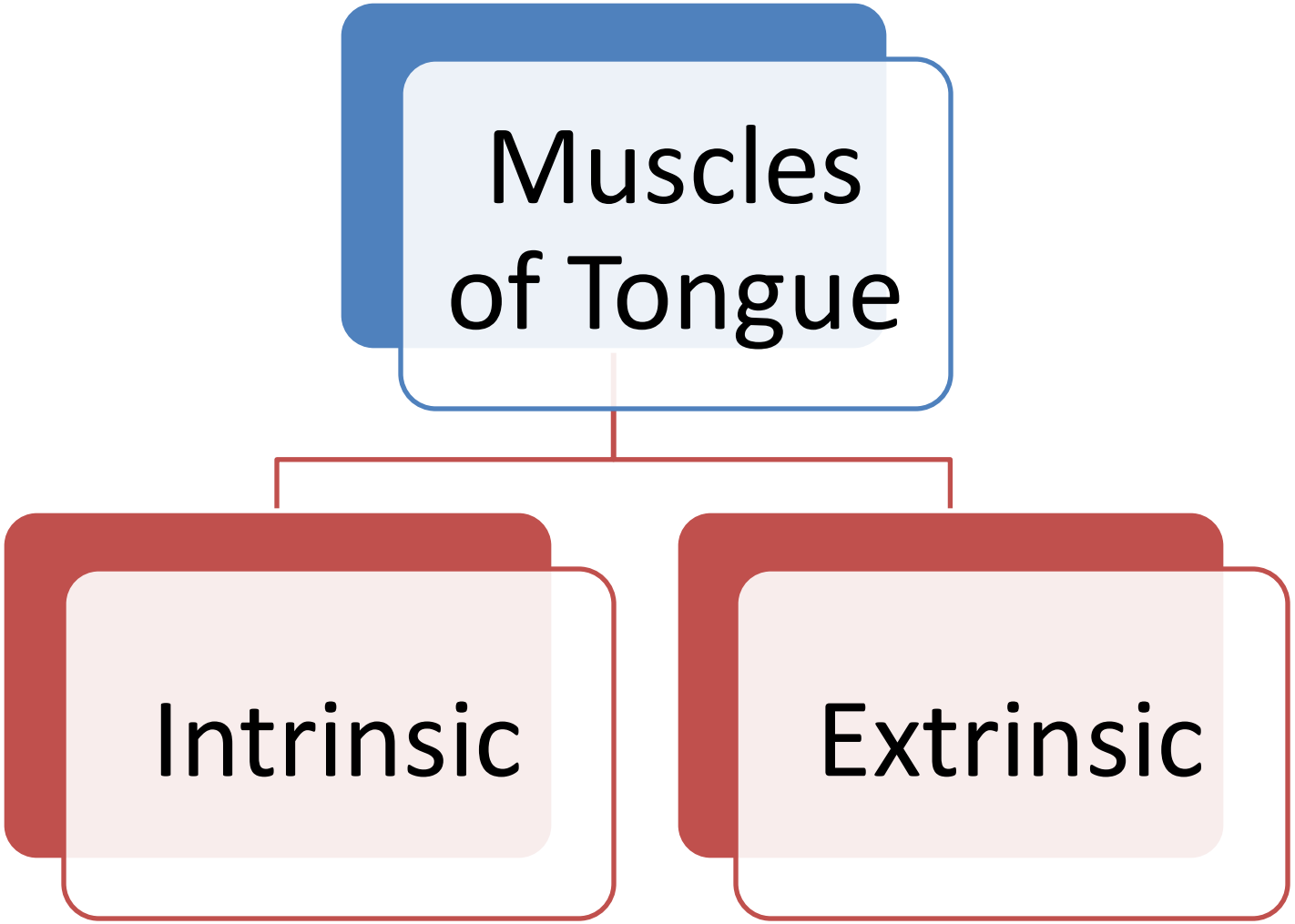

Pons
Mandible
Hyoid bone

Inferior surface of Tongue

Shows the following:

1. **Lingual frenulum**: mucus membrane fold connecting tongue to mucosa of floor of mouth.
2. **Deep lingual vein**: lateral to frenulum
3. **Sublingual folds** overlying sublingual salivary glands
4. **Sublingual papilla**: on both sides of frenulum, where submandibular ducts open




Muscles of Tongue
Intrinsic
Extrinsic

INTRINSIC MUSCLES OF TONGUE

They are not attached to bones but lie inside the tongue.

Narrow tongue

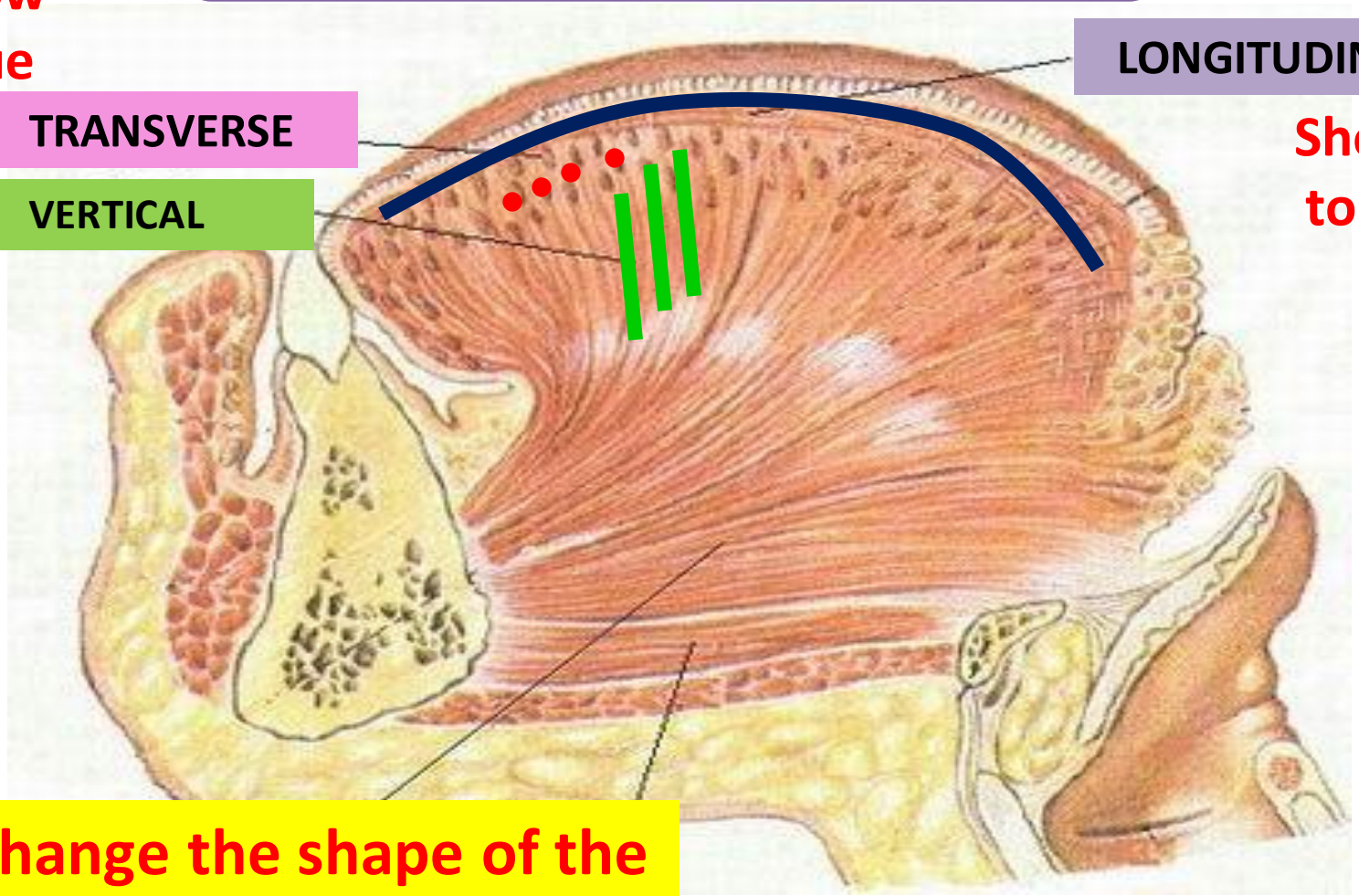
TRANSVERSE

VERTICAL

Flatten tongue

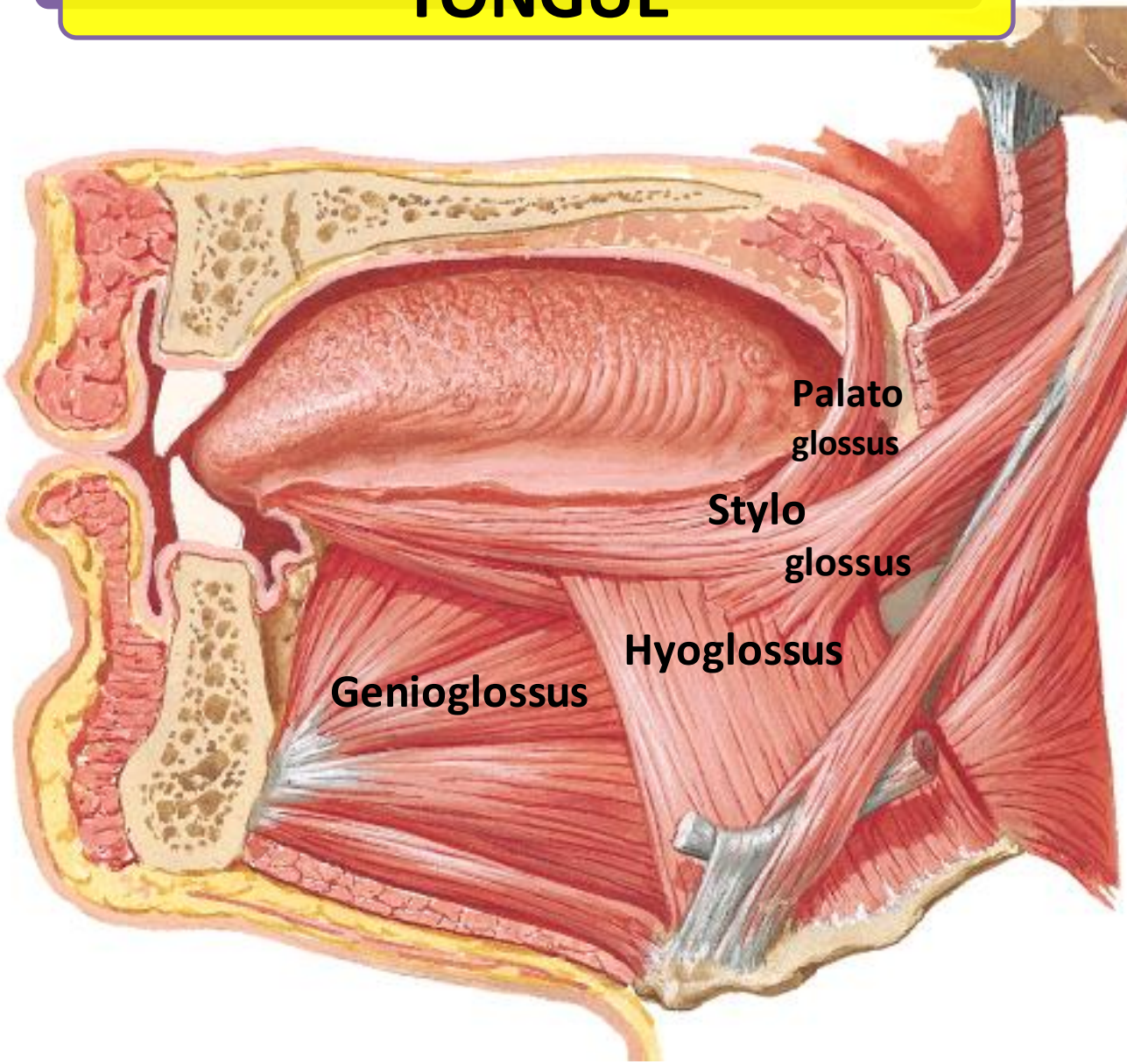
LONGITUDINAL

Shorten tongue



They change the shape of the tongue

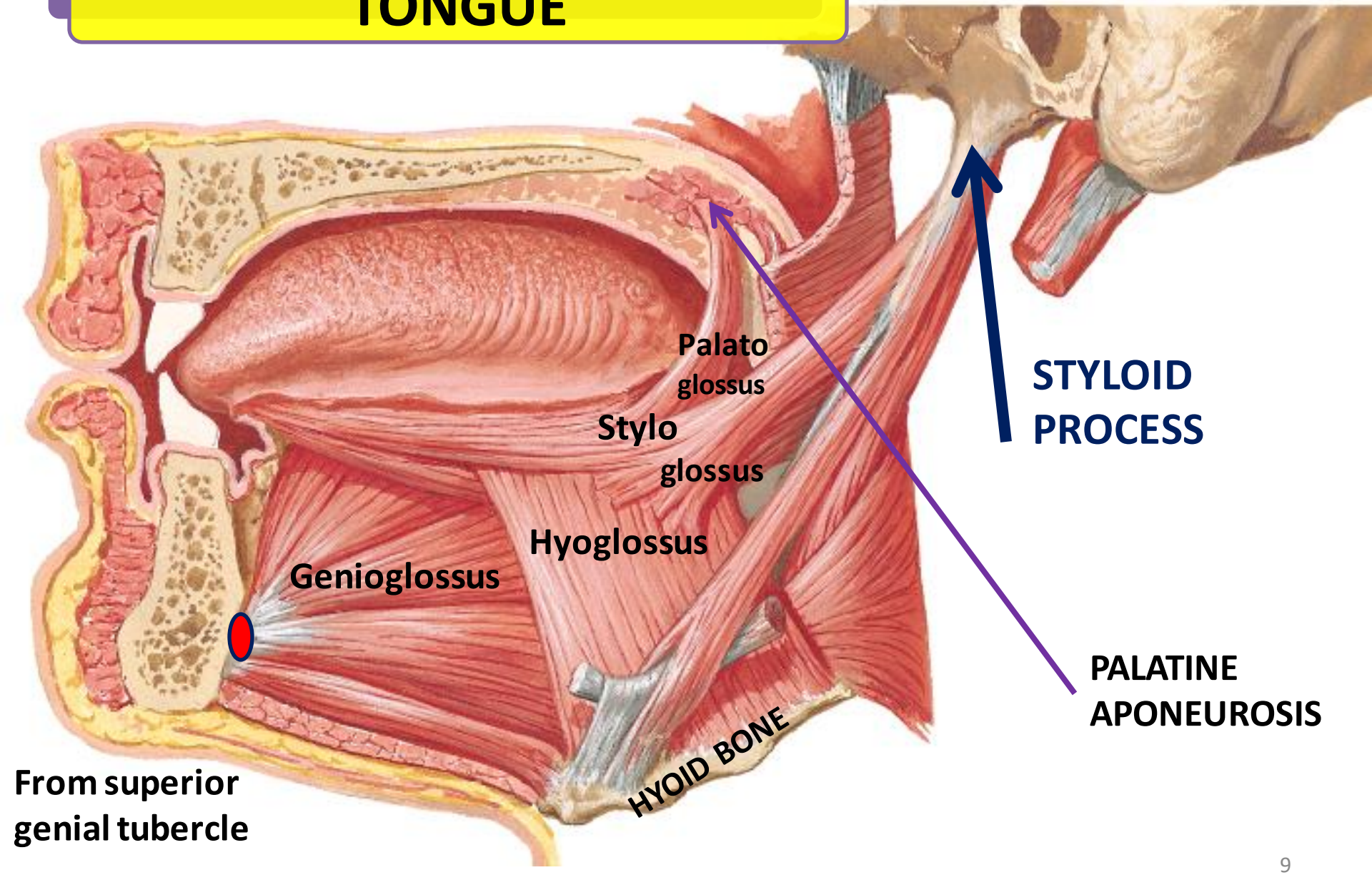
EXTRINSIC MUSCLES OF TONGUE



Genioglossus
Hyoglossus
Styloglossus
Palatoglossus

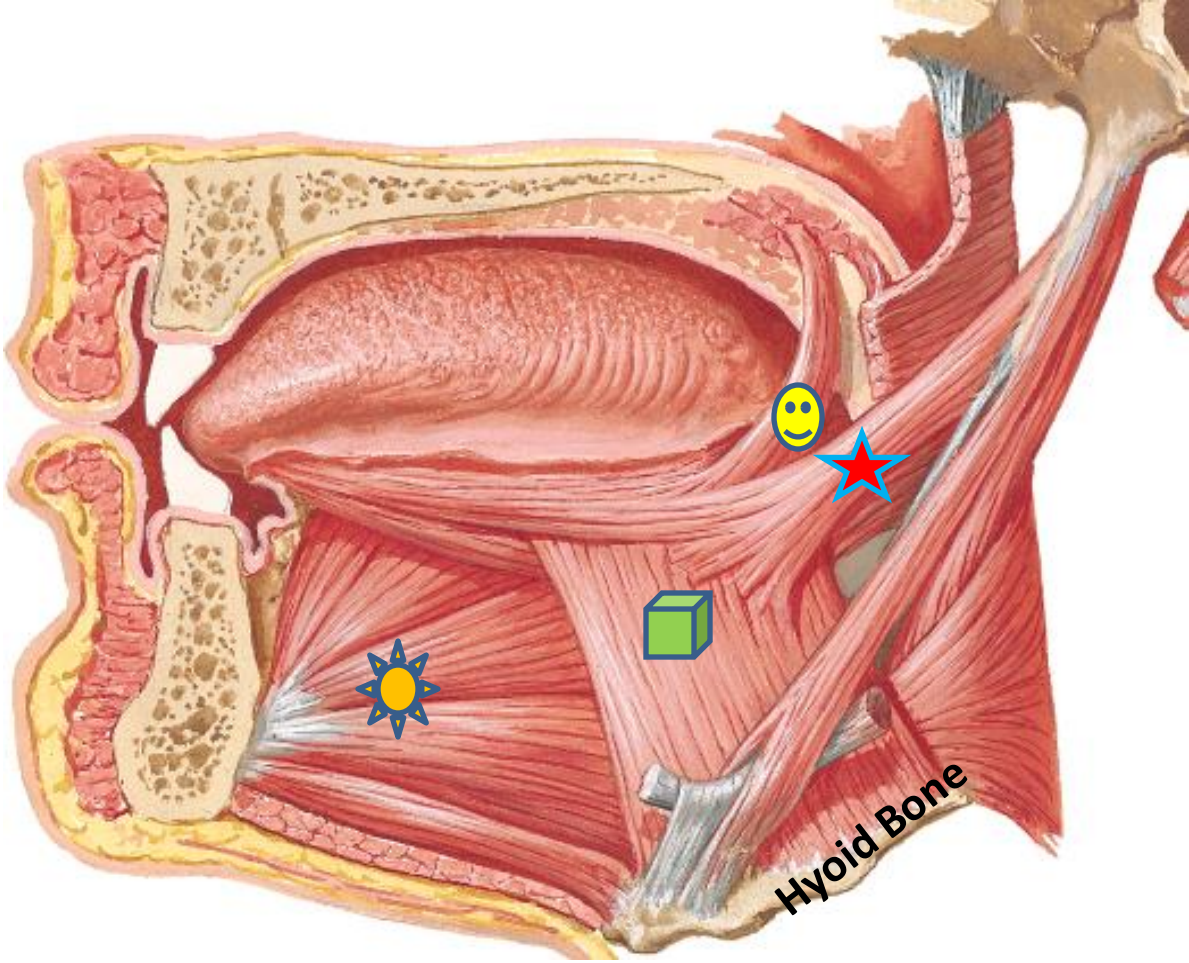
EXTRINSIC MUSCLES OF TONGUE

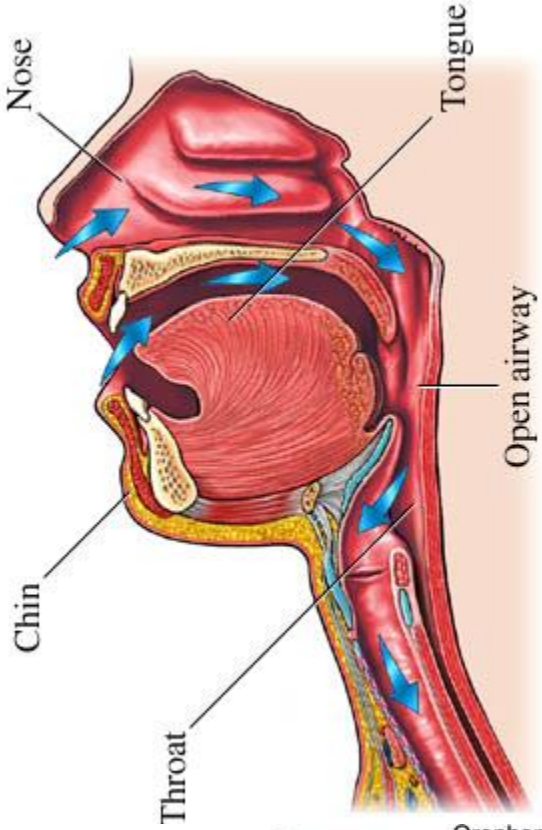
ORIGIN

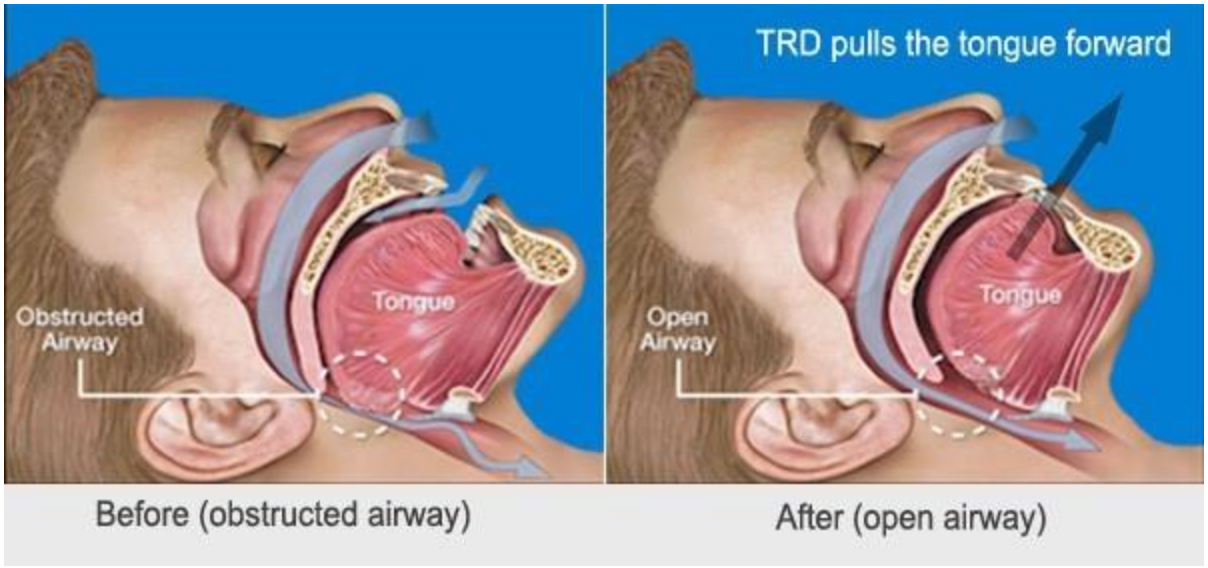


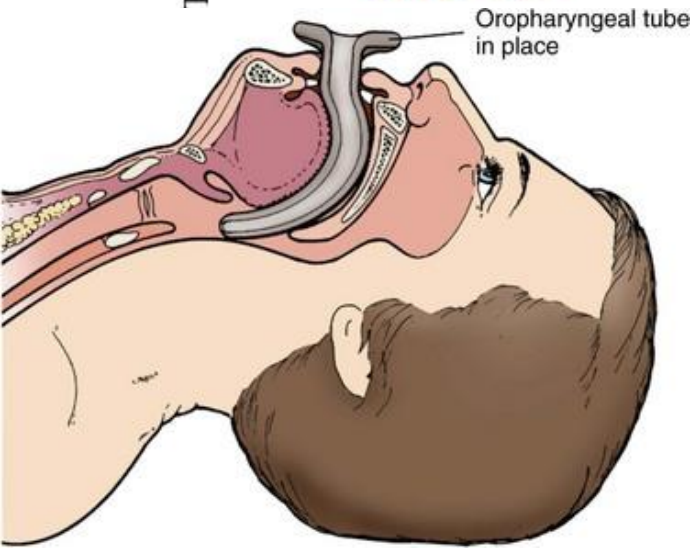
Action of extrinsic muscles of tongue:

1. Palatoglossus: elevator
2. Hyoglossus: depressor
3. Genioglossus: protractor
4. Styloglossus: retractor









If genioglossus is paralyzed, tongue falls posteriorly & obstructs the airway➔ suffocation

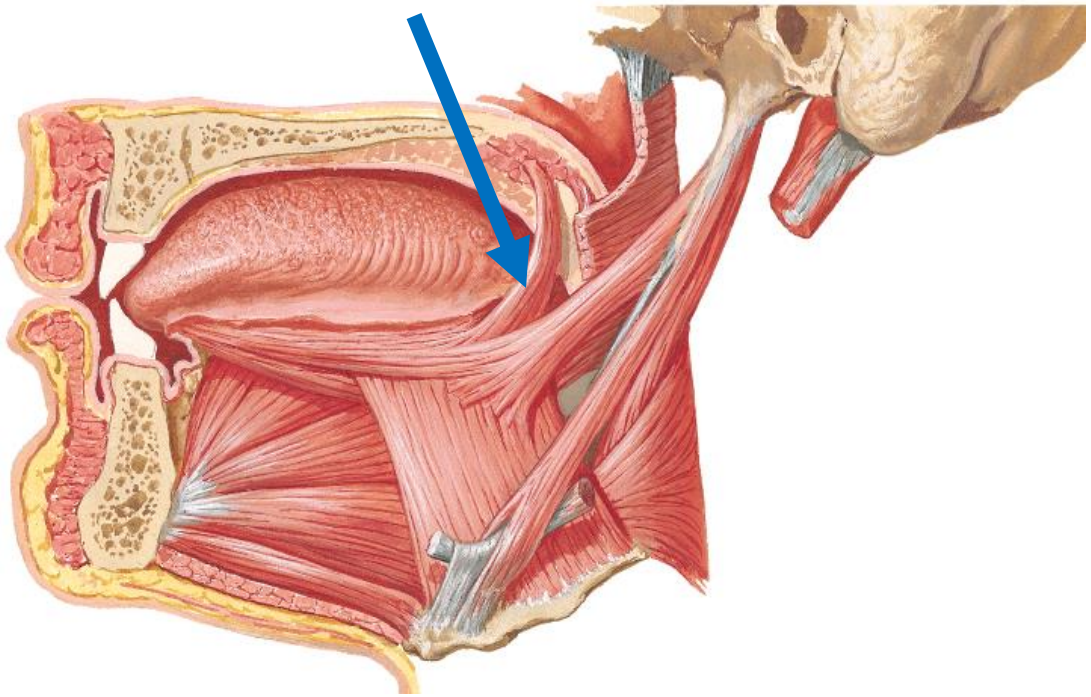
During general anesthesia, there is total relaxation of genioglossus➔ tongue must be prevented from falling backward by inserting an airway (oropharyngeal tube)

NERVE SUPPLY OF MUSCLES OF TONGUE

ALL intrinsix & extrinsic muscles of tongue are supplied by HYPOGLOSSAL NERVE (12th cranial nerve)

EXCEPT

PALATOGLOSSUS supplied by CRANIAL ACCESSORY N (11th cranial n) through pharyngeal plexus { like muscles of the palate }



SENSORY NERVE SUPPLY OF TONGUE

Anterior 2/3:

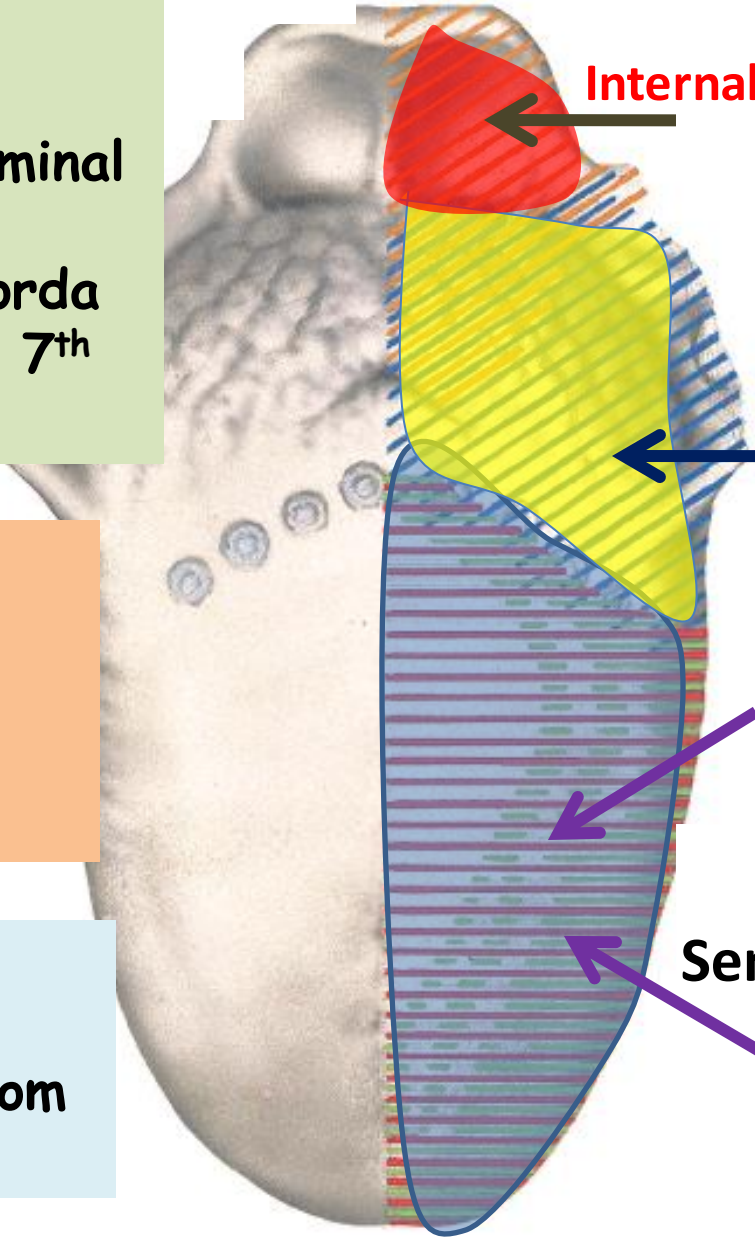
1. General sensations : lingual n (from trigeminal 5th cranial n)
2. Taste sensation: chorda tympani (from facial 7th cranial n)

Posterior 1/3:

General & taste by glossopharyngeal nerve (9th cranial n)

Most posterior part

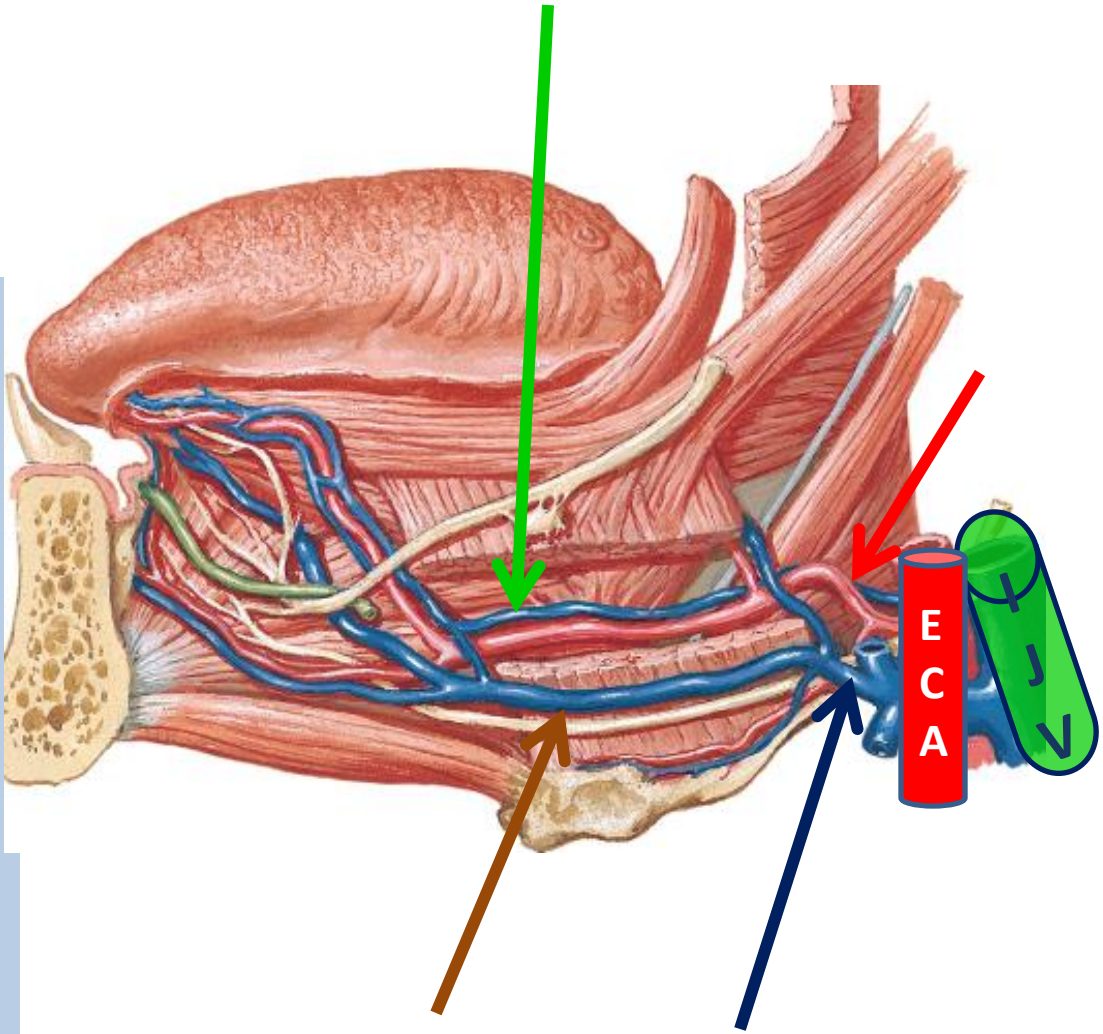
infront of epiglottis by internal laryngeal n (from vagus 10th cranial n)



BLOOD SUPPLY OF TONGUE

Artery of tongue:
Lingual artery (branch from external carotid)

Veins of tongue:
Lingual veins:
a)Dorsal lingual veins accompany lingual artery
b) Deep lingual vein runs on inferior surface of tongue
* Lingual veins drain into internal jugular vein



When quick absorption of a drug is desired, they are placed under the tongue where they dissolve and enter the deep lingual veins in less than a minute

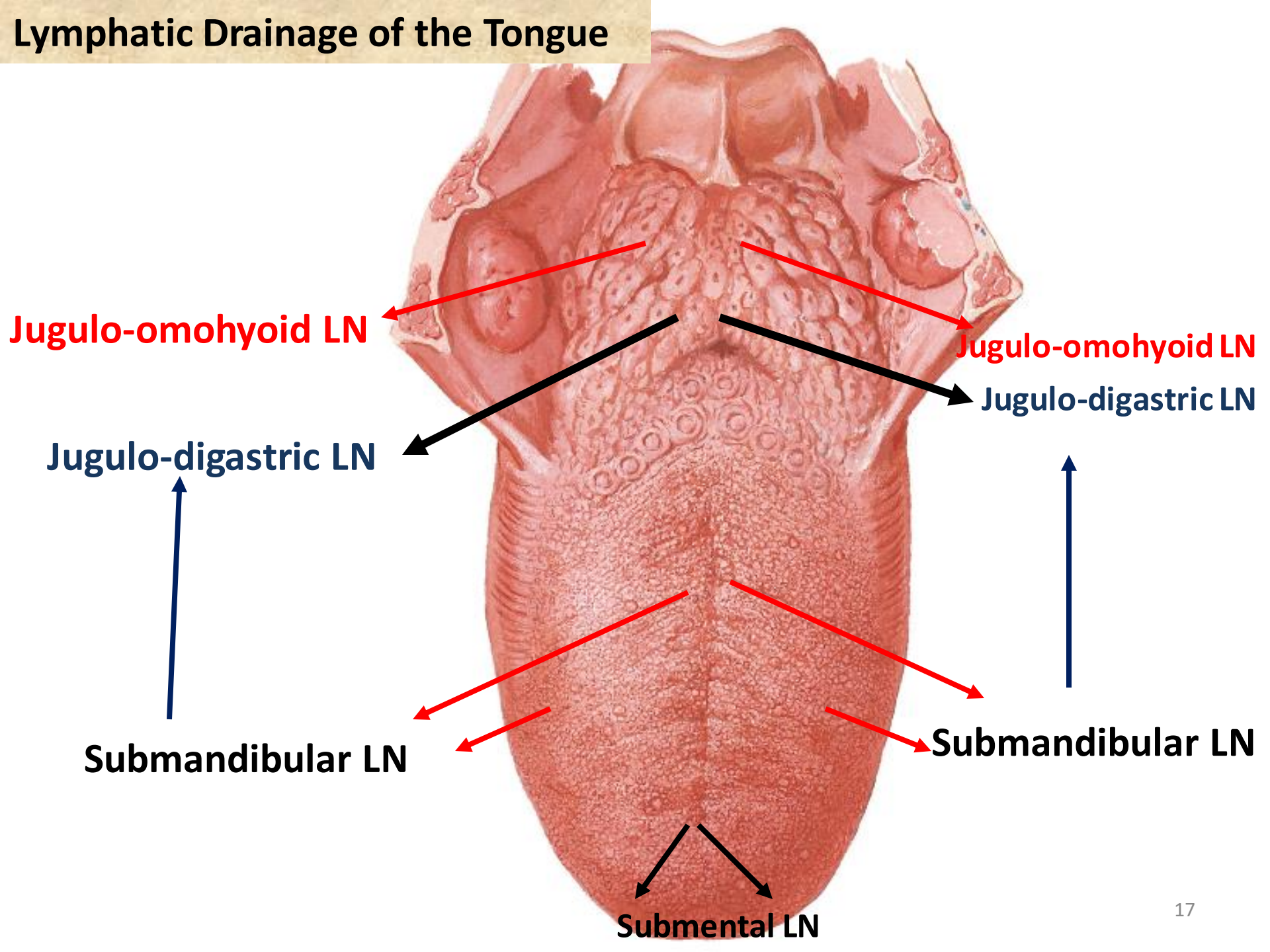
Lymphatic Drainage of Tongue

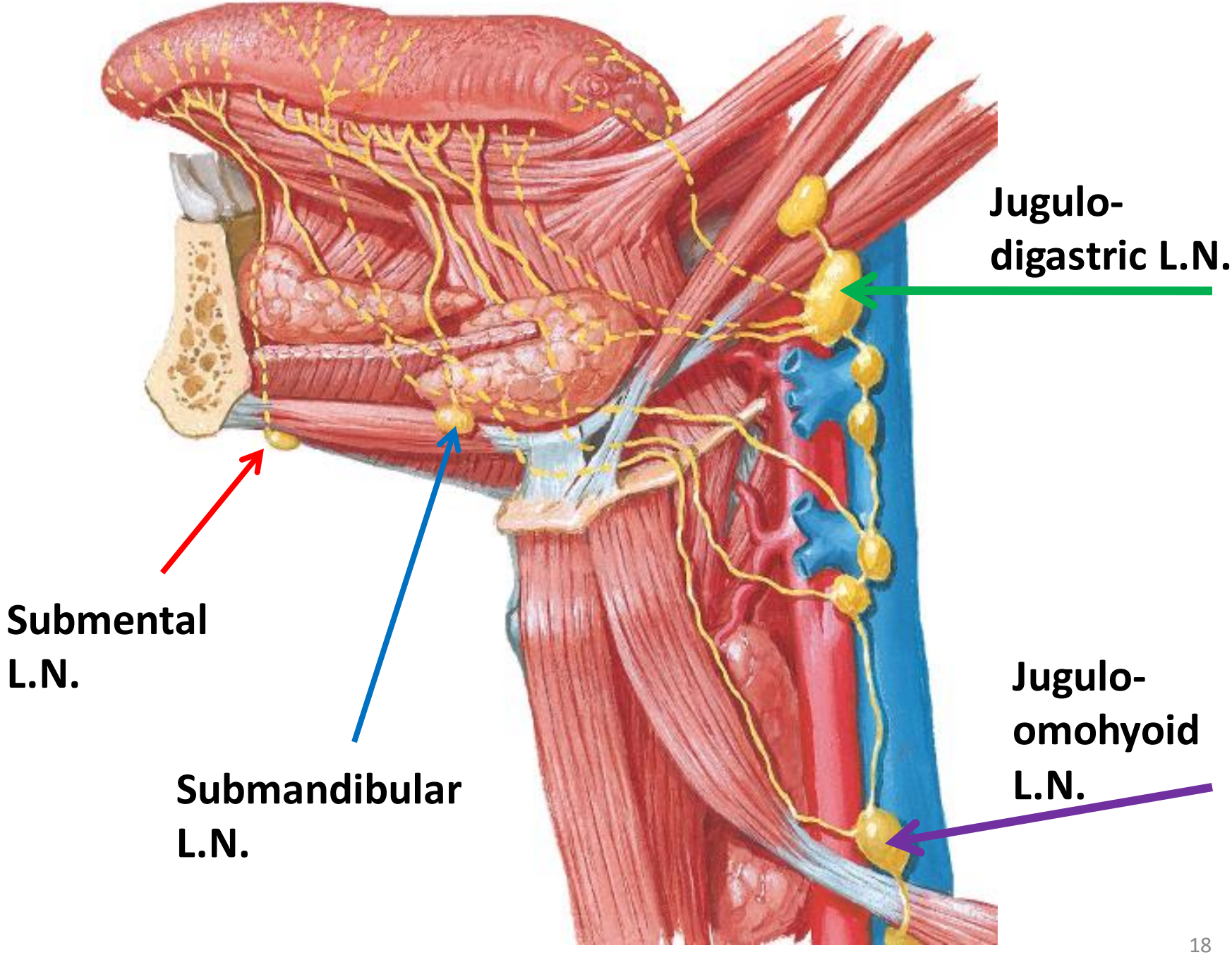
Tip of tongue: to submental L.N. of both sides

Anterior 2/3 (Margin & body of tongue) : to submandibular L.N. then to deep cervical L.N. (jugulo-digastric or jugulo-omohyoid L.N.)

Posterior 1/3: jugulo-digastric & jugulo-omohyoid L.N. of both sides

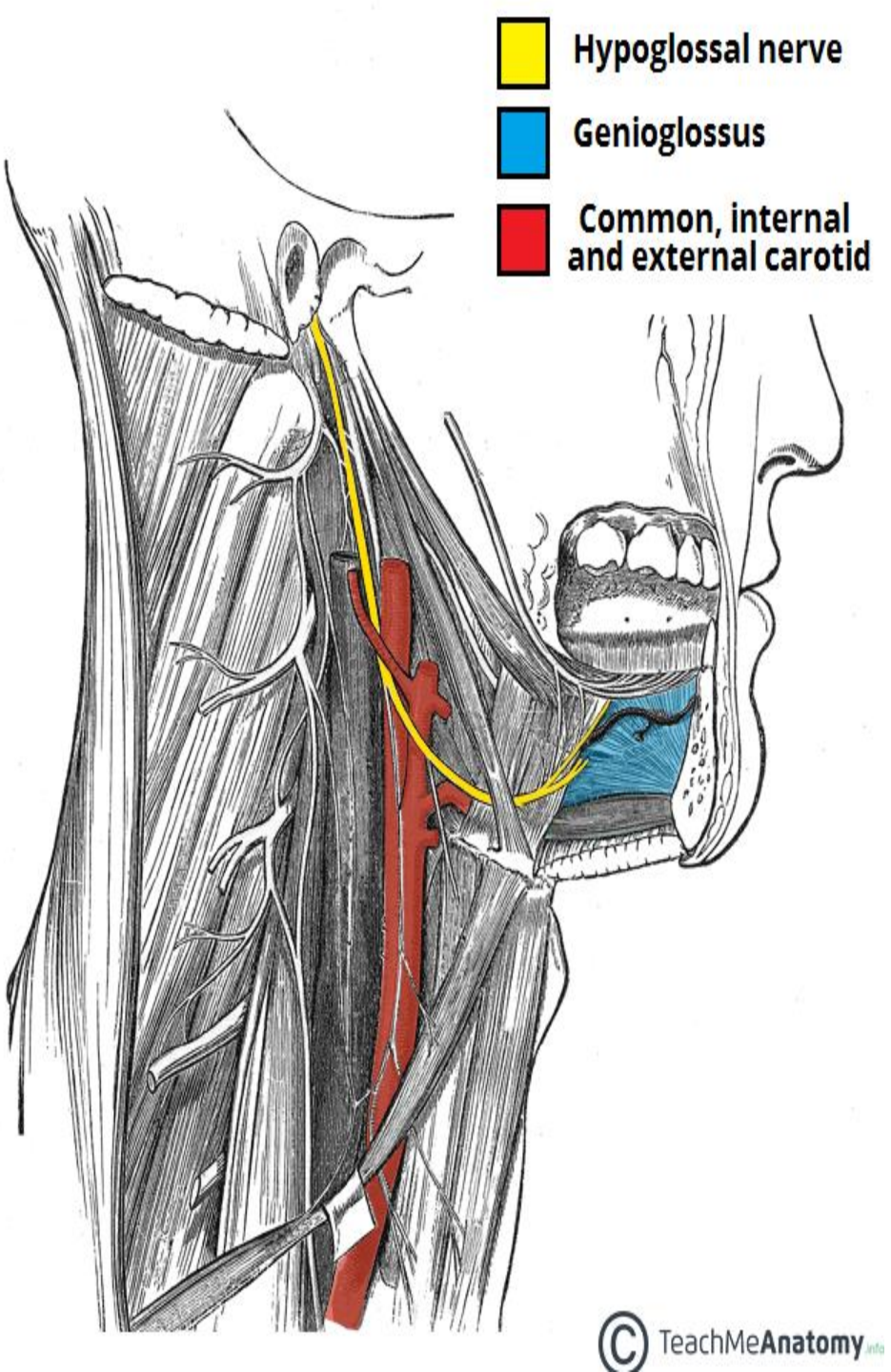
Lymphatic Drainage of the Tongue




Jugulo-
digastric L.N.
Submental
L.N.
Submandibular
L.N.
Jugulo-
omohyoid
L.N.

Hypoglossal nerve

- Pass between IJV & ICA
- Crosses ICA, ECA, & lingual artery
- Descends till the lower border of post. belly of digastric & passes forward to enter digastric Δ, running over hyoglossus *m.* to pass to undersurface of the tongue.



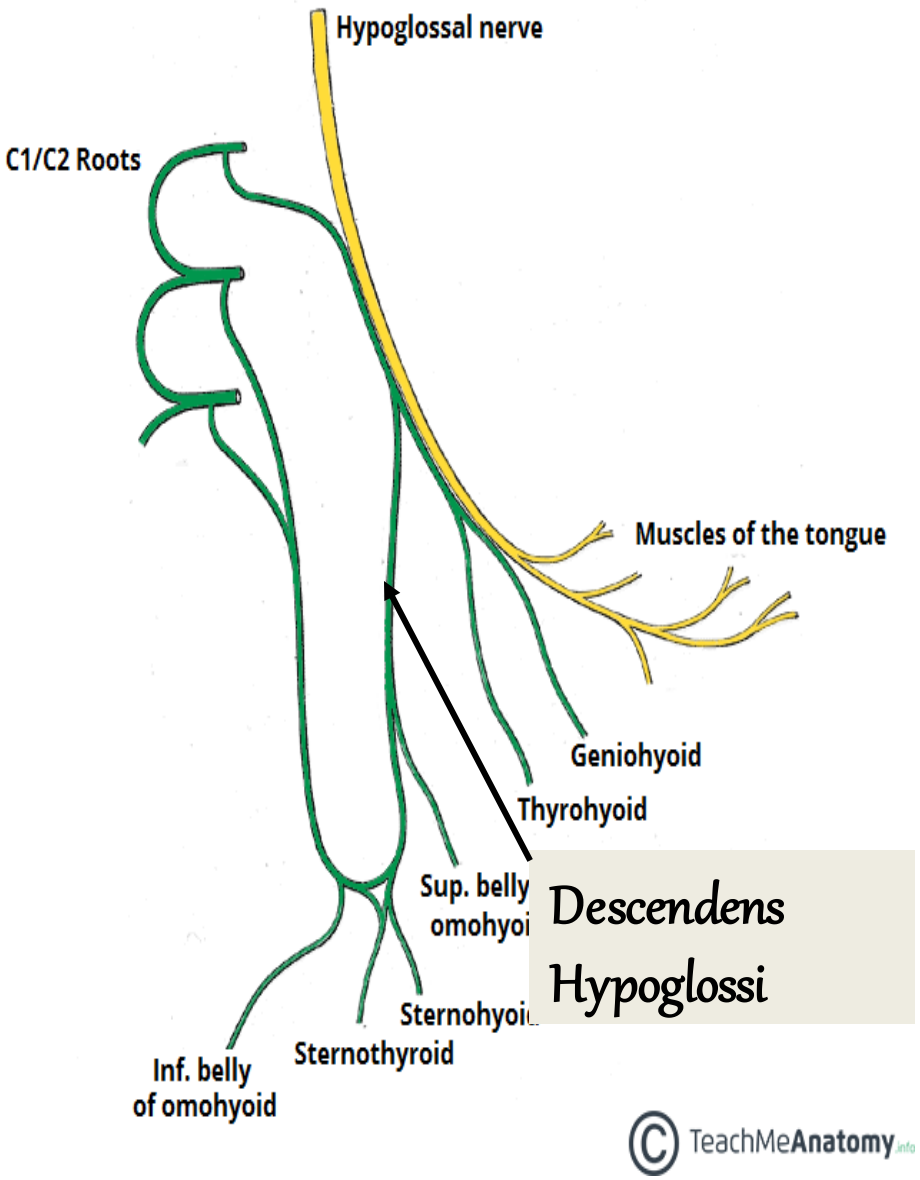
1-The first group : fibres from C1"related anatomically to hypoglossal".

a-Meningeal nerve.: contains sensory & sympathetic fibres supplying bone & meninges of anterior part of posterior cranial fossa.

b-Nerve to thyrohyoid.

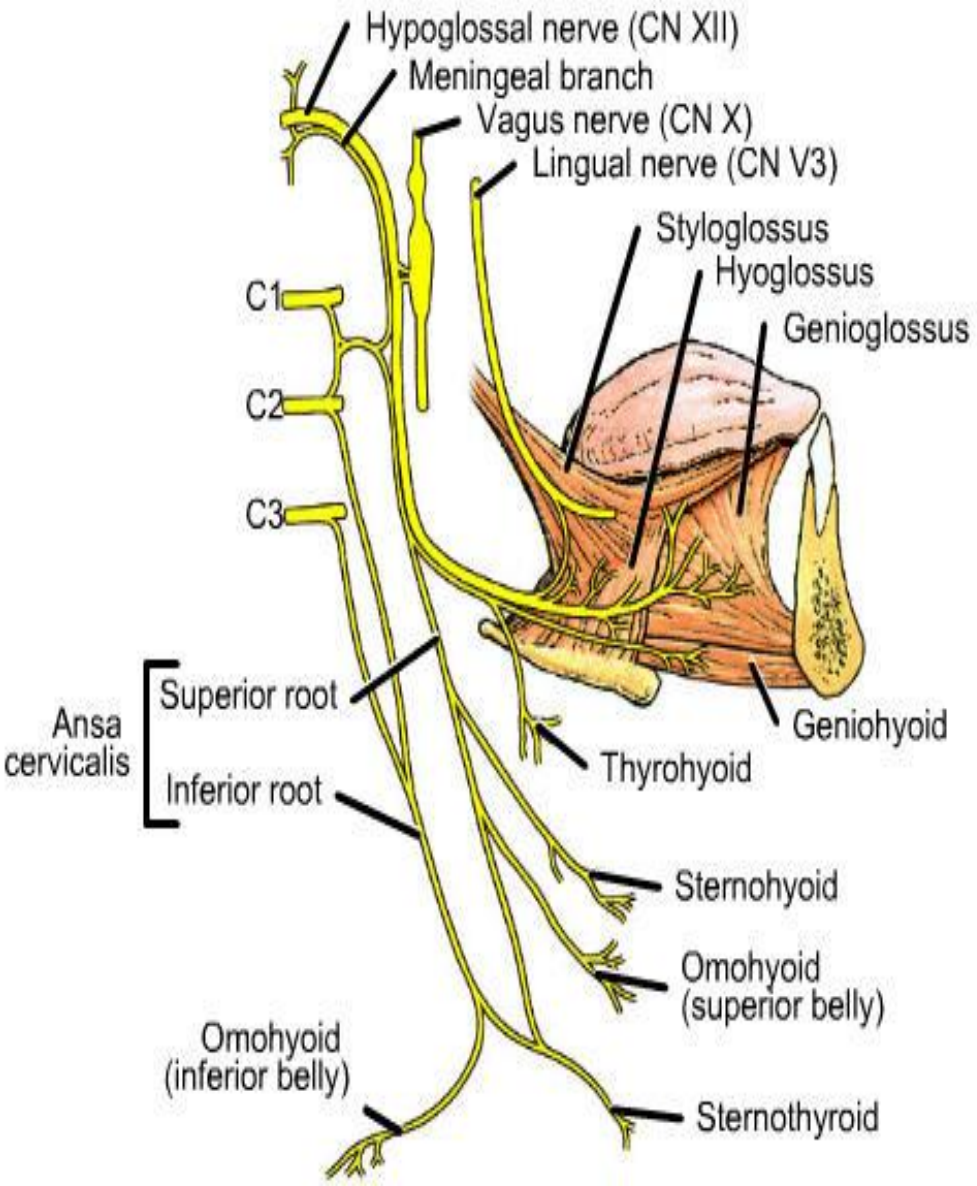
c-Nerve to geniohyoid.

d-Descending hypoglossi or upper root of ansa cervicalis.



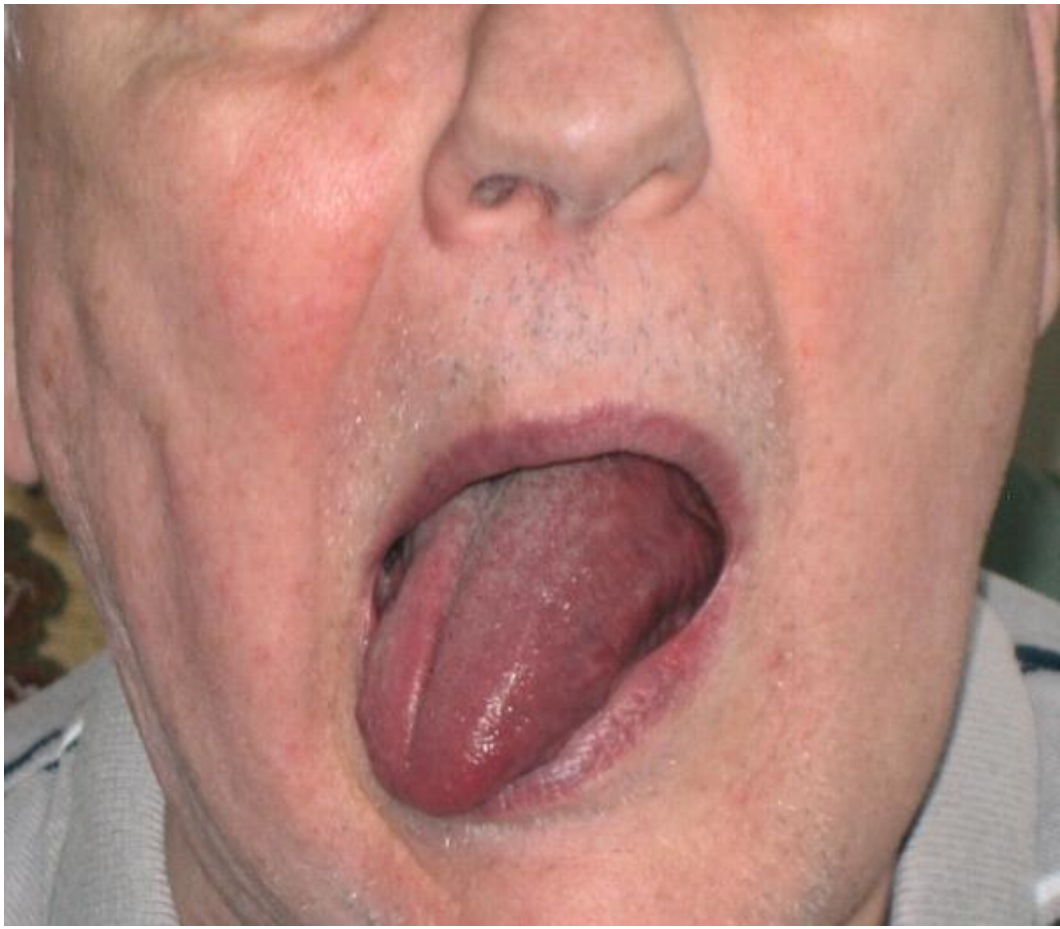
2-The second group"from hypoglossal itself": supplies the following:-

-Styloglossus, hyoglossus & genioglossus +All intrincic muscles.



APPLIED ANATOMY

- Complete section of the hypoglossal nerve on one side ➔ unilateral paralysis of tongue
- If for a long time ➔ atrophy of muscles of the affected half of tongue
- If you ask the patient to protrude his tongue ➔ tongue deviates towards the affected side due to the unopposed action of the normal half
- **TONGUE POINTS TOWARDS THE SIDE OF INJURY**

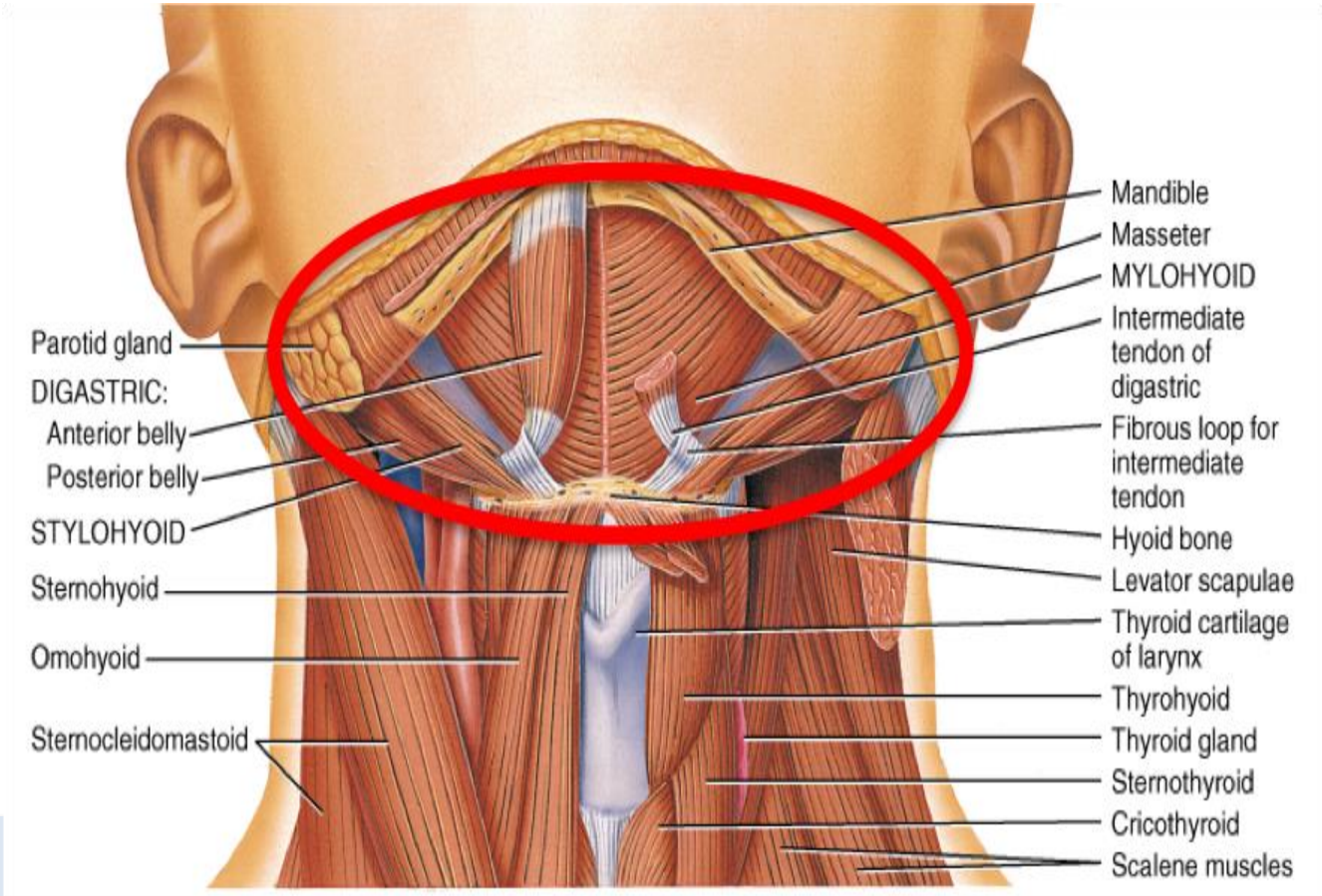


Does this patient have right or left hypoglossal nerve injury?

Match the item in column A with its correct cross match from column B

COLUMN A	COLUMN B
1) Intrinsic muscles of tongue	A) Chorda tympani (facial n)
2) Palatoglossus	B) Lingual nerve
3) Sensations from posterior 1/3 of tongue	C) Change the shape of tongue
4) Taste sensations from anterior 2/3 of tongue	D) Protrudes tongue
5) Genioglossus	E) Elevates tongue
	F) Glossopharyngeal nerve
	G) Duct of submandibular gland

Submandibular region

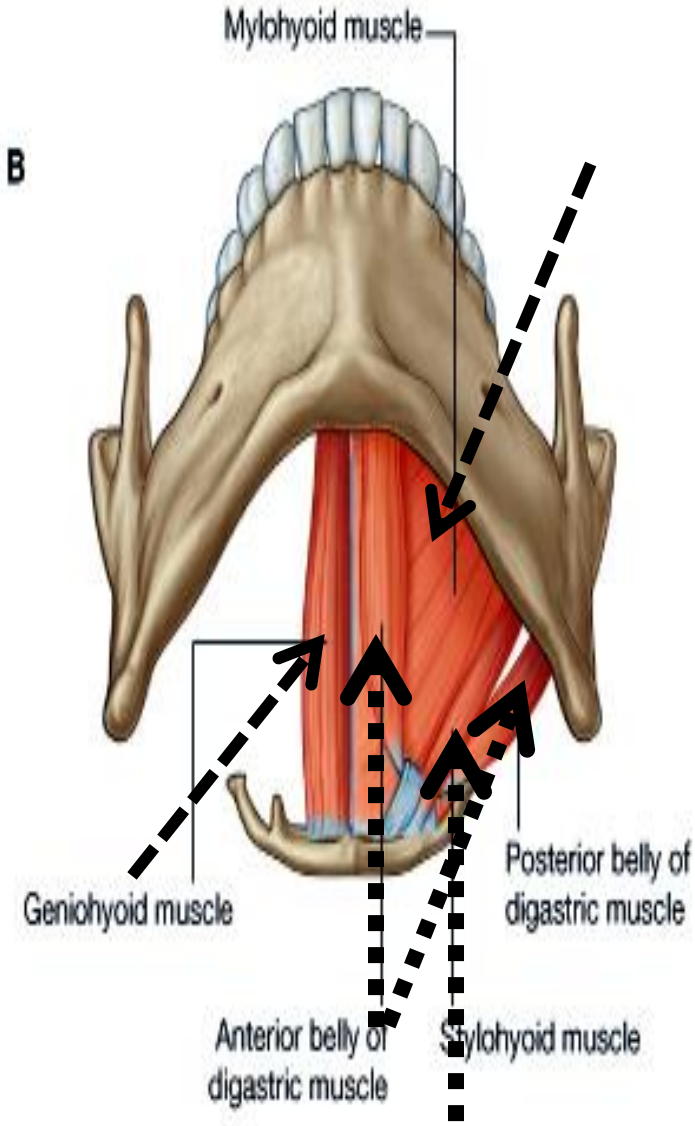


Submandibular (Suprahyoid) region includes structures in the area between mandible and hyoid bone.

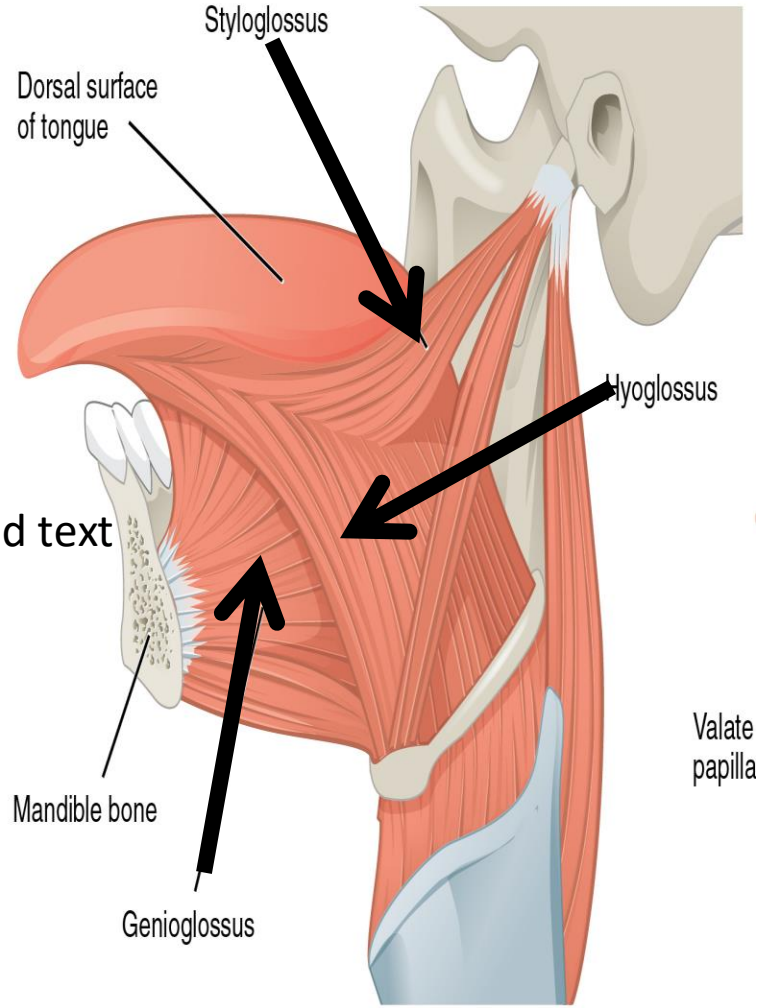
Contents:

1) Muscles:

a) Suprahyoid muscles: digastric, stylohyoid, mylohyoid and geniohyoid.



b) **Extrinsic muscles of tongue**: styloglossus, hyoglossus and genioglossus.

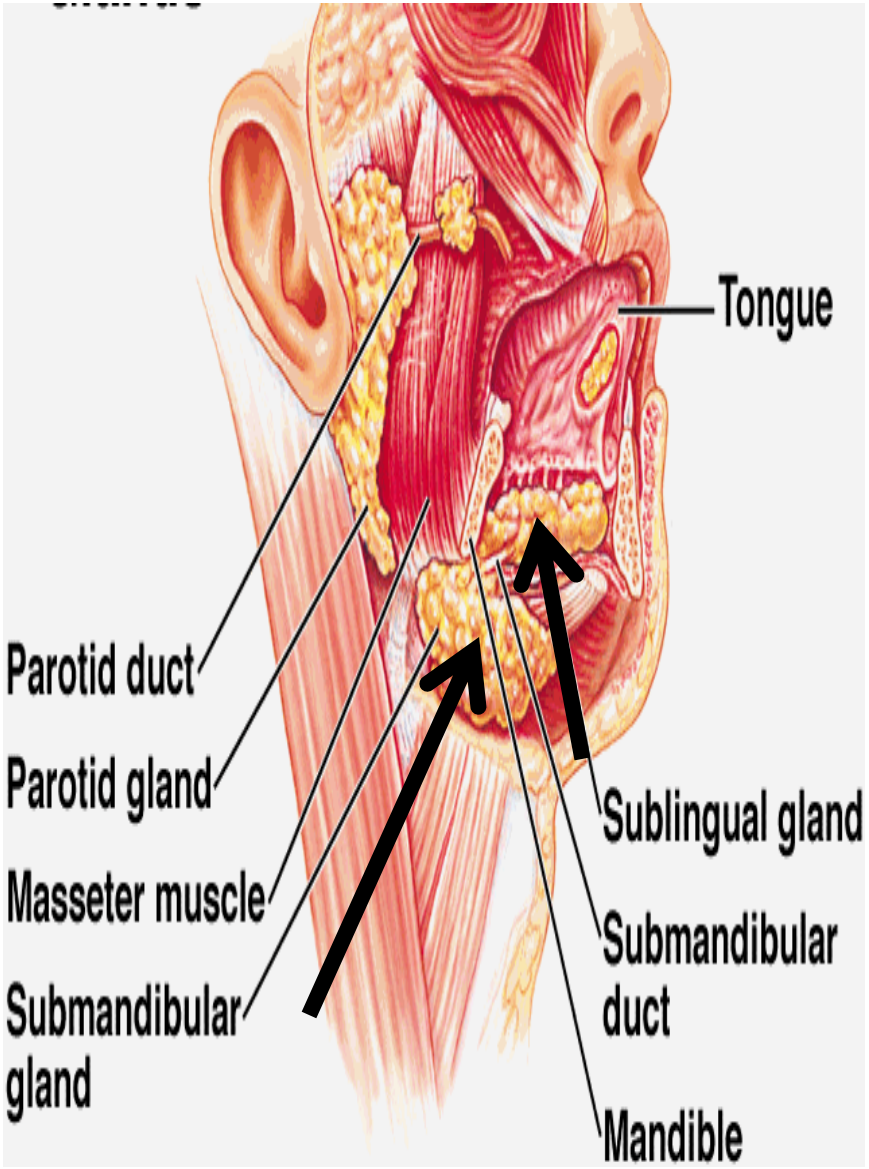


(a) Extrinsic tongue muscles

Click to add text

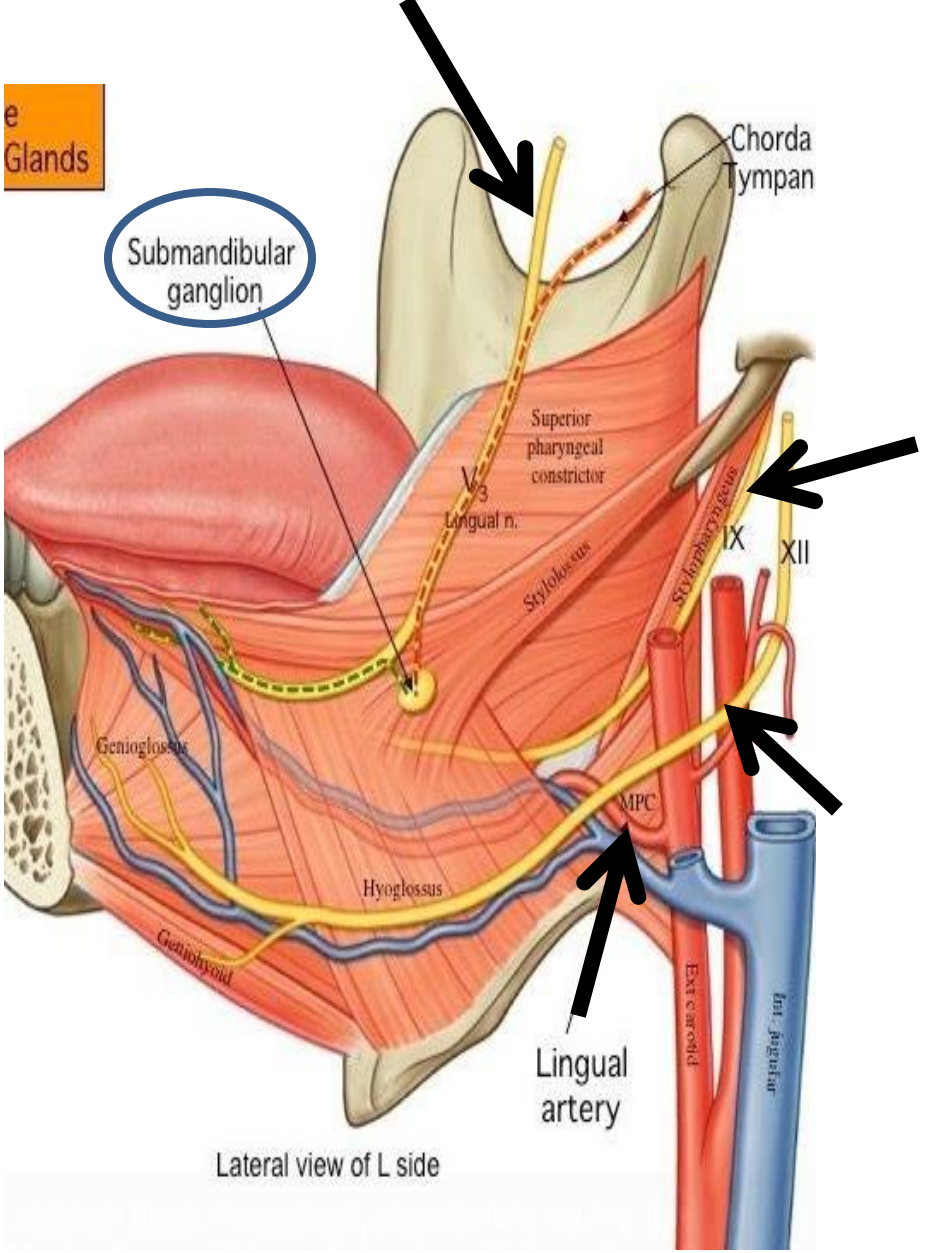
2) Glands:

Submandibular and sublingual salivary glands.



3) Nerves: Lingual (Submandibular ganglion), glossopharyngeal and hypoglossal nerves

4) Blood vessels: Lingual and facial vessels



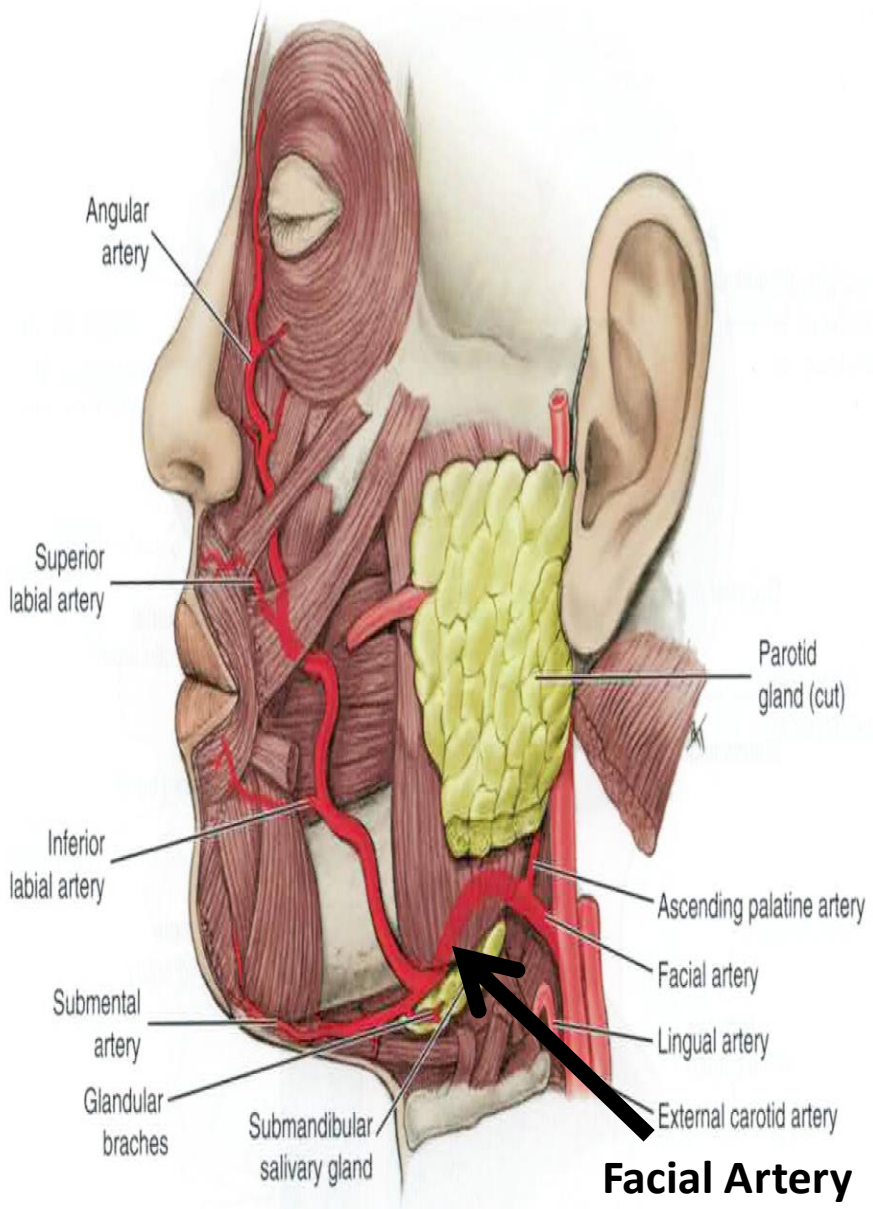


FIGURE 6-6 Pathway of the facial artery.

Digartric muscle

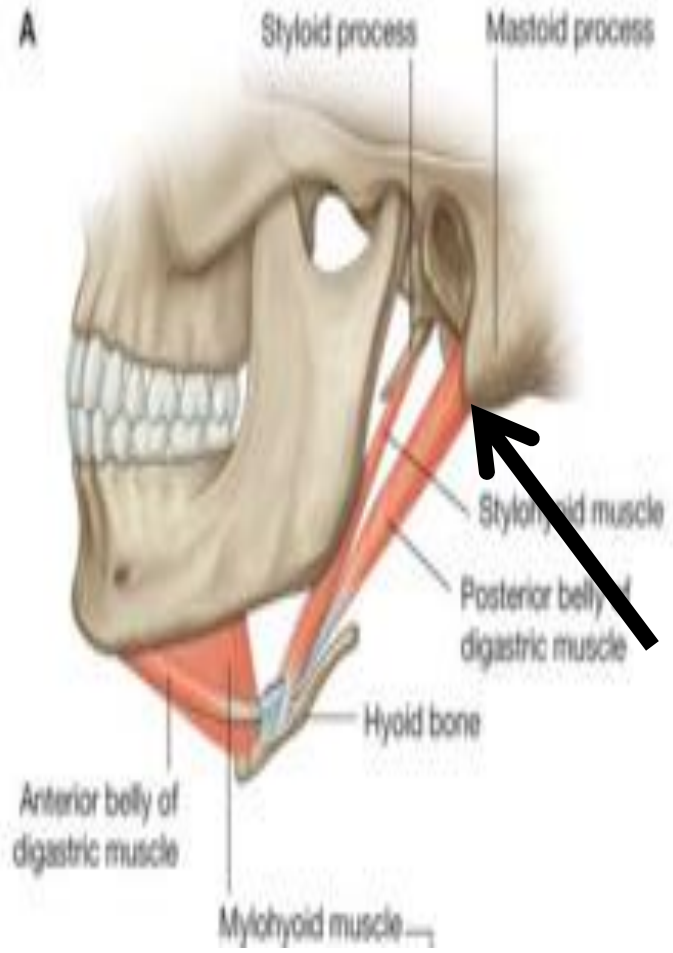
Origin :

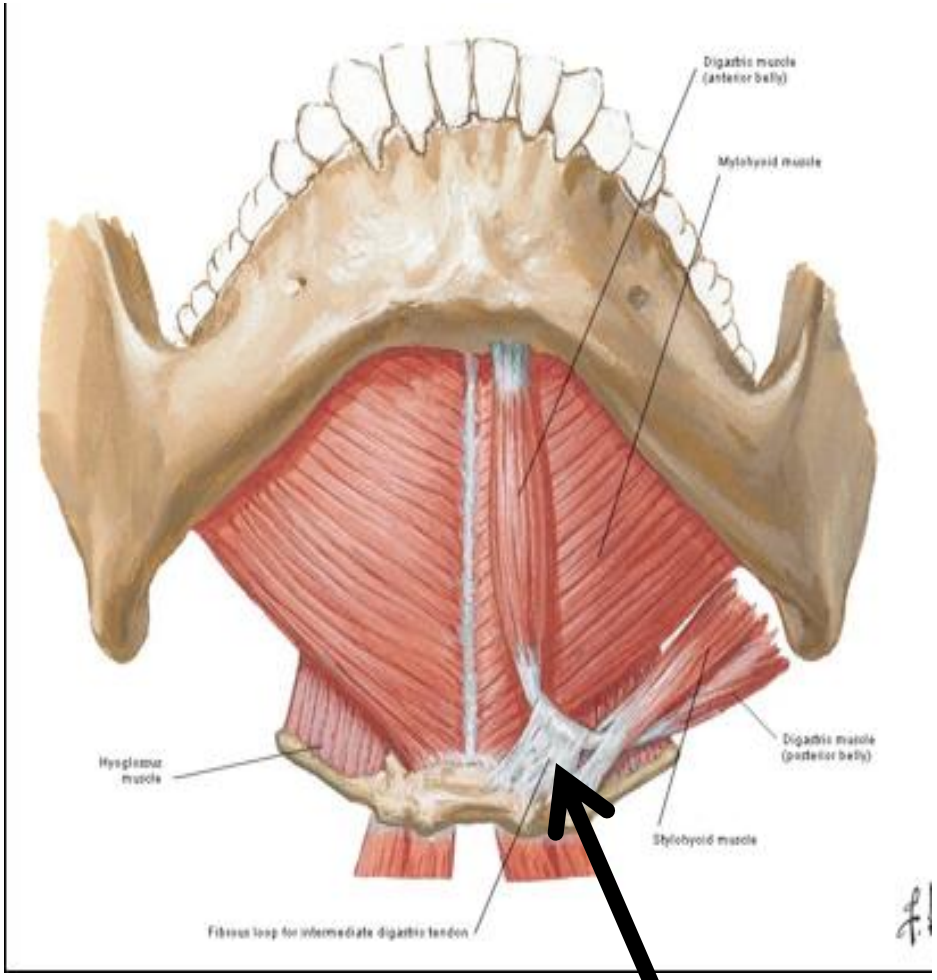
a) Anterior belly:

Digastric fossa of the mandible

b) Posterior belly:

Digastric notch on medial surface of mastoid process.





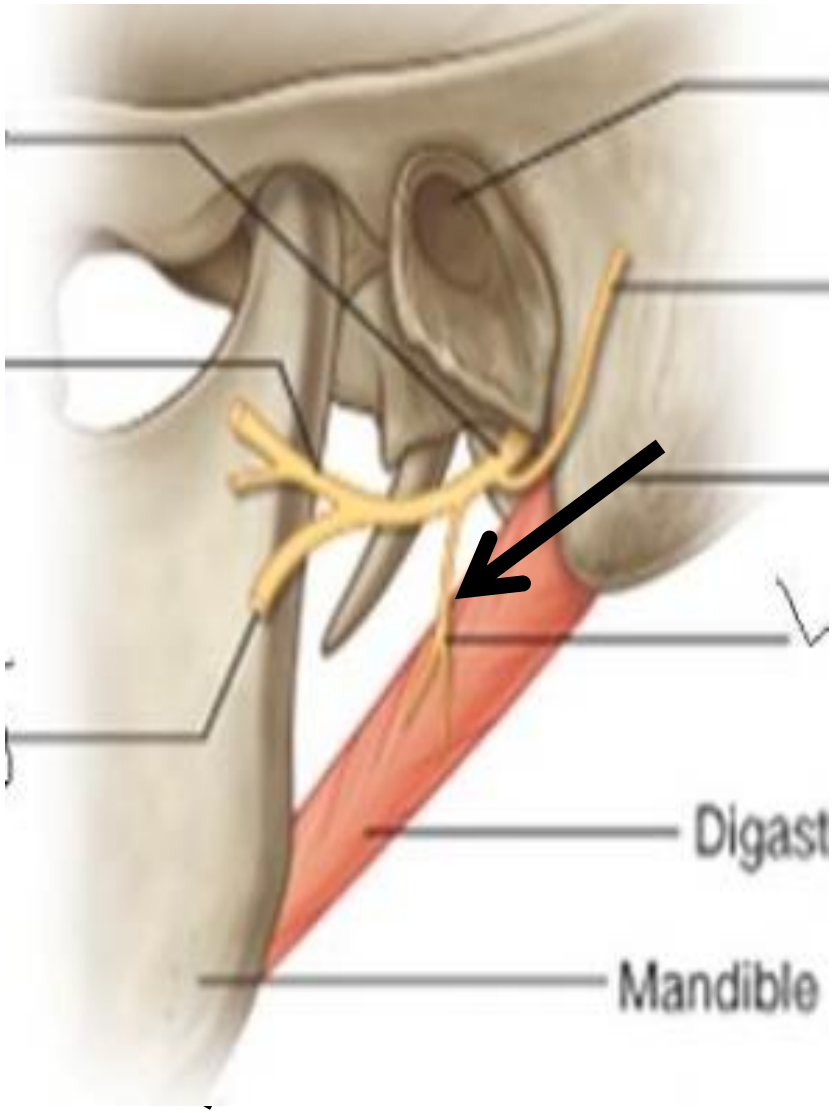
Insertion:

Intermediate tendon which is held to hyoid bone by a fibrous loop

Nerve supply:

a) Anterior belly: n. to mylohyoid

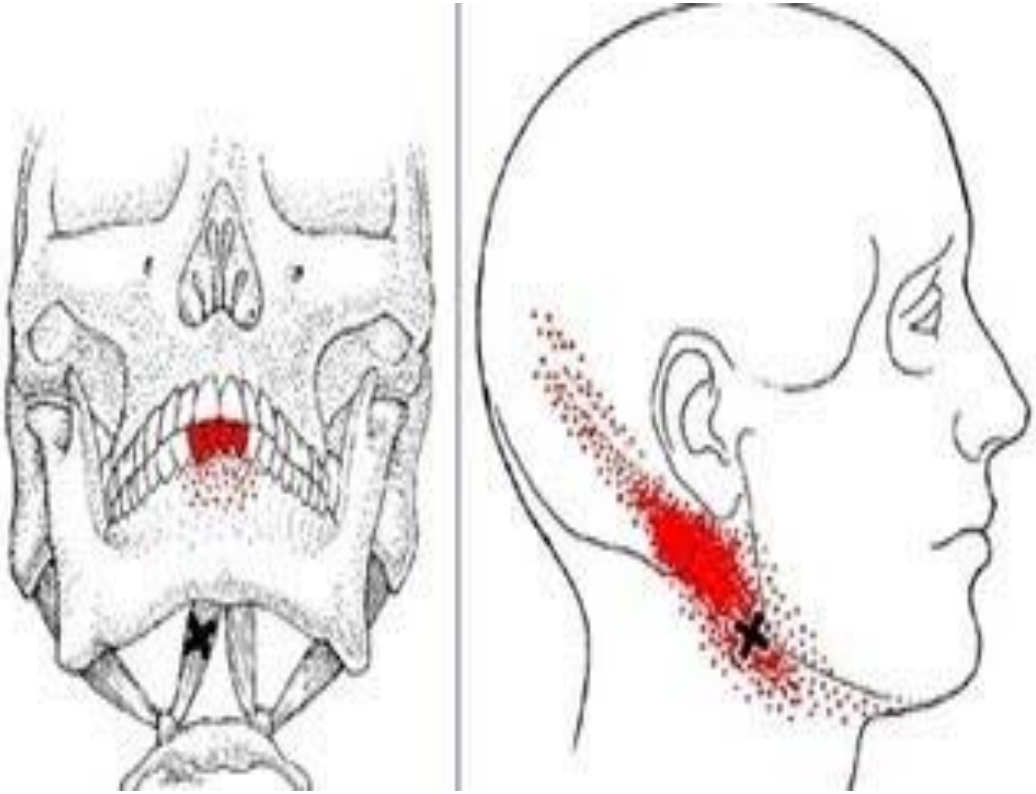
b) Posterior belly: Facial n.



Action:

a. If the hyoid bone is fixed, it depresses the mandible (helping lateral pterygoid m.).

b. Elevate hyoid bone during swallowing.



Problems occur in the digastic because of habitual mouth breathing, which often occurs from chronic sinus problems, nasal blockage such as from nasal polyps, or a deviated septum.Each belly of the digastric has its own referred pain patterns. The most widespread and common pain is referred from the posterior belly and this causes pain in the upper part of the sternocleidomastoid.

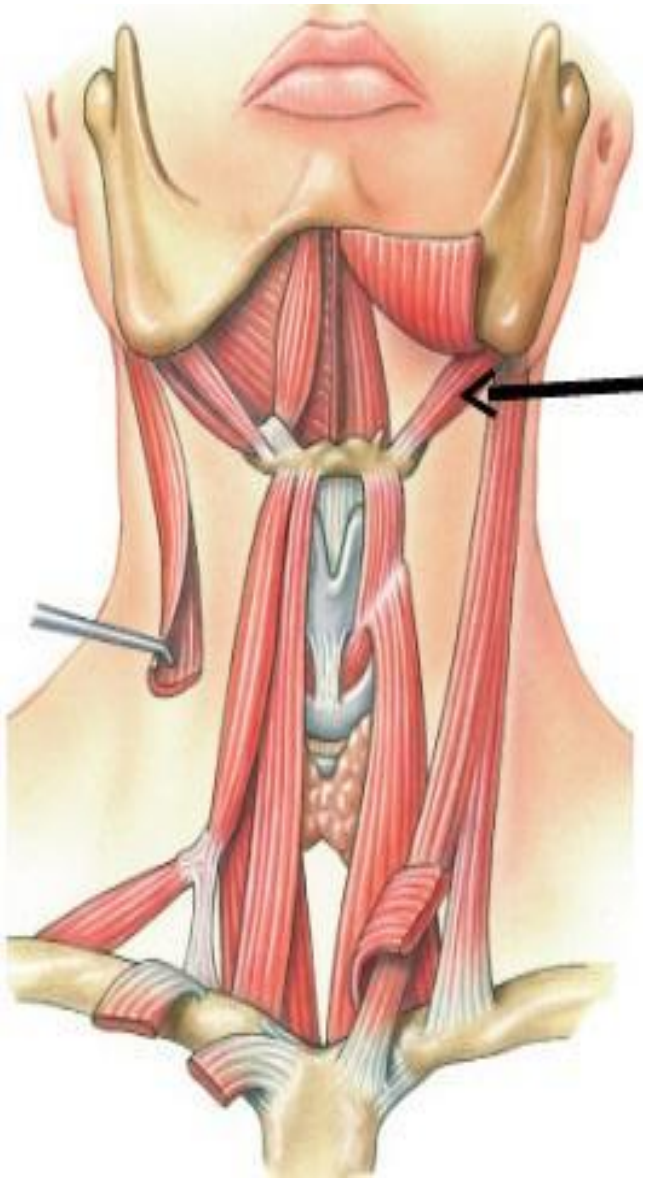
Stylohyoid muscle

Origin :

Posterior surface of styloid process.

Insertion:

Hyoid bone where its tendon is perforated by the posterior belly of digastric *m.*

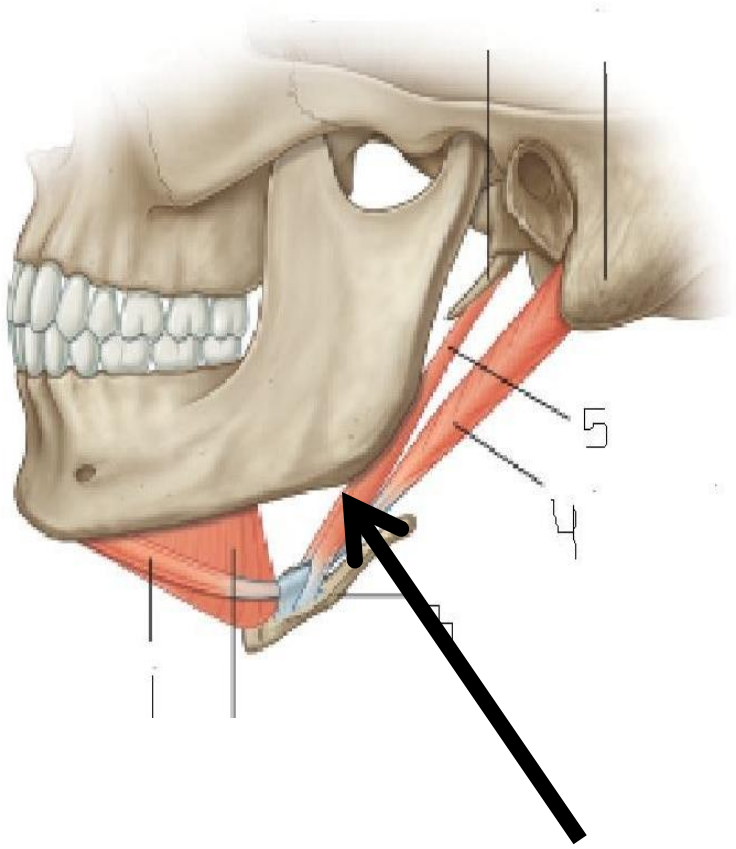


Nerve supply :

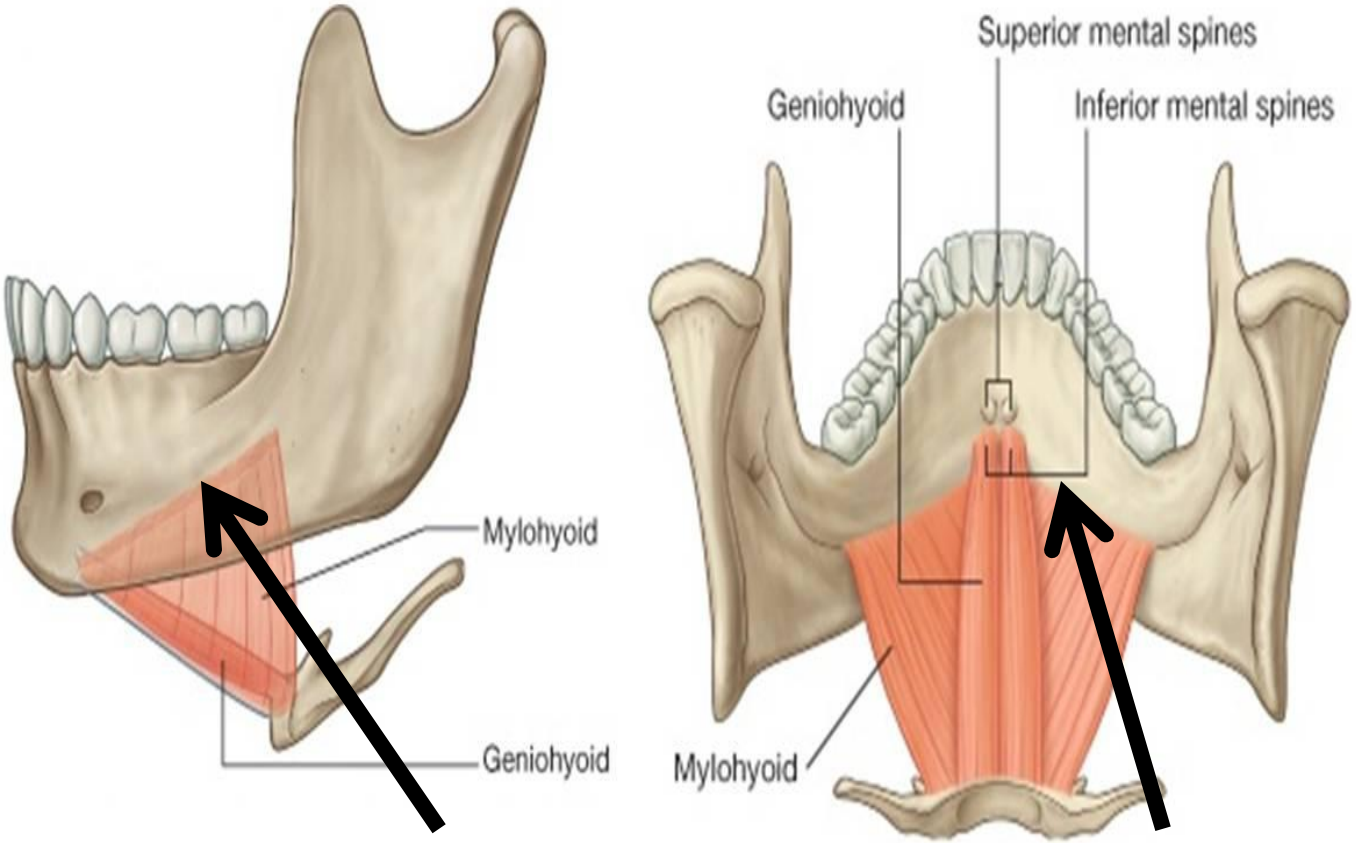
Facial *n.*

Action :

pulls hyoid bone upward & backward.

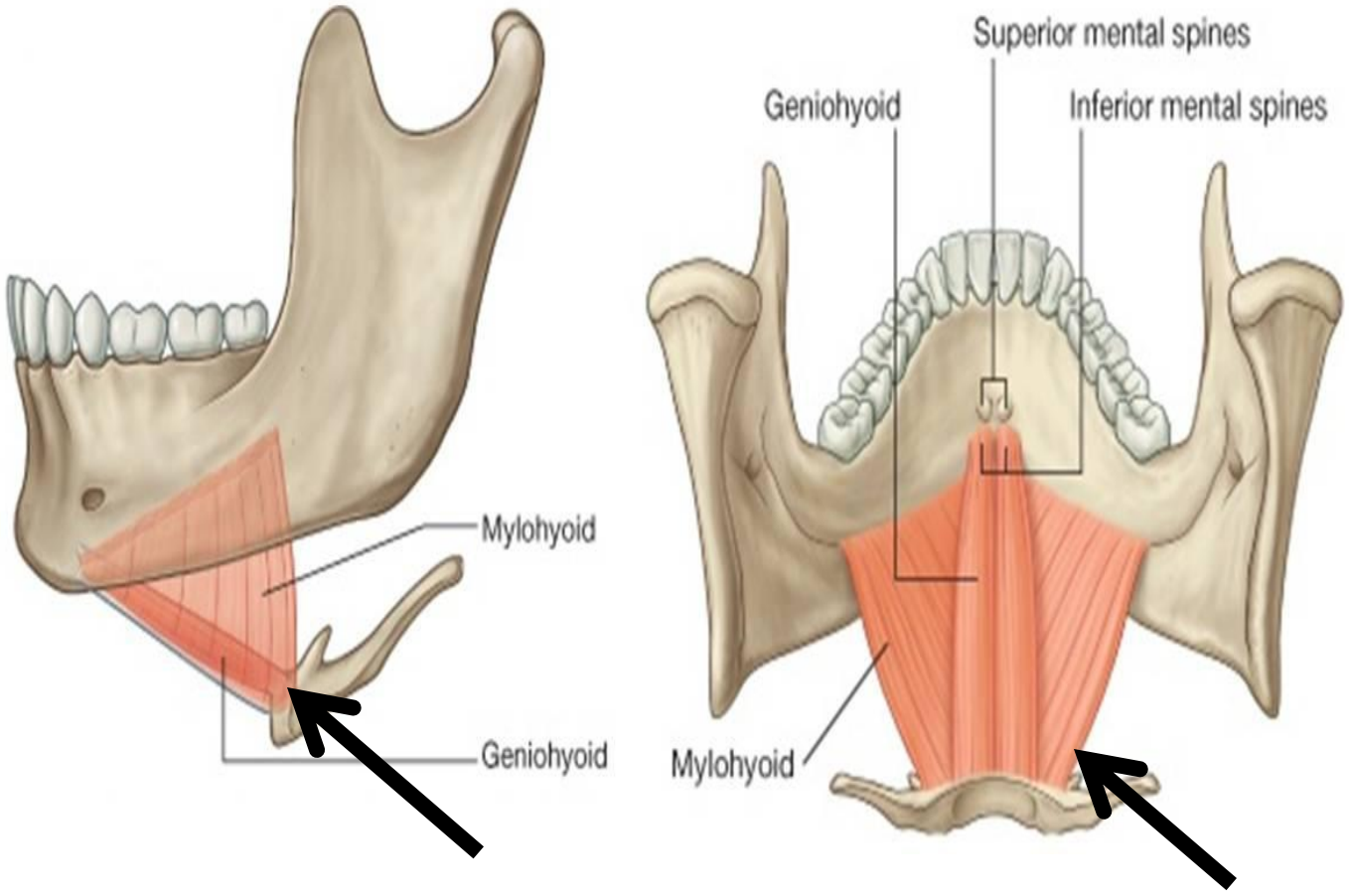


Mylohyoid muscle



Origin :

Mylohyoid line of the mandible.



Insertion:

a) Anterior & middle fibers inserted into the mylohyoid raphe

b) Posterior fibers into hyoid bone.

Nerve supply :

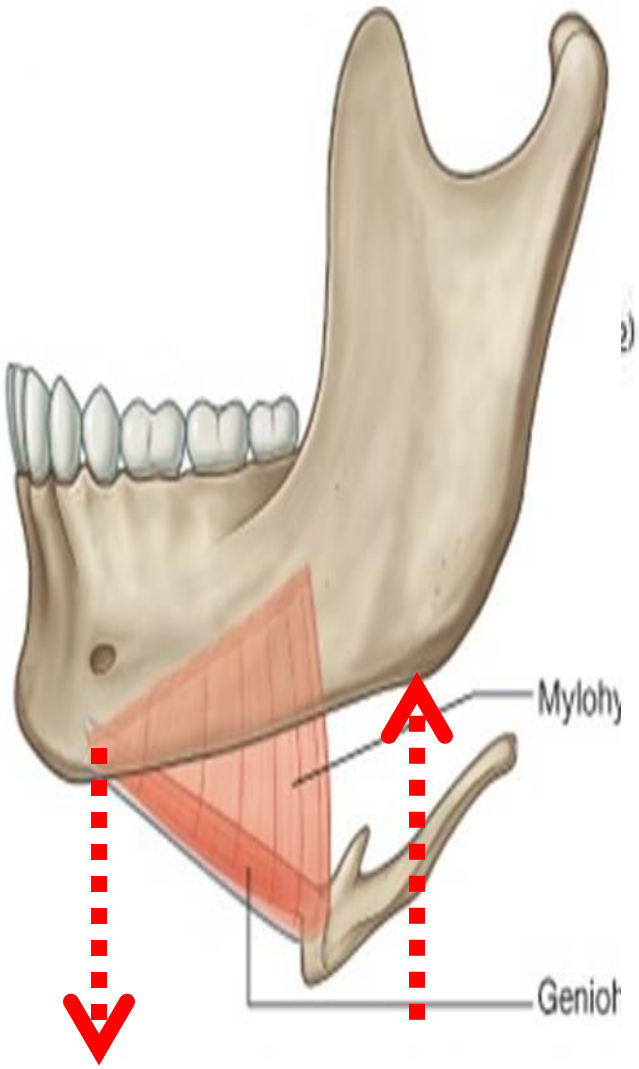
Nerve to Mylohyoid

Action :

a. Elevates the floor of mouth during the early stage of swallowing.

b. Helps in depression of the mandible (*if the hyoid bone is fixed).*

c. Supports the floor of the mouth (called diaphragma oris).



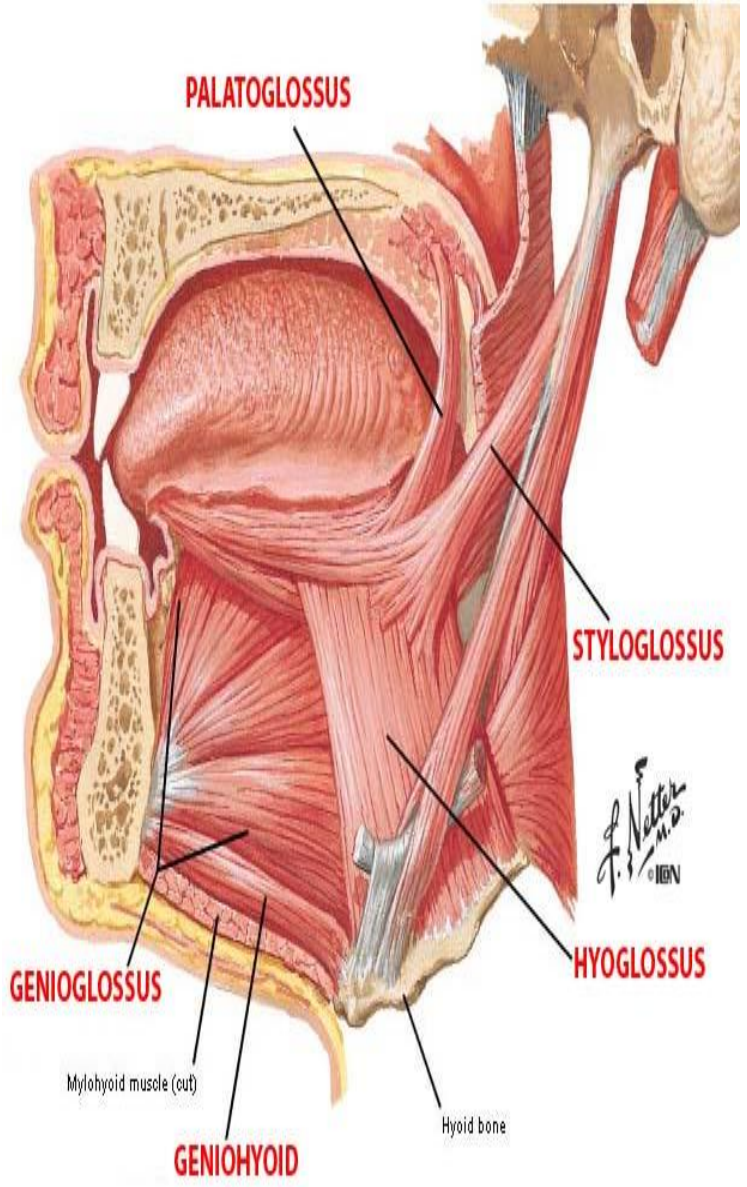
Geniohyoid muscle

Origin :

Inferior genial tubercle of body of mandible

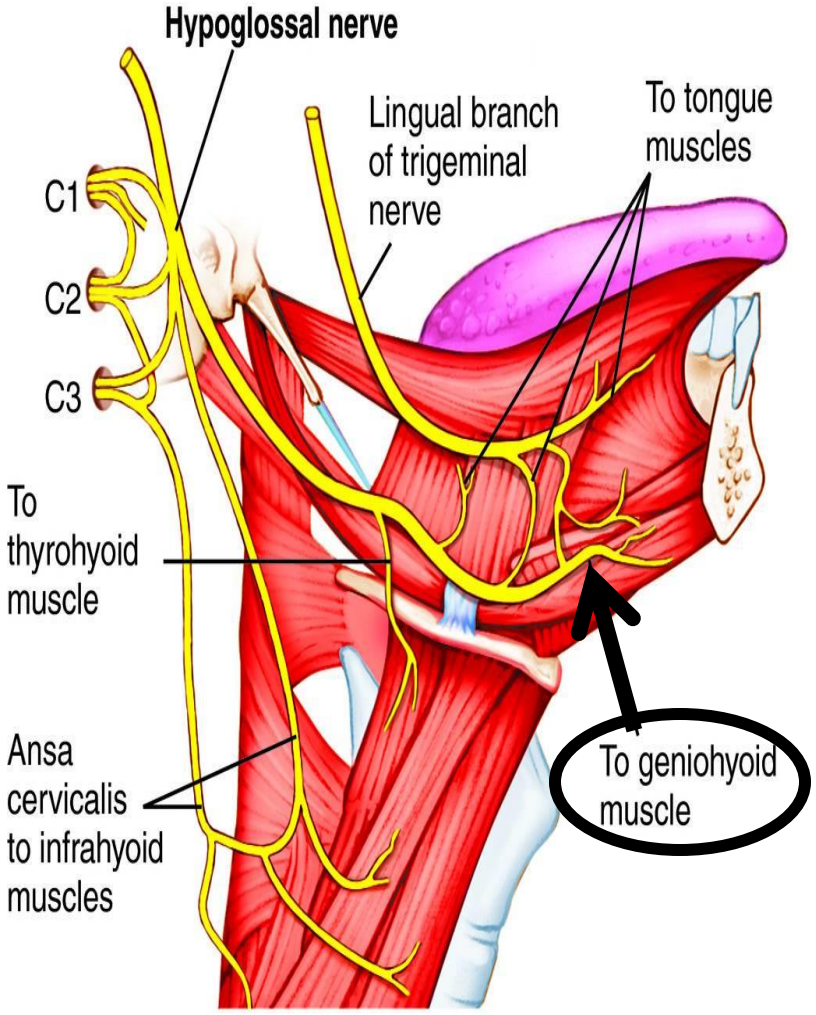
Insertion:

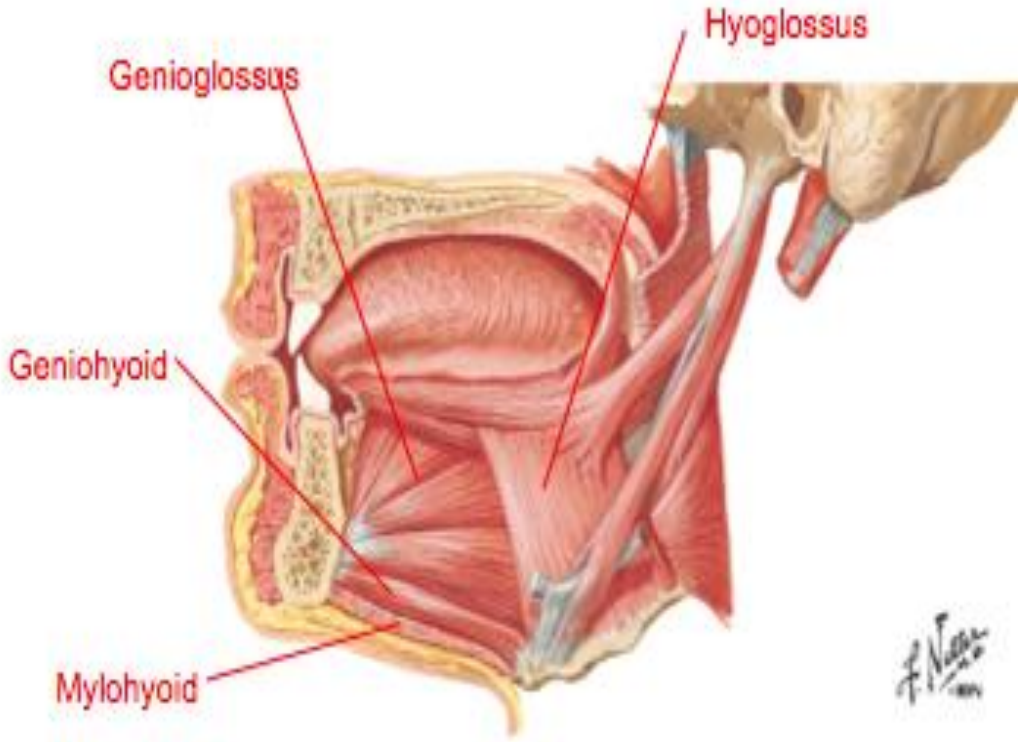
body of hyoid bone



Nerve supply :

C1 via Hypoglossal n





Action :

Elevates hyoid bone, or depresses the mandible *(if the hyoid bone is fixed).*

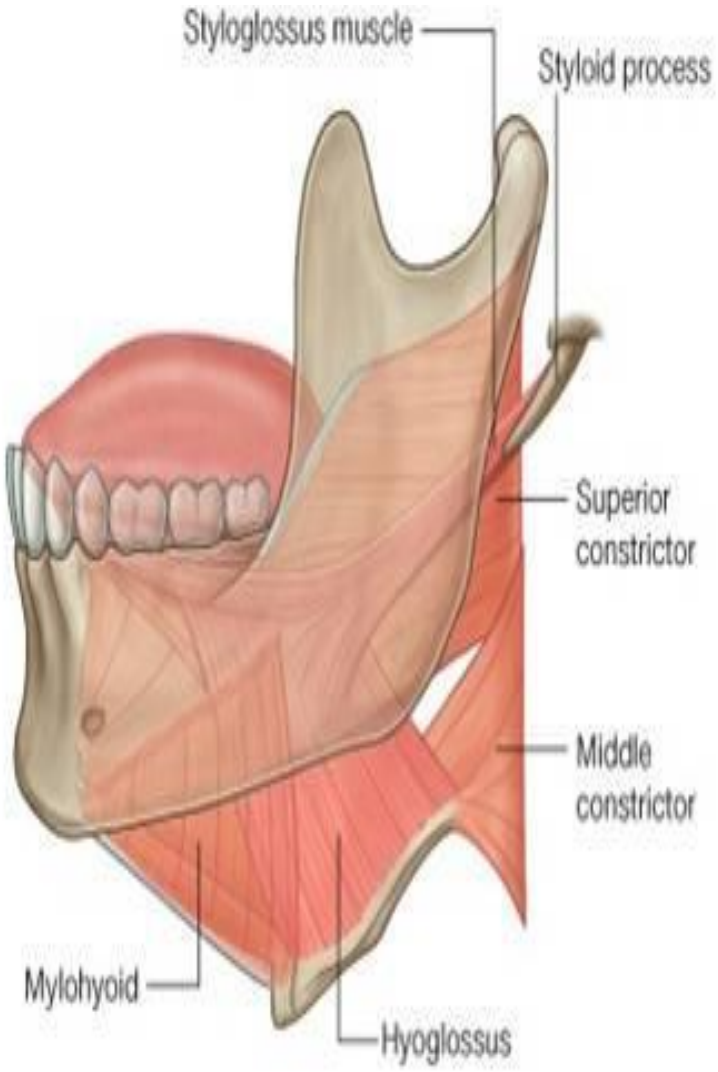
Hyoglossus muscle

Origin:

Hyoid bone

Insertion :

Its fibers run upward deep to mylohyoid to end in posterior ½ of the side of the tongue

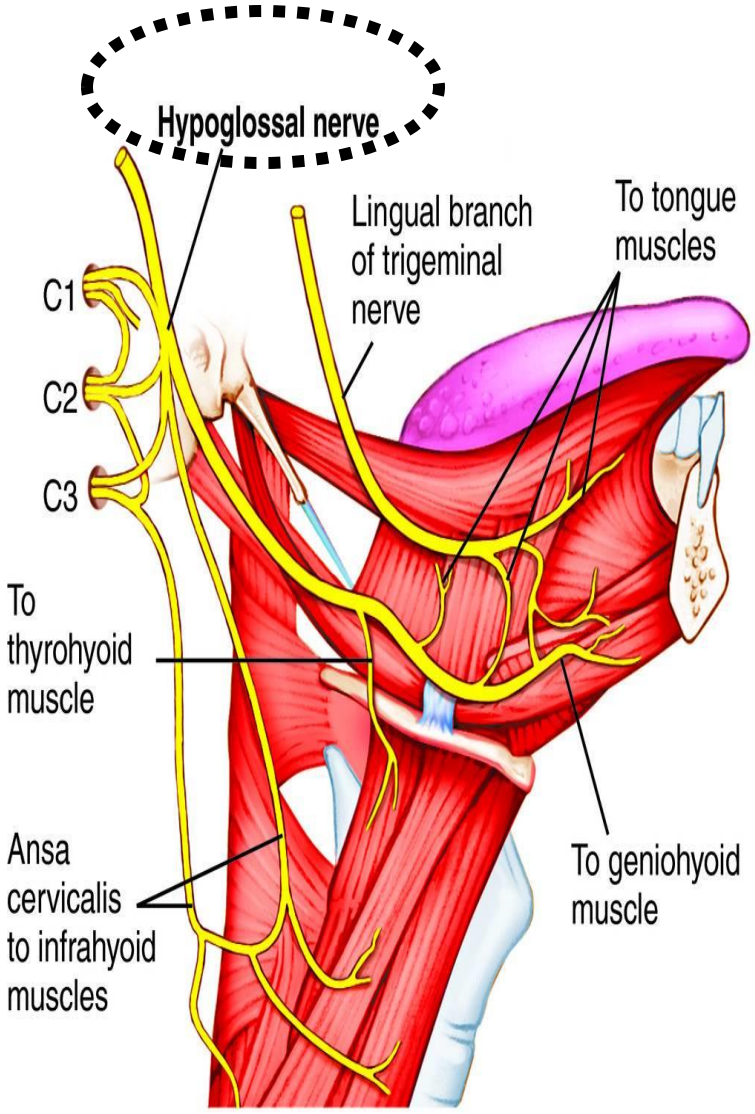


Nerve supply

Hypoglossal nerve.

Action :

Depression of the tongue during swallowing



Relations of hyoglossus muscle:

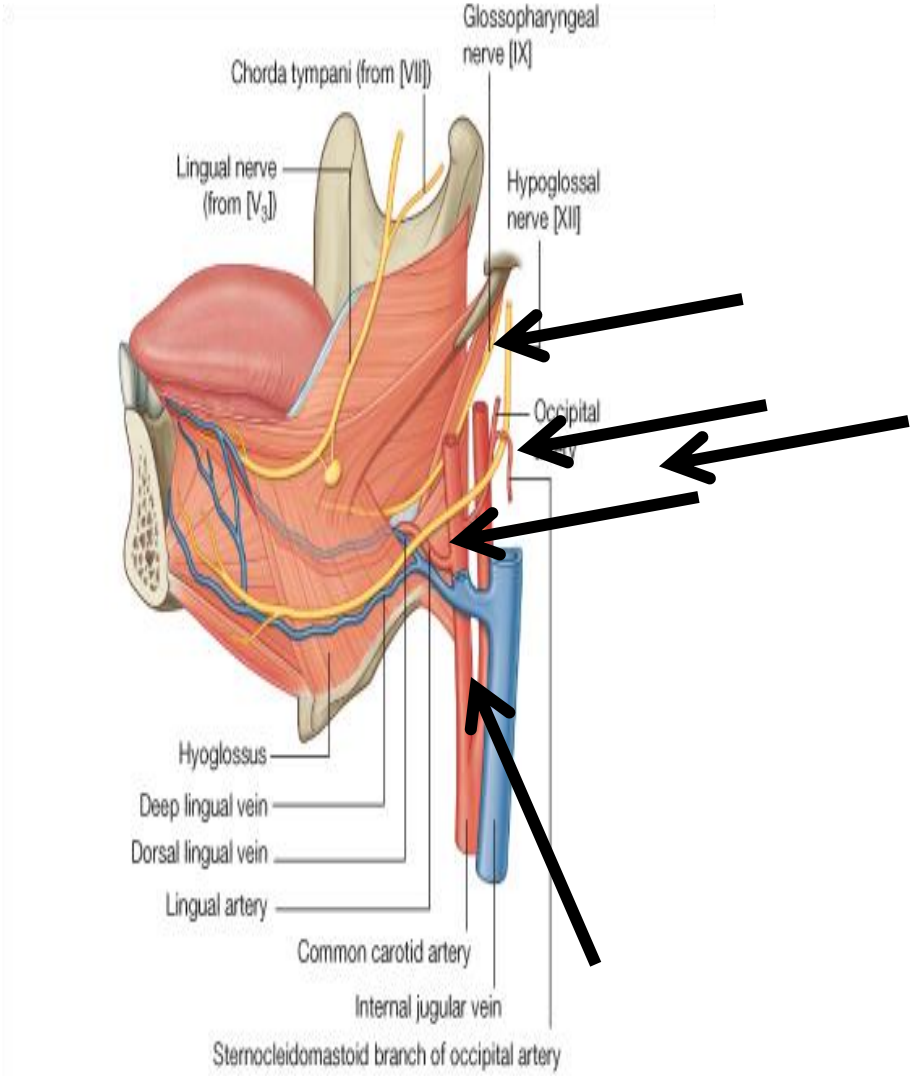
a) Superficial (lateral):

. 2 muscles: styloglossus & mylohyoid.

. 2 nerves: lingual n. + submandibular ganglion + hypoglossal nerve.

. Gland: deep part of submandibular gland. + submandibular duct.

. Vessel: deep lingual vein



Genioglossus

Origin :

Upper genial tubercle of mandible

Insertion:

Whole length of under surface of tongue

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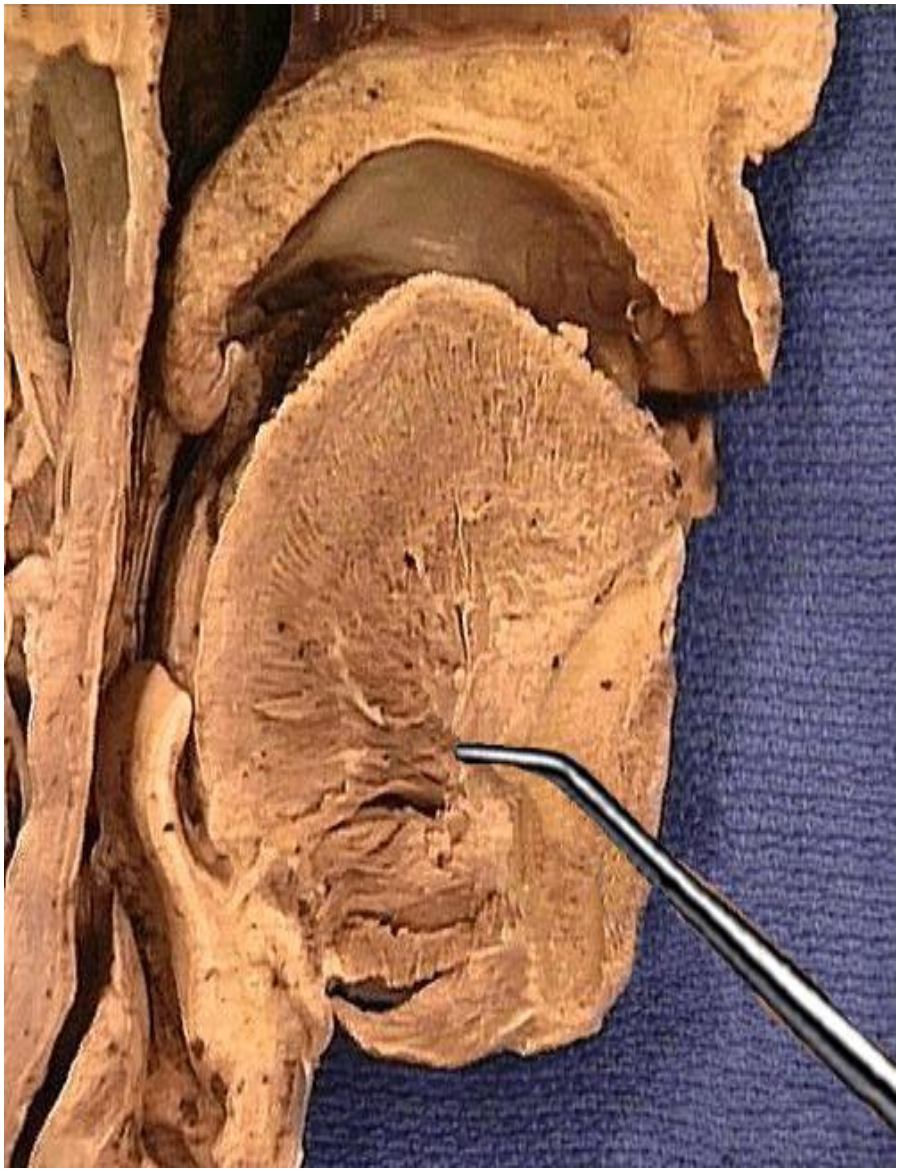
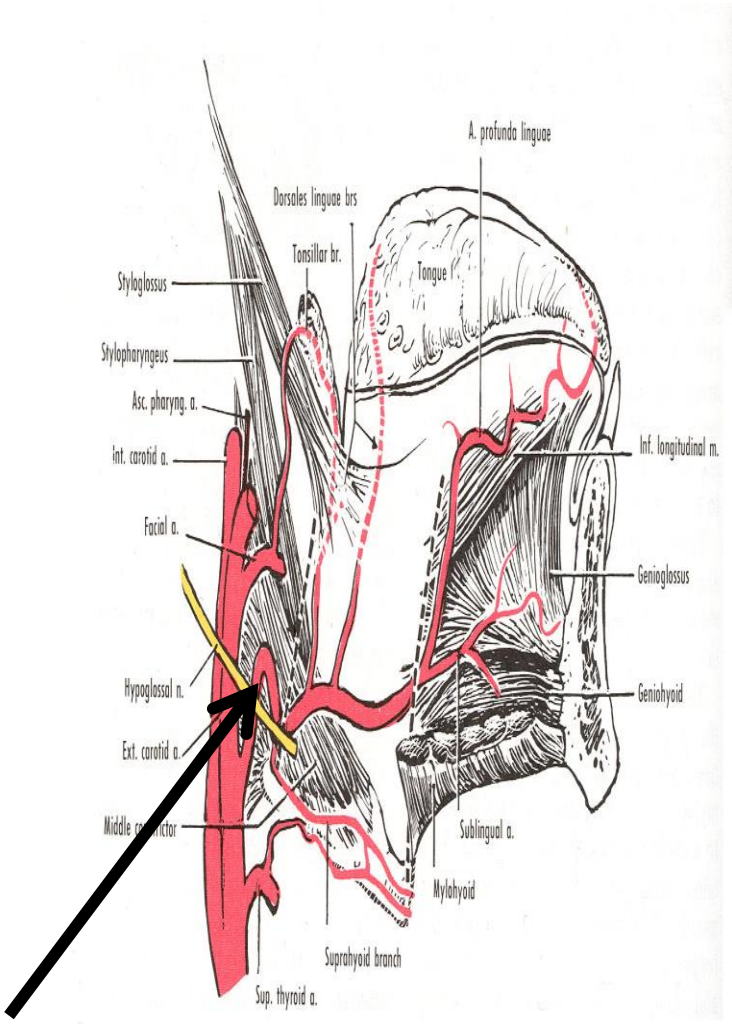
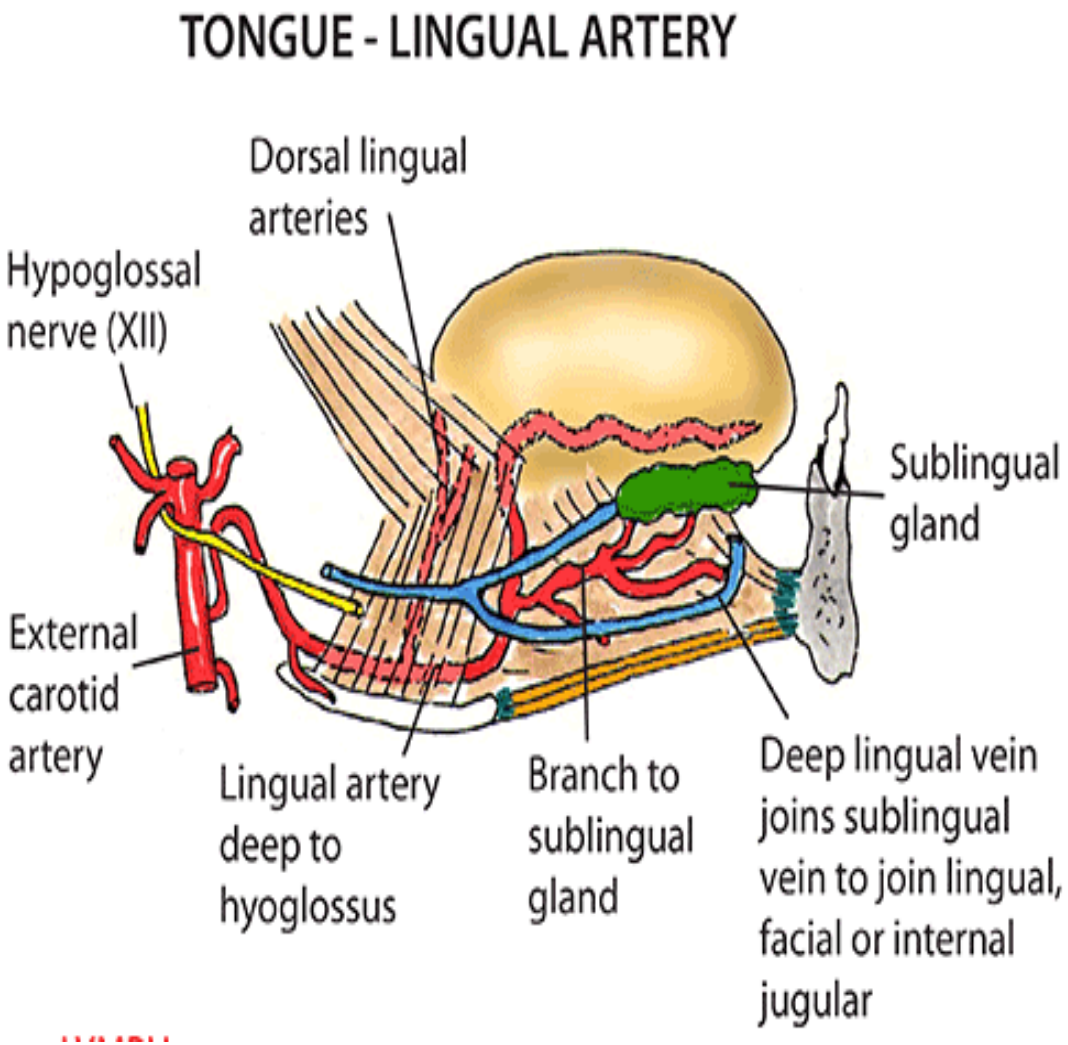


Lingual artery

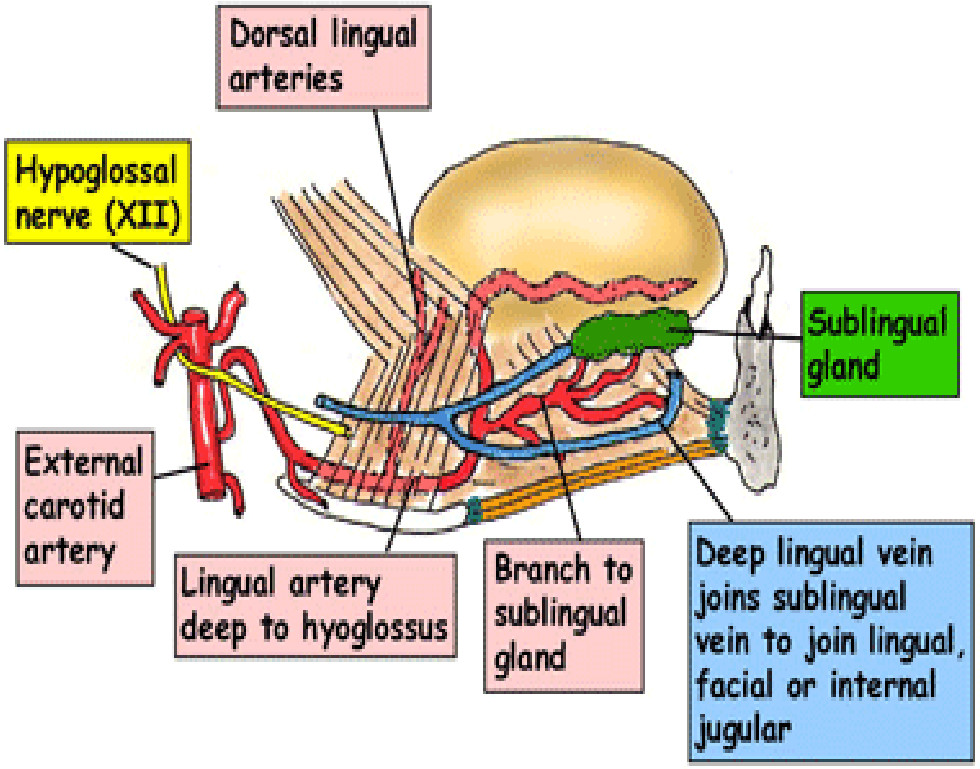
Origin: from anterior aspect of ECA in carotid triangle

Its course is tortuous & is divided by hyoglossus m. into 3 parts





1st part (before the m.): forms a loop opposite the greater cornu of hyoid bone, crossed superficially by the hypoglossal n.

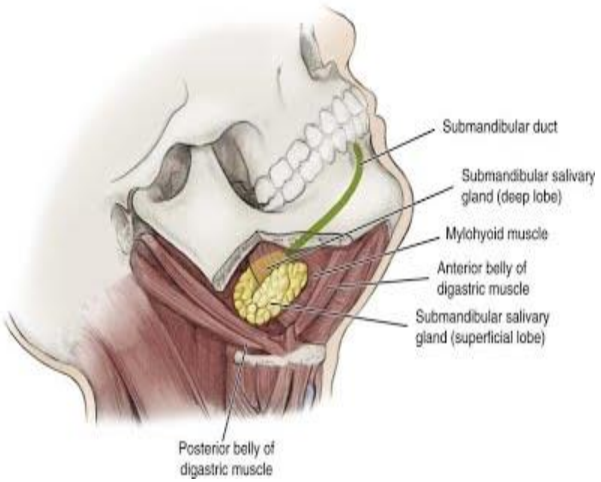


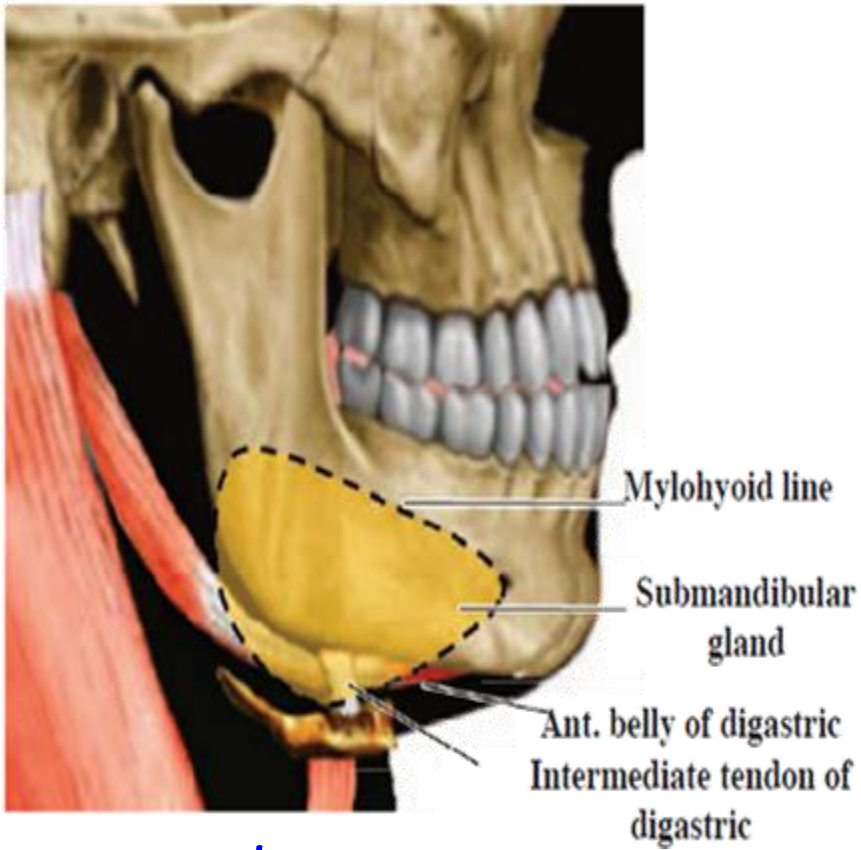
b. 2nd part (behind the m.).

c. 3rd part (beyond the m.), ascends along the anterior border of hyoglossus then runs on the under surface of tongue to end by anastomosing with its fellow of the opposite side

Submandibular gland

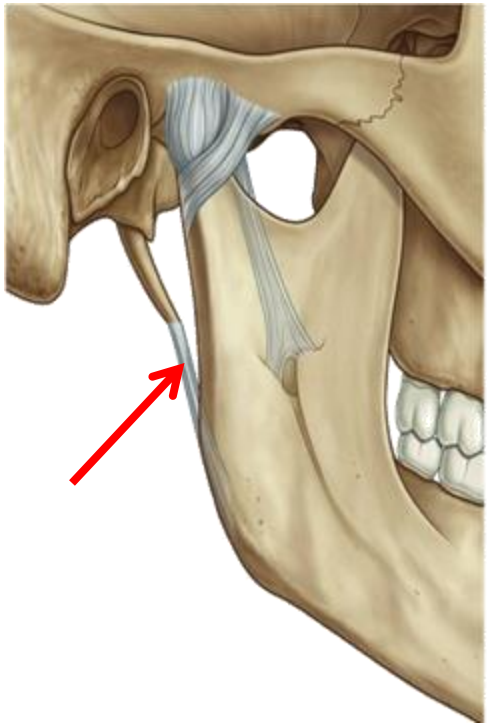
Site and extent

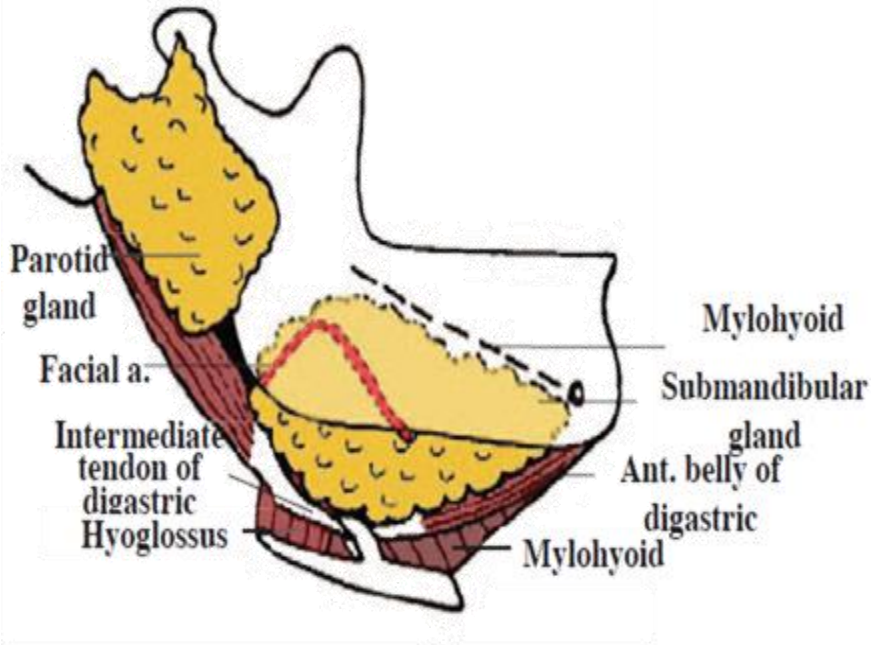




It lies deep to the body of mandible in digastric triangle.

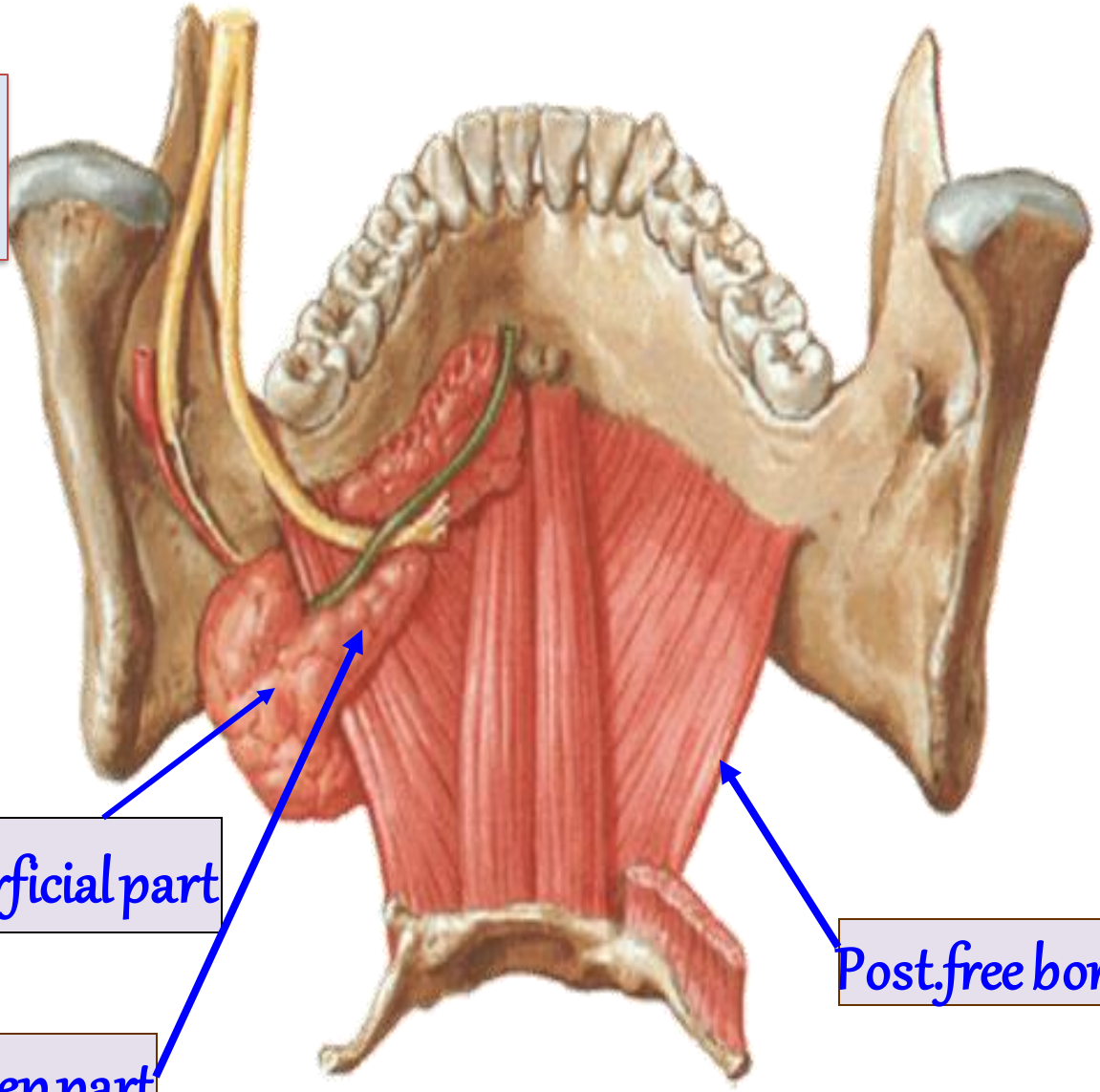
1. Superiorly: up to mylohyoid line.
2. Inferiorly: overlaps intermediate tendon of the digastric.
3. Anteriorly: reaches anterior belly of digastric.

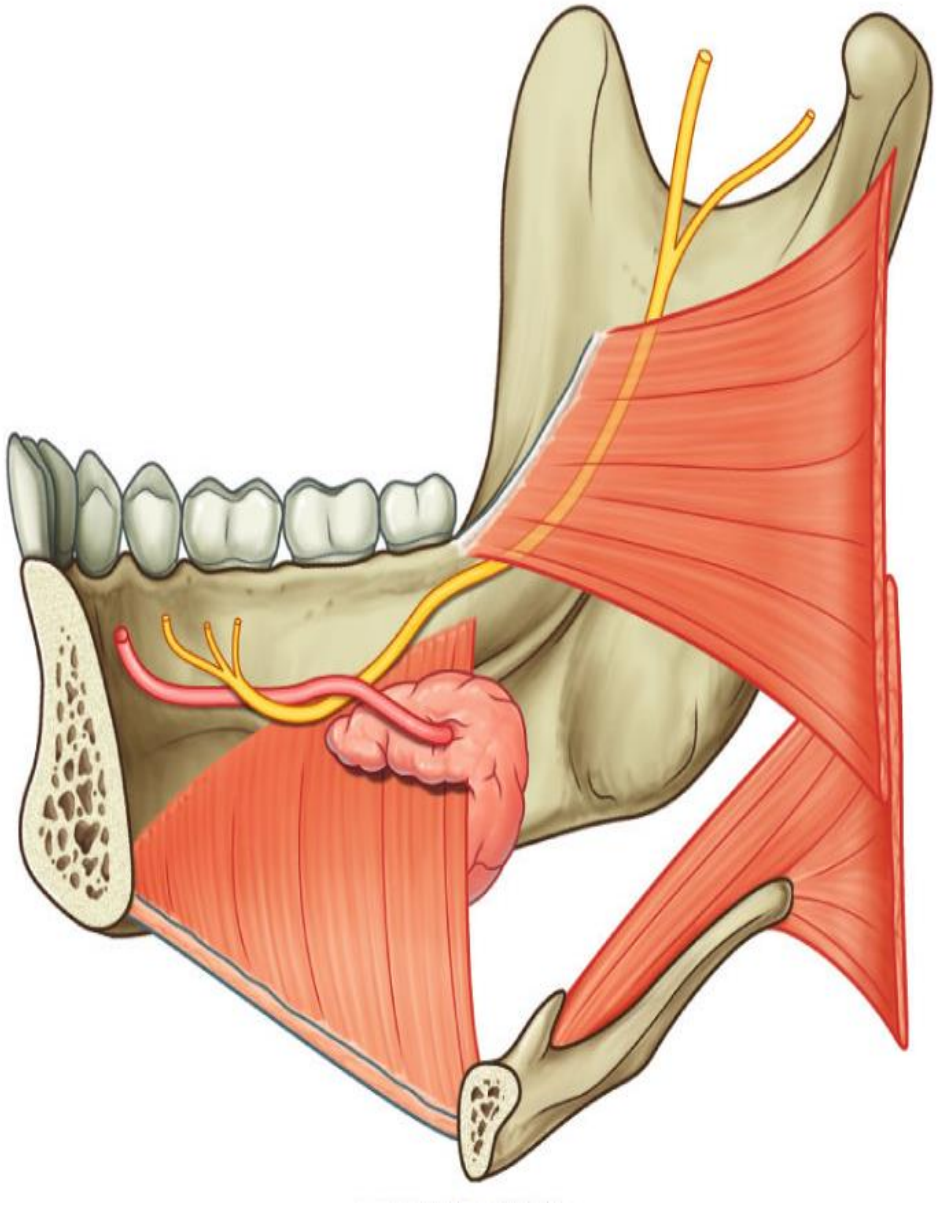




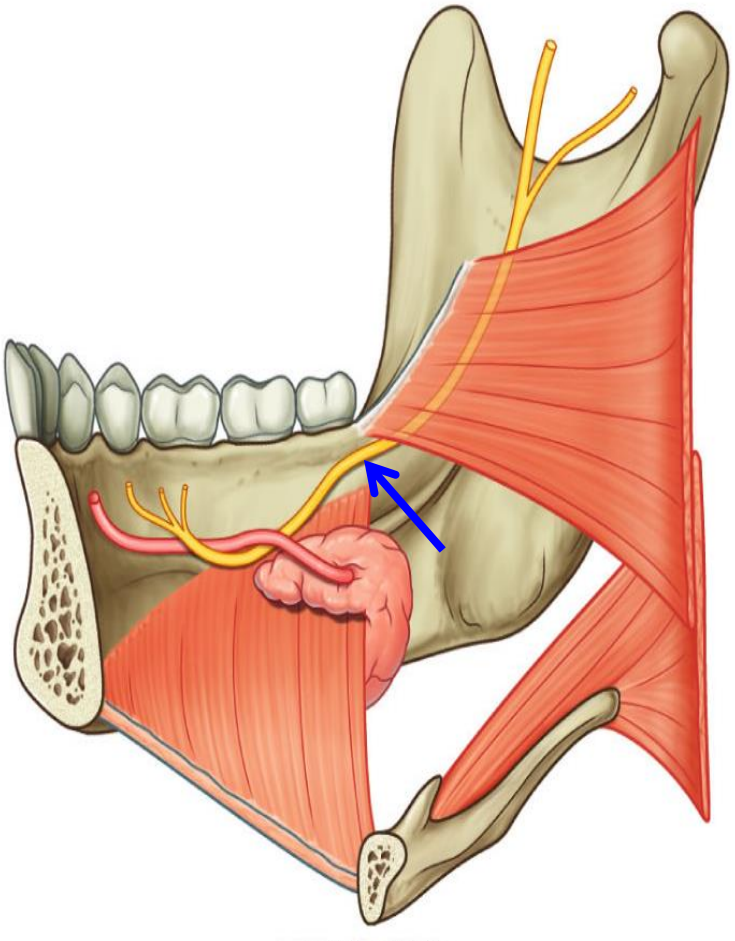
4. Posteriorly: reaches Stylomandibular ligament which separates it from the parotid gland.

Parts

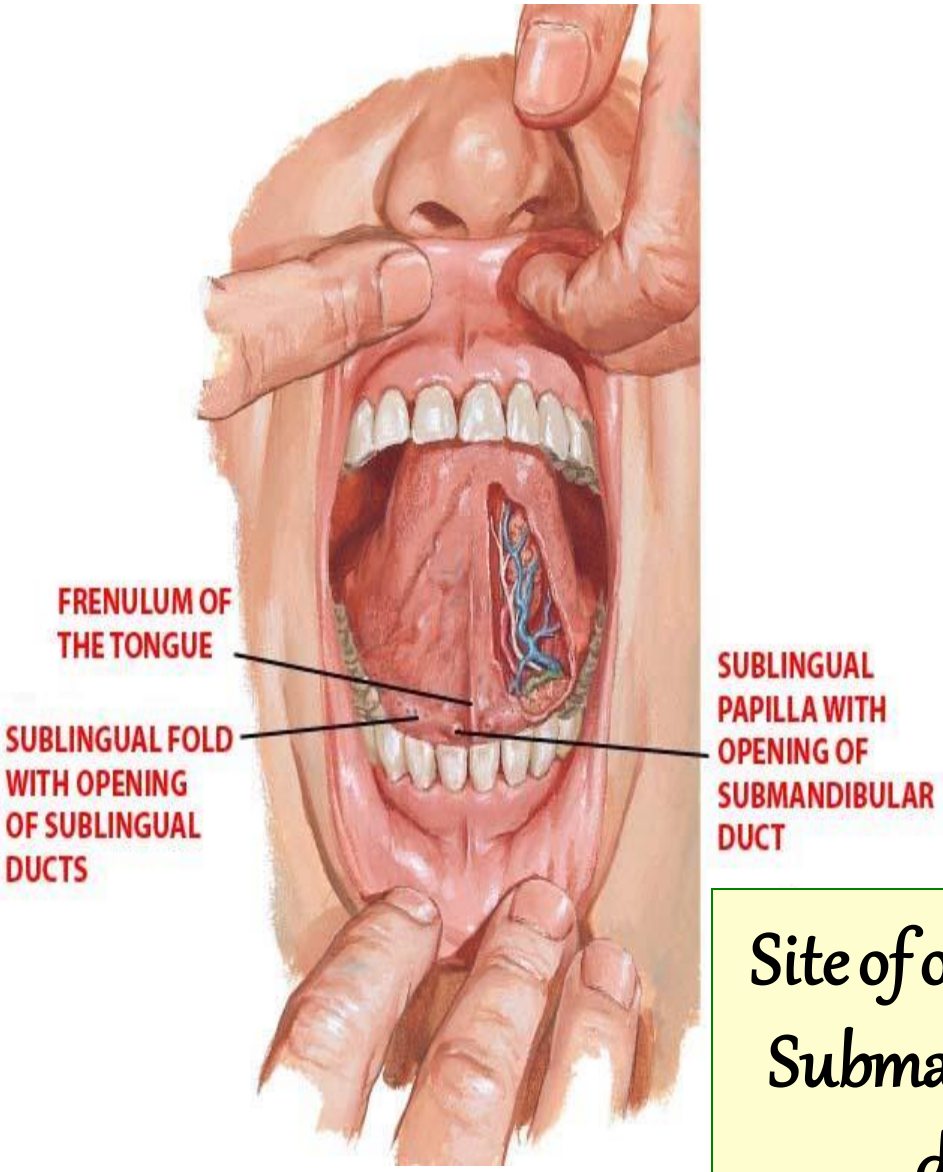




Relation between lingual nerve & Submandibular duct

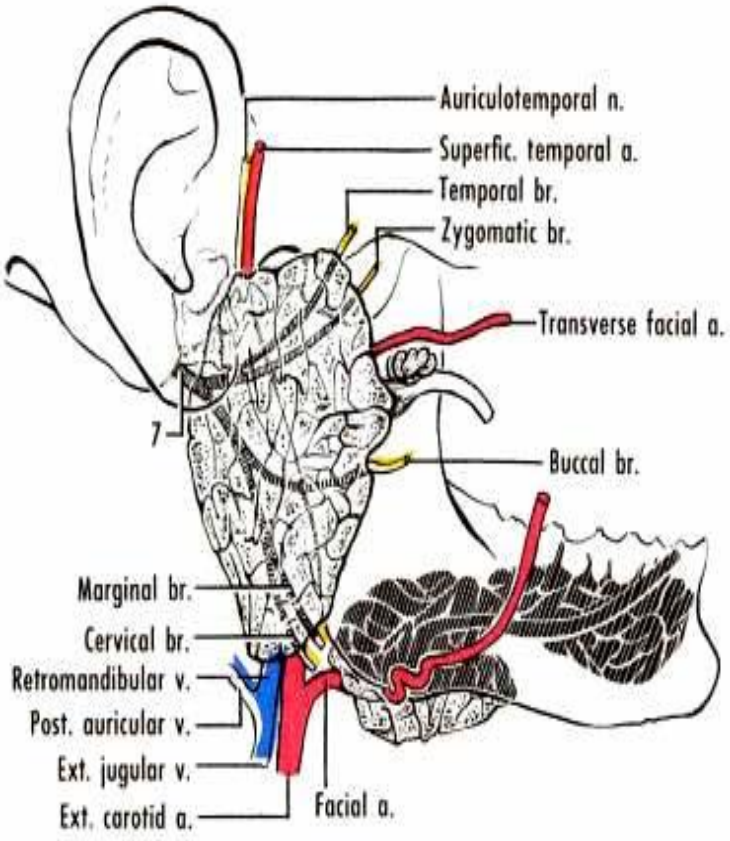


1. Lingual nerve is lateral to the duct.
2. Then inferior.
3. Finally medial.



Site of opening of Submandibular duct

- Blood supply:- Facial artery.
- Venous drainage :- Common facial vein.
- Lymph drainage:- Submandibular L.N.

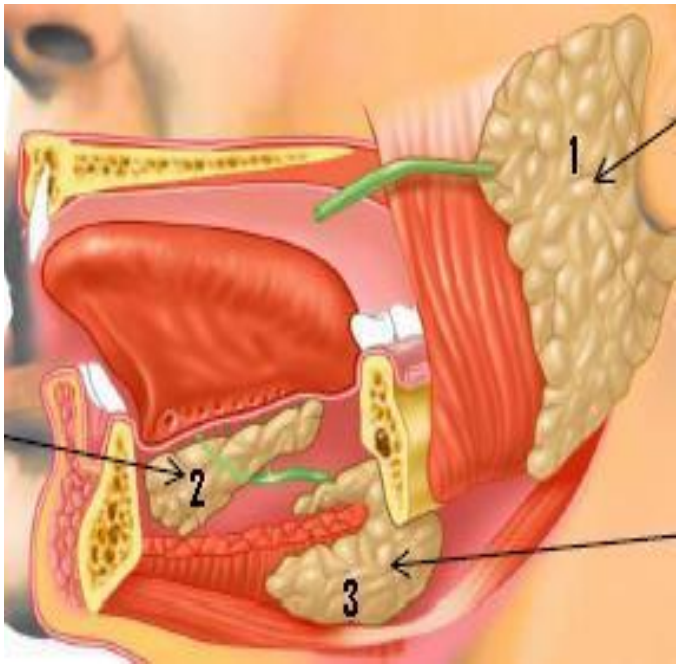


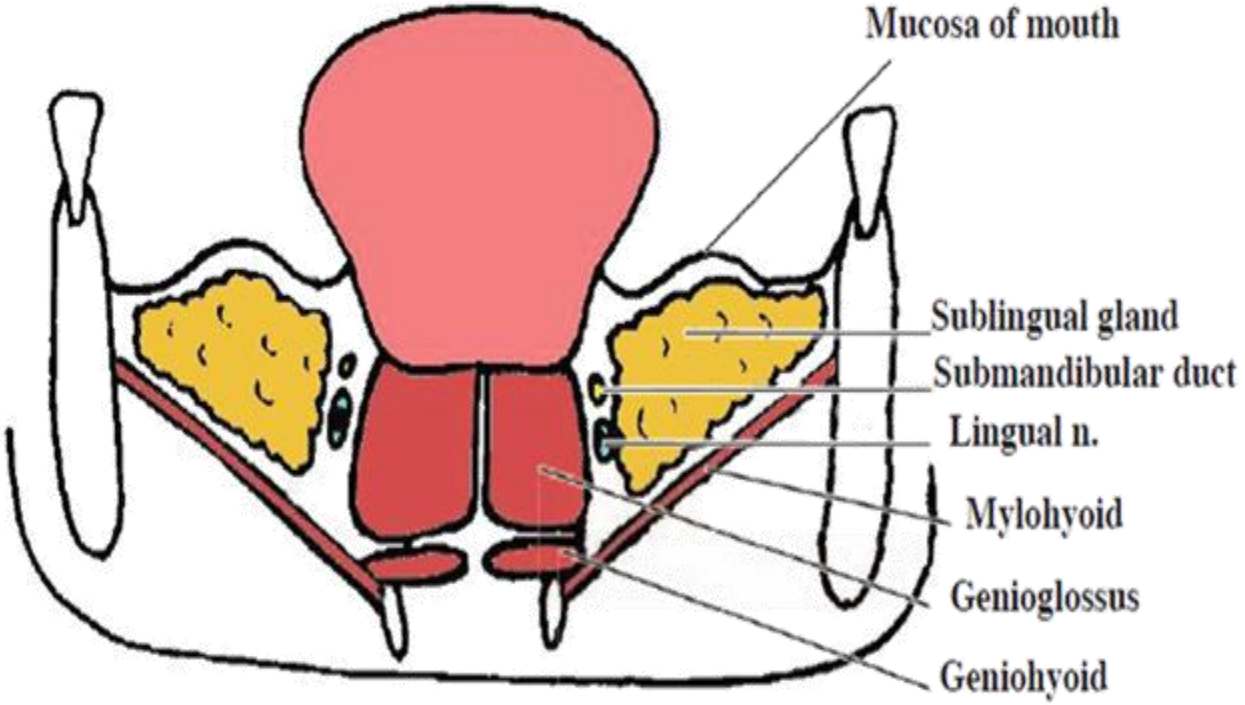
Sublingual gland

Site:

1. It occupies sublingual fossa of the mandible.
2. It lies below the mucosa of the floor of the mouth forming the sublingual fold.

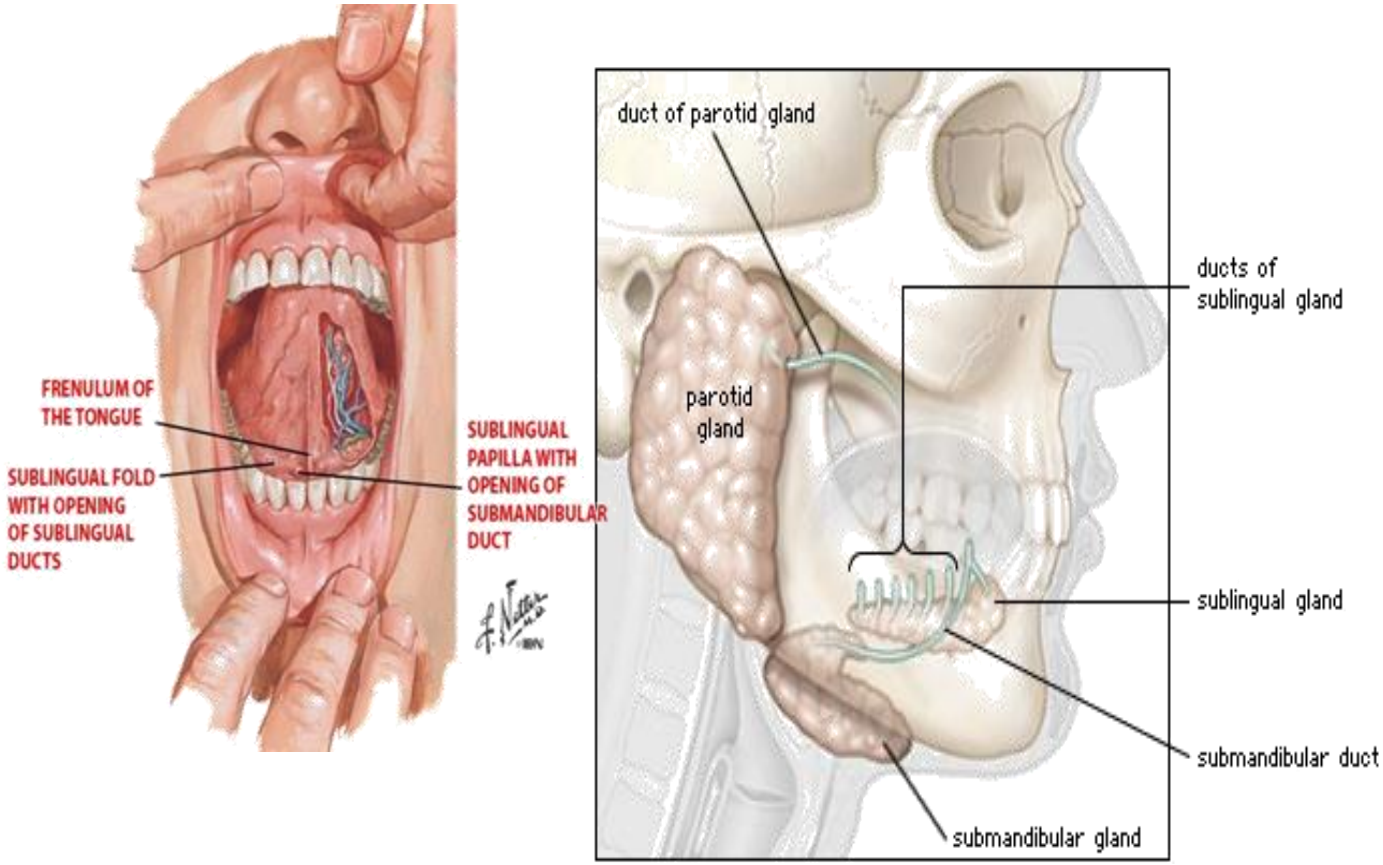
Shape: Almond shaped with a wide anterior end & a narrow posterior end



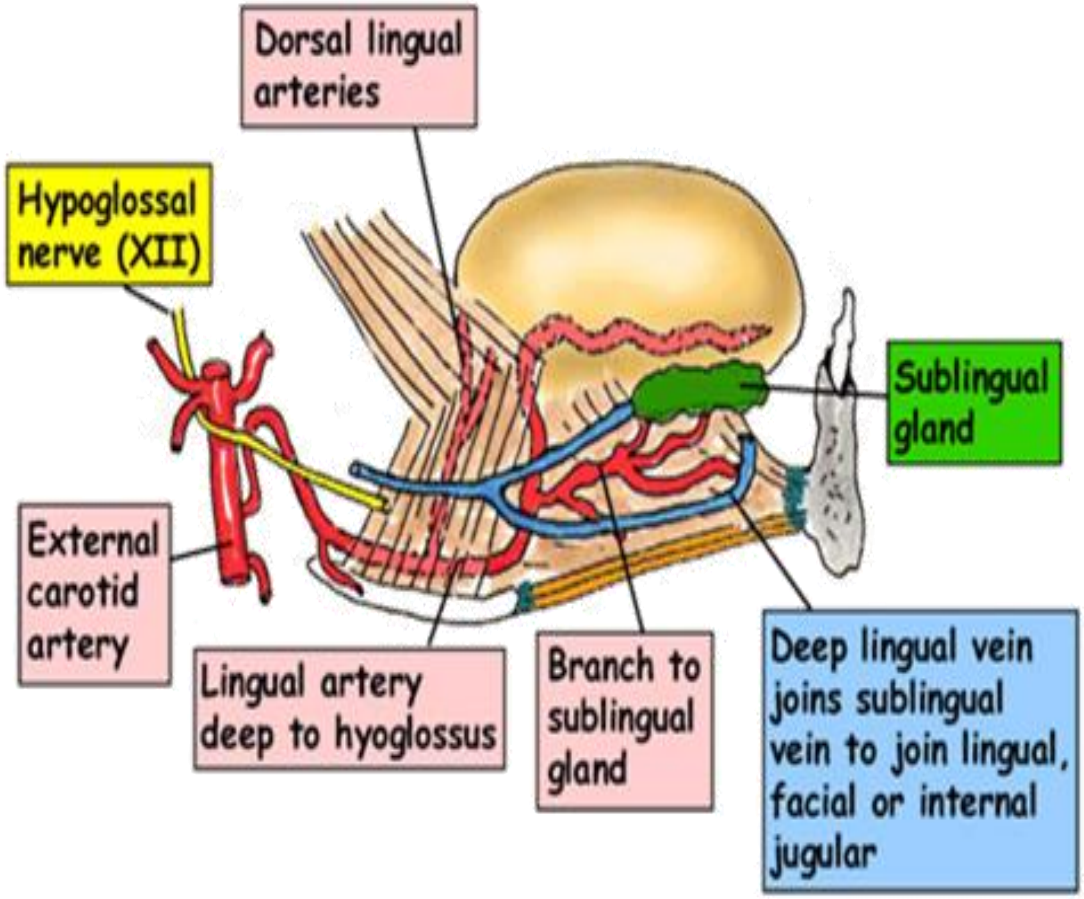


Relations:

1. Superiorly: mucosa of the floor of mouth.
2. Inferiorly: mylohyoid m.
3. Medially: genioglossus (separated from it by lingual n. & Submandibular duct).
4. Laterally: sublingual fossa of mandible.



- **Sublingual ducts**: 8-20 small ducts that open separately on the summit of the sublingual fold in the floor of the mouth on the side of the frenulum.



Blood supply: Sublingual branches of lingual *a.* + *Submental branches of facial a.*

Nerve supply: similar to the Submandibular gland.

A 65-year-old man is admitted to the emergency department after his head hit in an automobile collision. Radiographic and physical examinations reveal that the inferior alveolar nerve is injured at its origin. Which of the following muscles would most likely be paralyzed as a result?

A. Geniohyoid

B. Hyoglossus

C. Mylohyoid

D. Stylohyoid

E. Palatoglossus

Thank you