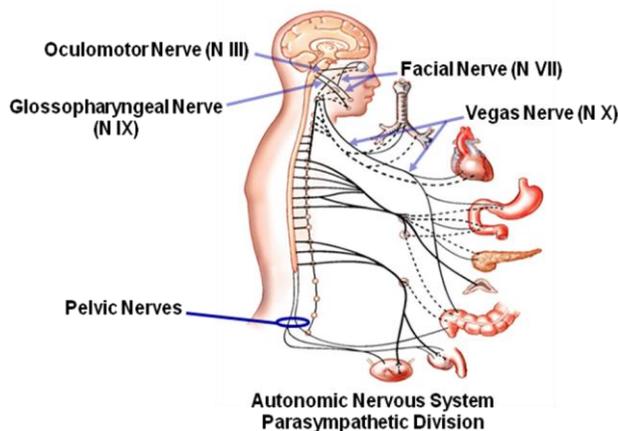


15: The Autonomic Nervous System

Key Terms

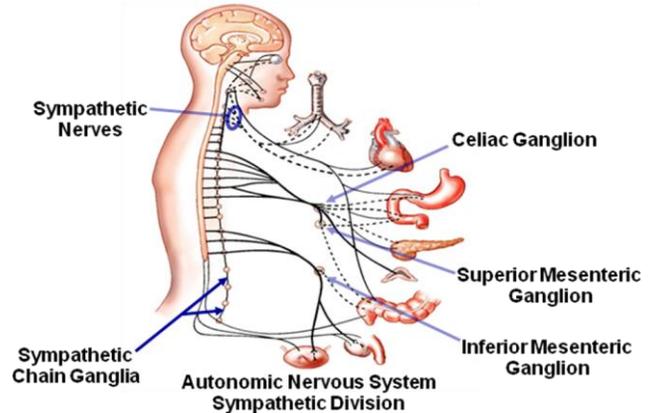
- **Autonomic Nervous System:** The autonomic nervous system is made up of afferent and efferent neurons that connect the autonomic nervous system to visceral effector organs.
- **Parasympathetic Division:** The parasympathetic division of the autonomic nervous system is active during periods of rest and digestion. The parasympathetic division innervation involves the cranial nerves, such as the facial nerve.
- **Sympathetic Division:** The sympathetic division of the autonomic nervous system is active during times of physical or mental stress on the body. As the system's activity increases, skeletal muscles and heart rate are prepared for a fight-or-flight response.
- **Sensory Information:** The autonomic nervous system generates a response, based on the information received from the sensory branch.
- **Vagus Nerve:** The vagus nerve synapses with the intramural ganglion. There are many targets, including: the visceral organs of the neck, thoracic cavity and most of the abdominal cavity. This leads to stimulation of secretion and an increase in motility in the stomach and intestine.
- **Nicotinic and Muscarinic Receptors:** The nicotinic receptor subtype is located on all the ganglionic neurons. Muscarinic receptors are located at cholinergic neuroeffector junctions (small narrow synaptic clefts).
- **Alpha and Beta Receptors:** Alpha receptors are located primarily on the surface of smooth muscle cells in blood vessels. Beta receptors are located in the heart, liver and skeletal muscles.
- **Autonomic Plexuses:** Within the abdominopelvic cavities, both the parasympathetic and sympathetic fibers mix in special plexuses.
- **Autonomic Control:** The control of the autonomic nervous system can be divided as follows: (1) sympathetic division is controlled from the posterior and lateral hypothalamus, and (2) the parasympathetic division is controlled from portions of the anterior and medial hypothalamus.

Parasympathetic Division

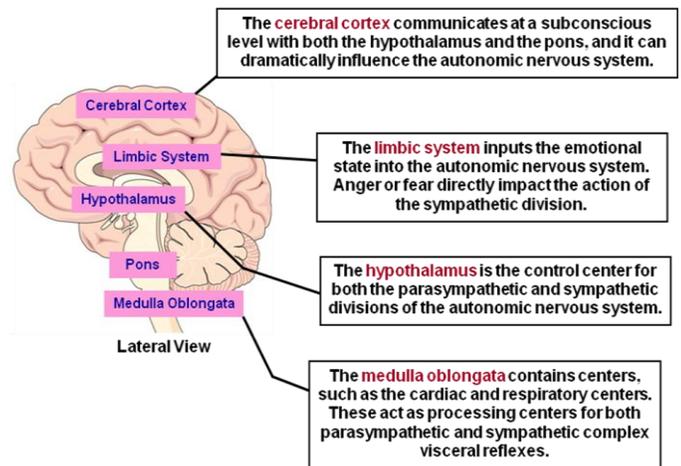


The parasympathetic division of the autonomic nervous system is active during periods of rest and digestion. The parasympathetic division innervation involves the cranial nerves, such as the facial nerve.

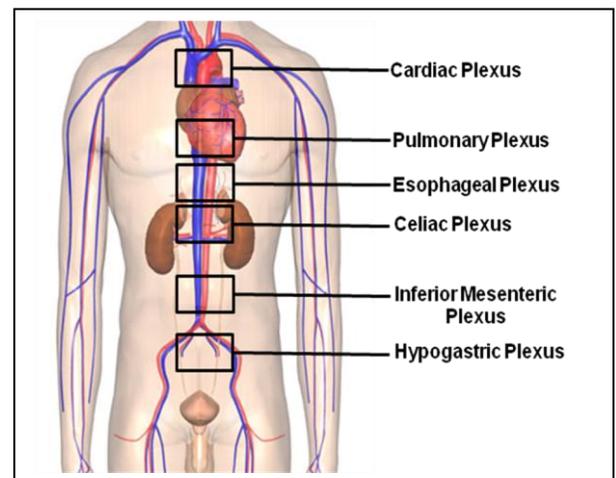
Sympathetic Division



Levels of Autonomic Control



Autonomic Plexuses



Within the abdominopelvic cavities, both the parasympathetic and sympathetic fibers mix in special plexuses: cardiac, pulmonary, esophagus, celiac, inferior mesenteric and the hypogastric plexus.