Mouth and Tongue
口腔 與 舌頭

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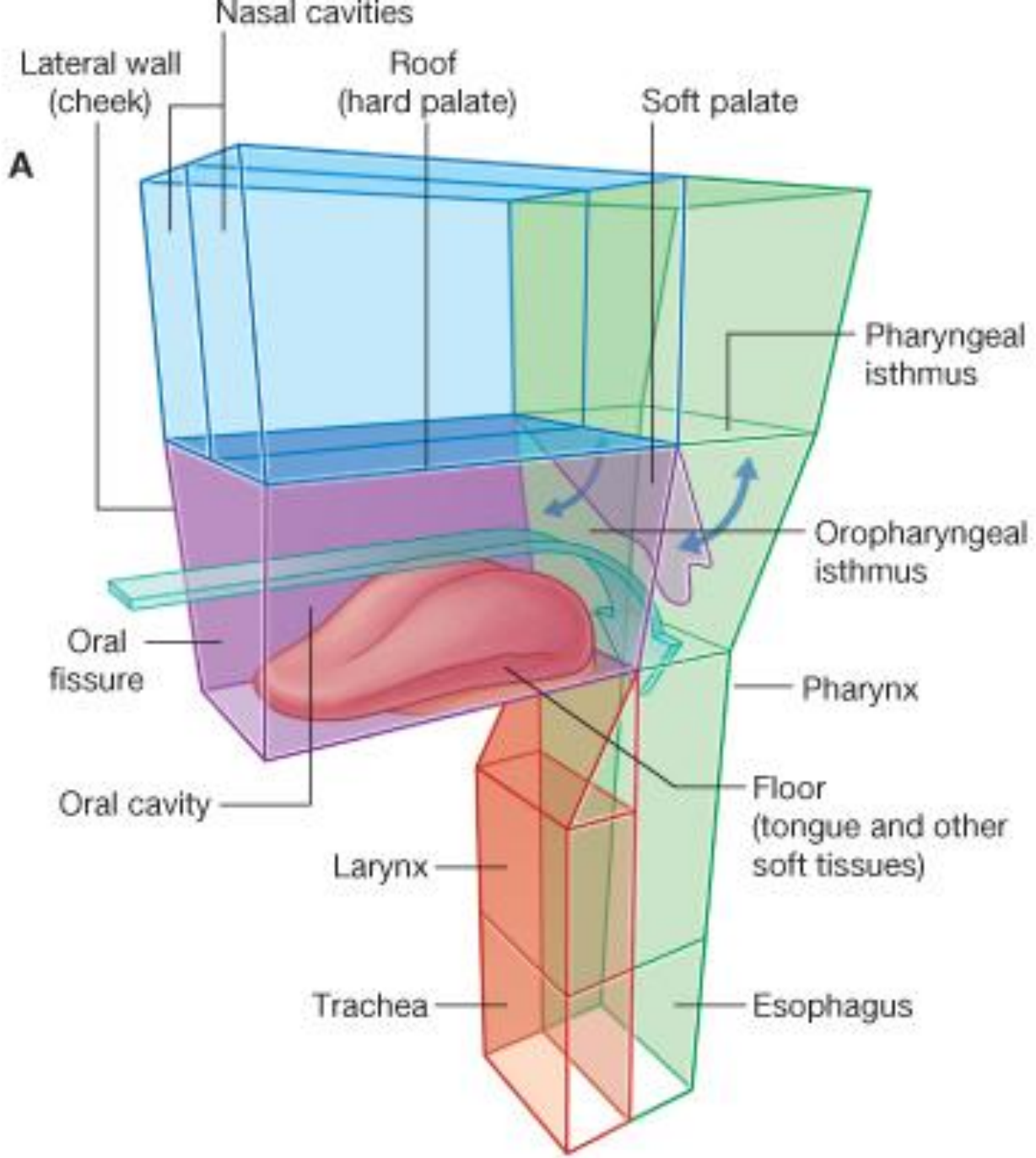
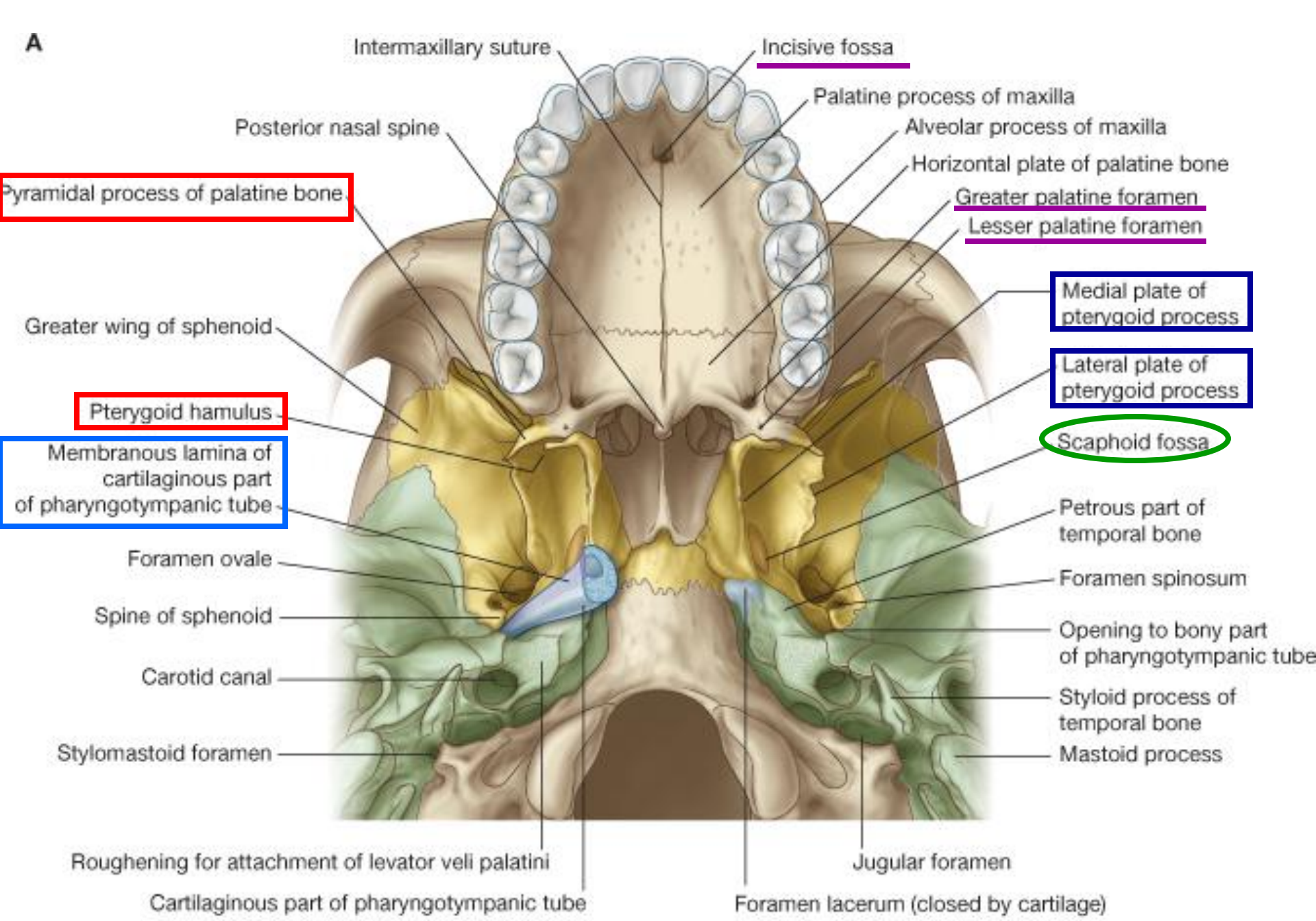
Outline:

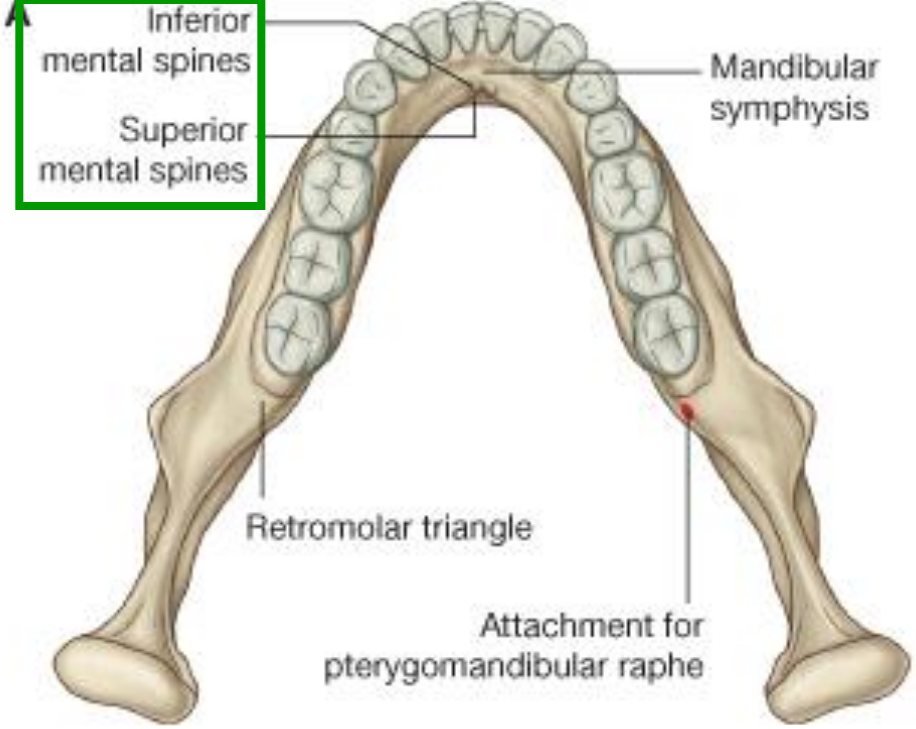
- Skeletal framework of oral cavity
- The floor (muscles) of oral cavity
- The structure and muscles of tongue
- The blood vessels and nerves of tongue
- Position, openings and nerve innervation of salivary glands
- The structure of soft and hard palates

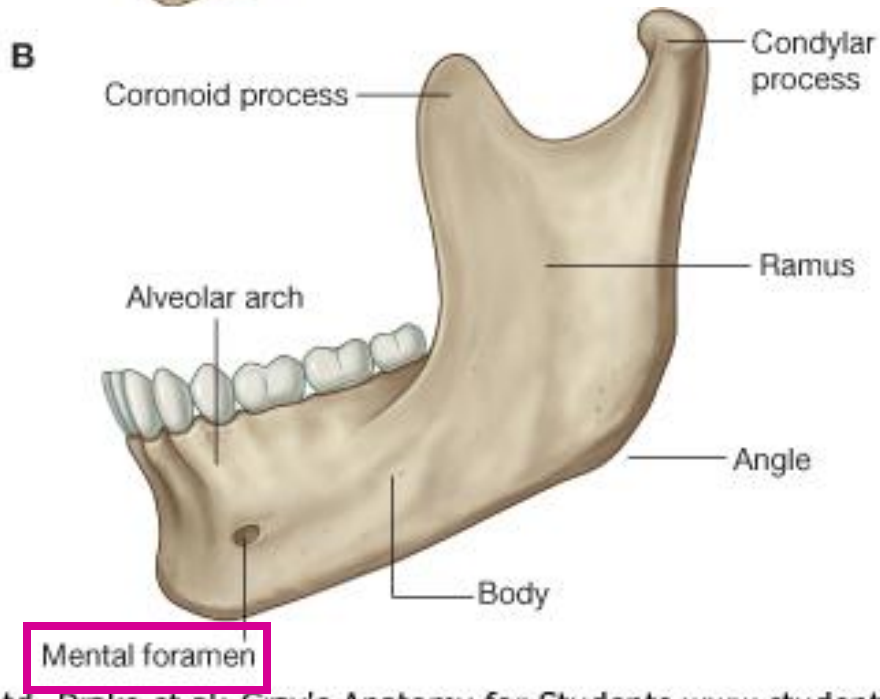


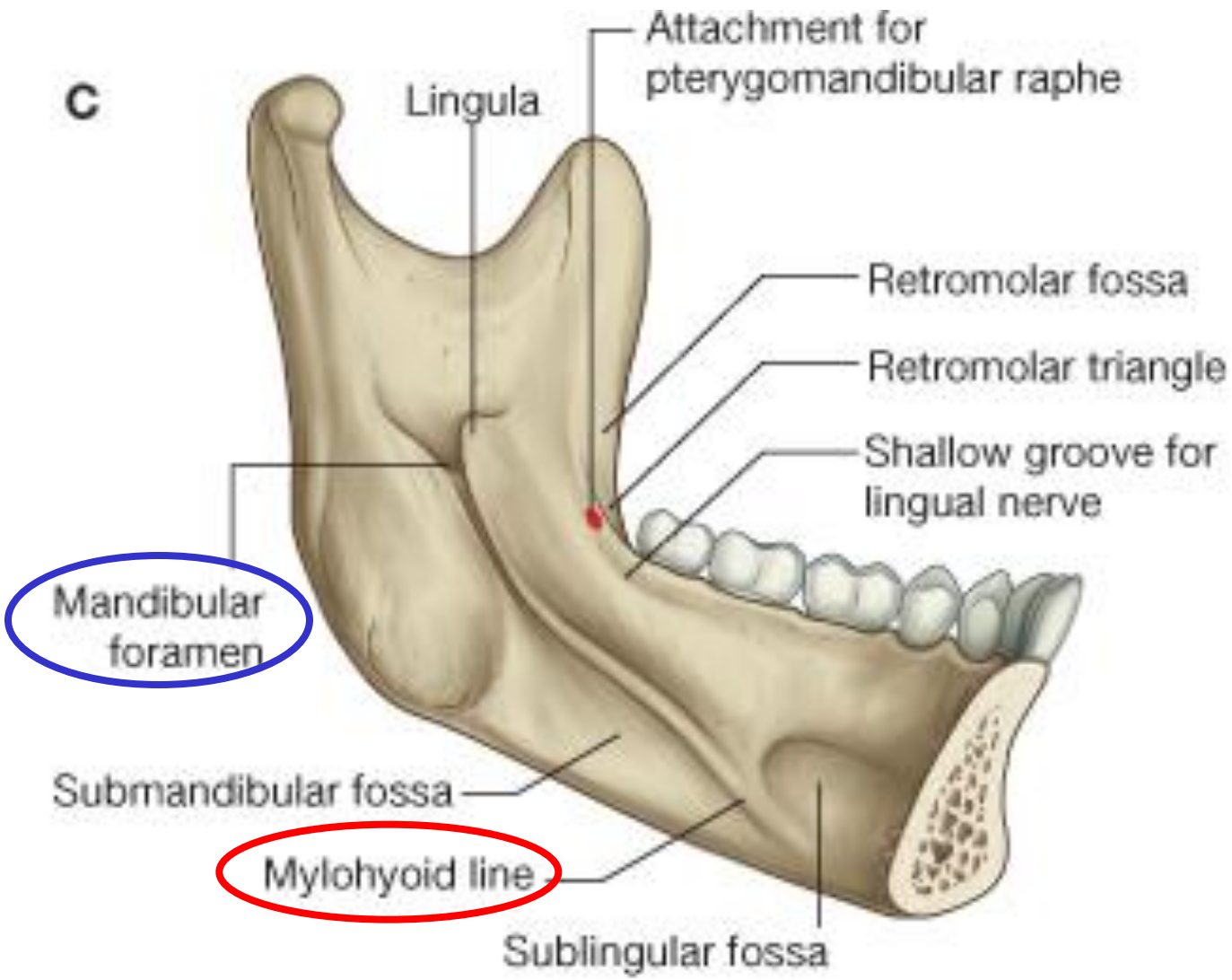
Skeletal framework of oral cavity

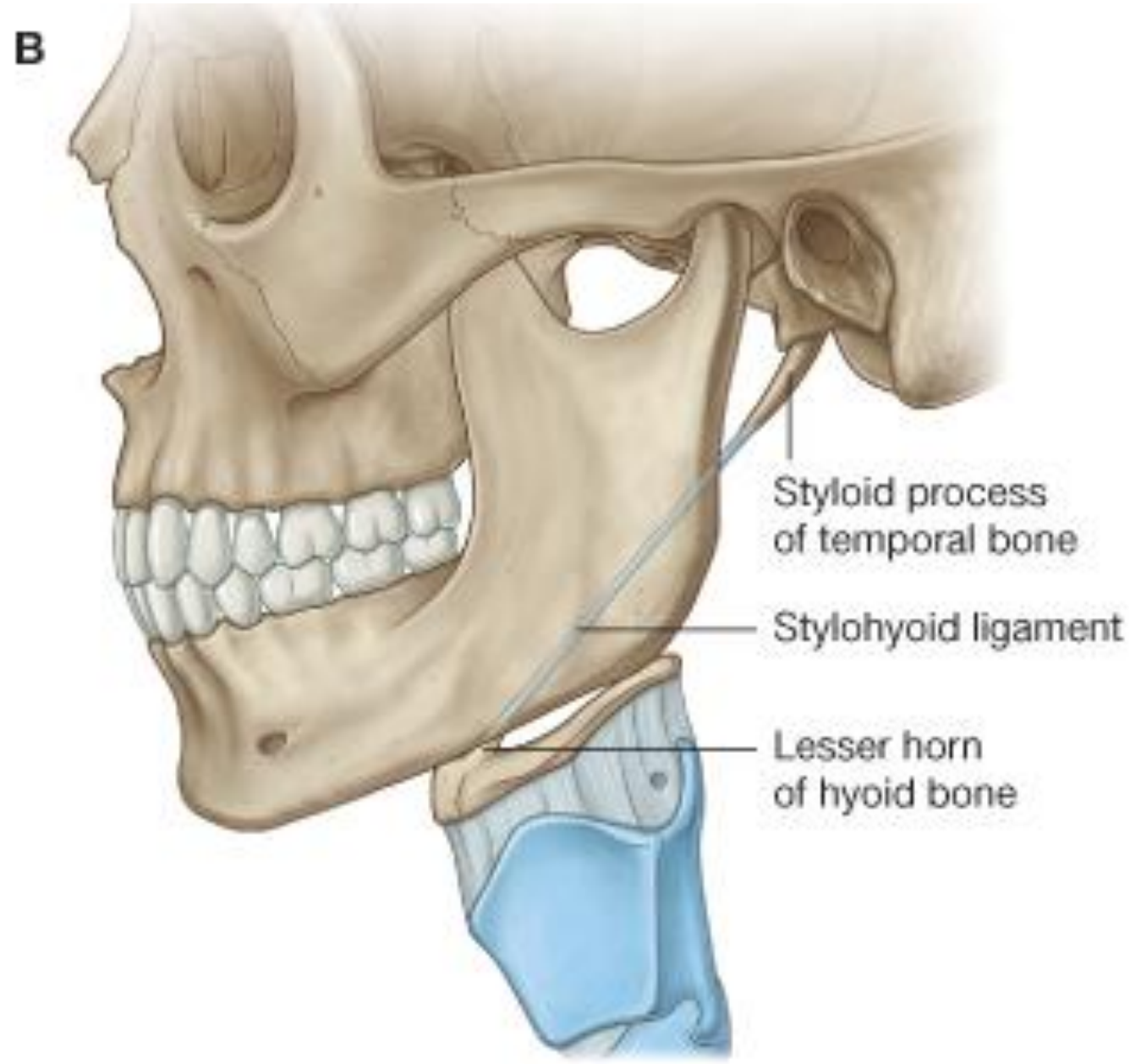
- **Maxilla**
- **Palatine bone**
- **Sphenoid bone**
- **Temporal bone**
- **Mandible**
- **Hyoid bone**

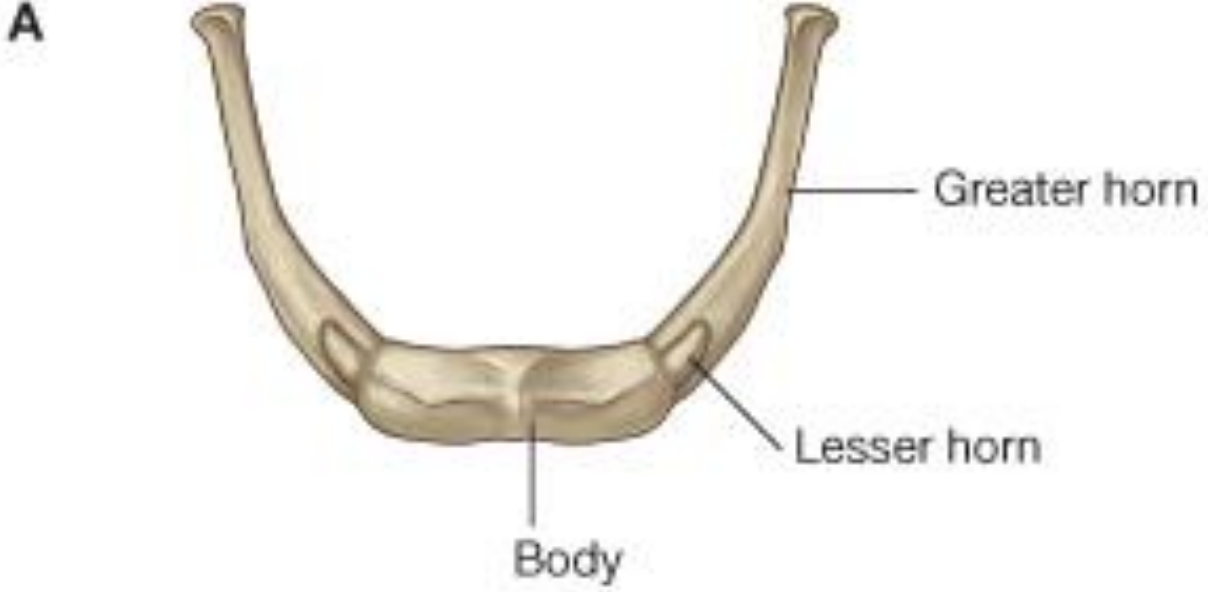


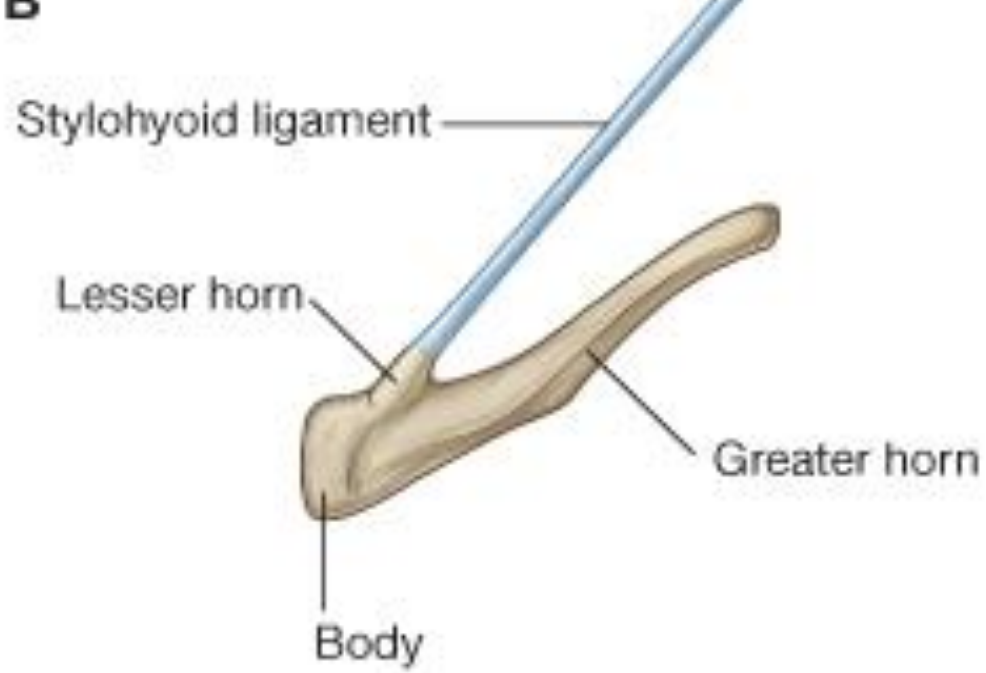












Oral Region

Oral cavity – **oral vestibule** and **oral cavity proper**

The lips

– covered by skin, **orbicularis muscle** & mucous membrane

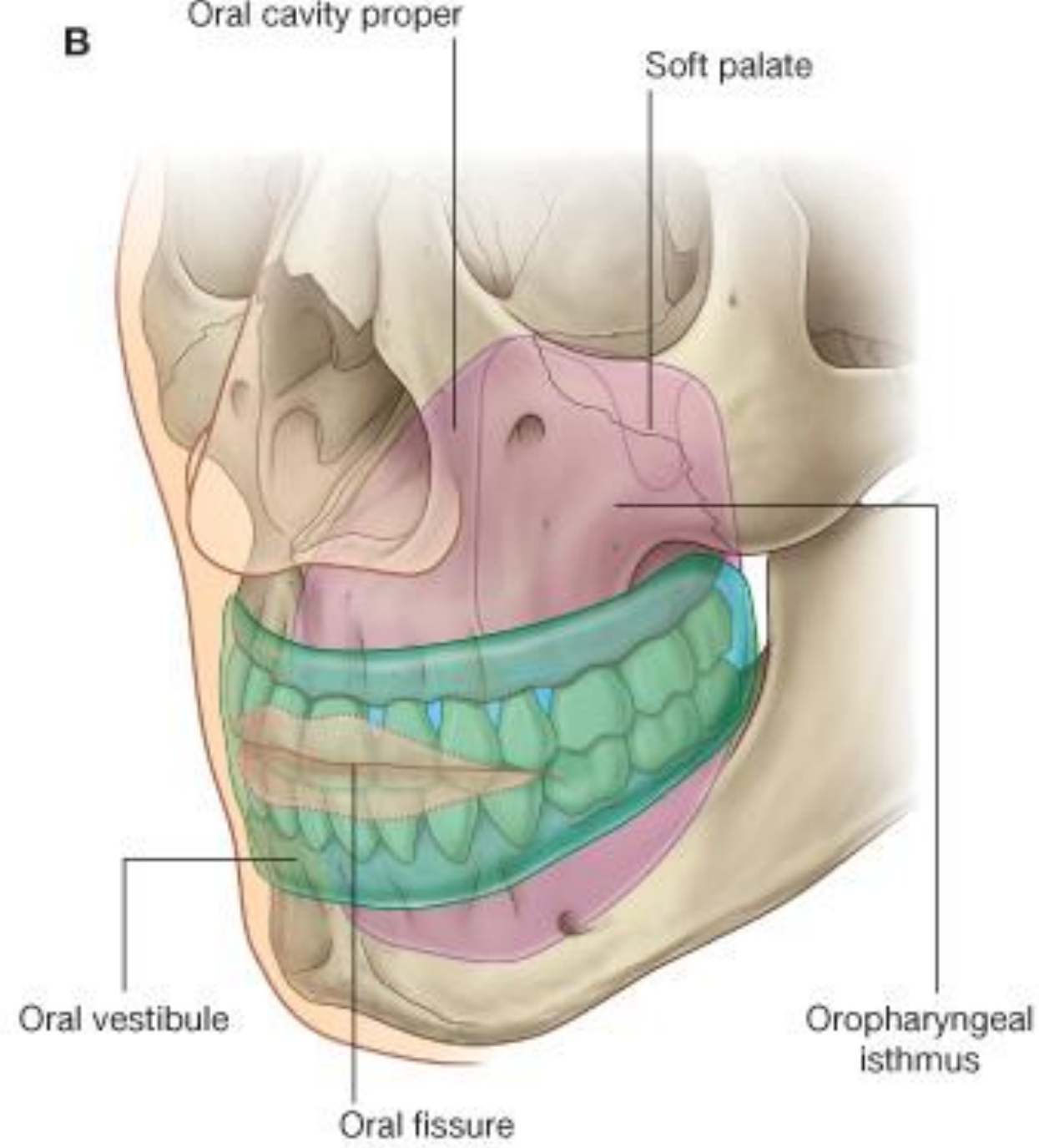
four parts: **cutaneous zone, vermilion border, transitional zone and mucosal zone**

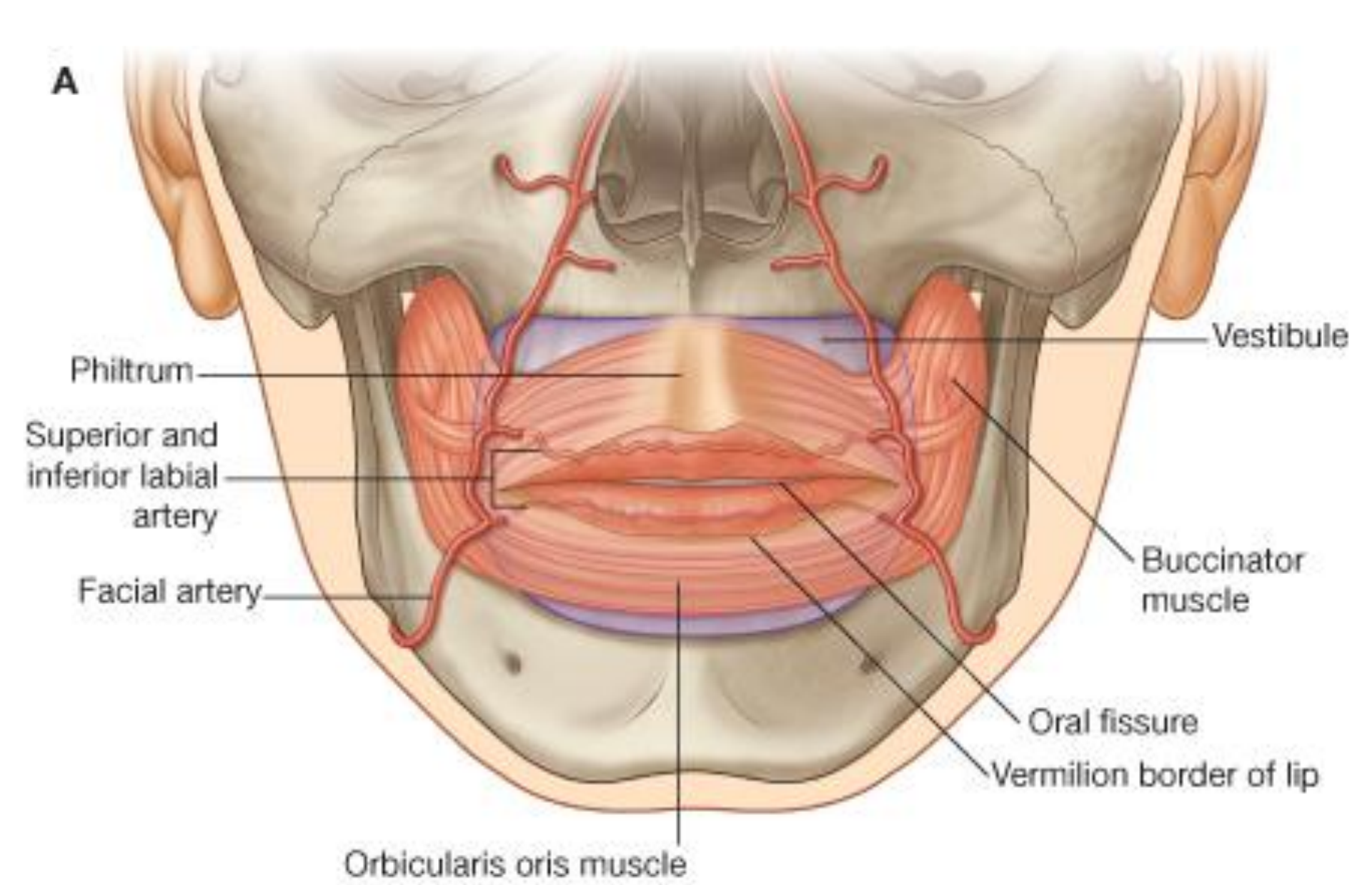
blood supply: **sup. & inf. labial arteries**

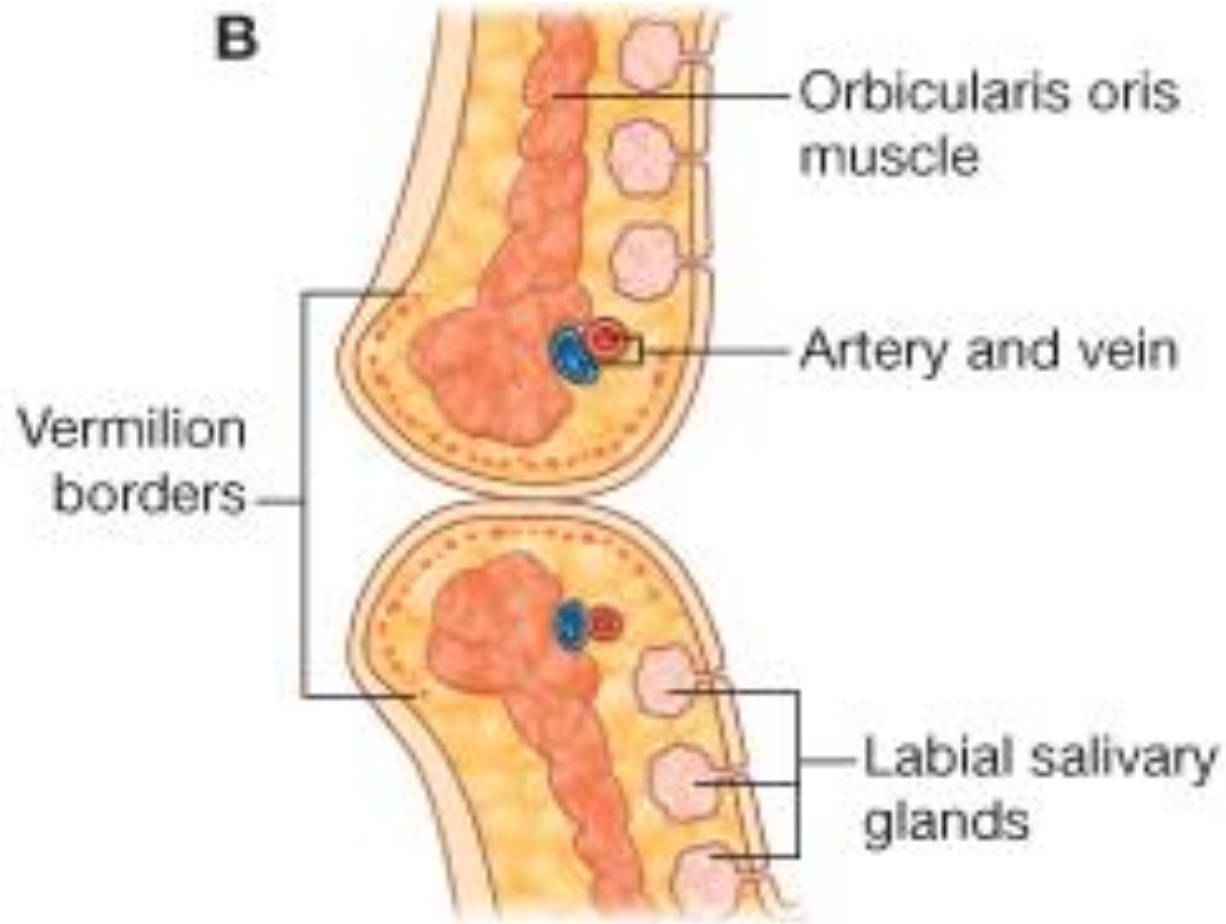
– branches of ***facial artery***

sensory nerves: **infraorbital nerve (CN V2)** and **mental nerve (CN V3)**

lymph: submandibular and submental lymph nodes







rake et al: Gray's Anatomy for Students www.stu

The cheeks

– the same structure as the lips

buccal fatpad, buccinator muscle, buccal glands

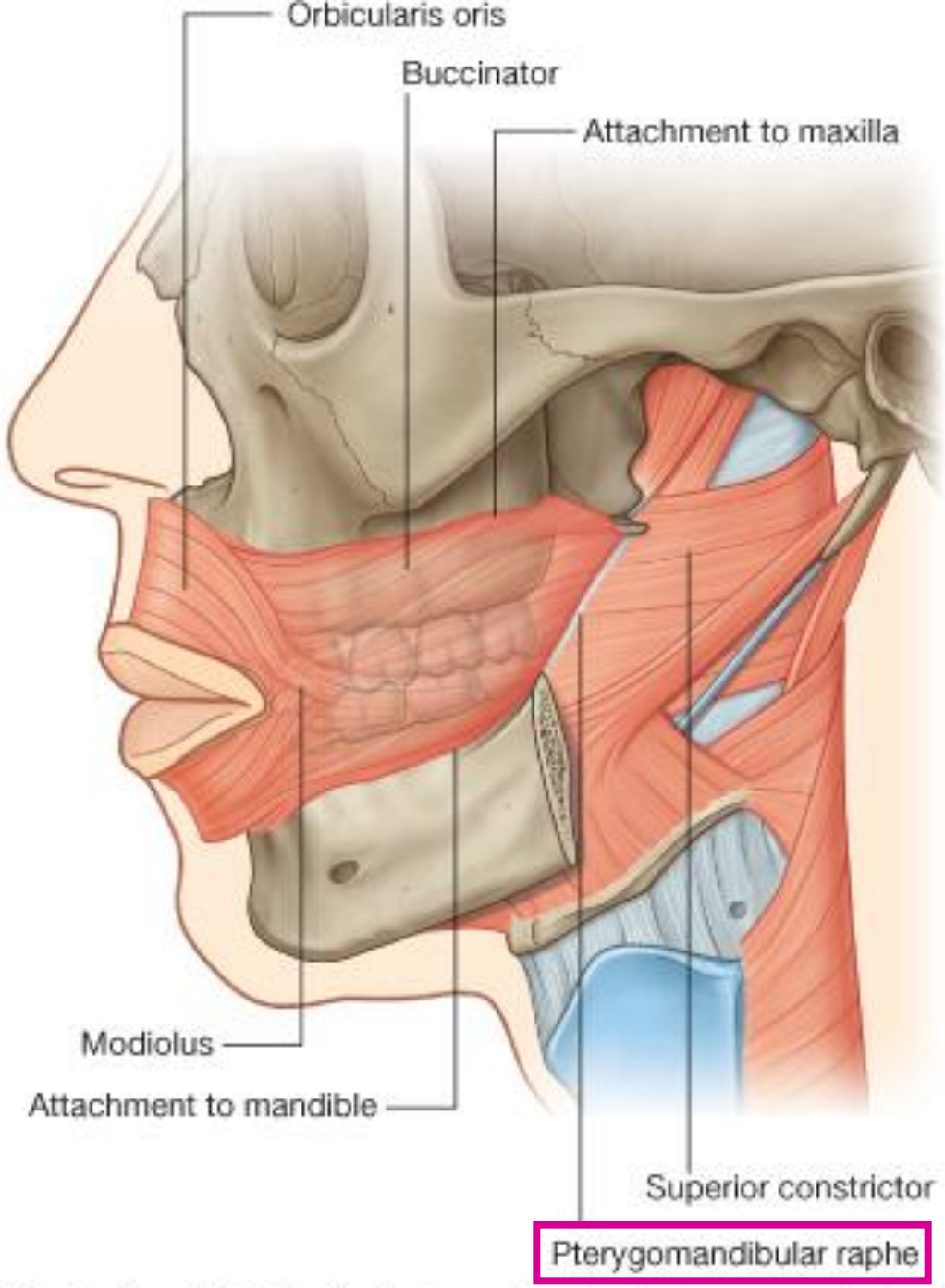
parotid duct – opening opposite the crown of **the 2nd maxillary molar tooth**

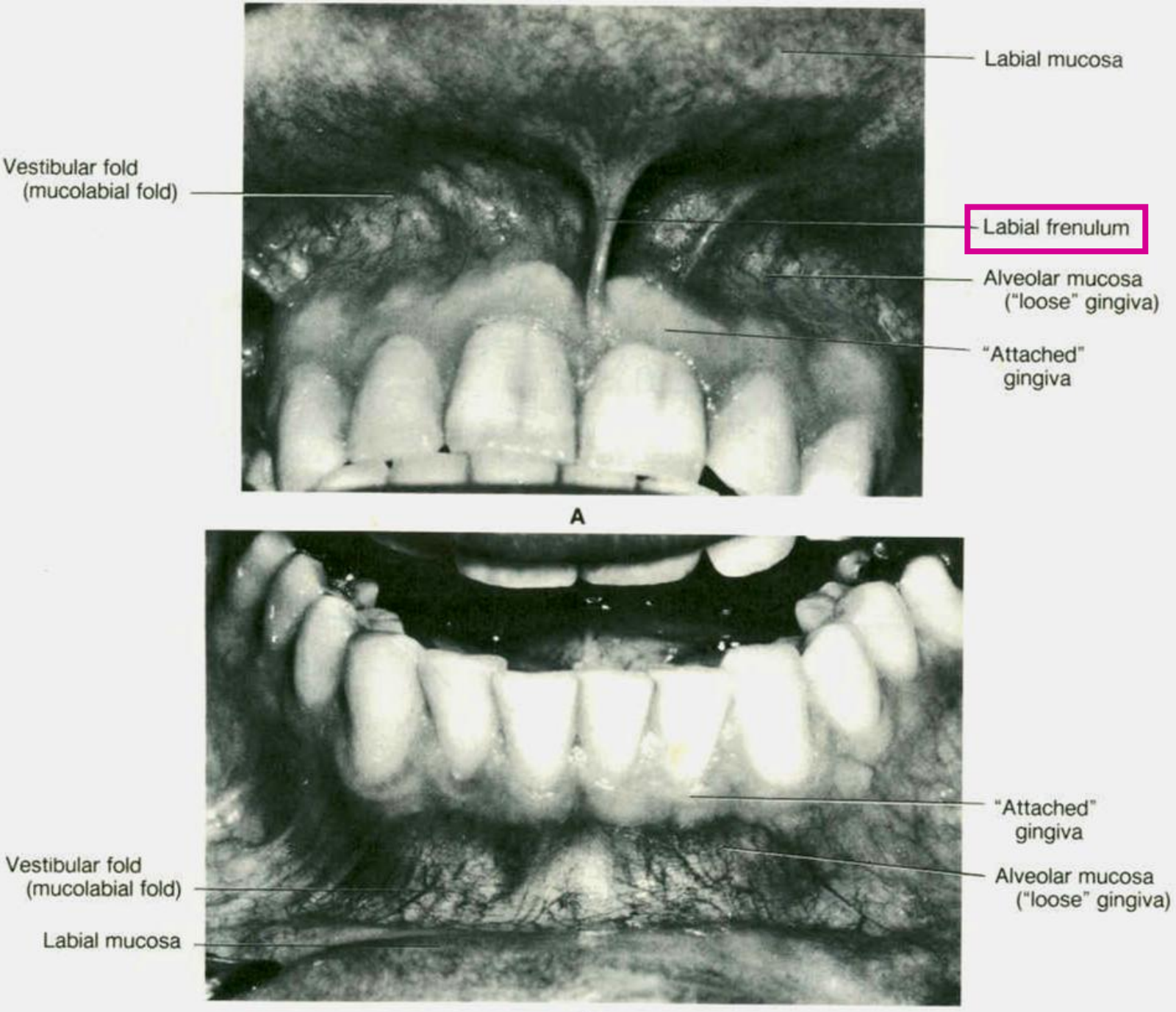
The gingivae (gums)

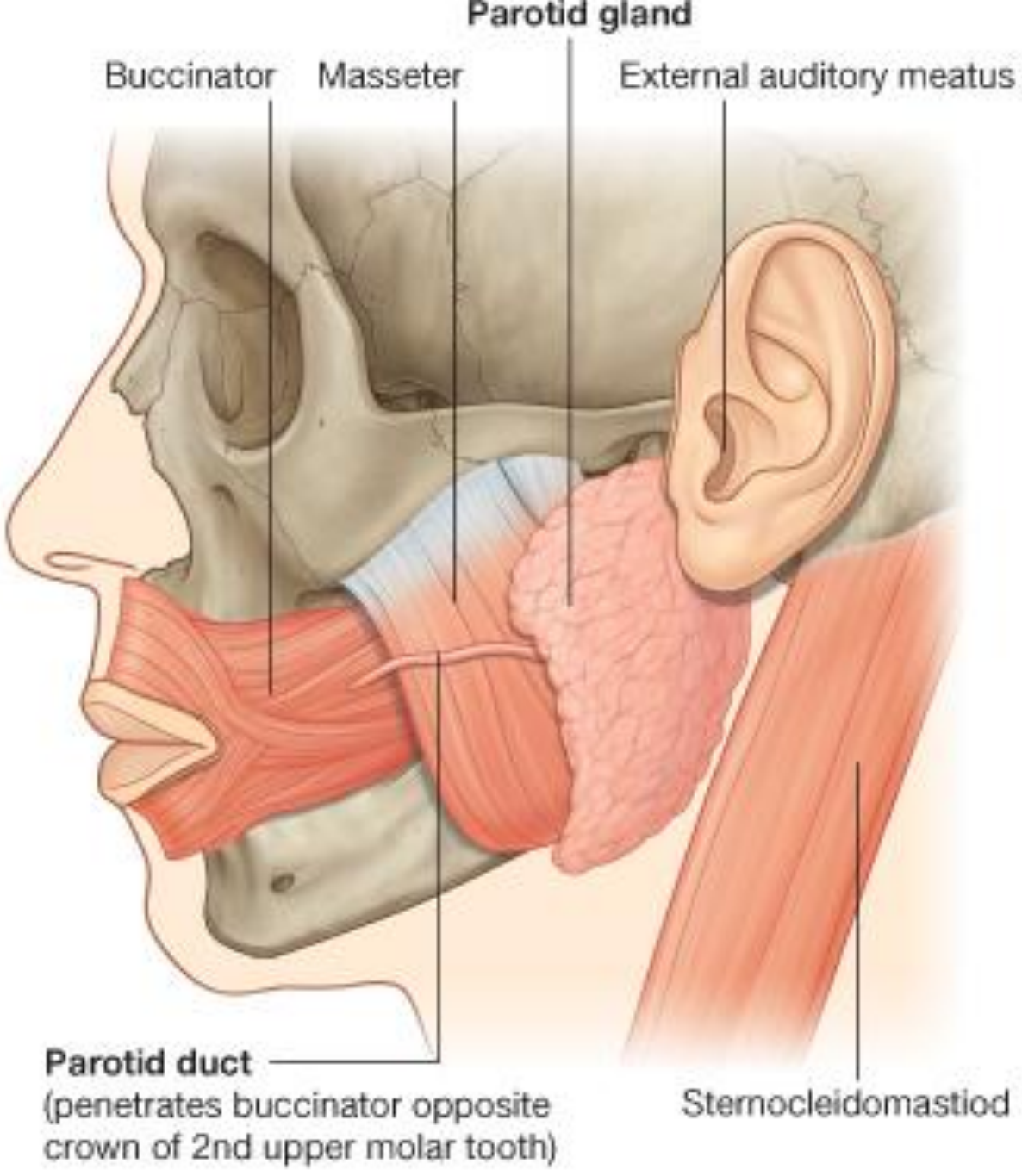
– fibrous tissue covered with mucous membrane

alveolar mucosa (loose gingiva) &

gingiva proper (attached gingiva)




Labial mucosa
Vestibular fold
(mucolabial fold)
Labial frenulum
Alveolar mucosa
("loose" gingiva)
"Attached"
gingiva
A
"Attached"
gingiva
Vestibular fold
(mucolabial fold)
Alveolar mucosa
("loose" gingiva)
Labial mucosa
B



The floor of oral cavity

- **Mylohyoid muscle**

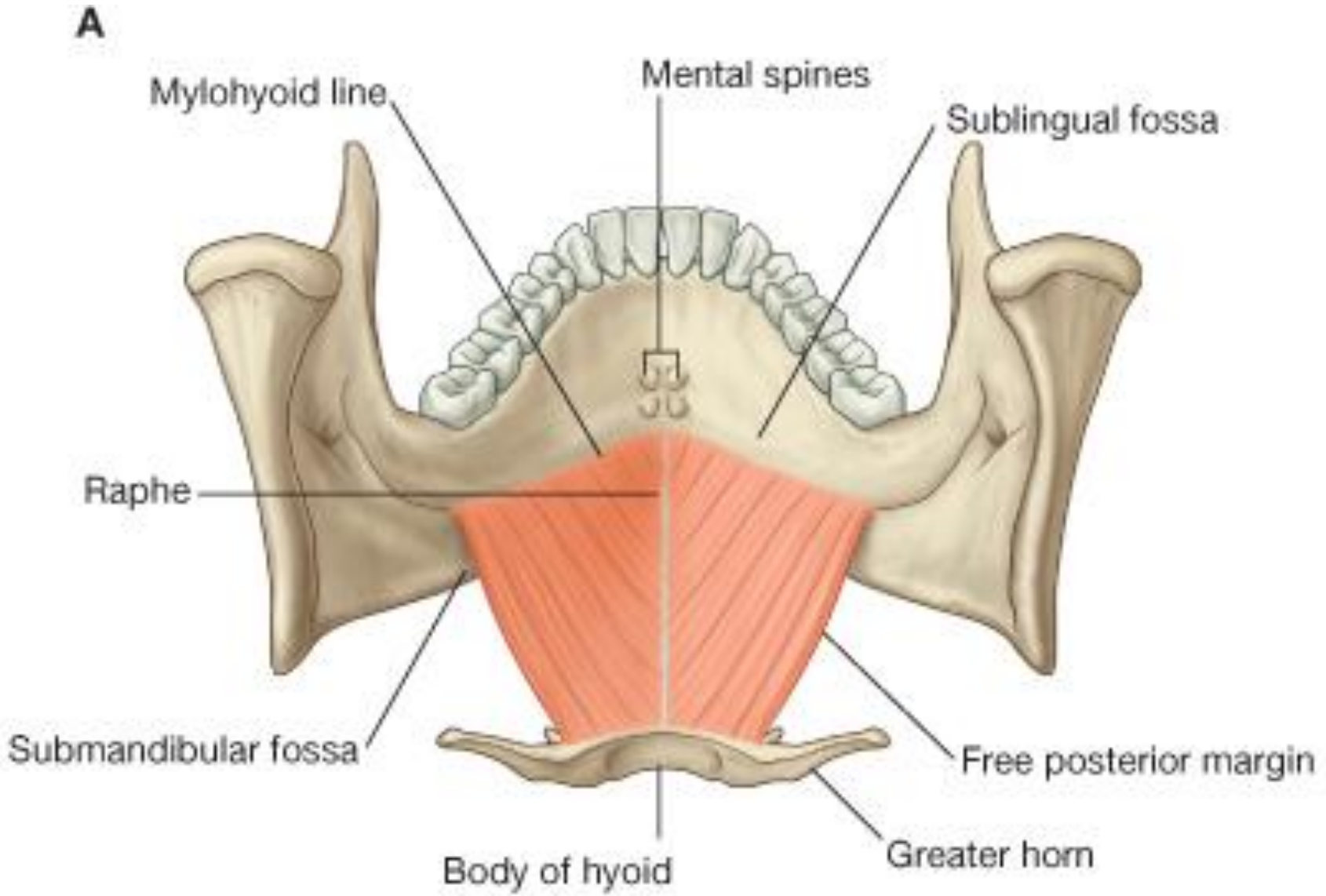
  Nerve: nerve to mylohyoid

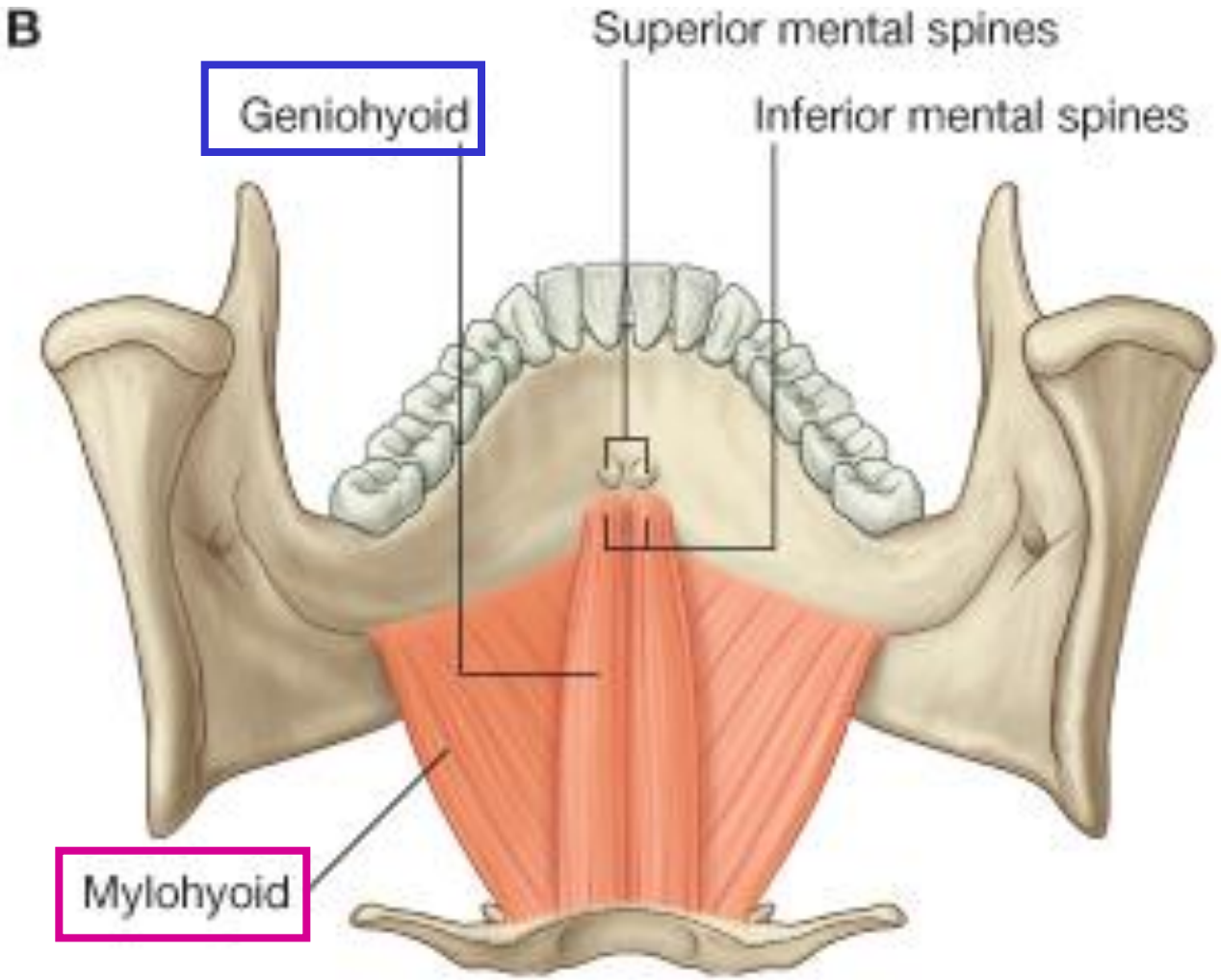
  (branch of inferior alveolar nerve)
  from mandibular nerve (CN V3)

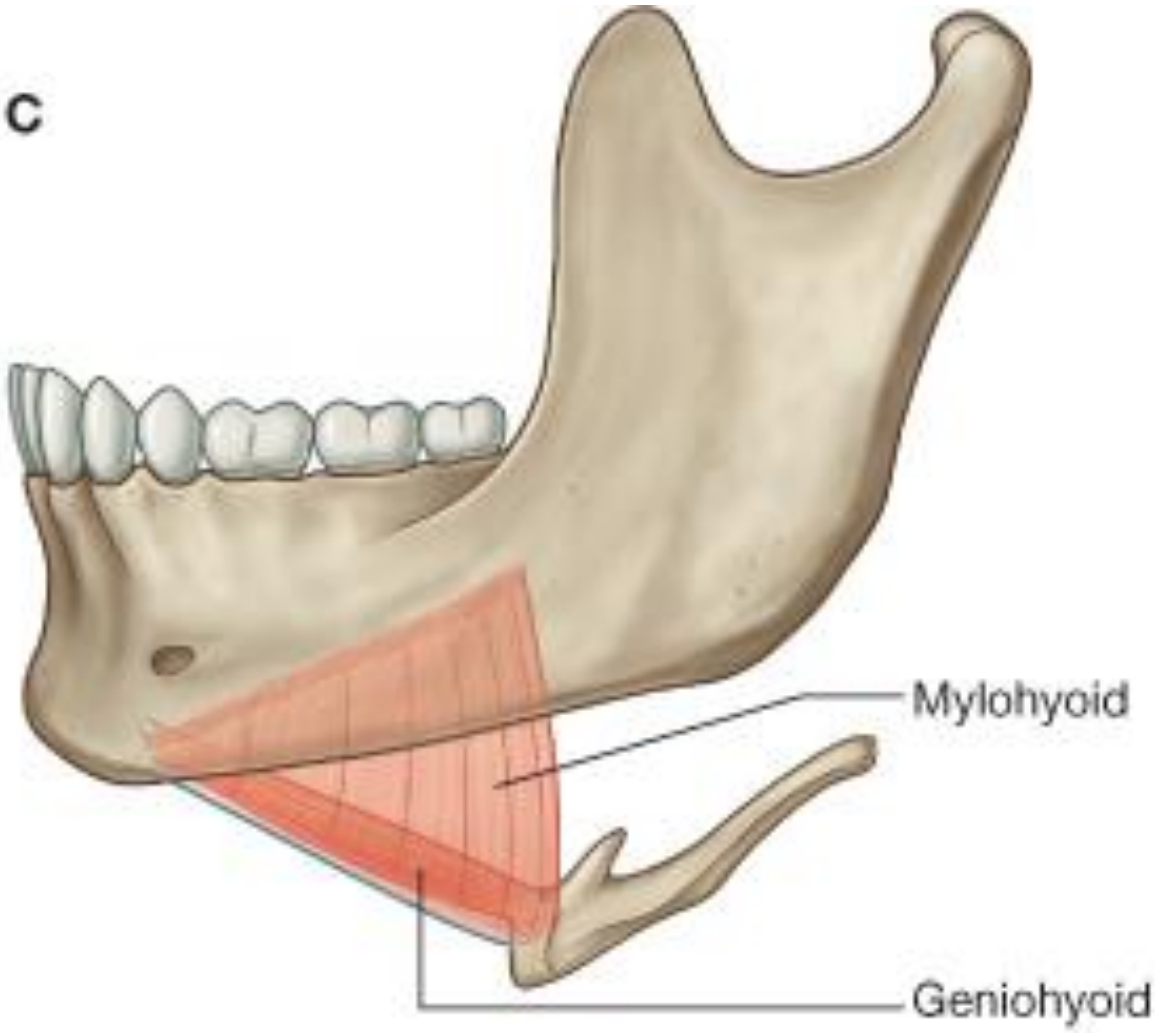
- **Geniohyoid muscle**

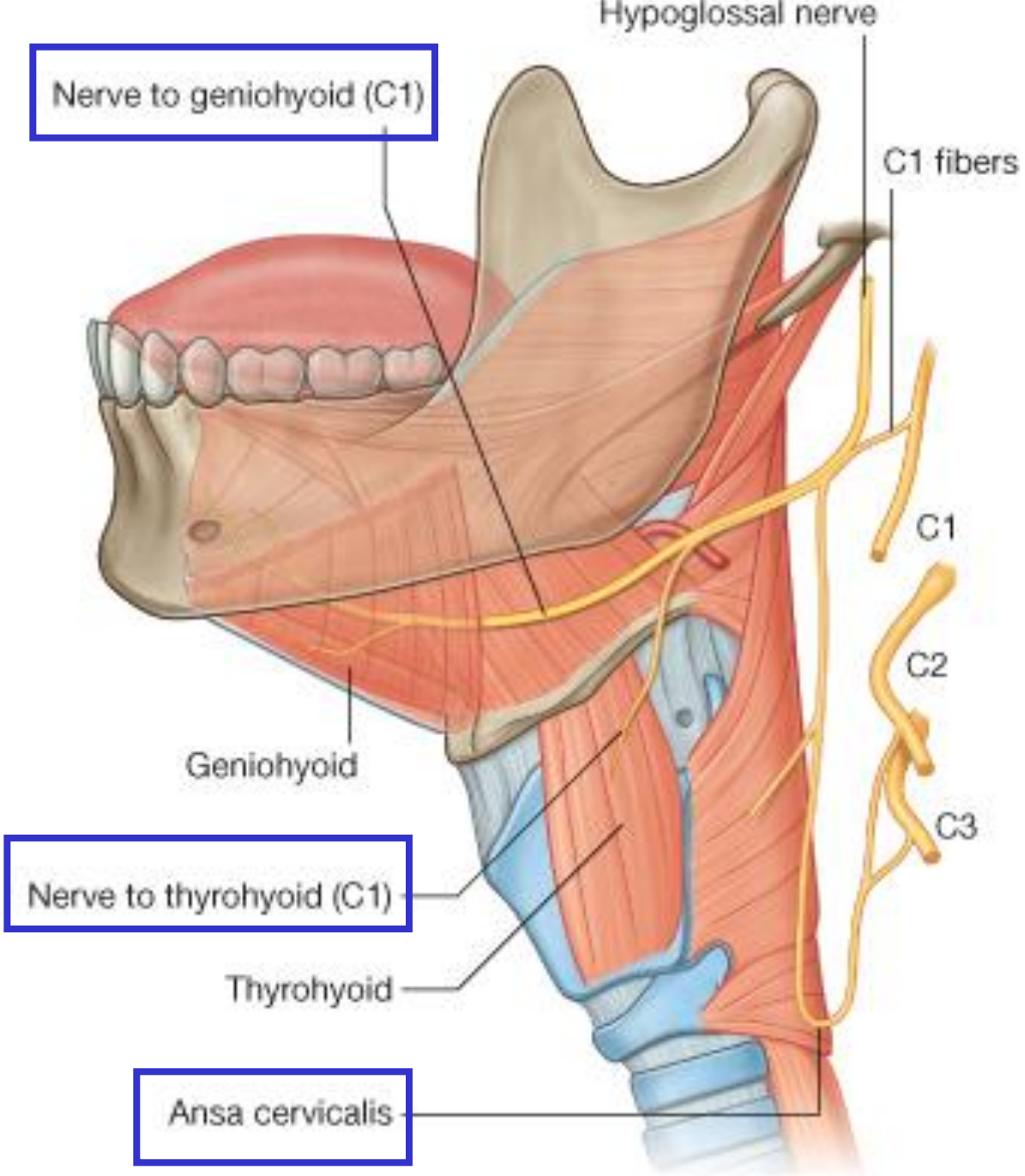
  Nerve: hypoglossal nerve

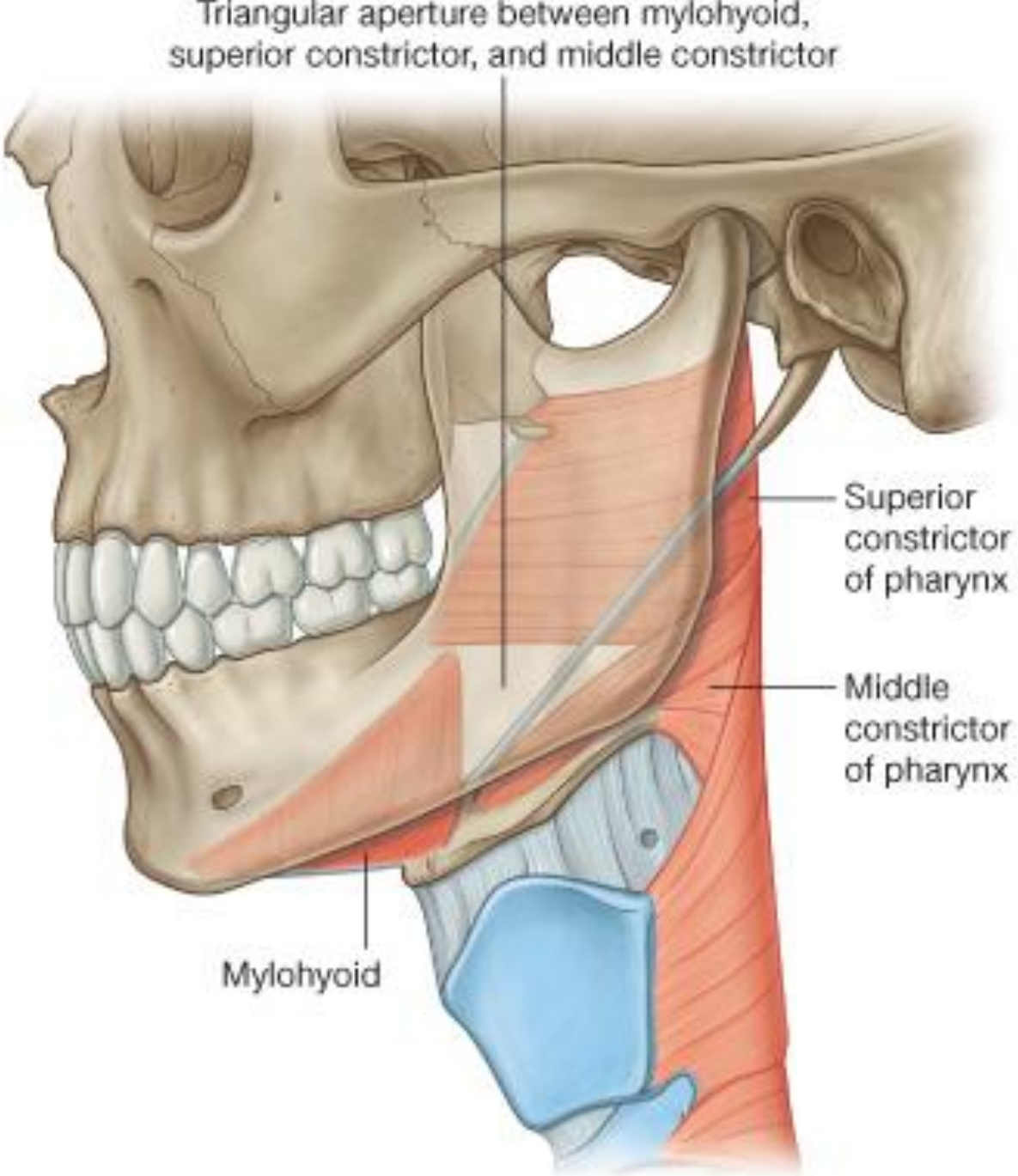
  (nerve fiber from cervical nerve; C1)











The Tongue (highly mobile muscular organ)

Gross features of the tongue

Sulcus terminalis – foramen cecum

Oral part (anterior 2/3)

Pharyngeal part (posterior 1/3)

Lingual frenulum,

Sublingual caruncle (opening of submandibular duct)

Midline groove (lingual septum)

The Tongue (highly mobile muscular organ)

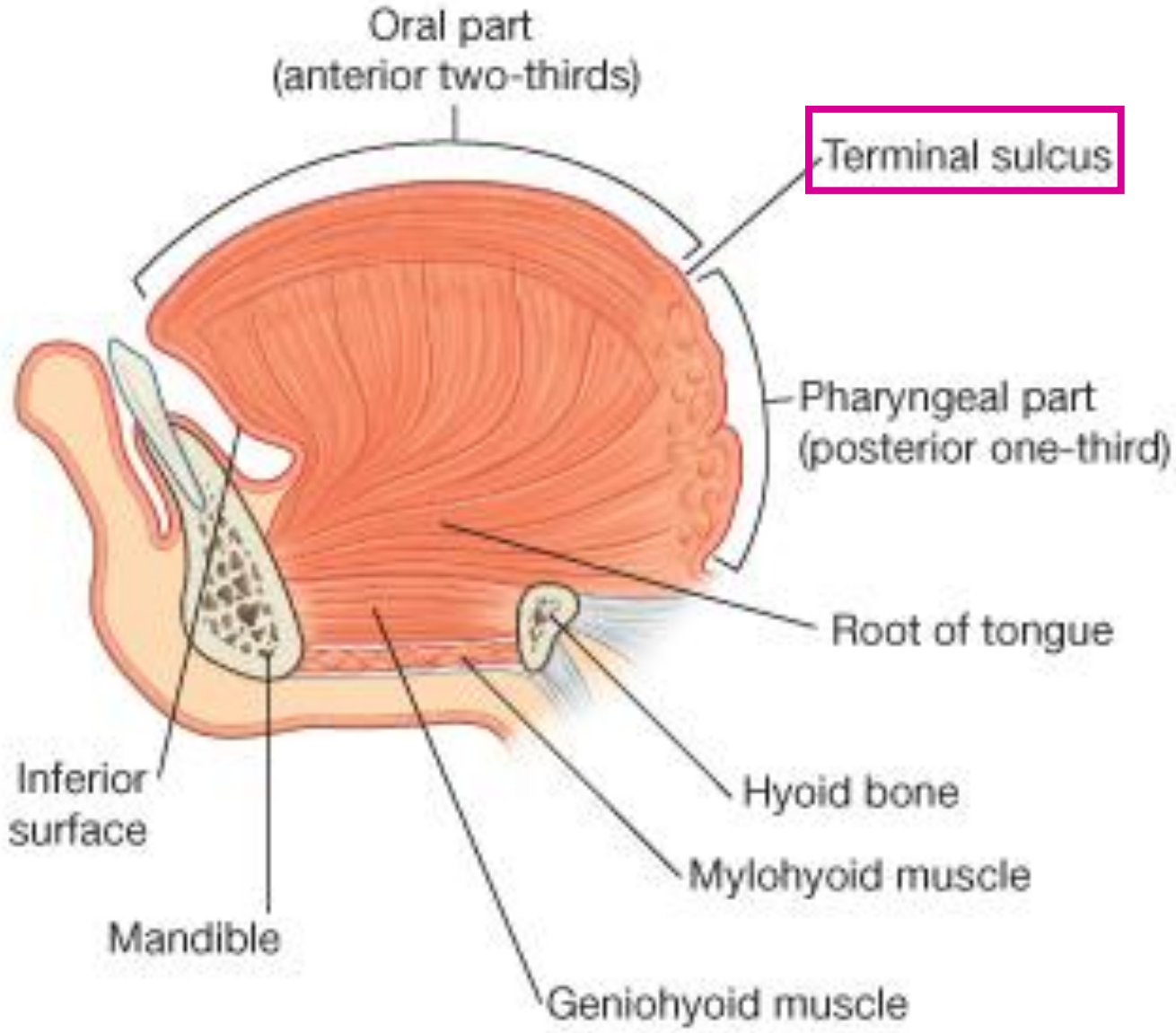
Lingual papillae and taste buds

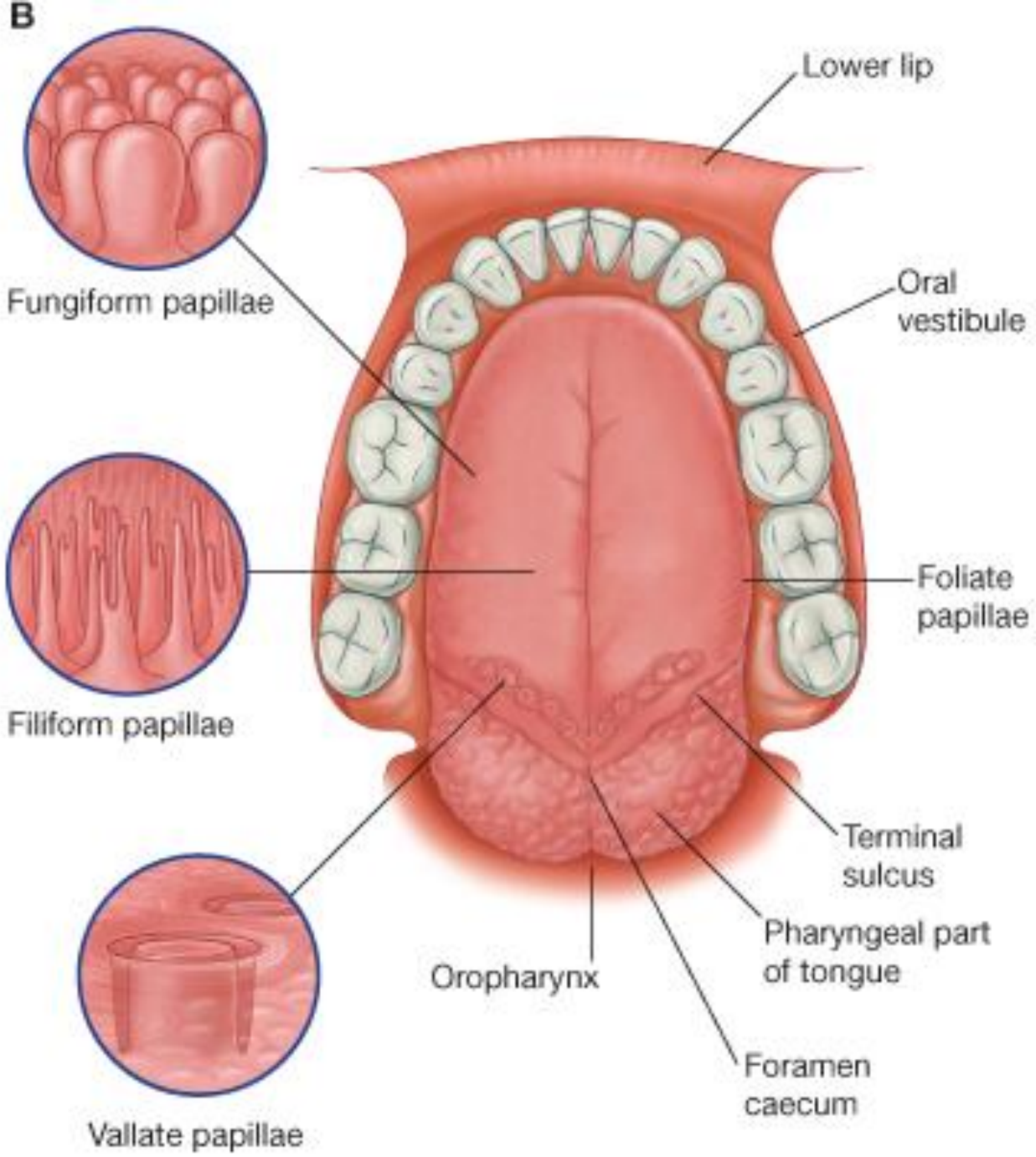
- **Filiform papillae** – sensitive to touch
- **Fungiform papillae** – taste buds
- **Vallate (circumvallate) papillae** – taste buds
- ***Foliate papillae*** – *poorly developed in humans*

Pharyngeal part of the tongue

- No papillae but with **lingual tonsil**

A





Muscles of the Tongue (CN XII)

Extrinsic muscles:

(1) **genio-glossus**

(2) **hyo-glossus**

(3) **stylo-glossus**

(4) **palato-glossus (cranial root of CN XI→CN X)**

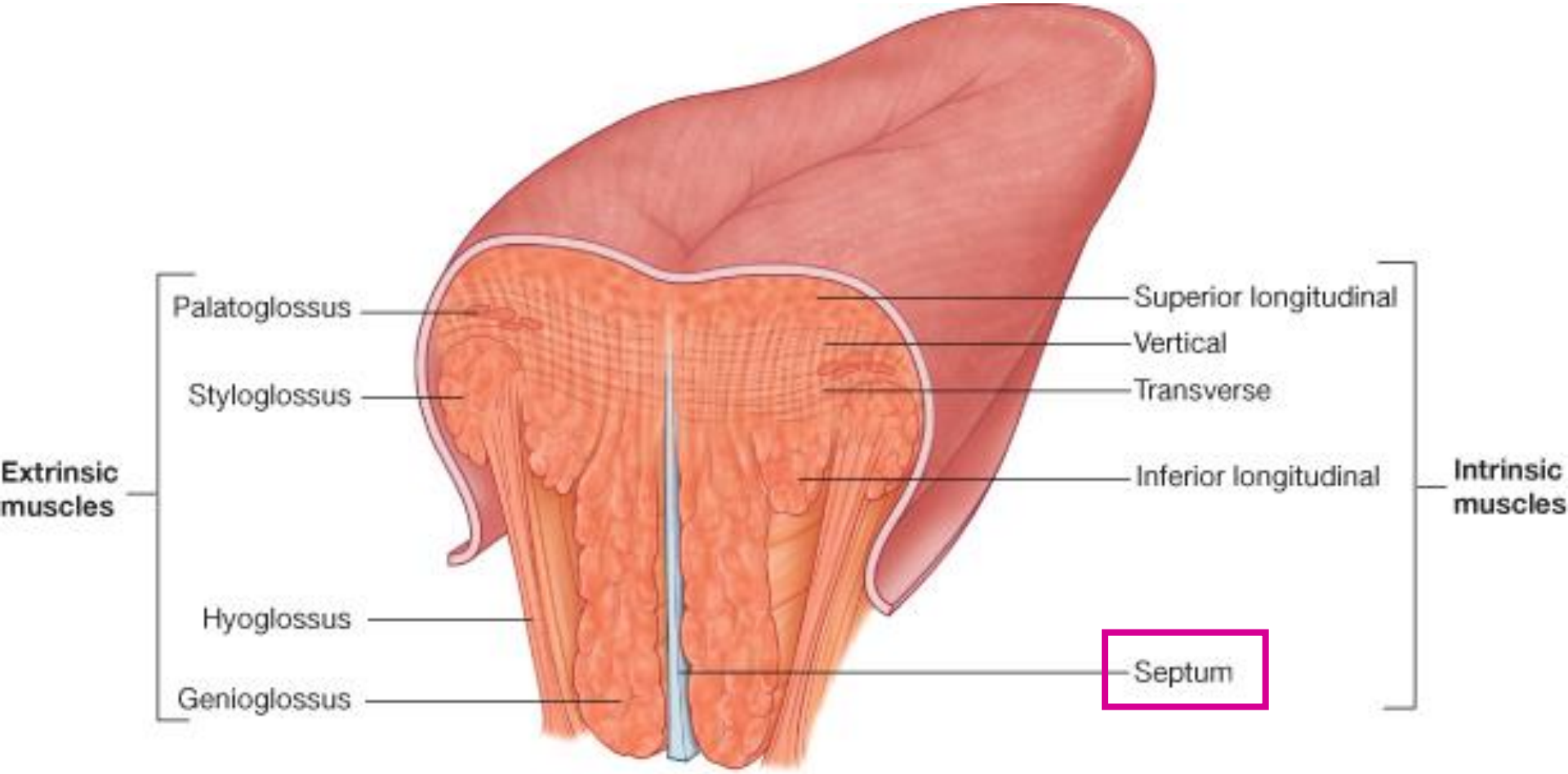
Intrinsic muscles :

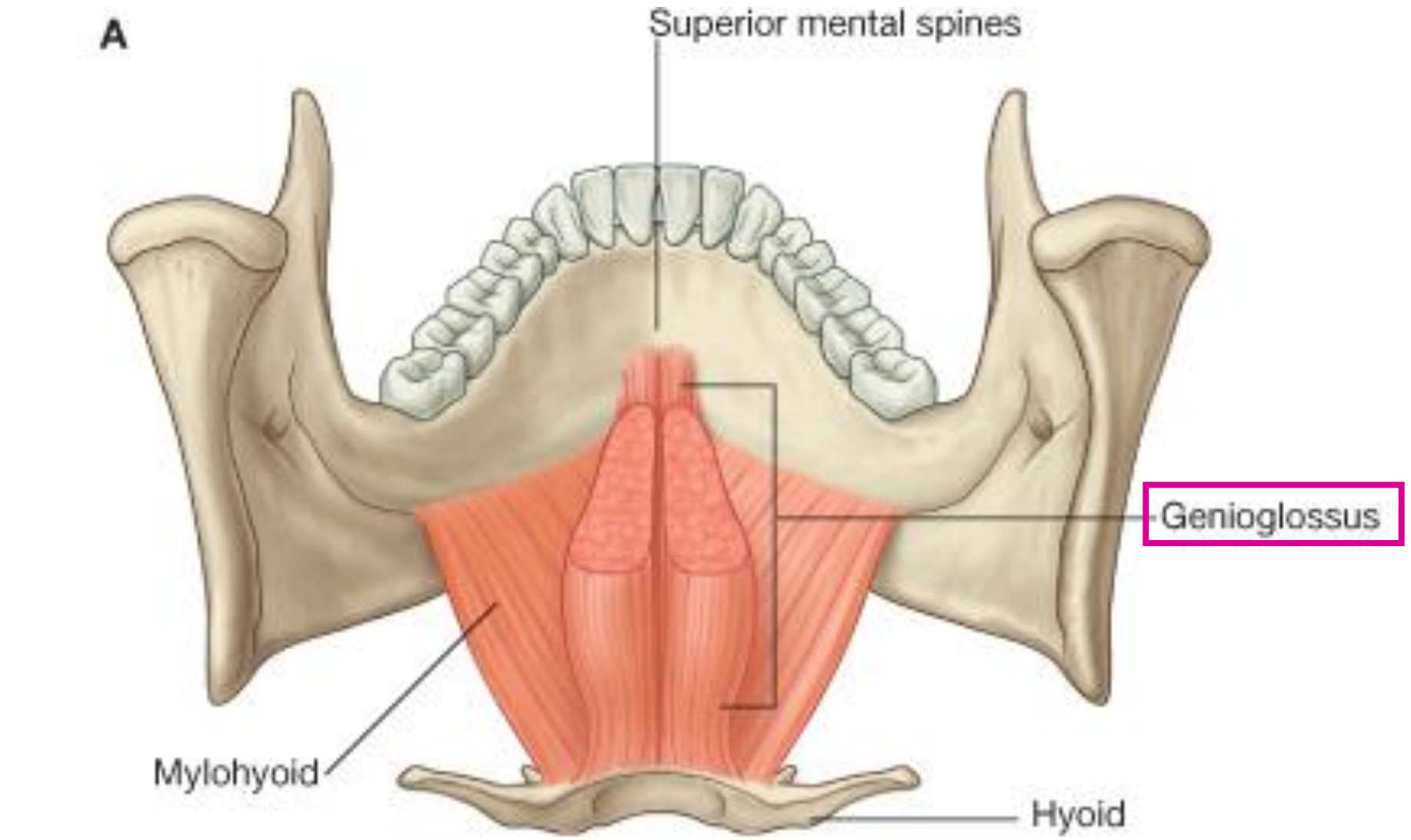
(1) **superior longitudinal muscle**

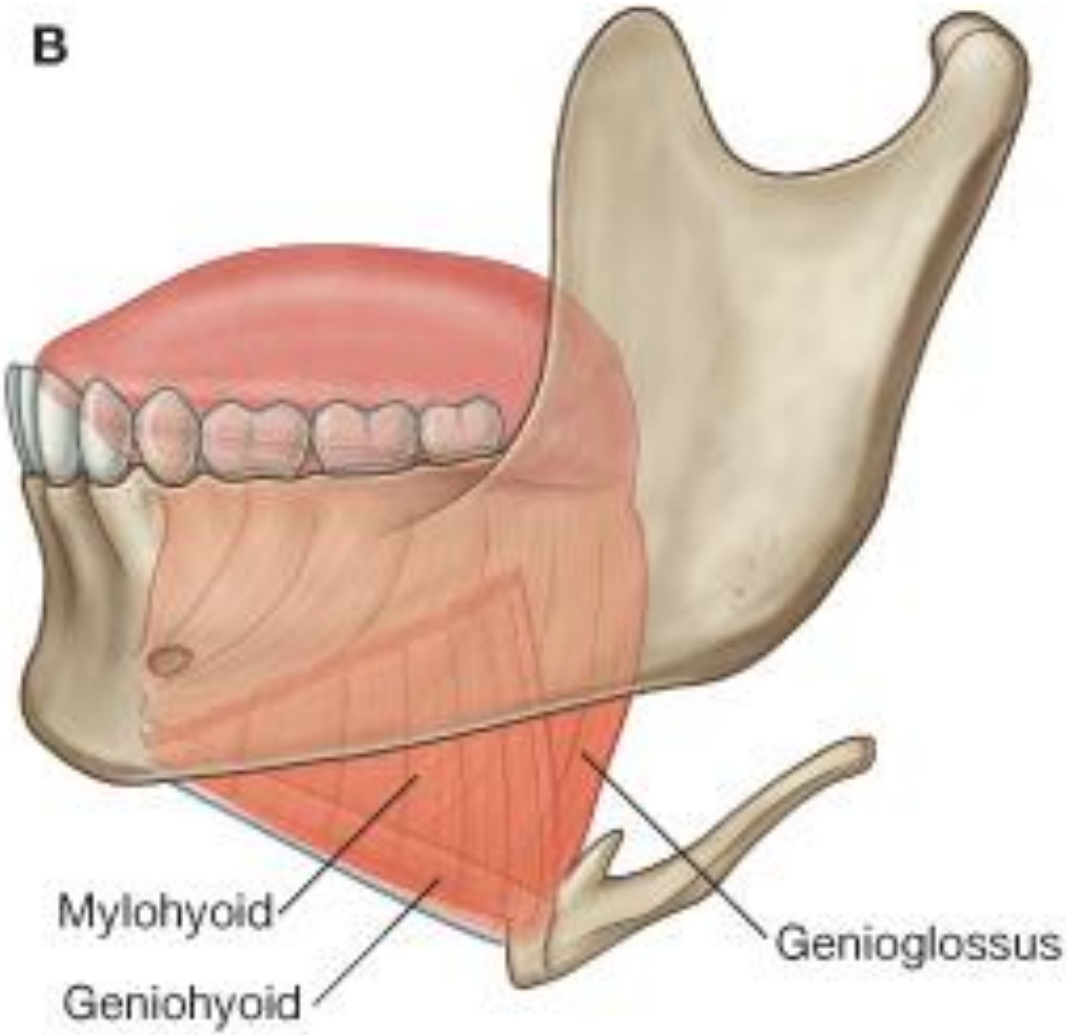
(2) **inferior longitudinal muscle**

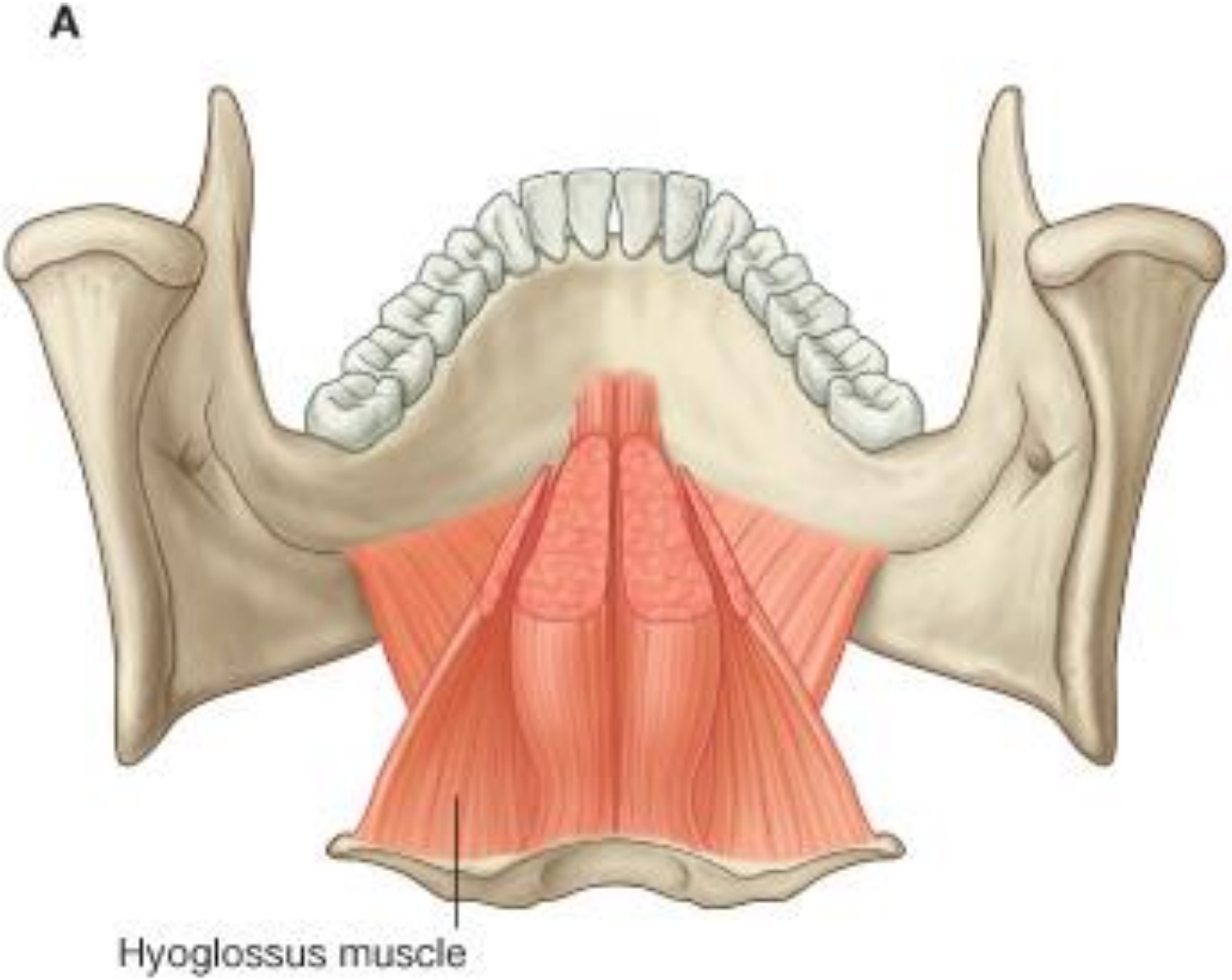
(3) **transverse muscle**

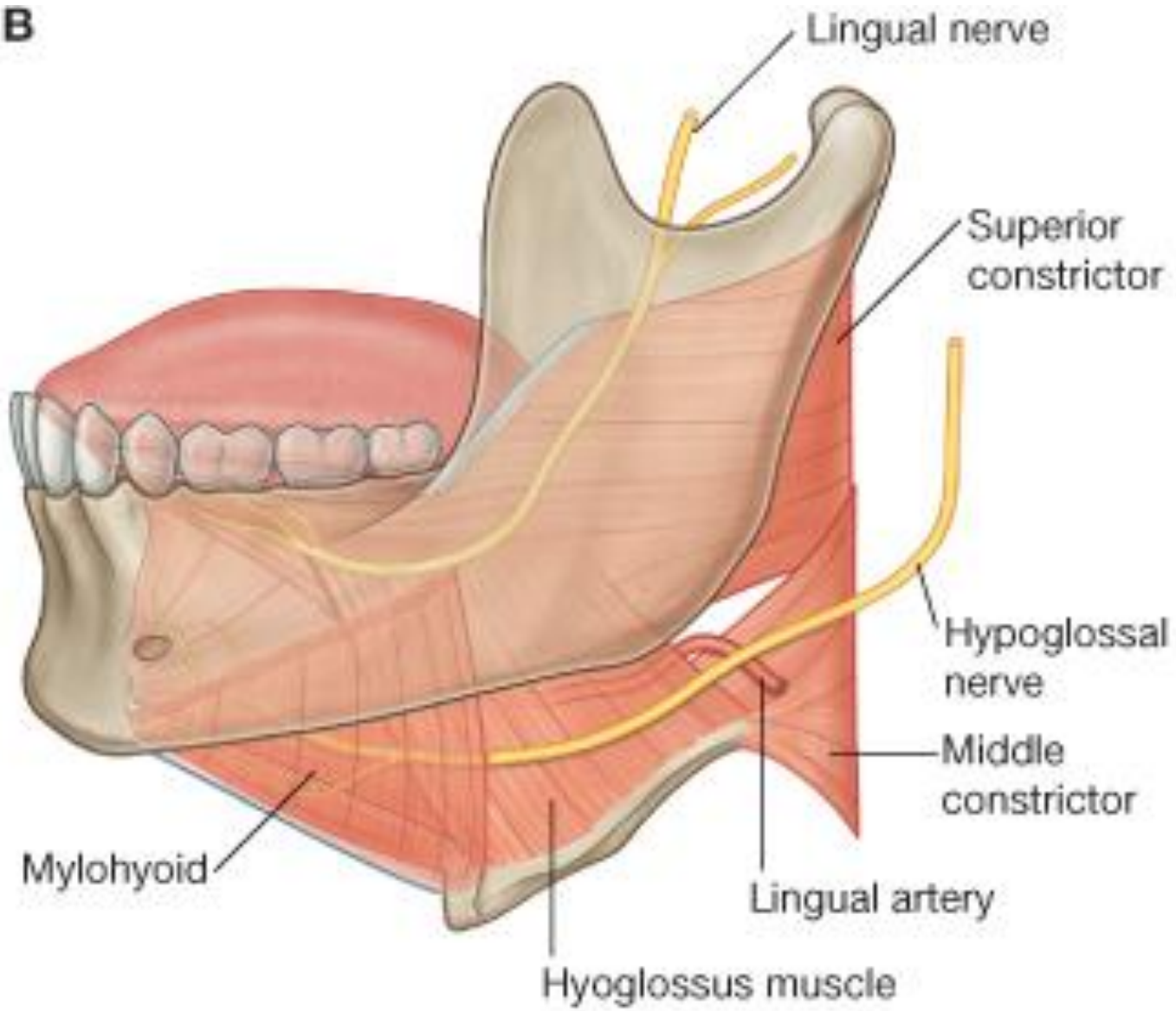
(4) **vertical muscle**

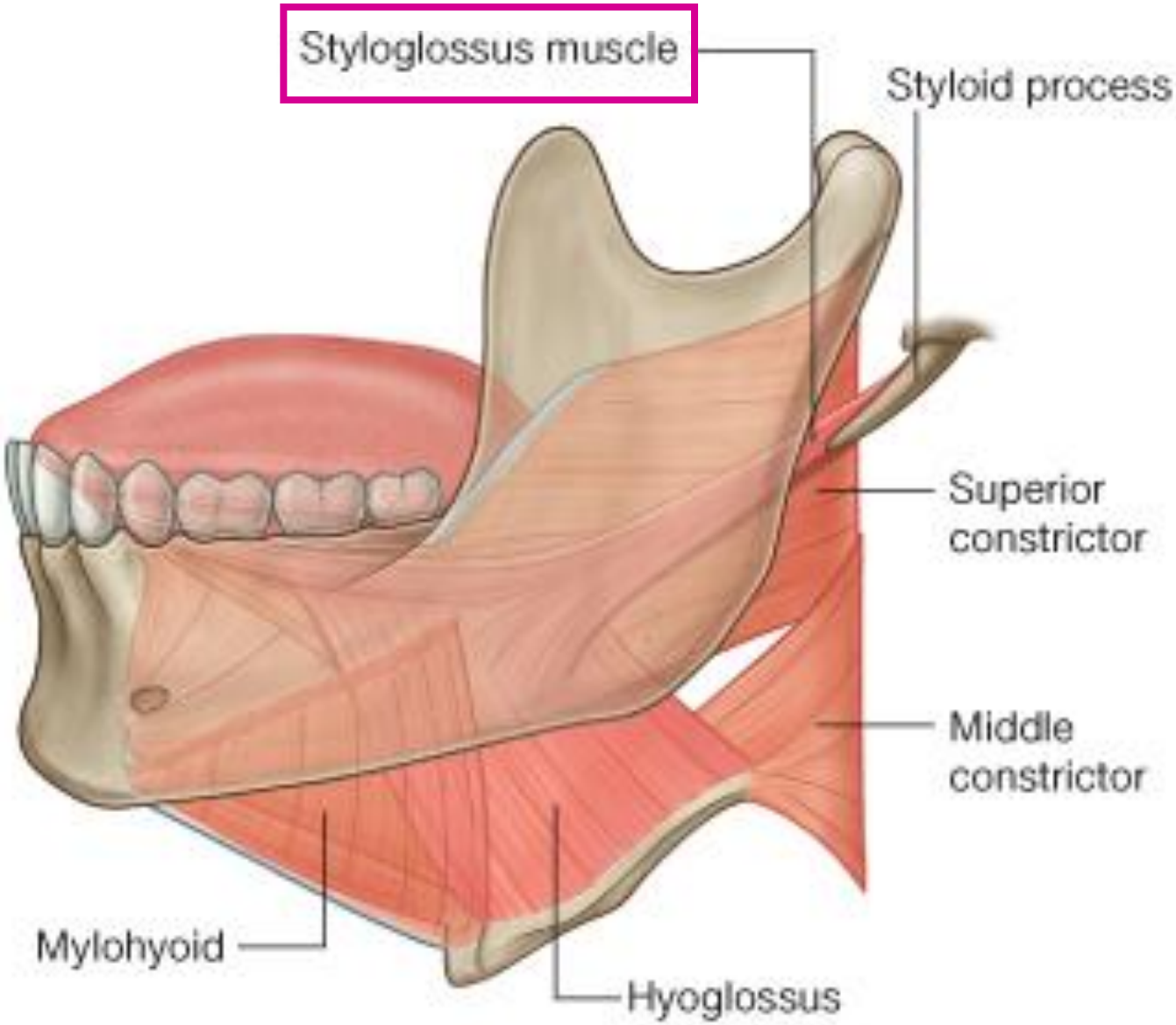


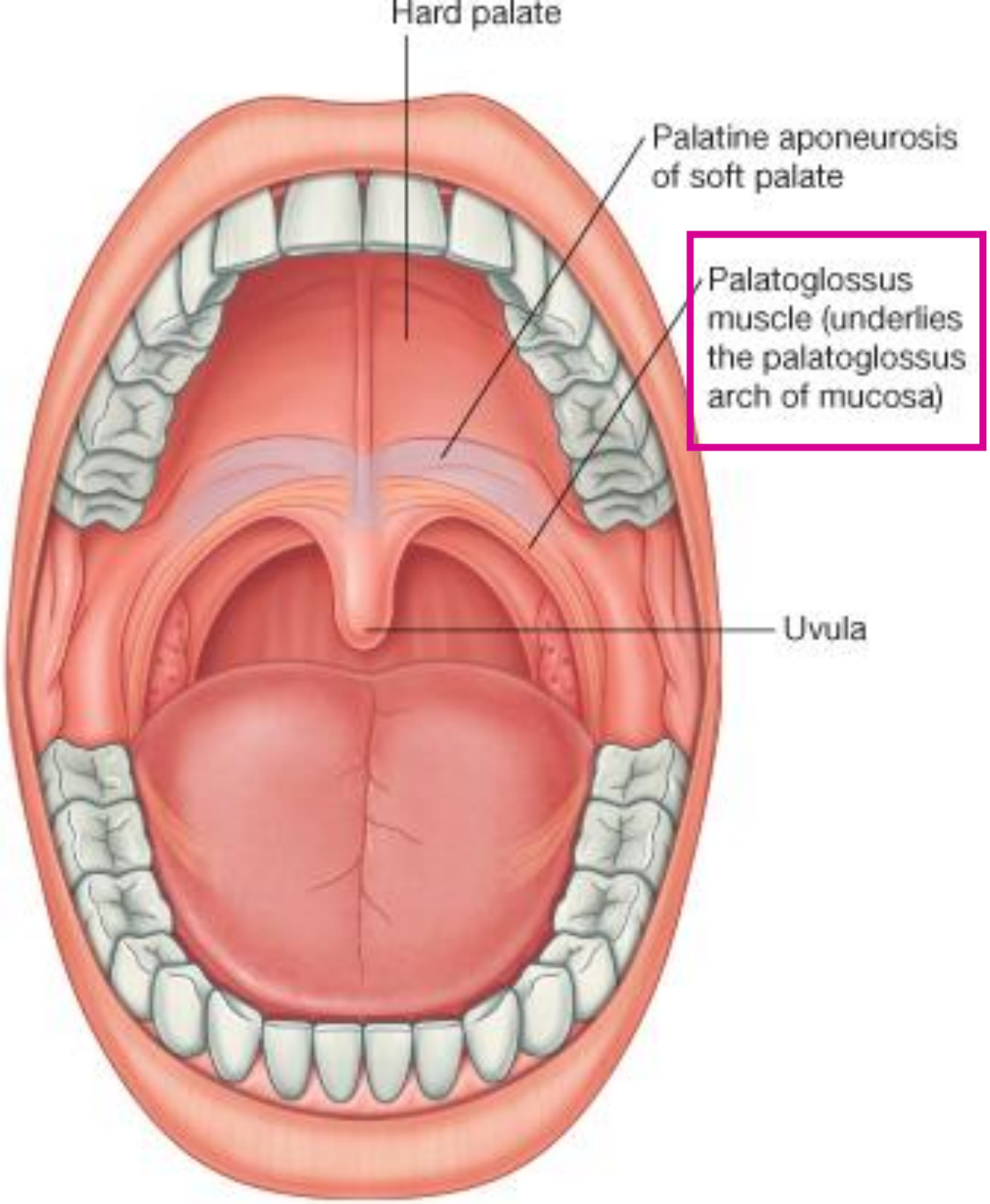












Arteries of tongue : **lingual artery**

→ **dorsal lingual branches** (***pharyngeal part***)

deep lingual artery (***oral part***)

sublingual branches (***sublingual gland***)

Veins of tongue: **lingual vein**

deep lingual vein

– can be seen on each side of **lingual frenulum**

dorsal lingual vein → lingual vein

→ facial vein or internal jugular vein

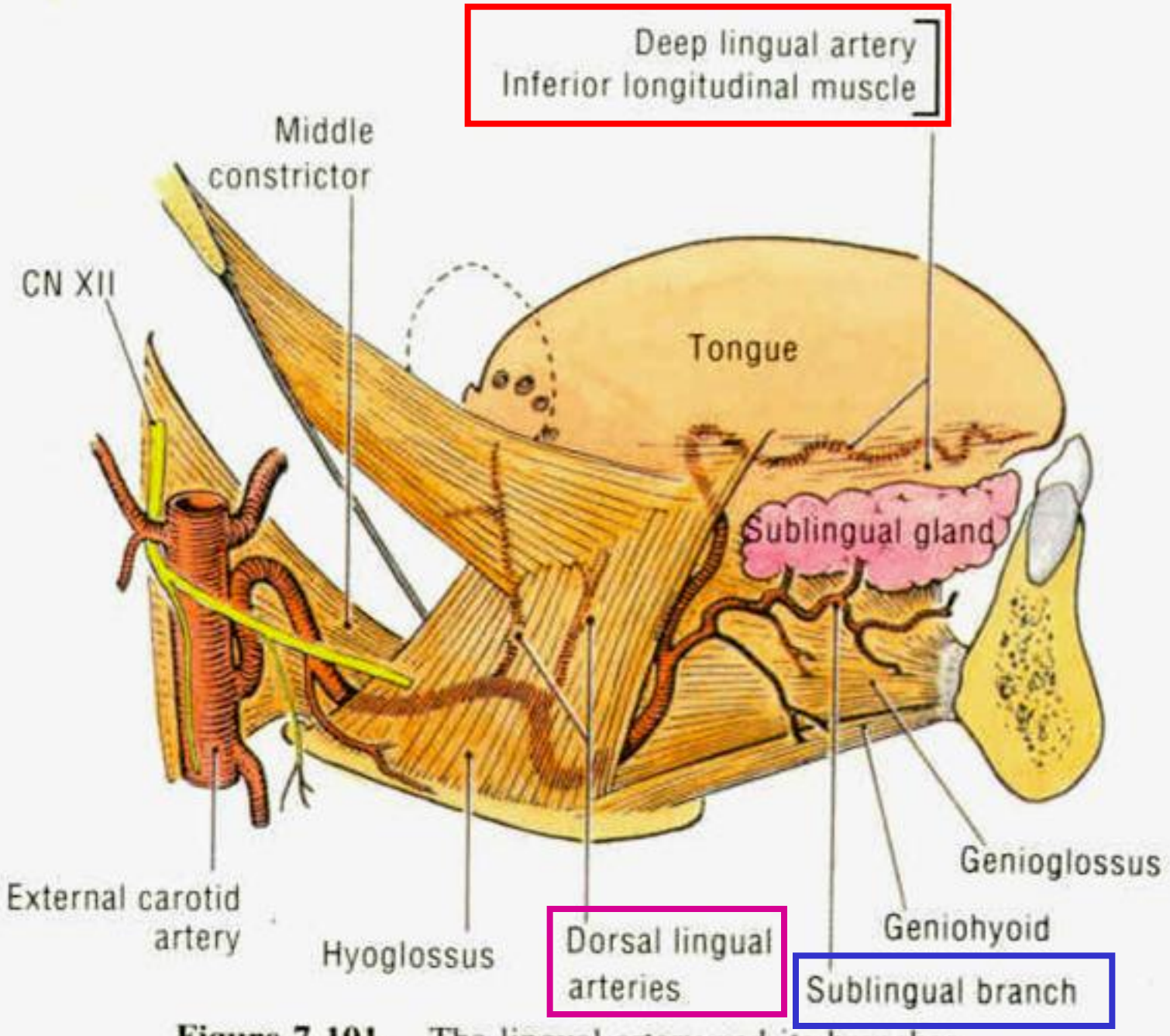
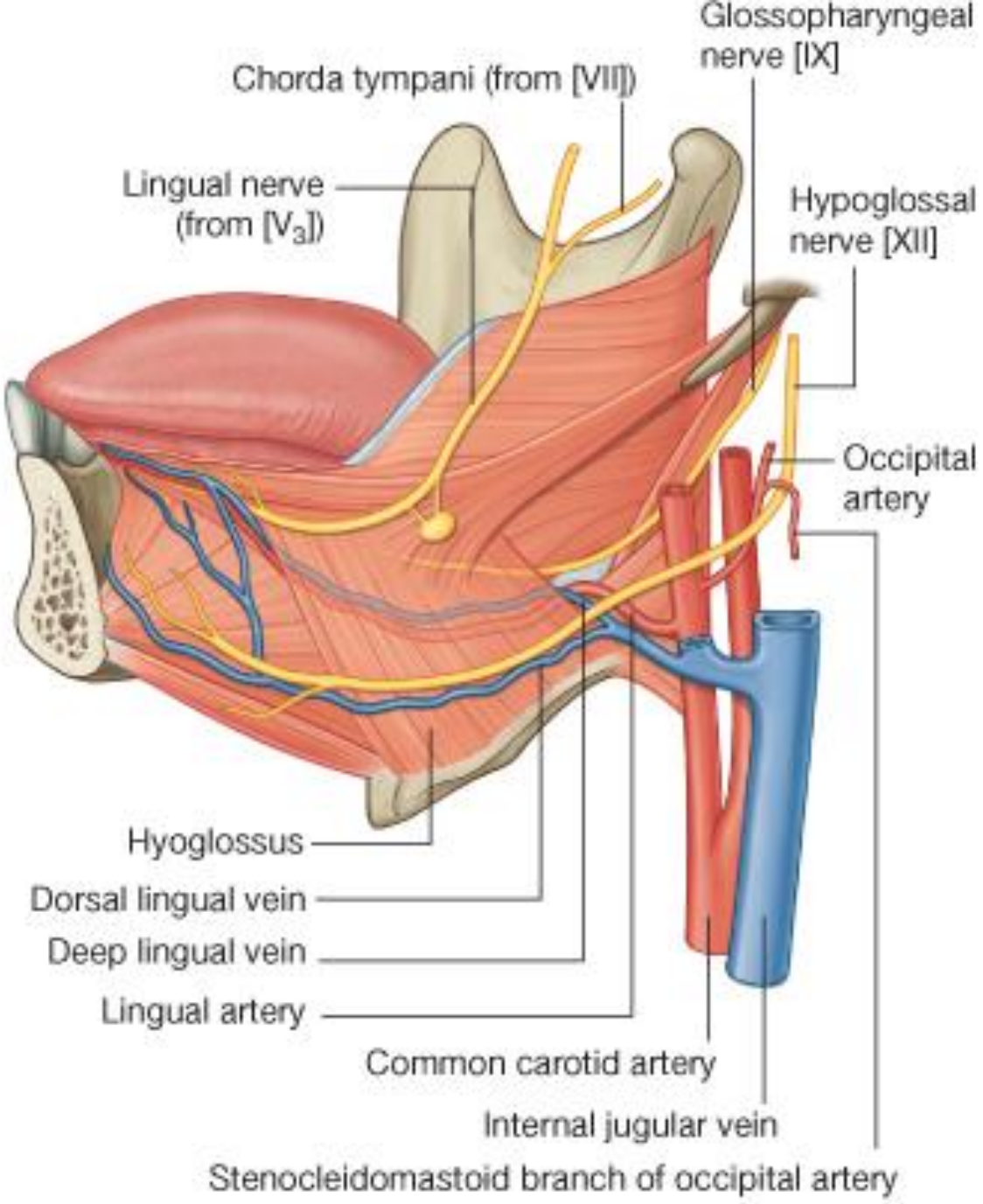


Figure 7-101. The lingual artery and its branches.



Nerves of tongue

motor : **hypoglossal nerve (CN XII)**

except: **palatoglossus**

– *pharyngeal plexus* of ***vagus nerve (CN X)***

sensory : ant. 2/3 – **lingual nerve** (branch of CN V3)

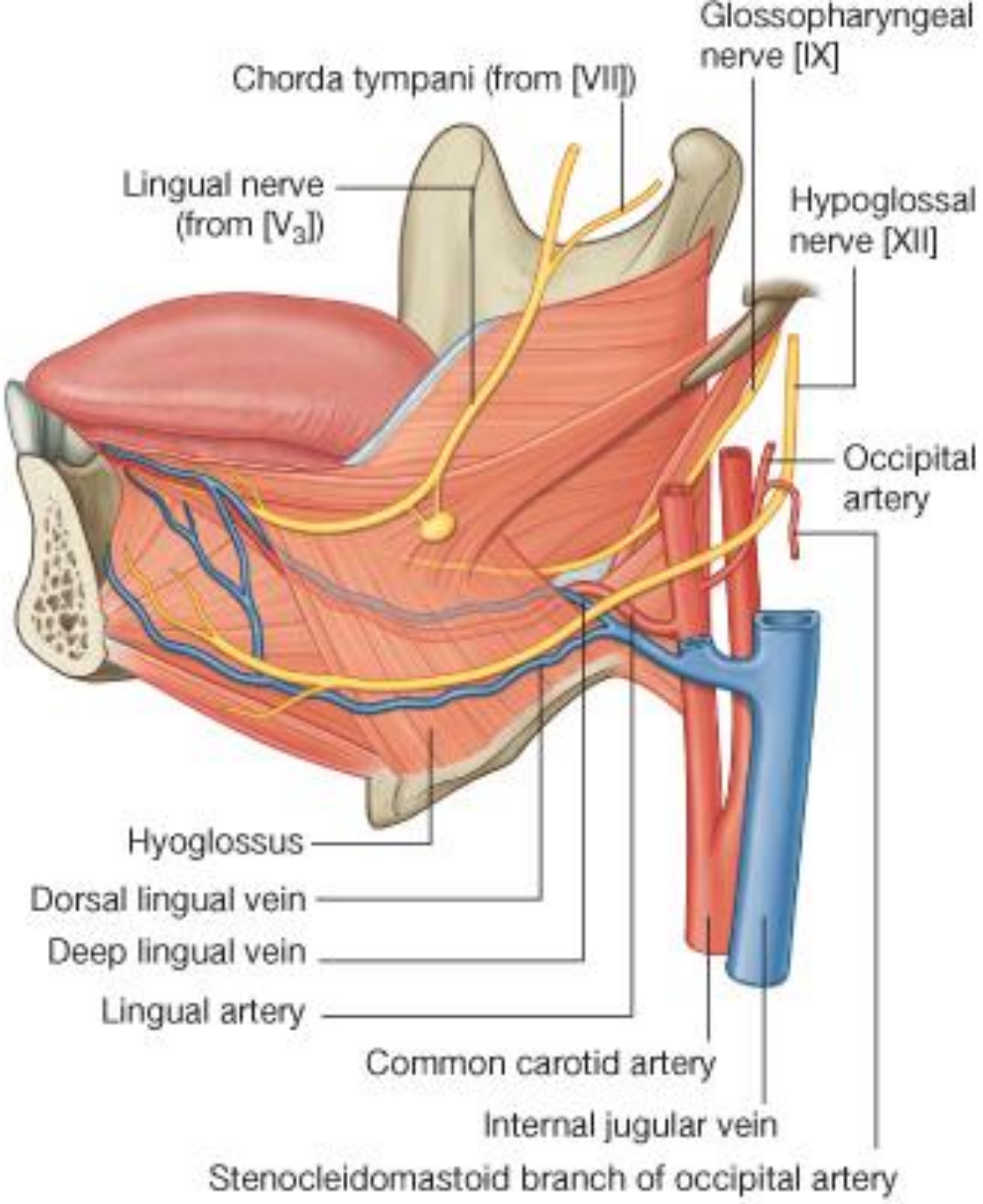
post. 1/3 – lingual branch of

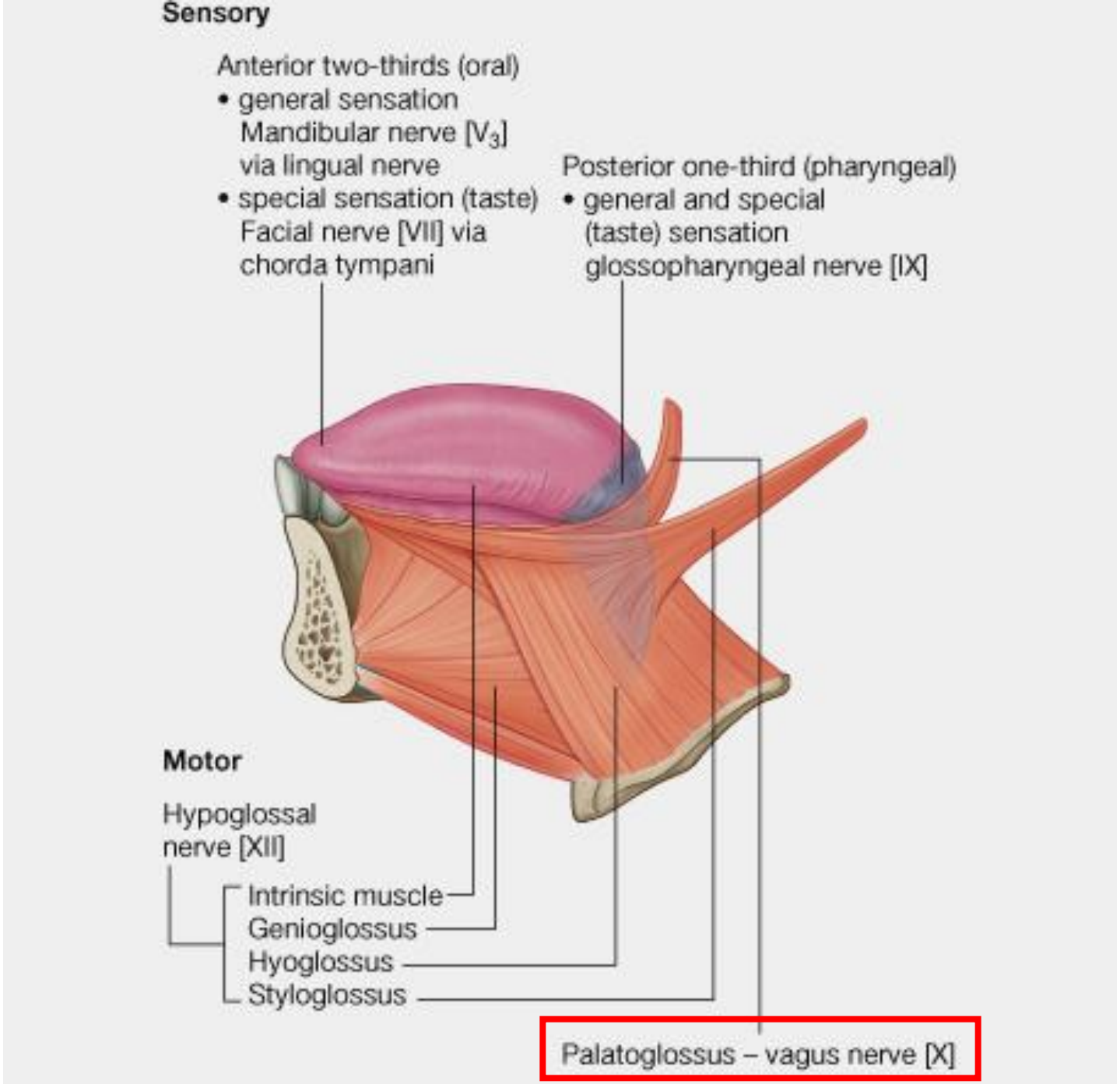
glossopharyngeal n.

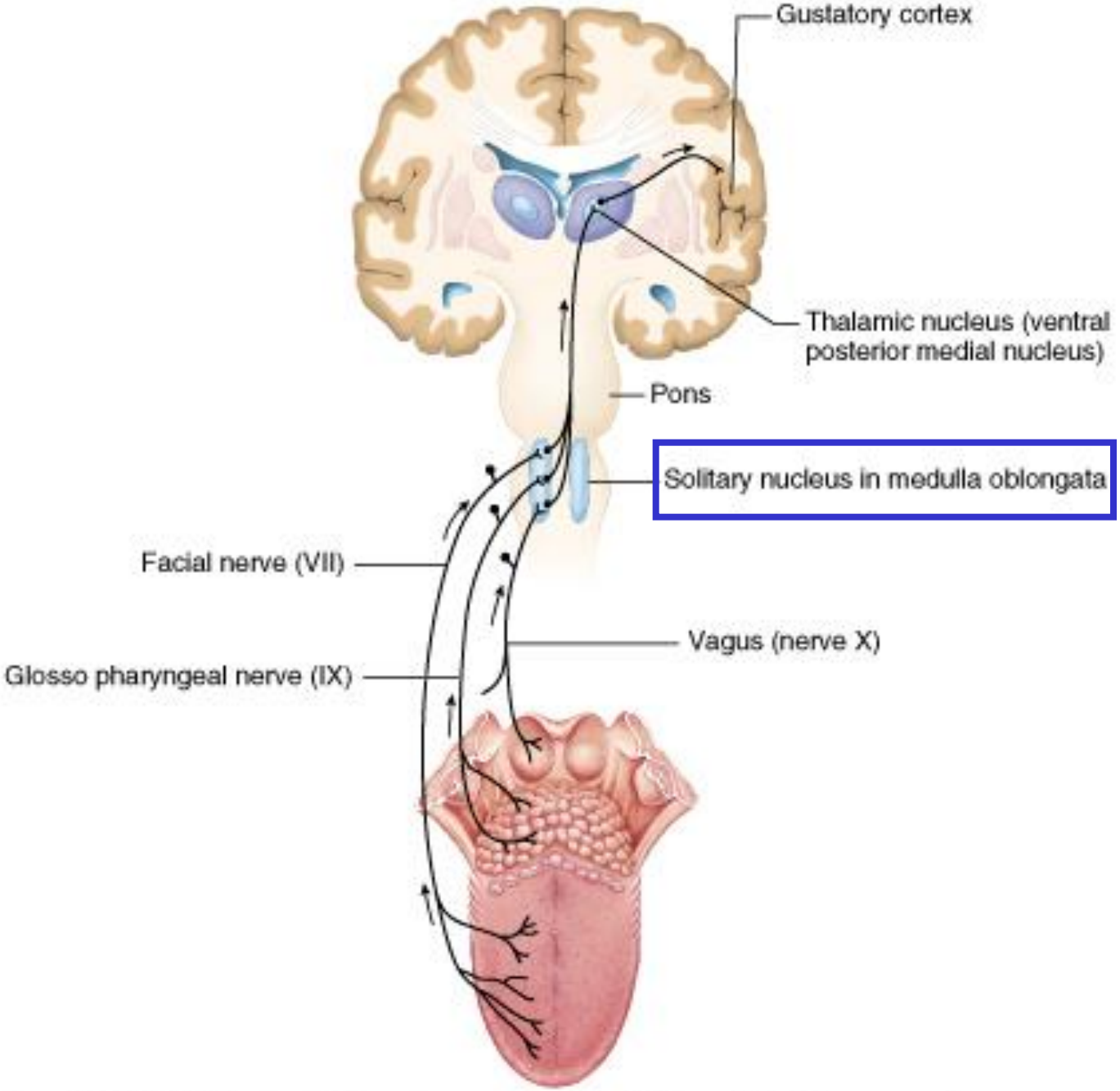
Nerves of tongue

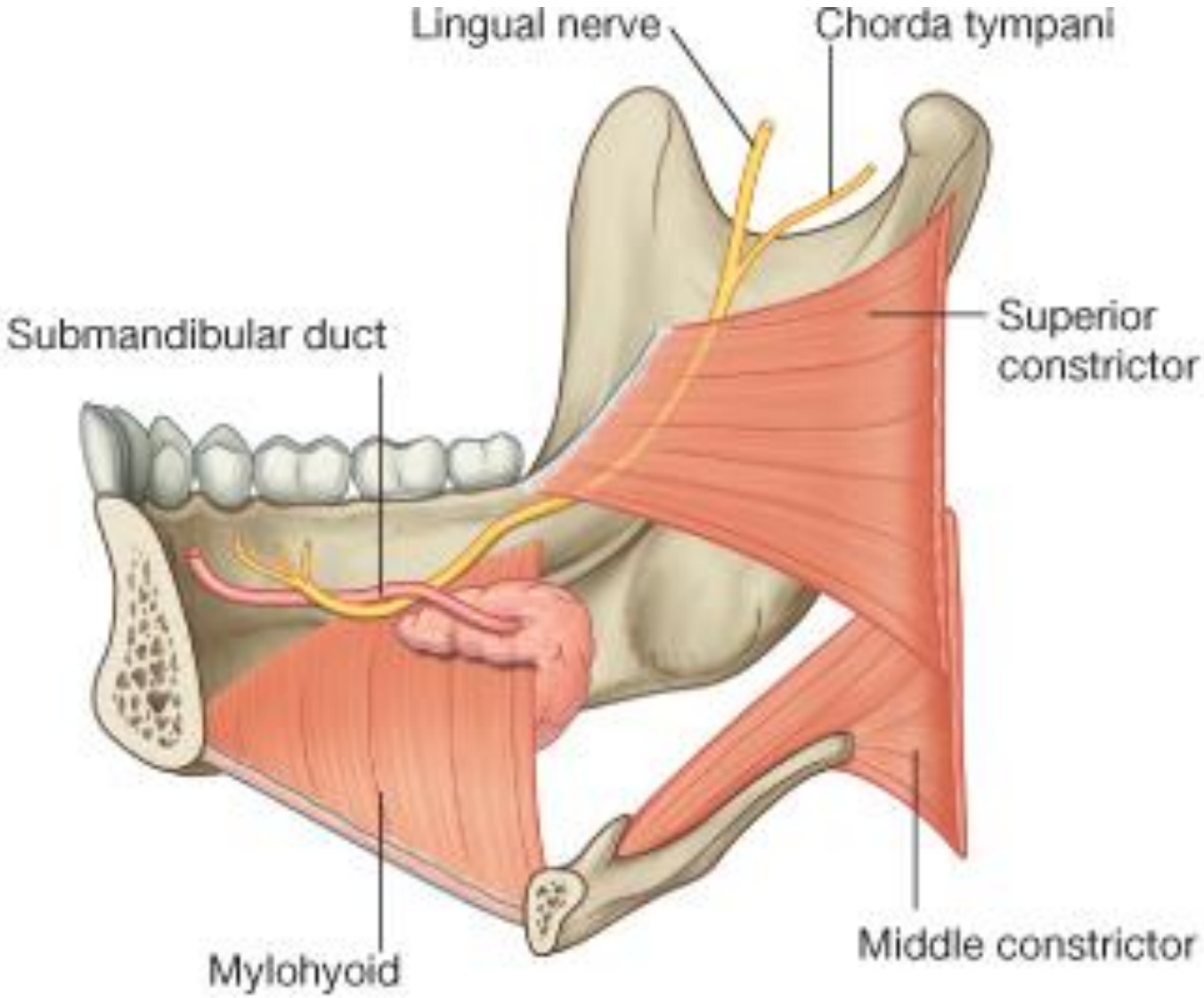
taste : ant. 2/3 – **chorda tympani nerve**
(a branch of **facial nerve**)
post. 1/3 – lingual branch of **glossopharyngeal n.**
epiglottis – **internal laryngeal nerve**
(a branch of **vagus nerve**)

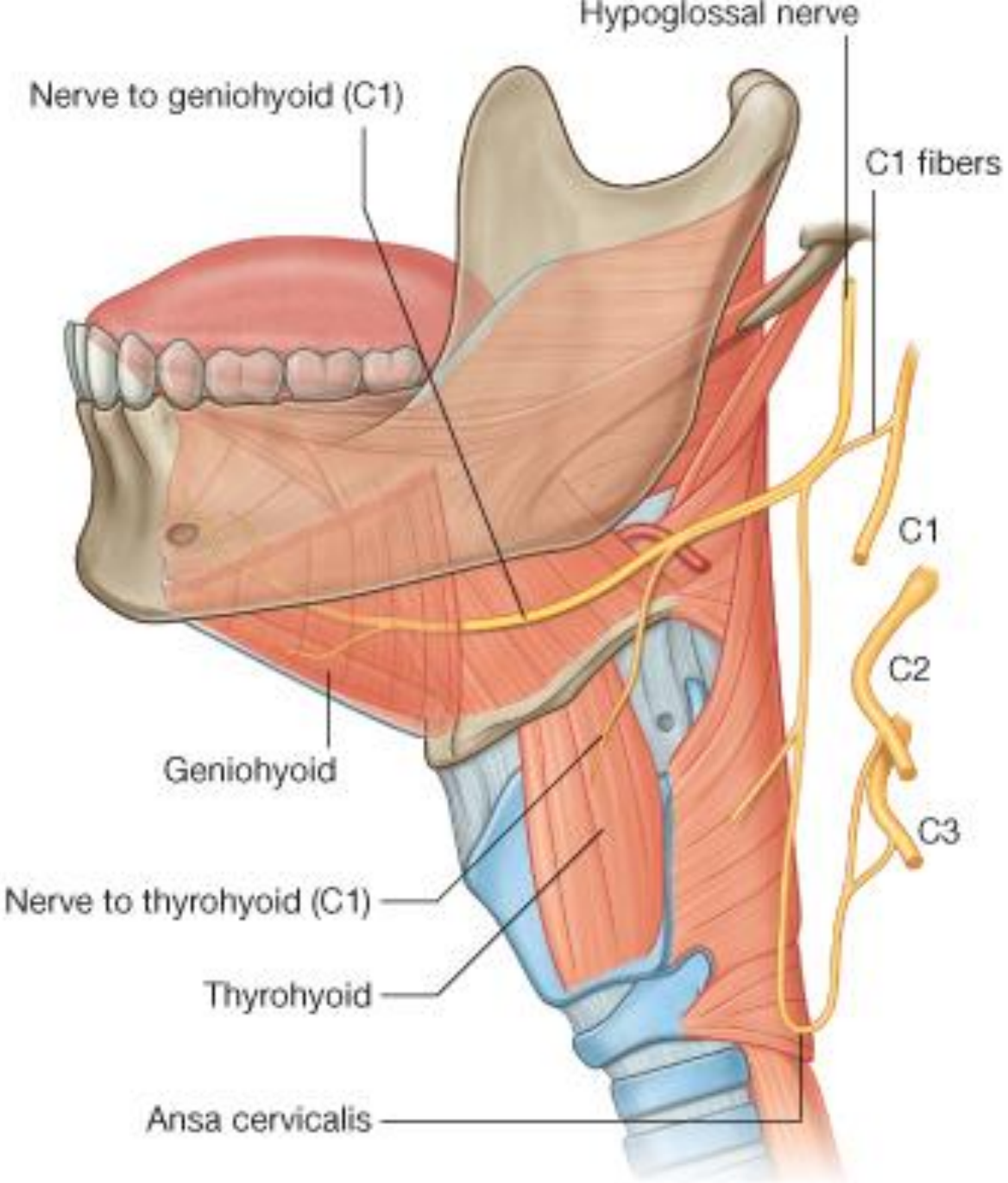
parasympathetic fibers : by **chorda tympani nerve**
to **submandibular ganglion** supply
submandibular and **sublingual salivary glands**











The salivary glands

(1) **parotid glands** – as described before

(2) **submandibular glands**

submandibular ducts

– between **mylohyoid** and **hyoglossus** muscles

artery : **submental branch** of facial artery

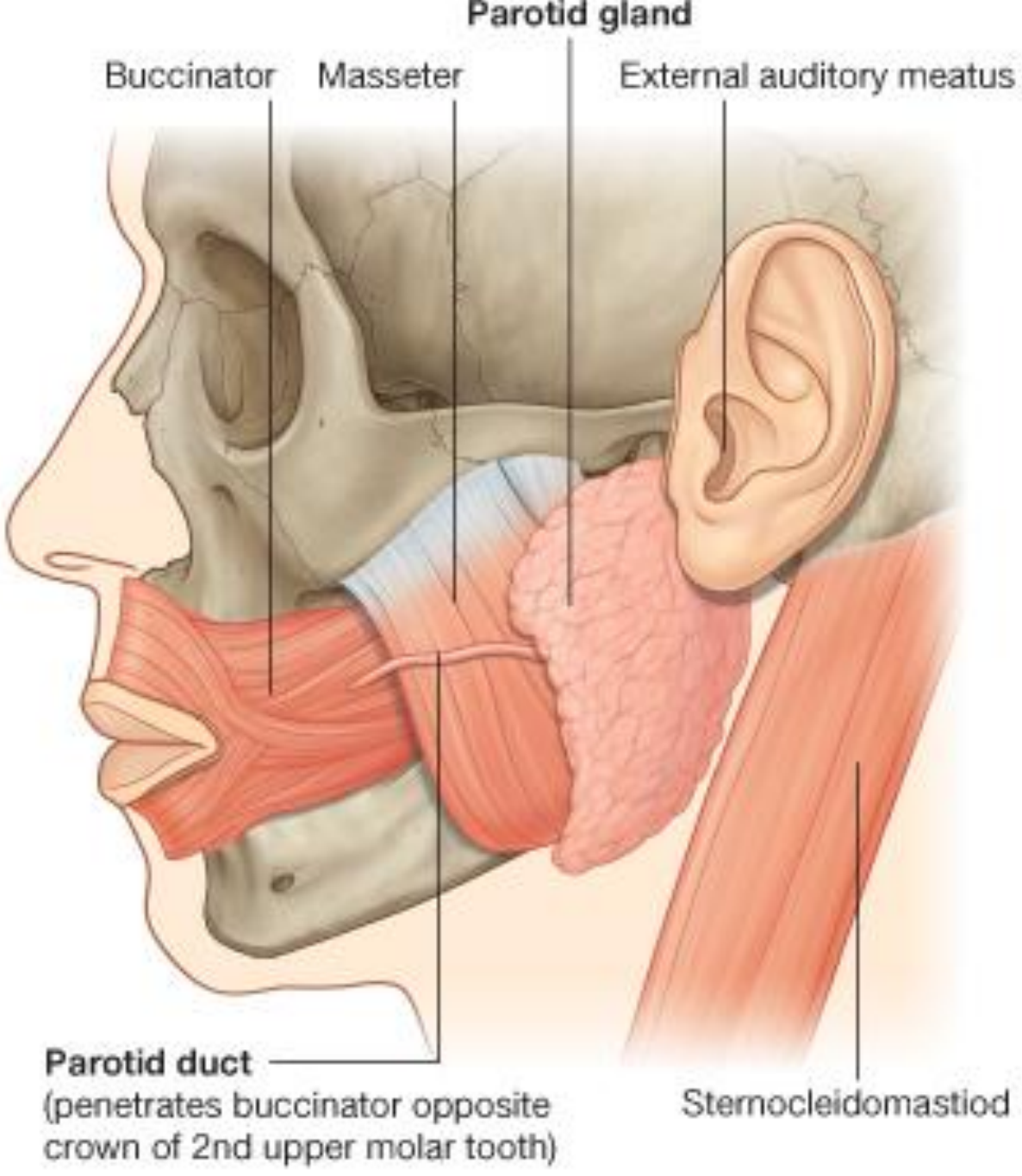
parasympathetic fibers: ***submandibular ganglion***

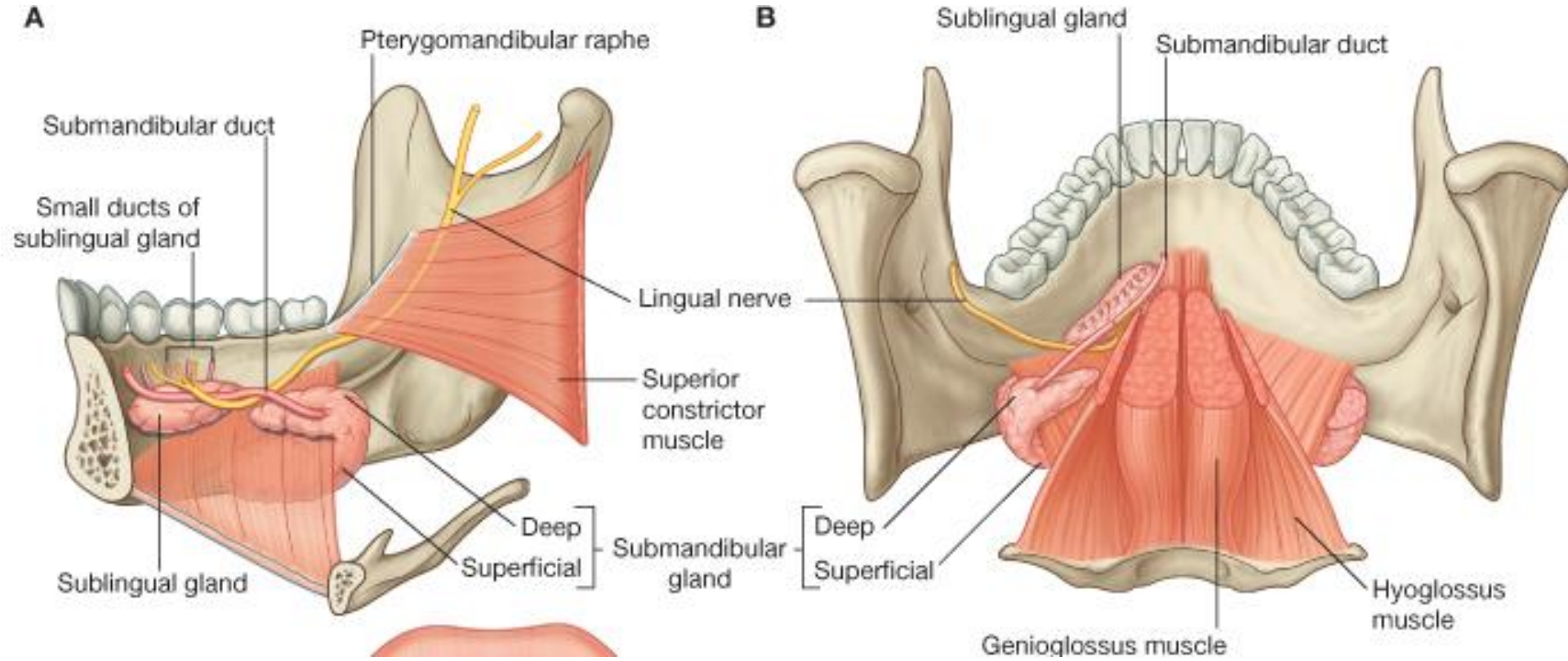
(3) **sublingual glands**

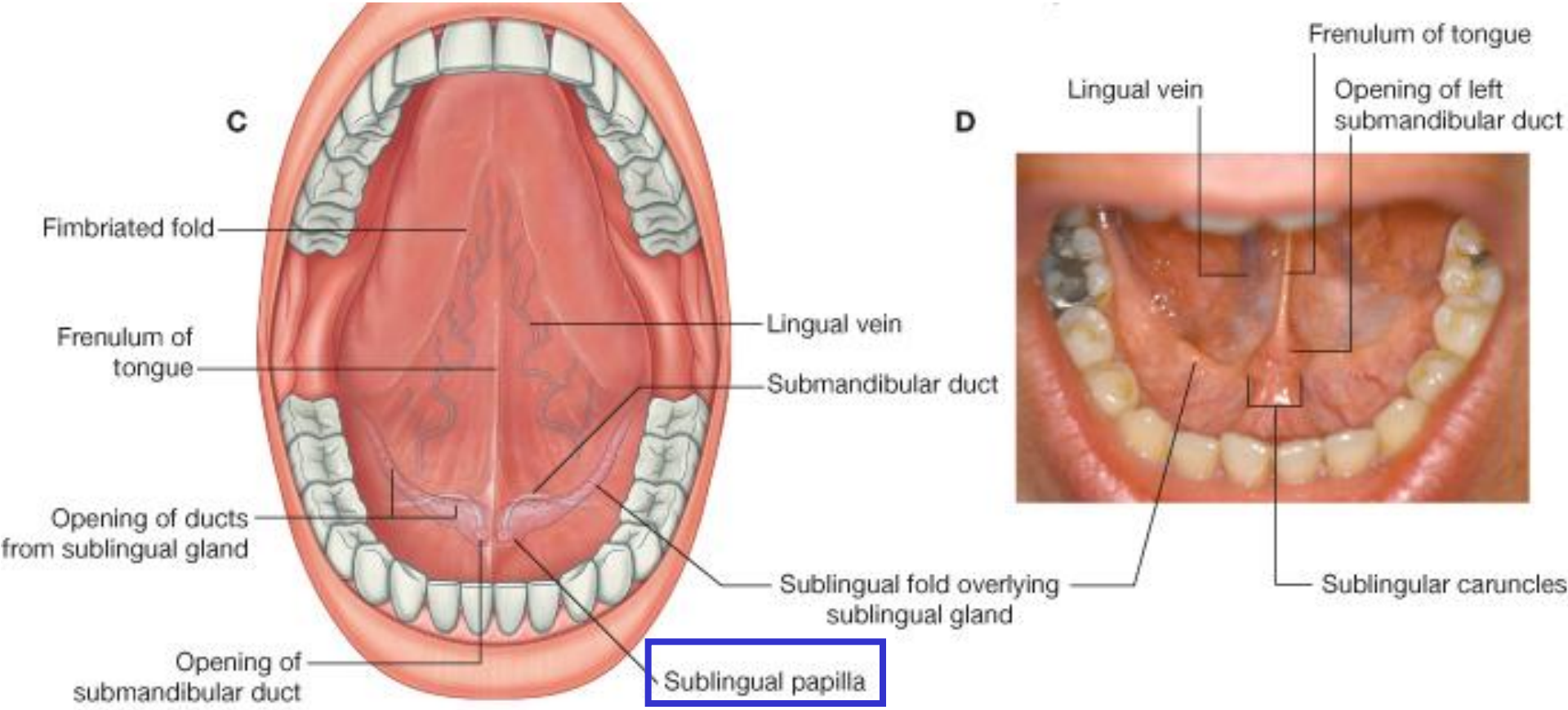
artery: **sublingual** and **submental** arteries

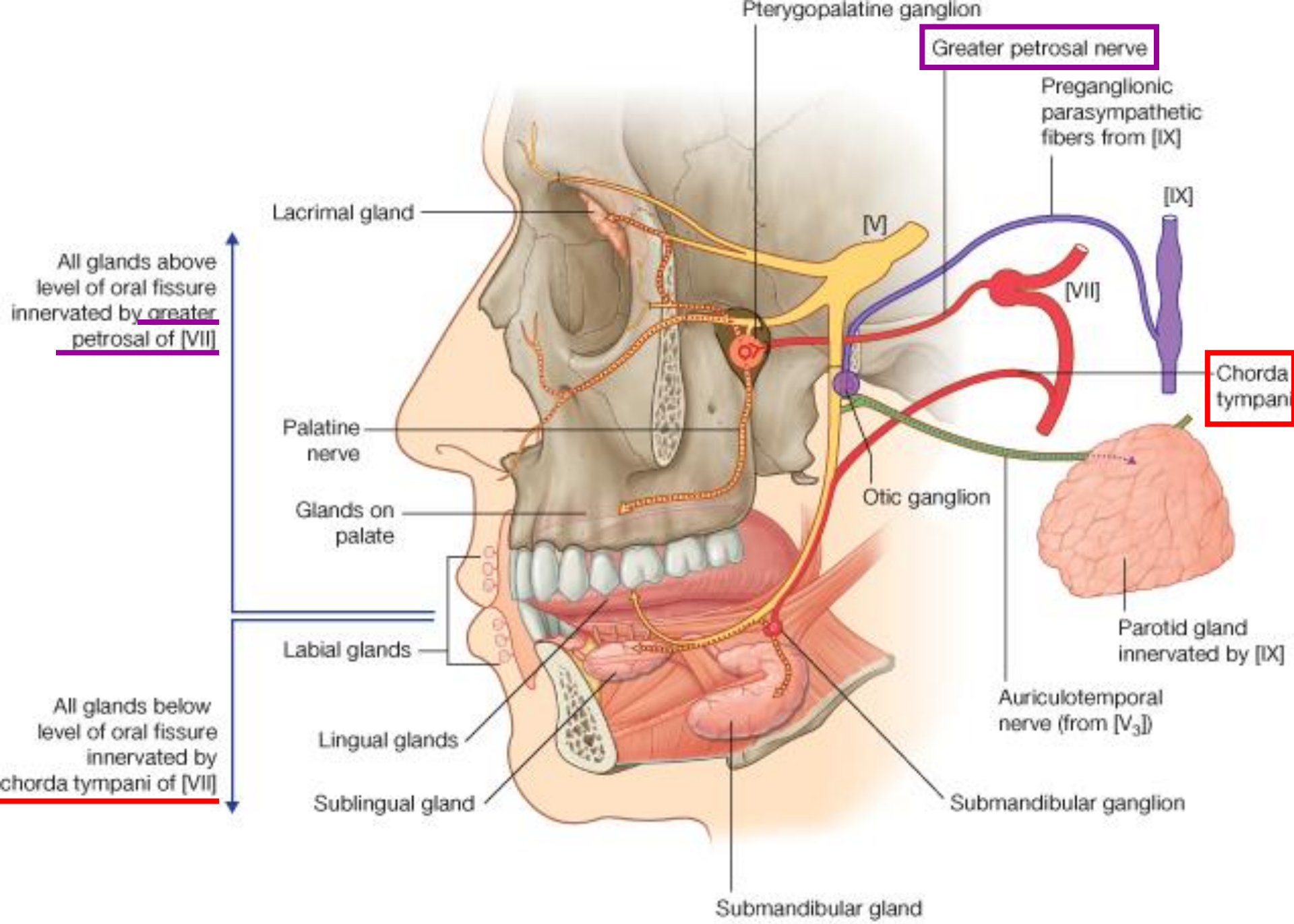
– branches of **lingual** and **facial** arteries

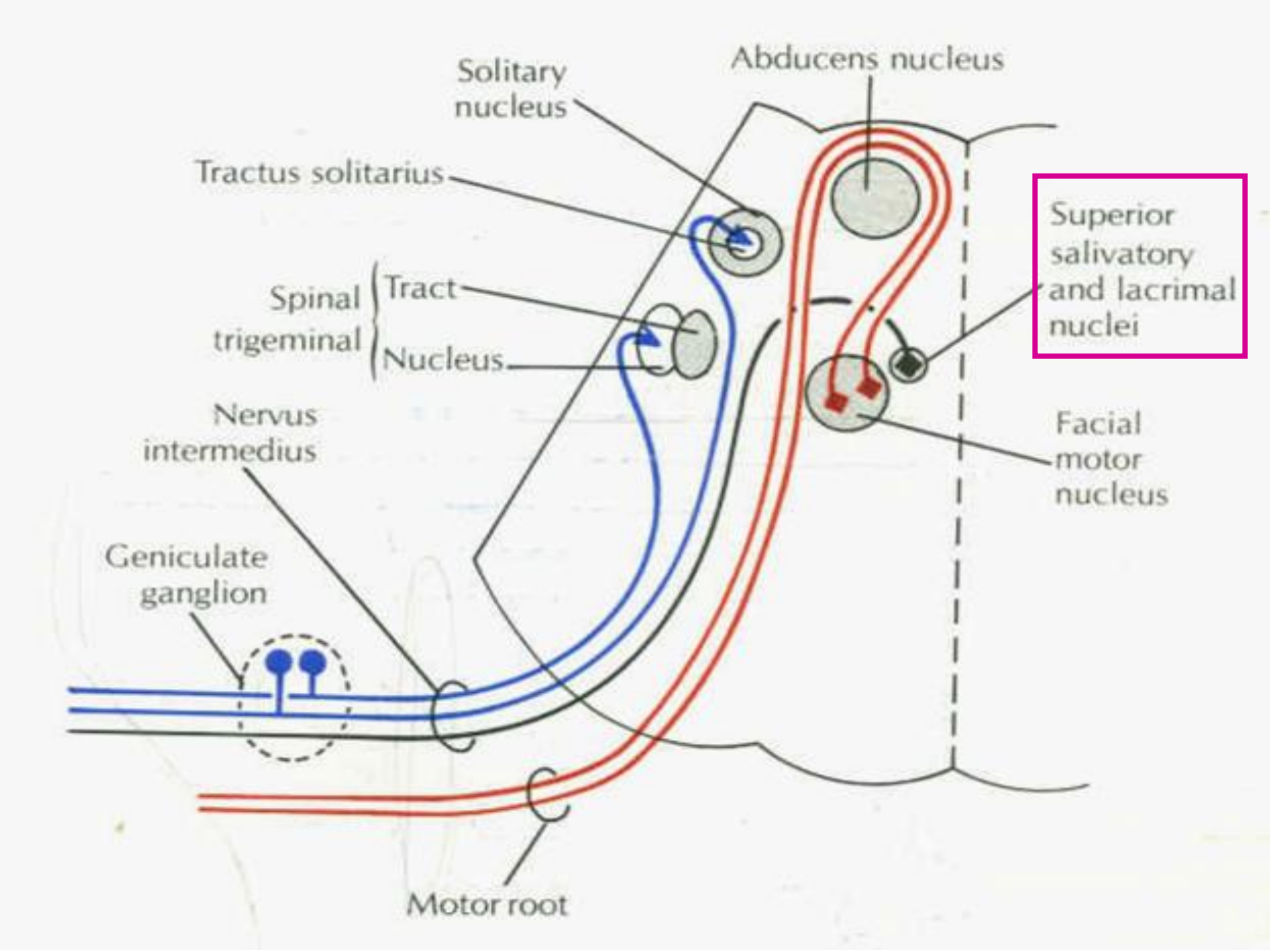
parasympathetic fibers: ***submandibular ganglion***




A
Pterygomandibular raphe
Submandibular duct
Small ducts of sublingual gland
Lingual nerve
Superior constrictor muscle
Deep
Superficial
Submandibular gland
Sublingual gland
B
Sublingual gland
Submandibular duct
Deep
Superficial
Hyoglossus muscle
Genioglossus muscle






Solitary nucleus
Abducens nucleus
Tractus solitarius
Superior salivatory and lacrimal nuclei
Spinal trigeminal
Tract
Nucleus
Nervus intermedius
Facial motor nucleus
Geniculate ganglion
Motor root

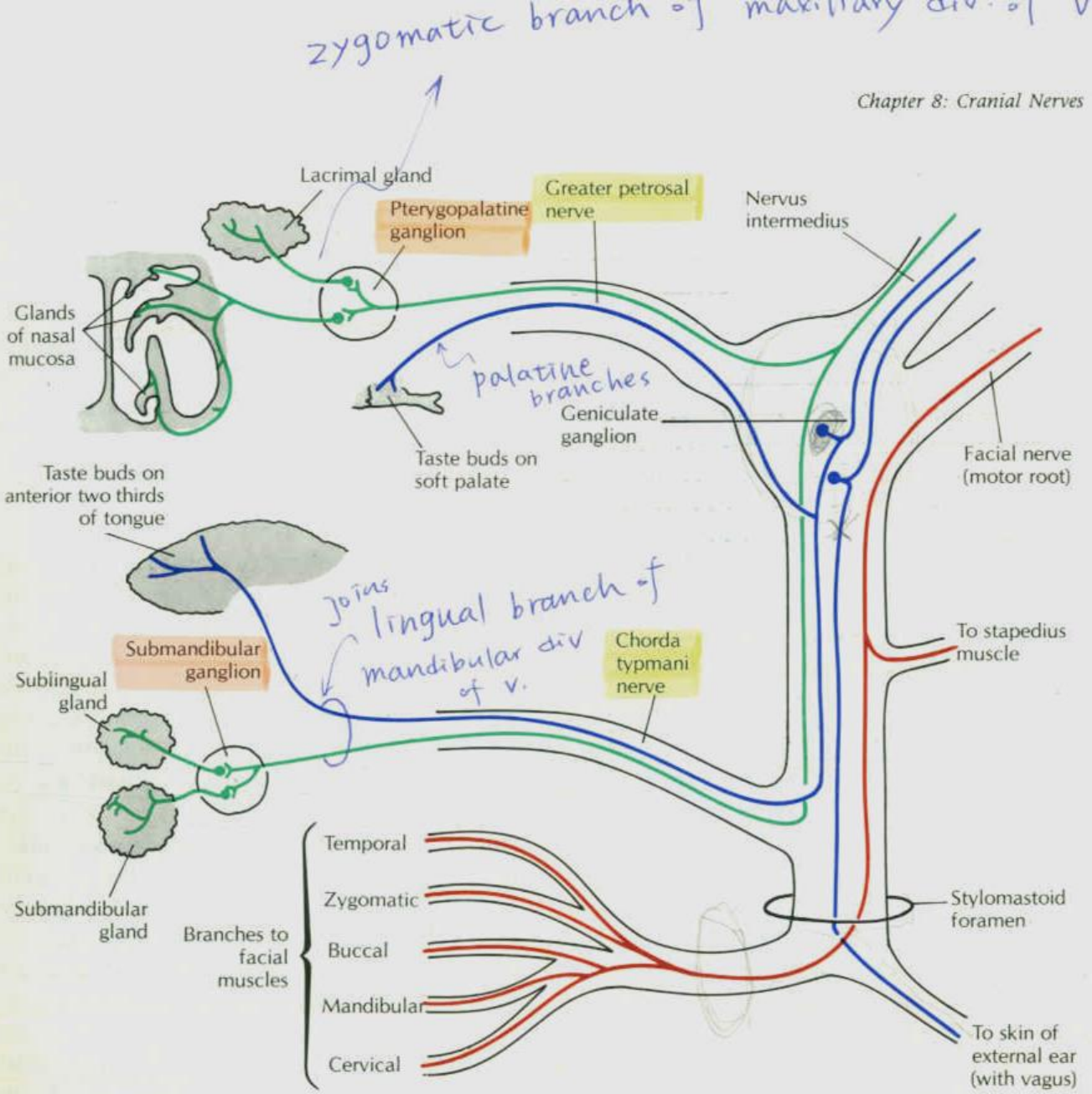


Figure 8-10. Components of the peripheral parts of the facial nerve. (Primary sensory neurons are blue; motor neurons are red; preganglionic and post-ganglionic parasympathetic neurons are green.)

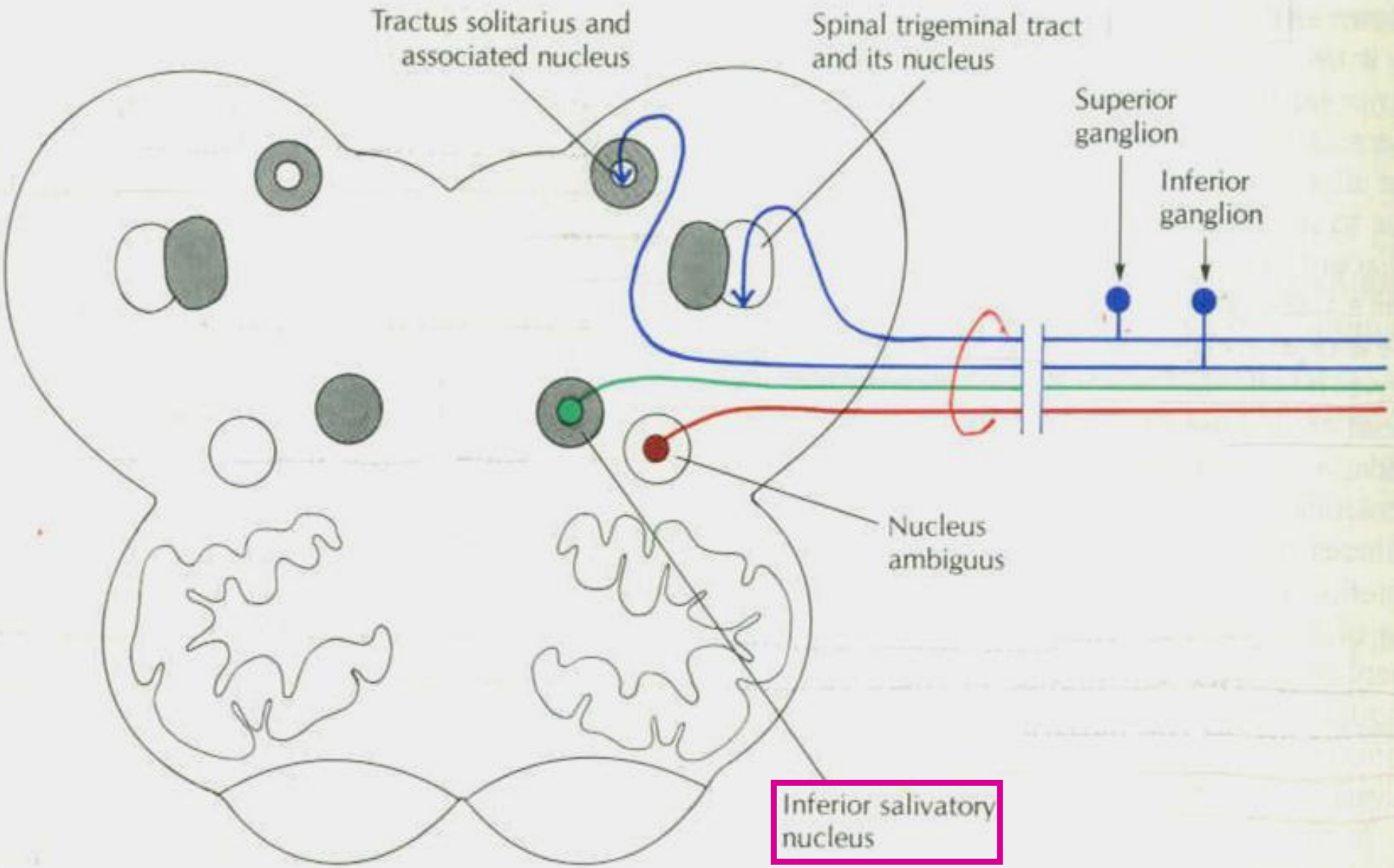


Figure 8-11. Components of the glossopharyngeal nerve in the medulla. (Primary sensory neurons are blue; motor neurons are red; preganglionic parasympathetic neurons are green.)

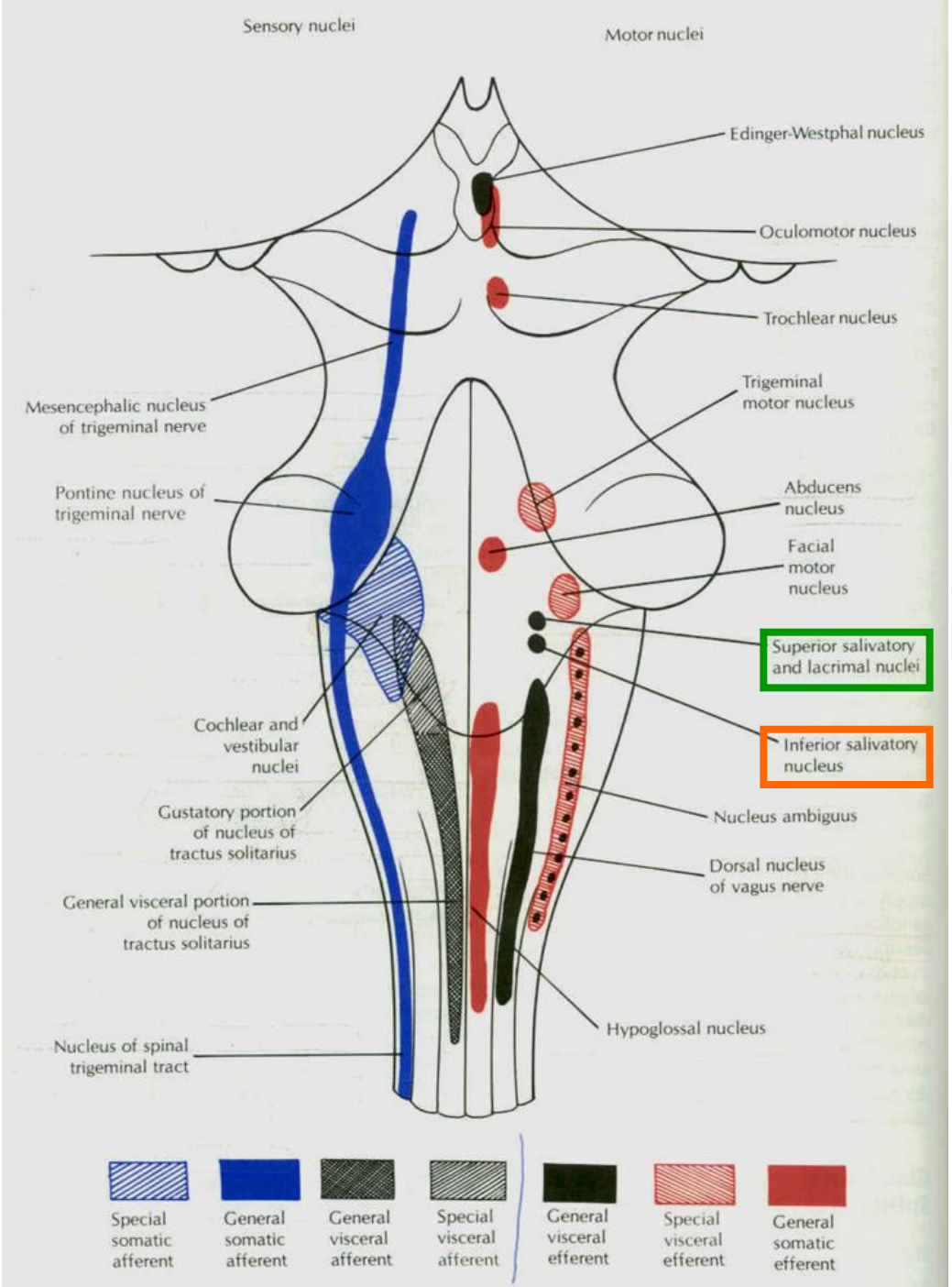
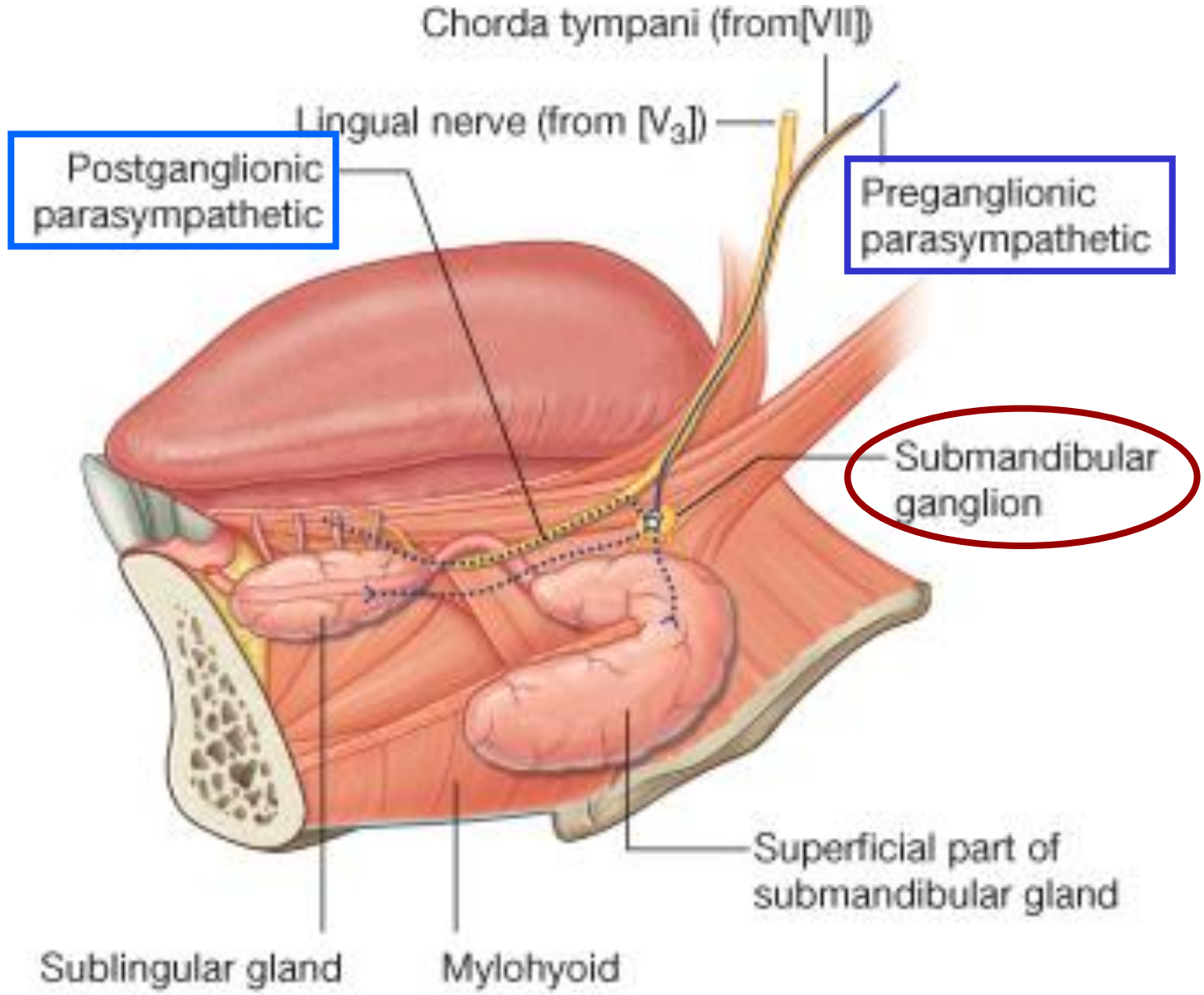


Figure 8-15. Classification of the nuclei of cranial nerves.



The palate – roof of oral cavity

Hard palate

(palatine process of maxilla and
horizontal plates of palatine bone)

Incisive foramen

– nasopalatine nerve & br of sphenopalatine artery

Greater palatine foramen

– greater palatine vessels and nerve

Lesser palatine foramen

– lesser palatine vessels and nerve

Palatine glands and raphe

Soft palate

(muscles & aponeurosis) – separate nasopharynx from oropharynx

Uvula (musculus uvula)

Palatoglossal arch (palatoglossus) & **Palatopharyngeal arch (palatopharyngeus)**

Palatine tonsil in tonsil fossa

Levator veli palatini

Tensor veli palatini

Vessels of palatine – branches of **maxillary artery**

termination of post. septal branch of **sphenopalatine a.**

greater & lesser palatine arteries

(branches of **descending palatine artery**)

ascending palatine artery

(branches of ***facial artery***)

ascending pharyngeal artery

Veins → **pterygoid venous plexus**

Nerves of palate

– branches of **pterygopalatine ganglion**

Sensory: **nasopalatine nerve**

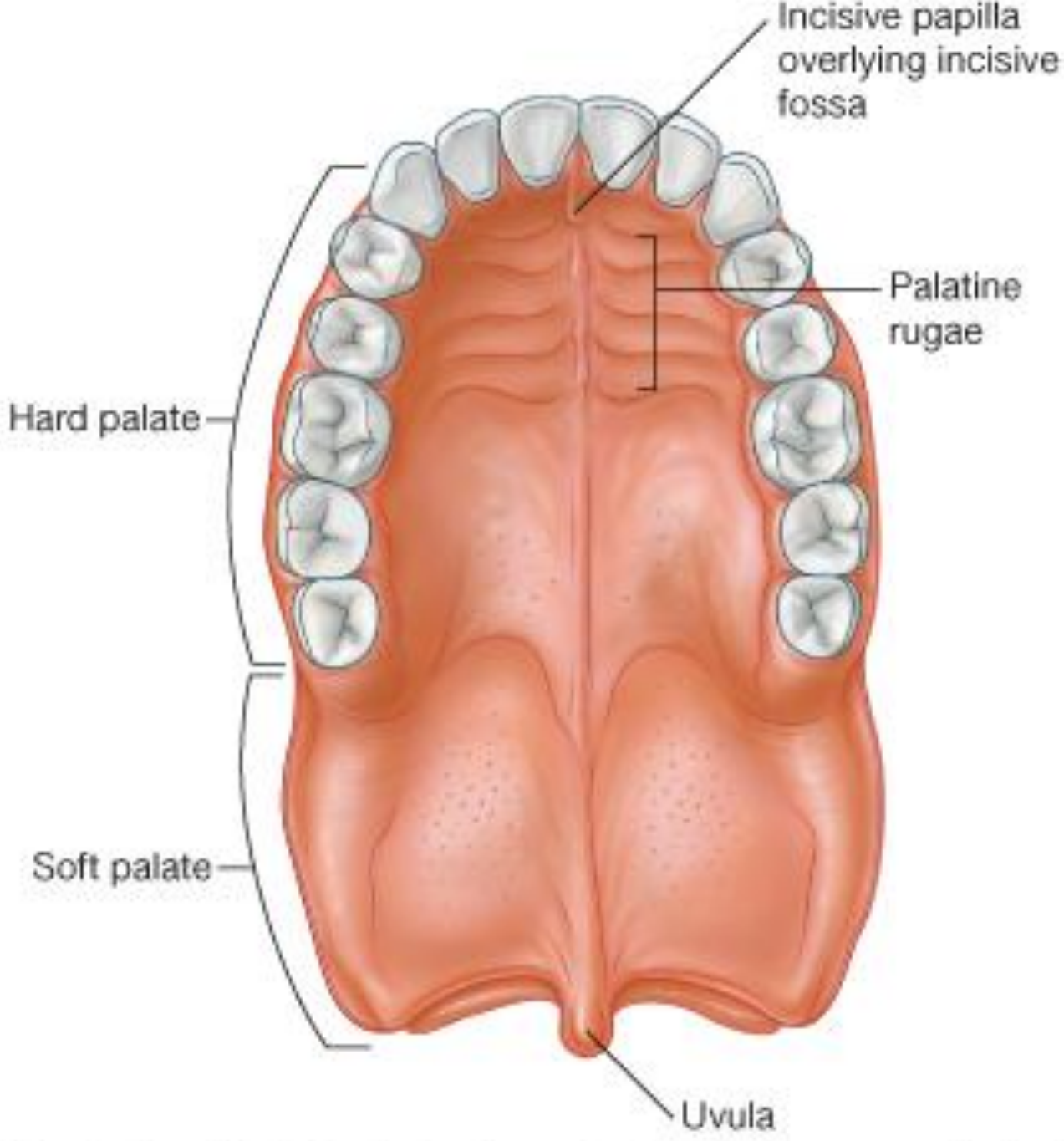
greater & lesser palatine nerves

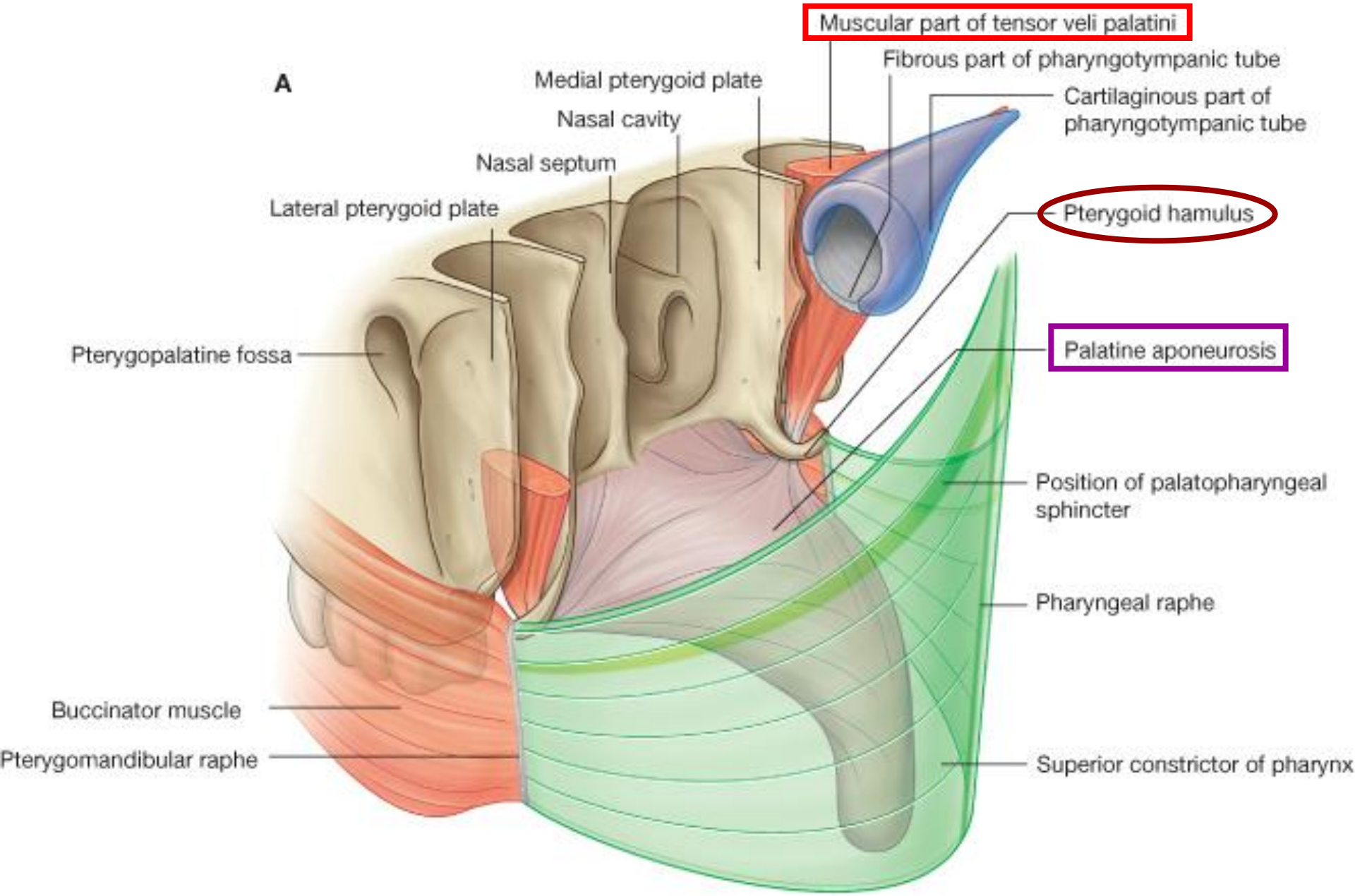
Motor: **medial pterygoid nerve (CN V3)**

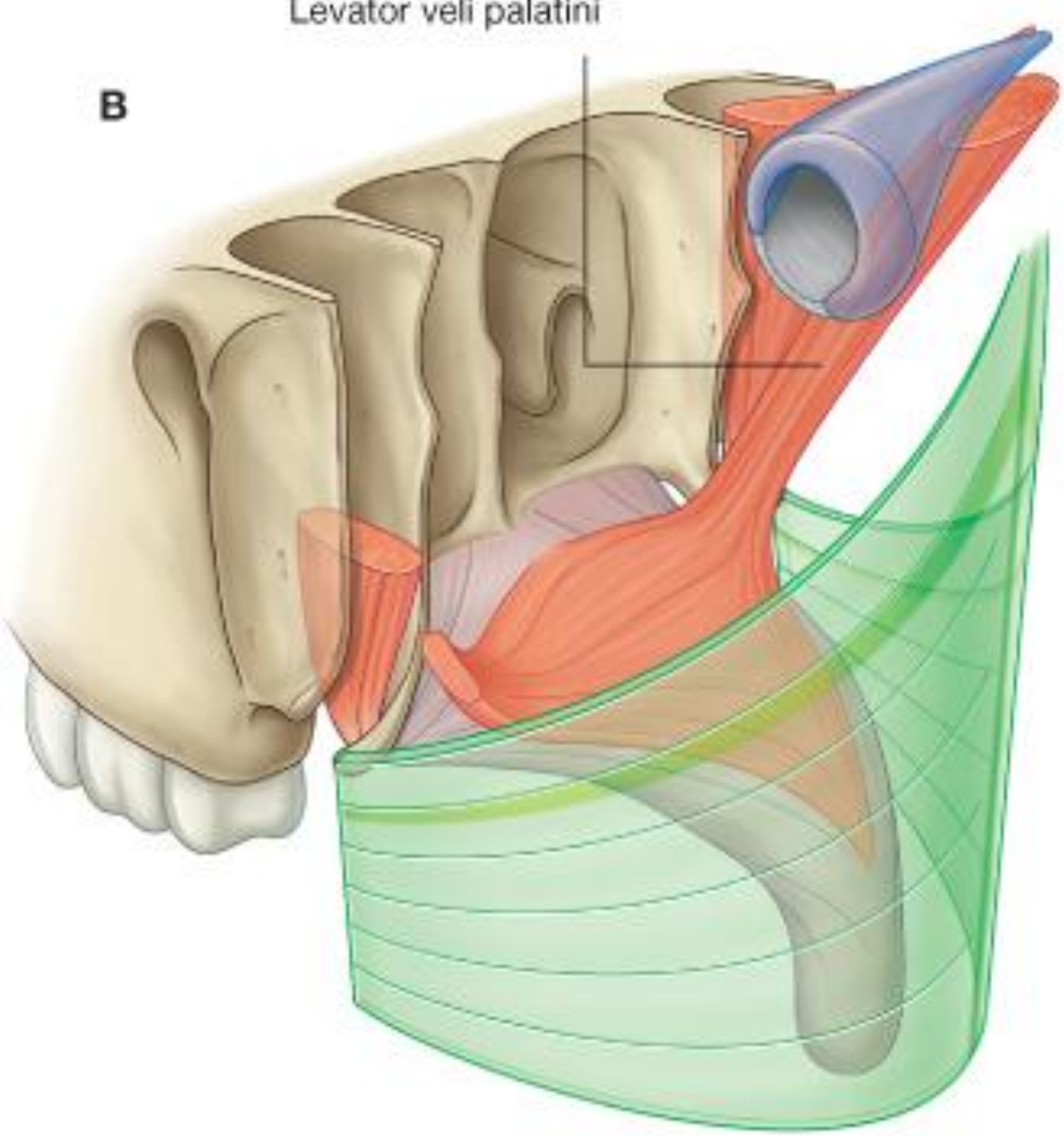
→ **tensor veli palatini**

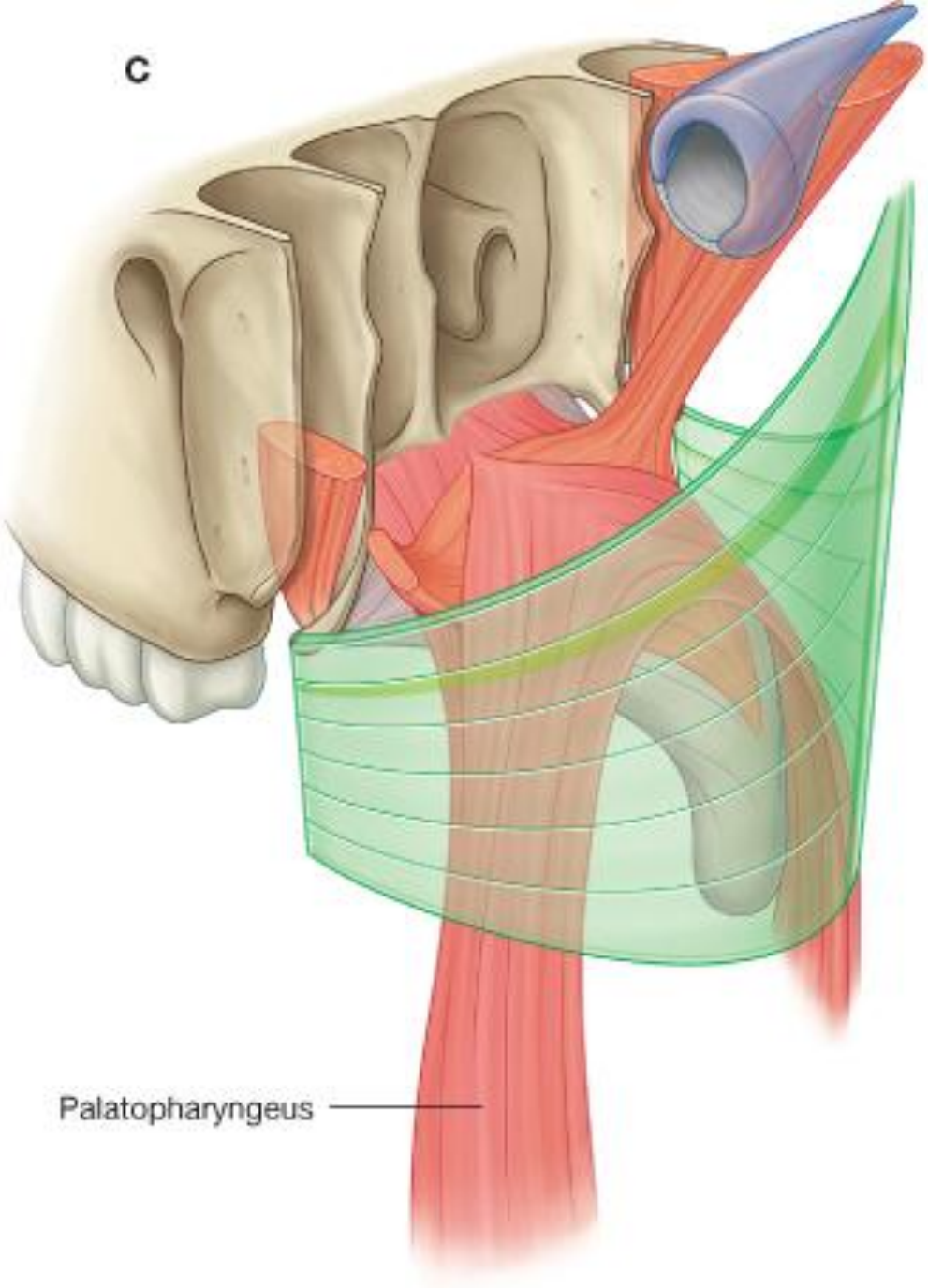
cranial part of CN XI through **CN X**

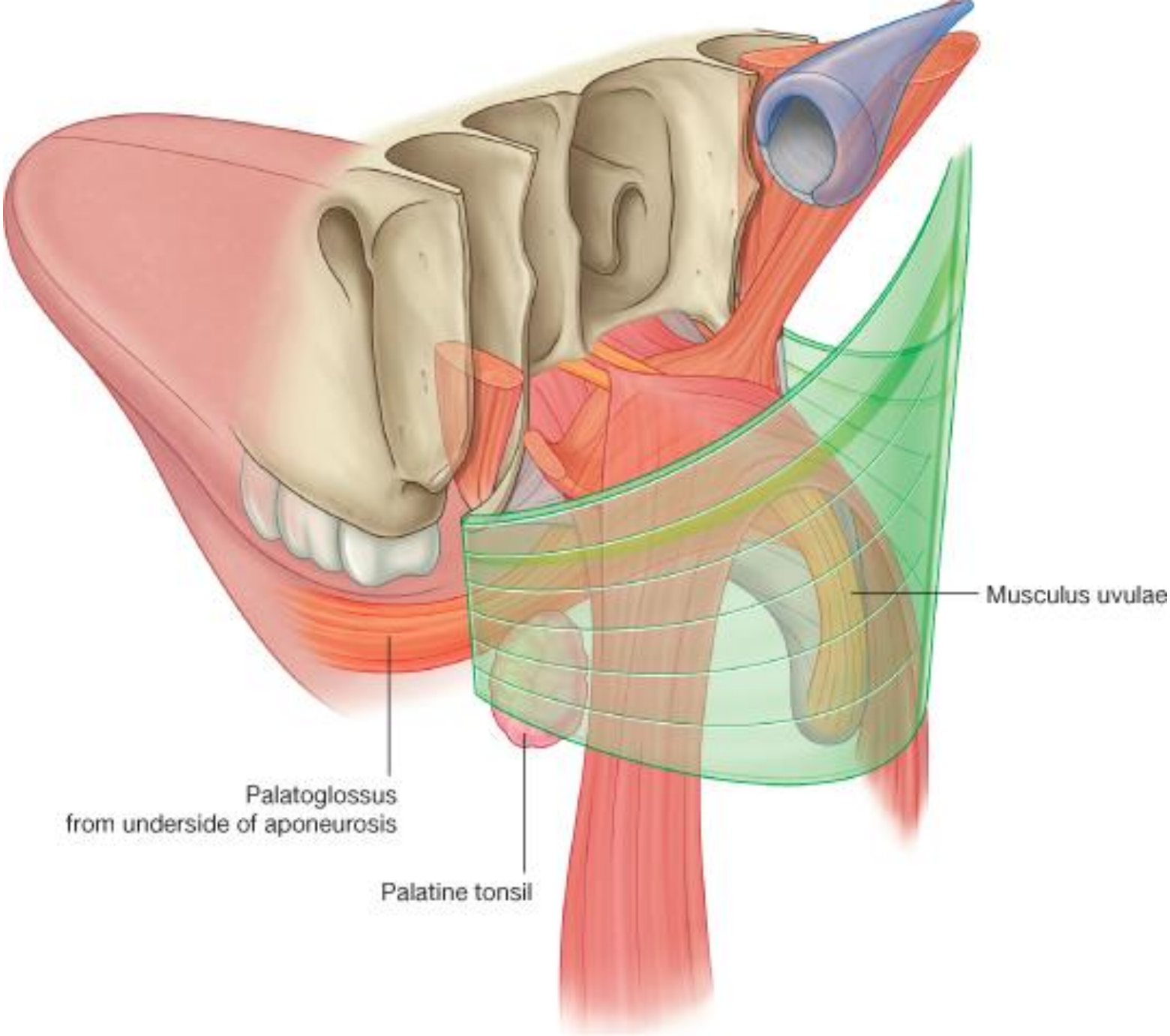
pharyngeal plexus→ **other soft palate muscles**

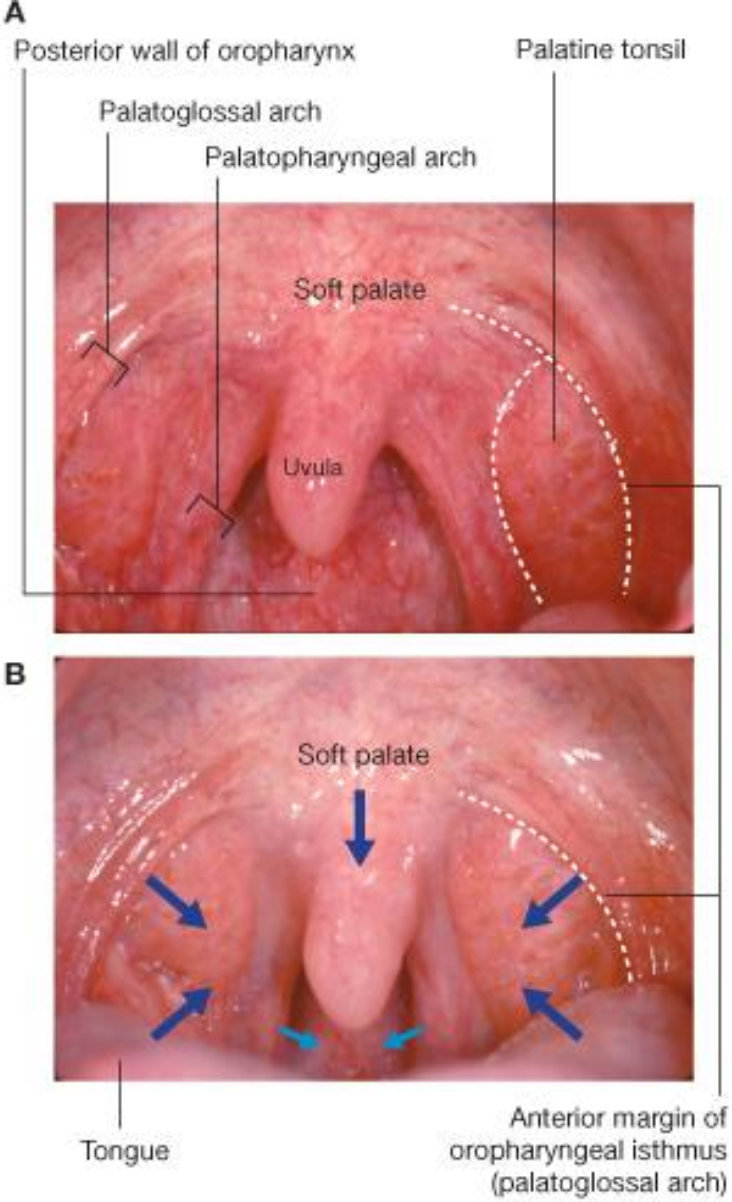






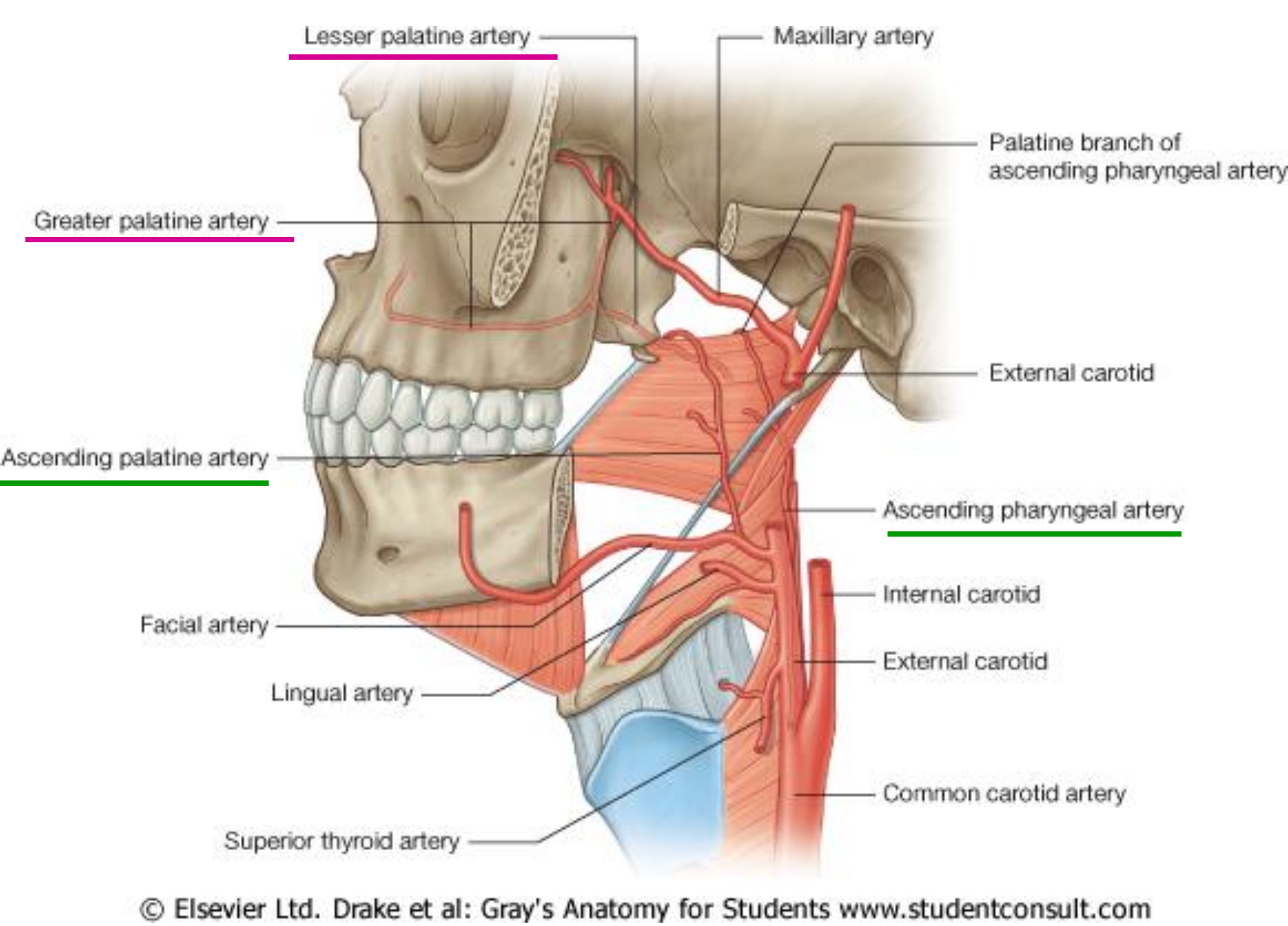


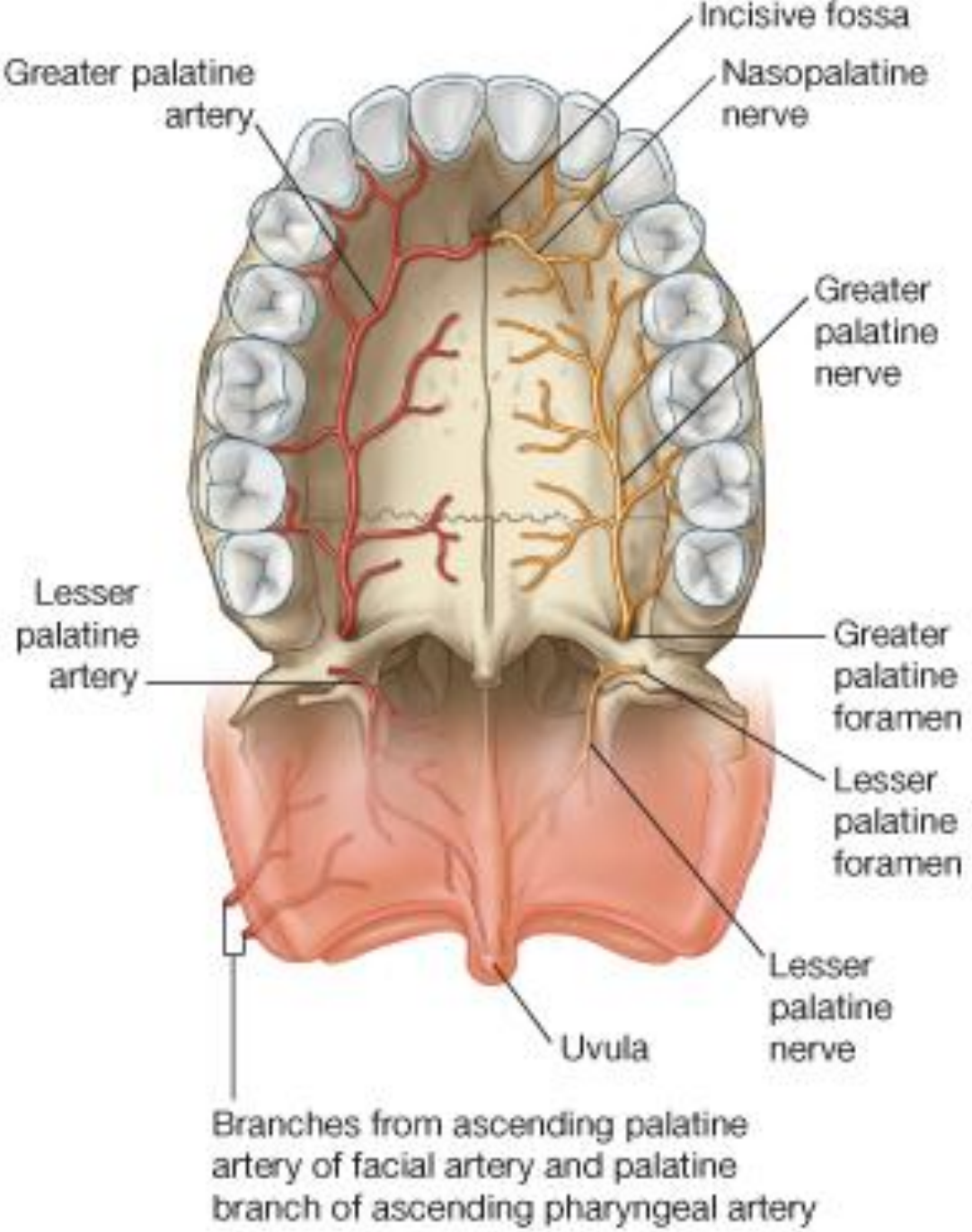


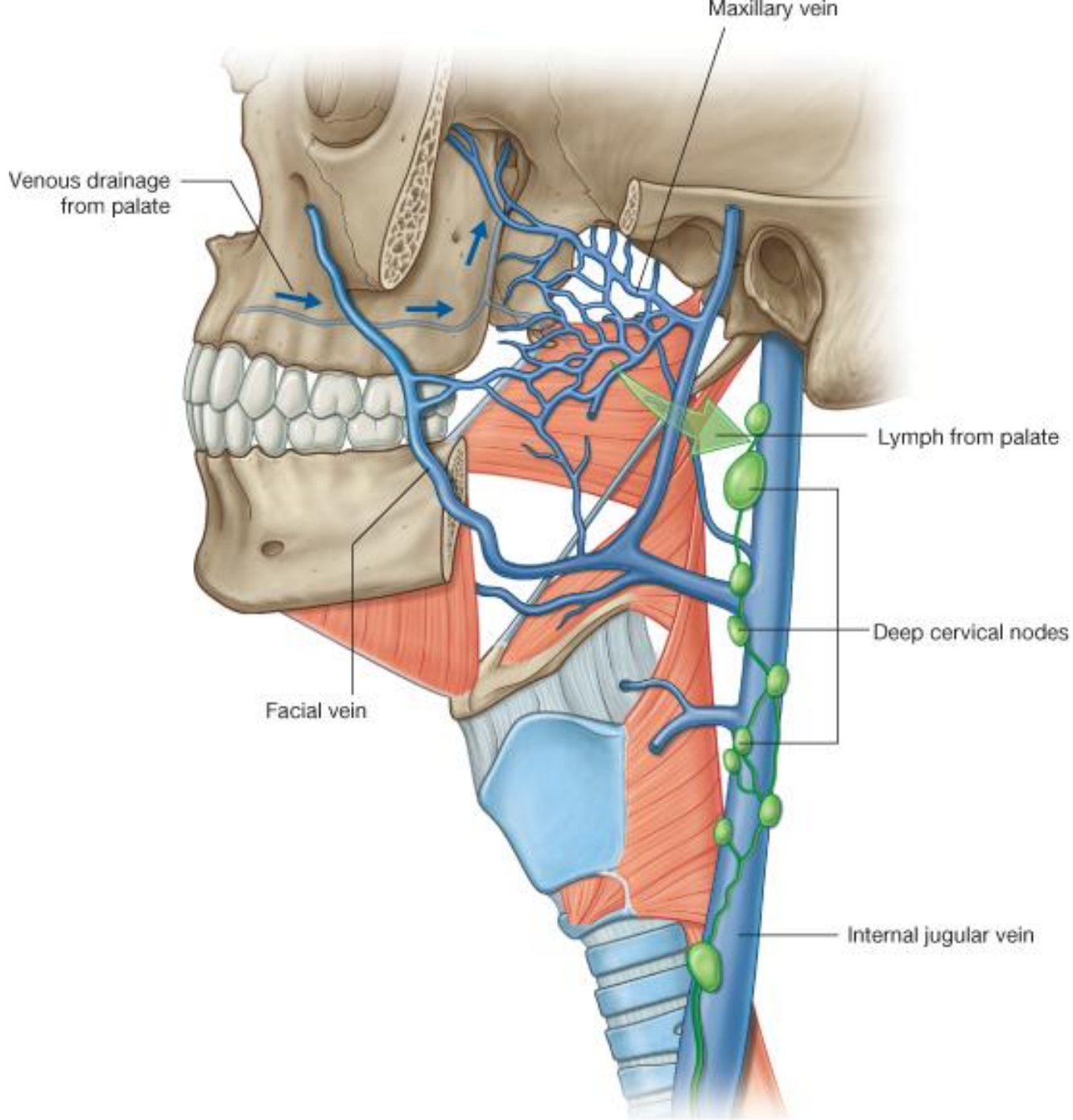


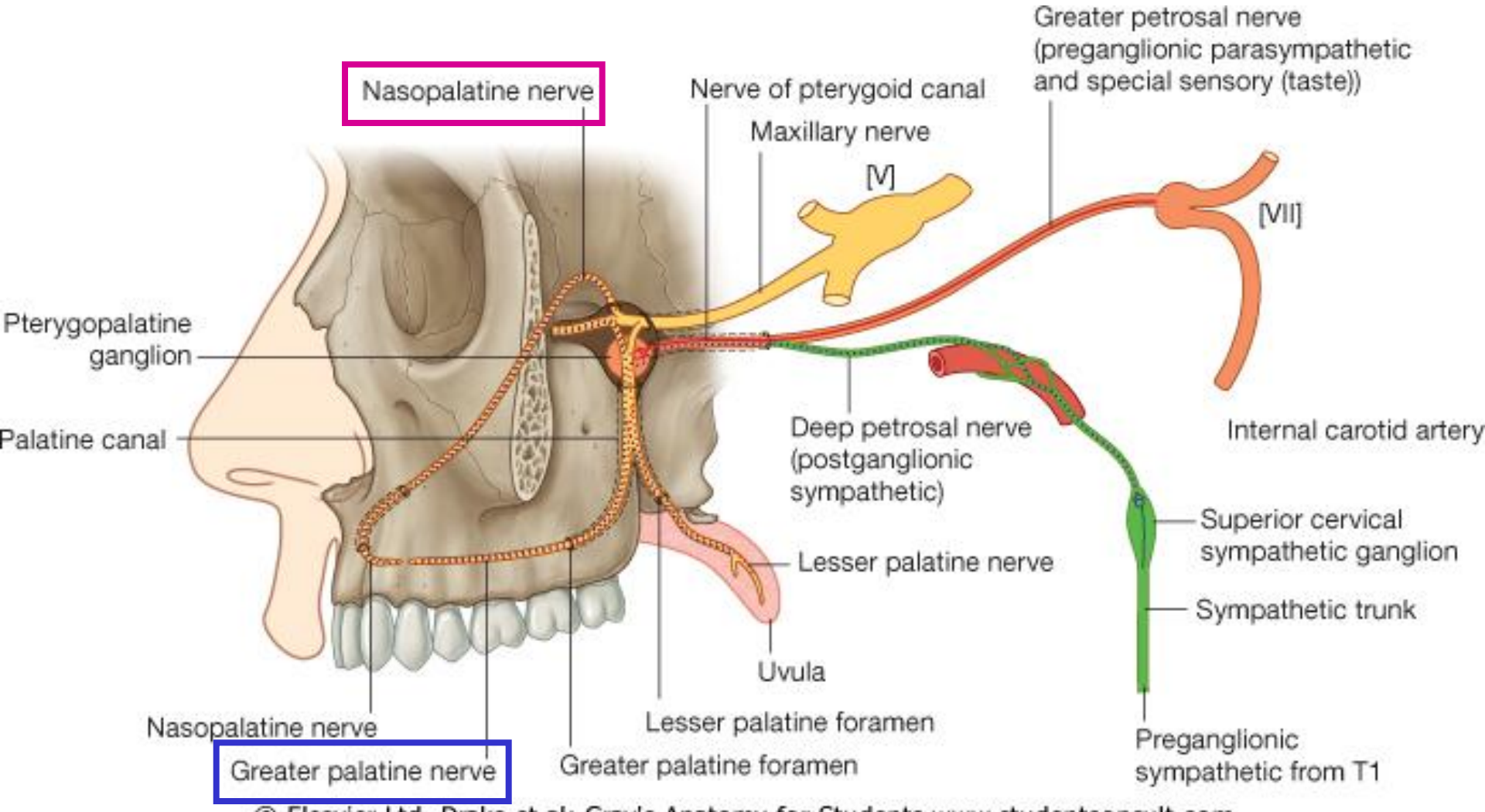
Closure of oropharyngeal isthmus

- Medial and downward movement of palatoglossus arches
- Medial and downward movement of palatopharyngeal arches
- Upward movement of tongue
- Downward and forward movement of soft palate









The teeth

Parts of teeth : **crown, neck, root**
– fixed by periodontal ligament

Types of teeth : **incisors, canines, premolars** and **molars**

Structures of teeth : **enamel, dentine, cementum, apical foramen, root canal** & **pulp cavity**

Vessels of teeth :
maxillary artery
→ inferior alveolar branches
→ post., mid. and ant. superior alveolar branches

Veins with the same name → **pterygoid venous plexus**

Lymph vessels → submandibular, submental and deep cervical lymph nodes

Nerves of teeth – *sensory*

maxillary nerve (CN V2)

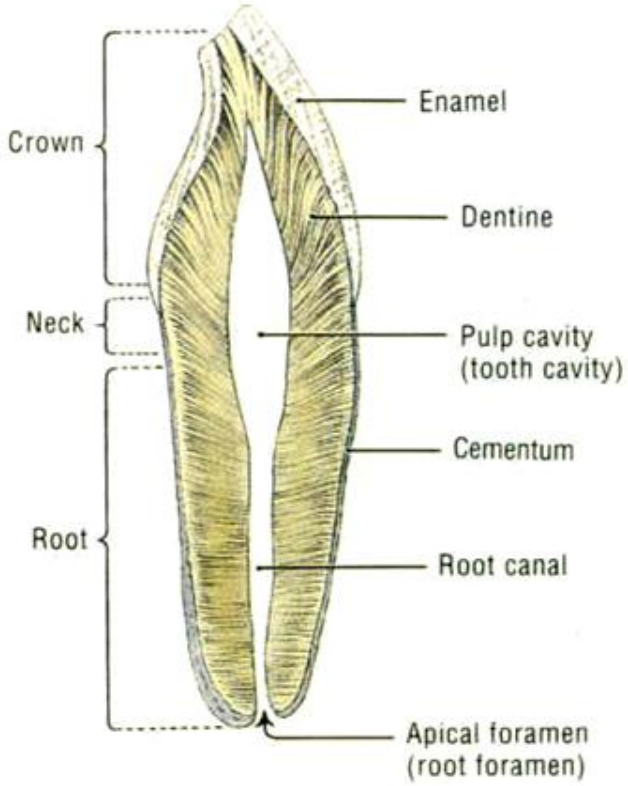
→ post. sup. alveolar nerve for ***molar***

→ mid. sup. alveolar nerve for ***premolar***

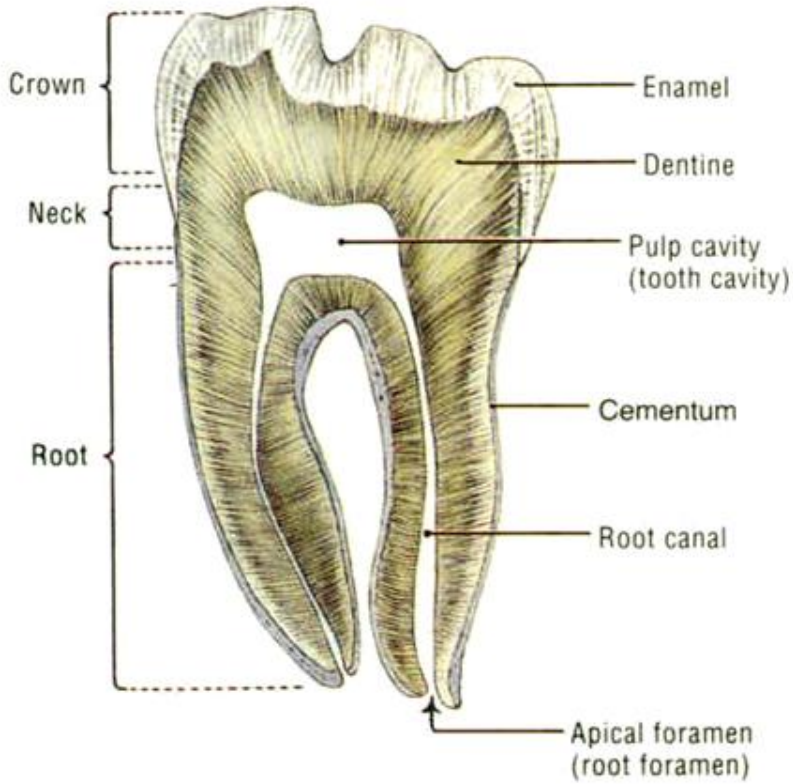
→ ant. sup. alveolar nerve for ***canine & incisor***

mandibular nerve (CN V3)

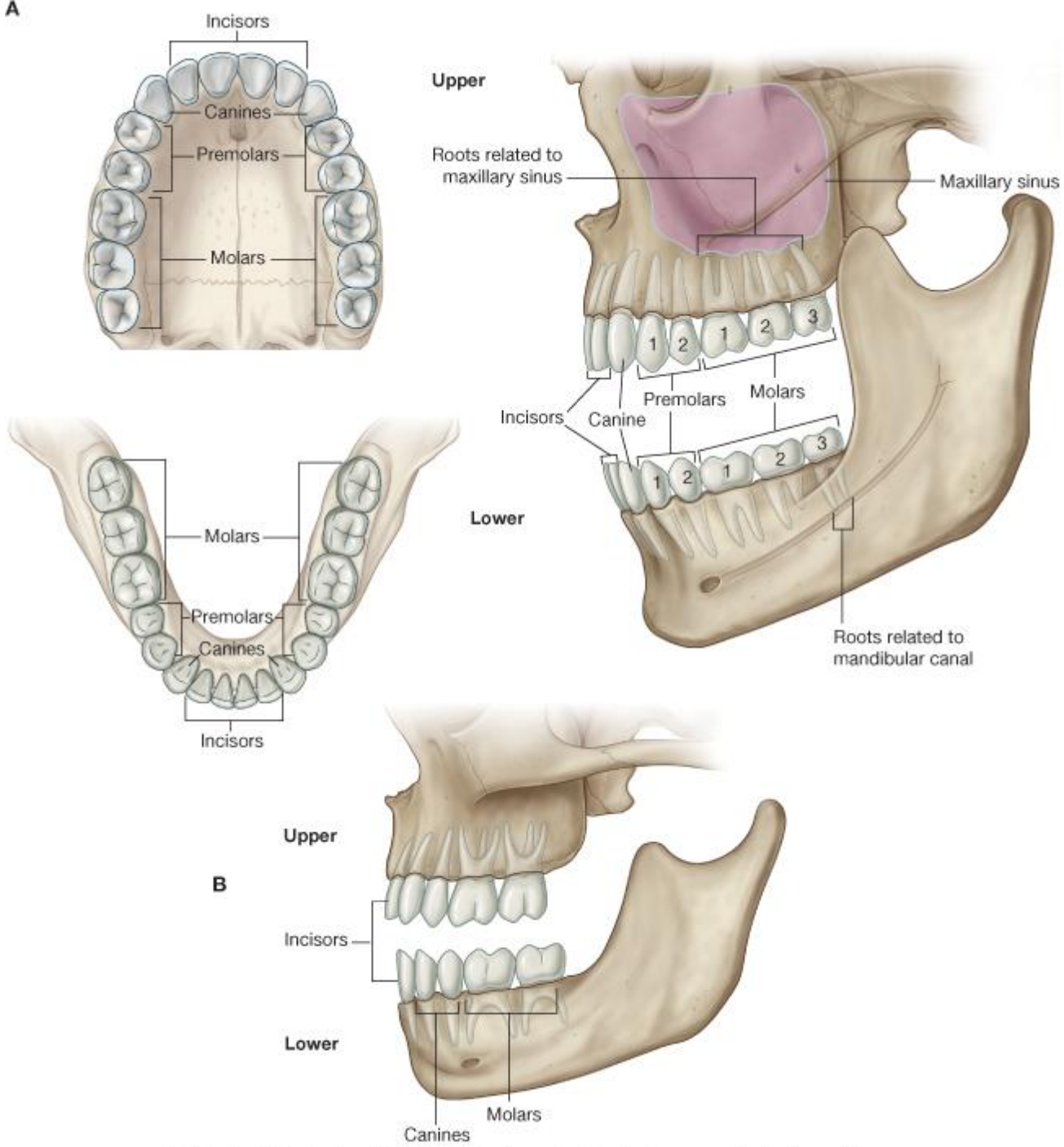
→ inf. alveolar nerve for mandibular teeth

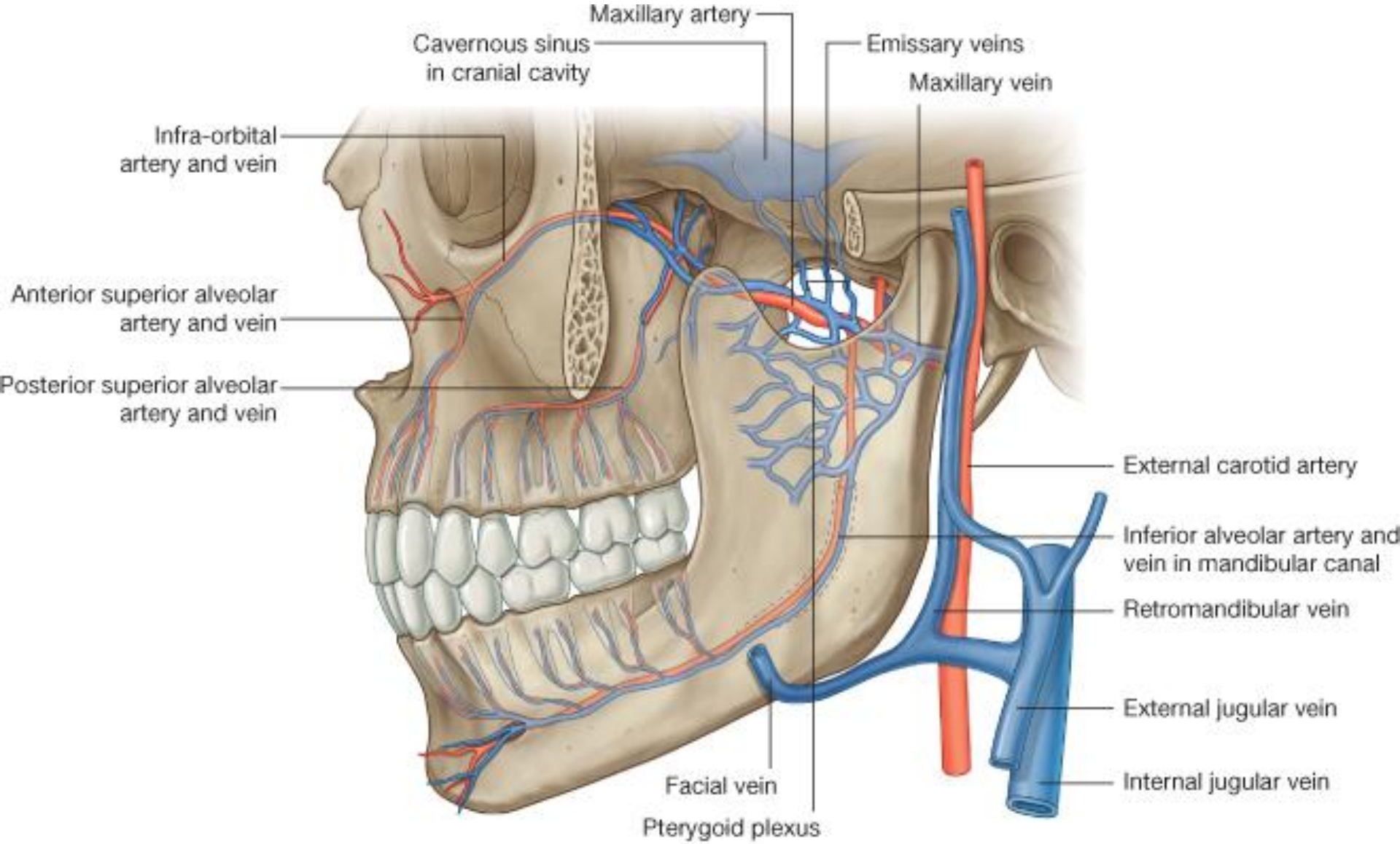

Crown
Neck
Root
Enamel
Dentine
Pulp cavity
(tooth cavity)
Cementum
Root canal
Apical foramen
(root foramen)

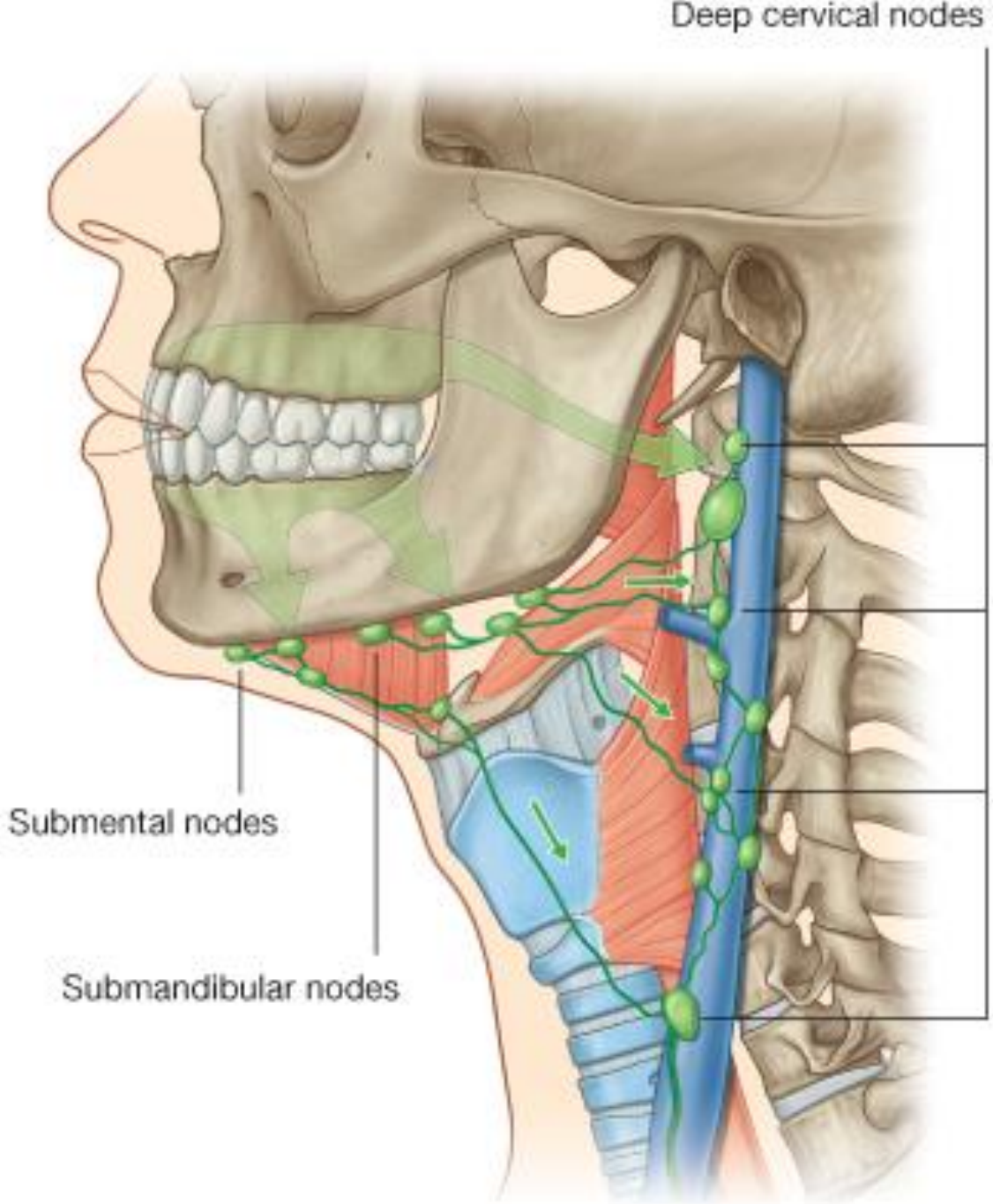
A

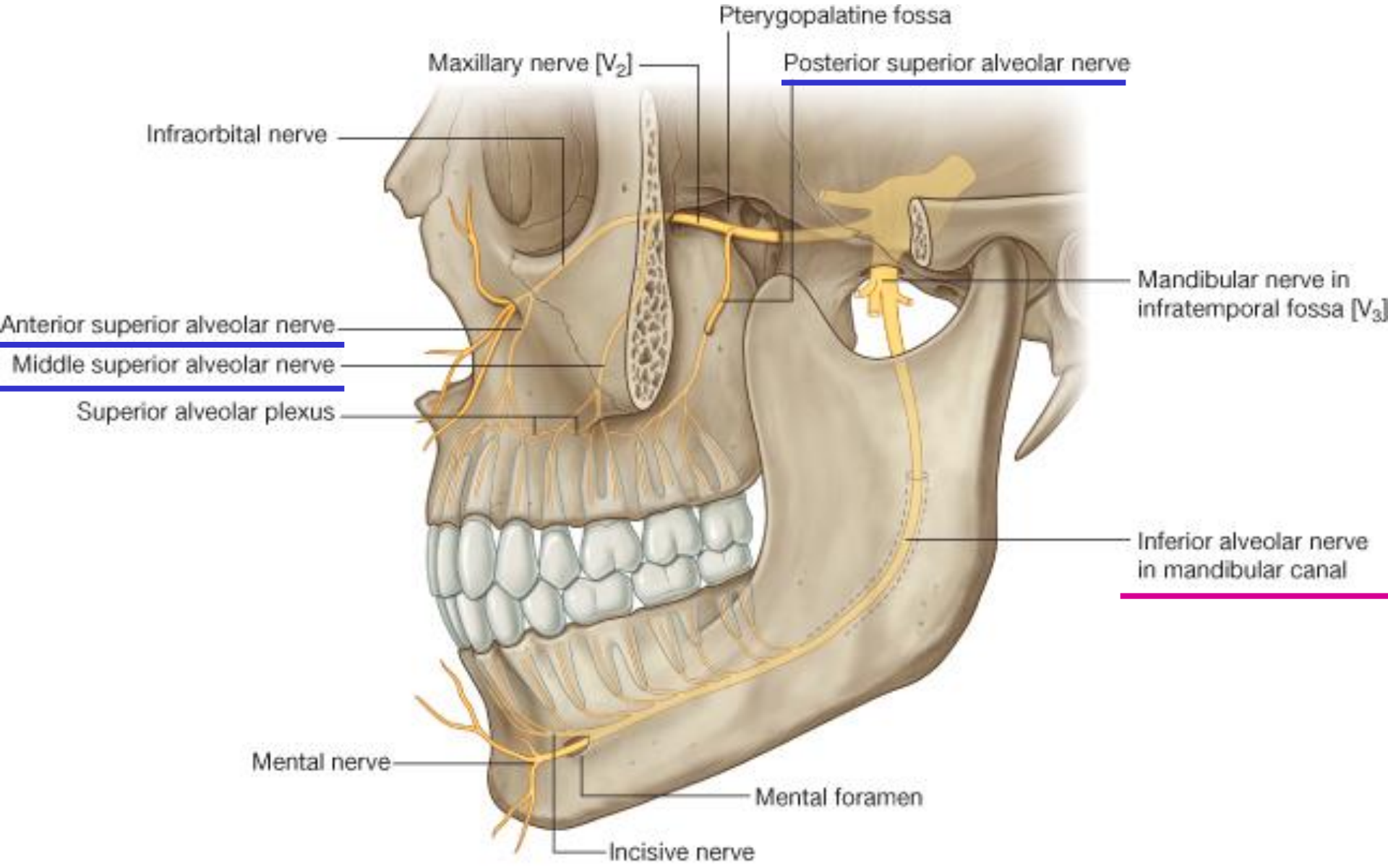

Crown
Neck
Root
Enamel
Dentine
Pulp cavity
(tooth cavity)
Cementum
Root canal
Apical foramen
(root foramen)

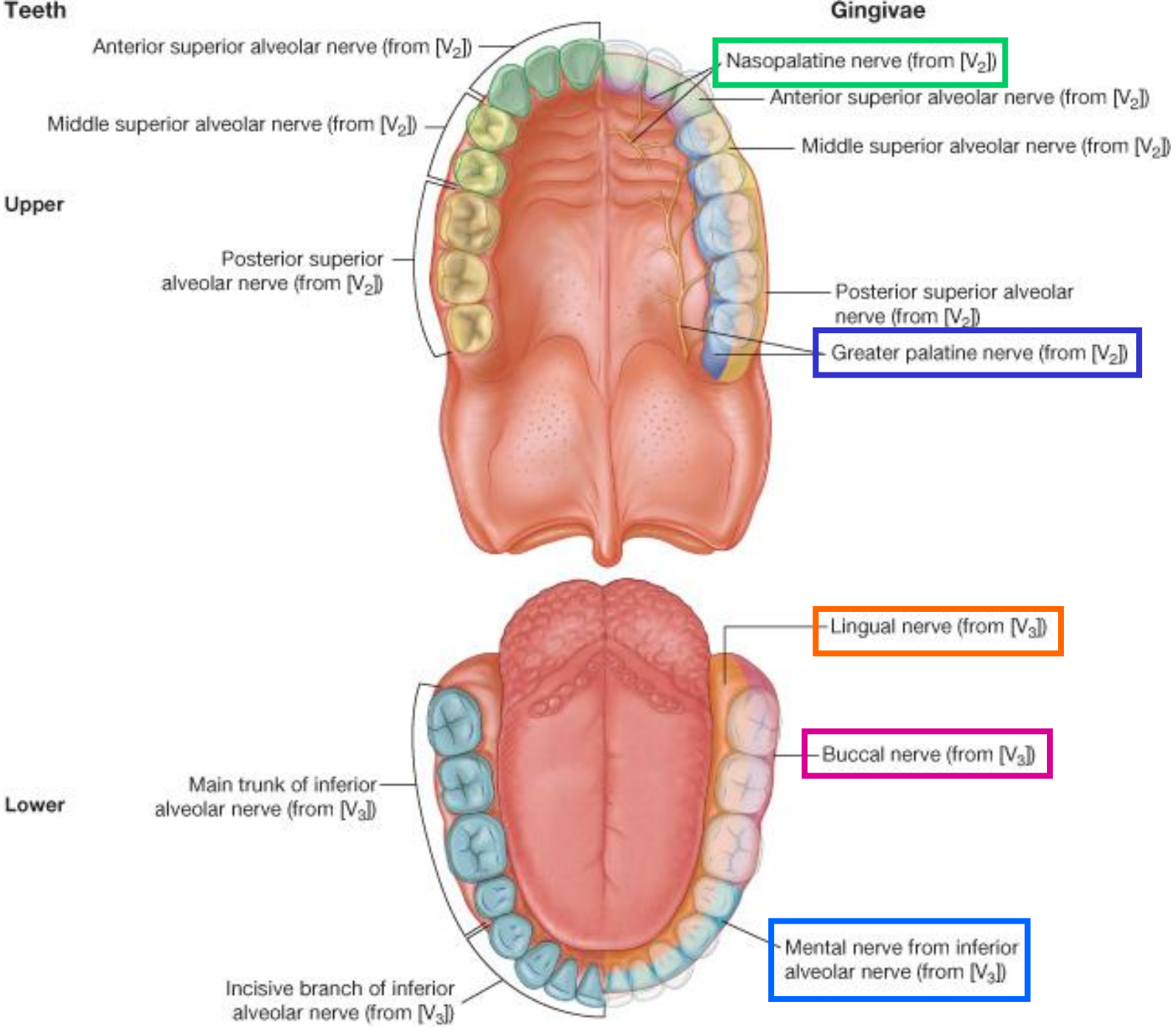
B











Dissection of Mouth

Palate, Tonsil and Pharyngeal wall

Hard palate and *soft palate*

1. Find **greater palatine foramen** and

   remove mucoperiosteum to identify

   greater palatine artery & nerve (anteriorly)
   lesser palatine artery & nerve(posteriorly)

Palatine tonsil

1. Find **palatine tonsil** between **palatoglossal arch** and **palatopharyngeal arch**.
2. If tonsil is absent, remove mucosa to study **tonsilar bed**.
3. Examine **bed of palatine tonsil**, and **tonsil branch of ascending palatine artery** & **tonsil branch of facial artery**.
4. Remove **pharyngobasilar fascia** to expose **palatopharyngeus** and **superior constrictor**.
6. Remove small part of superior constrictor just anterior to palatopharyngeus, and expose **styloglossus** & **glossopharyngeal nerve** (IX).

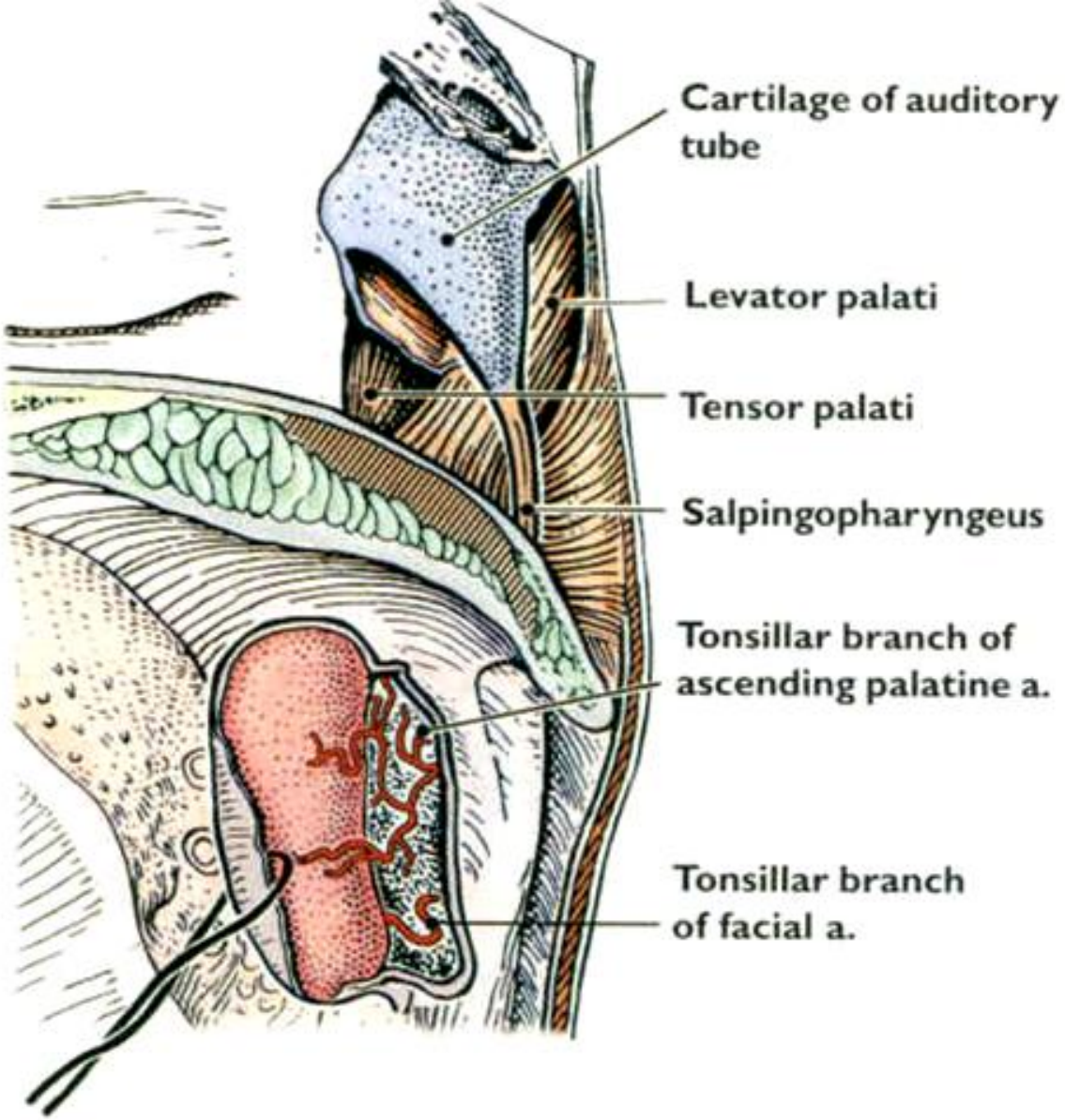


Figure 7.91. Second step in removal of the palatine tonsil: free the anterior and superior borders by blunt dissection; separate the inferior pole from the lymphoid tissue of the tongue.

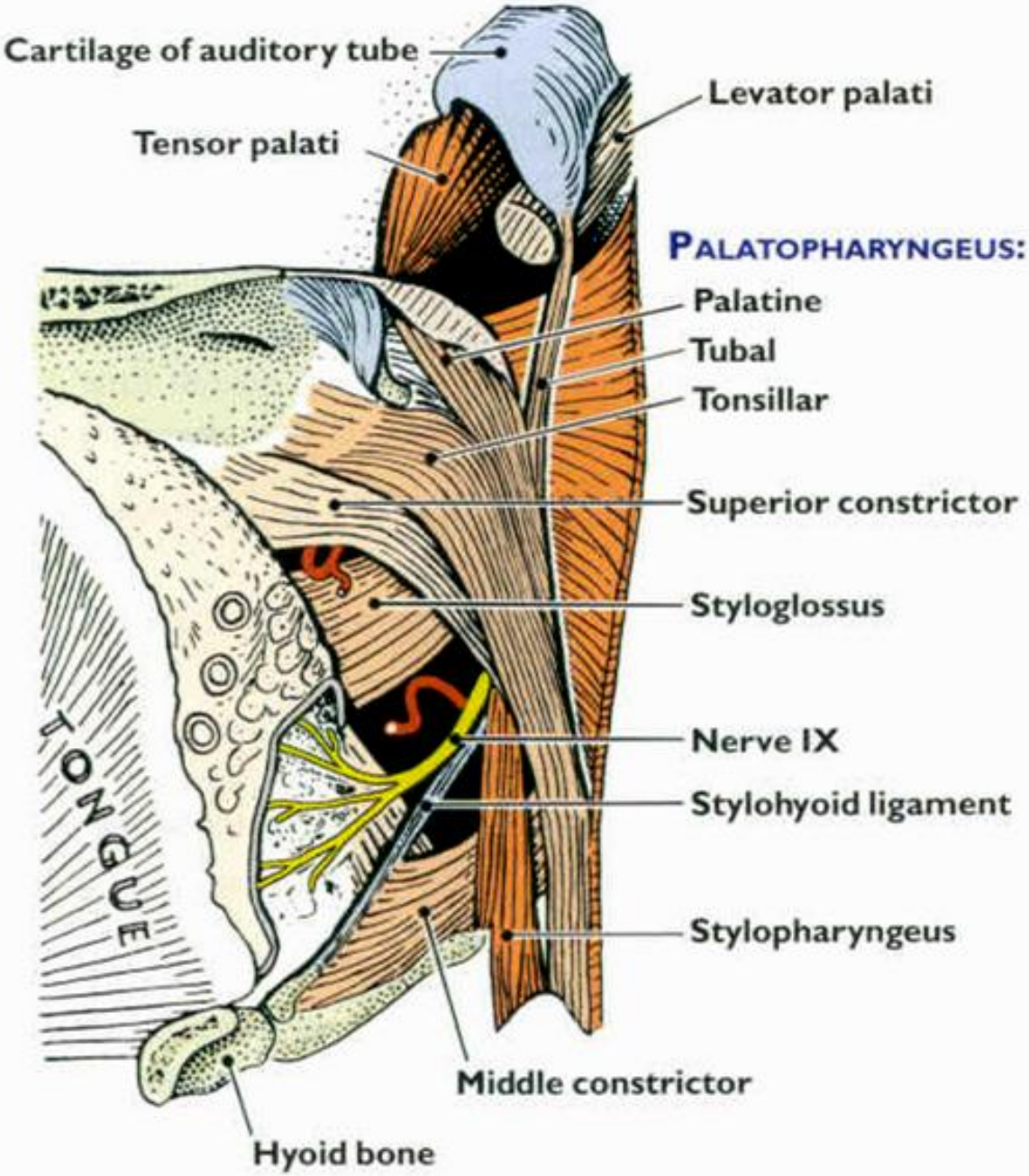


Figure 7.92. Bed of palatine tonsil; dissection of nasopharynx.

Pharyngeal wall

1. Remove mucosa to expose **palato-pharyngeus**:

2. Examine **pterygo-mandibular raphe**
   (origin of **superior constrictor** and **buccinator**).

3. Examine 1st gap:
   auditory tube, levator veli palatini &
   ascending pharyngeal artery
   ascending palatine artery

Levator veli palatini and tensor veli palatini

1. Posterior view, examine the **levator veli palatini**
2. Cut **levator veli palatini** close to the base of skull and reflect it inferiorly.
3. Expose **tensor veli palatini** (arise from **scaphoid fossa**), identify **hamulus of medial pterygoid plate**.
4. Remove part of **tensor veli palatini** to expose **mandibular nerve (V3)** from medial side.
5. To identify **otic ganglion** near **foramen ovale**.

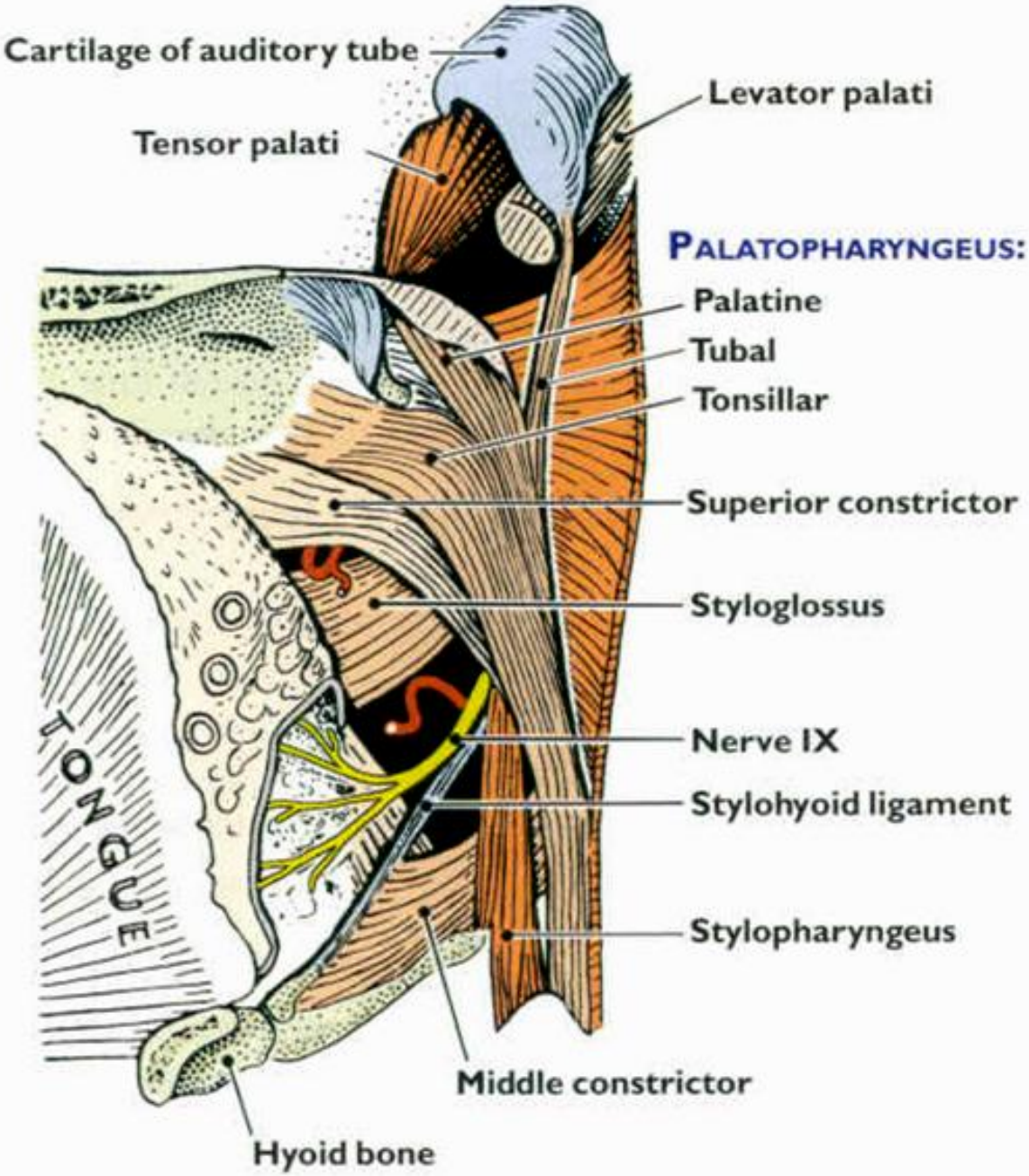


Figure 7.92. Bed of palatine tonsil; dissection of nasopharynx.

Mouth and Tongue

1. Identify **sublingual salivary gland**, **submandibular duct**, **lingual nerve**, **submandibular ganglion** & **hypoglossal nerve**.
2. Detach **mylohyoid muscle** from **hyoid bone** to expose **hyoglossus muscle**.
3. Examine **hypoglossal nerve, lingual nerve** and **lingual artery**.
4. Detach **hyoglossus muscle** from **hyoid bone** to expose **lingual artery and its branches**.
5. Examine **styloglossus** (its fibers interdigitate hyoglossus), **genioglossus** & **geniohyoid** ms.

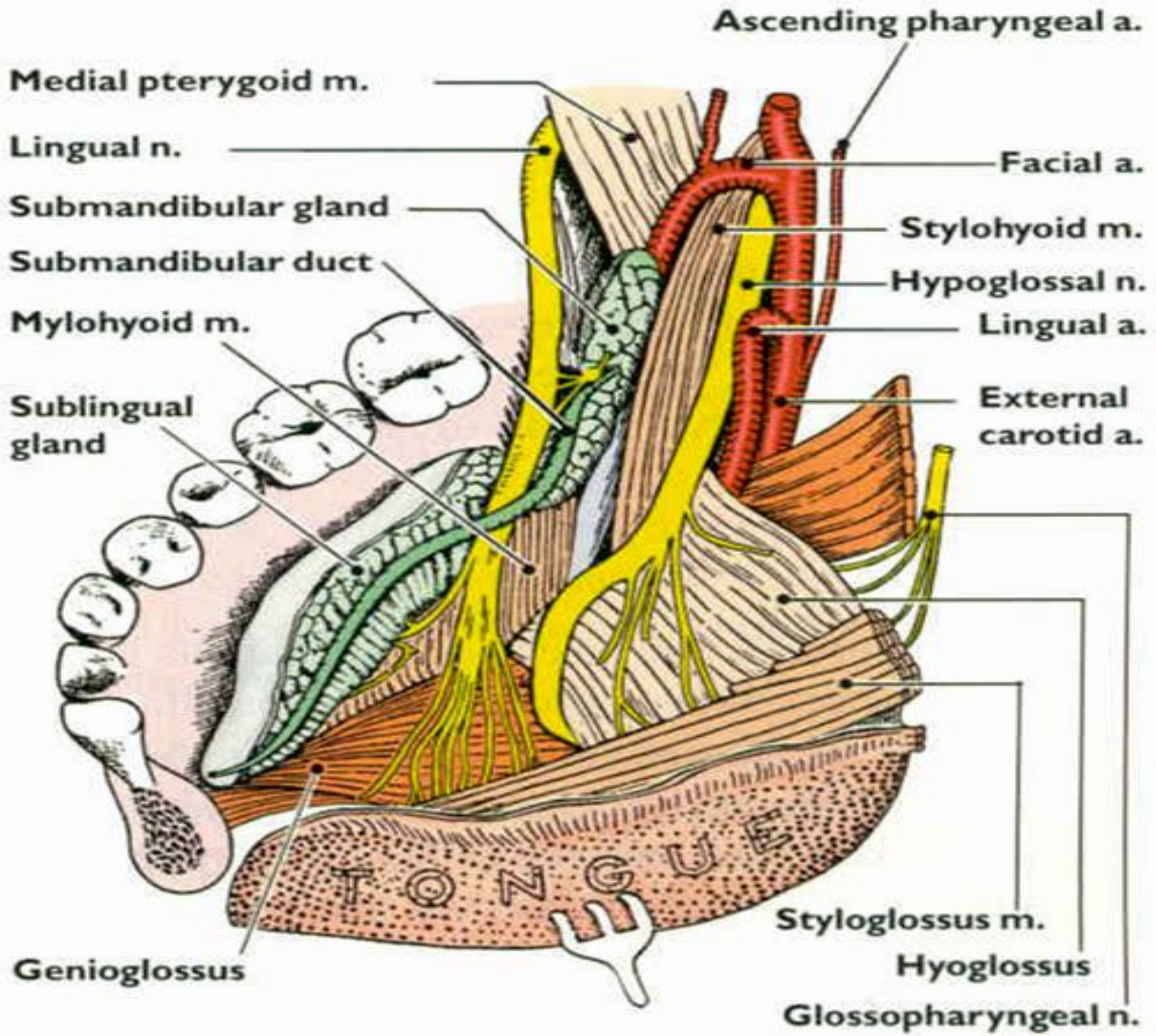


Figure 7.95. Dissection of the floor of the mouth (right side).

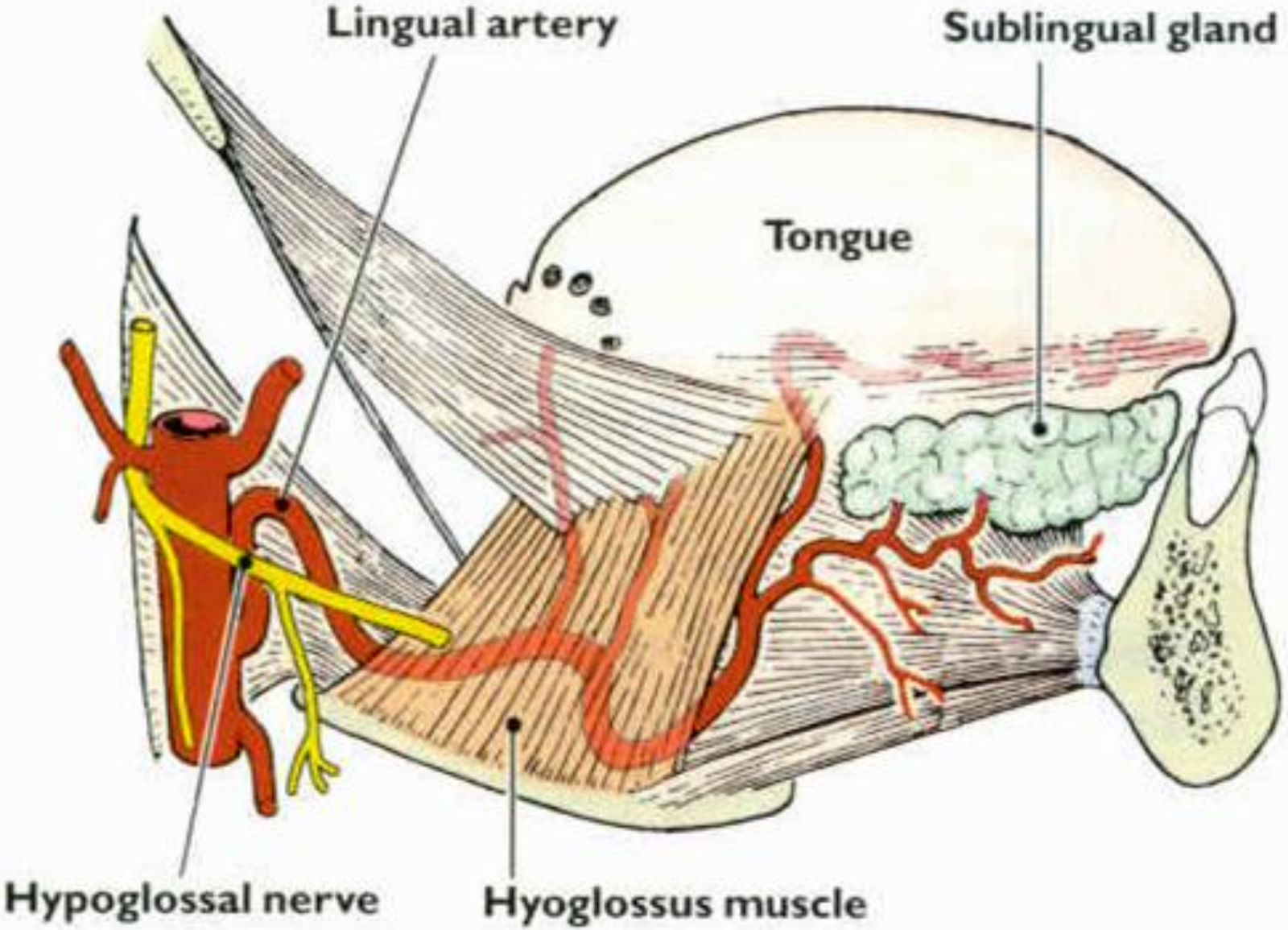


Figure 7.96. The hyoglossus muscle intervenes between the lingual artery and the hypoglossal nerve (XII).