

## Brain Review 3

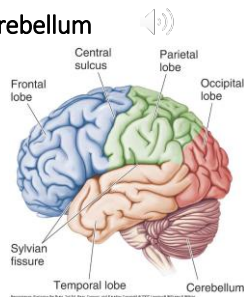
### Learning Objectives

You should be able to:

- Name and identify the cerebrum, the lobes of the brain, the cerebral cortex, and its major regions/divisions.
- Name the three major arteries in the brain and understand their importance.
- Describe the sensory and motor homunculus
- Describe how the cerebral cortex controls movement

### Cerebral Lobes and Cerebellum

- Frontal lobes
- Parietal lobes
- Temporal lobes
- Occipital lobes
- Cerebellum



### Functions of Cerebral Lobes and Cerebellum

#### Frontal lobes

- Motor planning and control
- Speech production
- Executive functions
- Motivation, inhibition, etc.

#### Parietal lobes

- Receives primarily somato-sensory information
- Visual-spatial processing

#### Temporal lobes

- Language comprehension
- Memory (medial structures)
- Processing of colors, shapes, numbers

#### Occipital lobes

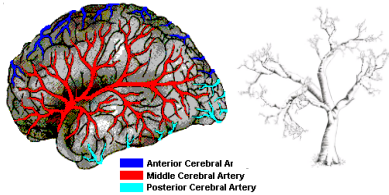
- Receives primary visual information

#### Cerebellum

- Coordination of movement
- Maintenance of balance
- Motor learning
- Cognitive functions

## Blood supply

- As the arteries spread over the brain, the individual vessels branch and narrow (like a tree's branches)



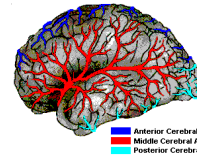
## Arterial Supply in the Brain

There are 3 major arteries that supply the brain with blood

- 1 supplies the **Front of the Brain**
- 1 supplies the **Middle of the Brain**
- 1 supplies the **Back of the Brain**

**Question:**

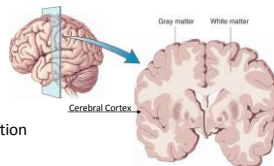
- If the blood supply to the **Middle Cerebral artery (in bright red)** was interrupted what areas of the brain would be affected?



[http://www.medem.com/MedLib/article\\_detailib.cfm?article\\_id=ZZZ0ZF46JC&sub\\_cat=75](http://www.medem.com/MedLib/article_detailib.cfm?article_id=ZZZ0ZF46JC&sub_cat=75)

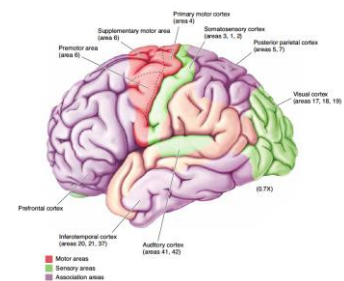
## Cerebral Cortex

- The outermost layer of gray matter making up the superficial aspect of the cerebrum.
- Three kinds of functional areas
  - Motor** areas: movement
  - Sensory** areas: perception
  - Association** areas: integrate diverse information to enable purposeful action



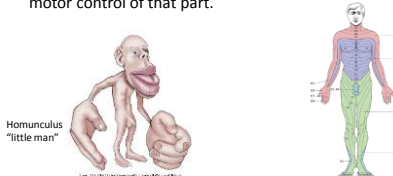
<http://www.khan.com/book/brainmap/section/brainmap3.1.4.0f.jpg>

## Major Sensory, Motor & Association Areas

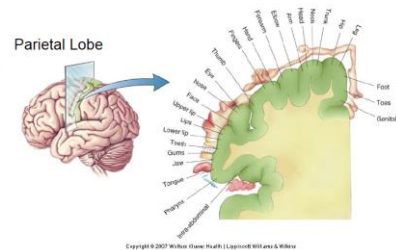


## Homunculus

- The entire body surface is somatotopically represented on the **sensory cortex**. Size of the body part on the cortex reflects the density of sensory input received from that part.
- Output from the **motor cortex** is organized similarly. The amount of cortical surface dedicated to a body part is related to the degree of motor control of that part.

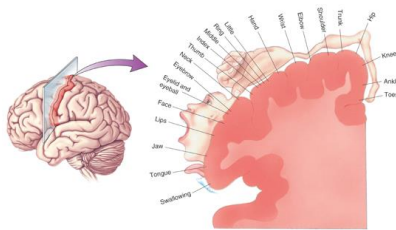


## Somatosensory Cortex



## Motor Cortex

- Somatotopic organization of precentral gyrus



## Homunculus

