



	Glossopharyngeal nerve (IX)	Vagus Nerve (X)	Accessory Nerve (XI)	Hypoglossal Nerve (CN XII)																								
Type	MIXED nerve.		Pure MOTOR nerve.																									
Deep origin	<p>✍ It has 4 nuclei:</p> <table border="1"> <thead> <tr> <th>Nucleus</th> <th>Supply</th> </tr> </thead> <tbody> <tr> <td>Motor nucleus "Upper part of nucleus ambiguus"</td> <td>Stylopharyngeus muscle</td> </tr> <tr> <td>Parasympathetic nucleus "Inferior salivatory nucleus"</td> <td>Parotid gland "P1"</td> </tr> <tr> <td colspan="2">2 sensory nuclei:</td> </tr> <tr> <td>Nucleus solitarius</td> <td>Receives Taste fibers from posterior third of the tongue</td> </tr> <tr> <td>Spinal trigeminal nucleus</td> <td>Receives sensory fibers from a small area behind the ear</td> </tr> </tbody> </table> <p>✍ Afferent fibers of glossopharyngeal nerve convey information from:</p> <ul style="list-style-type: none"> <li>- Receptors for general sensation in pharynx, the posterior third of tongue, Eustachian tube and middle ear</li> <li>- Taste buds of pharynx and posterior third of the tongue</li> </ul> <p>✍ Chemoreceptors in the carotid body and baroreceptors in carotid sinus</p>	Nucleus	Supply	Motor nucleus "Upper part of nucleus ambiguus"	Stylopharyngeus muscle	Parasympathetic nucleus "Inferior salivatory nucleus"	Parotid gland "P1"	2 sensory nuclei:		Nucleus solitarius	Receives Taste fibers from posterior third of the tongue	Spinal trigeminal nucleus	Receives sensory fibers from a small area behind the ear	<p>✍ It has 4 nuclei:</p> <table border="1"> <thead> <tr> <th>Nucleus</th> <th>Supply</th> </tr> </thead> <tbody> <tr> <td>Motor nucleus "Middle part of nucleus ambiguus"</td> <td>Muscles of pharynx "except stylopharyngeus", larynx &amp; palate "except the tensor palati muscle".</td> </tr> <tr> <td>Parasympathetic nucleus "Dorsal motor nucleus of vagus"</td> <td>Supplies thoracic &amp; abdominal organs as far as the left colic flexure.</td> </tr> <tr> <td colspan="2">2 sensory nuclei:</td> </tr> <tr> <td>Nucleus solitarius</td> <td>Receives taste fibers from the most posterior part of the tongue &amp; epiglottis. They terminate in the upper 1/3 of the nucleus.</td> </tr> <tr> <td>Spinal trigeminal nucleus</td> <td>Receives sensory fibers from the external auditory meatus &amp; tympanic membrane</td> </tr> </tbody> </table> <p>✍ Afferent fibers of the vagus convey information from:</p> <ul style="list-style-type: none"> <li>- Receptors for general sensation in pharynx, larynx, esophagus, tympanic membrane, external auditory meatus and part of the concha of the external ear</li> <li>- Chemoreceptors in the aortic bodies and baroreceptors in aortic arch</li> <li>- Receptors widely distributed throughout the thoracic and abdominal viscera</li> </ul>	Nucleus	Supply	Motor nucleus "Middle part of nucleus ambiguus"	Muscles of pharynx "except stylopharyngeus", larynx & palate "except the tensor palati muscle".	Parasympathetic nucleus "Dorsal motor nucleus of vagus"	Supplies thoracic & abdominal organs as far as the left colic flexure.	2 sensory nuclei:		Nucleus solitarius	Receives taste fibers from the most posterior part of the tongue & epiglottis. They terminate in the upper 1/3 of the nucleus.	Spinal trigeminal nucleus	Receives sensory fibers from the external auditory meatus & tympanic membrane	<p>✍ It has 2 roots:</p> <p><b>A. Cranial Root:</b></p> <ul style="list-style-type: none"> <li>- It arises from the lower part of nucleus ambiguus.</li> <li>- It leaves cranial cavity through the jugular foramen and joins vagus nerve.</li> <li>- It is distributed with the recurrent laryngeal nerve to all muscles of the larynx except cricothyroid muscle.</li> </ul> <p><b>B. Spinal root:</b></p> <ul style="list-style-type: none"> <li>- It arises from the upper 5 or 6 cervical segments of spinal cord.</li> <li>- It supplies sternomastoid and trapezius muscles.</li> </ul>	<p>✍ It arises from the hypoglossal nucleus of medulla in the floor of the 4<sup>th</sup> ventricle.</p> <p>✍ It exits from pre-olivary fissure.</p> <p>✍ It supplies all muscles of tongue except palatoglossus muscle.</p>
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Lesion	<ol style="list-style-type: none"> <li>1) Loss of taste sense from the posterior 1/3 of tongue.</li> <li>2) Loss of the pharyngeal gag reflex.</li> <li>3) Loss of the carotid sinus reflex.</li> </ol>	<ol style="list-style-type: none"> <li>1) Paralysis of muscles of the pharynx causes dysphagia &amp; loss of pharyngeal gag reflex.</li> <li>2) Paralysis of ms of the larynx causes hoarseness of voice.</li> <li>3) Paralysis of ms of the palate causes regurgitation of food from the nose &amp; deviation of uvula to normal side.</li> <li>4) Anesthesia of the larynx causes loss of cough reflex.</li> </ol>	<p>▪ Lesion of Spinal Accessory Nerve:</p> <ol style="list-style-type: none"> <li>1) Paralysis of sternomastoid → inability to rotate the head to opposite side.</li> <li>2) Paralysis of trapezius → inability to shrug (up and down) shoulder.</li> </ol>	<ol style="list-style-type: none"> <li>1) LMN paralysis of the same side of tongue (hemiparalysis)</li> <li>2) Deviation of the protruded tongue toward the affected side.</li> </ol>																								



Taste pathway	
Receptors	Taste buds of the tongue, epiglottis, soft palate and oropharynx.
Nerves	1) Anterior 2/3 of the tongue - Facial nerve through Chorda tympani
	2) Posterior 1/3 of the tongue, the vallate papillae, soft palate & oropharynx - Glossopharyngeal nerve
	3) Epiglottis & most posterior part of the tongue - Vagus nerve through Internal laryngeal
First-order neuron Ganglia	4) Anterior 2/3 of the tongue - Geniculate ganglion of the facial nerve
	5) Posterior 1/3 of the tongue - inferior ganglion of the glossopharyngeal nerve
	6) Epiglottis & most posterior part of the tongue - inferior ganglion of the vagus nerve
	<ul style="list-style-type: none"> <li>▪ The peripheral branches of the ganglia end in the taste buds.</li> <li>▪ The central branches enter the brainstem and end in the nucleus solitarius.</li> </ul>
Second-order neuron	<p>📝 <b>Upper 1/3 Of Nucleus Solitarius</b></p> <ul style="list-style-type: none"> <li>- <b>Axons of nucleus solitarius</b> cross to the opposite side and ascend in the central tegmental tract dorsal to the medial lemniscus to end in the ventral posterior medial nucleus of the thalamus (VPMNT).</li> <li>- <b>Collateral branches reach the salivatory nuclei for reflex activity.</b></li> </ul>
Third-order neuron	<p>📝 <b>VPMNT:-</b></p> <ul style="list-style-type: none"> <li>- Axons of VPMNT pass through the posterior limb of the internal capsule and terminate in the taste area (area 43) (gustatory area) in the lower part of the postcentral gyrus.</li> </ul>