

"Vagus Nerve (Cranial Nerve X)"

- Type of Nerve: Motor and sensory

"Vagus Nerve Nuclei"

» Three nuclei:

- 1) Main Motor Nucleus
- 2) Parasympathetic Nucleus
- 3) Sensory Nucleus

» Main Motor Nucleus

- Location: Deep in the reticular formation of the medulla oblongata
- Formation: Composed of the nucleus ambiguus
- Input: Receives corticonuclear fibers from both cerebral hemispheres

> Efferent Supply:

- Constrictor muscles of the pharynx
- Intrinsic muscles of the larynx

» Parasympathetic Nucleus

- Formation: Forms the dorsal nucleus of the vagus
- Location: Beneath the floor of the lower part of the fourth ventricle, posterolateral to the hypoglossal nucleus

> Afferent Input:

- Hypothalamus via descending autonomic pathways
- Glossopharyngeal nerve (carotid sinus reflex)

> Efferent Distribution:

- Involuntary muscles of the bronchi, heart, esophagus, stomach, small intestine
- Large intestine up to the distal third of the transverse colon

» Sensory Nucleus

- Lower Part of Nucleus: Nucleus of the tractus solitarius

- Taste Sensation Pathway:

- Travels via peripheral axons of nerve cells in the inferior ganglion of the vagus nerve
- Central processes synapse on nerve cells in the nucleus

- > Efferent Fiber Pathway:

- Cross the median plane
- Ascend to the ventral nuclei of the opposite thalamus and to various hypothalamic nuclei
- From the thalamus, axons pass through the internal capsule and corona radiata to the postcentral gyrus

- > Afferent Information for Common Sensation:

- Enters the brainstem via the superior ganglion of the vagus nerve
- Terminates in the spinal nucleus of the trigeminal nerve

"Vagus Nerve Course"

» Origin and Initial Path:

- Leaves the anterolateral surface of the upper medulla oblongata as rootlets in a groove between the olive and inferior cerebellar peduncle.
- Passes laterally through the posterior cranial fossa.
- Exits the skull via the jugular foramen.

» Sensory Ganglia and Accessory Nerve Connection

> Sensory Ganglia:

- Superior Ganglion: Rounded, located within the jugular foramen.
- Inferior Ganglion: Cylindrical, located just below the jugular foramen.

> Accessory Nerve Connection:

- Cranial root of the accessory nerve joins the vagus nerve below the inferior ganglion.
- Primarily joins the pharyngeal and recurrent laryngeal branches of vagus nerve

» Neck Descent

- Position: Descends vertically in the neck within the carotid sheath.

• Accompanies:

- Internal jugular vein.
- Internal and common carotid arteries.

"Right Vagus Nerve Path"

> Thoracic Path:

- Enters the thorax, passing posterior to the root of the right lung.
- Contributes to the pulmonary plexus.

- Passes onto the posterior surface of the esophagus, contributing to the esophageal plexus.

> Abdominal Path:

- Enters the abdomen via the esophageal opening of the diaphragm.

> Posterior Vagal Trunk:

- Name for the right vagus in the abdomen.
- Distributes to the posterior surface of the stomach.
- Sends a large celiac branch to the duodenum, liver, kidneys, small intestine, and large intestine (up to the distal third of the transverse colon).
- Distribution facilitated by the celiac, superior mesenteric, and renal plexuses.

"Left Vagus Nerve Path"

> Thoracic Path:

- Enters the thorax, crossing the left side of the aortic arch.
- Descends behind the root of the left lung.
- Contributes to the pulmonary plexus.
- Continues onto the anterior surface of the esophagus, contributing to the esophageal plexus.

> Abdominal Path:

- Enters the abdomen through the esophageal opening of the diaphragm.

> Anterior Vagal Trunk:

- Name for the left vagus in the abdomen.
- Divides into branches distributed to the stomach, liver, upper duodenum, and head of the pancreas.