

Systemic Module

CNSII

“Anatomy”

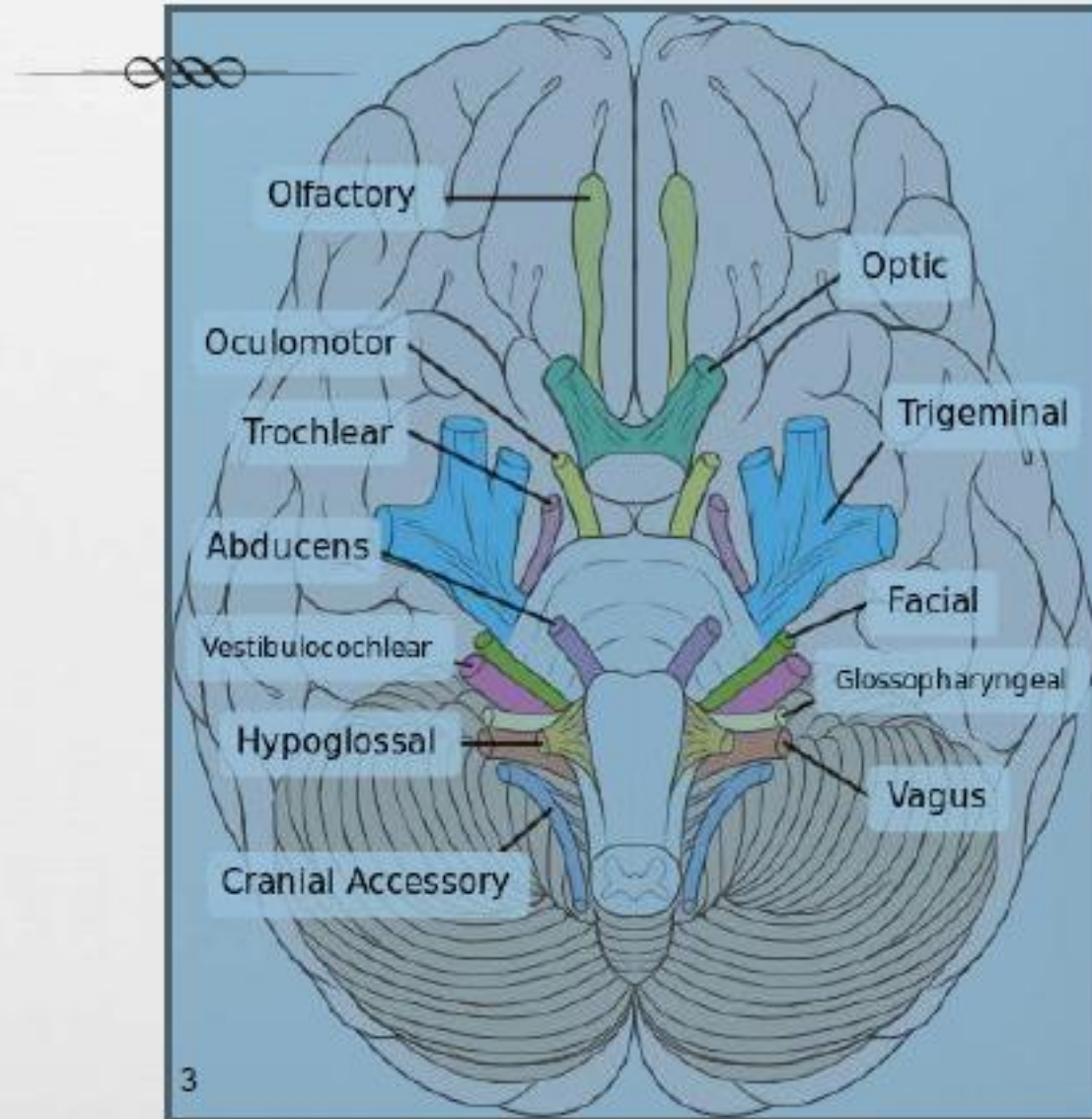
Glossopharyngeal Nerve (VII)

Dr. Ayman Alzubi

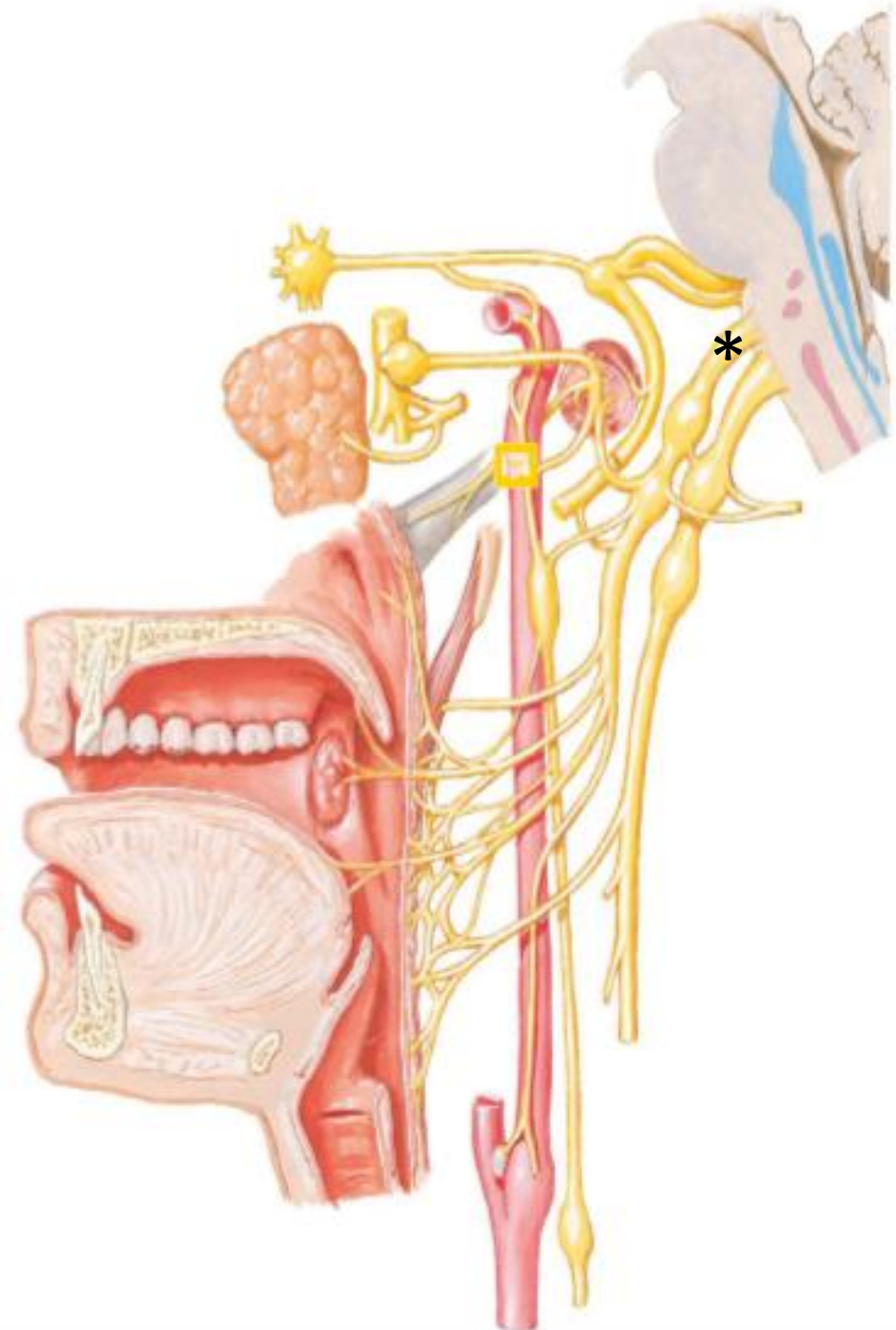
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Cranial nerves

- 1st Olfactory.
- 2nd Optic.
- 3rd Oculomotor.
- 4th Trochlear.
- 5th Trigeminal.
- 6th Abducent
- 7th Facial.
- 8th Acoustic.
- 9th Glossopharyngeal
- 10th Vagus.
- 11th Accessory
- 12th Hypoglossal



Glossopharyngeal Nerve

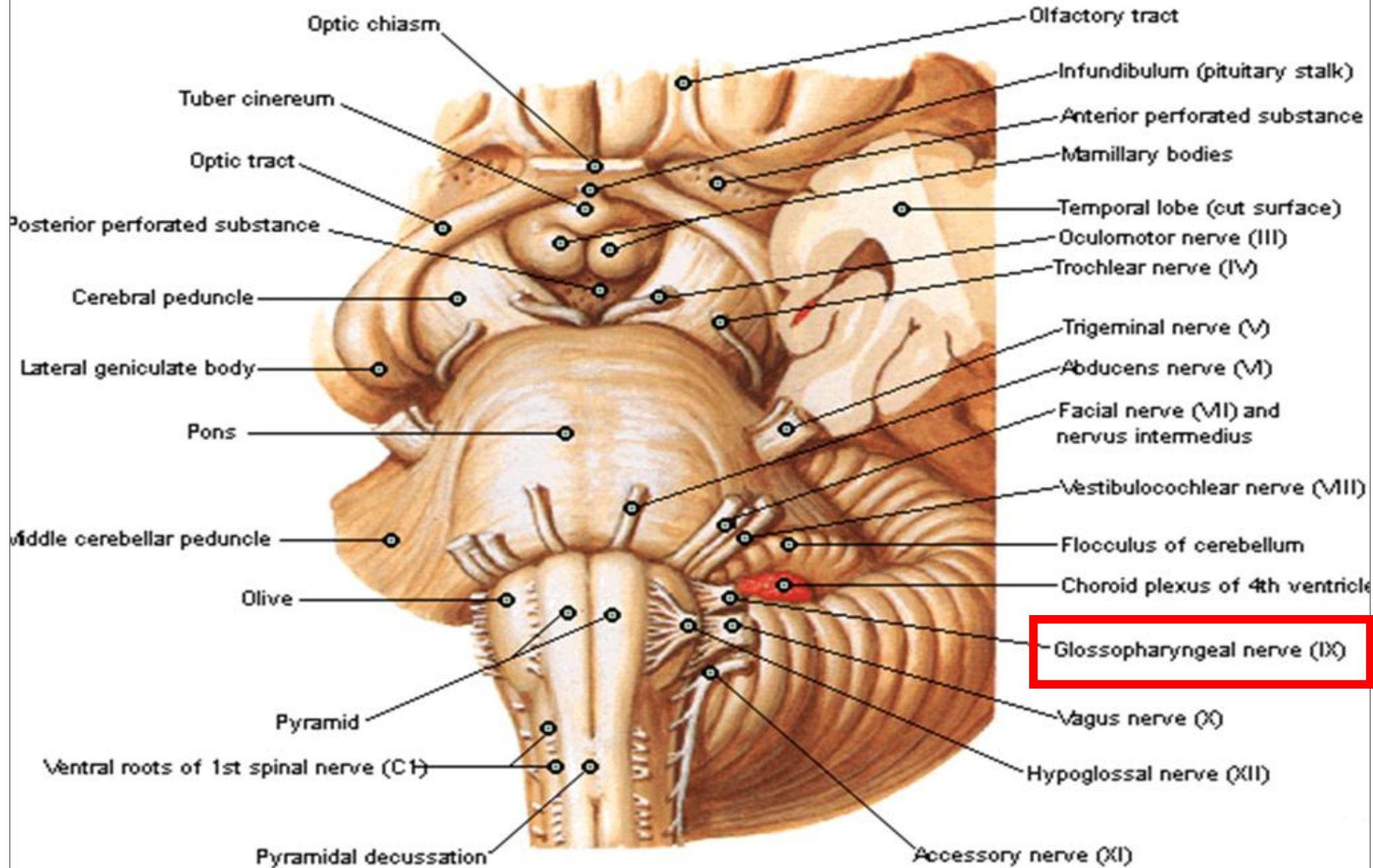


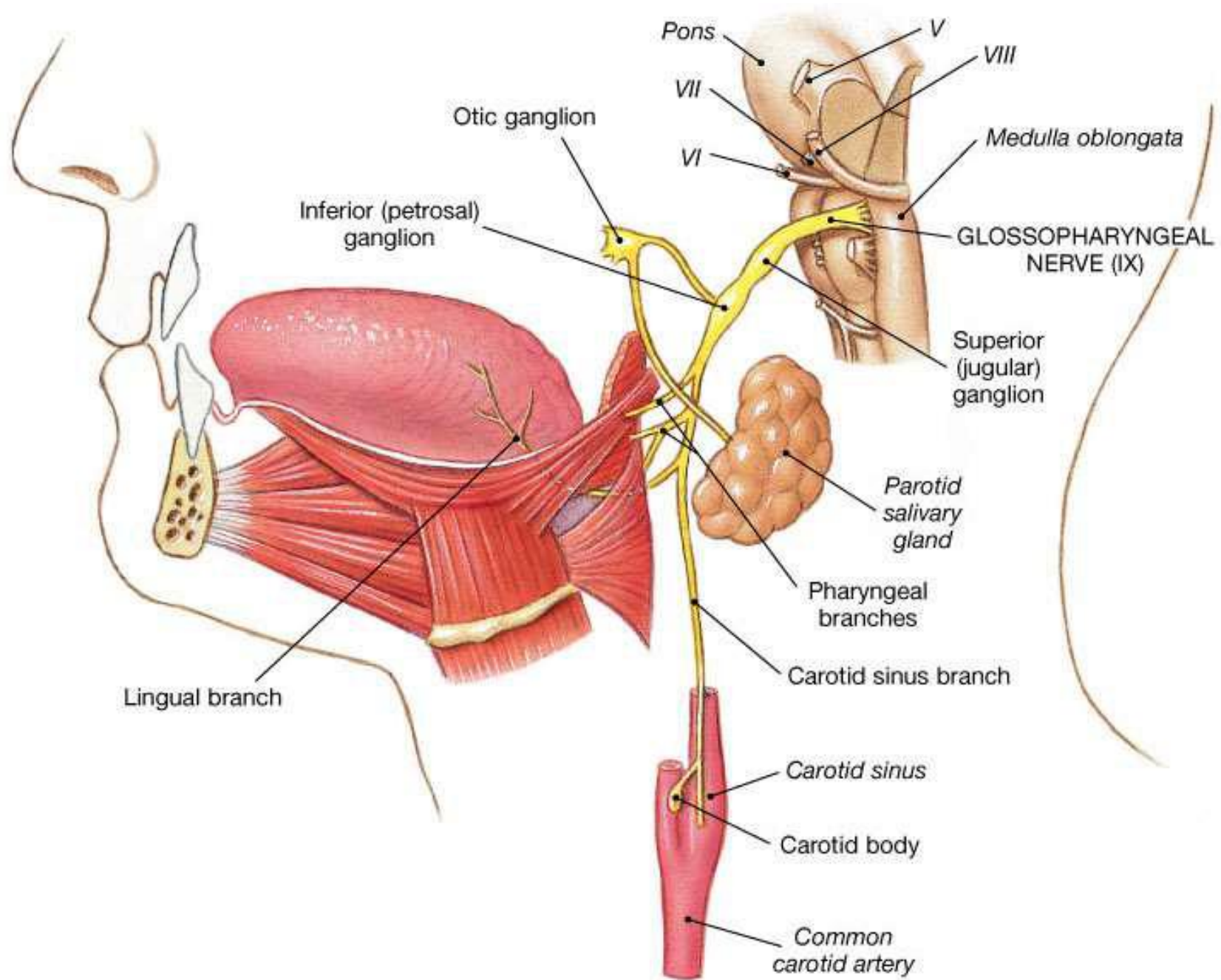
Glossopharyngeal Nerve

- The 9th cranial nerve.
- Mixed nerve with motor and sensory functions.
- Distributed principally to tongue and pharynx.
- **Attachment to brain stem:** Emerges from the ventral surface of medulla, posterior to the olive, above the vagus nerve.

Brainstem

Anteroinferior View





Functions of Glossopharyngeal Nerve

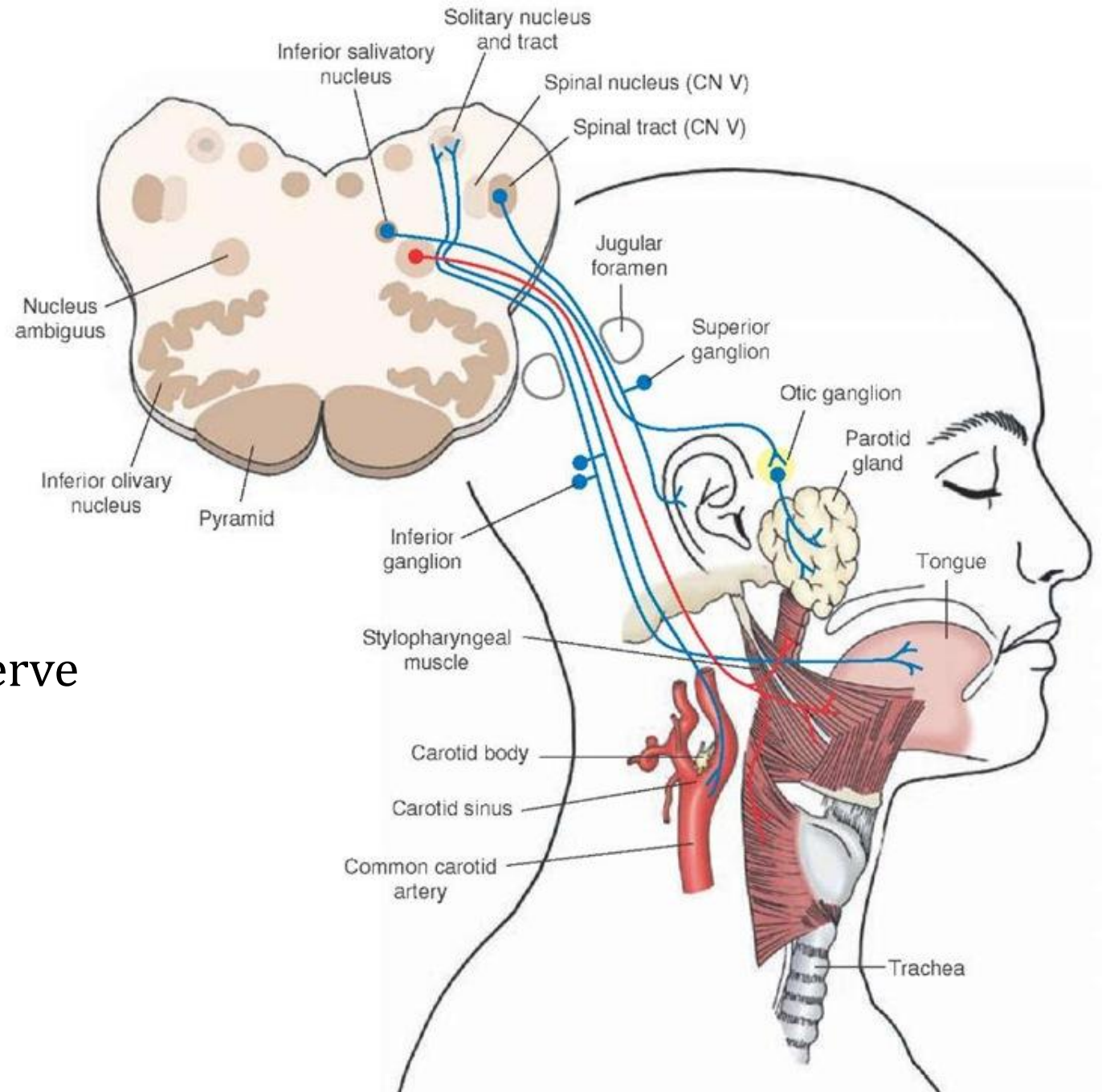
- **Sensory:** Innervates the pharynx, posterior 1/3 of the tongue, soft palate, tonsils, carotid body and sinus, middle ear cavity and Eustachian tube.
- **Special sensory:** Carries the taste sensation from the posterior 1/3rd of the tongue.
- **Motor:** Innervates the stylopharyngeus muscle of the pharynx
- **Parasympathetic:** Provides innervation to the parotid gland.

Glossopharyngeal Nerve Nuclei

- **Nucleus Ambiguus**
 - Motor to stylopharyngeus.
- **Inferior Salivatory Nucleus**
 - Parasympathetic (via otic ganglion) to parotid gland.
- **Solitary Tract Nucleus**
 - General sensation from pharynx, posterior tongue, middle ear, and carotid body and sinus.
 - Taste from posterior 1/3 of tongue.
- **Spinal Nucleus of Trigeminal Nerve**
 - Cutaneous sensation from external ear.

Nuclei of Glossopharyngeal Nerve

- Nucleus Ambiguous
- Inferior Salivatory Nucleus
- Solitary Tract Nucleus
- Spinal Nucleus of Trigeminal Nerve



Course of Glossopharyngeal Nerve

Emerges from the ventral surface of the medulla oblongata. Runs laterally in the posterior cranial fossa



Leaves the skull by passing through the central part of the jugular foramen (Has superior and inferior ganglia immediately outside the jugular foramen)



At its exit from the skull, it passes forward between the internal jugular vein and internal carotid artery

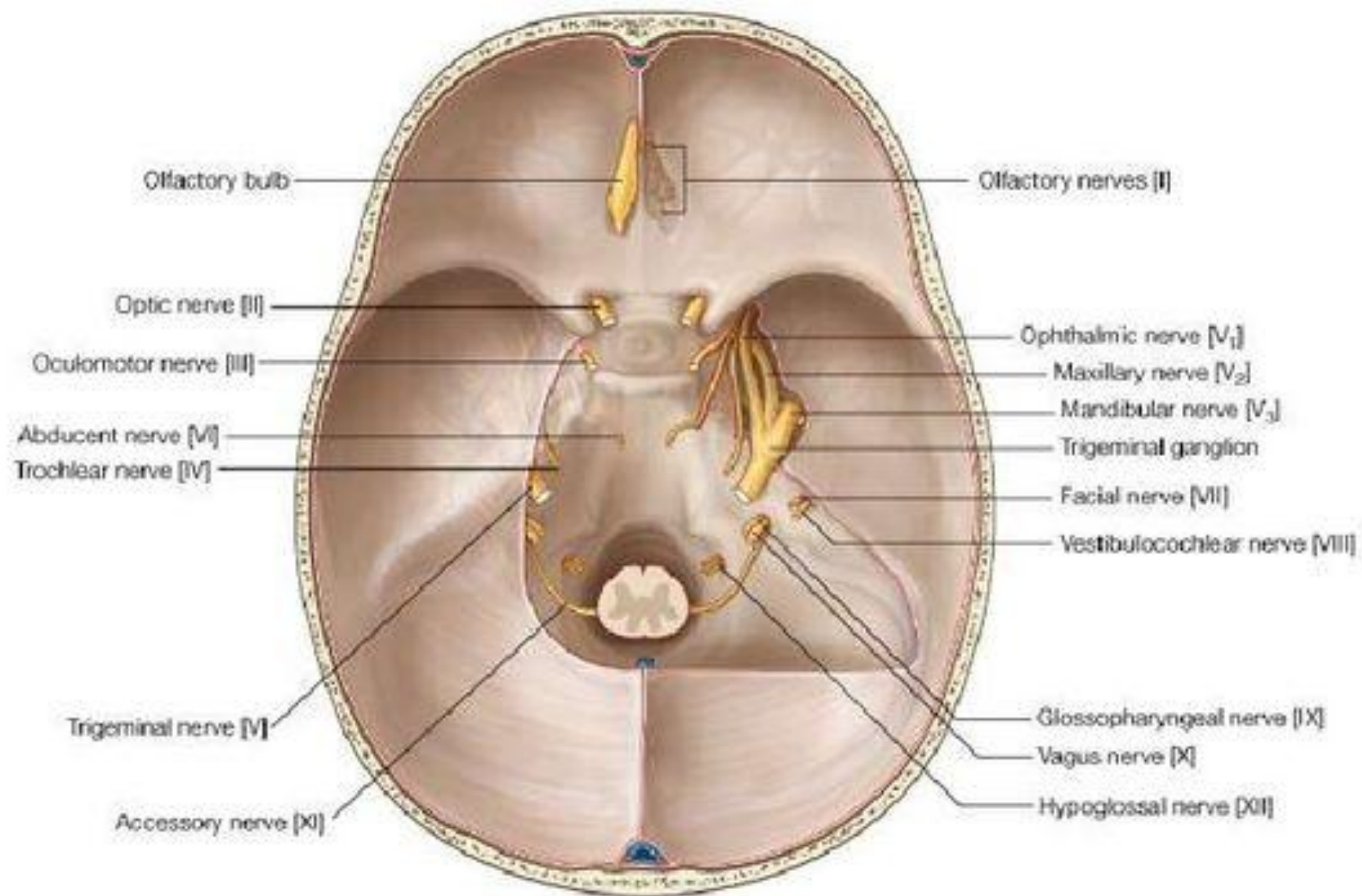


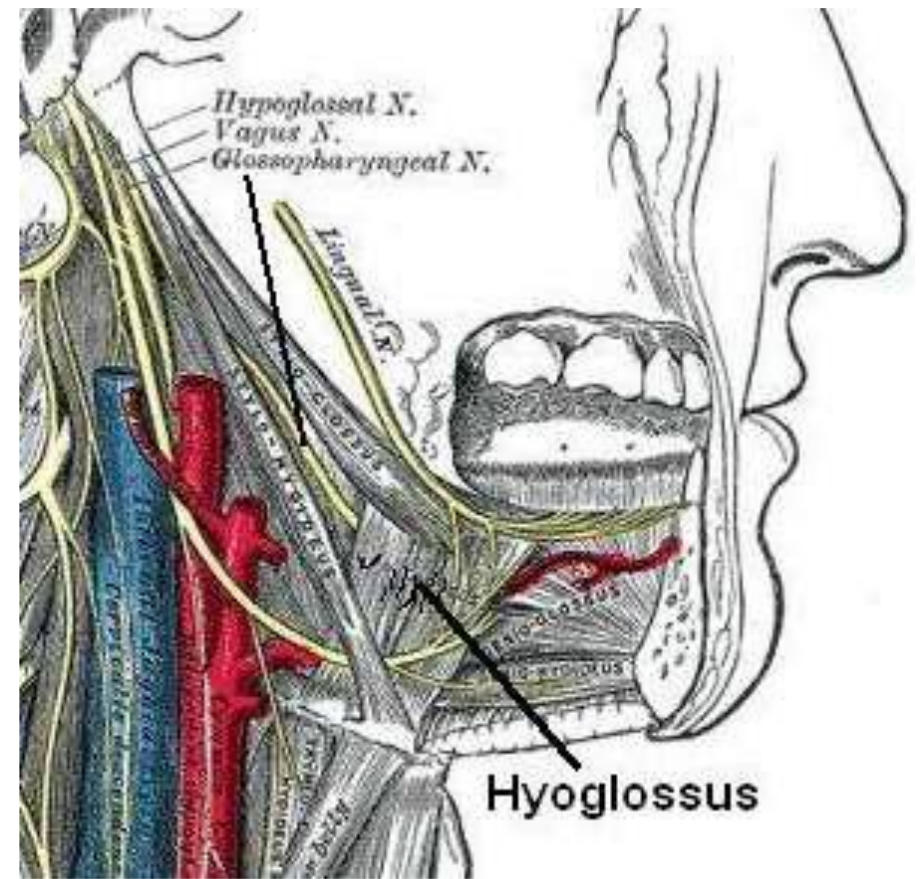
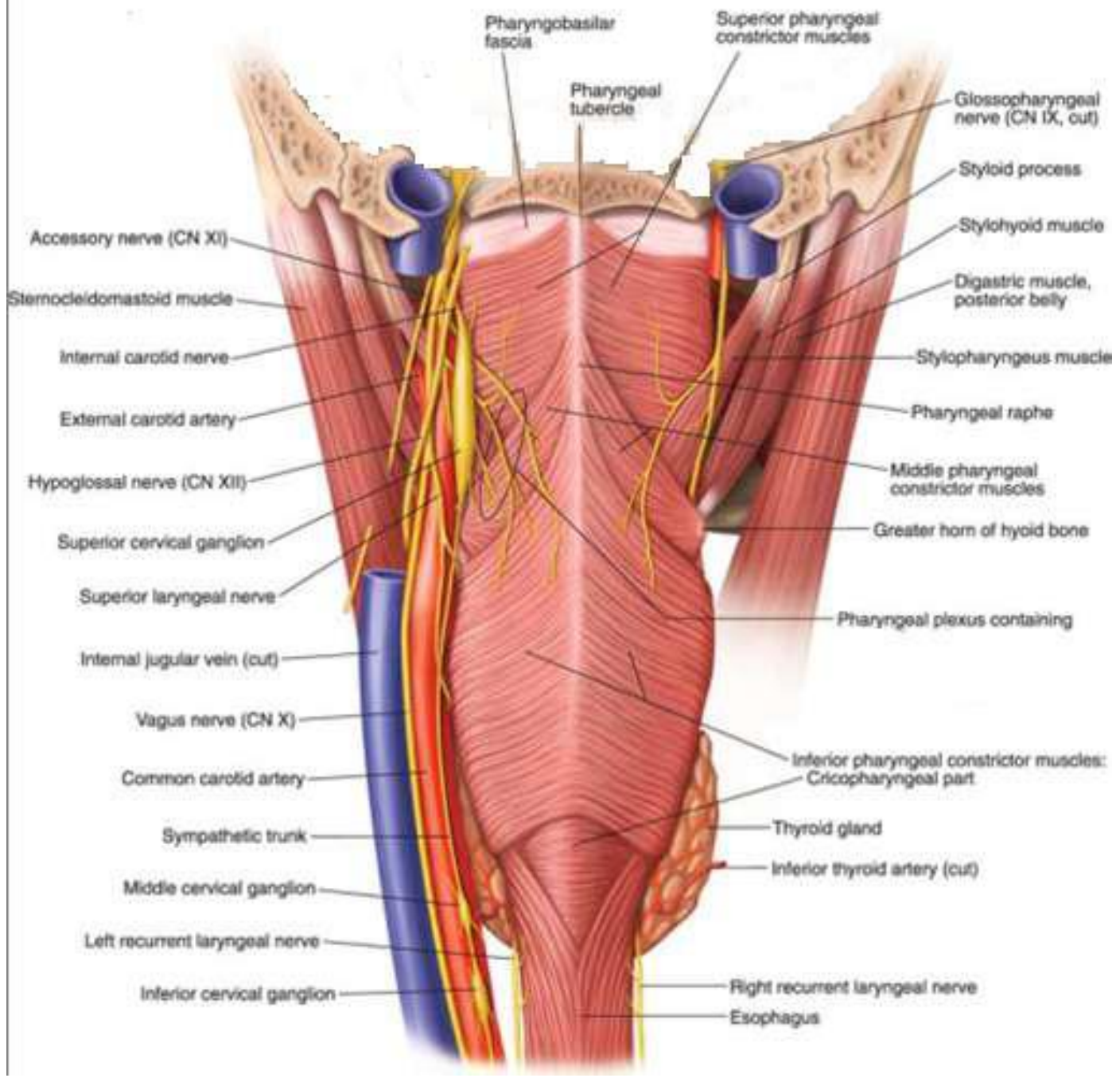
Descends to the lower border of the stylopharyngeus muscle. Then curves forward around the stylopharyngeus and passes through the gap between the superior and middle constrictor muscles of the pharynx



Within the pharynx, it terminates by dividing into several branches – **lingual**, **tonsil** and **pharyngeal**

Cranial nerves exiting the cranial cavity

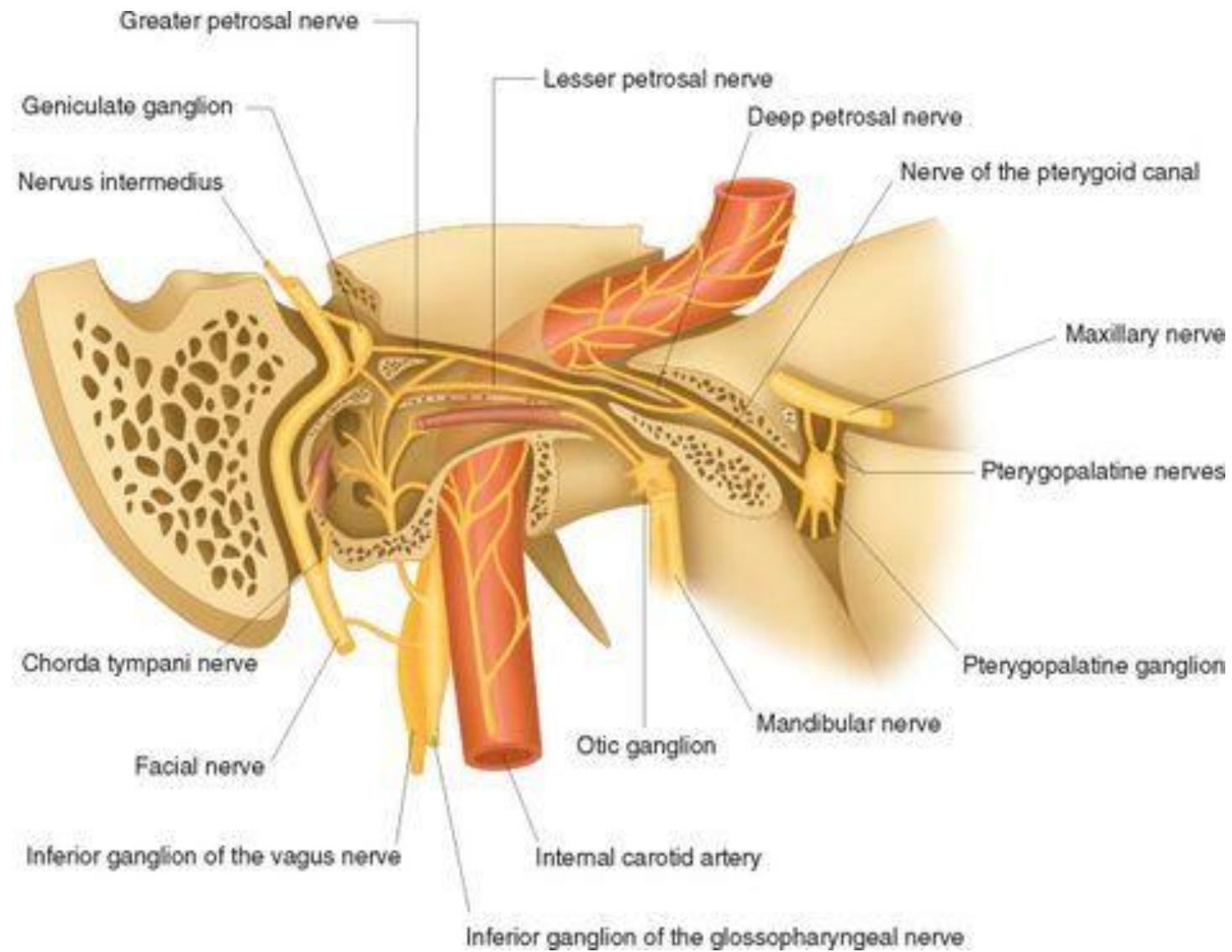




Branches of Glossopharyngeal Nerve

1. Tympanic branch (Jacobson's Nerve):

- It has a mixed sensory and parasympathetic composition.
- Arises as the nerve traverses the jugular foramen.
- It penetrates the temporal bone and passes through “tympanic canal” to enter the cavity of the middle ear. Here, it forms ***the tympanic plexus*** (a network of nerves that provide sensory innervation to the middle ear, internal surface of the tympanic membrane and Eustachian tube) → the upper end of plexus forms the ***lesser petrosal nerve*** → passes through “foramen ovale” → to **Otic ganglion** → Postganglionic parasympathetic fibers in ***Auriculotemporal nerve*** to reach **Parotid gland**.



Contd..

2. Carotid branch:

- Sensory nerve to the carotid sinus and carotid body.
- Emerges from the glossopharyngeal nerve from about 1 cm beneath the basis of the cranium → Descends along the internal carotid artery towards the bifurcation of the common carotid artery → sends terminal branches to the **carotid sinus*** and the **carotid body***.

3. Nerve to stylopharyngeus muscle:

- Motor nerve to **stylopharyngeus muscle**.

Contd..

4. Pharyngeal branches:

- 3-4 Sensory branches, contribute to the formation of the *pharyngeal plexus* and supplies the **mucous membrane of pharynx**.
- The pharyngeal plexus receives also:
 1. Motor fibers (*the pharyngeal branches of vagus nerve*).
 2. Sympathetic fibers (*the pharyngeal branches of the superior cervical ganglion*).
 - The nerves of this plexus innervate many of the pharyngeal muscles, soft palate muscles and the mucosa of the pharynx.

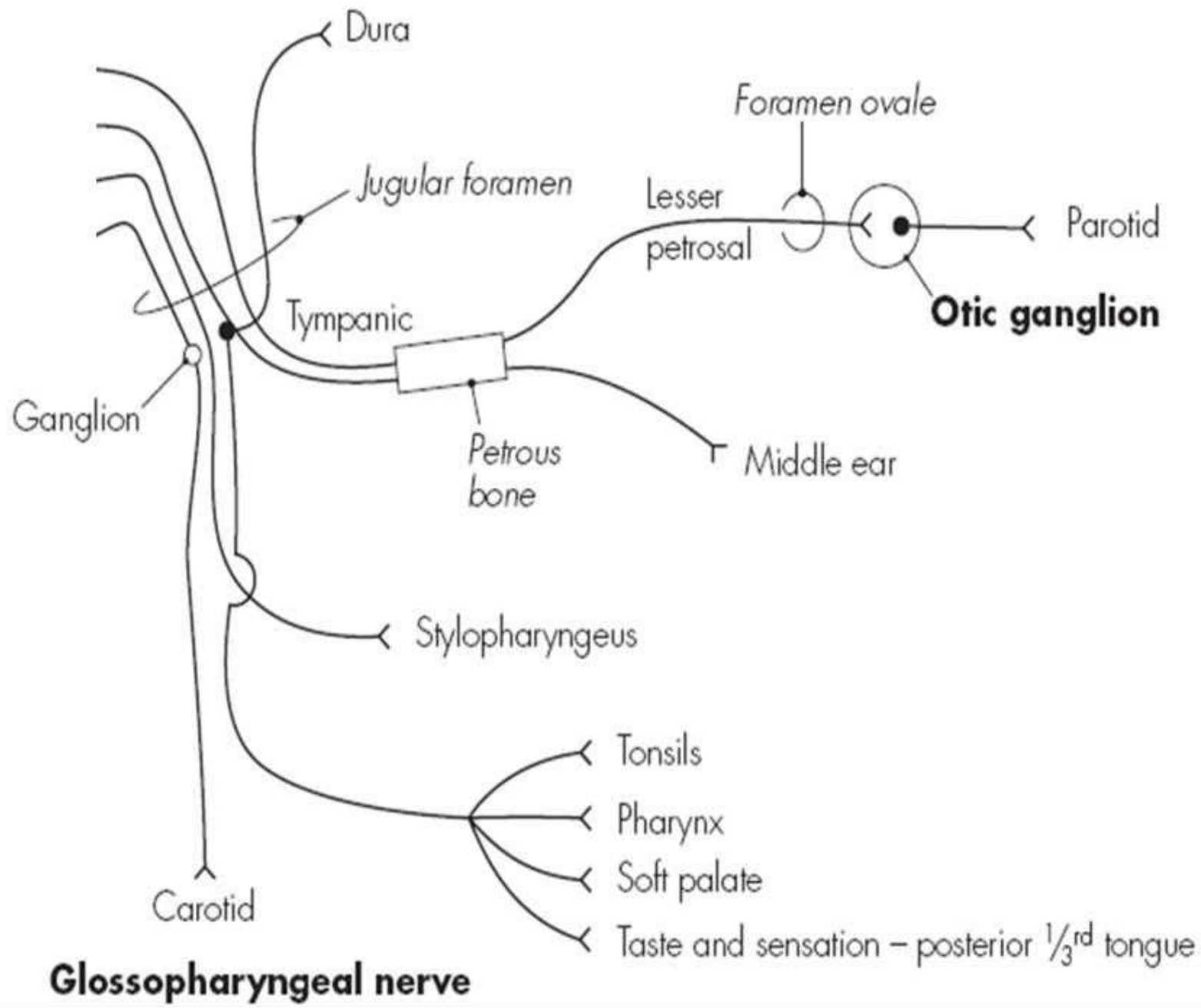
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5. Tonsillar branches:

- Sensory innervation to the **palatine tonsils, soft palate and palatoglossal arches.**

6. Lingual branches:

- Terminal branches to mucous membrane of the **posterior 1/3 rd of the tongue (taste and general sensation)..**



Applied Anatomy

Lesion of glossopharyngeal Nerve

- Ipsilateral loss of general and taste sensation from posterior 1/3rd of the tongue.
- Ipsilateral loss of salivation from parotid gland.
- Ipsilateral loss of gag reflex.
- Only mild dysphagia due to paralysis of stylopharyngeus (Not Important)

Applied Anatomy

The “pharyngeal reflex” or “gag reflex”

- On touching the roof of the mouth, the back of the tongue, soft palate, or the back of the throat there is a reflex contraction of pharyngeal muscles causing gagging and retching.
 - The **afferent nerve** in this process is the **glossopharyngeal nerve** (IX).
 - The **efferent nerve** in this process is the **vagus nerve** (X).



Afferent (IX) → N Ambiguous → efferent to pharyngeal muscle (X)

Thank You

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