VESTIBULO – COCUHLEAR NERVE (8 VIII)

Type: special sensory nerve (purely sensory)

Formed of 2 parts :

Cochlear part: carrying hearing impulses.

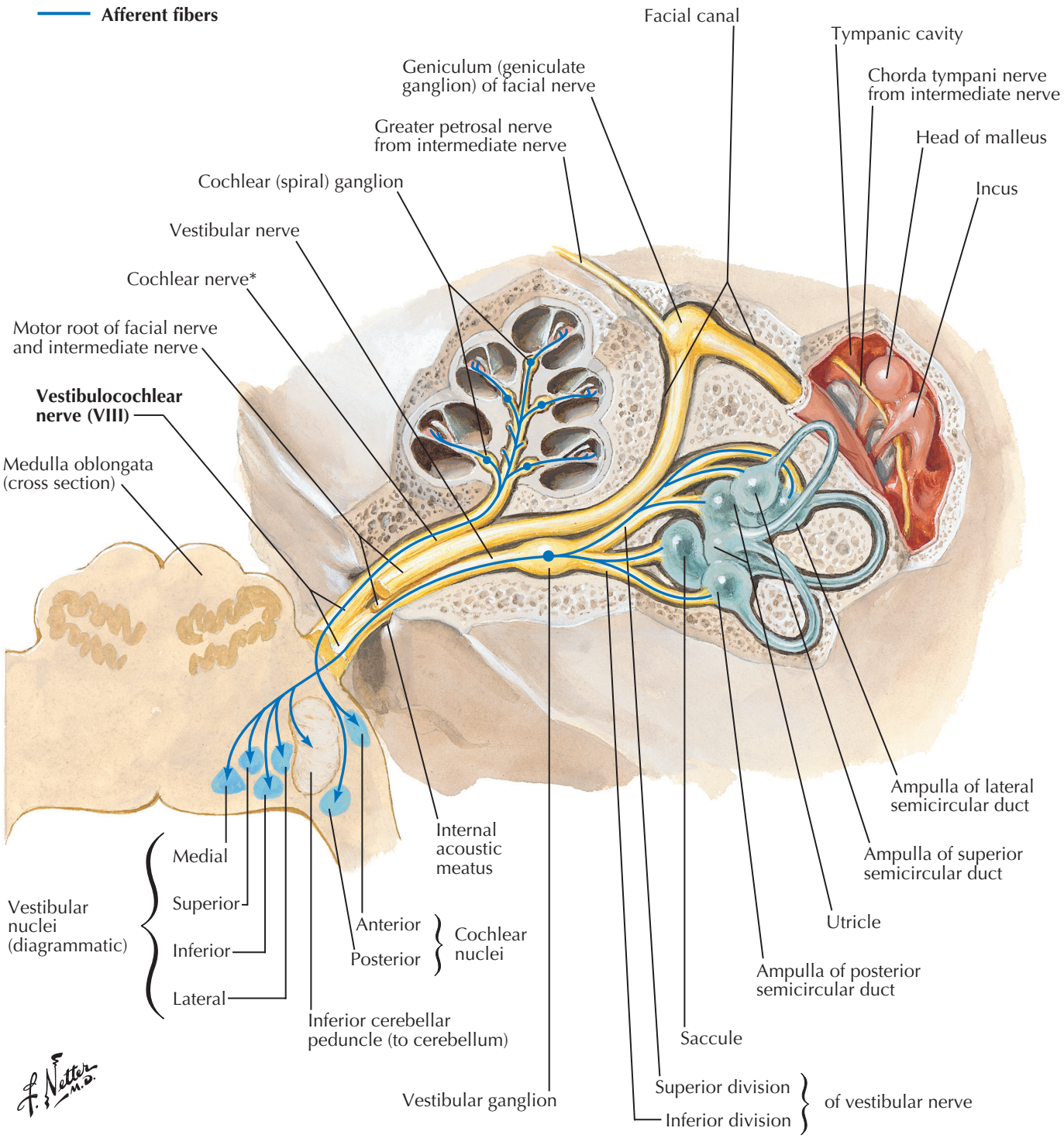
Vestibular part: carrying equilibrium impulses.

Exit from the brain stem: from the anterior aspect at the ponto-meduallary junction.

Course:

Enters the internal auditory meatus (with facial nerve) where:

1) Cochlear part ends in the cochlea.
2) Vestibular part ends in the utricle, saccule and 3 semicircular canals.



*Note: The cochlear nerve also contains efferent fibers to the sensory epithelium. These fibers are derived from the vestibular nerve while in the internal auditory meatus.

Glossopharyngeal Nerve CN IX

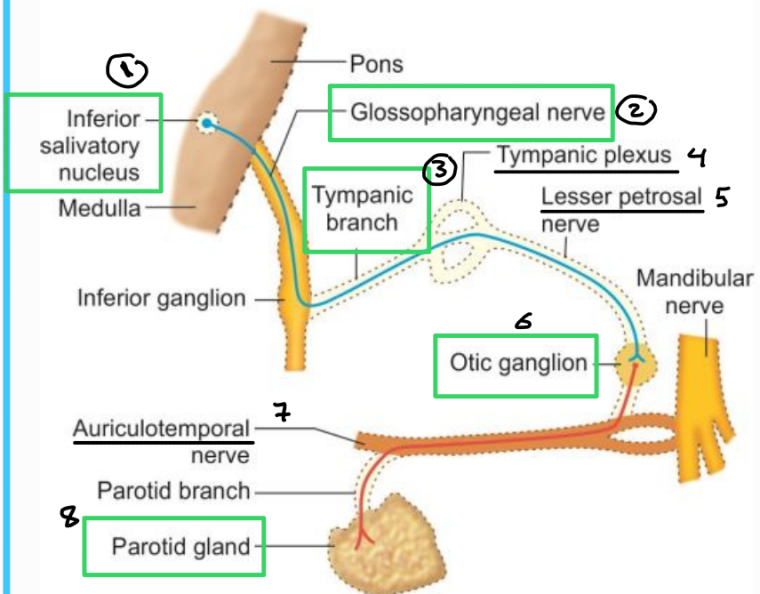
- Is a motor and sensory nerve
- It emerges from the anterior surface of the medulla oblongata between the olive and the inferior cerebellar peduncle.
- It passes laterally in the posterior cranial fossa and leaves the skull by passing through the jugular foramen.
- The superior and inferior sensory ganglia are located on the nerve as it passes through the foramen.
- Then descends through the upper part of the neck to the back of the tongue

Somatic (Branchial) Motor

Motor fibers pass to one muscle, the stylopharyngeus, (Derived from the 3rd pharyngeal arch.

Visceral (Parasympathetic) Motor

Following a circuitous route initially involving the tympanic nerve, presynaptic parasympathetic fibers are provided to the otic ganglion for innervation of the parotid gland.



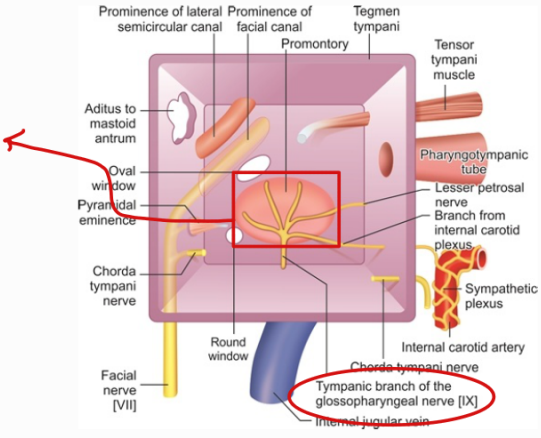
Somatic (General) Sensory

1. The tympanic nerve.

Via the tympanic plexus, supplies :⬇️⬇️

1. The mucosa of the tympanic cavity
2. Pharyngotympanic tube
3. The internal surface of the tympanic membrane.

Tympanic plexus



The 2.pharyngeal 3.Tonsillar, and 4. lingual nerves

1. Mucosa of the oropharynx
2. Isthmus of the fauces (L., throat),
3. Palatine tonsil and soft palate
4. Posterior third of the tongue

Somatic (General) Sensory

In addition to general sensation (touch, pain, temperature),
Tactile (actual or threatened) stimuli determined to be unusual or unpleasant here may evoke the **gag reflex or even vomiting.**

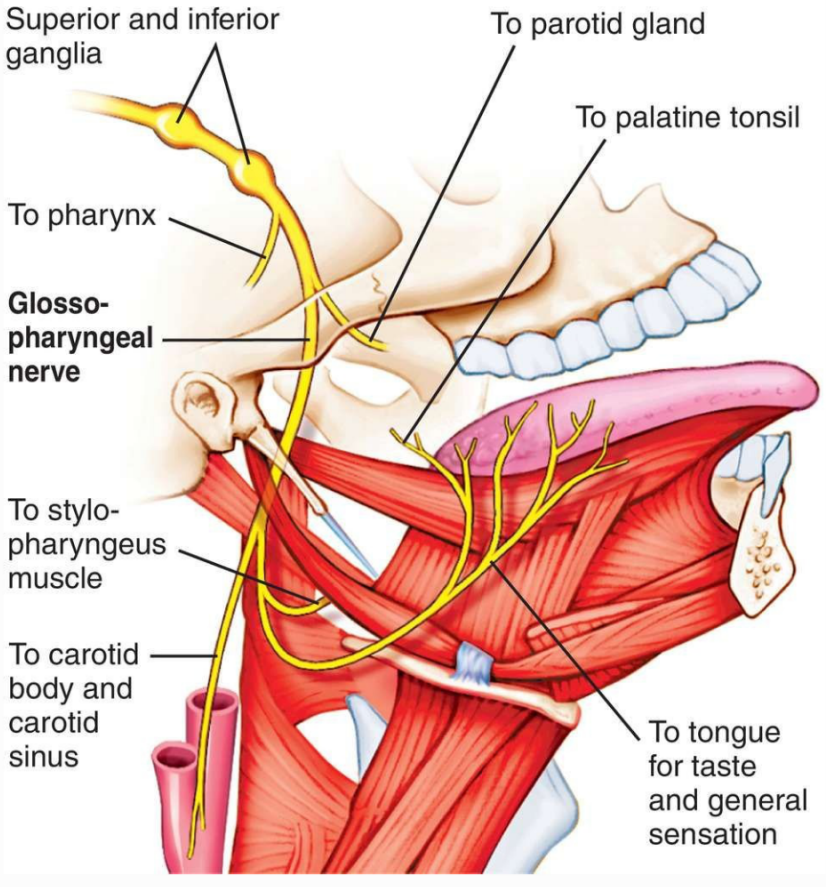
Visceral Sensory

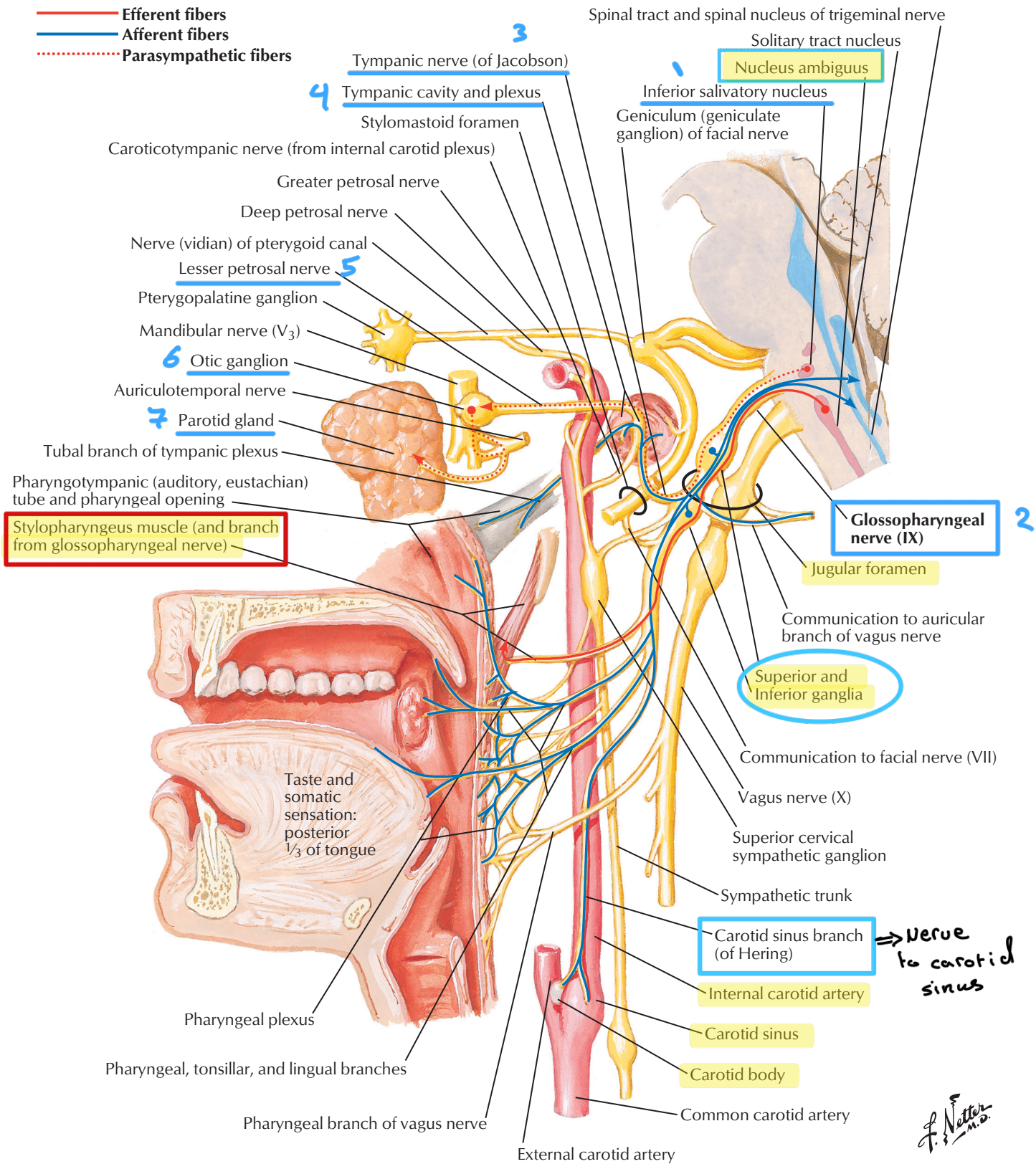
The carotid sinus nerve ➡️ to the carotid sinus

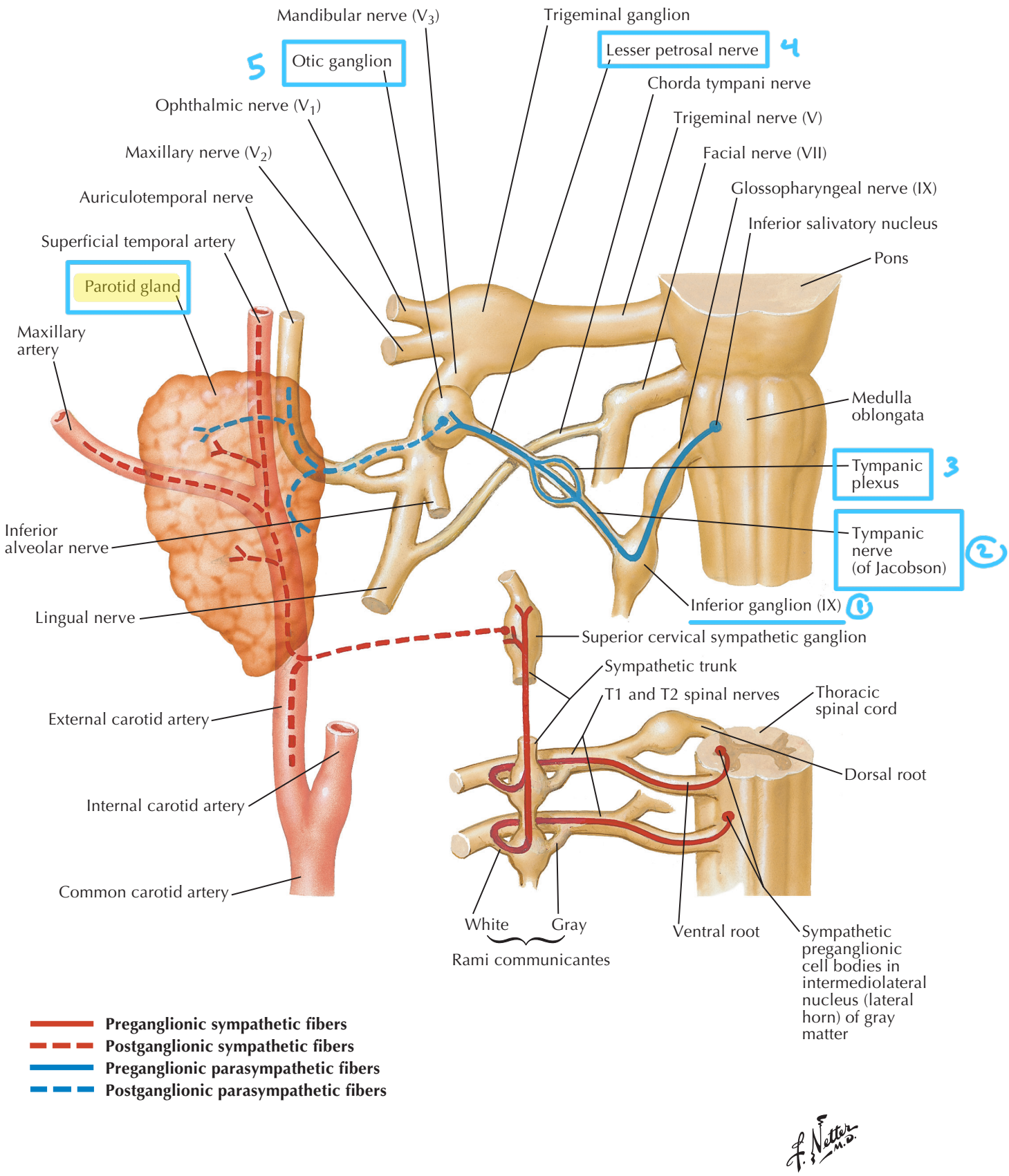
- Baro-(presso-) receptor ➡️ Sensitive to changes in blood pressure .
- The carotid body ⬇️⬇️ A chemoreceptor sensitive to blood gas (oxygen and carbon dioxide levels).

Special Sensory (Taste)

Taste fibers are conveyed from the **posterior third of the tongue** to the sensory ganglia, the superior and inferior ganglia of CN IX




Efferent fibers
Afferent fibers
Parasympathetic fibers
Spinal tract and spinal nucleus of trigeminal nerve
Solitary tract nucleus
Nucleus ambiguus
Inferior salivatory nucleus
Geniculum (geniculate ganglion) of facial nerve
Tympanic nerve (of Jacobson)
Tympanic cavity and plexus
Stylomastoid foramen
Caroticotympanic nerve (from internal carotid plexus)
Greater petrosal nerve
Deep petrosal nerve
Nerve (vidian) of pterygoid canal
Lesser petrosal nerve
Pterygopalatine ganglion
Mandibular nerve (V3)
Otic ganglion
Auriculotemporal nerve
Parotid gland
Tubal branch of tympanic plexus
Pharyngotympanic (auditory, eustachian) tube and pharyngeal opening
Stylopharyngeus muscle (and branch from glossopharyngeal nerve)
Glossopharyngeal nerve (IX)
Jugular foramen
Communication to auricular branch of vagus nerve
Superior and Inferior ganglia
Communication to facial nerve (VII)
Vagus nerve (X)
Superior cervical sympathetic ganglion
Sympathetic trunk
Carotid sinus branch (of Hering)
Nerve to carotid sinus
Internal carotid artery
Carotid sinus
Carotid body
Common carotid artery
External carotid artery
Taste and somatic sensation: posterior 1/3 of tongue
Pharyngeal plexus
Pharyngeal, tonsillar, and lingual branches
Pharyngeal branch of vagus nerve
1
2
3
4
5
6
7


Mandibular nerve (V_3)
Trigeminal ganglion
Otic ganglion
Lesser petrosal nerve
Chorda tympani nerve
Ophthalmic nerve (V_1)
Trigeminal nerve (V)
Maxillary nerve (V_2)
Facial nerve (VII)
Auriculotemporal nerve
Glossopharyngeal nerve (IX)
Inferior salivatory nucleus
Superficial temporal artery
Pons
Parotid gland
Maxillary artery
Medulla oblongata
Tympanic plexus
Inferior alveolar nerve
Tympanic nerve (of Jacobson)
Lingual nerve
Inferior ganglion (IX)
Superior cervical sympathetic ganglion
Sympathetic trunk
T1 and T2 spinal nerves
Thoracic spinal cord
External carotid artery
Dorsal root
Internal carotid artery
Common carotid artery
White
Gray
Rami communicantes
Ventral root
Sympathetic preganglionic cell bodies in intermediolateral nucleus (lateral horn) of gray matter
Preganglionic sympathetic fibers
Postganglionic sympathetic fibers
Preganglionic parasympathetic fibers
Postganglionic parasympathetic fibers

Hypoglossal Nerve CN XII

- Is a motor nerve.

Course ⬇️⬇️

- It emerges on the **anterior surface of the medulla** oblongata between the pyramid and the olive.
- **Crosses the posterior cranial fossa,** and leaves the skull through the hypoglossal canal.

The nerve then passes downward and forward in the neck .

- **Crosses the internal and external carotid arteries** to reach the tongue .
- In the upper part of its course, it is **joined by C1 fibers from the cervical plexus**

- **Meningeal branch**

- **Descending branch + (C1 fibers)**
- Passes downward
- **Joins the descending cervical nerve (C2 and 3) to form the ansa cervicalis .**

Branches from this loop supply:

1. The omohyoid, the sternohyoid, and the sternothyroid muscles.

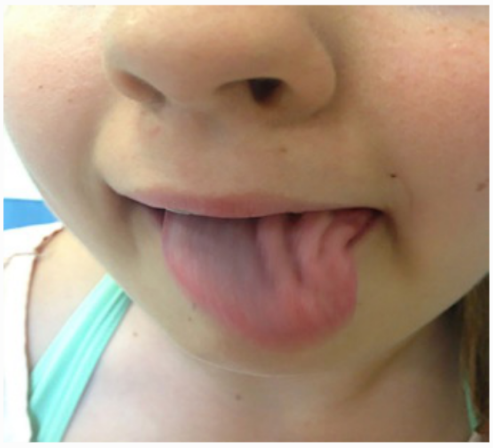
- **Nerve to the thyrohyoid muscle (C1)**
- **Muscular branches**
- **All the muscles of the tongue except the palatoglossus (pharyngeal plexus).**
- **Nerve to the geniohyoid muscle (C1).**

The hypoglossal nerve :

1. **Innervates the muscles of the tongue (except the palatoglossus)**
2. **Controls the shape and movements of the tongue.**

Injury to Hypoglossal Nerve

- **Paralyzes the ipsilateral half of the tongue.**
- After some time, the **tongue atrophies, making it appear shrunken and wrinkled.**
- When the tongue is protruded, its apex deviates toward the paralyzed side because of the **unopposed action of the genioglossus** muscle on the normal side of the tongue



Hypoglossal Nerve (XII): Schema

See also Plate 32