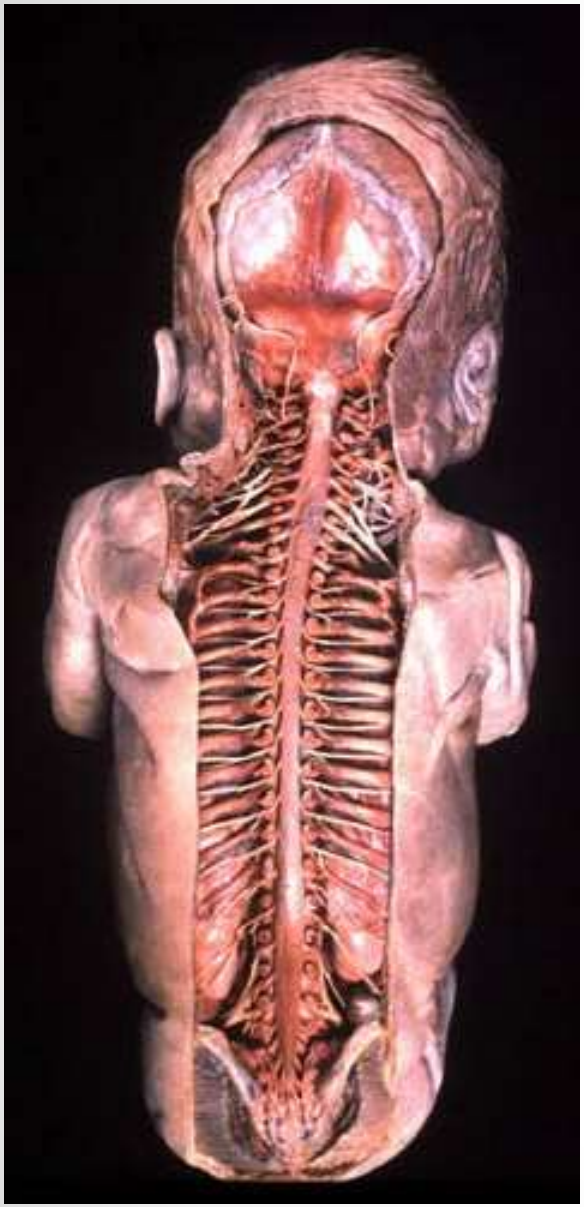


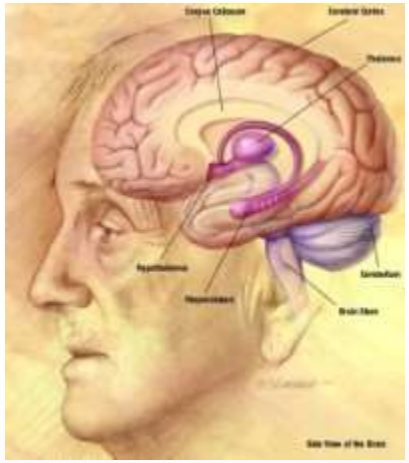
Parts of the Central Nervous System

EQ: Compare and contrast the different parts of the brain and their functions.

Interesting Brain Facts

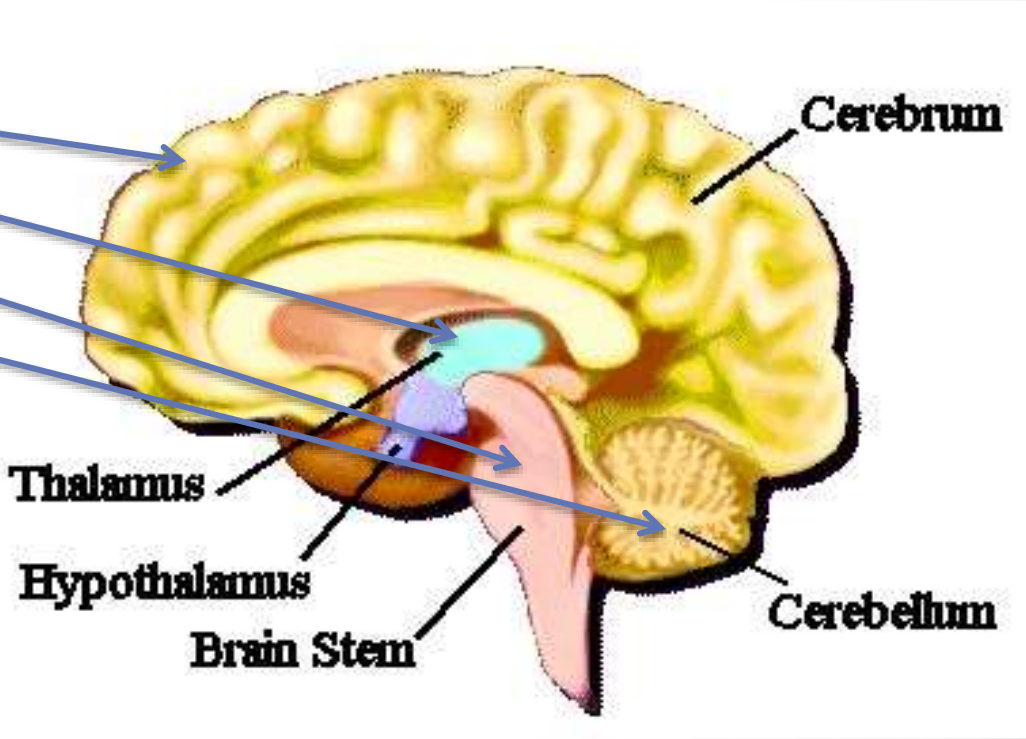
- No pain receptors in the brain – the brain feels no pain
- The brain weighs only about 3 lbs
- It's the fattest organ in the body – 60% fat
- Your brain uses 20% of the total oxygen in your body
- You produce 10-23 watts of power while awake

- Though only 2% of our body weight, it uses 20% of our bodies energy
- The brain is suspended in **Cerebrospinal fluid**, effectively floating in liquid that acts as both a cushion to physical impact and a barrier to infections.



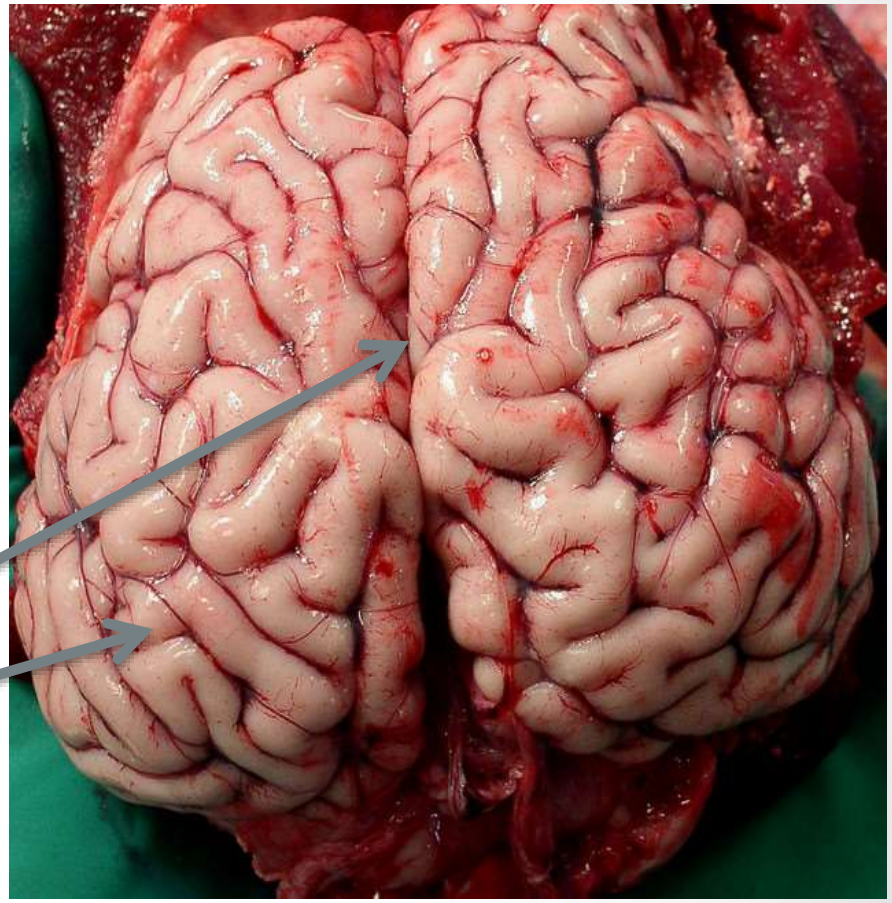
Quick Overview

- Look at the 4 main brain regions
  - Cerebrum
  - Diencephalon
  - Brain stem
  - cerebellum

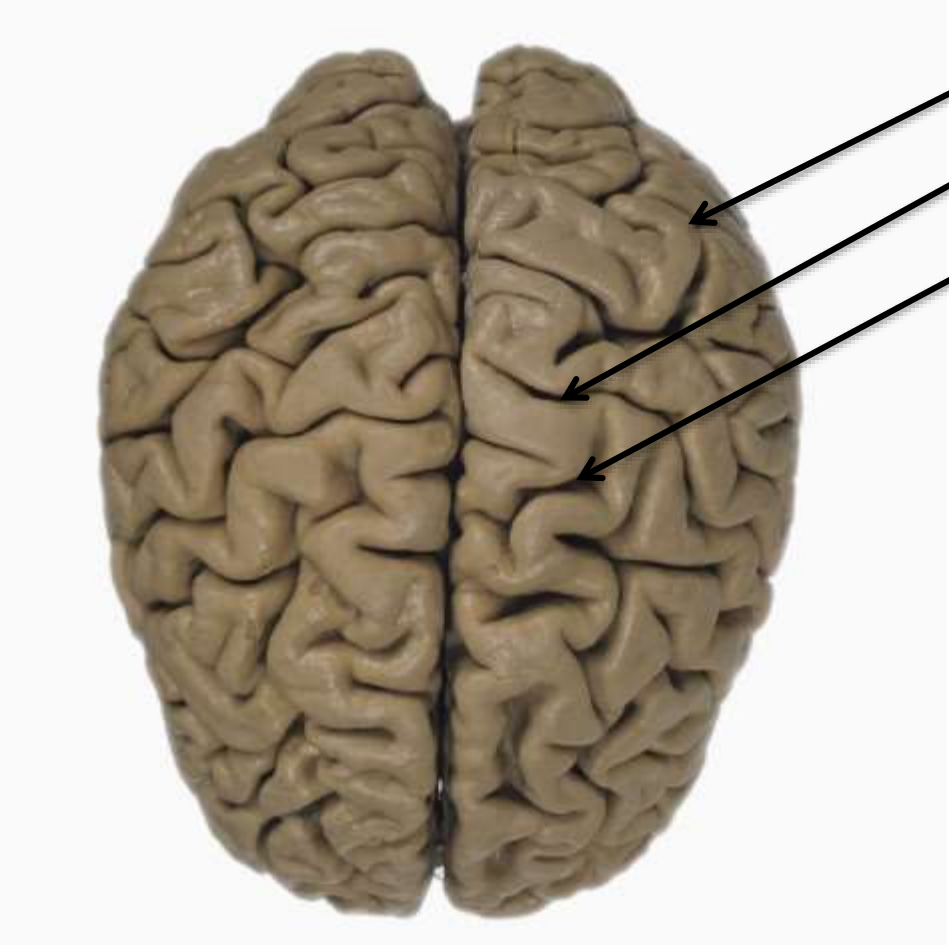


Brain Region #1 Cerebrum

- Largest of the regions and most superior part of brain
- Controls higher mental function
- Two hemispheres; left and right divided by the longitudinal fissure
- Crowned by a cortex of gray matter



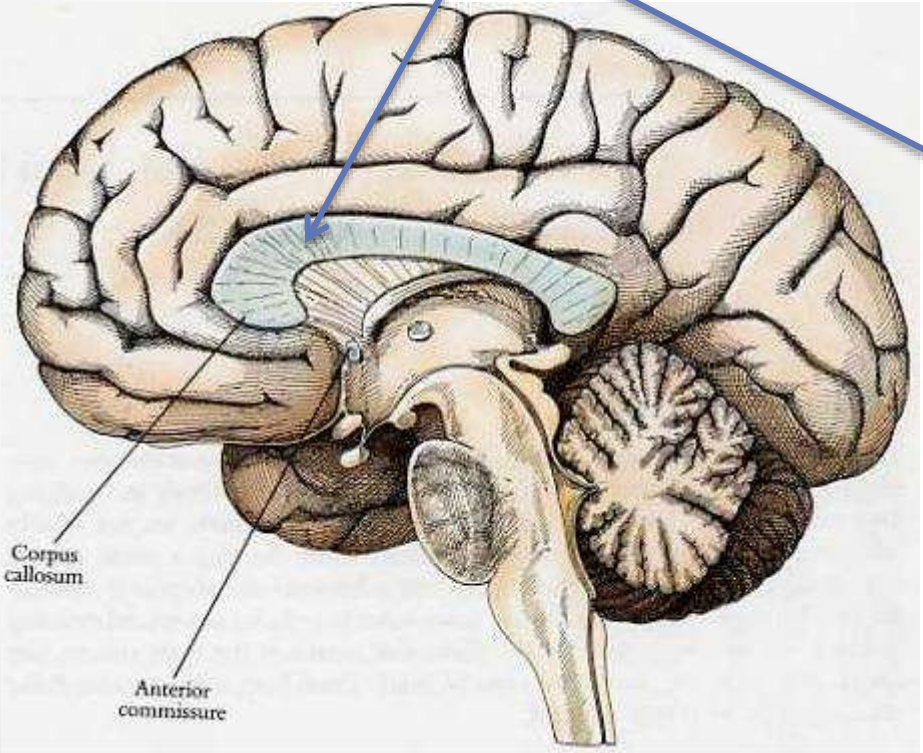
Cerebrum

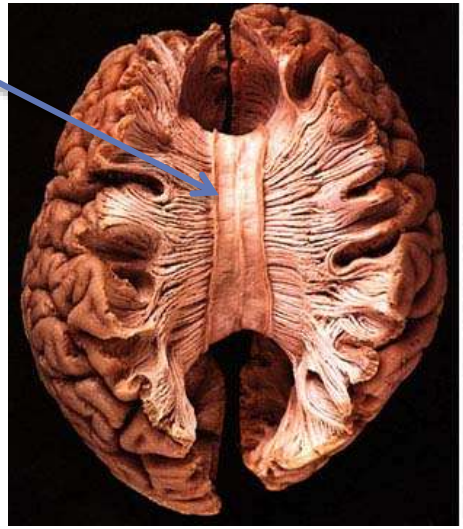


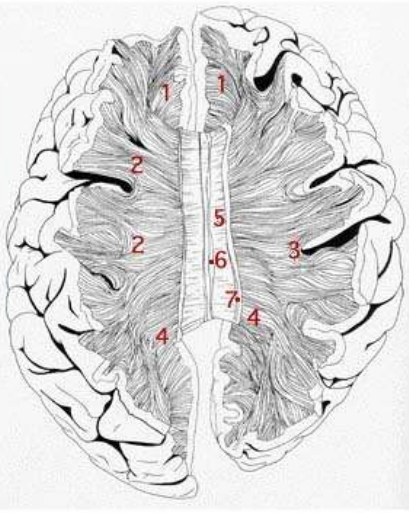
- Gyri (ji're): the ridges
- Sulci (sul'ki): grooves
- Fissures: deep grooves
- Lobes: different parts of cerebrum created by the fissures & sulci

Cerebral Hemispheres

- left and right side separated by the corpus callosum; connects two hemispheres

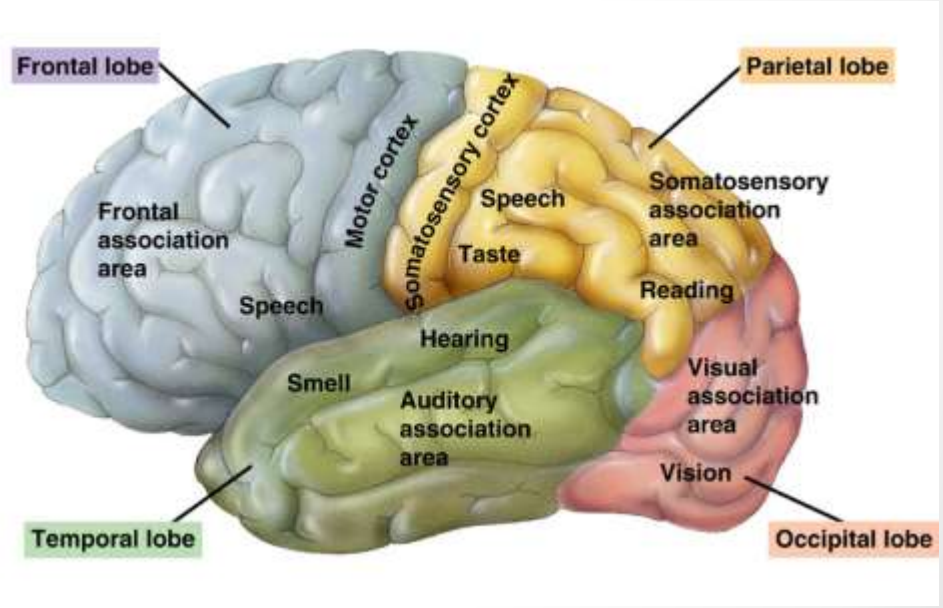




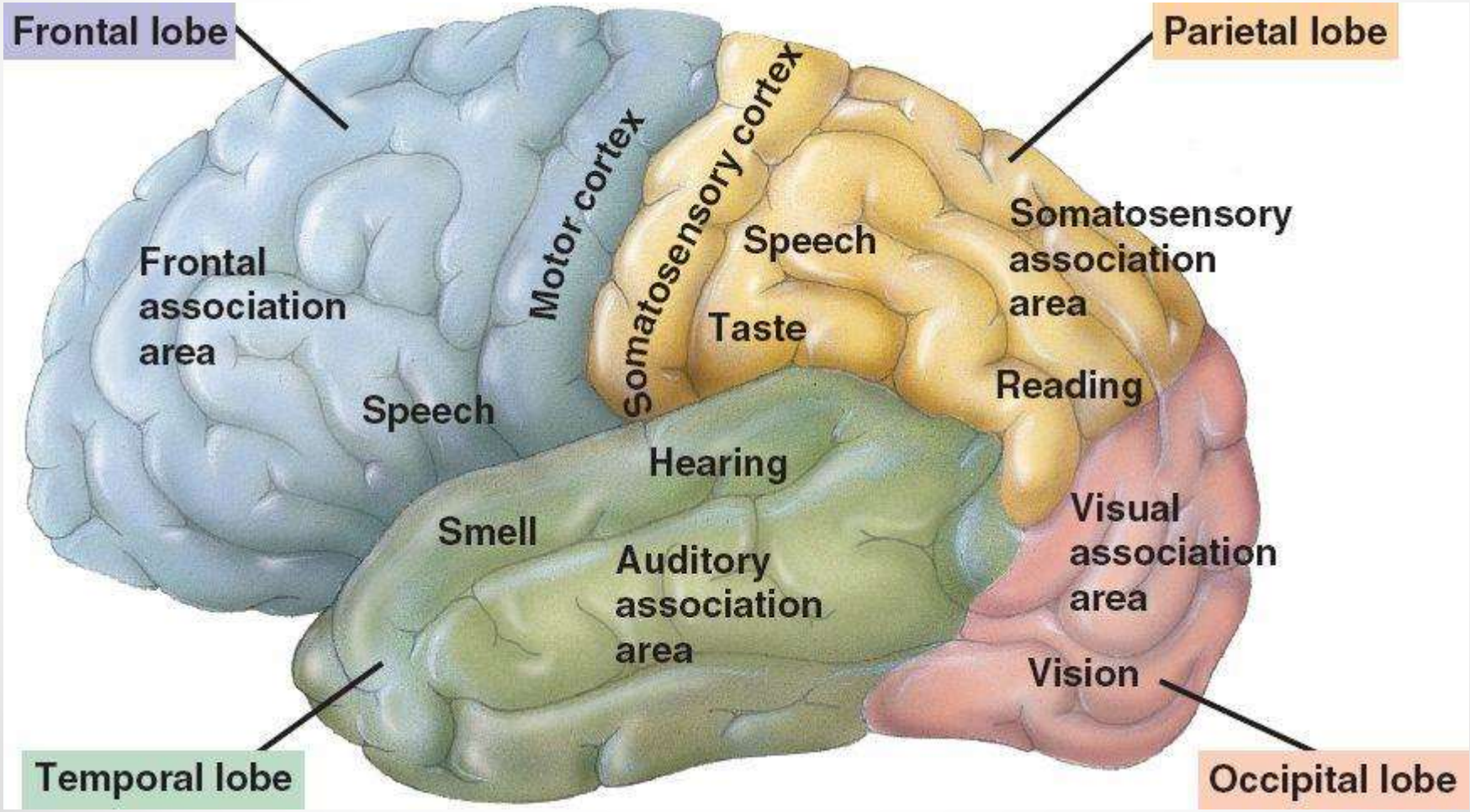


Cerebral Cortex

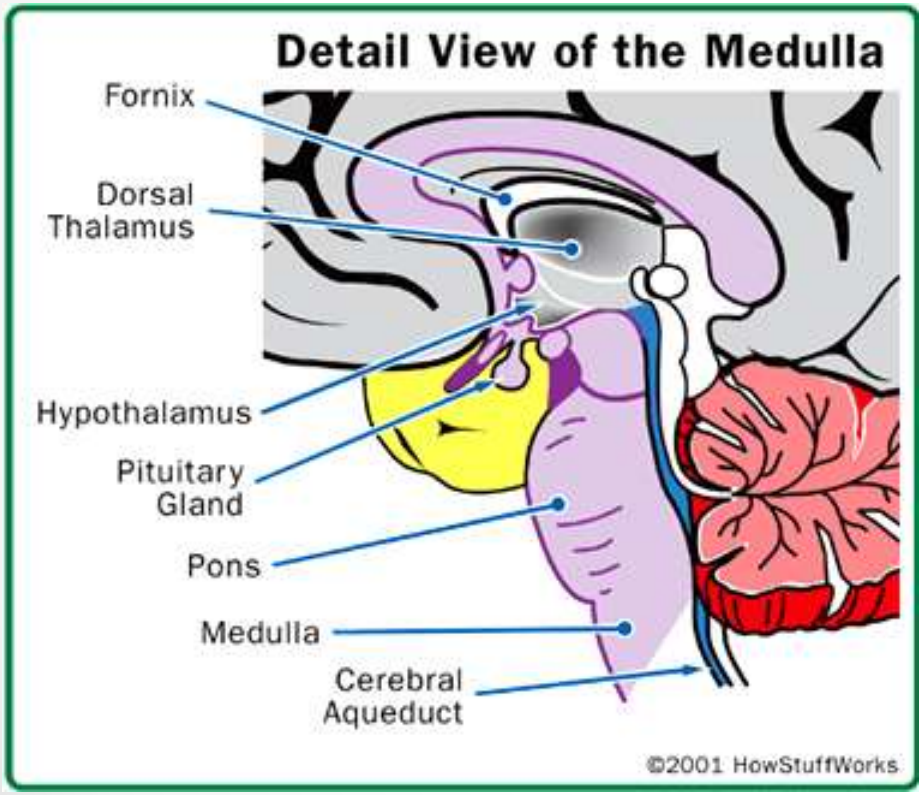
- Speech, memory, logical and emotional response, consciousness, sensation, voluntary movement
- Divided into lobes named after the skull bones



Lobe & Functions



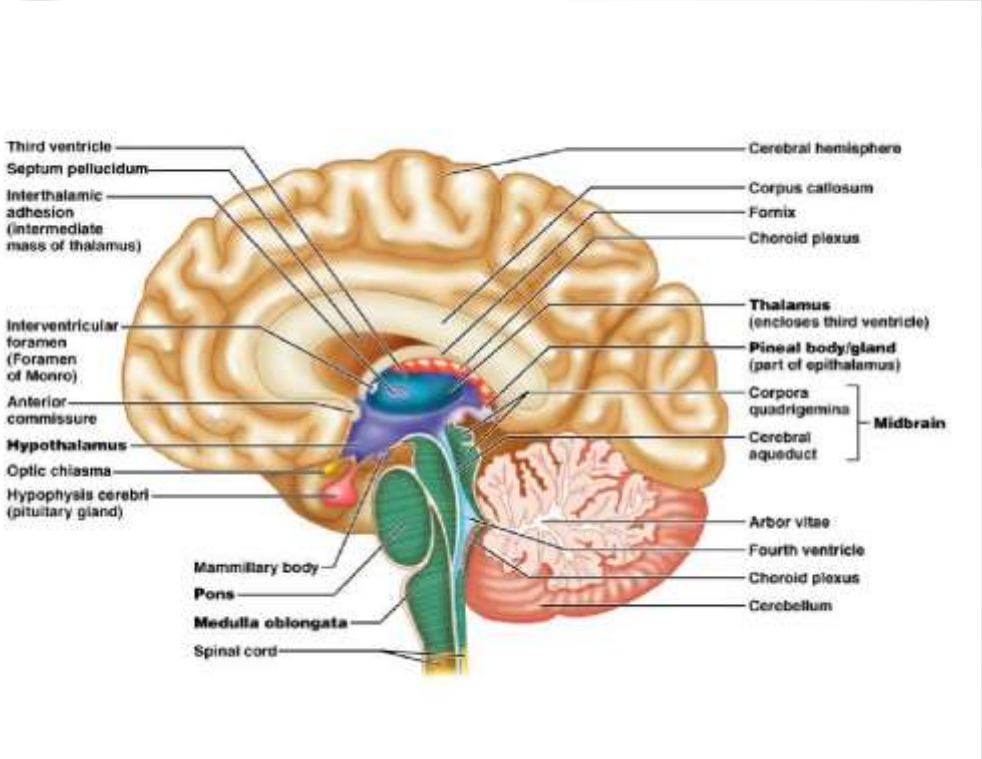
The Lower or "Lizard" Brain



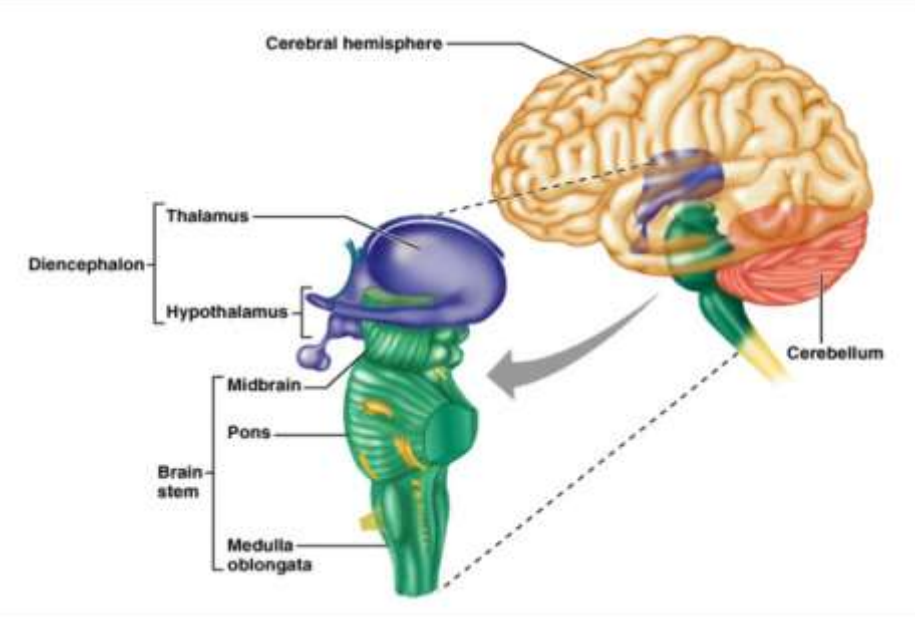
- The basic **lower brain** consists of the **spinal cord**, **brainstem** and **diencephalon**

Brain Region #2 - Diencephalon

- Found under the cerebrum and above the brain stem
- Contains the thalamus and the hypothalamus
- They make up the "limbic system" where thirst, appetite, sex, pain, and pleasure centers are located
- Thalamus is an important relay station



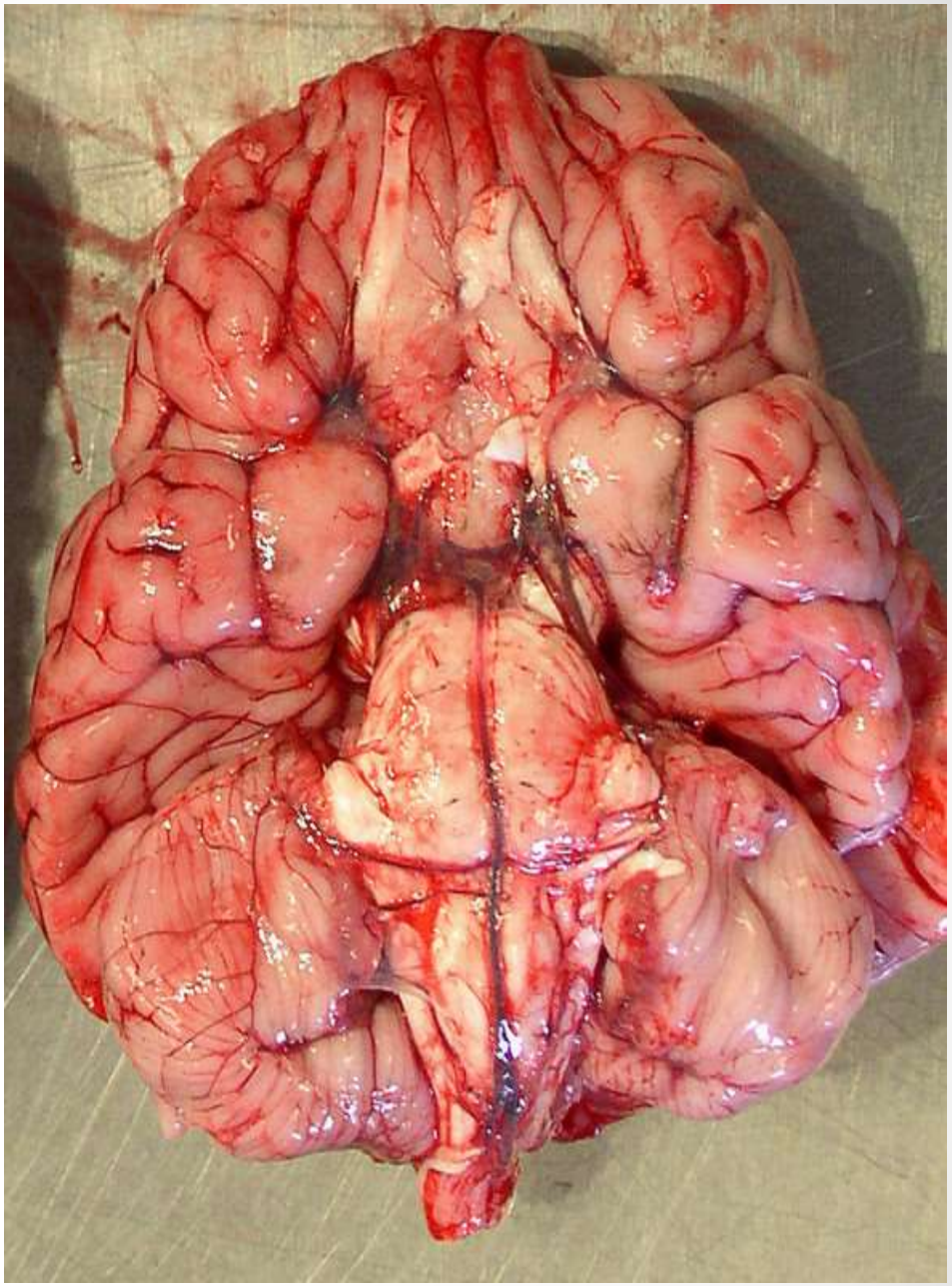
Region #3 – The Brain Stem



- 3 main structures; midbrain, pons, and medulla oblongata
- Midbrain: handles visual & auditory systems as well as eye movement
- Pons: breathing center
- Medulla oblongata: centers for heart rate, bp, breathing, swallowing, vomiting, etc

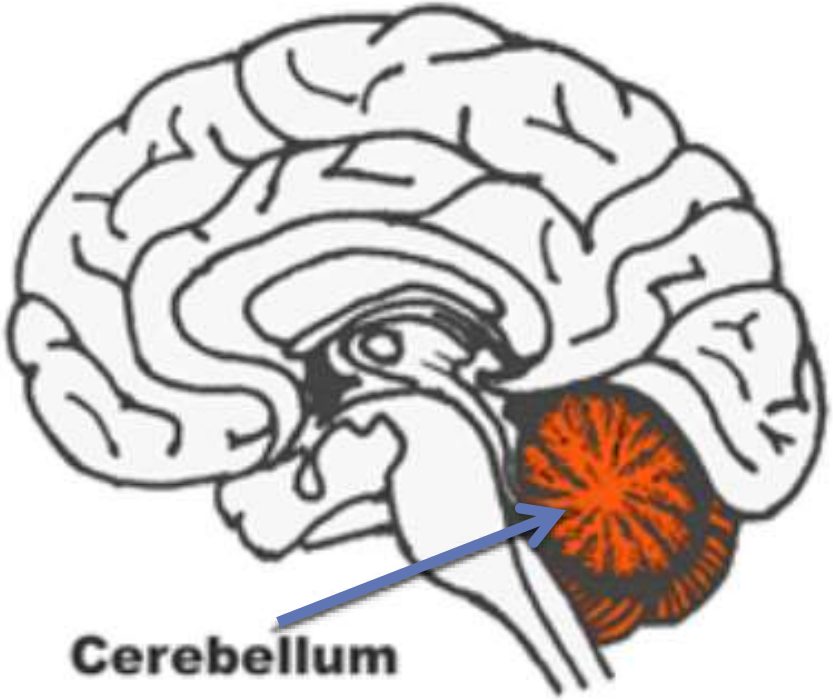
Brain Stem -

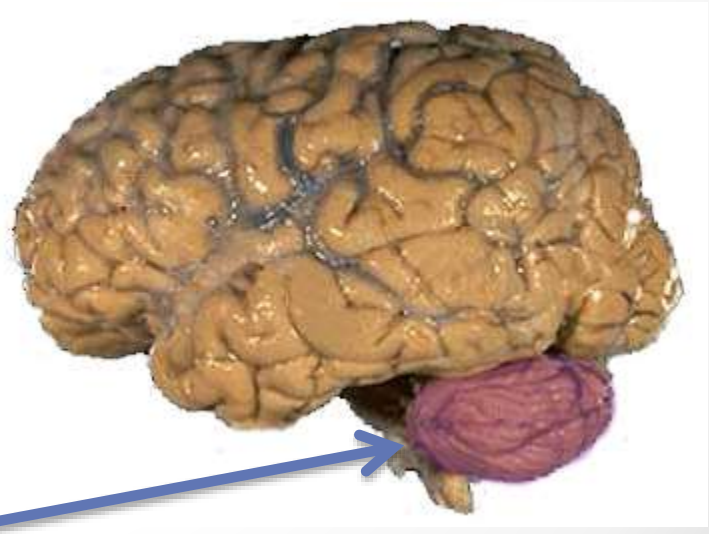
regulates visceral functions (autonomic system)



Region #4 - Cerebellum

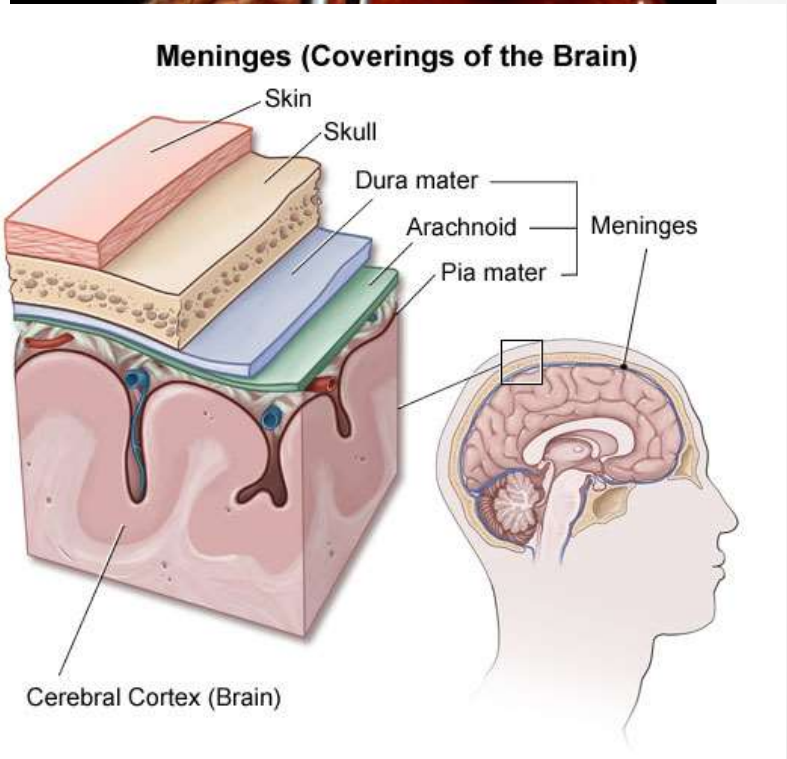
- Timing of skeletal muscle activity as well as balance and equilibrium



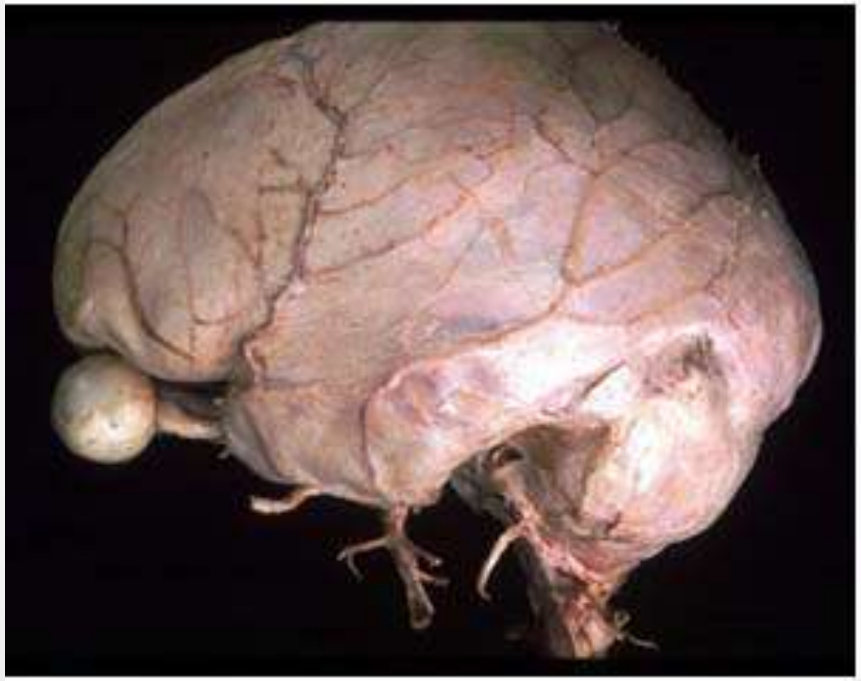


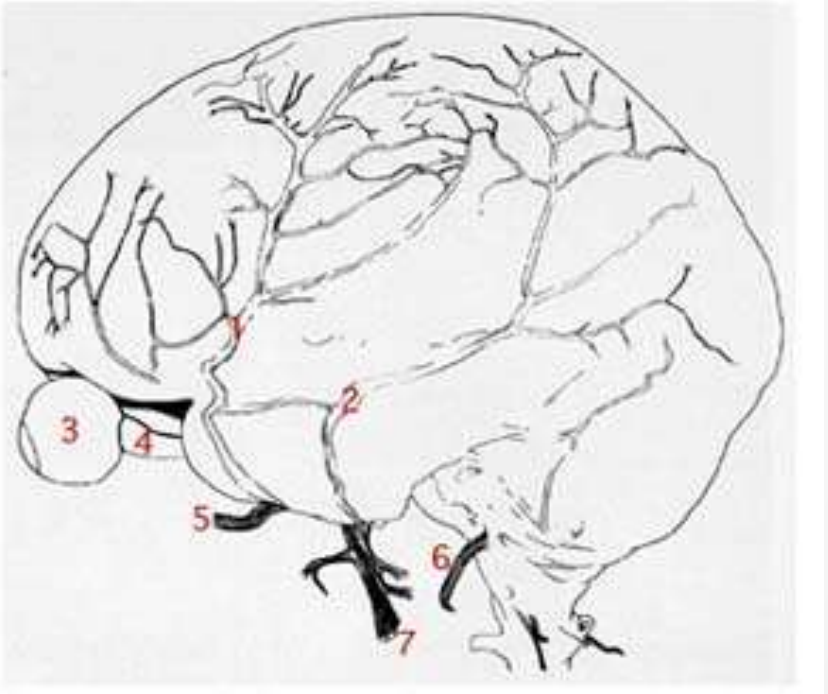
Protection of CNS

- The Meninges
  - Dura mater – "tough mother" outermost layer
  - Arachnoid - "spider web" middle layer
  - Pia mater – "gentle mother" clings tightly to the brain

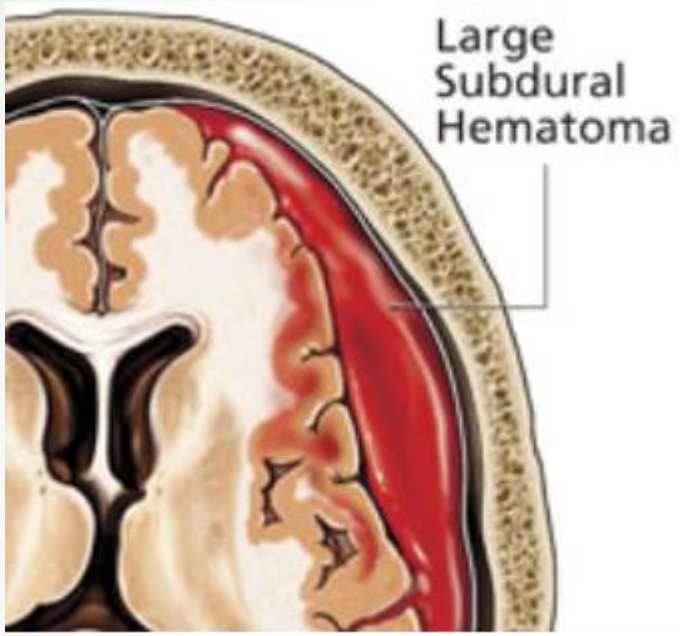


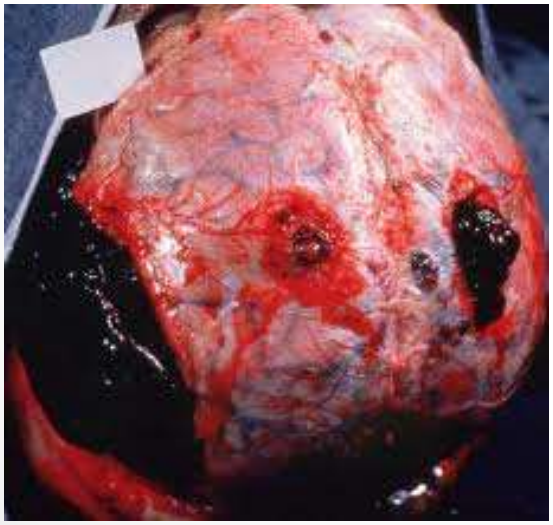
Dura Mater

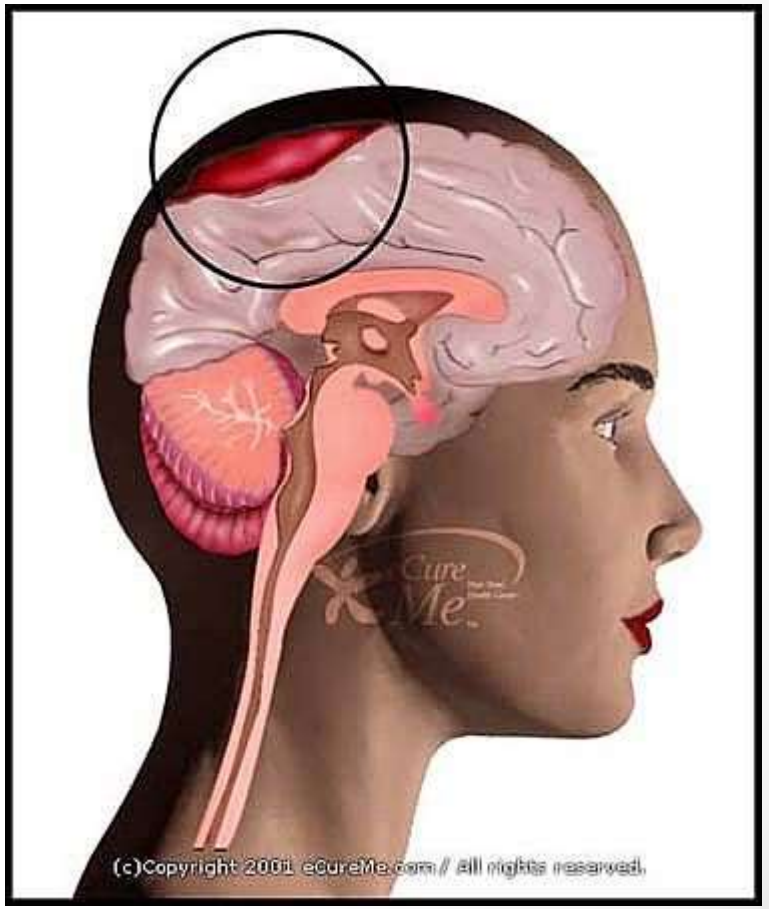




Subdural Hematoma

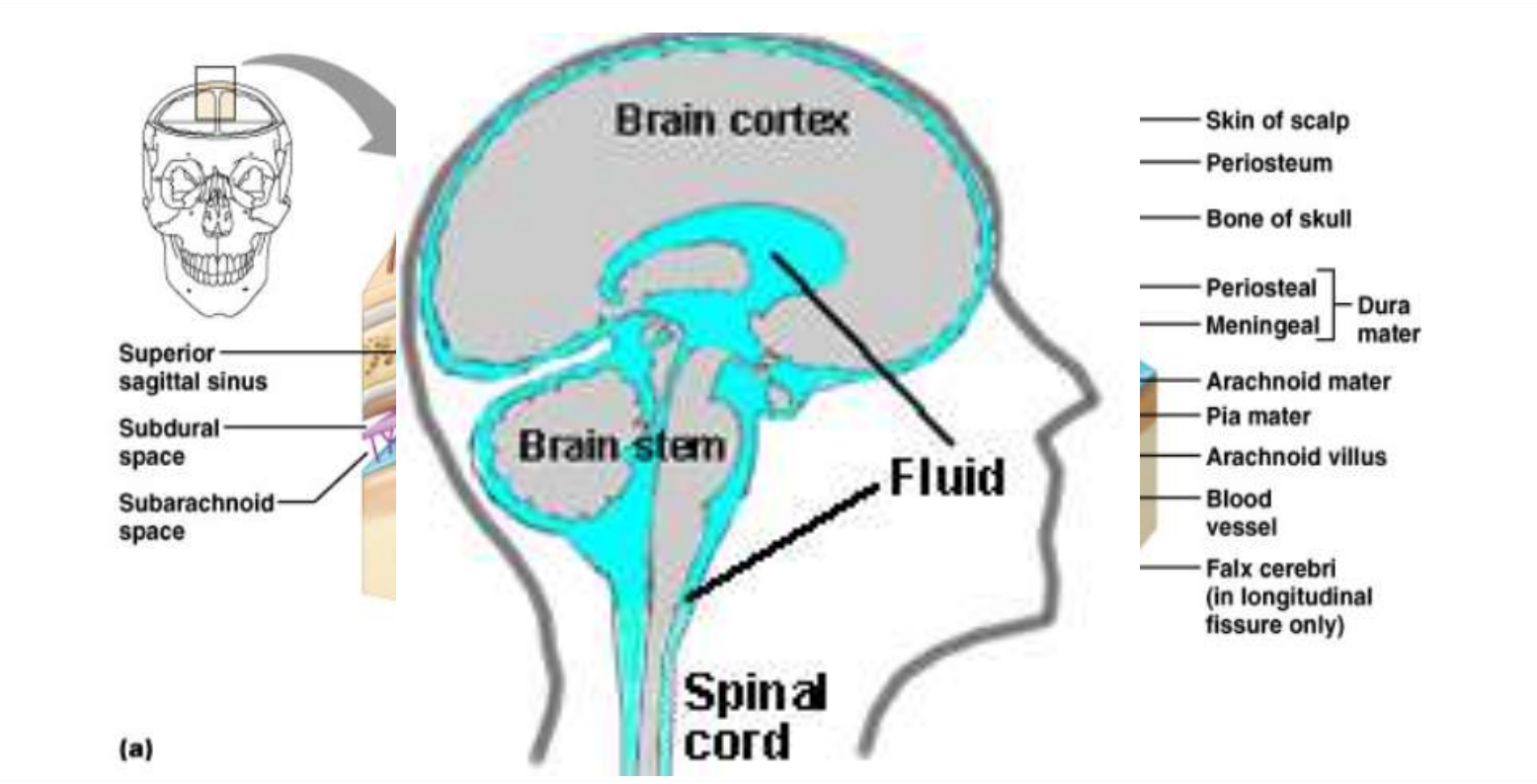




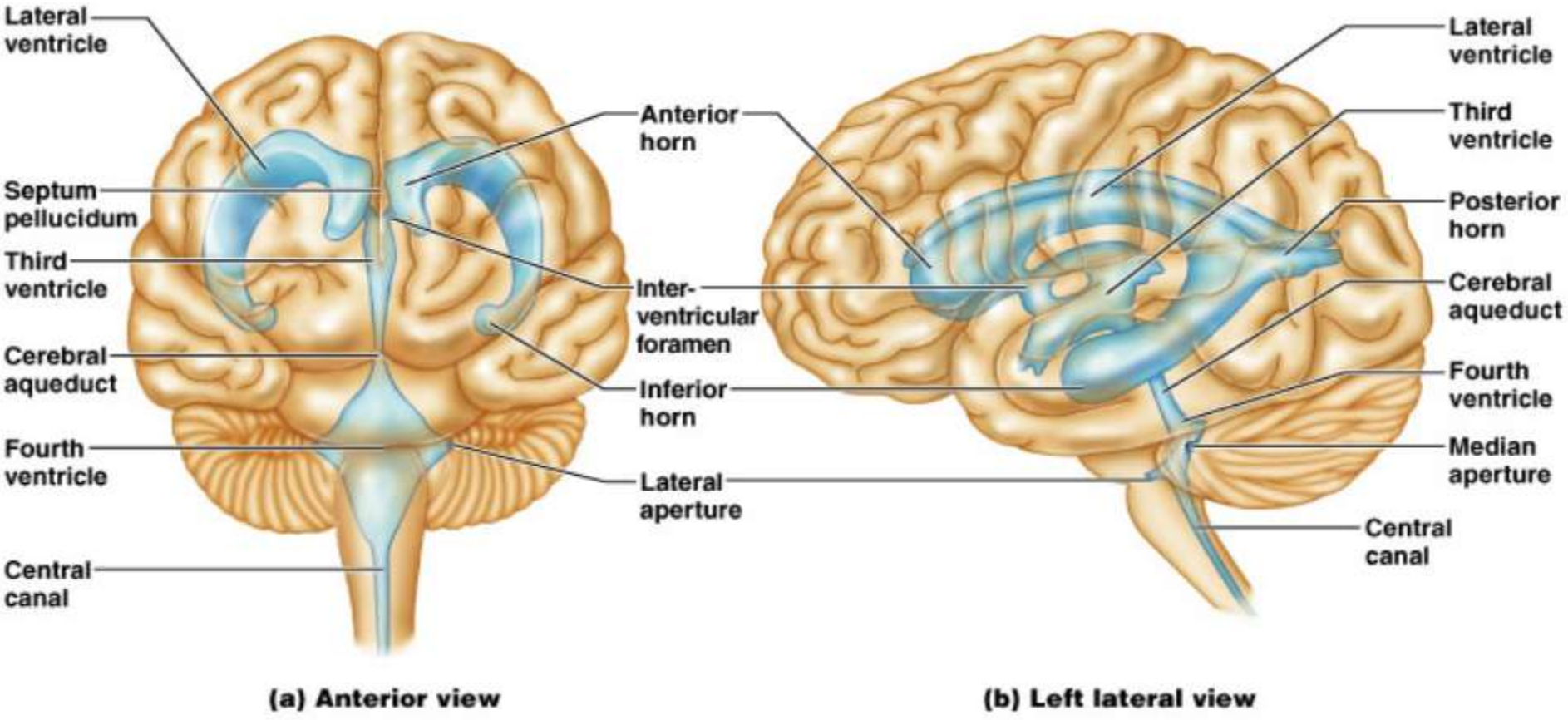


Cerebrospinal Fluid (CSF)

- For further protection, the brain and spinal cord float in a sea of **cerebrospinal fluid** within the skull and spine



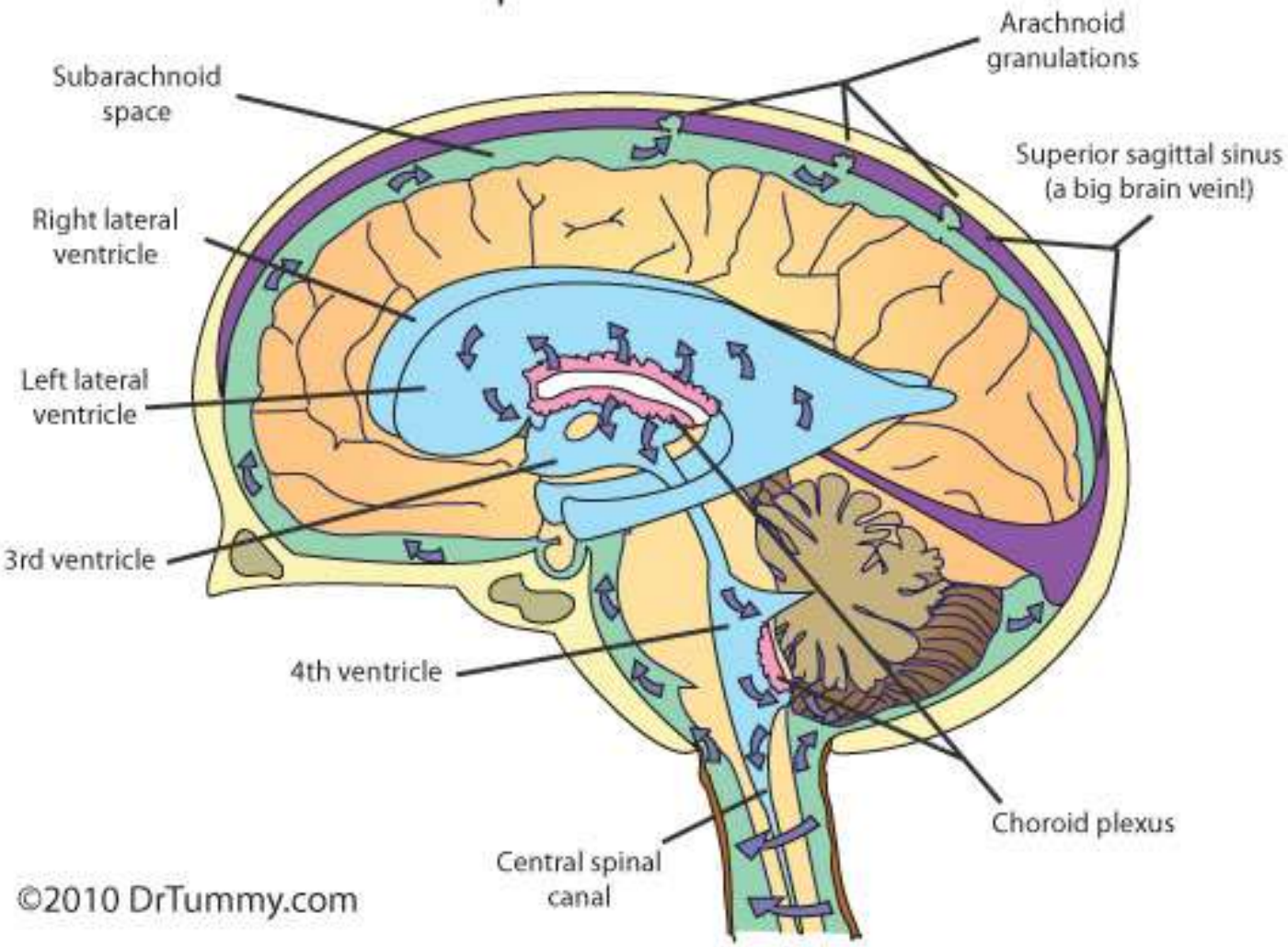
VENTRICLES OF THE BRAIN



Fluid filled cavities, contain CSF

The Brain

Cerebral Spinal Fluid Circulation



Hydrocephalus

- CSF forms and drains at a constant rate
- A blockage can result in too much CSF in the brain leading to hydrocephalus

Blood Brain Barrier

- A barrier of the least permeable capillaries around the brain
- The blood–brain barrier acts very effectively to protect the brain from many common bacterial infections
- But it is useless against fat soluble molecules like alcohol, nicotine, and most anesthetics