The Cerebral Cortex

- The intricate fabric of interconnected neural cells covering the cerebral hemispheres.
- The body’s ultimate control and information-processing center.
The Cerebral Cortex

- Made up of 4 areas called lobes:
  - Frontal Lobe
  - Parietal Lobe
  - Occipital Lobe
  - Temporal Lobe
The Cerebral Cortex

- **Frontal Lobes**
  - **Location:**
    - Behind the forehead.
  - **Function:**
    - Involved in speaking, muscle movement, and making plans and judgments.
The Cerebral Cortex

- **Parietal Lobes**
  - **Location:** At the top of the head toward the rear.
  - **Function:** Receives sensory input for touch and body position.
The Cerebral Cortex

- **Occipital Lobes**
  - **Location:** Back of the head.
  - **Function:** Receives visual information.
The Cerebral Cortex

- **Temporal Lobes**
  - **Location:** Roughly above the ears.
  - **Function:** Receives auditory information.
## The Cerebral Cortex

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Major Structures of the Brain

- Cerebellum
- Broca’s Area
- Wernicke’s Area
- Corpus Callosum
- Thalamus
- Limbic System
  - Amygdala
  - Hippocampus
  - Hypothalamus
- Brainstem
  - Medulla
  - Pons
  - Reticular Formation
Major Structures of the Brain

- **Cerebellum**

  - **Location:**
    - The “little brain” at the rear of the brainstem.
Major Structures of the Brain

- **Broca's Area**

  **Location:**
  - In the left side of the frontal lobe.

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Major Structures of the Brain

- **Wernicke’s Area**
  - **Location:**
    - In the left temporal lobe.
Major Structures of the Brain

- Corpus Callosum

**Location:**
- The large band of neural fibers connecting the left and right hemispheres of the brain.

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Major Structures of the Brain

- **Thalamus**

  - **Location:**
    - At the top of the brainstem.
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Major Structures of the Brain

- **Limbic System**
  - A doughnut-shaped neural system located below the cerebral hemispheres.
  - Associated with *emotions and drives*.
  - Includes:
    - Amygdala
    - Hippocampus
    - Hypothalamus
Major Structures of the Brain

- Limbic System
- Amygdala
  - **Location:** Two lima bean-sized neural clusters.

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Major Structures of the Brain

- Limbic System
  - Hippocampus
  - **Location**: Neural center.
Major Structures of the Brain

- Limbic System
- Hypothalamus

Location:
- Neural structure lying below the thalamus.
## Limbic System

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<td>Neural structure lying below the thalamus.</td>
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Major Structures of the Brain

- Brainstem
  - Central core of the brain, beginning where the spinal cord swells as it enters the skull.
  - Responsible for **automatic survival functions**.
  
  Includes:
  - Medulla
  - Pons
  - Reticular Formation
Major Structures of the Brain

- **Brainstem**
- **Medulla**

**Location:**
- At the base of the brainstem.

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Major Structures of the Brain

- **Brainstem**
- **Pons**

**Location:**
- Sits just above the medulla.
Major Structures of the Brain

- Brainstem
- Reticular Formation

**Location:**
- A nerve network inside the brainstem.

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# Brainstem

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two cerebral hemispheres

Thalamus: relays messages between lower brain centers and cerebral cortex

Hypothalamus: controls maintenance functions such as eating; helps govern endocrine system; linked to emotion and reward

Pituitary: master endocrine gland

Reticular formation: helps control arousal

Medulla: controls heartbeat and breathing

Spinal cord: pathway for neural fibers traveling to and from brain; controls simple reflexes

Cerebellum: coordinates voluntary movement and balance

Amygdala: linked to emotion

Hippocampus: linked to memory
Major Functions of the Brain

- Cerebellum
- Broca’s Area
- Wernicke’s Area
- Corpus Callosum
- Thalamus
- Limbic System
  - Amygdala
  - Hippocampus
  - Hypothalamus
- Brainstem
  - Medulla
  - Pons
  - Reticular Formation
Major Functions of the Brain

- **Cerebellum**
  - **Function:**
    - Processing sensory input.
    - Coordinating movement output.
    - Balance.
Major Functions of the Brain

- **Broca’s Area**
  - **Function:**
    - Controls language expression.
    - Directs muscle movements involved in speech.
Major Functions of the Brain

- **Wernicke’s Area**
  - **Function:**
    - Controls language reception.
    - Involved in language comprehension and expression.
Major Functions of the Brain

- **Corpus Callosum**
  - **Function:** Carries messages between the left and right hemispheres.
Major Functions of the Brain

Thalamus

- **Function:**
  - The brain’s sensory switchboard.
  - Directs messages to the sensory receiving areas in the cortex.
  - Transmits replies to the cerebellum and medulla.

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Major Functions of the Brain

- Limbic System
- Amygdala
  - **Function:** Involved in emotion.
Major Functions of the Brain

- Limbic System
- Hippocampus

**Function:**
- Helps process explicit memories for storage.
Major Functions of the Brain

- **Limbic System**

- **Hypothalamus**
  - **Function:**
    - Directs maintenance activities (eating, drinking, body temperature).
    - Helps govern the endocrine system via the pituitary gland, linked to emotion.
## Limbic System

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                   • Helps govern the endocrine system via the pituitary gland, linked to emotion. |
Major Functions of the Brain

- Brainstem
  - Function: Controls heartbeat and breathing.

- Medulla
Major Functions of the Brain

- **Brainstem**
  - Function: Helps coordinate movements.

- **Pons**
Major Functions of the Brain

- **Brainstem**

- **Reticular Formation**
  - **Function:**
    - Helps control arousal.
    - Helps filters incoming stimuli.
    - Relays important information to other areas of the brain.
## Brainstem

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