Overview of the Nervous System
The Brain and Behavior

Psychology 372
Physiological Psychology
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First

- All parts are interrelated.
- Thus, you need all parts to function normally.
- Neurons = Nerve cells

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The Nervous System is Composed of Two Parts

- Central Nervous System
  - Consists of all neurons (nerve cells) located in the brain and spinal cord
- Peripheral Nervous System
  - Consists of all neurons (nerve cells) located outside the brain and spinal cord.

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Peripheral Nervous System

- Two divisions
  - Somatic
  - Autonomic

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Somatic System

- Contains Three major sets of neurons in Two groups.
- Afferent neurons
- Efferent neurons
- Internuncial neurons
Cranial Nerves

- Innervate the head, neck, and some internal organs.
- 12 Sets (See Next Page)
- Motor only (red), sensory only (blue), mixed function.

Spinal Nerves (31 pair)

- 8 Cervical
- 12 Thoracic
- 5 Lumbar
- 5 Sacral
- 1 Coccygeal

Afferent neurons

- Are sensory in nature.
- Receive information from sensory receptors (structures) and sends that information toward the central nervous system.

Efferent neurons

- Are motor in nature
- Gets information from the central nervous system and sends it to the muscles of the body.

Internuncial Neurons

- Are located in the Spinal Cord
- Connect afferent pathways to efferent pathways.
- Also, send information to the brain
- Are involved in reflex arcs.
- Are typically T shaped cells.
Autonomic System

- Consists of neurons that go to and from various internal organs.
- Regulates heart rate, blood pressure, digestion, etc.
- Has two parts
  - Sympathetic nervous system
  - Parasympathetic nervous system

Think of What Happens When a Lion Chases You

- Sympathetic
  - Increases Heart Rate
  - Increases Respiration
  - Decreases Digestion

- Parasympathetic
  - Decreases Heart Rate
  - Decreases Respiration
  - Increases Digestion

Overview of the ANS

Central Nervous System

- Consists of
  - Brain
  - Spinal Cord

Brain

- Has 100 billion neurons or nerve cells
- Neurons are the functional element of the brain.
- Also has approximately 120 billion Glial cells.
- Also has several membranes (meninges)
- Is surrounded by fluid (CSF)

Glial

- Has many functions
- Acts as a glue
- Provides nutrients
- Helps Regulate Brain Activity
- Eliminates Wastes
- Breaks down Neurotransmitters
- Makes Myelin
Meninges
- Is a series of membranes that protect the brain and spinal cord.
- Three layers
  - Dura Mater - Outer layer
    (is very thick)
  - Arachnoid - Middle layer
    Overlies the arachnoid space (CSF)
  - Pia mater - Inner layer
    Covers the entire brain

Ventricles
- Are major spaces in the brain
- Are also covered by the meninges
- Contains choroid plexus cells

Cerebrospinal Fluid (CSF)
- Is a fluid that surrounds the brain
- Makes the brain lighter
- Is made from choroid plexus cells found with the ventricles of the brain.