Ch 7: Nervous System - part 2

THE HUMAN BRAIN
Parts of the Brain:

- The brain has 3 main parts:
  1) **CEREBRUM**
  2) **CEREBELLUM**
  3) **BRAIN STEM**

(plus, the **DIENCEPHALON**)
CEREBRUM:

- divided into hemispheres (R and L)
- each hemisphere divided into lobes (frontal, parietal, temporal, occipital)
- each hemisphere has a highly folded outer covering of gray matter = CEREBRAL CORTEX
- hemispheres are connected by white matter called CORPUS CALLOSUM
CEREBRUM – functions!

• where memories are stored
• interprets sensory impulses arriving from sense organs
• centers for motor coordination; send motor impulses to muscles
• where conscious decisions are made
• intelligence and personality stem from cerebral activity
Cerebral Hemispheres and Cerebral Commissures

Frontal section of the human brain, which illustrates the fundamental duality of the human forebrain.

Midsagittal section of the human brain, which illustrates the corpus callosum and other commissures.
• 2 functional cortical areas:

1) **Motor Cortex**: sends commands to **skeletal muscles**
2) **Somatosensory Cortex**: 
*receives and integrates signals from touch, pain, pressure, and temperature receptors;*

*divided into specific areas so that we can associate specific stimuli with specific parts of the body.*
CEREBELLUM: coordination of movement; balance; hand-eye coordination
BRAINSTEM:

- anterior end of spinal cord;

- 3 parts that function in:
  - HOMEOSTASIS
  - movement coordination
  - conduction of info. to higher brain centers:
Lateral view of brainstem

- Thalamus
- Optic tract
- Midbrain
- Pons
- Cranial nerves
- Medulla oblongata
- Spinal cord

Cut edges of ascending tracts to cerebrum
Cut edges of tracts leading to cerebellum
1) Medulla oblongata: controls breathing, heart and blood vessel activity, swallowing, vomiting, digestion
2) **Pons**: regulates breathing centers in the **medulla oblongata**
3) **Midbrain**: receives and sends sensory information; coordinates eye movements with other movements
DIENCEPHALON:

- located between the cerebral hemispheres and above the midbrain.
- includes the:
  - thalamus
  - hypothalamus
  - optic tracts & optic chiasma
  - posterior pituitary gland
  - pineal gland
THALAMUS: relay center that sorts out & transmits sensory info. to and from cerebrum
HYPOTHALAMUS:

• important regulator of HOMEOSTASIS
• contains body’s thermostat (regulates temperature)
• includes centers for regulating hunger & thirst
• plays role in sexual response and mating behavior
• fight-or-flight response, pleasure, daily biorhythms
Human Diencephalon

- Bands of myelinated axons
- Right thalamus
- Left thalamus
- Hypothalamus
- Cerebellum