

**Honors Anatomy  
Chapter 8- Lecture Notes**

**Fill In Notes**

**Lecture Notes**

I. Functions of the Nervous System

- A. List the 5 functions of the nervous system.

II. Divisions of the Nervous System

- A. Beginning with the heading, The Nervous System, construct a tree map illustrating the divisions of the body's nervous system.

Nervous System

III. Cells of the Nervous System

A. Neurons

**-Define the following terms.**

Neuron-

Dendrites-

Axon-

Axon hillock-

Cell body-

Myelin sheath-

Node of Ranvier-

1. Types of Neurons

**-Define the following terms.**

Multipolar neuron-

Bipolar neuron-

Unipolar neuron-

Sensory neuron-

Motor neuron-

Interneuron-

B. Neuroglia

**-Define the following terms.**

Astrocytes-

Ependymal cells-

Microglia-

Oligodendrocytes-

Schwann cells-

C. Organization of Nervous Tissue

1. What does gray matter consist of?

- a. Gray matter that surrounds the cerebrum of the brain is called the \_\_\_\_\_.
- b. Clusters of gray matter deep in the brain are called \_\_\_\_\_.
- c. Clusters of cell bodies in the PNS are called \_\_\_\_\_.

2. What does white matter consist of?

- a. White matter in the CNS for conduction pathways called \_\_\_\_\_.
- 1. What is the function of the nerve tract?

- b. In the PNS, bundles of axons and their myelin sheaths are called \_\_\_\_\_.

IV. Electrical Signals and Neural Pathways

A. Explain the charge on the inside of the neuron with respect to the outside of neuron.

**-Define the following terms.**

Resting membrane potential-

Polarized-

Voltage-gated ion channel-

Chemical-gated ion channel-

Na<sup>+</sup>/K<sup>+</sup> Pump-

1. Which of the channels and pumps are passive transports and active transports?

B. Action Potentials

**-Define the following terms.**

Depolarization-

Threshold-

Repolarization-

Hyperpolarization (Undershoot)-

All-or-None-

Saltatory conduction-

C. The Synapse

**-Define the following terms.**

Synapse-

Presynaptic terminal-

Postsynaptic membrane-

Synaptic cleft-

Synaptic vesicles-

Synaptic cleft-

1. Explain the difference between a stimulation (excitatory) response and an inhibition (inhibitory) response

D. Reflexes

1. Define reflex.

2. Define reflex arc.

3. List the 5 components of the reflex arc.

V. The Central and Peripheral Nervous System

- A. Explain what each nervous system consists of.

The central nervous system consists of:

The peripheral nervous system consists of:

VI. Spinal Cord (Central Nervous System)

- A. The spinal cord extends from the \_\_\_\_\_ to the \_\_\_\_\_.

1. The end of the spinal cord is called the \_\_\_\_\_ (horse's tail).

## Lecture Notes

- B. The white matter of the spinal cord consists of \_\_\_\_\_  
\_\_\_\_\_ where as gray matter of the  
spinal cord consists of \_\_\_\_\_.

### Match the spinal cord parts with their functions.

- |                         |   |
|-------------------------|---|
| 1. anterior horn        | a. White matter on the anterior spinal cord.    |
| 2. dorsal column        | b. White matter on the posterior spinal cord.   |
| 3. dorsal root          | c. White matter next to the lateral horn.       |
| 4. dorsal root ganglion | d. Gray matter on the posterior spinal cord.    |
| 5. lateral column       | e. Gray matter on the anterior spinal cord.     |
| 6. lateral horn         | f. Gray matter next to the lateral column       |
| 7. posterior horn       | g. Contains somatic and autonomic neurons.      |
| 8. ventral column       | h. Contains sensory neurons                     |
| 9. ventral root         | I. Contains the cell bodies of sensory neurons. |

### VII. Spinal Nerves (Peripheral Nervous System)

- A. Where does a spinal nerve arise from?

- B. The location where nerves come together and then separate is called a  
\_\_\_\_\_.

1. List the 3 major plexuses.

### VIII. Brain (Central Nervous System)

- A. List the 4 major regions of the brain.

B. Brainstem

1. List the 3 sections of the brainstem.

a. Medulla oblongata

1. What functions does the medulla oblongata control?

b. Pons

1. The pons is a bridge (relays information) between the  
\_\_\_\_\_ and the \_\_\_\_\_.
2. List all of the functions the pons controls.

c. Midbrain

1. Inferior colliculi
- a. The 2 inferior colliculi are major relay centers for the  
\_\_\_\_\_ in the CNS.
2. Superior colliculi
- a. The 2 superior colliculi are involved in \_\_\_\_\_.

3. Other functions of the midbrain.
  - a. List 2 other functions associated with the midbrain.

C. Cerebellum (pg. 217 and 224)

1. The cerebellum is attached to the brainstem by \_\_\_\_\_  
\_\_\_\_\_.
  - a. The cerebellar cortex consists of \_\_\_\_\_  
\_\_\_\_\_.
  - b. Internally, the cerebellum consists of \_\_\_\_\_  
\_\_\_\_\_.
2. List the functions of the cerebellum.

D. Diencephalon

1. The diencephalon is located between the \_\_\_\_\_  
and the \_\_\_\_\_.
2. List the 3 parts of the diencephalon.

3. Thalamus

- a. Sensory input from the \_\_\_\_\_ and  
\_\_\_\_\_ ascend into the thalamus.
- b. Thalamic neurons send their sensory input to the  
\_\_\_\_\_.
- c. List 2 feelings the thalamus senses.

4. Epithalamus

- a. What is the epithalamus involved with?

5. Hypothalamus

- a. The hypothalamus contains nuclei that are important in maintaining  
\_\_\_\_\_.
- b. The hypothalamus plays a central role in \_\_\_\_\_  
\_\_\_\_\_.
- c. The hypothalamus's sensations are \_\_\_\_\_  
\_\_\_\_\_.
- d. The hypothalamus plays a major role in controlling the secretion of  
\_\_\_\_\_.
- e. Mamillary bodies are involved in \_\_\_\_\_  
\_\_\_\_\_.

E. Cerebrum

1. The cerebrum is divided into a left and right \_\_\_\_\_.
- a. The right and left halves are separated by the \_\_\_\_\_  
\_\_\_\_\_.
- b. The outermost region of the cerebrum is the \_\_\_\_\_  
\_\_\_\_\_.
1. The cerebral cortex has 2 surface features called the  
\_\_\_\_\_ and the \_\_\_\_\_.

**Match the lobes of the cerebrum with their function.**

- |                   |  |
|-------------------|--|
| 1. Frontal lobe   | a. Controls voluntary motor functions, motivation, aggression, mood, olfactory.    |
| 2. Occipital lobe | b. Reception and conscious perception of touch, pain, temperature, balance, taste. |
| 3. Parietal lobe  | c. Reception and perception of visual input.                                       |
| 4. Temporal lobe  | d. Olfactory and auditory sensations, memory.                                      |

2. The frontal lobe and parietal lobe are separated by the \_\_\_\_\_.

3. The temporal lobe is separated from the frontal and parietal lobe by the \_\_\_\_\_.

**4. Sensory and Motor Areas of the Cerebral Cortex**

a. \_\_\_\_\_ are areas of the cerebral cortex that perceive sensations.

b. \_\_\_\_\_ are areas of the cerebral cortex that are adjacent to primary sensory areas that are involved in process and recognition.

**Match the sensory areas of the cortex with their functions.**

- |                                   |   |
|-----------------------------------|---|
| 1. Primary somatic sensory cortex | a. Receives general sensory input- pain, pressure, temperature from the thalamus.                       |
| 2. Visual cortex                  | b. Receives and perceives sensory input for vision.   |
| 3. Primary auditory cortex        | c. Receives and perceives sensory input for hearing.  |
| 4. Broca's area                   | d. The area where speech is formed.   |
| 5. Wernicke's area                | e. The area where speech is comprehended.   |
| 6. Primary motor cortex           | f. Controls movements of skeletal muscles.  |
| 7. Premotor area                  | g. Area where motor functions are organized before they actually initiated in the primary motor cortex. |
| 8. Prefrontal area                | h. The area of the brain involved with planning movements, mood, motivation, regulation of emotions.    |

**IX. Meninges and Cerebrospinal Fluid**

A. \_\_\_\_\_ are connective tissue coverings that protect the brain and spinal cord.

B. List the 3 meninges of the central nervous system.

**C. Ventricles**

1. \_\_\_\_\_ are fluid-filled cavities.

a. List the 3 ventricles of the brain.

**D. Cerebrospinal Fluid**

1. What is the function of cerebrospinal fluid?

2. CSF is produced by the \_\_\_\_\_ located in the \_\_\_\_\_.

X. Cranial Nerves (Peripheral Nervous System)

A. What are the 2 general categories of cranial nerves?

1. The motor functions of cranial nerves are subdivided into

- a. Somatic cranial nerves innervate \_\_\_\_\_
- b. Parasympathetic cranial nerves innervate \_\_\_\_\_

2. Sensory functions of cranial nerves can be divided into

3. What is a mixed cranial nerve?

B. Match the cranial nerve with its function.

- |                       |   |
|-----------------------|---|
| 1. abducent           | a. Smell  |
| 2. accessory          | b. Vision   |
| 3. facial             | c. Controls 4/6 extrinsic eye muscles, constricts pupil, thickens lens  |
| 4. glossopharyngeal   | d. Controls 1 extrinsic eye muscle  |
| 5. hypoglossal        | e. Sensory face and teeth, controls muscles for chewing   |
| 6. oculomotor         | f. Controls 1 extrinsic eye muscle  |
| 7. olfactory          | g. Senses taste; controls facial expressions; controls salivary and tear glands.  |
| 8. optic              | h. Hearing and balance  |
| 9. trigeminal         | i. Senses taste and touch on tongue; controls muscles of pharynx; controls salivary glands  |
| 10. trochlear         | j. Sensation in pharynx, larynx, and viscera; controls actions of palate, pharynx, and larynx; controls smooth muscles of viscera of thorax and abdomen |
| 11. vagus             | k. Controls neck and upper back muscles   |
| 12. vestibulocochlear | l. Controls movement of tongue  |

XI. Autonomic Nervous System

A. List the 2 divisions of the Autonomic Nervous System.

B. Sympathetic Division

1. What is the function of the sympathetic division of the ANS?

C. Parasympathetic Division

1. What is the function of the parasympathetic division of the ANS?



**Summary/Thinking Map**

Beginning at the synapse discuss how an action potential is transmitted from one neuron to the next and how that new action potential propagates down the axon.