

Nervous System Notes: Anatomy

Function: _____

- The system is composed of different types of nerve cells called _____
 - o One neuron may communicate with thousands of other neurons
 - o Communication between neurons can be _____ electrical signals or short-distance chemical signals
- In all vertebrates, the nervous system shows a high degree of cephalization and distinct CNS and PNS components
 - o The brain provides the _____ power that underlies the complex behavior of vertebrates
 - o The spinal cord integrates _____ to certain kinds of stimuli and conveys information to and from the brain

Information Processing

- The nervous system processes information through detection, generation, transmission, and integration of signal information
 - o Essentially: _____

Divisions of the Nervous System

- 2 main divisions are the Central and Peripheral Nervous systems – CNS and PNS
 - o The _____ integrates and processes information from the body
 - o The _____ transmits information to and from the CNS
- Divisions of PNS:
 - o **Sensory** and **Motor** division
 - Sensory = _____
 - Motor = _____
 - o Motor division can be separated into the **Somatic** nervous system and the **Autonomic** nervous system – SNS and ANS
 - **Somatic nervous system**
 - Carries signals to skeletal muscles and is _____ controlled
 - **Autonomic nervous system**
 - _____ regulates the internal environment
 - Carries signals to cardiac muscle, smooth muscle, and glands
 - o Autonomic nervous system divides into **Parasympathetic** and **Sympathetic** divisions
 - The ANS division have antagonistic effects on target organs
 - **Sympathetic division:** _____ response
 - **Parasympathetic division:** promotes a return to self-maintenance functions and _____

Types of Neurons

- **Sensory neurons** transmit information from _____
 - o Detects external stimuli and internal conditions
- **Interneurons** _____ the information in the CNS
 - o This can be in the spinal cord or connect up to the brain
- **Motor neurons** transmit information _____
 - o Neurons communicate with effector cells/organs (muscles and glands)

Stages of Information Processing

- Reflex arc – _____
 - o This pathway includes:
 -
 -
 -
 -
 -
 - o This is a much _____ response compared to the typical stimulus-response transmission pathways
 - o The reason is that reflex arcs do not involve the integration of the _____ and have fewer _____ compared to other pathways
 - o Reflex arcs also do not require conscious control and _____ occur which leads to some of our _____ responses

Neuron Structure

- _____ = contains the organelles
- _____ = highly branched extensions that receive signals from other neurons
- _____ = cytoplasmic extension that transmits signals to other cells at _____
 - o May be covered with _____ which is a fatty cell wrapped around the axon to form the _____
- _____ = space between the Schwann cells on the axon
- _____ = contains the vesicles of neurotransmitters (chemical messengers that act as ligands)

Supporting Cells (Glia)

- Essential for the structural integrity of the nervous system and for the normal functioning of neurons
- CNS: Astrocytes – supplies nutrients to neurons in the CNS
 - o Oligodendrocytes – protection
 - o Ependymal cells – lines ventricles and has cilia to move cerebrospinal fluid
 - o Microglial cells – protection against microorganisms and clean up cellular debris
- PNS: Schwann cells – _____