Oral cavity – Hard and soft palate Pharynx

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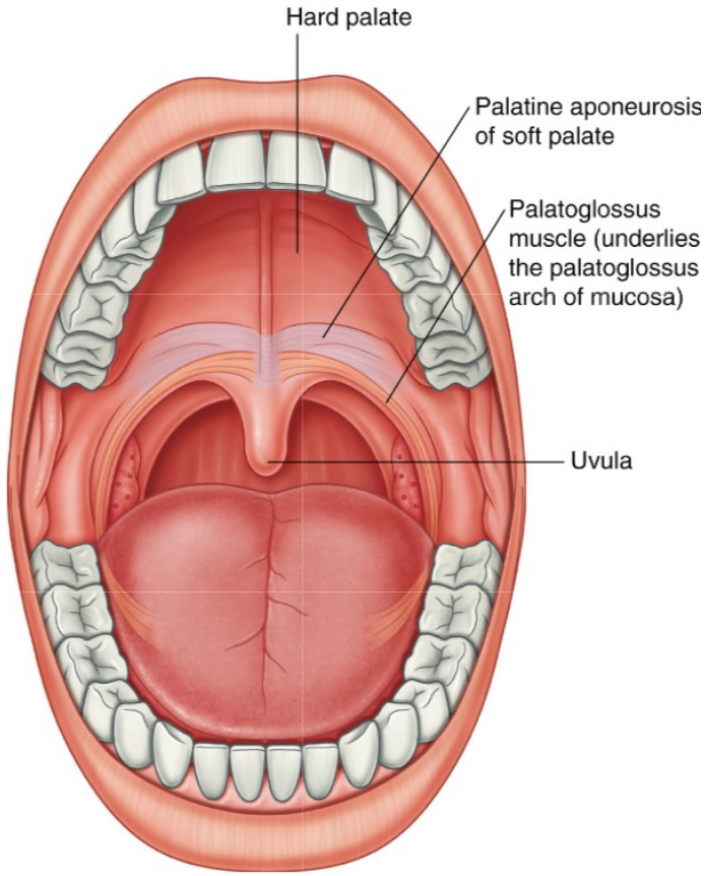
Oral cavity

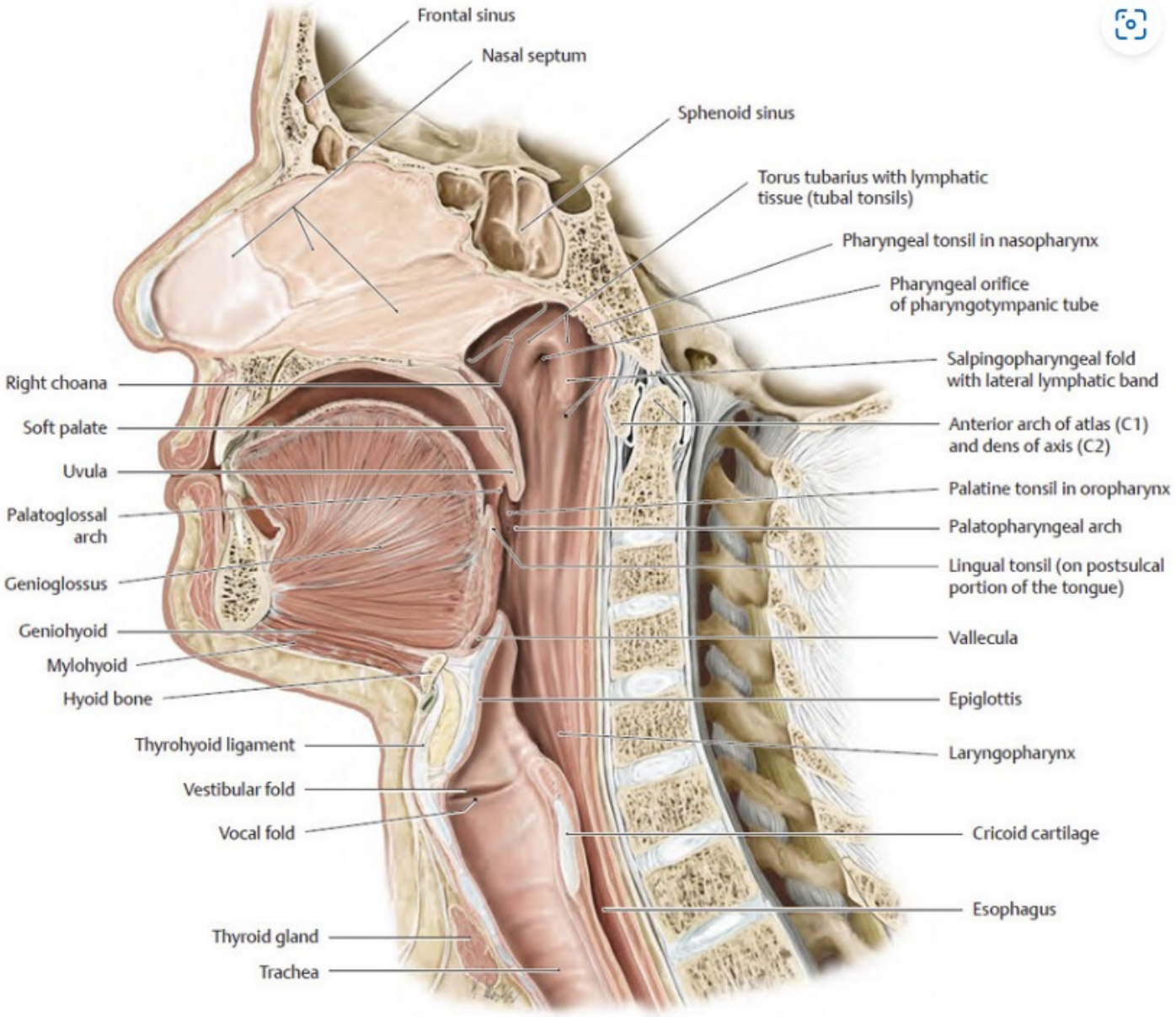
Oral vestibule: The space bounded externally by lips and cheek, internally by teeth, gingiva and alveolar processes. It has a horseshoe shape.

Oral cavity proper: is bounded at the sides and in front by the alveolar process (containing the teeth) and at the back by the isthmus of the fauces (oropharyngeal isthmus). Its roof is formed by the hard palate at the front, and the soft palate at the back. The floor is formed by the mylohyoid muscles.

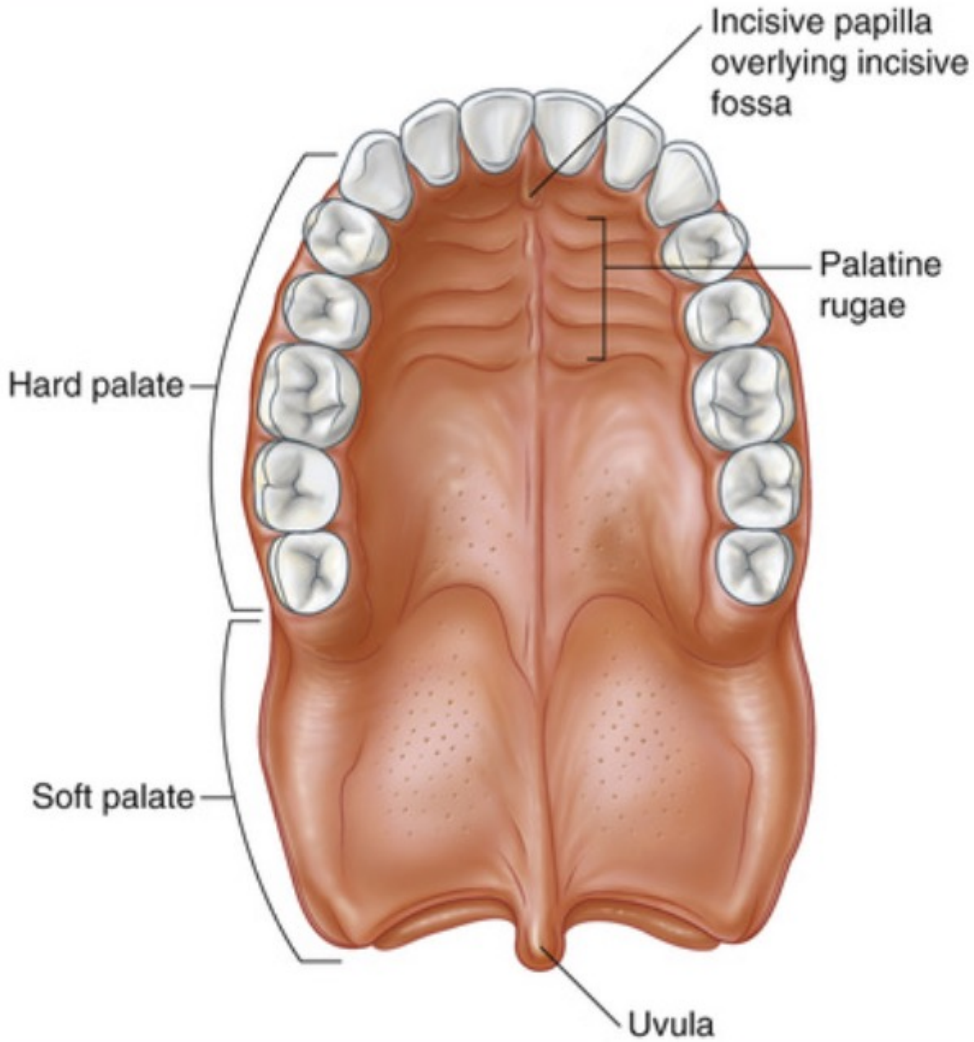


The oral cavity is located inferior to the nasal cavity and anterior to the pharynx.

The roof of the oral cavity is formed by the hard palate in its anterior two thirds and by the soft palate in its posterior one third



The palate forms the roof of the oral cavity and the floor of the nasal cavity. It is divided into a bony hard palate and a muscular soft palate.



Hard palate

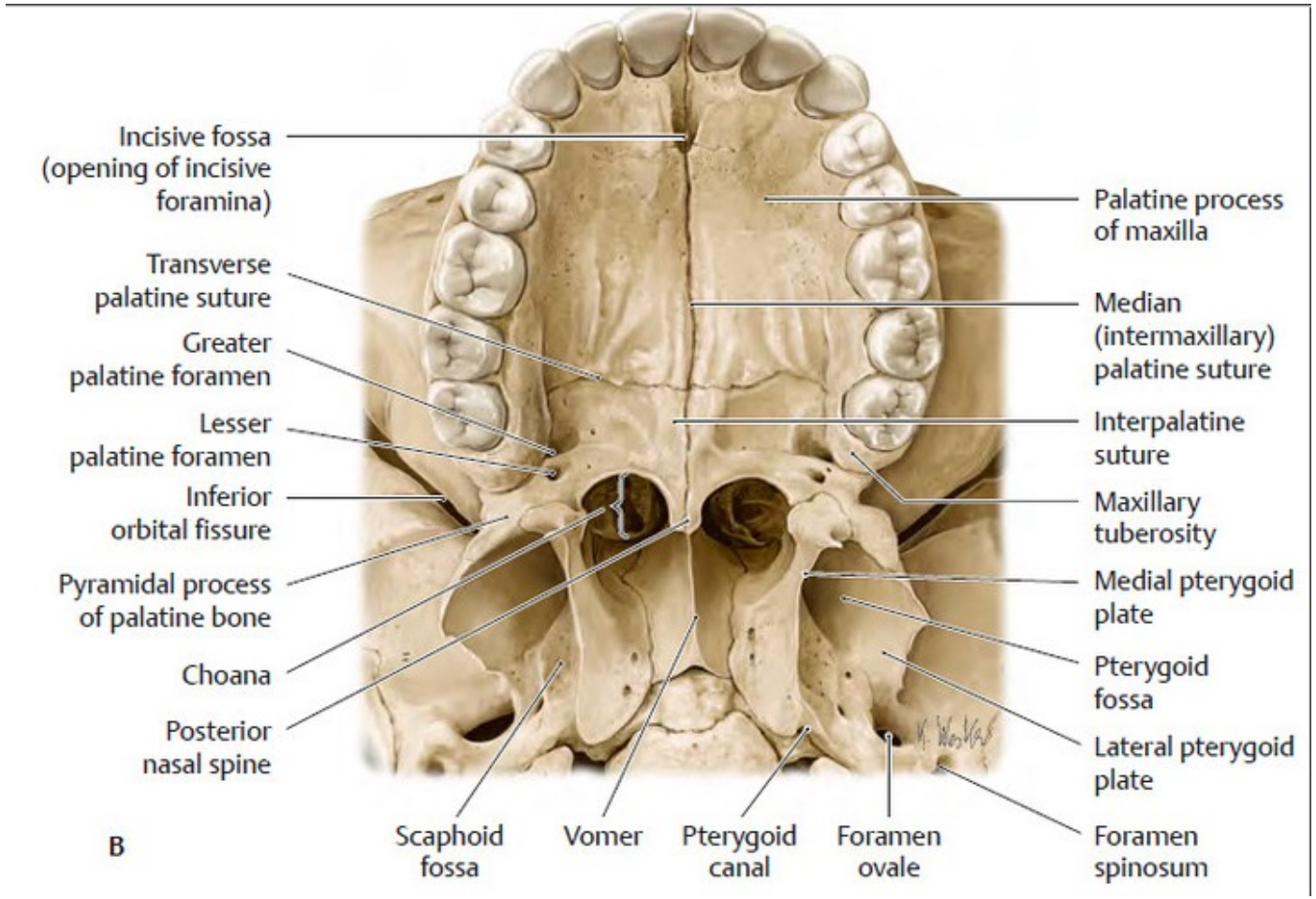
The palatine processes of the maxillae form the anterior three-quarters of the hard palate. The horizontal plates of the palatine bones form the posterior one-quarter. In the oral cavity, the upper alveolar arch borders the hard palate anteriorly and laterally. Posteriorly, the hard palate is continuous with the soft palate.

Foramen incisivum located 8-10 mm behind the central incisors (nasopalatine n + vessels)

Hard palate consists of a bony plate covered above and below by mucosa:

- Above, it is covered by respiratory mucosa and forms the floor of the nasal cavities.
- Below, it is covered by a tightly bound layer of oral mucosa.

The mucosa is tightly bound to the periosteum of the bones of the hard palate. The mucosa may become stripped off of the periosteum when local anesthetic solution is introduced into the palate, which is very painful.

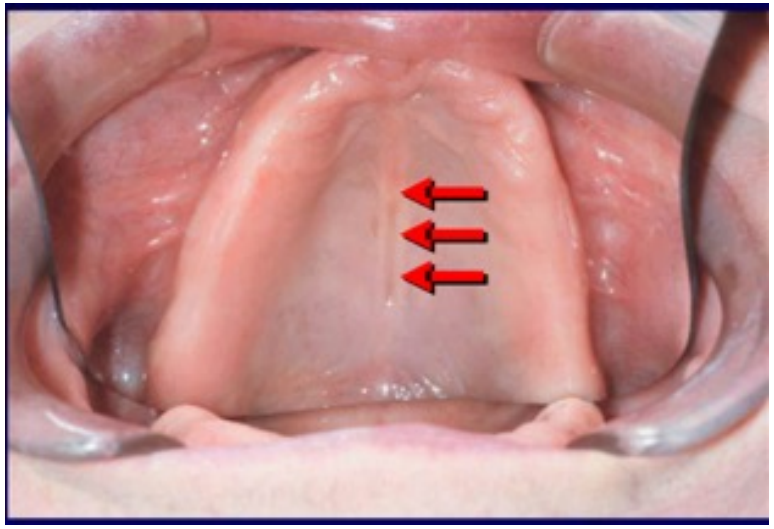


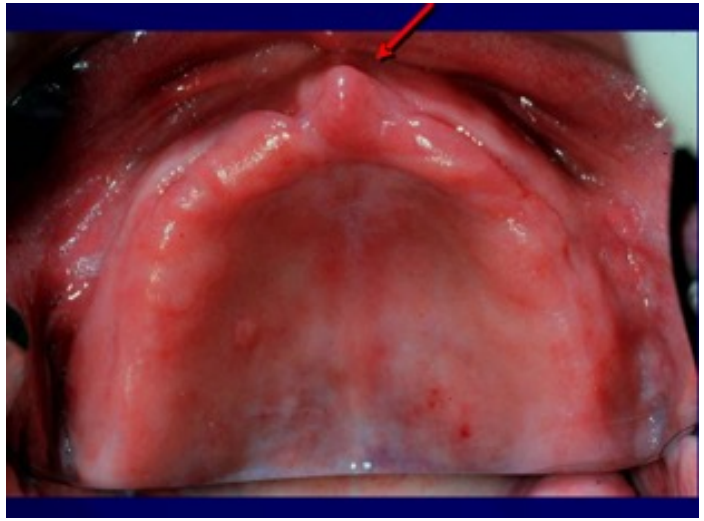
Hard palate

The mucosa of the hard palate in the oral cavity possesses numerous transverse palatine folds (palatine rugae) - It is covered with tough masticatory mucosa, which forms irregular folds anteriorly, known as rugae, which aid in guiding food toward the pharynx.

There ia a median longitudinal ridge (palatine raphe), which ends anteriorly in a small oval elevation (incisive papilla).

Incisive papilla: on the mucosa visible in the midline just behind the central incisors, 4 mm long and 2 mm wide. Evaluates the consistency and temperature of food intake. Incisive papilla is used as a landmark for setting of teeth when making dentuer.





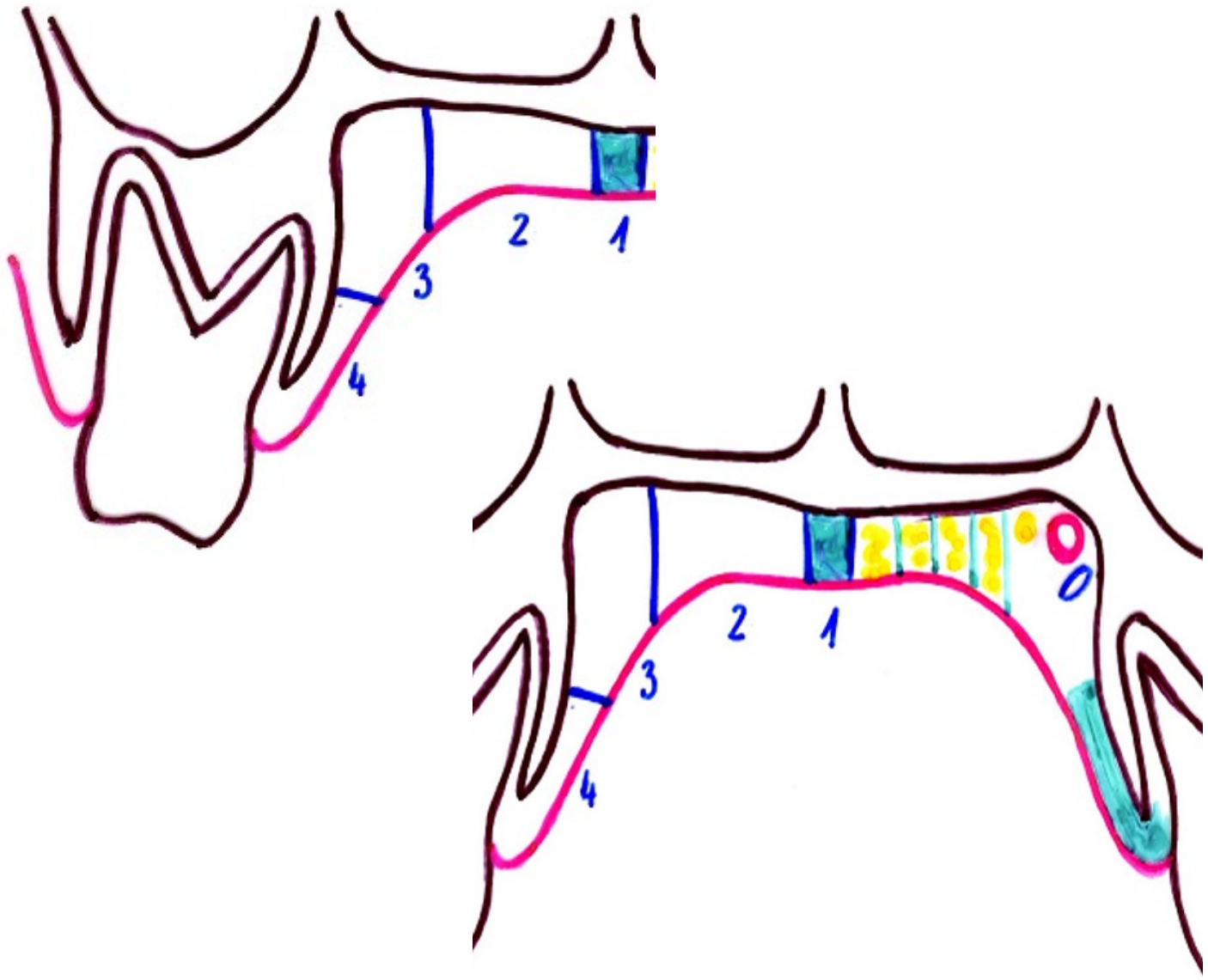
Zones of hard palate according to the content of submucousal connective tissue:

Zone 1: Palatine raphe – MUCOPERIOSTEUM

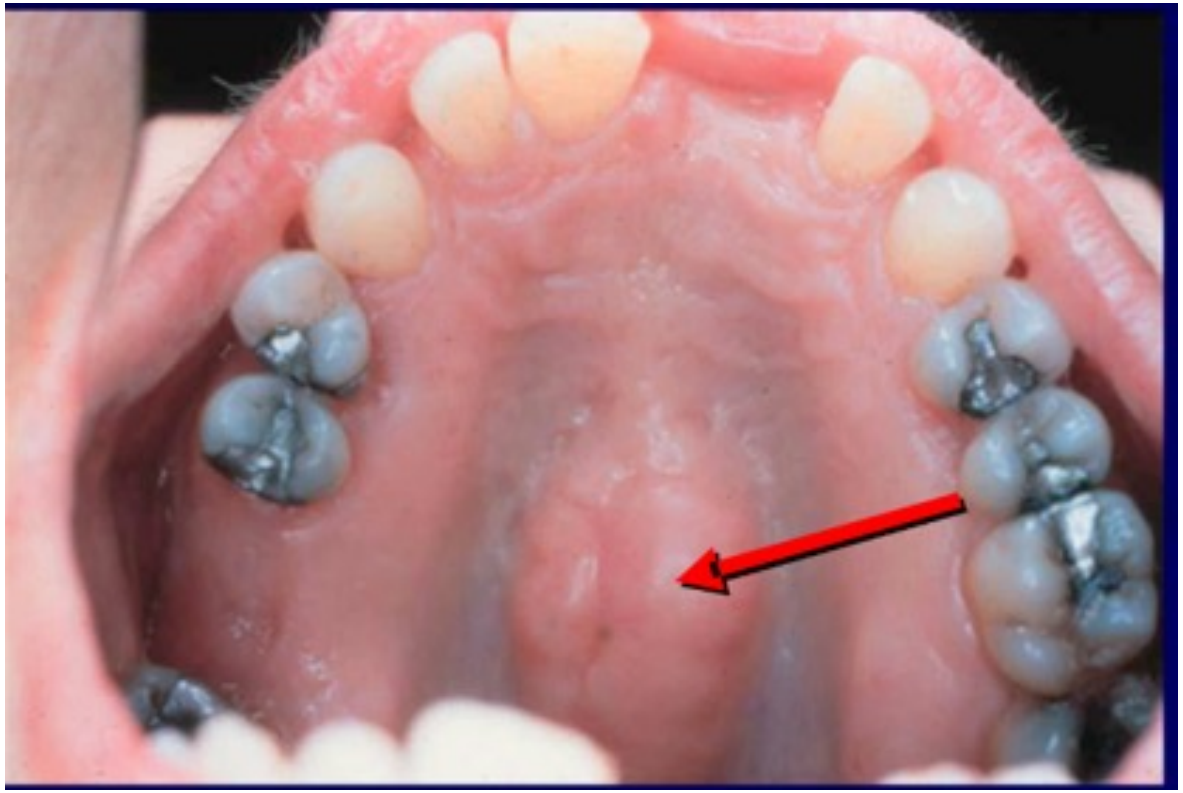
Zone 2: between 1 and 3 (anteriorly containing fat- till level of the canine and posteriorly containing mucouse Palatine glands- convex till level of M1)

Zone 3: Palatine sulcus + incisive papilla containing submucousal loose connective tissue – Greater palatine N and vesselse (nerve located more medially)

Zone 4: GINGIVA - MUCOPERIOSTEUM



Torus palatinus

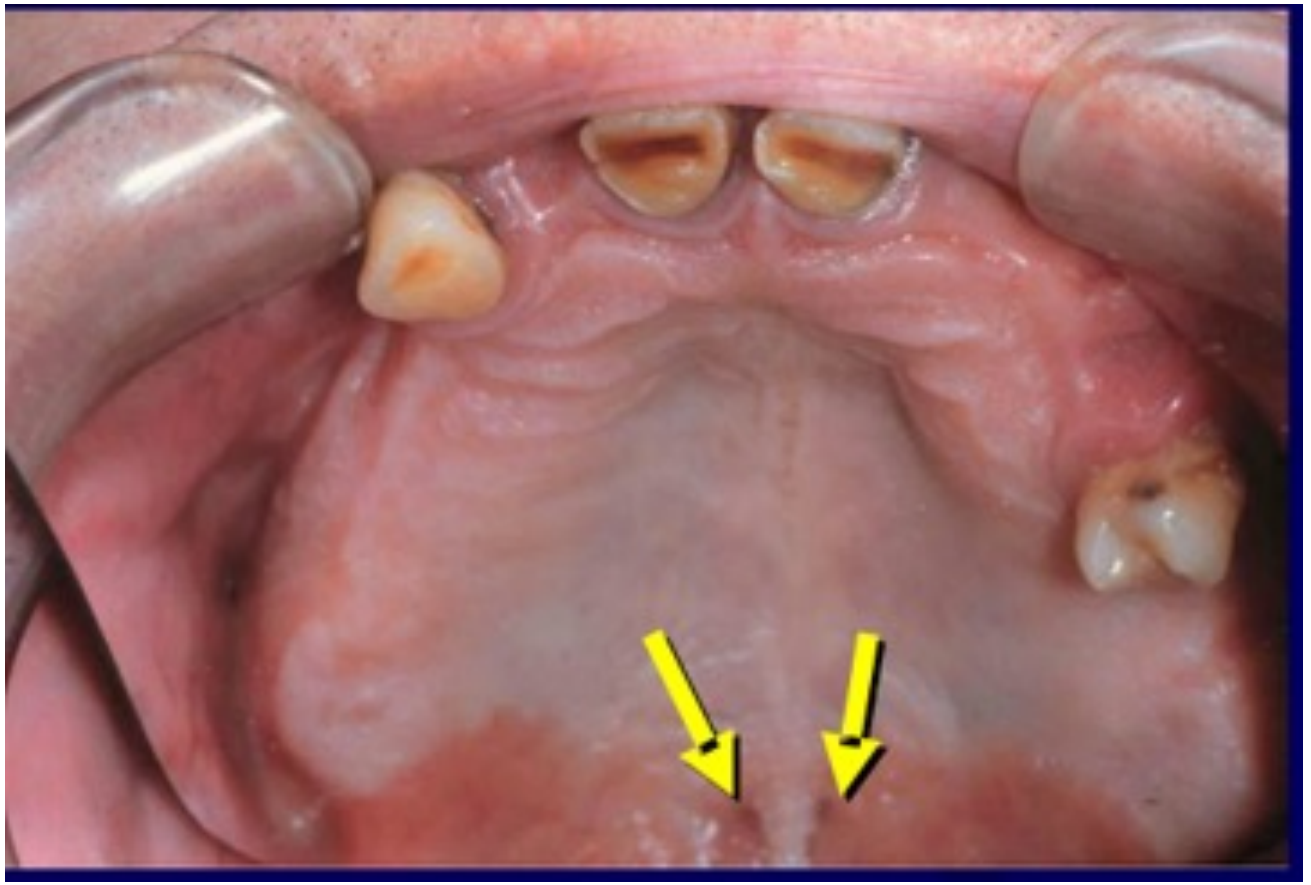


Foveae palatinae

Located at the posterior end of the hard palate near the median palatine raphe

There are 2 shallow fossae and they are Place of opening of the mucinose glands of posterior hard palate and soft palate.

Mucous membrane has orange color.

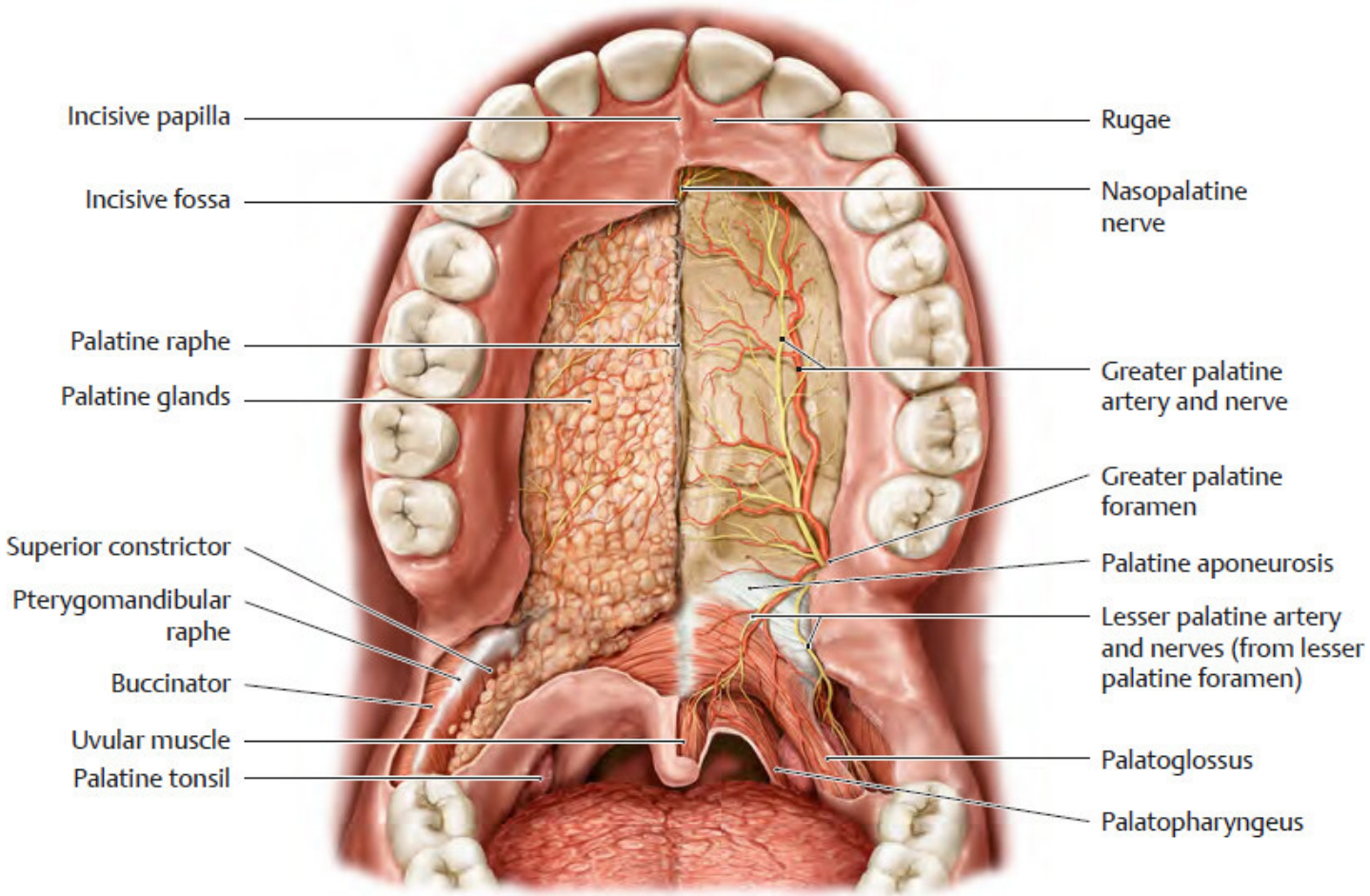


Neurovasculature of the hard palate

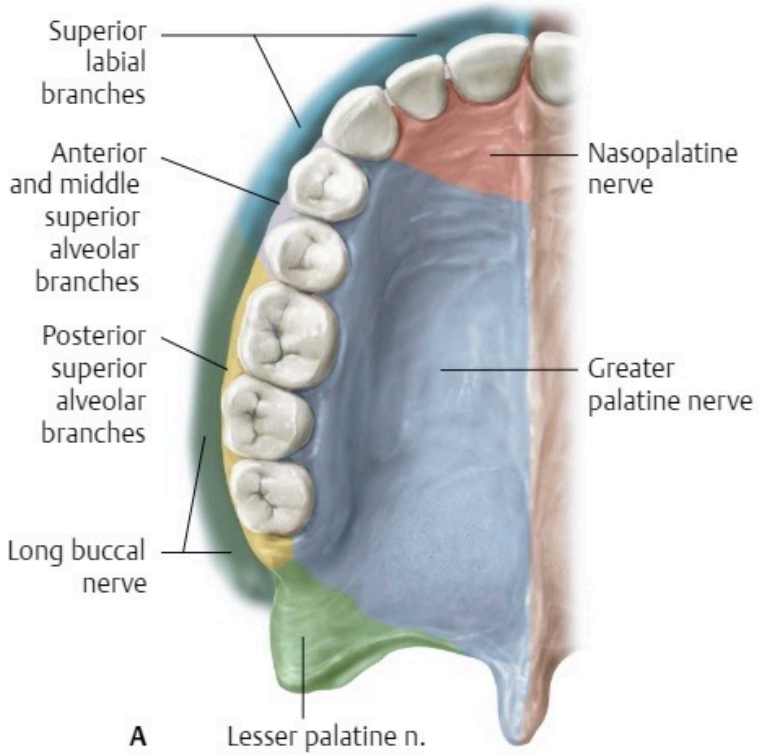
Blood supply	Venous drainage	Innervation	Lymphatic drainage
Greater palatine a., Nasopalatine a. Sphenopalatine a.*	Pterygoid plexus	•Anterior one third: nasopalatine n. (from CN V_2) •Posterior two thirds: greater palatine n. (from CN V_2)	•Submandibular nodes •Superior deep cervical nodes •Retropharyngeal nodes (rarely)
*Supplies the aspect of the hard palate that forms the floor of the nasal cavity.			

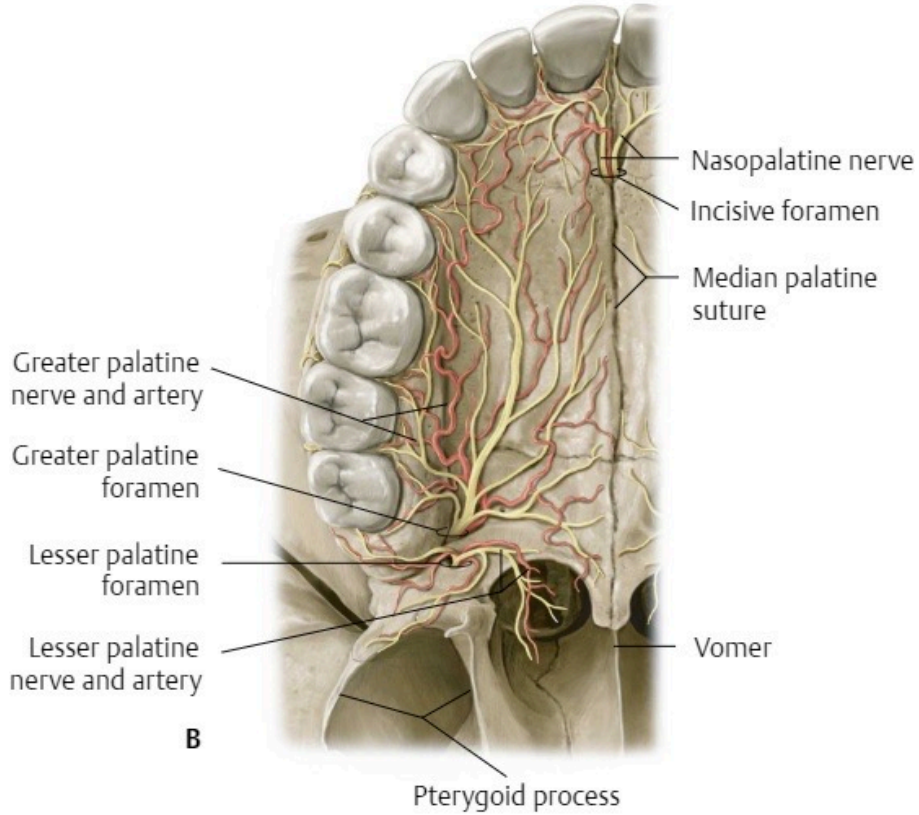
The hard palate receives it blood supply from the greater palatine artery which arises from the descending palatine artery a branch of maxillary artery and nasopalatine artery which arises from the sphenopalatine artery a branch of maxillary artery

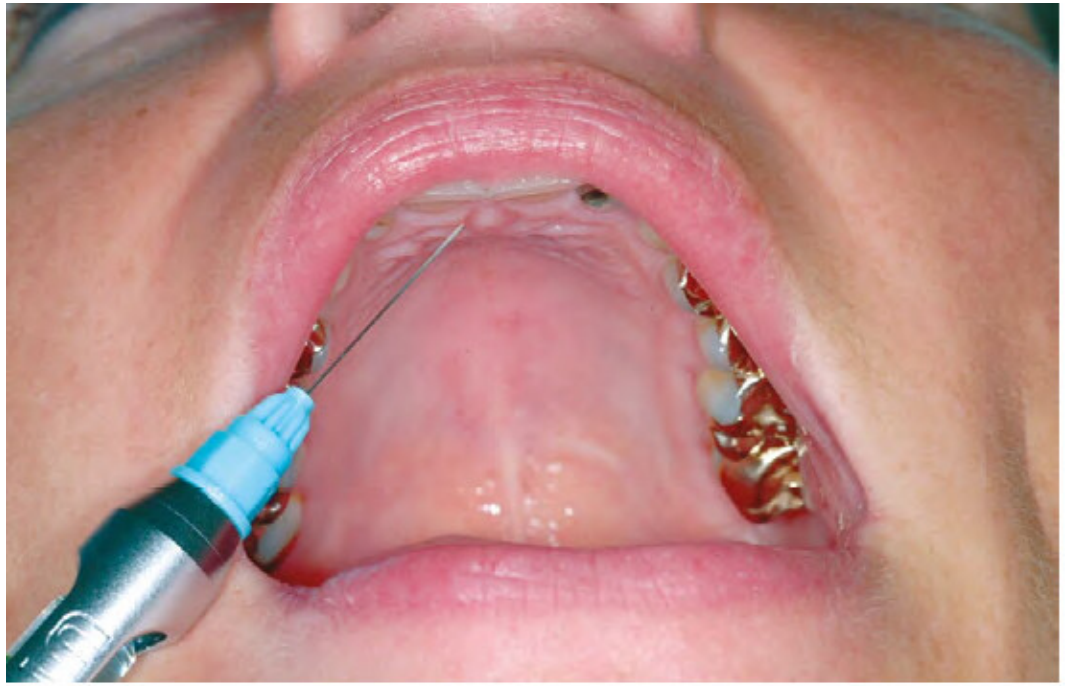
This view also shows the pterygomandibular raphe, which is a ligament formed from the buccopharngeal fascia. It attaches superiorly to the pterygoid hamulus and inferiorly to the posterior end of mylohyoid line of the mandible (retromolar triangle). The buccinator muscle is attached to the pterygomandibular raphe anteriorly and the superior constrictor of the pharynx posteriorly. The raphe forms an important landmark for the administration of an inferior alveolar nerve block !!



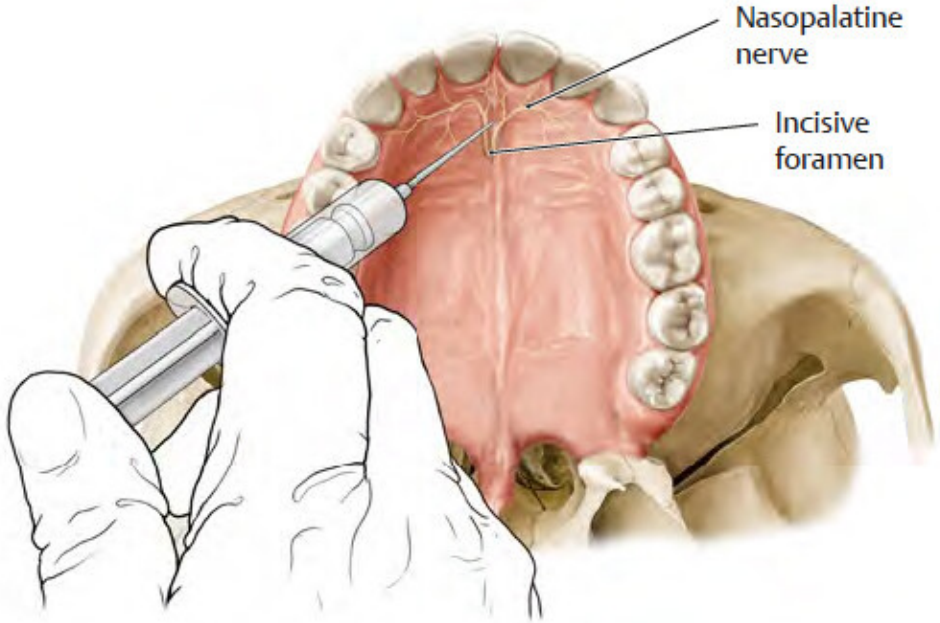
The hard palate is innervated by branches of the maxillary division of the trigeminal nerve (CN V_2). The anterior one third of the palate is innervated by the nasopalatine nerve, which emerges from the incisive foramen. The posterior two thirds is innervated by the greater palatine nerve, which emerges from the greater palatine foramen along with the greater palatine artery (and the lesser palatine nerves and artery, which innervates and supplies the soft palate).







A



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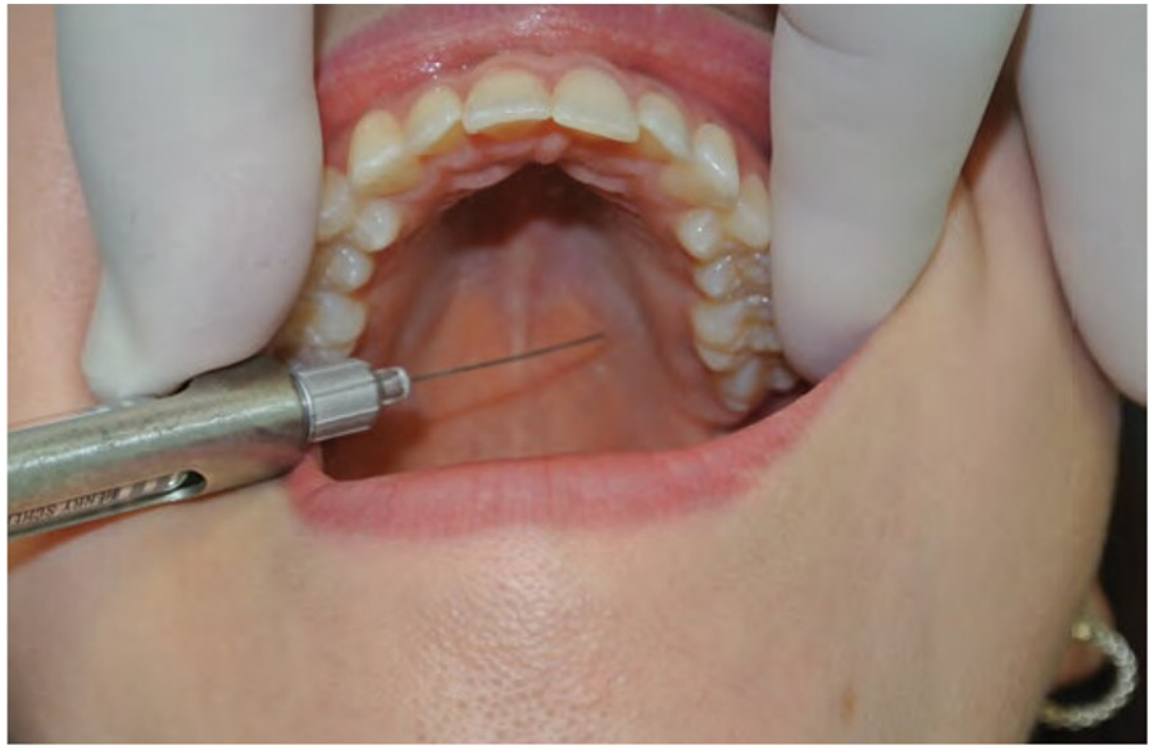
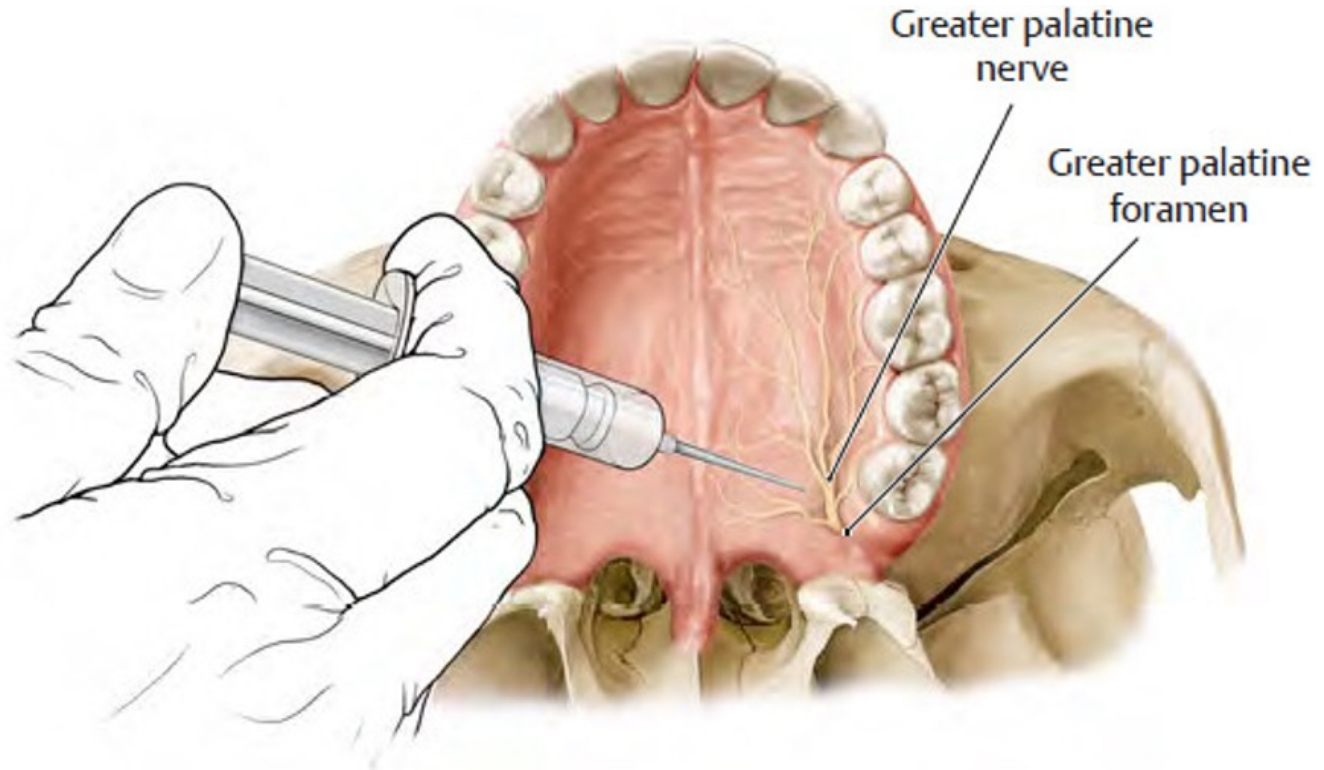
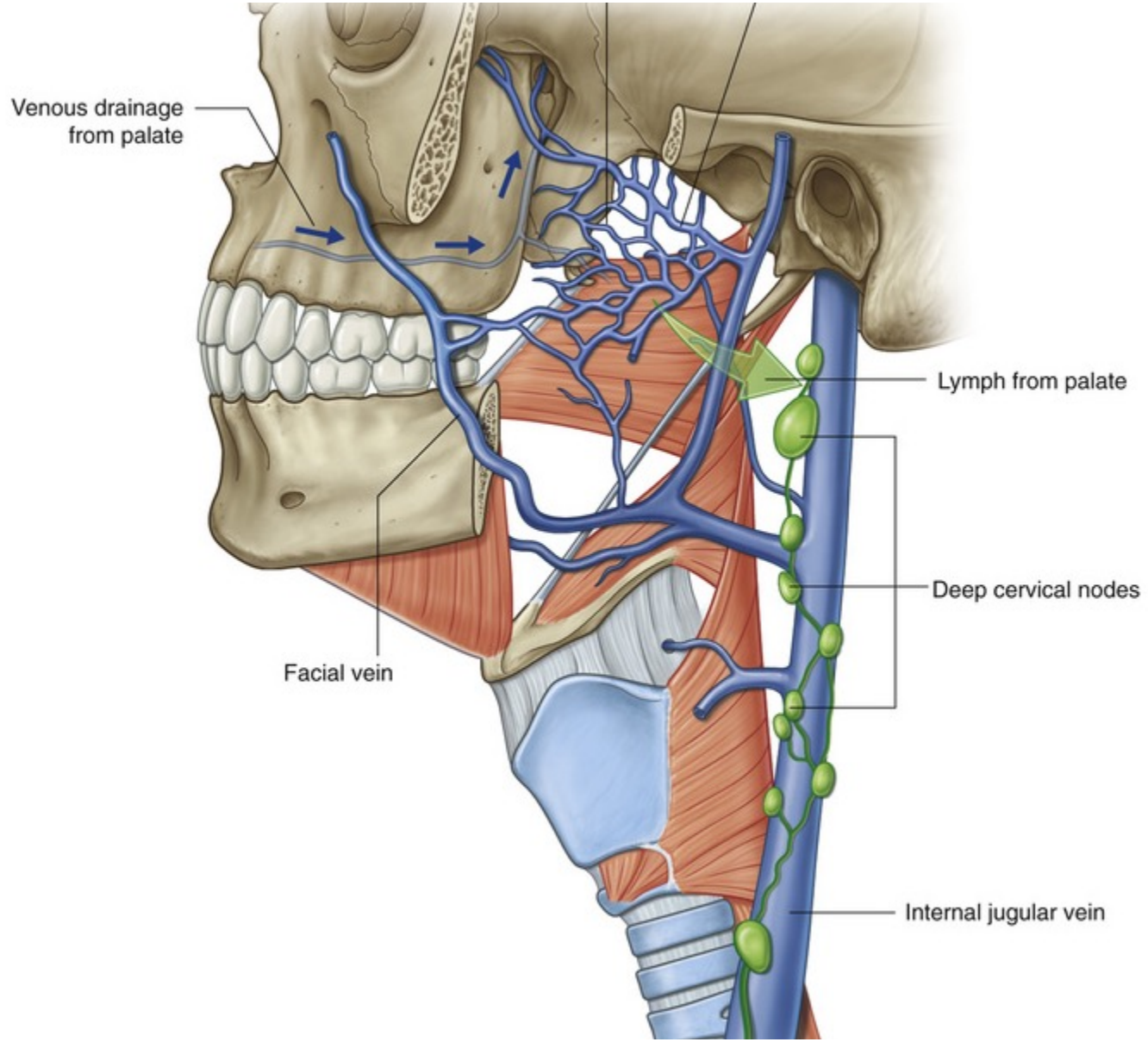




Venous and Lymphatic drainage

Veins drain to the pterygoid plexus.

Lymph from the hard palate most commonly drains to the submandibular nodes or directly to the superior deep cervical nodes.



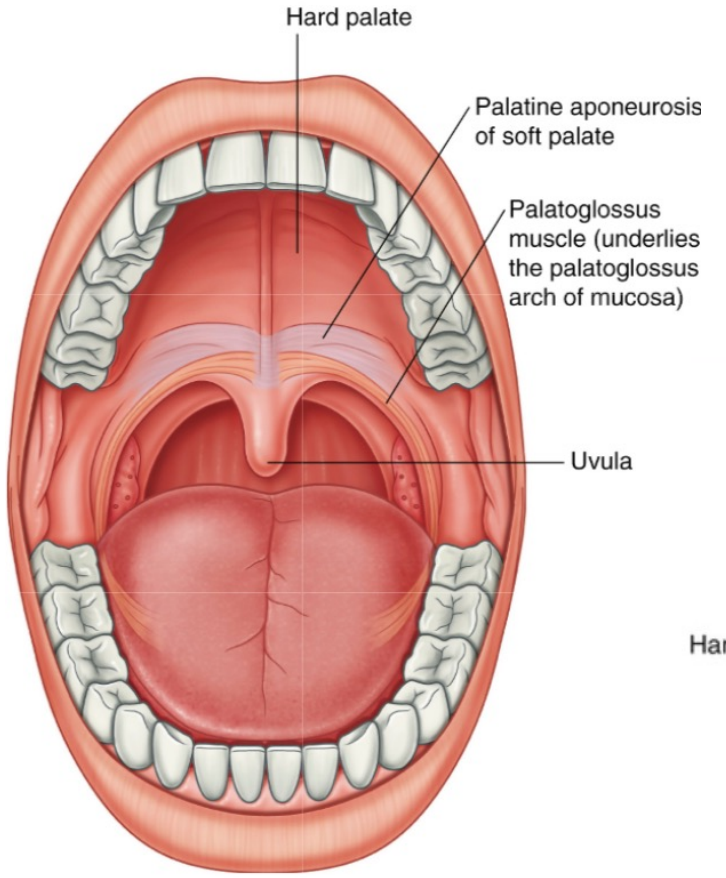
Soft palate

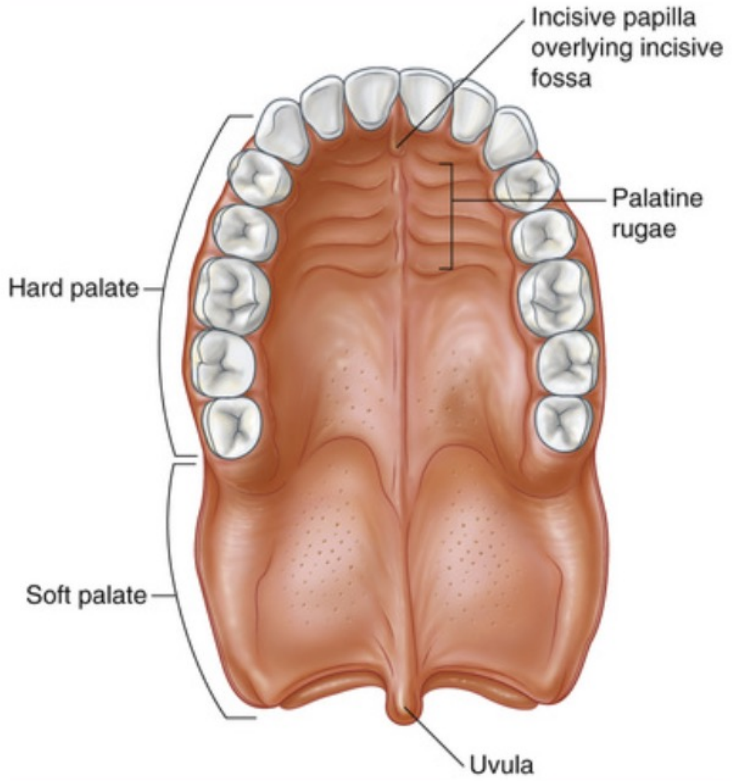
The soft palate continues posteriorly from the hard palate and acts as a valve that can be:

- **depressed to help close the oropharyngeal isthmus, and**
- **elevated to separate the nasopharynx from the oropharynx.**

The soft palate is formed and moved by five muscles and is covered by mucosa that is continuous with the mucosa lining the pharynx and oral and nasal cavities.

The small tear-shaped muscular projection that hangs from the posterior free margin of the soft palate is the uvula.





Muscles of the soft palate and pharyngotympanic tube

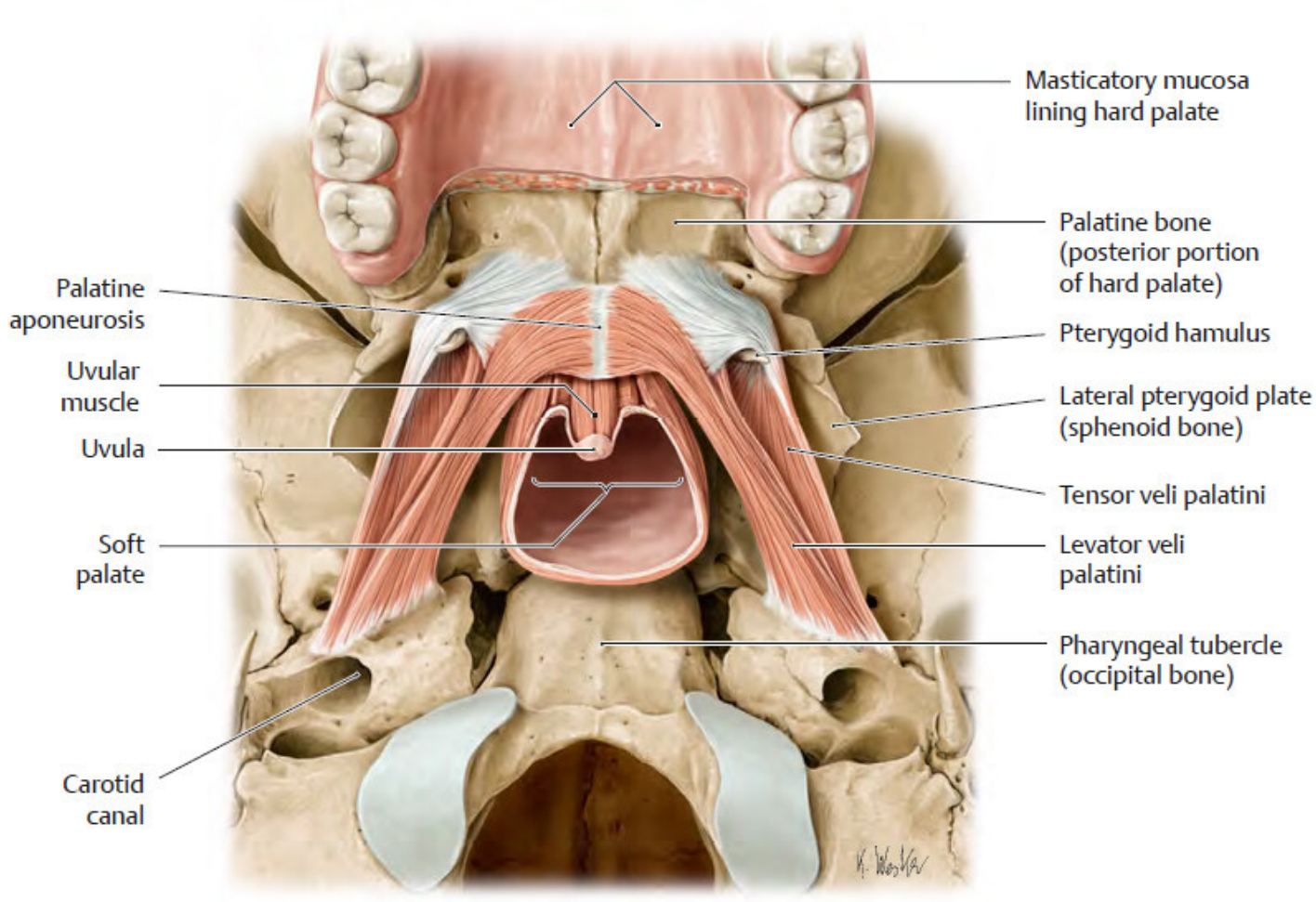
Inferior view.

The soft palate is the aponeurotic and muscular region hanging from the hard palate at the posterior portion of the oral cavity.

It separates the oropharynx from the nasopharynx, particularly during swallowing when it is tensed.

The palatoglossus and palatopharyngeus restrict the communication between the oral cavity and oropharynx.

The tensor veli palatini has a significant role in keeping open the pharyngotympanic (auditory) tube.

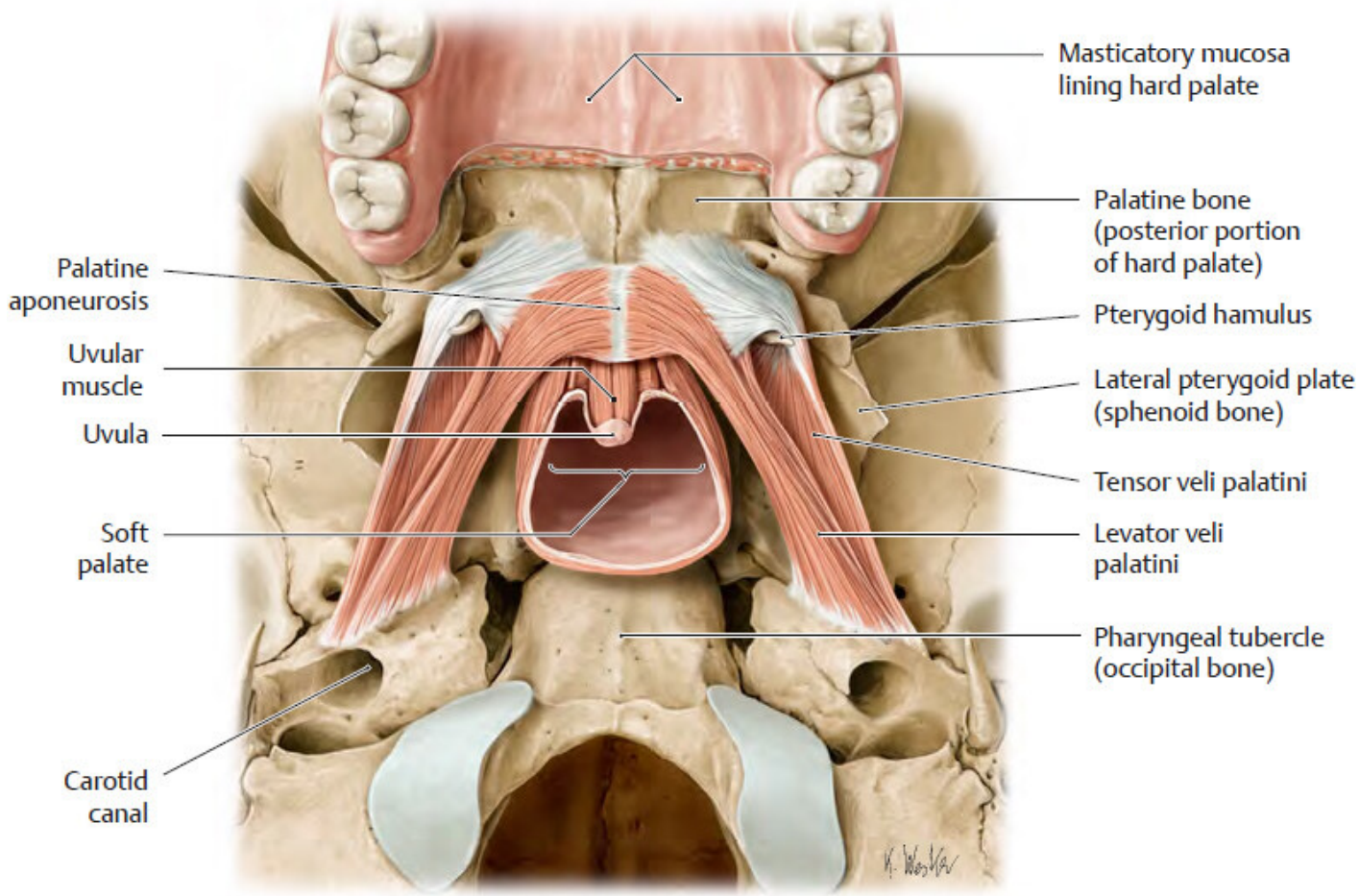


Muscles of soft palate

Five muscles on each side contribute to the formation and movement of the soft palate. Two of these, the **tensor veli palatini and levator veli palatini, descend** into the palate from the **base of the skull.**

Two others, the **palatoglossus and palatopharyngeus, ascend** into the palate from the **tongue and pharynx**, respectively.

The last muscle, the musculus uvulae, is associated with the **uvula.**



Muscles of the soft palate

Muscle	Origin	Insertion	Innervation	Action
Tensor veli palatini	Sphenoid bone (scaphoid fossa of pterygoid process and medial aspect of the spine; it is connected to the anterolateral membranous wall of the pharyngotympanic (auditory tube)	Palatine aponeurosis and palatine bone (horizontal plate) via a tendon that is redirected medially by the pterygoid hamulus	N. to medial pterygoid (CN V_3)	*Bilaterally:* tenses anterior portion of the soft palate and flattens its arch, separating the nasopharynx from oropharynx. Opens pharyngotympanic (auditory) tube. *Unilaterally:* deviates soft palate laterally.
Levator veli palatini	Vaginal process and petrous part of temporal bone (via a tendon, anterior to the carotid canal); it is connected to the inferior portion of the pharyngotympanic tube	Palatine aponeurosis (the two levators combine to form a muscular sling)	Vagus n. (CN X) via pharyngeal plexus	*Bilaterally:* pulls the posterior portion of the soft palate superoposteriorly, separating the nasopharynx from the oropharynx.
Uvular muscle (musculus uvulae)	Palatine bone (posterior nasal spine) and palatine aponeurosis (superior surface)	Mucosa of the uvula		Pulls the uvula posterosuperiorly, separating the nasopharynx from the oropharynx.
Palatoglossus (palatoglossal arch)	Palatine aponeurosis (oral surface)	Lateral tongue to dorsum or intrinsic transverse muscle		*Bilaterally:* pulls the root of the tongue superiorly narrowing the oropharngeal isthmus, separating the oral cavity from the oropharynx.

Muscle	Origin	Insertion	Innervation	Action
Palatopharyngeus (palatopharyngeal arch)	Palatine aponeurosis (superior surface) and posterior border of palatine bone	Thyroid cartilage (posterior border) or lateral pharynx	Vagus n. (CN X) via pharyngeal plexus	***Bilaterally:*** **Elevates the pharynx anteromedially.**

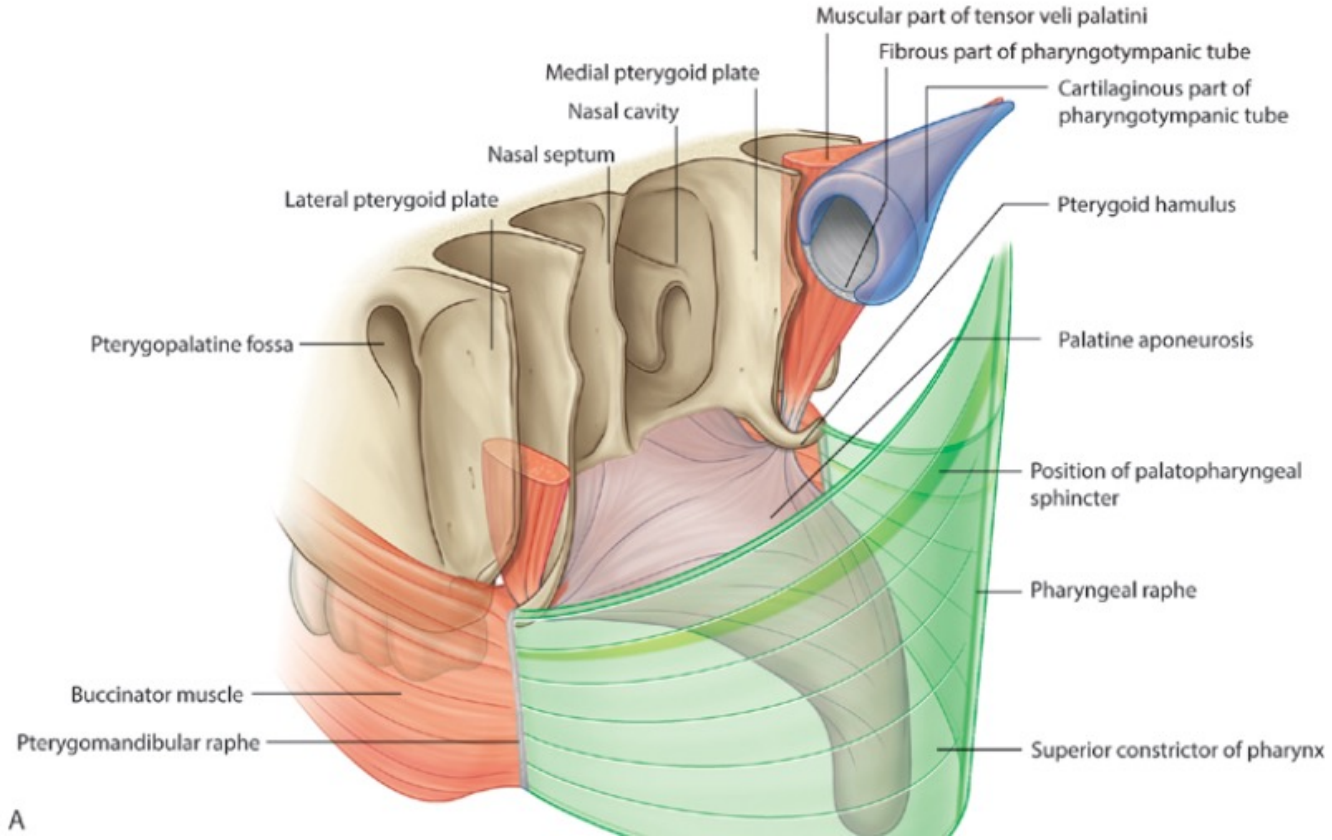
Tensor veli palatini

The tensor veli palatini muscle is composed of two parts—a vertical muscular part and a more horizontal fibrous part, which forms the palatine aponeurosis.

The vertical part of the tensor veli palatini is thin and triangular in shape with its base attached to the skull and its apex pointed inferiorly. It continues laterally along the membranous part of the pharyngotympanic tube to the spine of the sphenoid bone.

The tensor veli palatini descends vertically along the lateral surface of the medial plate of the pterygoid process and pharyngeal wall to the pterygoid hamulus where the fibers converge to form a small tendon.

The tendon loops 90° medially around the pterygoid hamulus, penetrating the origin of the buccinator muscle as it does, and expands like a fan to form the fibrous horizontal part of the muscle. This fibrous part is continuous across the midline with its partner on the other side to form the palatine aponeurosis.



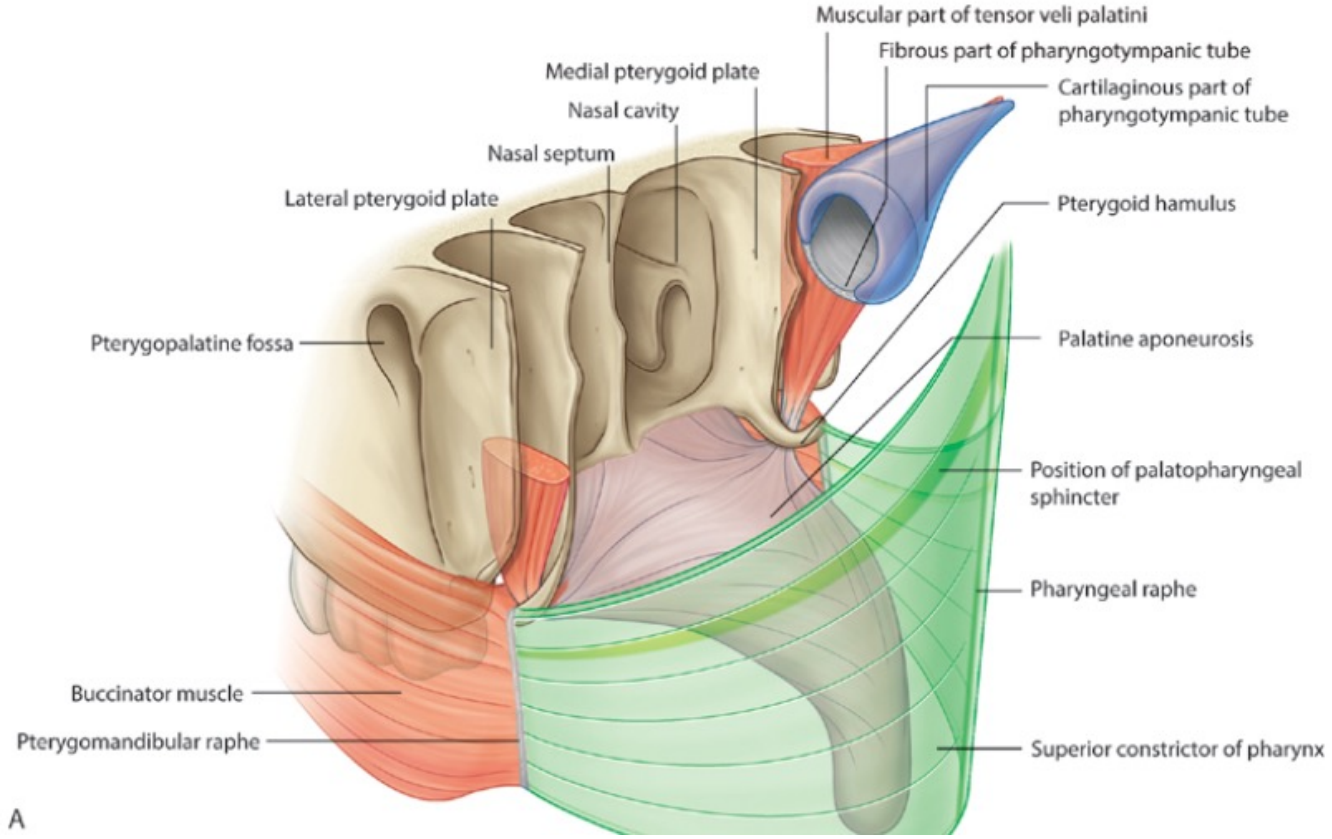
The palatine aponeurosis

The palatine aponeurosis is attached anteriorly to the margin of the hard palate, but is unattached posteriorly where it ends in a free margin. This expansive aponeurosis is the major structural element of the soft palate to which the other muscles of the palate attach.

The tensor veli palatini:

- tenses (makes firm) the soft palate so that the other muscles attached to the palate can work more effectively, and
- opens the pharyngotympanic tube! when the palate moves during yawning and swallowing as a result of its attachment superiorly to the membranous part of the pharyngotympanic tube.

The tensor veli palatini is innervated by the nerve to the medial pterygoid from the mandibular nerve [V3].



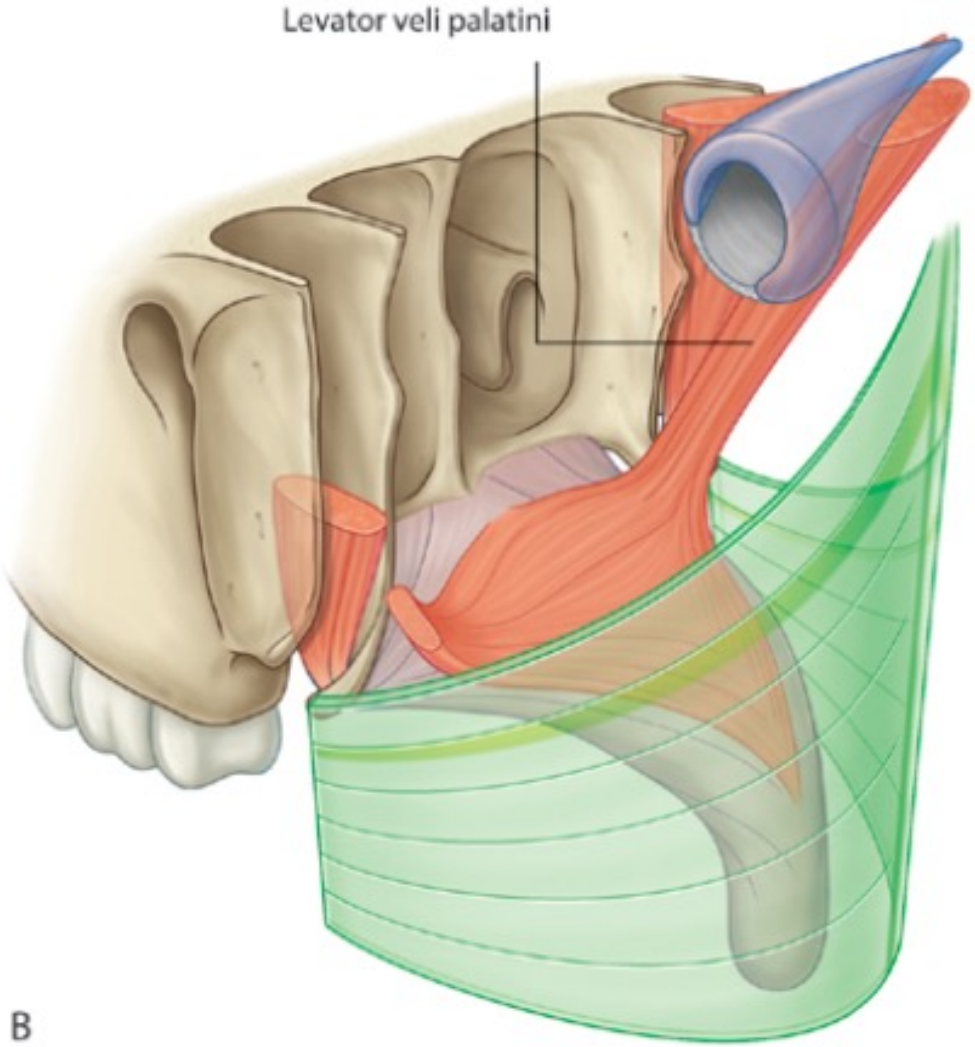
Levator veli palatini

The levator veli palatini muscle originates from the base of the skull and descends to the upper surface of the palatine aponeurosis. On the skull, it originates from a roughened area on the petrous part of the temporal bone immediately anterior to the opening of the carotid canal. Some fibers also originate from adjacent parts of the pharyngotympanic tube.

The levator veli palatini passes anteroinferiorly through fascia of the pharyngeal wall, passes medial to the pharyngotympanic tube, and inserts onto the palatine aponeurosis. Its fibers interlace at the midline with those of the levator veli palatini on the other side.

Unlike the tensor veli palatini muscles, the levator veli palatini muscles do not pass around each pterygoid hamulus, but course directly from the base of the skull to the upper surface of the palatine aponeurosis. Therefore, they are the only muscles that can elevate the palate above the neutral position and close the pharyngeal isthmus between the nasopharynx and oropharynx.

The levator veli palatini is innervated by the vagus nerve [X] through the pharyngeal branch to the pharyngeal plexus (CN IX,X).



“Ah.”

Clinically, the levator veli palatini can be tested by asking a patient to say “ah.” If the muscle on each side is functioning normally, the palate elevates evenly in the midline. If one side is not functioning, the palate deviates away from the abnormal side.

Note that the uvula hangs down from the roof of the mouth, directly in the mid-line. With an "Ah," the uvula rises up. Deviation to one side may be caused by CN 9 or 10 palsy (the uvula deviates away from the affected side), a tumor or an infection.
Cranial Nerve 9 Dysfunction: Patient has suffered stroke, causing loss of function of left CN 9. As a result, uvula is pulled towards the normally functioning (ie right) side.

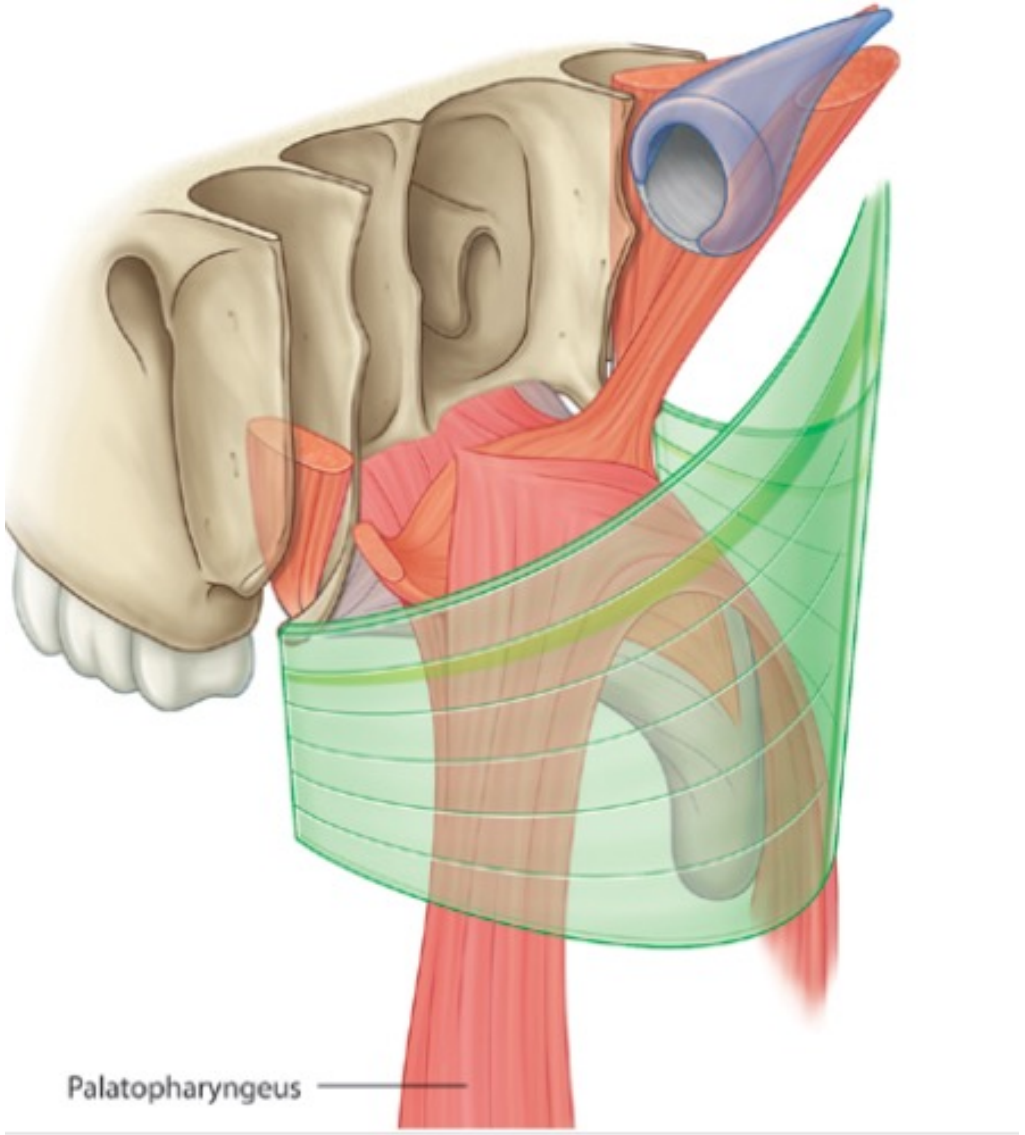
Palatopharyngeus

The palatopharyngeus muscle originates from the superior surface of the palatine aponeurosis and passes posterolaterally over its margin to descend and become one of the longitudinal muscles of the pharyngeal wall. It is attached to the palatine aponeurosis by two flat lamellae separated by the levator veli palatini muscle. The more anterior and lateral of these two lamellae is attached to the posterior margin of the hard palate as well as to the palatine aponeurosis.

The palatopharyngeus muscles:

- depress the palate and move the palatopharyngeal arches toward the midline like curtains—both these actions help close the oropharyngeal isthmus; and
- elevate the pharynx during swallowing.

The palatopharyngeus is innervated by the vagus nerve [X] through the pharyngeal branch to the pharyngeal plexus.

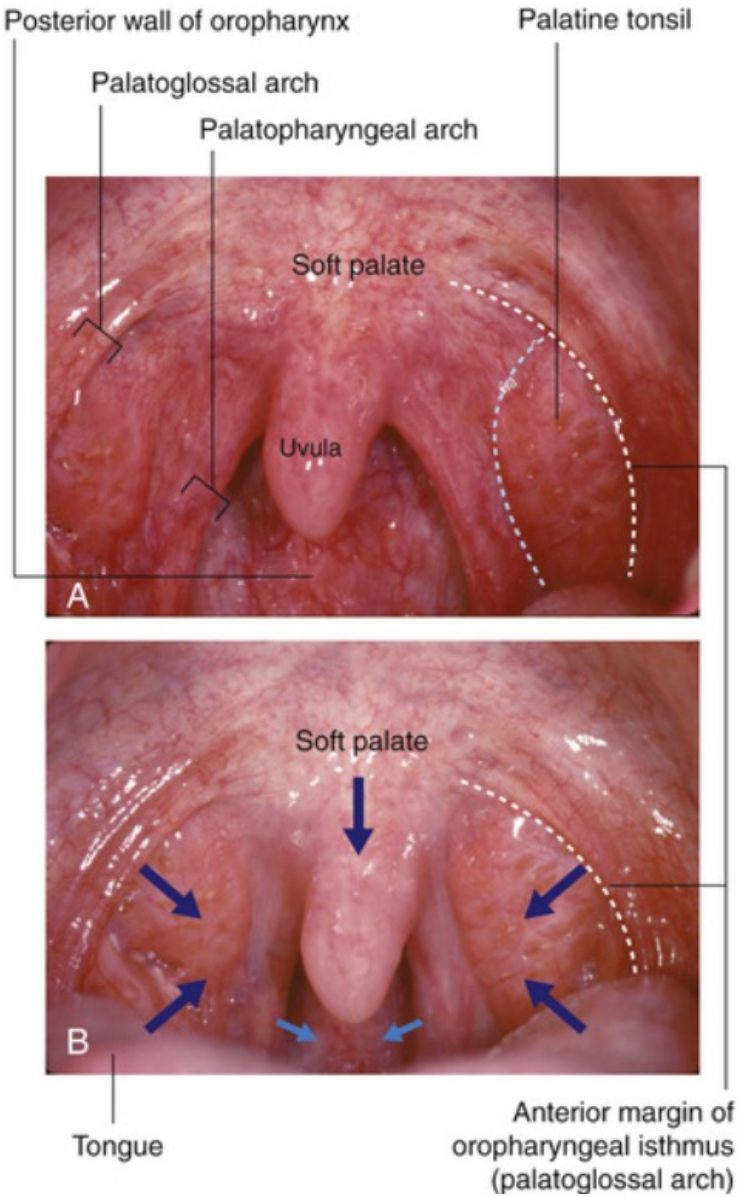


Open mouth with soft palate.
A. Oropharyngeal isthmus opened. B. Oropharyngeal isthmus closed.

The two palatopharyngeus muscles, one on each side, underlie the palatopharyngeal arches on the oropharyngeal wall.

The palatopharyngeal arches lie posterior and medial to the palatoglossal arches when viewed anteriorly through the oral cavity

On each side, the palatine tonsil is between the palatopharyngeal and palatoglossal arches on the lateral oropharyngeal wall.



Palatoglossus

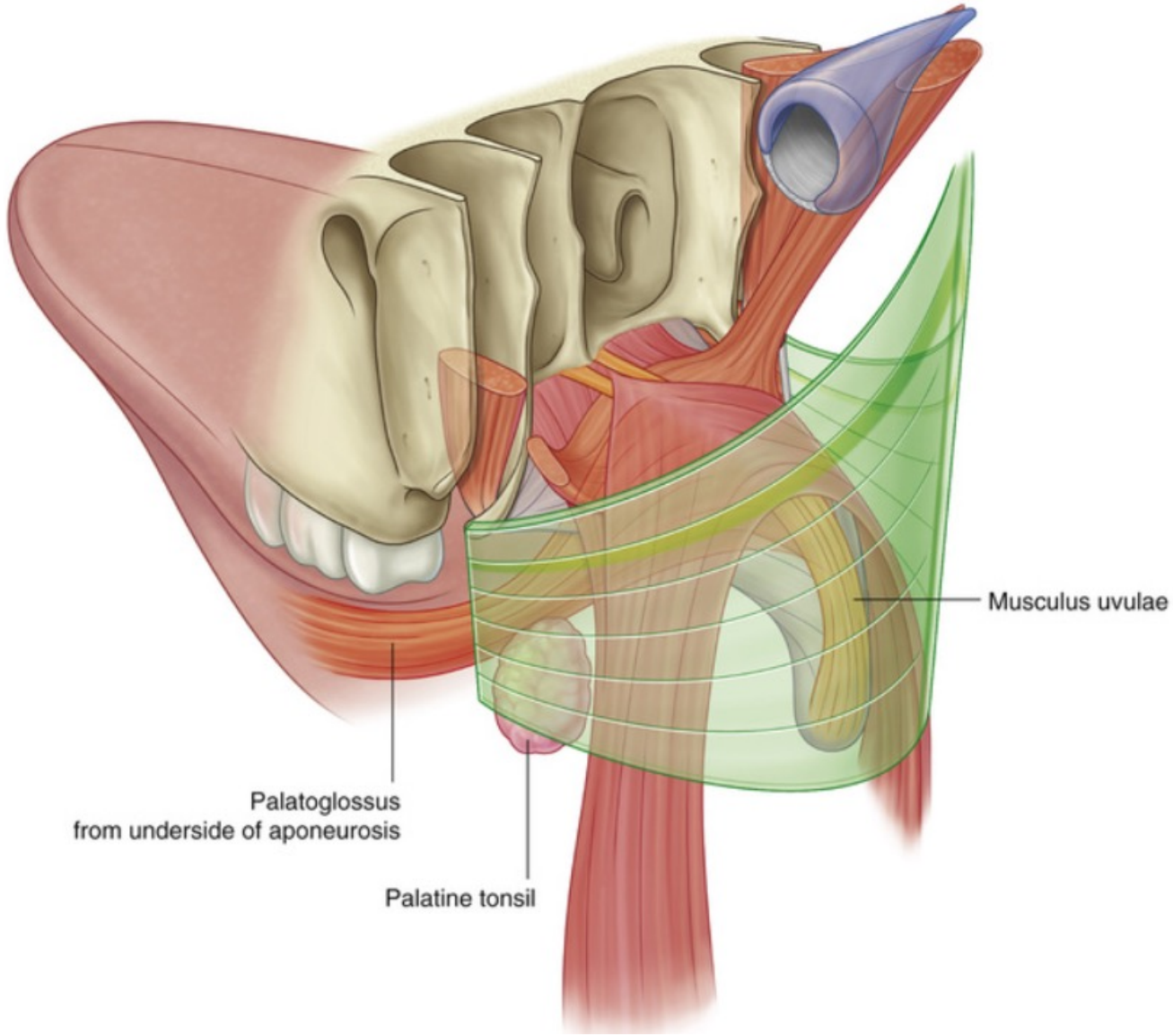
The palatoglossus muscle attaches to the inferior (oral) surface of the palatine aponeurosis and passes inferiorly and anteriorly into the lateral surface of the tongue

The palatoglossus muscle underlies a fold of mucosa that arches from the soft palate to the tongue. These palatoglossal arches, one on each side, are lateral and anterior to the palatopharyngeal arches and define the lateral margins of the oropharyngeal isthmus.

The palatine tonsil is between the palatoglossal and palatopharyngeal arches on the lateral oropharyngeal wall.

The palatoglossus muscles depress the palate, move the palatoglossal arches toward the midline like curtains, and elevate the back of the tongue. These actions help close the oropharyngeal isthmus.

The palatoglossus is innervated by the vagus nerve [X] through the pharyngeal branch to the pharyngeal plexus.

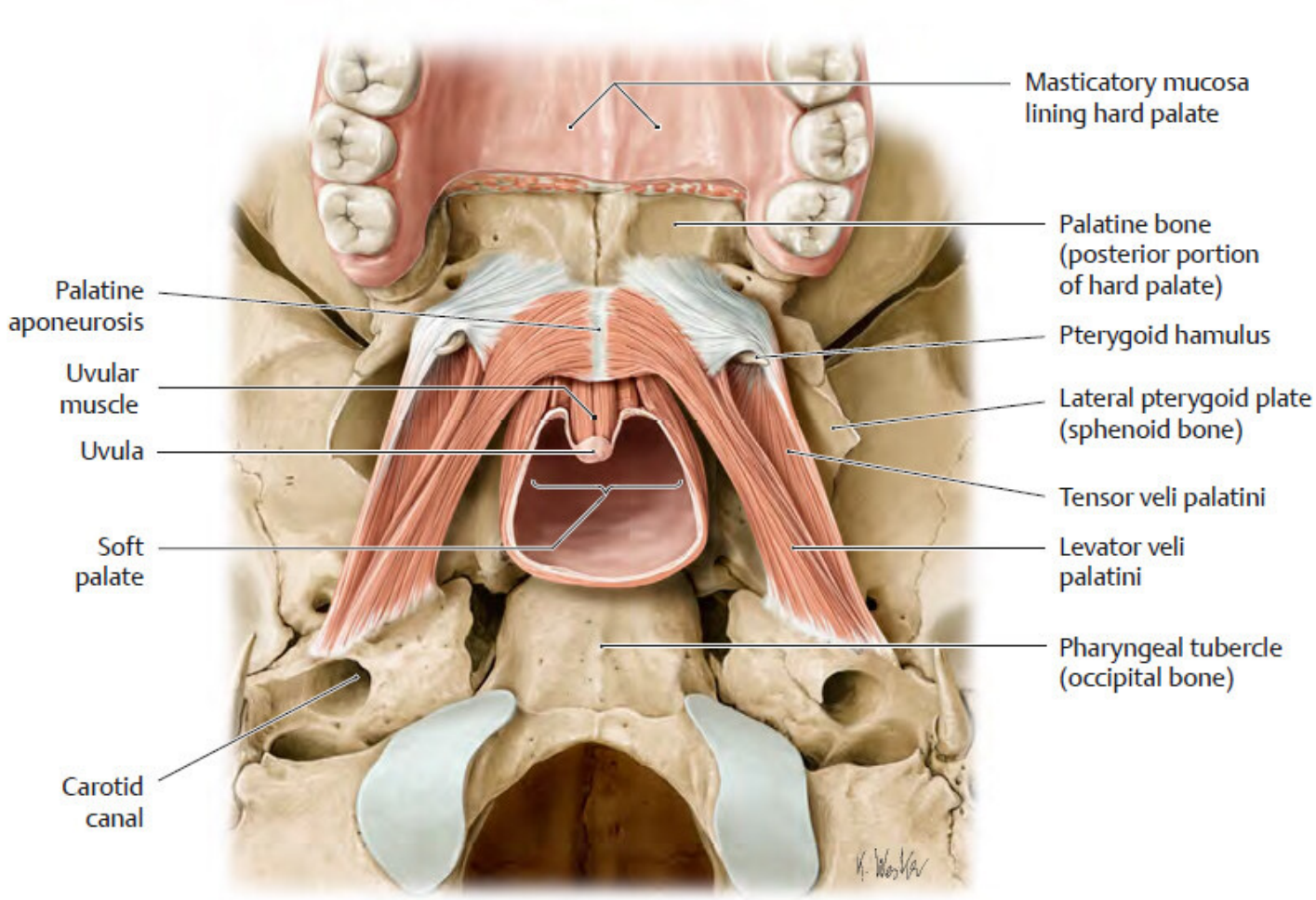


Musculus uvulae

The musculus uvulae originates from the posterior nasal spine on the posterior margin of the hard palate and passes directly posteriorly over the dorsal aspect of the palatine aponeurosis to insert into connective tissue underlying the mucosa of the uvula. It passes between the two lamellae of the palatopharyngeus superior to the attachment of the levator veli palatini. Along the midline, the musculus uvulae blends with its partner on the other side.

The musculus uvulae elevates and retracts the uvula. This action thickens the central part of the soft palate and helps the levator veli palatini muscles close the pharyngeal isthmus between the nasopharynx and oropharynx.

The musculus uvulae is innervated by the vagus nerve [X] through the pharyngeal branch to the pharyngeal plexus.



Artery blood supply

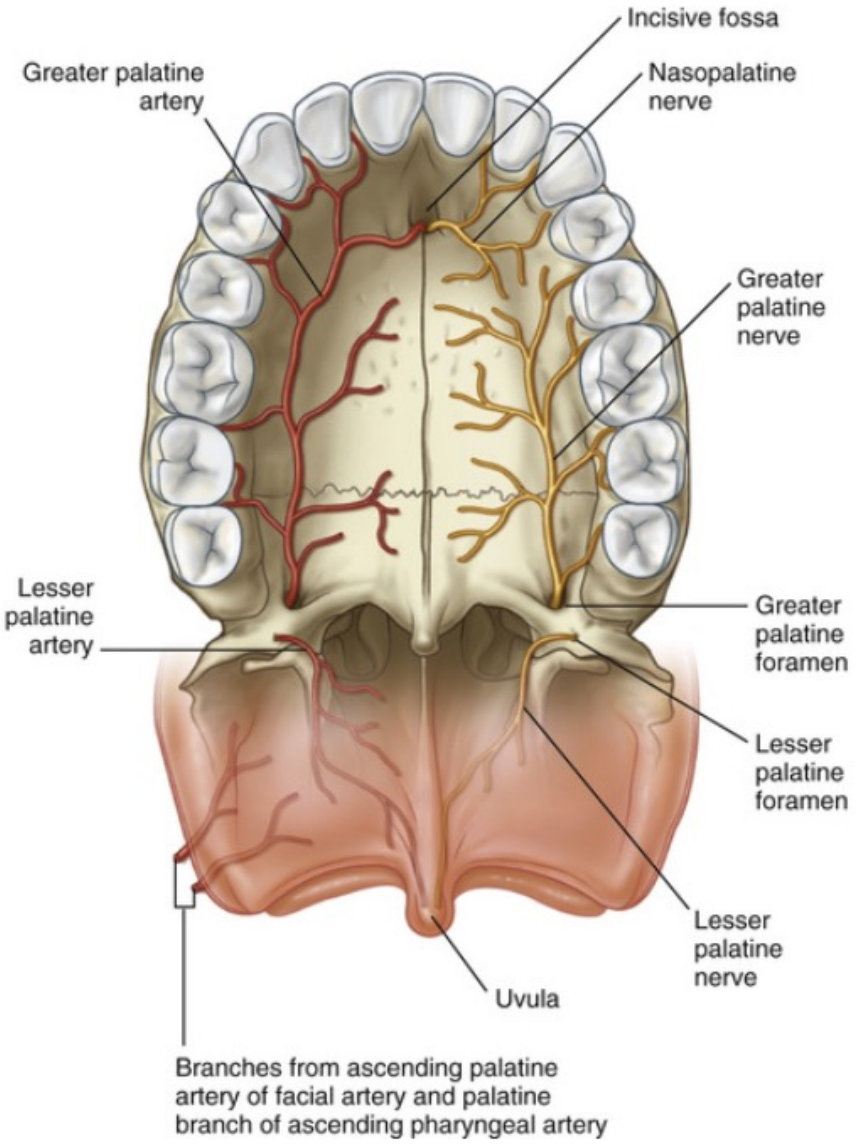
Arteries of the palate include :

.The descending palatine artery branch of maxillary artery which then gives off the greater and lesser palatine arteries for hard and soft palate respectively.

.The ascending palatine artery a branch of the facial artery

.The palatine branch of the ascending pharyngeal artery.

The maxillary, facial, and ascending pharyngeal arteries are all branches that arise in the neck from the external carotid artery.



Artery blood supply

The ascending palatine artery of the facial artery ascends along the external surface of the pharynx. The palatine branch loops medially over the top of the superior constrictor muscle of the pharynx to penetrate the pharyngeal fascia with the levator veli palatini muscle and follow the levator veli palatini to the soft palate.

The palatine branch of the ascending pharyngeal artery follows the same course as the palatine branch of the ascending palatine artery from the facial artery and may replace the vessel.

The descending palatine artery originates from the maxillary artery in the pterygopalatine fossa. It descends into the palatine canal where it gives origin to a small lesser palatine branch, and then continues through the greater palatine foramen onto the inferior surface of the hard palate. The greater palatine artery passes forward on the hard palate and then leaves the palate superiorly through the incisive canal to enter the medial wall of the nasal cavity where it terminates. The greater palatine artery is the major artery of the hard palate. It also supplies palatal gingiva.

The lesser palatine branch passes through the lesser palatine foramen just posterior to the greater palatine foramen, and contributes to the vascular supply of the soft palate.

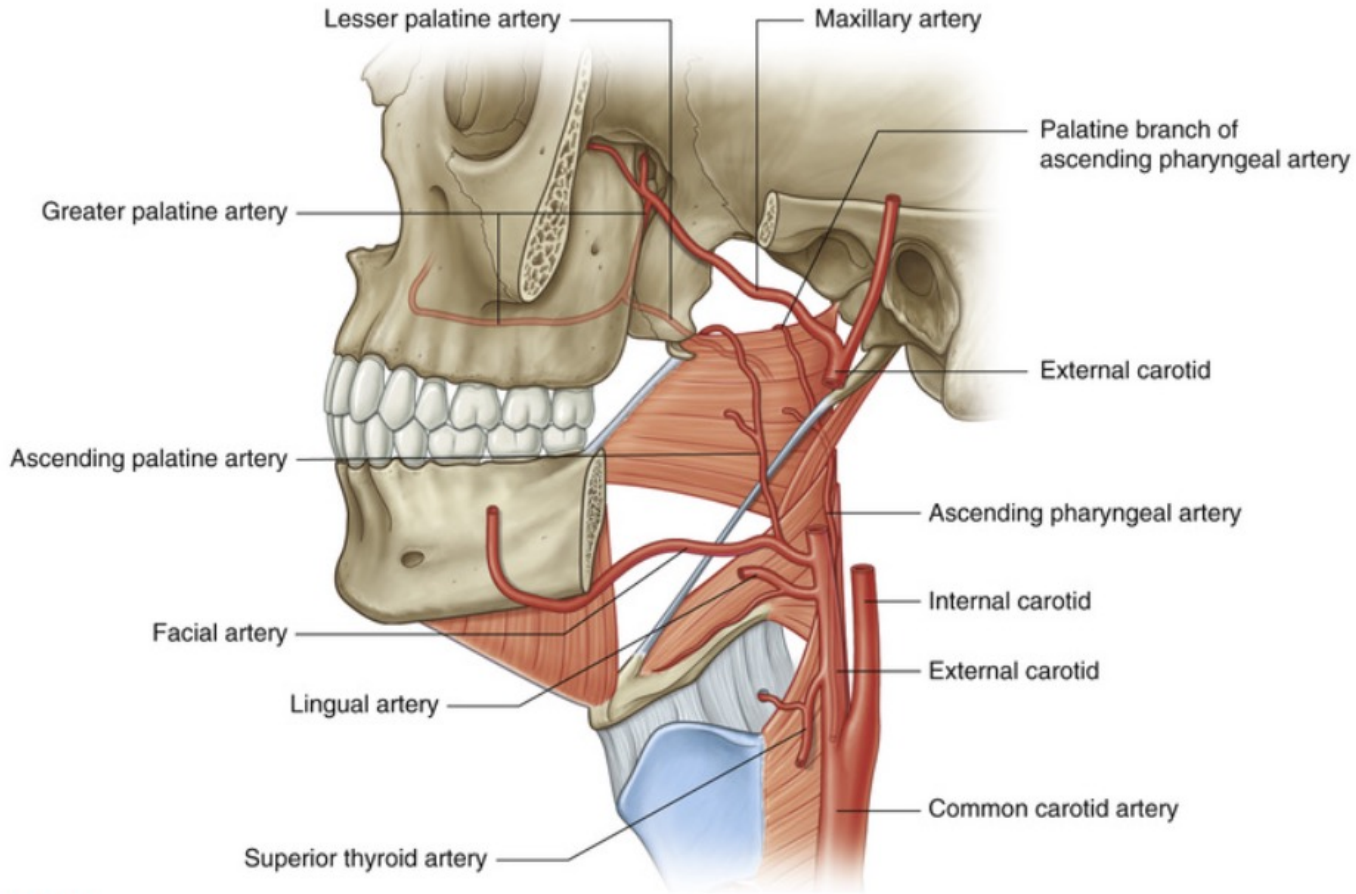


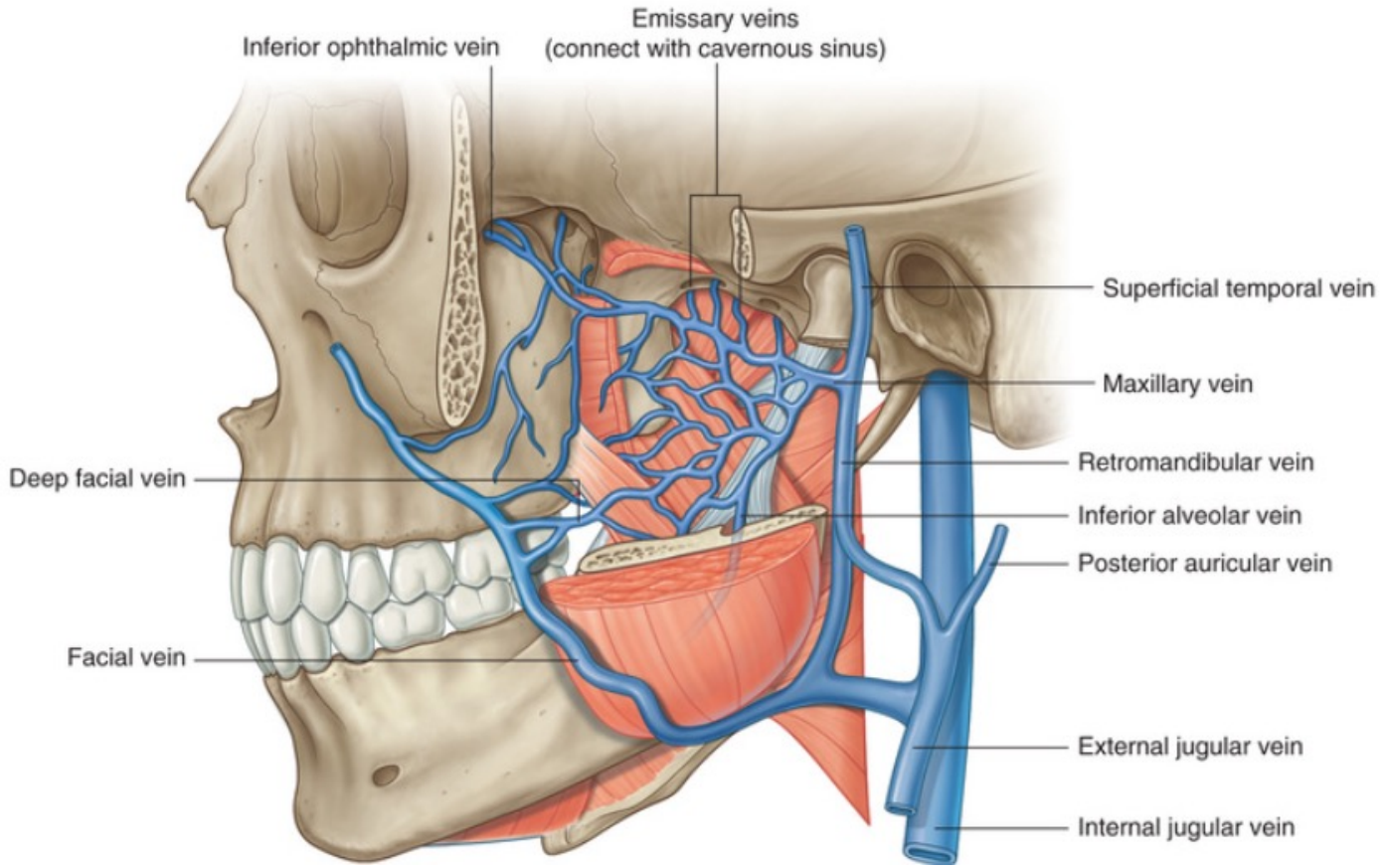
FIG. 8.273 Arteries of the palate.

Venous drainage of palate

Veins from the palate generally follow the arteries (greater and lesser palatine vv.) and ultimately drain into the pterygoid plexus of veins in the infratemporal fossa,

or into a network of veins associated with the palatine tonsil, which drain into the pharyngeal plexus of veins

or directly into the facial vein.



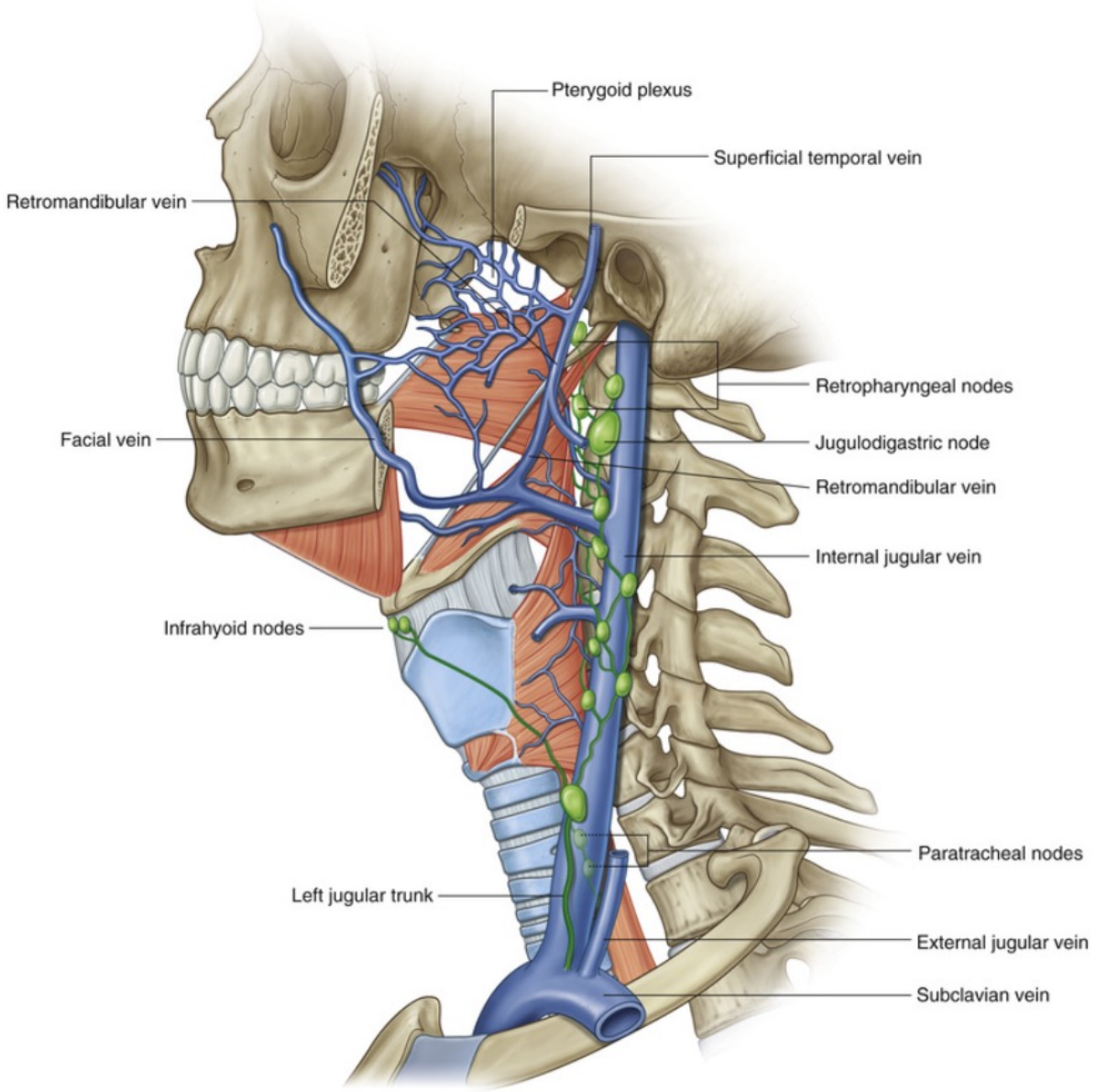
Lymphatic drainage

Lymphatic vessels from the palate drain into

.submandibular nodes,

.retropharyngeal nodes and

.deep cervical nodes



The palate is supplied by the greater and lesser palatine nerves and the nasopalatine nerve

General sensory fibers carried in all these nerves originate in the pterygopalatine fossa from the maxillary nerve [V2].

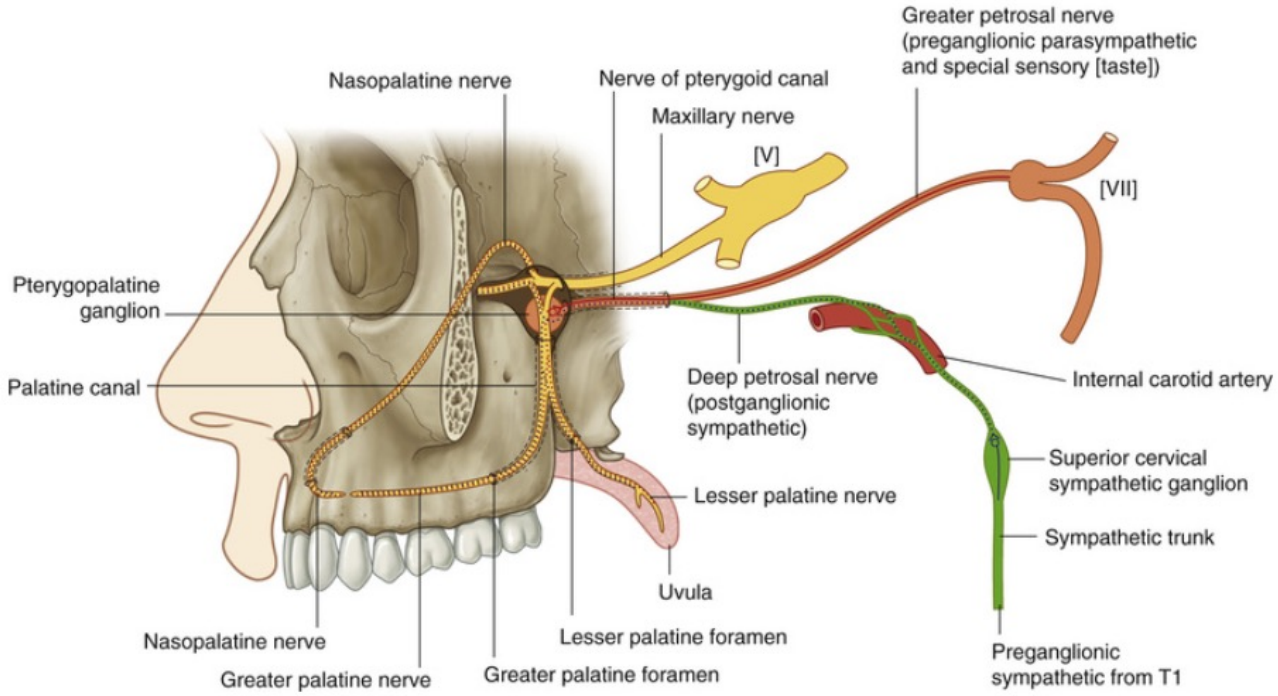
Parasympathetic (to glands) and SA (taste on soft palate) fibers from a branch of the facial nerve [VII] join the nerves in the pterygopalatine fossa, as do the sympathetics (mainly to blood vessels) ultimately derived from the T1 spinal cord level.

The greater and lesser palatine nerves descend through the pterygopalatine fossa and palatine canal to reach the palate:

- The greater palatine nerve travels through the greater palatine foramen and turns anteriorly to supply the hard palate and gingiva as far as the first premolar.
- The lesser palatine nerve passes posteromedially to supply the soft palate.

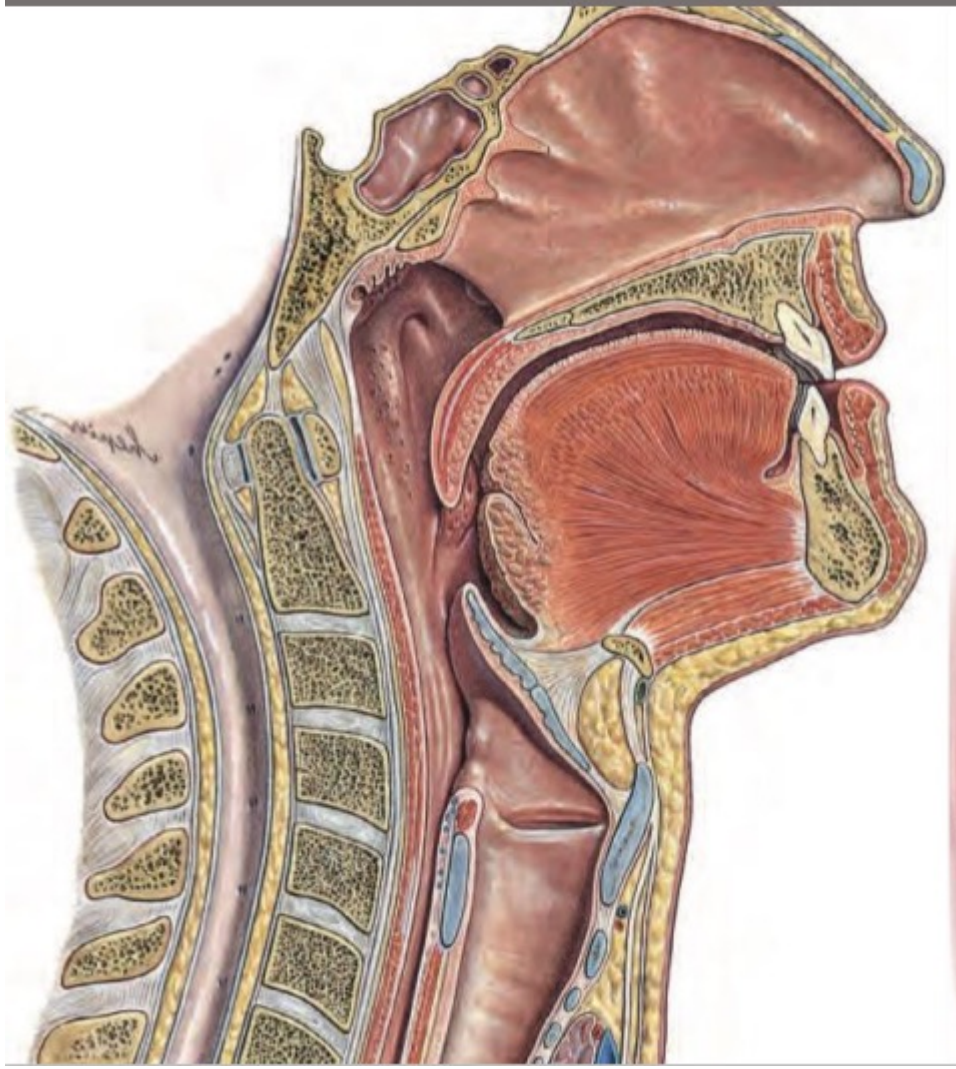
The nasopalatine nerve also originates in the pterygopalatine fossa, but passes medially into the nasal cavity. It continues medially over the roof of the nasal cavity to reach the medial wall, then anteriorly and obliquely down the wall to reach the incisive canal in the anterior floor, and descends through the incisive canal and fossa to reach the inferior surface of the hard palate.

The nasopalatine nerve supplies gingiva and mucosa adjacent to the incisors and canine.



8.276 Innervation of the palate.

pharynx



- Epipharynx = nasopharynx
- Mesopharynx = oropharynx
- Hypopharynx = laryngopharynx

- Cavitas nasi
- Cavitas oris
- Cavum tympani
- Larynx
- Oesophagus

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The muscular posterior wall of the pharynx has been divided along the midline (pharyngeal raphe) and spread open to demonstrate its mucosal anatomy.

Nasopharynx (Epipharynx)

Level: C1

Upper portion, lying between the roof (formed by sphenoid and occipital bones) and the soft palate

Oropharynx (Mesopharynx)

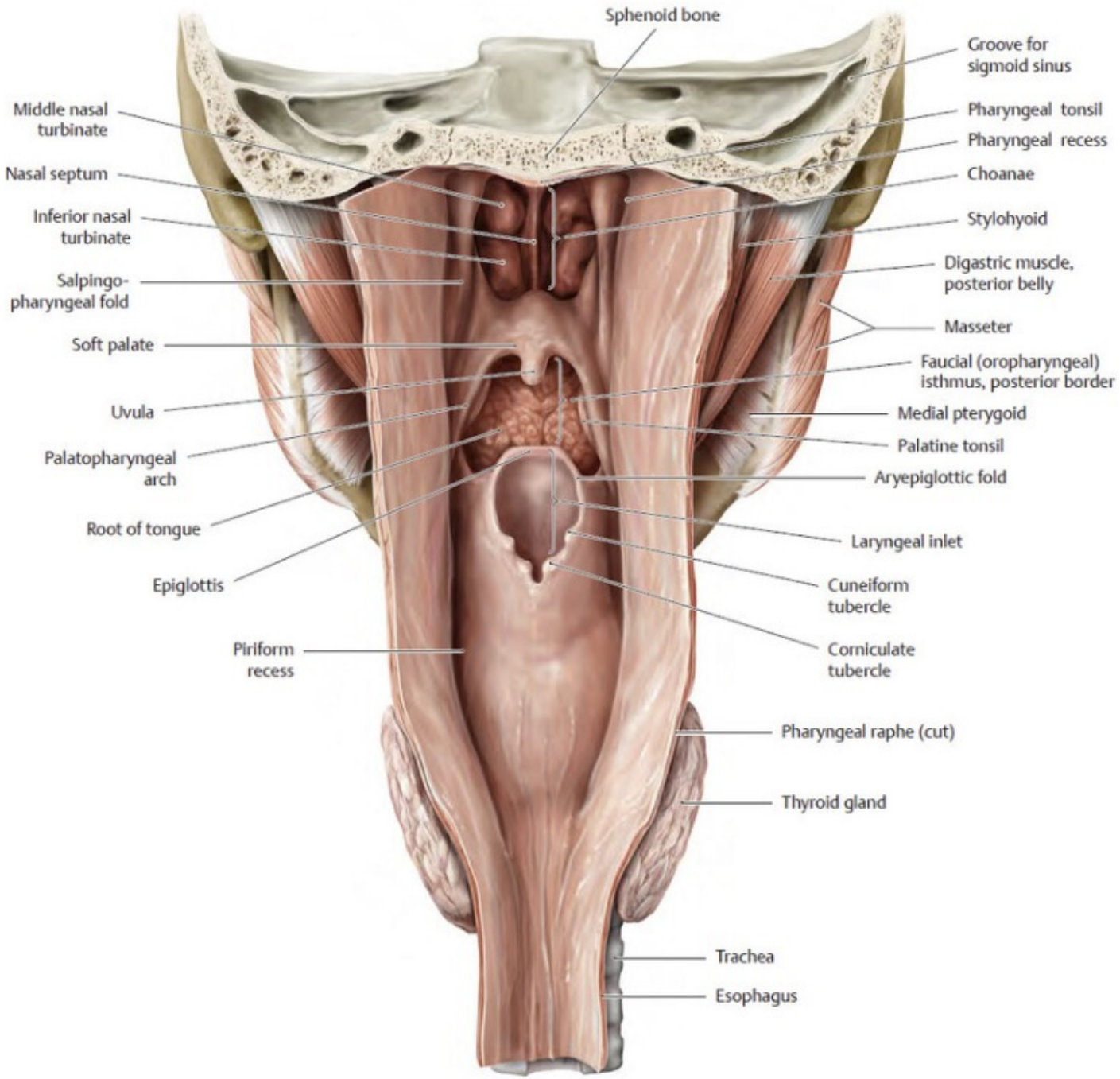
Level: C2–C3

Middle portion, lying between the uvula and the epiglottis

Laryngopharynx (Hypopharynx)

Level: C4–C6

Lower portion, lying between the epiglottis and the inferior border of the cricoid cartilage



The anterior portion of the muscular pharyngeal tube communicates with three cavities (nasal, oral, and laryngeal). The three anterior openings divide the pharynx into three parts with corresponding vertebral levels.

Region	Level	Description	Communications	
Nasopharynx (Epipharynx)	C1	Upper portion, lying between the roof (formed by sphenoid and occipital bones) and the soft palate	Nasal cavity	Via choanae
			Tympanic cavity	Via pharyngotympanic tube
Oropharynx (Mesopharynx)	C2–C3	Middle portion, lying between the uvula and the epiglottis	Oral cavity	Via oropharyngeal isthmus (formed by the palatoglossal arch)
Laryngopharynx (Hypopharynx)	C4–C6	Lower portion, lying between the epiglottis and the inferior border of the cricoid cartilage	Larynx	Via laryngeal inlet
			Esophagus	Via cricopharyngeus (pharyngeal sphincter)

Pharyngeal musculature

Fascia pharyngobasilaris

Fascia buccopharyngealis

Musculi constrictores

M. constrictor pharyngis superior (N. X)

Sphincter palatopharyngeus

M. constrictor pharyngis medius (N. X)

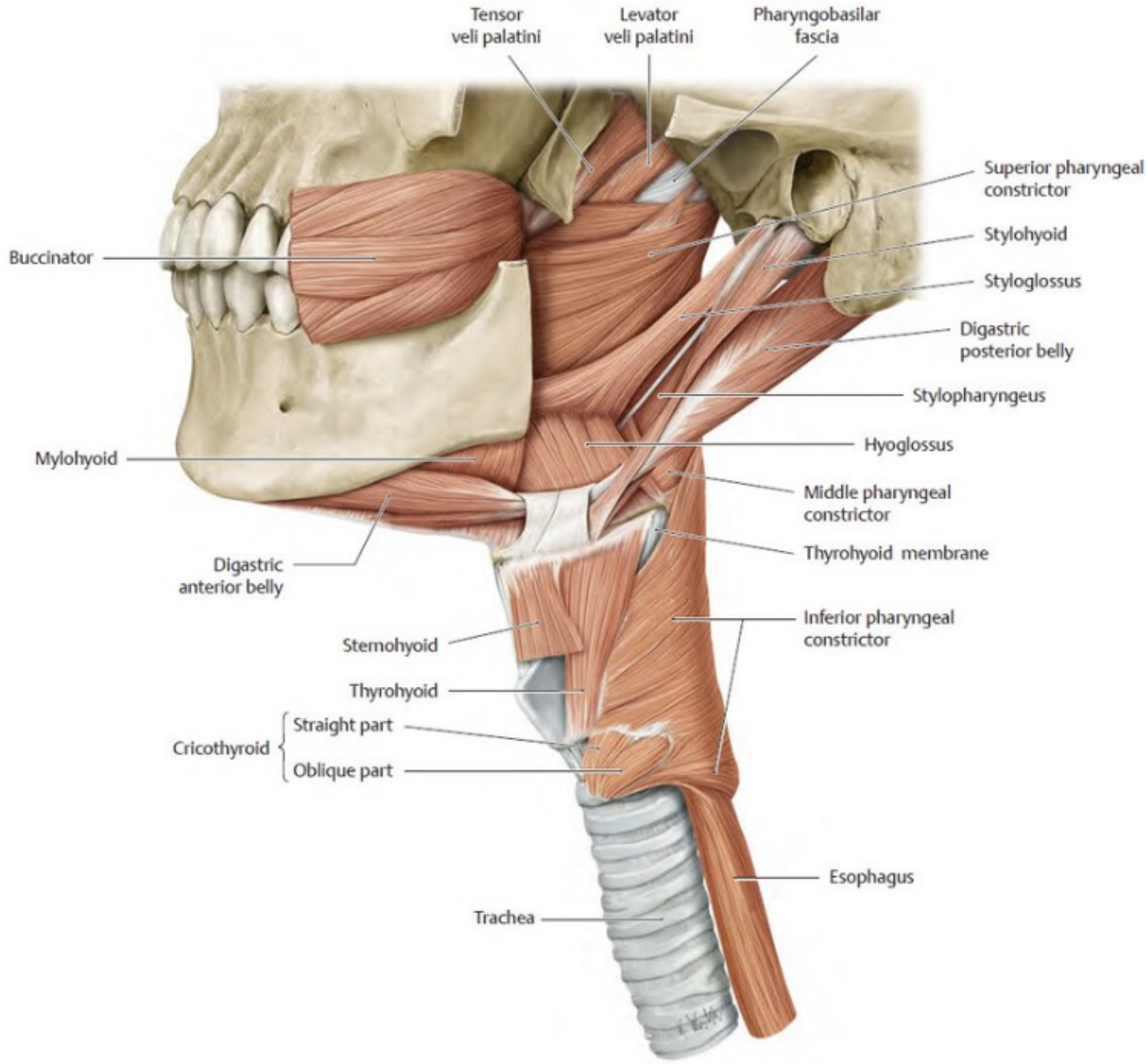
M. constrictor pharyngis inferior (N. X)

Musculi longitudinales (elevators)

M. salpingopharyngeus (N. X)

M. palatopharyngeus (N. X)

M. stylopharyngeus (N. IX)!



Pharyngobasilar fascia
Buccopharyngeal fascia

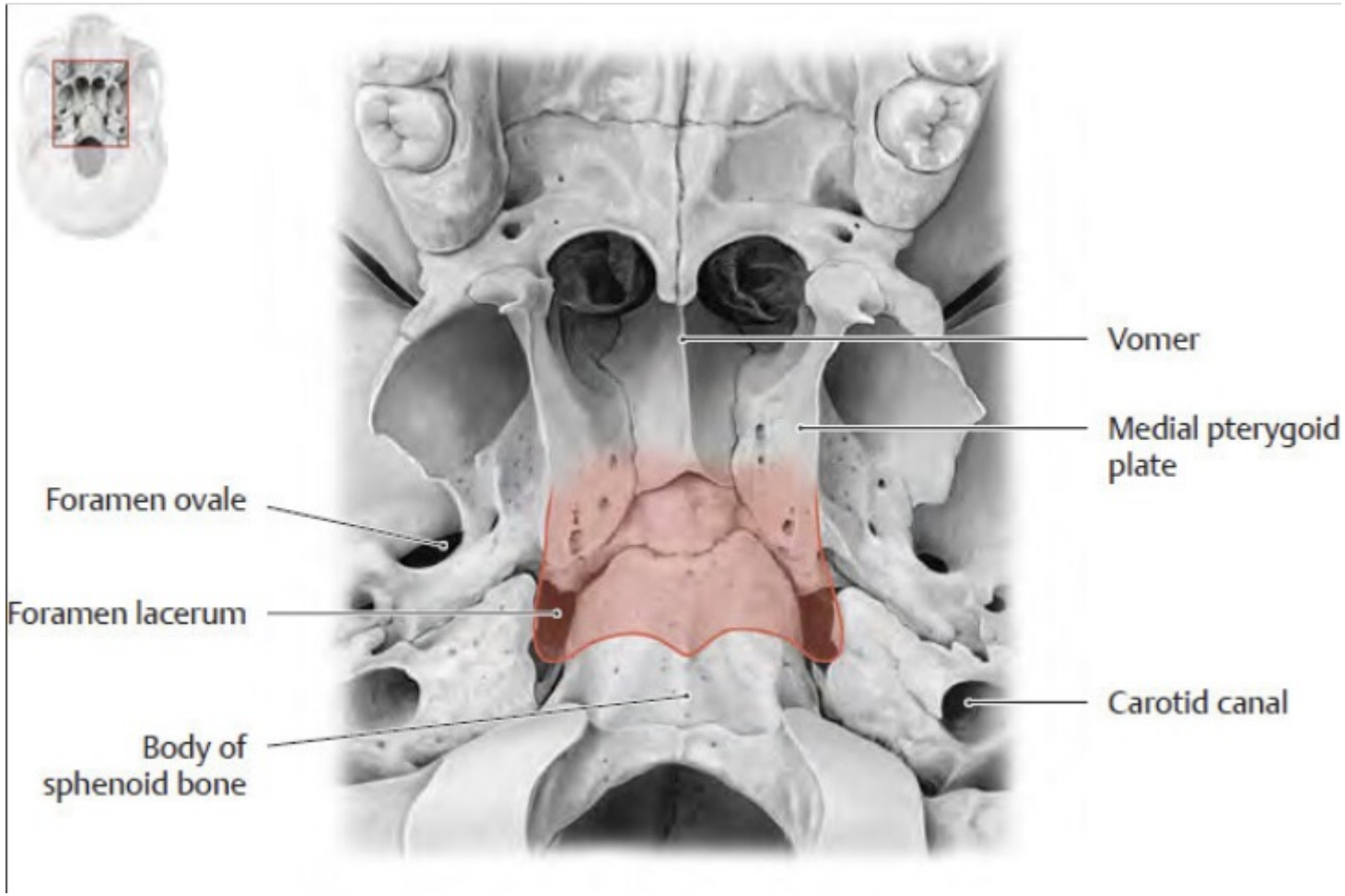
The pharyngobasilar fascia (pharyngeal aponeurosis) is a submucosa situated **between the mucous and muscular layers**. It attaches the wall of the pharynx to the **base of the cranium**.

Is located superior to the superior pharyngeal constrictor muscle. It attaches to the **basilar part of occipital bone**, the **petrous part of the temporal bone** (medial to the pharyngotympanic tube), the (posterior border of the) **medial pterygoid plate**, and the **pterygomandibular raphe**. It diminishes in thickness inferiorly. **Posteriorly, it is reinforced by the pharyngeal raphe.**

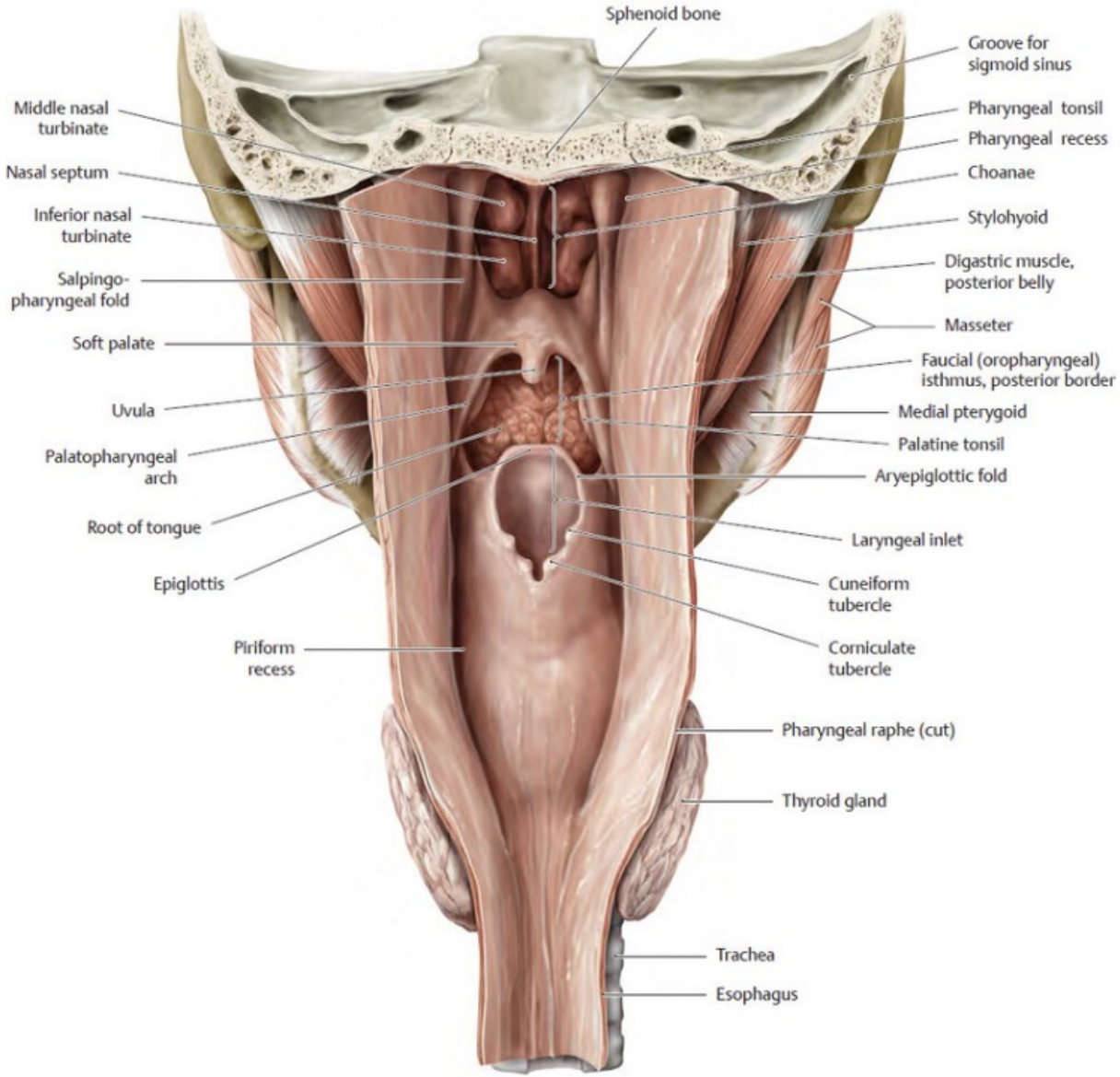
The pharyngobasilar fascia ensures that the naso pharynx is always open!

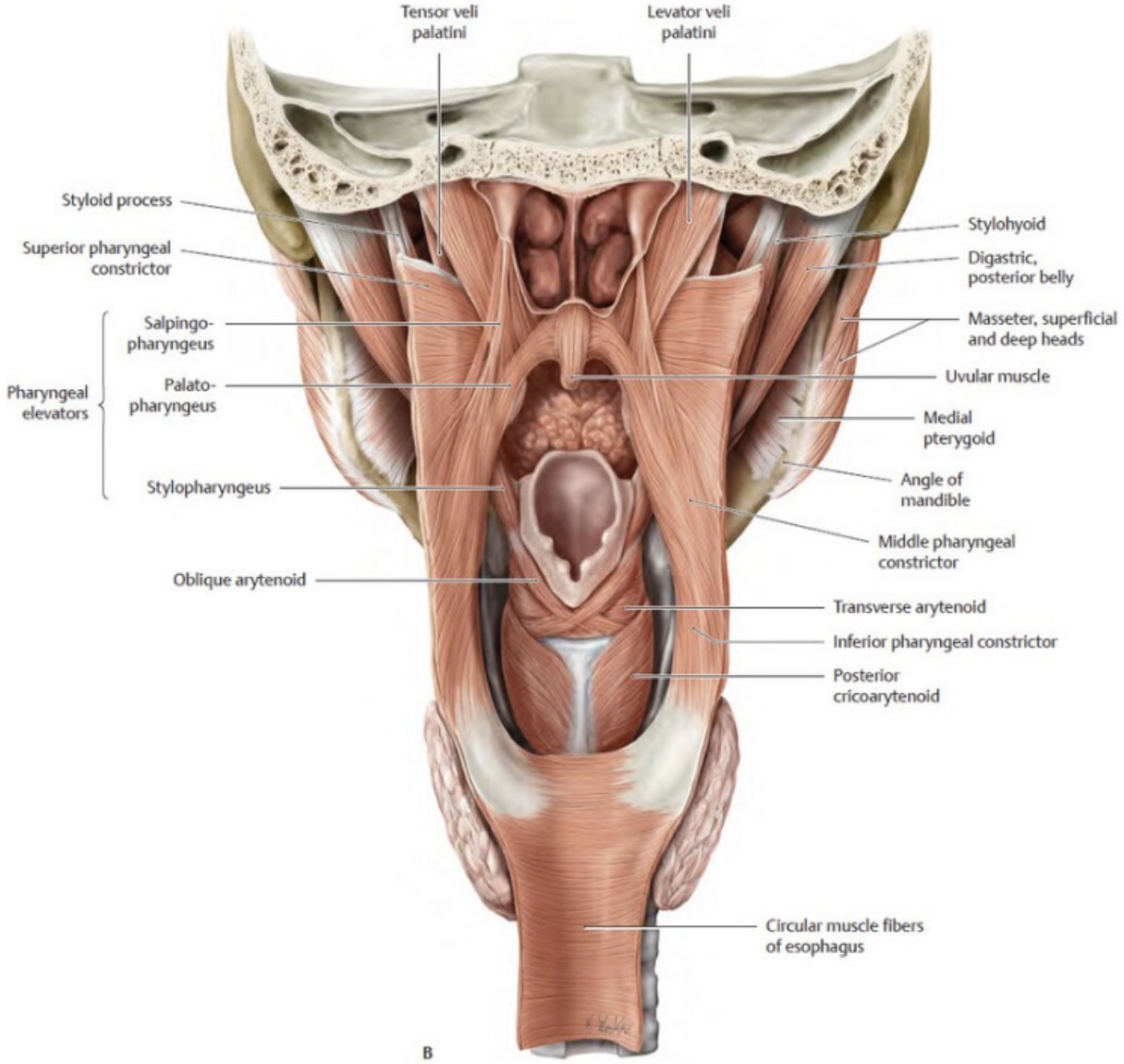
The buccopharyngeal fascia: It represents the **posterior portion of the pretracheal fascia.**

It envelops the **superior pharyngeal constrictor muscles**. It extends over the pterygomandibular raphe to cover the **buccinator muscle**

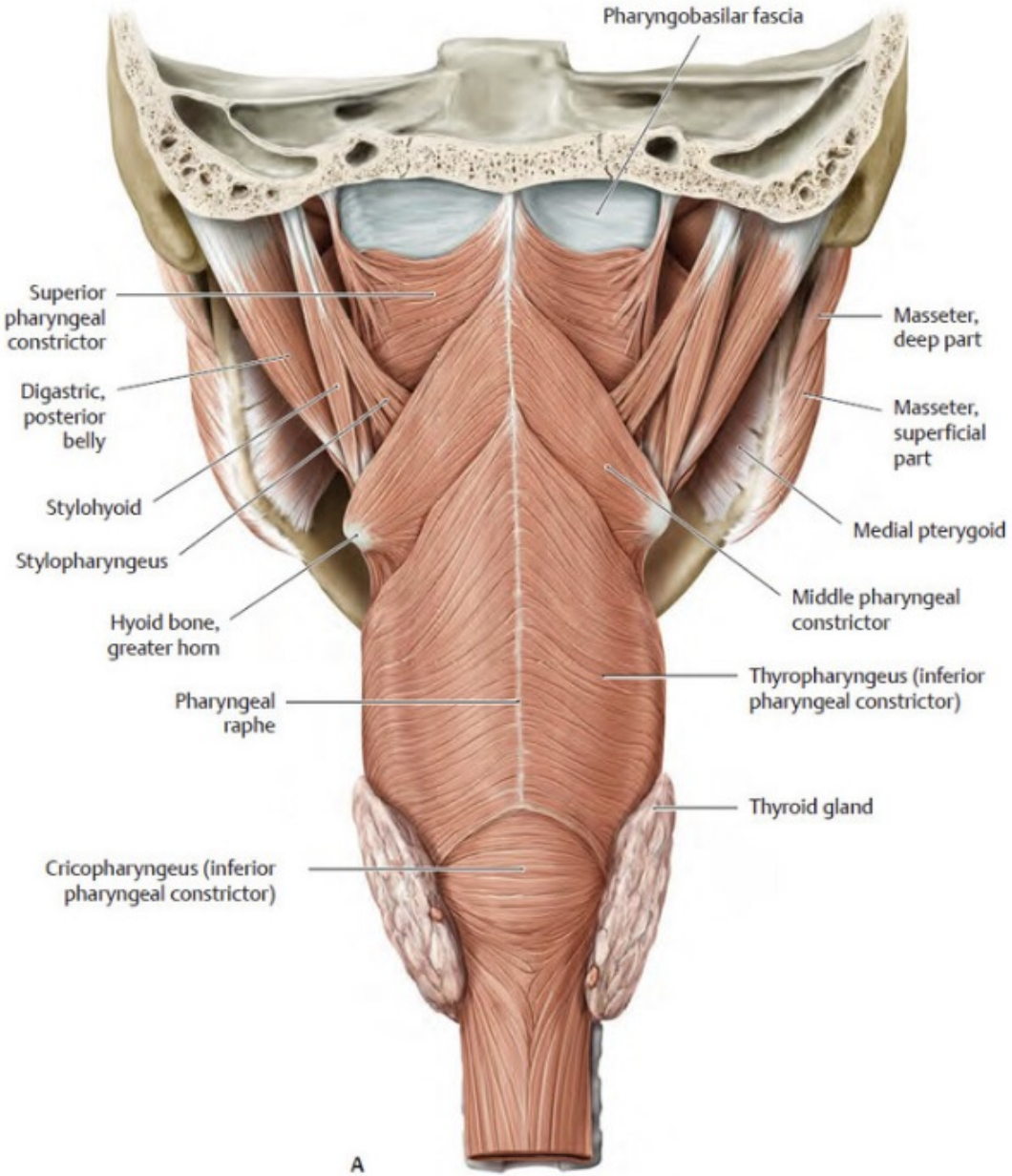


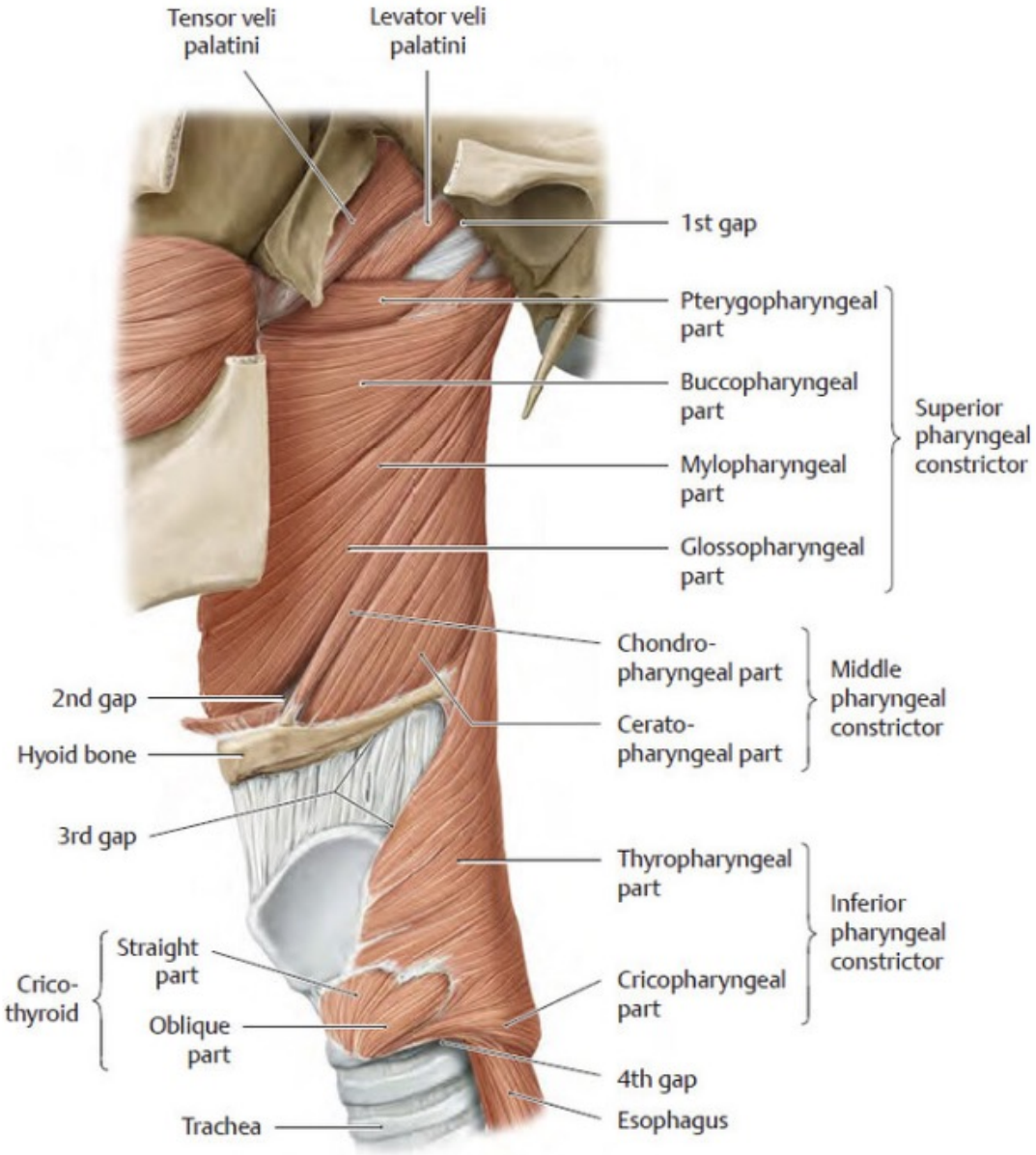
Pharynx, relations, muscles





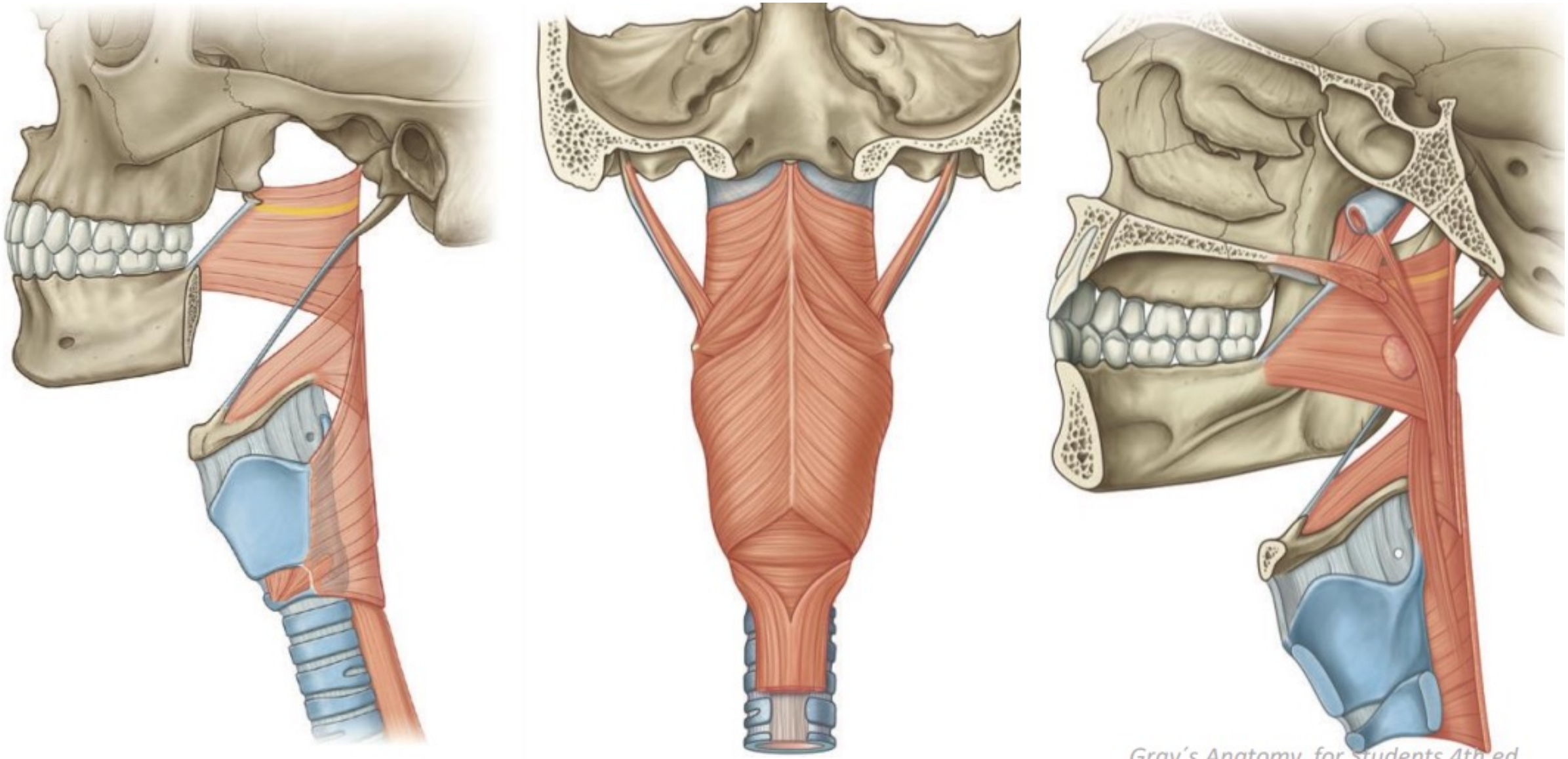
Pharyngeal constrictors





Muscle		Origin	Insertion	Innervation	Action
Superior pharyngeal constrictor	Pterygopharyngeus	Pterygoid hamulus (occasionally to the medial pterygoid plate)	Occipital bone (pharyngeal tubercle of basilar part, via median pharyngeal raphe)	Vagus n. (CN X) via pharyngeal plexus	Constricts the upper pharynx
	Buccopharyngeus	Pterygomandibular raphe			
	Mylopharyngeus	Mylohyoid line of mandible			
	Glossopharyngeus	Lateral tongue			
Middle pharyngeal constrictor	Chondropharyngeus	Hyoid (lesser horn) and stylohyoid ligament			Constricts the middle pharynx
	Ceratopharyngeus	Hyoid (greater horn)			
Inferior pharyngeal constrictor	Thyropharyngeus	Thyroid cartilage (oblique line of lamina and inferior horn)			Constricts the lower pharynx
	Cricopharyngeus	Cricoid cartilage (lateral margin)		Recurrent laryngeal n. (CN X) and/or external branch of the superior laryngeal n.	Sphincter at intersection of laryngopharynx and esophagus!

Pharyngeal constrictors



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M. constrictor inferior

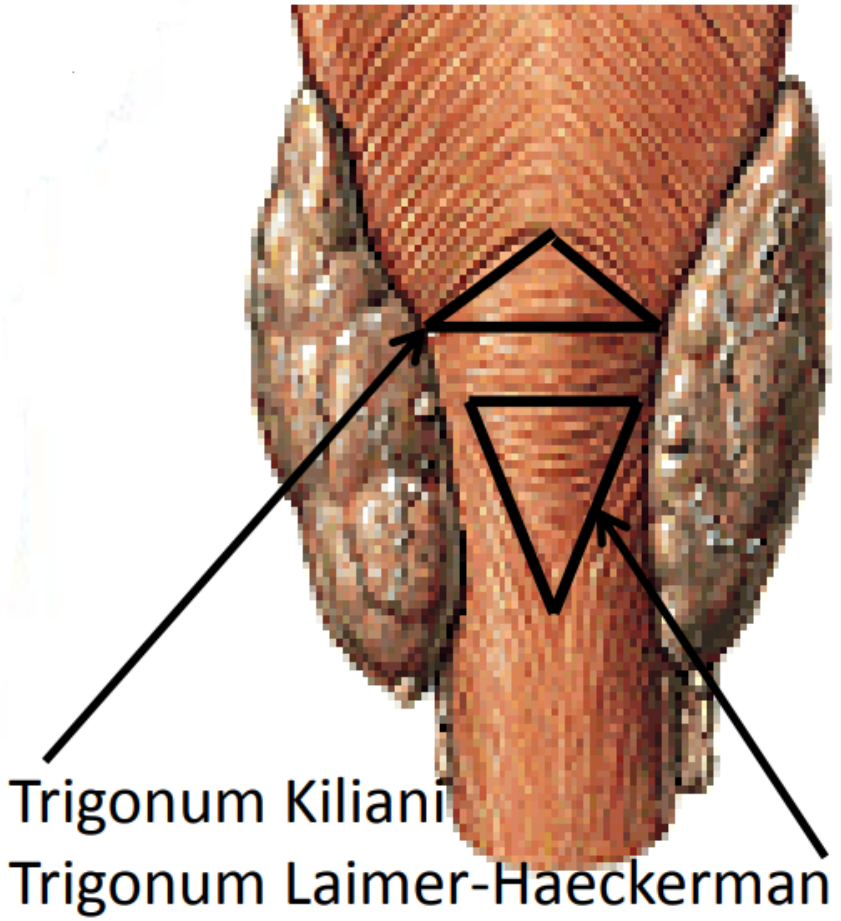
a) Pars thyropharyngea: (Pars obliqua)

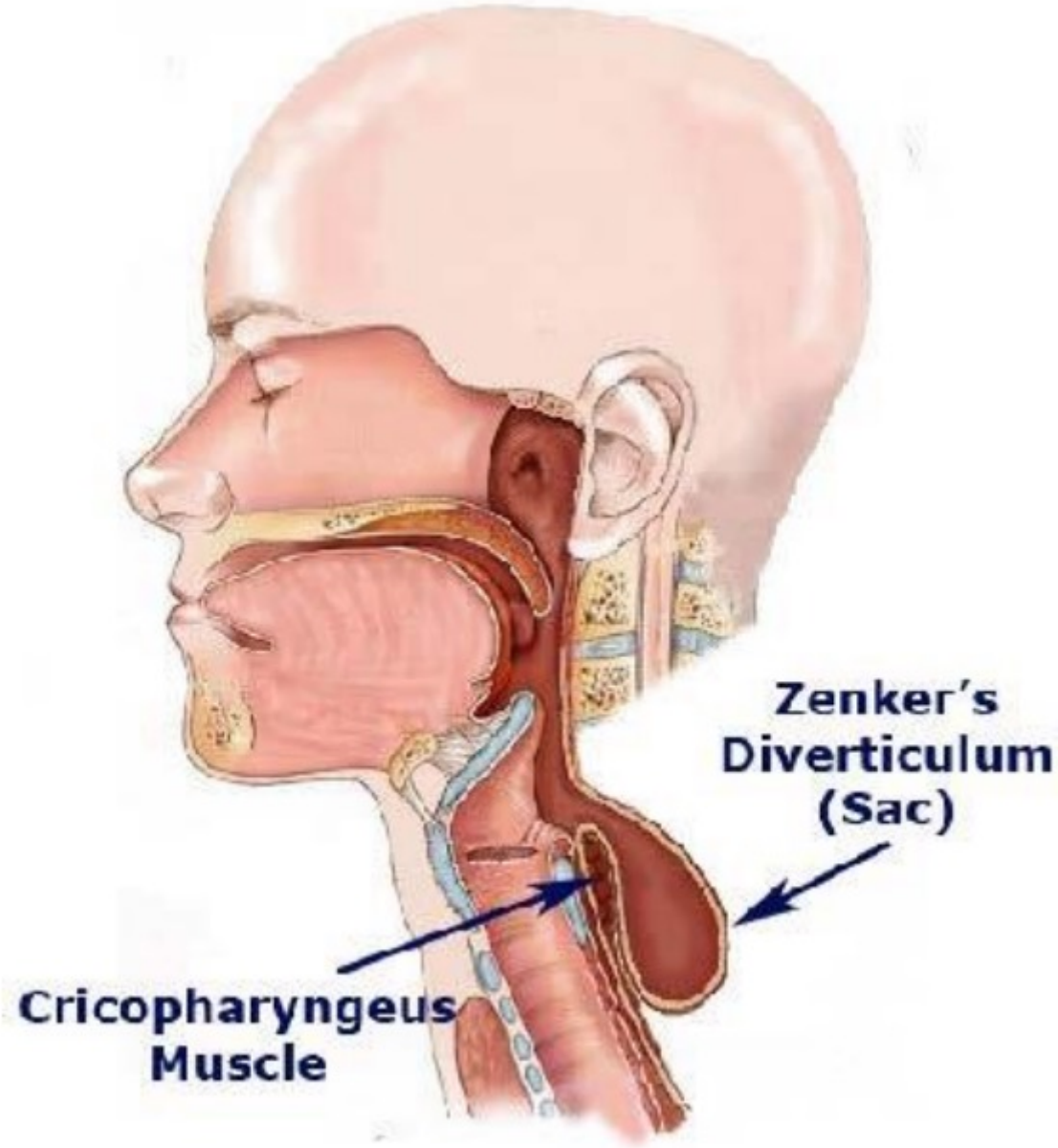
b) Pars cricopharyngea - M. cricopharyngeus: (Pars fundiformis): fibers are horizontal and continuous with the circular fibers of the esophagus called upper esophageal sphincter

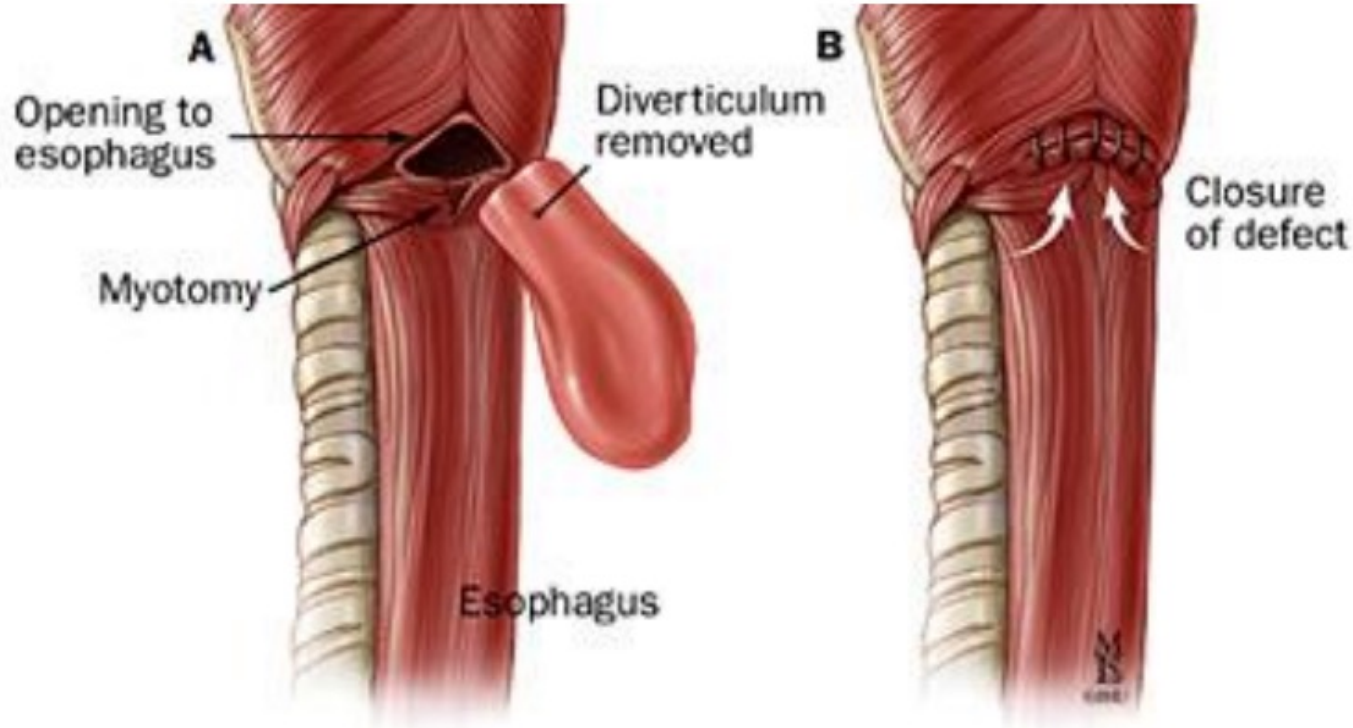
Killian's triangle: between a) and b)

Laimer's triangle: between b) and longitudinal fibres of esophagus

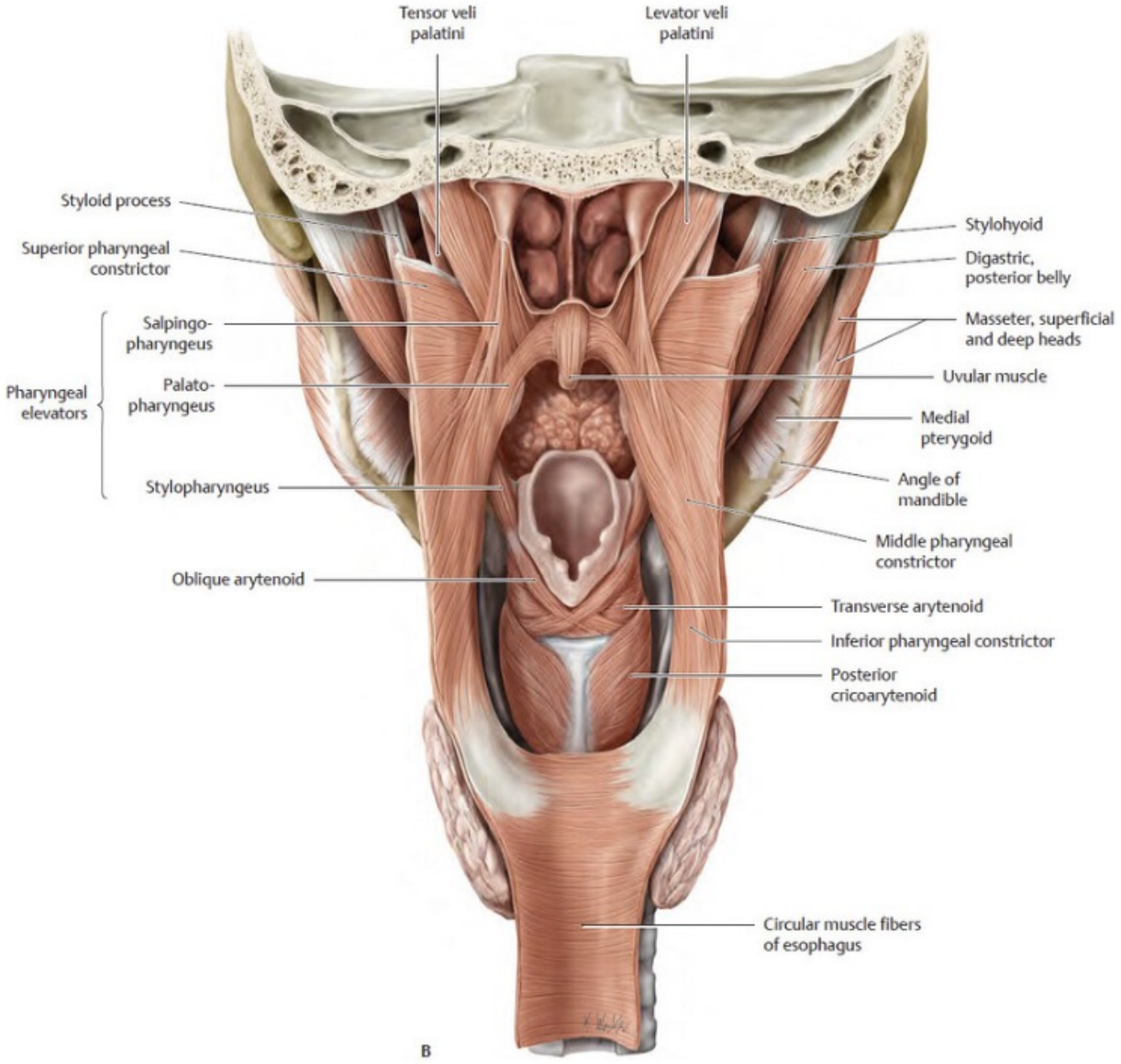
Zenker's diverticulum: Uncoordinated muscle contraction, cricopharyngeal spasm, or impaired relaxation of the inferior pharyngeal constrictor muscle

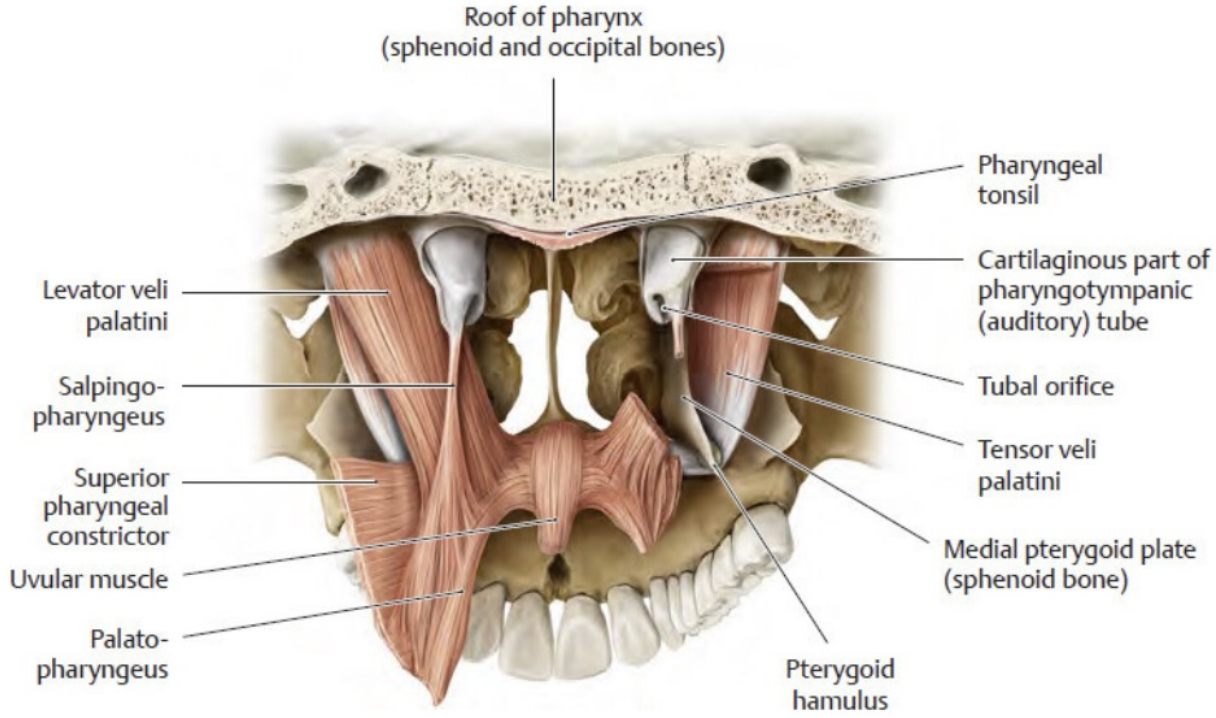



Zenker's
Diverticulum
(Sac)
Cricopharyngeus
Muscle


A
Opening to
esophagus
Diverticulum
removed
Myotomy
Esophagus
B
Closure
of defect

Pharyngeal elevators

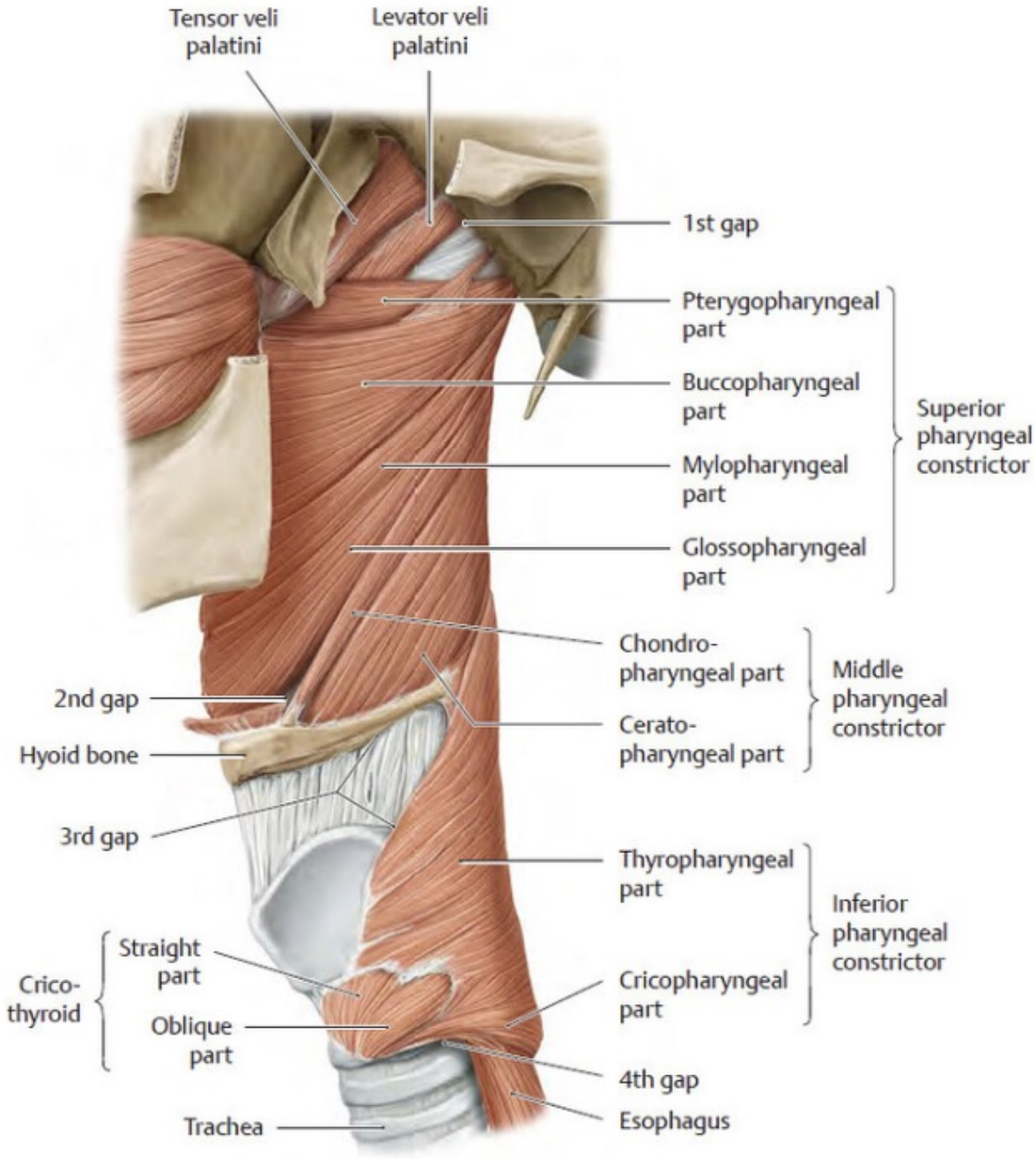




Muscle	Origin	Insertion	Innervation	Action
Palatopharyngeus (palatopharyngeal arch)	Palatine aponeurosis (superior surface) and posterior border of palatine bone	Thyroid cartilage (posterior border) or lateral pharynx	Vagus n. (CN X) via pharyngeal plexus	*Bilaterally:* Elevates the pharynx anteromedially.
Salpingopharyngeus	Cartilaginous pharyngotympanic tube (inferior surface)	Along salpingopharyngeal fold to palatopharyngeus		*Bilaterally:* Elevates the pharynx; may also open pharyngotympanic tube.
Stylopharyngeus	Styloid process (medial surface of base)	Lateral pharynx, mixing with pharyngeal constrictors, palatopharyngeus, and thyroid cartilage (posterior border)	Glossopharyngeal n. (CN IX)	*Bilaterally:* Elevates the pharynx and larynx.

Pharyngeal gaps

Gap	Transmitted structures
1st gap	Pharyngotympanic tube
	Levator veli palatini
2nd gap	Stylopharyngeus (inserts on larynx)
	Glossopharyngeal n. (CN IX)
3rd gap	Internal branch of superior laryngeal n.
	Superior laryngeal a. and v.
4th gap	Recurrent laryngeal n.
	Inferior laryngeal a.



Weakening of the pharyngeal wall

Oropharyngeal Trigon :

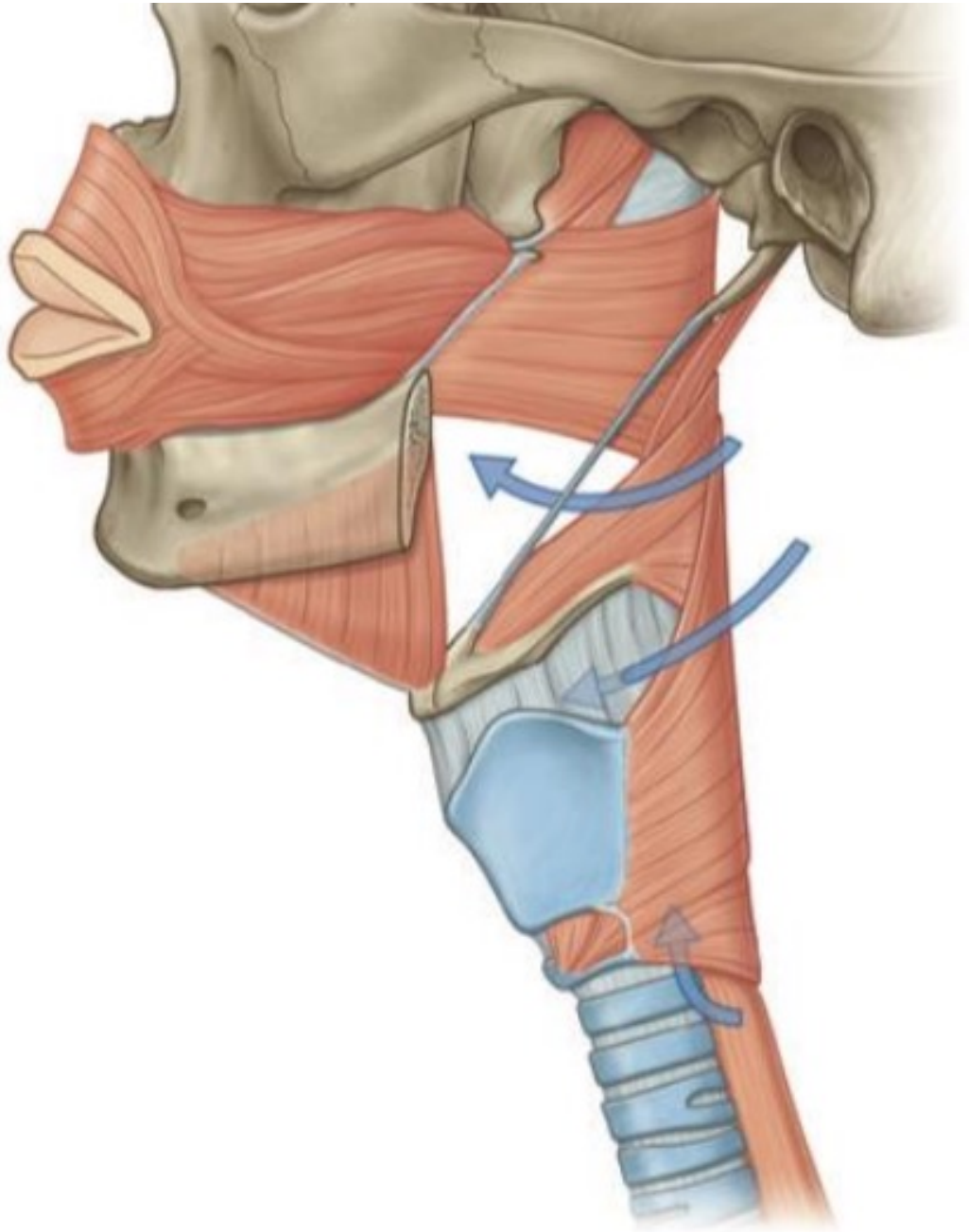
Muscles, nerves and vessels

Space between thyroid cartilage and hyoid bone :

N. leryngeus internus (internal branch of superior laryngeal nerve) , Vasa laryngelaes internae

Space between inferior pharyngeal constrictor m. and trachea

N. laryngeus recurrens

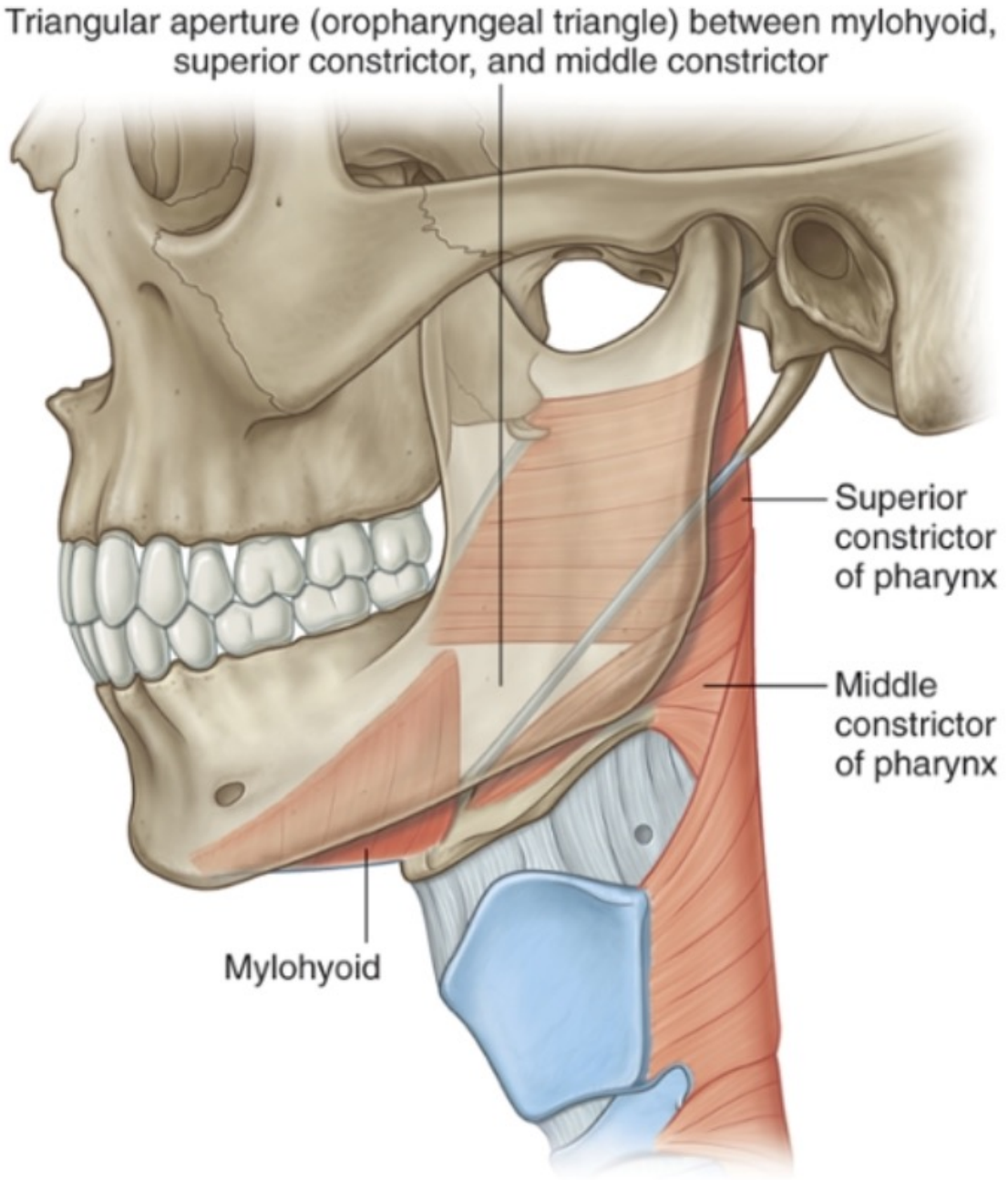


Oropharyngeal triangle

The **free posterior border of the mylohyoid muscle** on each side forms one of the three margins of a large **triangular aperture (oropharyngeal triangle)**, which is a major route by which structures in the **upper neck and infratemporal fossa of the head pass to and from structures in the floor of the oral cavity.** The other two muscles that complete the margins of the aperture are the **superior and middle constrictor muscles of the pharynx.**

Most structures that pass through the aperture are associated with the tongue and include **muscles (hyoglossus, styloglossus), vessels (lingual artery and vein), nerves (lingual, hypoglossal [XII], glossopharyngeal [IX]), and lymphatics**.

A large salivary gland (the **submandibular gland**) is "hooked" around the free posterior margin of the mylohyoid muscle and therefore also passes through the opening.

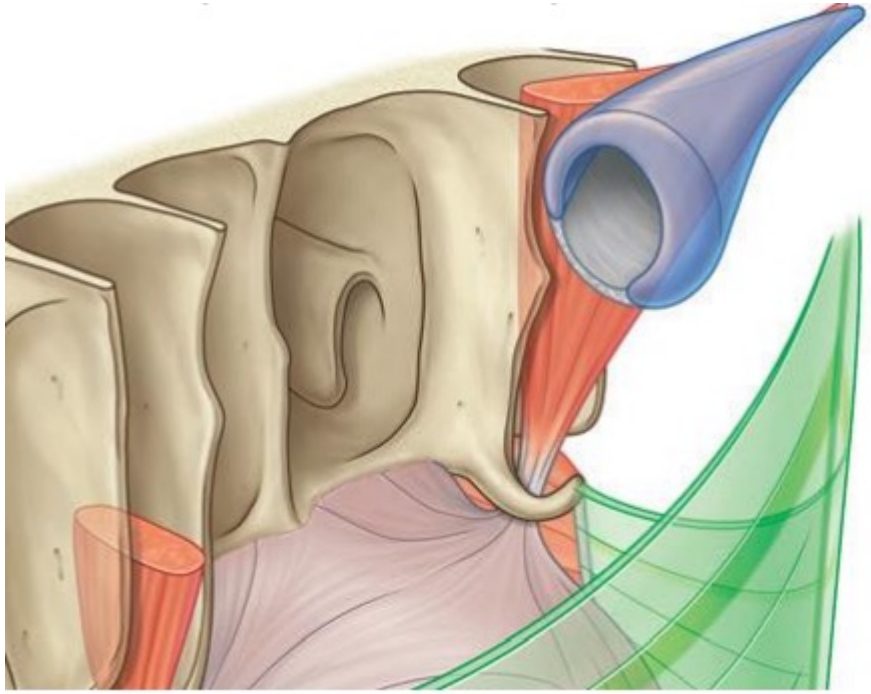


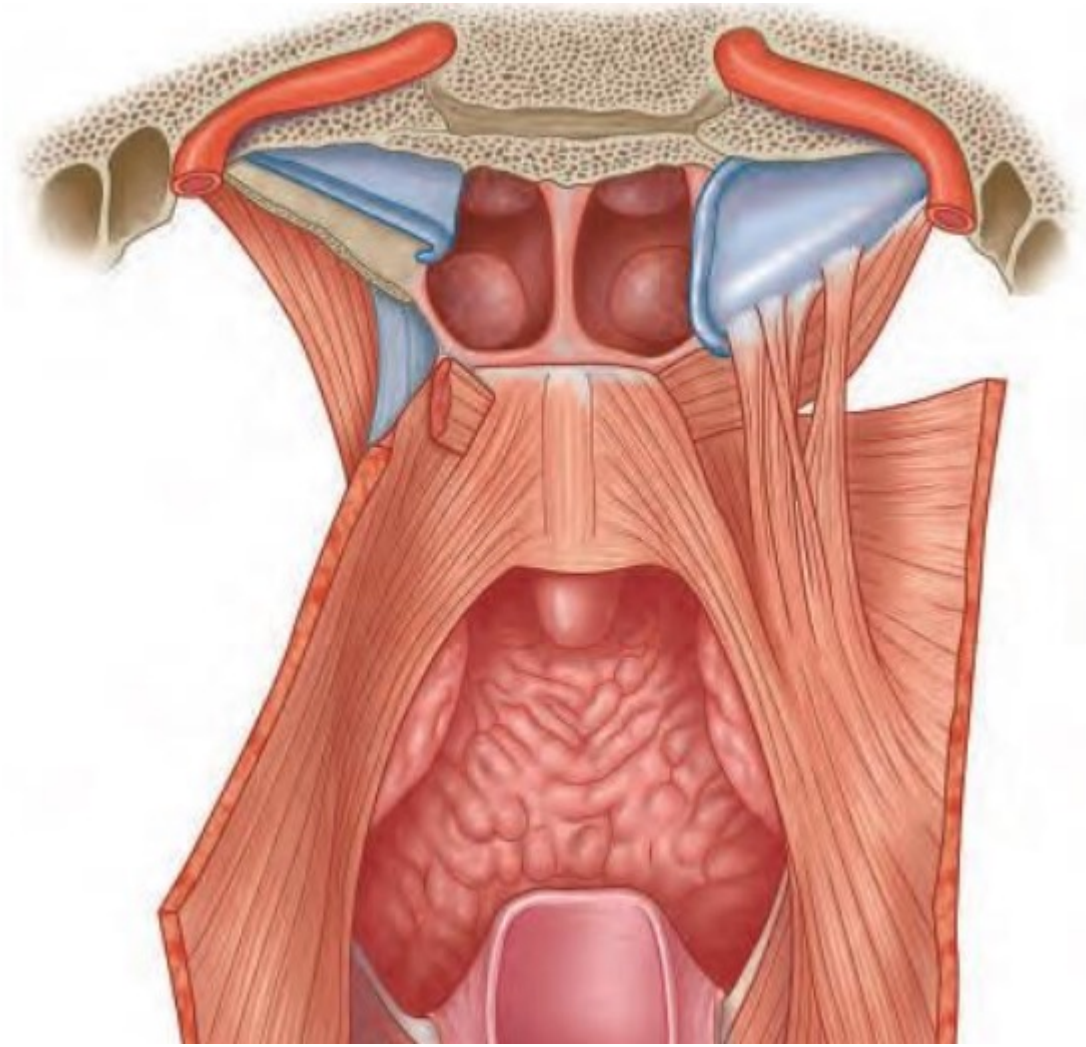
Eustachian tube, auditory tube or pharyngotympanic tube:

Tensor veli palatini attaches to the membranous part of the pharyngotympanic tube

Salpingopharyngeus m. attaches to the cartilaginous part of the pharyngotympanic tube

Both of them open the Eustachian tube!



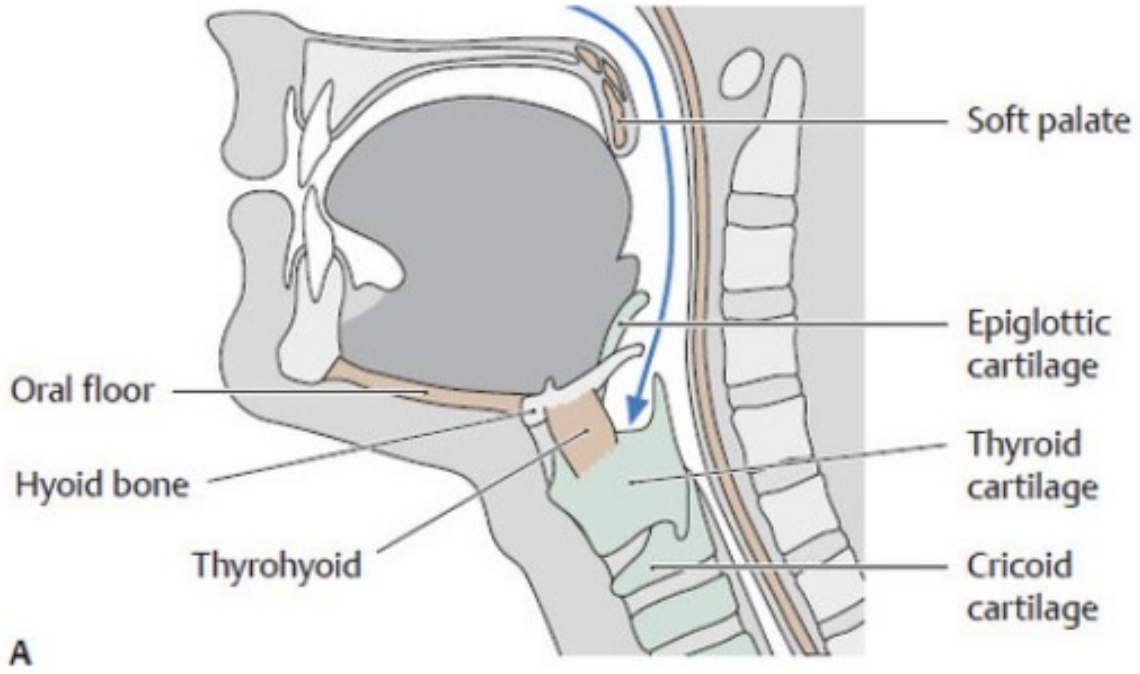


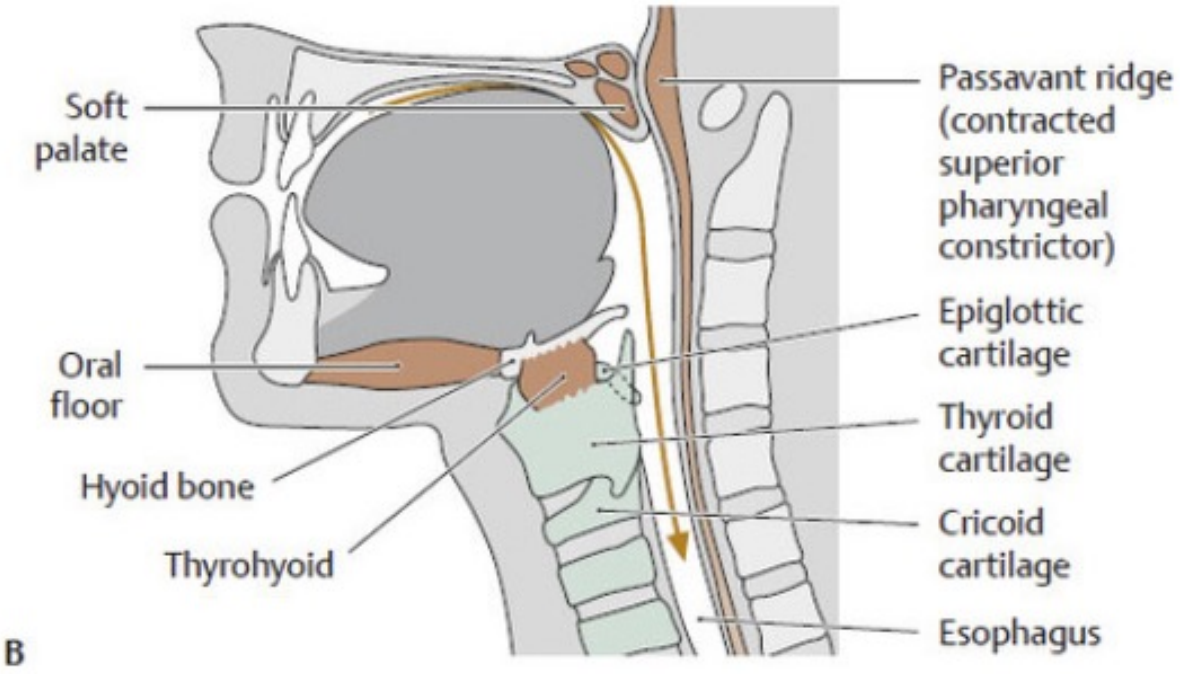
Swallowing consists of three phases:

Oral stage (voluntary initiation): The lingual muscles move the food bolus to the oropharyngeal isthmus, which first expands and then contracts.

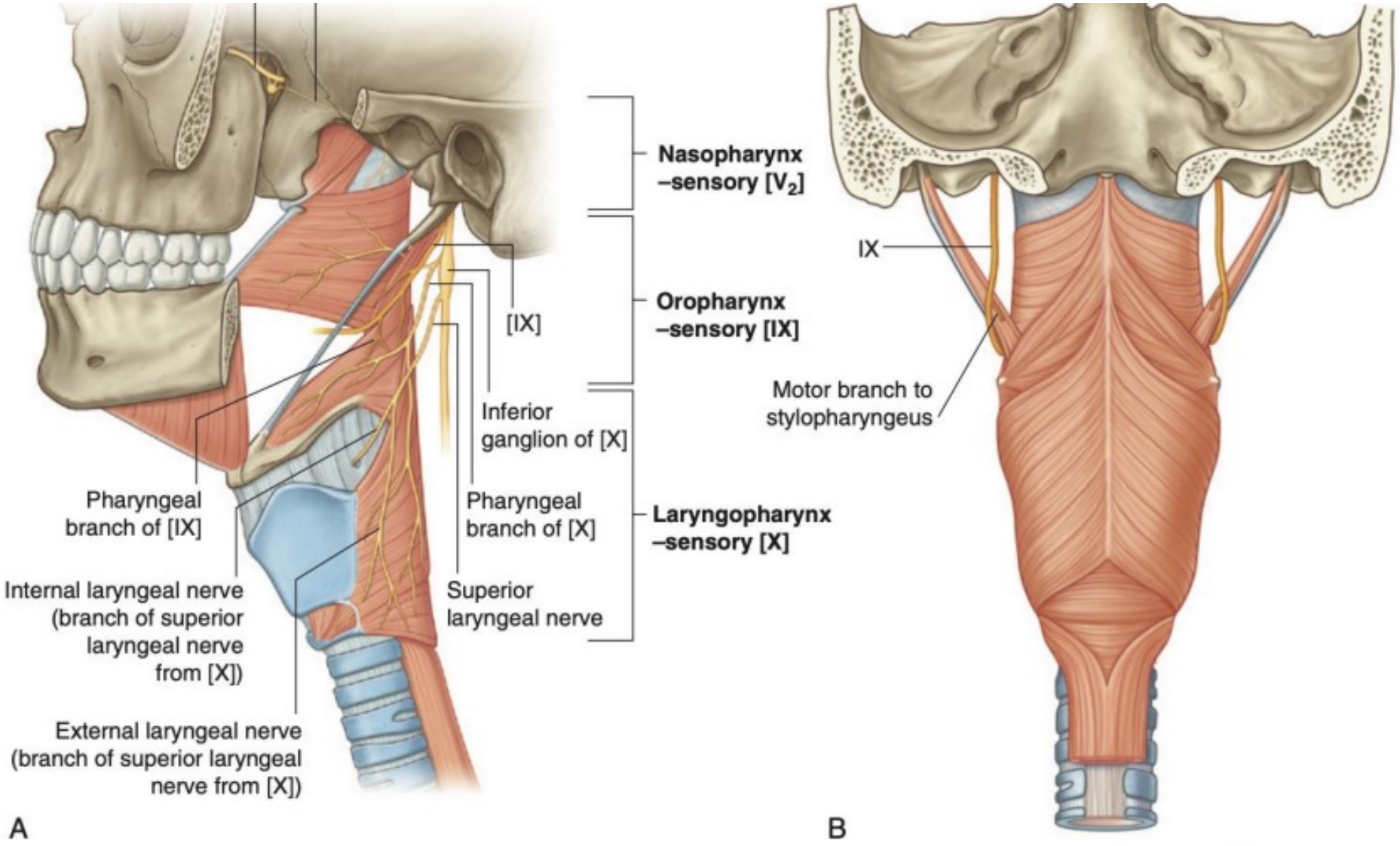
Pharyngeal stage (reflex closure of airway): The longitudinal pharyn geal muscles elevate the larynx. The lower airway (laryngeal inlet) is covered by the epiglottis. Meanwhile, the soft palate is tensed and elevated against the posterior pharyngeal wall, sealing off the upper airway.

Pharyngoesophageal stage (reflex transport): The constrictors move the food bolus to the stomach





Innervation of the pharynx



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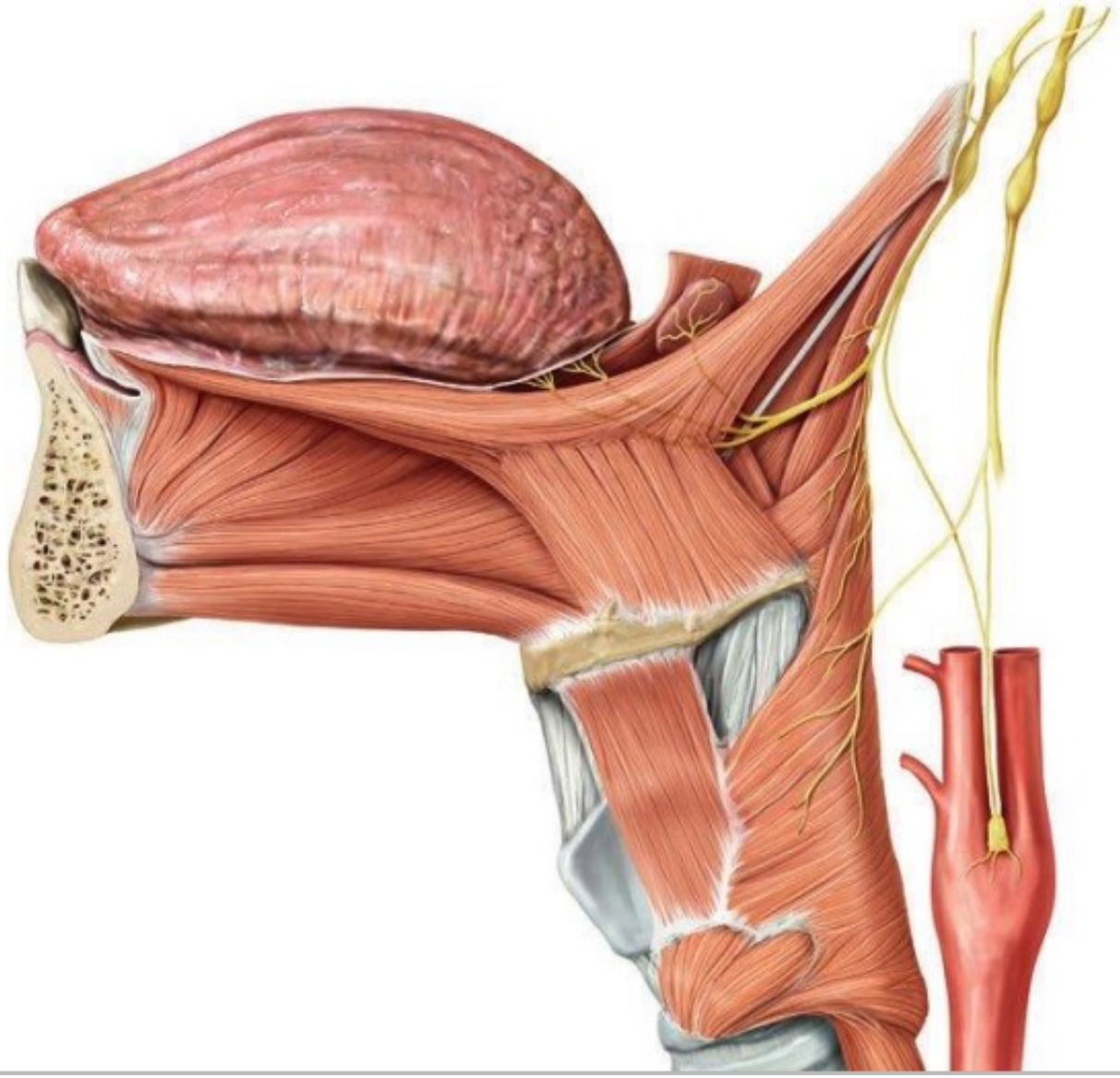
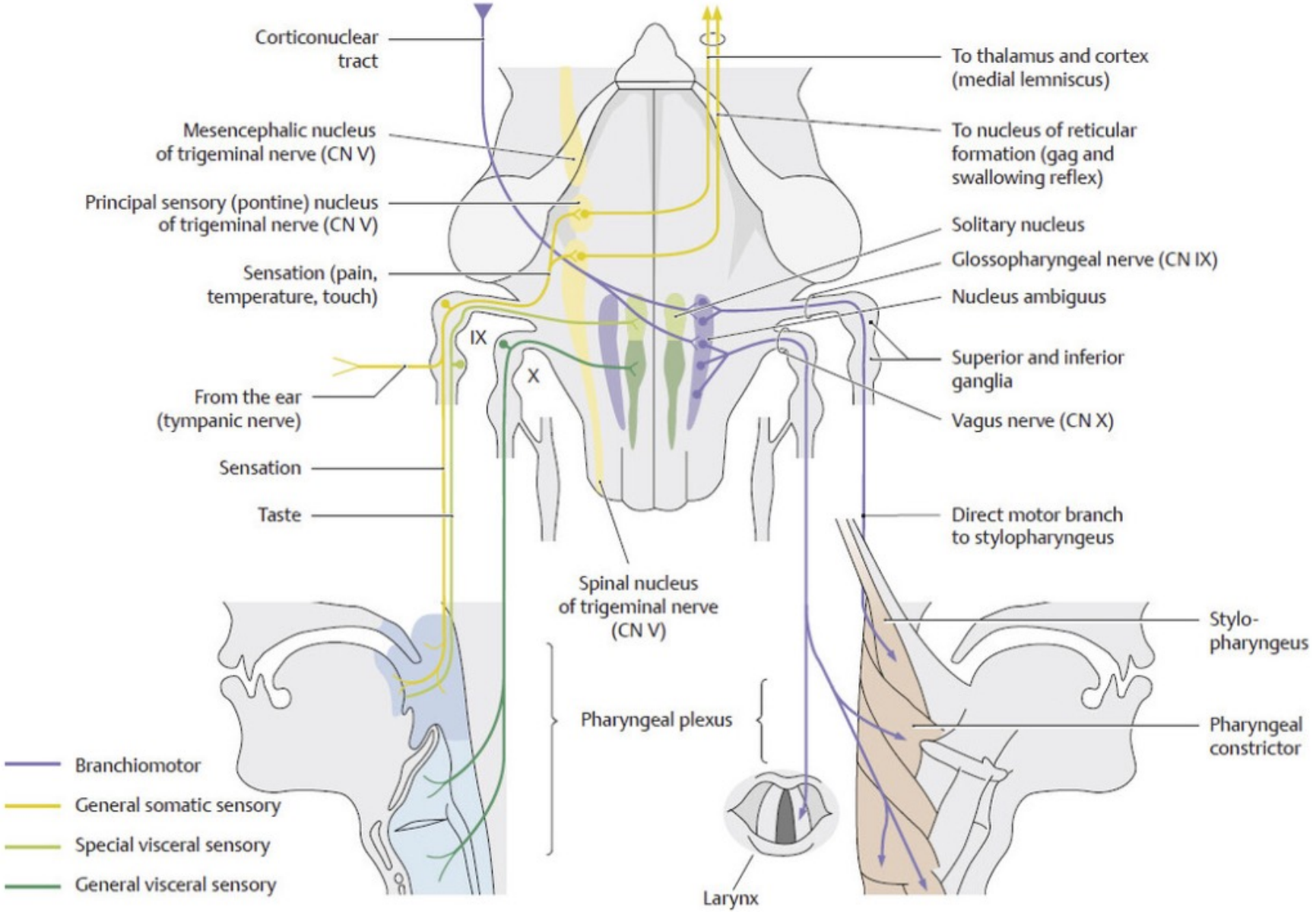
The pharynx receives sensory and motor innervation via the pharyngeal plexus

Pharyngeal branches of CN IX, CN X form pharyngeal plexus

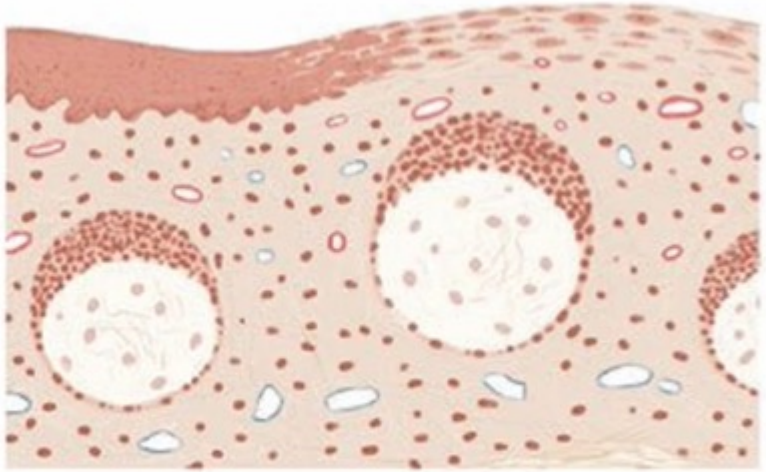


Note: **Only the vagus nerve contributes motor fibers to the pharyngeal plexus (the stylopharyngeus is supplied directly by CN IX).**



tonsillae

- Lymphoepithelial tissue
- No basement membrane
- Lymphatic folliculi



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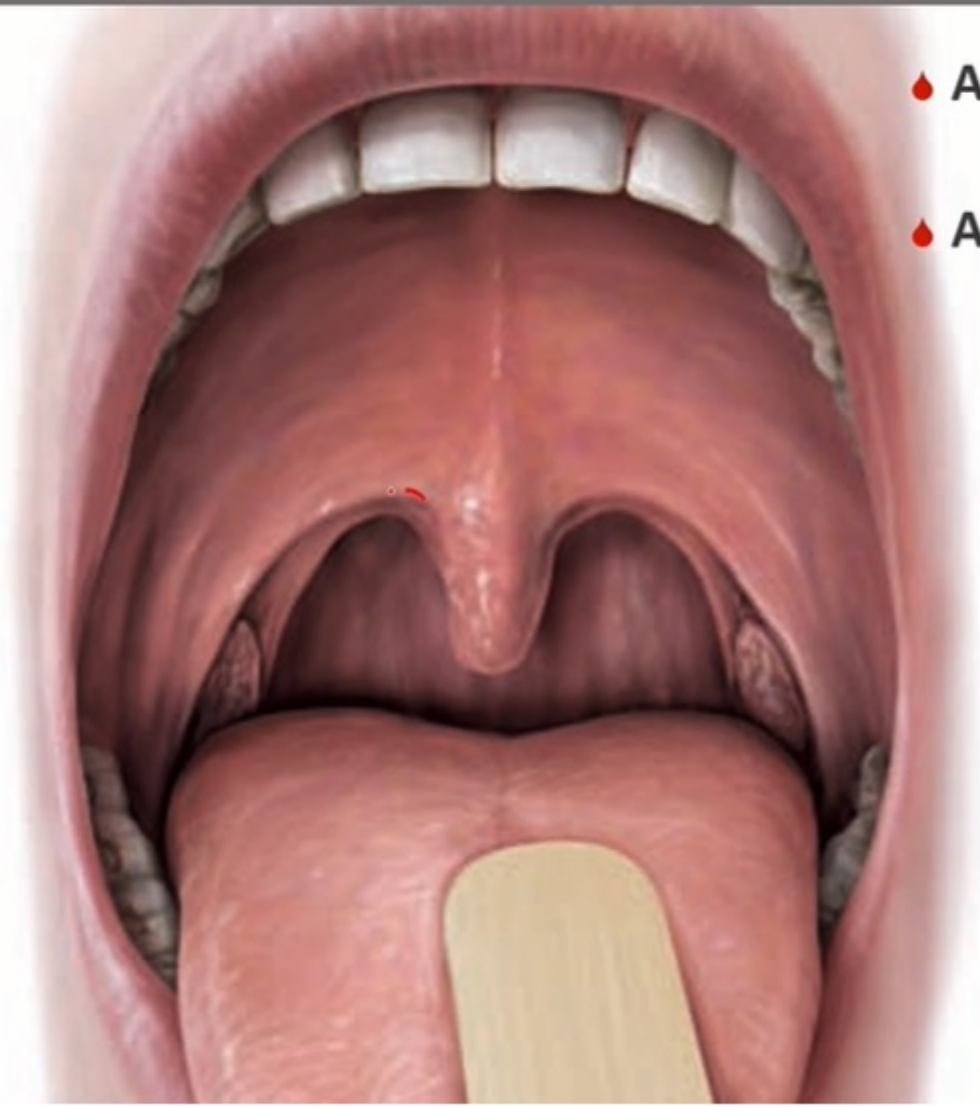
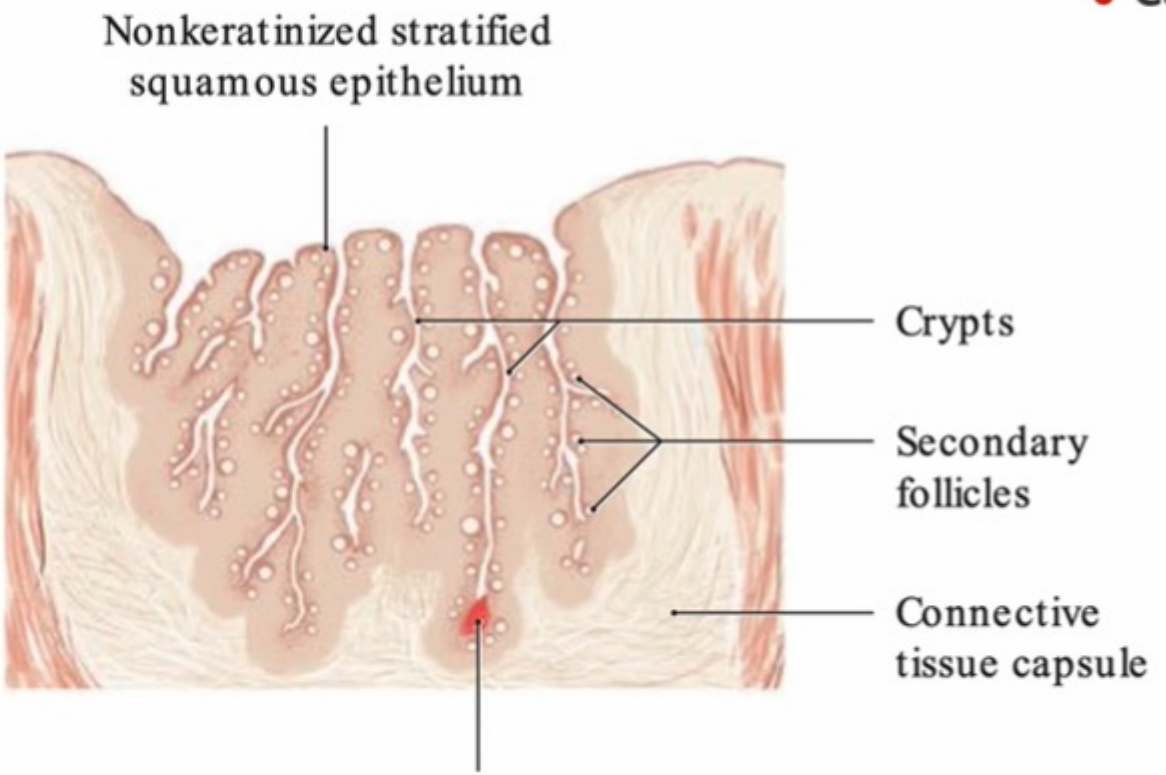
Fossa tonsillaris



- Arcus palatoglossus
  - M. palatoglossus
- Arcus palatopharyngeus
  - M. palatopharnygeus

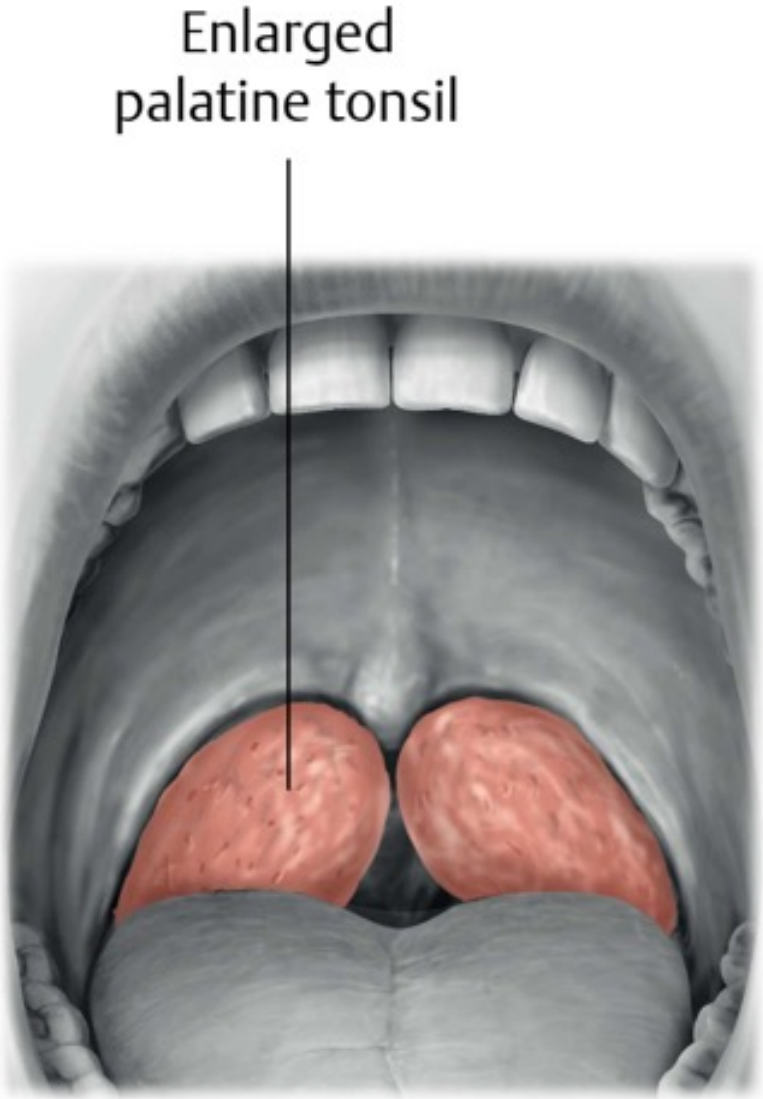
Tonsilla palatina

- Crypts
- Capsula

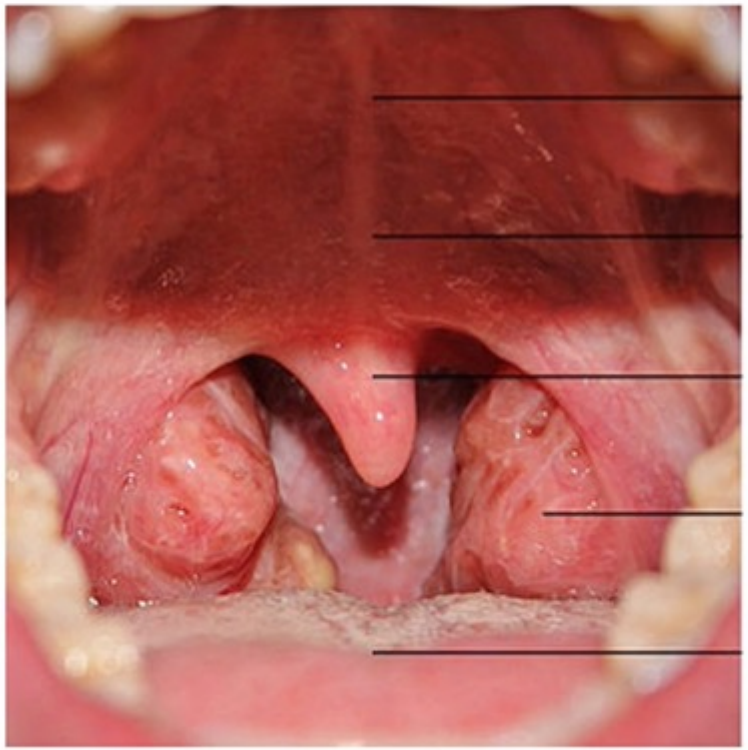


c

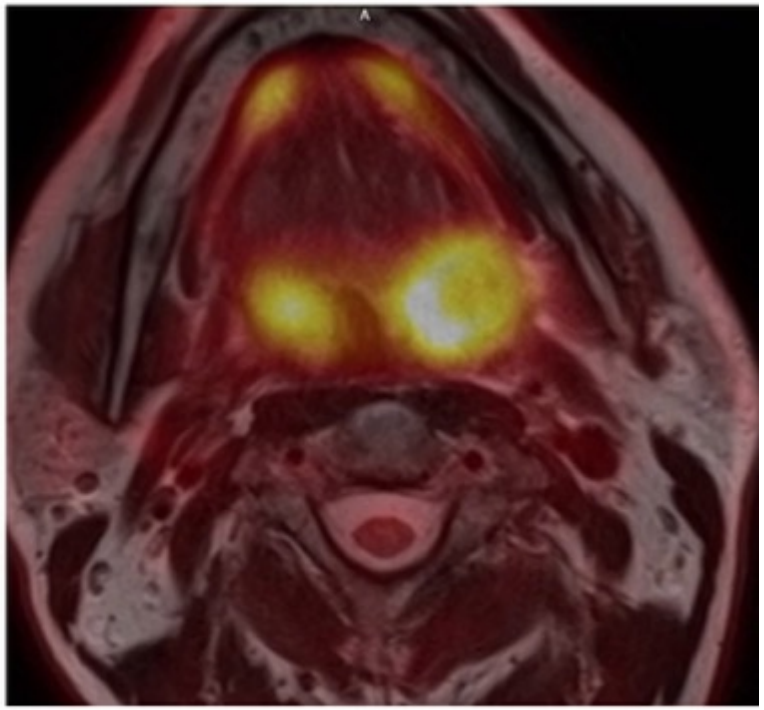
- Severe enlargement of the palatine tonsil (due to viral or bacterial in fection, as in tonsillitis) may significantly narrow the outlet of the oral cavity, causing difficulty in swallowing (dysphagia).
- Tonsillectomy, surgical removal of the palatine tonsil from the tonsillar bed along with its accompanying fascia, may damage the glossopharyngeal nerve (CN IX), which lies on the lateral wall of the pharynx. This could result in loss of sensation and taste from the posterior one third of the tongue.
- Bleeding after tonsillectomy



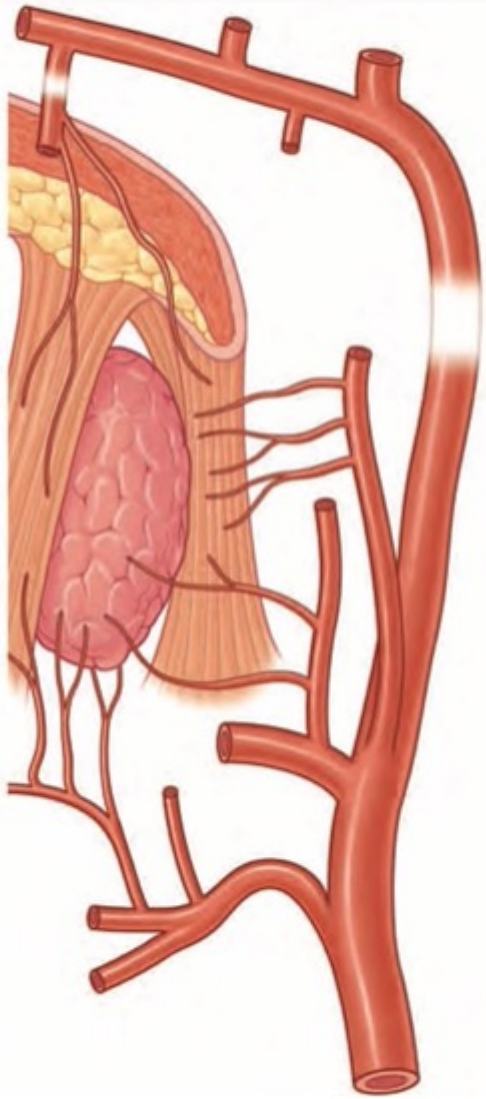
Tonsilla palatina



- Placed in fossa palatina
- crypts
- *A. lingualis*
- *A. facialis*
- *A. pharyngica ascendens*
- *A. maxillaris*
- Tonsilitis
- carcinoma
  - HPV

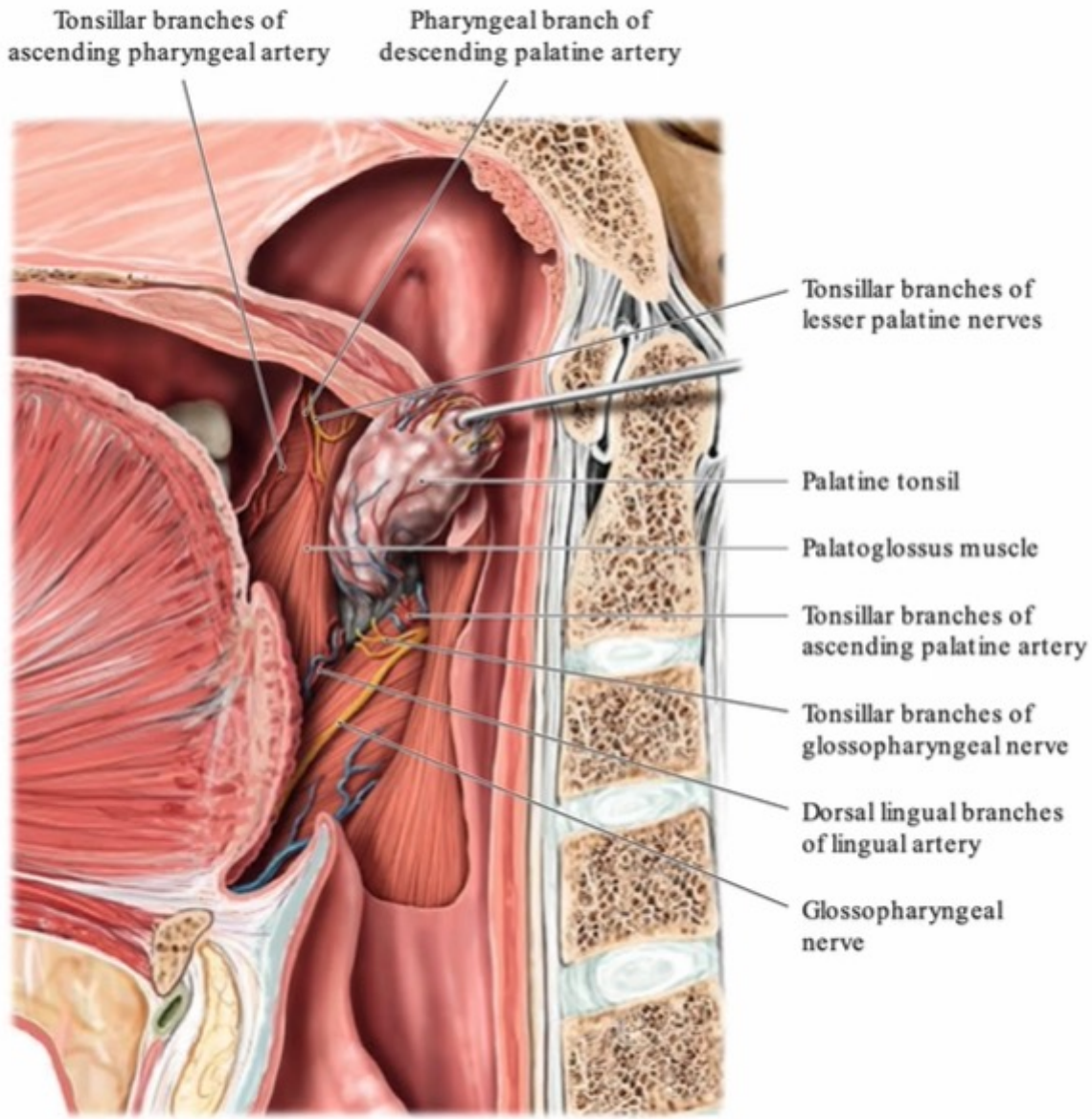


Arteries of tonsilla palatina

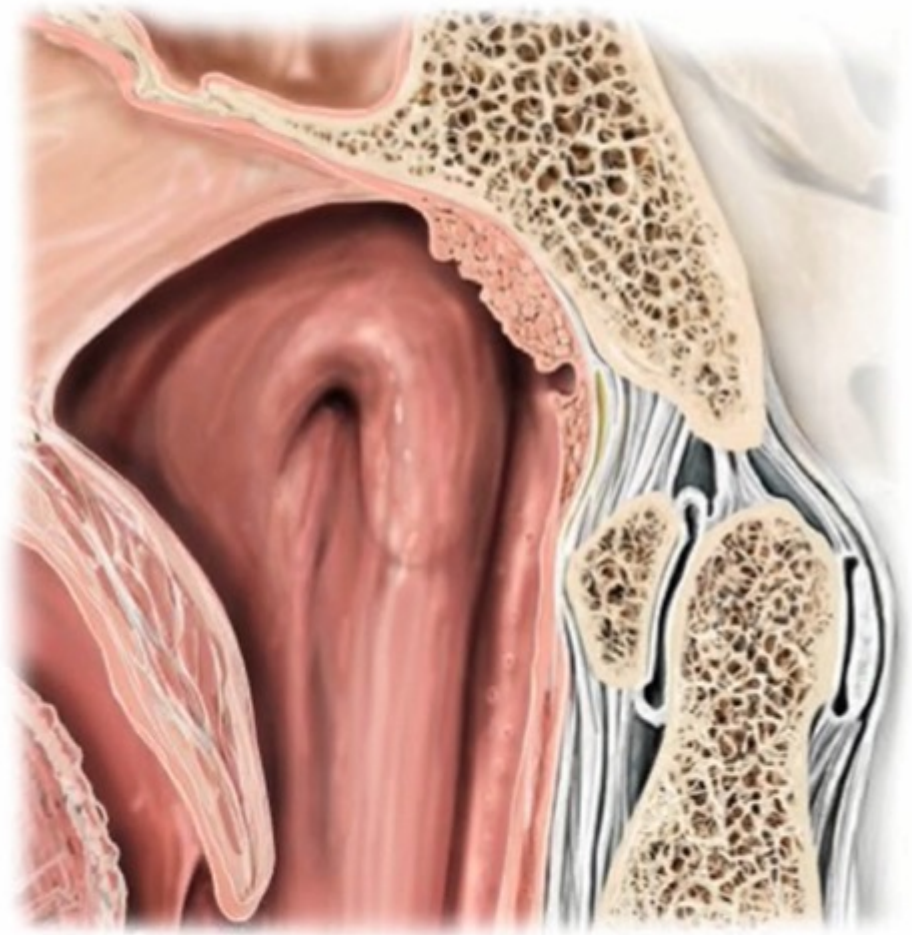


- A. lingualis
  - Rami dorsales linguae
- A. facialis
  - A.palatina ascendens
  - Ramus tonsillaris
- A. pharyngica ascendens
- A. maxillaris
  - A. palatina minor

Gray´s Anatomy


Tonsillar branches of ascending pharyngeal artery
Pharyngeal branch of descending palatine artery
Tonsillar branches of lesser palatine nerves
Palatine tonsil
Palatoglossus muscle
Tonsillar branches of ascending palatine artery
Tonsillar branches of glossopharyngeal nerve
Dorsal lingual branches of lingual artery
Glossopharyngeal nerve

Tonsilla pharyngica

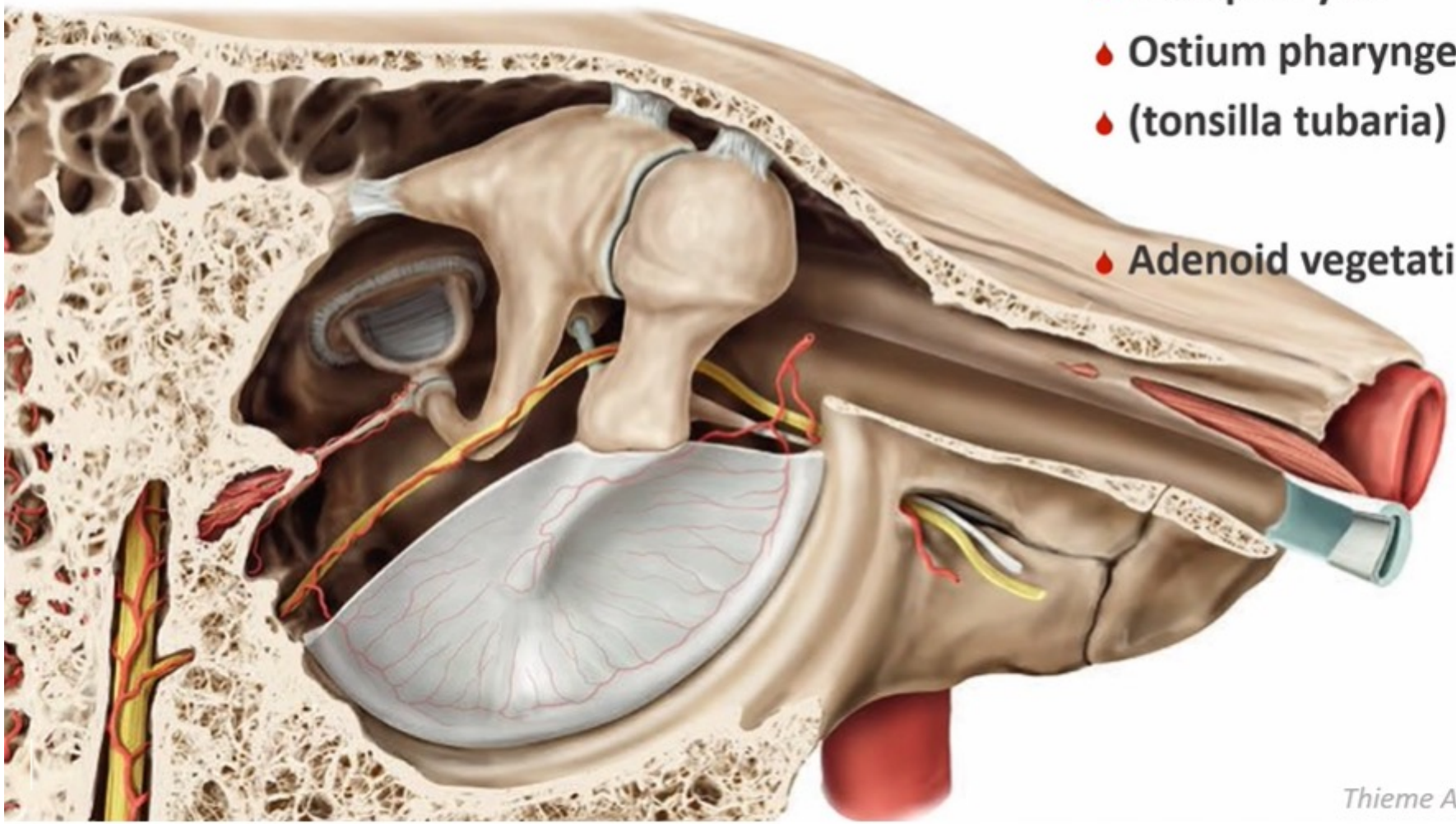


- Nasopharynx
- Ostium pharyngeale tubae auditivae
- (tonsilla tubaria)

- Adenoid vegetation

Thieme Atlas of Anatomy

Tonsilla pharyngica



- Nasopharynx
- Ostium pharyngeale tubae auditivae
- (tonsilla tubaria)
- Adenoid vegetation

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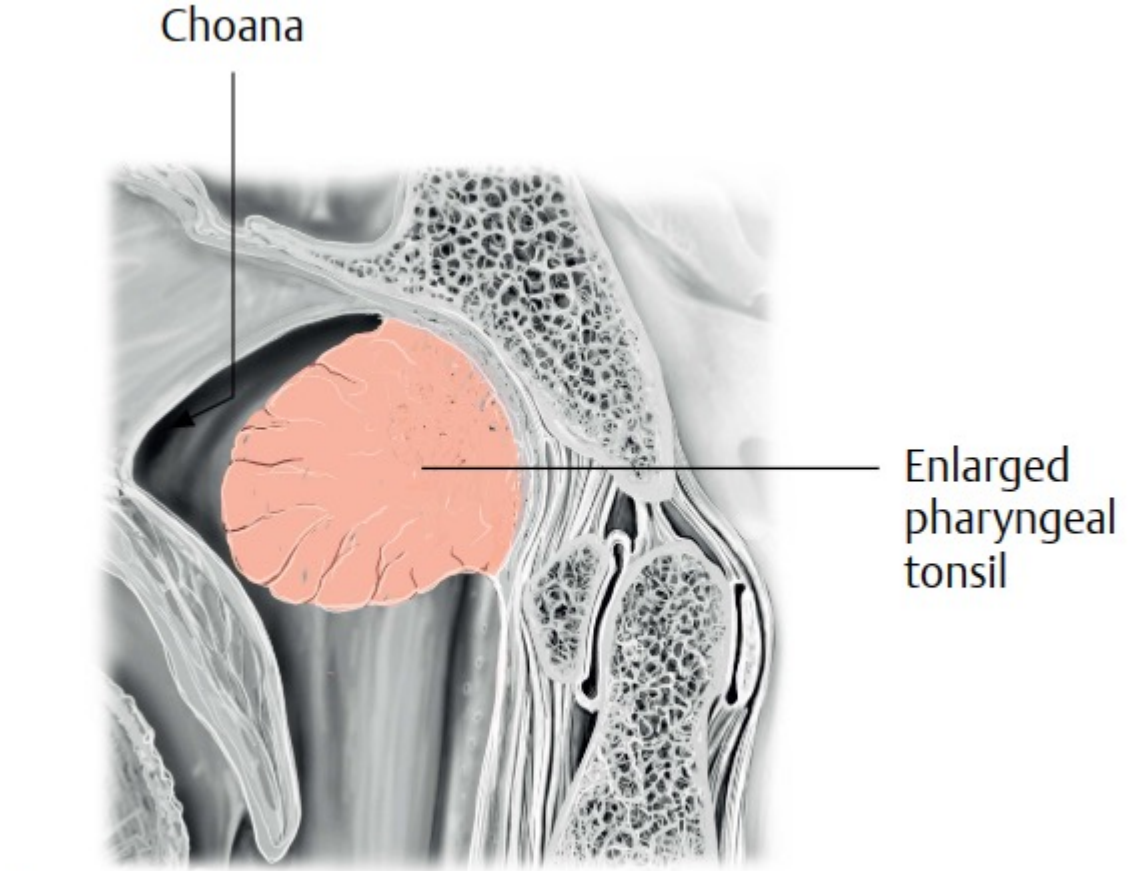
- An enlargement of the **pharyngeal tonsil** is very common in **pre school-aged children**. Chronic recurrent nasopharyngeal infections at that age often evoke a heightened immune response in the lymphatic tissue, causing **“adenoids” or “polyps.”** The enlarged pharyngeal tonsil blocks the **choanae**, obstructing the nasal airway and forcing the child to **breathe through the mouth**. Because the mouth is constantly open during respiration at rest, an experienced examiner can quickly diagnose the adenoidal condition by visual inspection.



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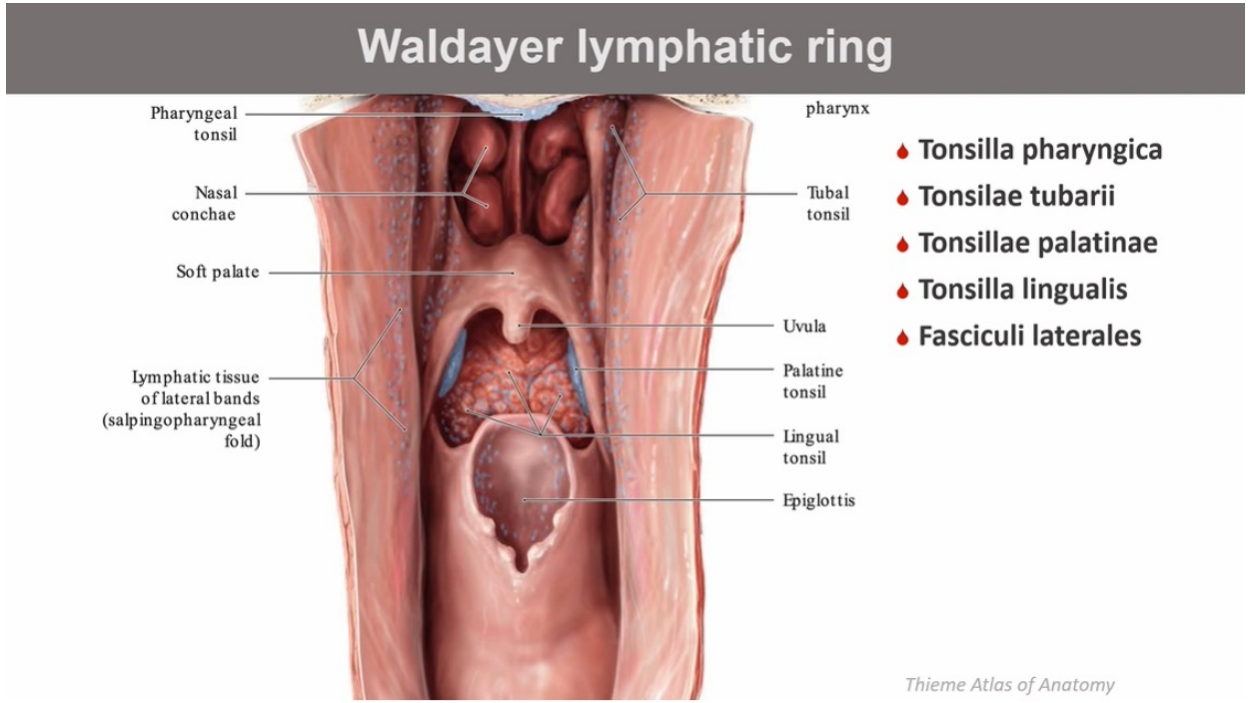
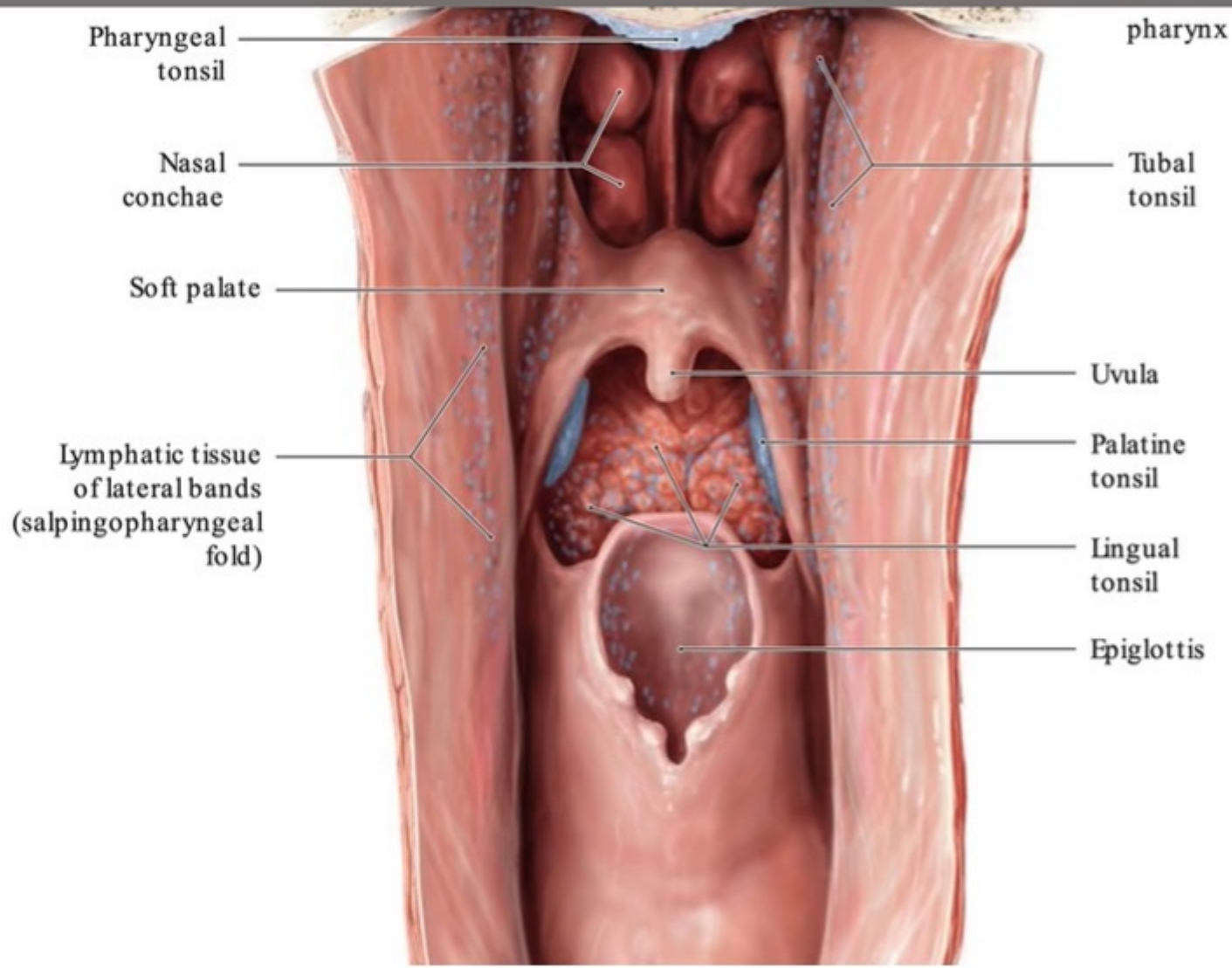
Waldeyer’s ring

- Waldeyer’s ring is composed of immunocompetent lymphatic tissue (tonsils and lymph follicles). The tonsils are “immunological sentinels” surrounding the passageways from the mouth and nasal cavity to the pharynx. The lymph follicles are distributed over all of the epithelium, showing marked regional variations. Waldeyer’s ring consists of the following structures:
- Unpaired pharyngeal tonsil on the roof of the pharynx
- Paired palatine tonsils in the oropharynx between the anterior and posterior pillars (the palatoglossal arch and the palatopharyngeal arch)
- Lingual tonsil, the lymph nodes embedded in the postsulcal portion of the tongue
- Paired tubal tonsils (tonsillae tubariae), which may be thought of as lateral extensions of the pharyngeal tonsil
- Paired lateral bands in the salpingopharyngeal fold



Waldayer lymphatic ring



- Tonsilla pharyngica
- Tonsilae tubarii
- Tonsillae palatinae
- Tonsilla lingualis
- Fasciculi laterales

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