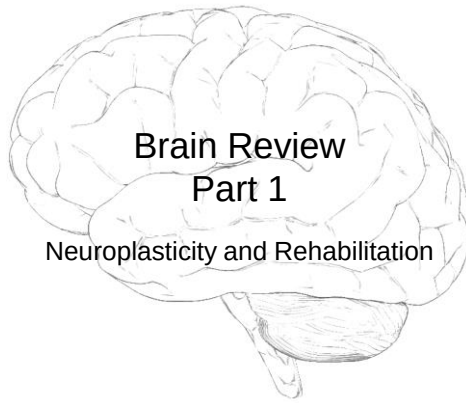




The Brain...



- Makes up 2% of body weight,
 - receives 20% of cardiac output (blood), and
 - uses 25% of the oxygen used by the body.
- The brain has **NO** metabolic reserves
 - No stored food or oxygen
- ❖ **TOTALLY** dependent on a constant blood supply
 - Blood supply cut-off for **10 s.**—lose consciousness
 - After **20 s.** electric activity stops
 - After **2-3 mins.** Brain damage!
 - What does CPR do?



The Brain



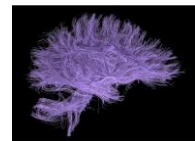
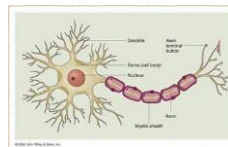
- **Consists of Gray Matter and White Matter**
- Gray matter:
 - 2 Types of cells
 - Tightly packed cell bodies of neurons and their dendrites, and
 - Glial cells
 - Glial cells provide support structure for neurons, about 1/2 of brain's mass.
 - are 5-10 times more numerous than neurons!
 - Very important, but little is known about them!
 - Brain's immune system
 - Help neurons make connections with each other
 - Make *Myelin (white fatty substance on axons)



The Brain



- White matter:
 - Myelinated axons of neurons that connect different brain regions (we'll talk about neuron structure later)
 - Bundles of axons which connect one part of the brain to another and to the spinal cord are called **tracts**
 - Tracts are named by the 2 things they connect (e.g., corticospinal; frontopontine)



Brain Hemispheres



- 2 Hemispheres divided by the Longitudinal Cerebral Fissure/ Superior Longitudinal fissure
- Hemispheres are **structurally** similar, but **functionally** different.
 - LH is usually bigger than the RH in right handers.
 - LH handles detail and very small differences better than the RH
 - Most language functions are in the LH in most people.
 - RH provides the “Big Picture”, the theme of the story
 - Also plays a big role in attention, especially spatial attention



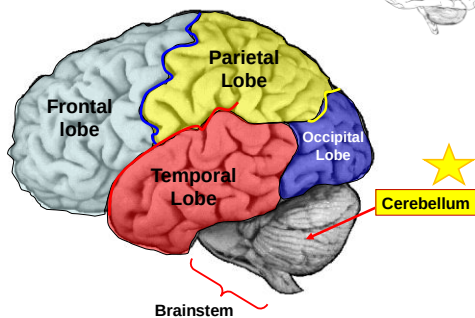
Some terms



- Gyrus (plural = gyri)
 - The “hills” of cortex that you see the tops of
- Sulcus (plural = sulci)
 - The valleys
- Fissures
 - Deep divisions between lobes/hemispheres



Lobes

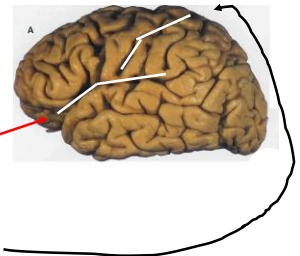


Brain Topography



2 Major Landmarks

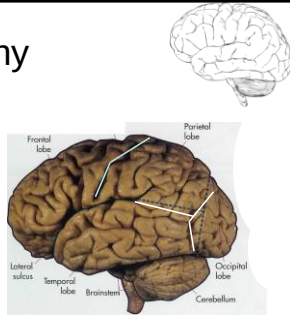
- Lateral fissure = Sylvian fissure (delimits temporal lobe)
 - “Perisylvian region” = Area around the Sylvian fissure
- Central fissure = divides brain anterior vs. posterior
 - Between the frontal lobe and the parietal lobe



Brain Topography

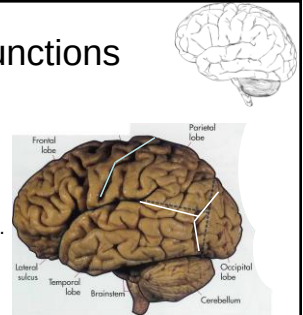
4 lobes/hemisphere:

- Frontal—1/3 of cortex, in front of central sulcus
- Parietal—between central sulcus and occipital lobe
- Occipital—lower posterior part of brain
- Temporal—lower 1/3 of each hemisphere; is below the lateral fissure (Sylvian fissure)



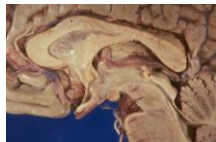
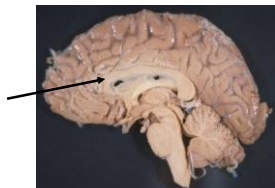
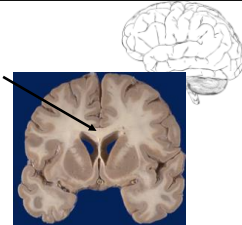
Brain lobes—Functions

- Frontal— Motor planning & programming; reacting to world; Complex Cognition: working memory, executive function
- Parietal— Tactile processing. Spatial awareness (of yourself and the world)
- Occipital— visual processing
- Temporal— acoustic processing, word meanings, language use



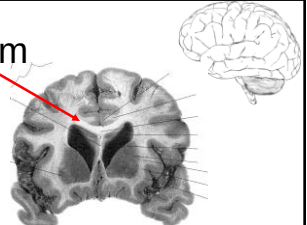
Corpus Callosum

- Primary white matter pathway that connects the brain hemispheres

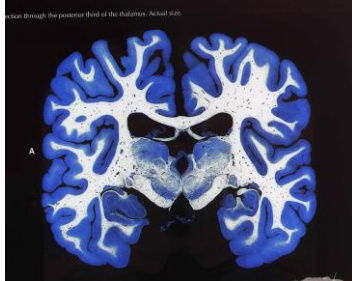


Corpus Callosum

- Largest bundle of white matter tracts in the brain
- Primary bidirectional pathways for interhemispheric communication
- A structural bridge between hemispheres



The Brain— what are we looking at?



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Go to
Brain Review, Part 2