

A&P Key Terms

15 Autonomic

Nervous System

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Published 2015

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4. Chapter: A&P Key Terms 15 Autonomic Nervous System

1. A&P Key Terms 15 Autonomic Nervous System Questions

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| acetylcholine | (ACh) neurotransmitter that binds at a motor end-plate to trigger depolarization |
| adrenal medulla | interior portion of the adrenal (or suprarenal) gland that releases epinephrine and norepinephrine into the bloodstream as hormones |
| adrenergic | synapse where norepinephrine is released, which binds to α - or β -adrenergic receptors |
| afferent branch | component of a reflex arc that represents the input from a sensory neuron, for either a special or general sense |
| agonist | any exogenous substance that binds to a receptor and produces a similar effect to the endogenous ligand |
| alpha (α)-adrenergic receptor | one of the receptors to which epinephrine and norepinephrine bind, which comes in three subtypes: α_1 , α_2 , and α_3 |
| antagonist | any exogenous substance that binds to a receptor and produces an opposing effect to the endogenous ligand |
| anticholinergic drugs | drugs that interrupt or reduce the function of the parasympathetic system |
| autonomic tone | tendency of an organ system to be governed by one division of the autonomic nervous system over the other, such as heart rate being lowered by parasympathetic input at rest |
| baroreceptor | mechanoreceptor that senses the stretch of blood vessels to indicate changes in blood pressure |
| beta (β)-adrenergic receptor | one of the receptors to which epinephrine and norepinephrine bind, which comes in two subtypes: β_1 and β_2 |
| cardiac accelerator nerves | preganglionic sympathetic fibers that cause the heart rate to increase when the cardiovascular center in the medulla initiates a signal |
| cardiovascular center | region in the medulla that controls the cardiovascular system through cardiac accelerator nerves and vasomotor nerves, which are components of the sympathetic division of the autonomic nervous system |
| celiac ganglion | one of the collateral ganglia of the sympathetic system that projects to the digestive system |
| central neuron | specifically referring to the cell body of a neuron in the autonomic system that is located in the |

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| | autonomic system that is located in the central nervous system, specifically the lateral horn of the spinal cord or a brain stem nucleus |
| <u>cholinergic</u> | synapse at which acetylcholine is released and binds to the nicotinic or muscarinic receptor |
| <u>chromaffin cells</u> | neuroendocrine cells of the adrenal medulla that release epinephrine and norepinephrine into the bloodstream as part of sympathetic system activity |
| <u>ciliary ganglion</u> | one of the terminal ganglia of the parasympathetic system, located in the posterior orbit, axons from which project to the iris |
| <u>collateral ganglia</u> | ganglia outside of the sympathetic chain that are targets of sympathetic preganglionic fibers, which are the celiac, inferior mesenteric, and superior mesenteric ganglia |
| <u>craniosacral system</u> | alternate name for the parasympathetic division of the autonomic nervous system that is based on the anatomical location of central neurons in brain-stem nuclei and the lateral horn of the sacral spinal cord; also referred to as craniosacral outflow |
| <u>dorsal longitudinal fasciculus</u> | major output pathway of the hypothalamus that descends through the gray matter of the brain stem and into the spinal cord |
| <u>dorsal nucleus of the vagus nerve</u> | location of parasympathetic neurons that project through the vagus nerve to terminal ganglia in the thoracic and abdominal cavities |
| <u>Eddinger-Westphal nucleus</u> | location of parasympathetic neurons that project to the ciliary ganglion |
| <u>efferent branch</u> | component of a reflex arc that represents the output, with the target being an effector, such as muscle or glandular tissue |
| <u>endogenous chemical</u> | substance produced and released within the body to interact with a receptor protein |
| <u>endogenous</u> | describes substance made in the human body |
| <u>epinephrine</u> | signaling molecule released from the adrenal medulla into the bloodstream as part of the sympathetic response |
| <u>exogenous chemical</u> | substance from a source outside the body, whether it be another organism such as a plant or from the synthetic processes of a laboratory, that binds to a transmembrane receptor protein |

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| <u>exogenous</u> | describes substance made outside of the human body |
| <u>fight-or-flight response</u> | set of responses induced by sympathetic activity that lead to either fleeing a threat or standing up to it, which in the modern world is often associated with anxious feelings |
| <u>G protein-coupled receptor</u> | membrane protein complex that consists of a receptor protein that binds to a signaling molecule-a G protein that is activated by that binding and in turn activates an effector protein (enzyme) that creates a second-messenger molecule in the cytoplasm of the target cell |
| <u>ganglionic neuron</u> | specifically refers to the cell body of a neuron in the autonomic system that is located in a ganglion |
| <u>gray rami communicantes</u> | (singular: ramus communicans) unmyelinated structures that provide a short connection from a sympathetic chain ganglion to the spinal nerve that contains the postganglionic sympathetic fiber |
| <u>greater splanchnic nerve</u> | nerve that contains fibers of the central sympathetic neurons that do not synapse in the chain ganglia but project onto the celiac ganglion |
| <u>inferior mesenteric ganglion</u> | one of the collateral ganglia of the sympathetic system that projects to the digestive system |
| <u>intramural ganglia</u> | terminal ganglia of the parasympathetic system that are found within the walls of the target effector |
| <u>lesser splanchnic nerve</u> | nerve that contains fibers of the central sympathetic neurons that do not synapse in the chain ganglia but project onto the inferior mesenteric ganglion |
| <u>ligand-gated cation channel</u> | ion channel, such as the nicotinic receptor, that is specific to positively charged ions and opens when a molecule such as a neurotransmitter binds to it |
| <u>limbic lobe</u> | structures arranged around the edges of the cerebrum that are involved in memory and emotion |
| <u>long reflex</u> | reflex arc that includes the central nervous system |
| <u>medial forebrain bundle</u> | fiber pathway that extends anteriorly into the basal forebrain, passes through the hypothalamus, and extends into the brain stem and spinal cord |
| <u>mesenteric plexus</u> | nervous tissue within the wall of the digestive tract that contains neurons that are the targets of autonomic preganglionic fibers and that project to the smooth muscle and glandular tissues in the digestive organ |

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| muscarinic receptor | type of acetylcholine receptor protein that is characterized by also binding to muscarine and is a metabotropic receptor |
| mydriasis | dilation of the pupil; typically the result of disease, trauma, or drugs |
| nicotinic receptor | type of acetylcholine receptor protein that is characterized by also binding to nicotine and is an ionotropic receptor |
| norepinephrine | signaling molecule released as a neurotransmitter by most postganglionic sympathetic fibers as part of the sympathetic response, or as a hormone into the bloodstream from the adrenal medulla |
| nucleus ambiguus | brain-stem nucleus that contains neurons that project through the vagus nerve to terminal ganglia in the thoracic cavity; specifically associated with the heart |
| parasympathetic division | division of the autonomic nervous system responsible for restful and digestive functions |
| parasympathomimetic drugs | drugs that enhance or mimic the function of the parasympathetic system |
| paravertebral ganglia | autonomic ganglia superior to the sympathetic chain ganglia |
| postganglionic fiber | axon from a ganglionic neuron in the autonomic nervous system that projects to and synapses with the target effector; sometimes referred to as a postganglionic neuron |
| preganglionic fiber | axon from a central neuron in the autonomic nervous system that projects to and synapses with a ganglionic neuron; sometimes referred to as a preganglionic neuron |
| prevertebral ganglia | autonomic ganglia that are anterior to the vertebral column and functionally related to the sympathetic chain ganglia |
| referred pain | the conscious perception of visceral sensation projected to a different region of the body, such as the left shoulder and arm pain as a sign for a heart attack |
| reflex arc | circuit of a reflex that involves a sensory input and motor output, or an afferent branch and an efferent branch, and an integrating center to connect the two branches |
| rest and digest | set of functions associated with the parasympathetic system that lead to restful actions and digestion |

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| | system that lead to restful actions and digestion |
| short reflex | reflex arc that does not include any components of the central nervous system |
| somatic reflex | reflex involving skeletal muscle as the effector, under the control of the somatic nervous system |
| superior cervical ganglion | one of the paravertebral ganglia of the sympathetic system that projects to the head |
| superior mesenteric ganglion | one of the collateral ganglia of the sympathetic system that projects to the digestive system |
| sympathetic chain ganglia | series of ganglia adjacent to the vertebral column that receive input from central sympathetic neurons |
| sympathetic division | division of the autonomic nervous system associated with the fight-or-flight response |
| sympatholytic drug | drug that interrupts, or "lyses," the function of the sympathetic system |
| sympathomimetic drug | drug that enhances or mimics the function of the sympathetic system |
| target effector | organ, tissue, or gland that will respond to the control of an autonomic or somatic or endocrine signal |
| terminal ganglia | ganglia of the parasympathetic division of the autonomic system, which are located near or within the target effector, the latter also known as intramural ganglia |
| thoracolumbar system | alternate name for the sympathetic division of the autonomic nervous system that is based on the anatomical location of central neurons in the lateral horn of the thoracic and upper lumbar spinal cord |
| varicosity | structure of some autonomic connections that is not a typical synaptic end bulb, but a string of swellings along the length of a fiber that makes a network of connections with the target effector |
| vasomotor nerves | preganglionic sympathetic fibers that cause the constriction of blood vessels in response to signals from the cardiovascular center |
| visceral reflex | reflex involving an internal organ as the effector, under the control of the autonomic nervous system |
| white rami communicantes | (singular: ramus communicans) myelinated structures that provide a short connection from a sympathetic |

that provide a short connection from a sympathetic chain ganglion to the spinal nerve that contains the preganglionic sympathetic fiber
