Unit 3B : The Brain

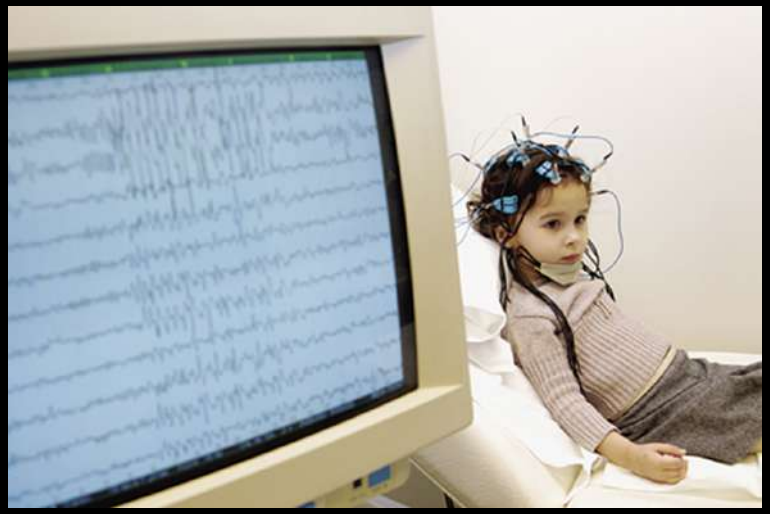
Having our head examined & the older brain structure

Studying the Brain

- Looking at the brain electrically, chemically, or magnetically has done to psychology what the micro-scope does for biology.
- Brain's Electrical Activity
  - EEG
- Neuroimaging Techniques
  - CT
  - PET
  - MRI
  - fMRI
- Lesion
  - EX: cutting the brain

Brain's Electrical Activity

- Electroencephalogram (EEG)
  - amplified reading of electrical wave activity
  - Record electrical patterns in your brain
  - EX: help diagnose a seizure, epilepsy, or brain death



Neuroimaging

- Computed Tomography (CT or CAT)
  - takes X-rays that can reveal brain damage
  - EX: In car accident and need to see if brain was hurt
- Positon Emission Tomography (PET)
  - show which part of the brain is most active when doing a task by locating a radioactive chemical glucose given prior to scan. The glucose is used by neurons when they are active
  - EX: want to see if certain parts of brain are working after car accident
- Magnetic Resonance Imaging (MRI)
  - detailed picture of the brain's soft tissues
  - Can give 3D images
  - EX: Locate a tumor or to see is a stroke happened.. More details
- Functional MRI (fMRI)
  - the functions in the brain, where blood is rushing
  - EX: understand how brain works to plan for surgery

The Breakdown

Brain Structure

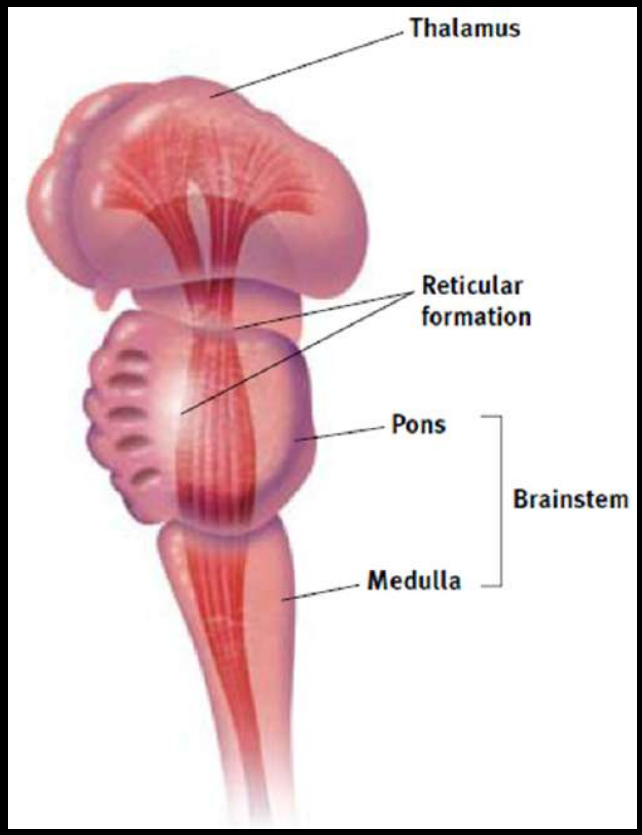
- CT
- MRI

Brain Function

- EEG
- PET
- fMRI

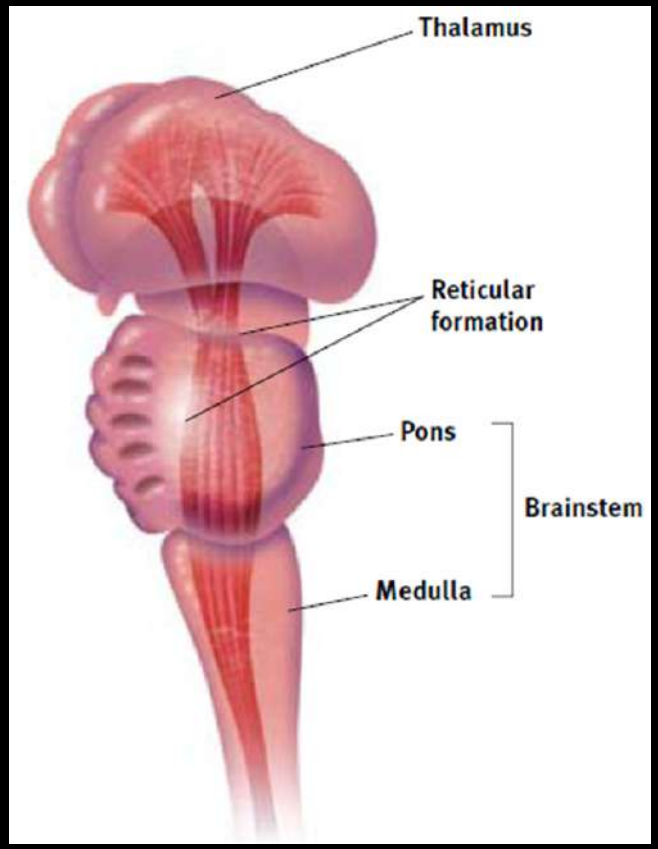
Older Brain Structures- Brainstem

- Brainstem
  - responsible for basic survival functions, this is a region in the brain
  - EX: break this and you die
  - Medulla
    - controls heartbeat and breathing
    - EX: Damage to this could stop breathing or heartbeat… death
  - Pons
    - helps coordinate movement
  - Reticular Formation
    - relay area for incoming info and sends it to other parts of the brain, plays a role is arousal
    - EX: directs sounds to the proper place



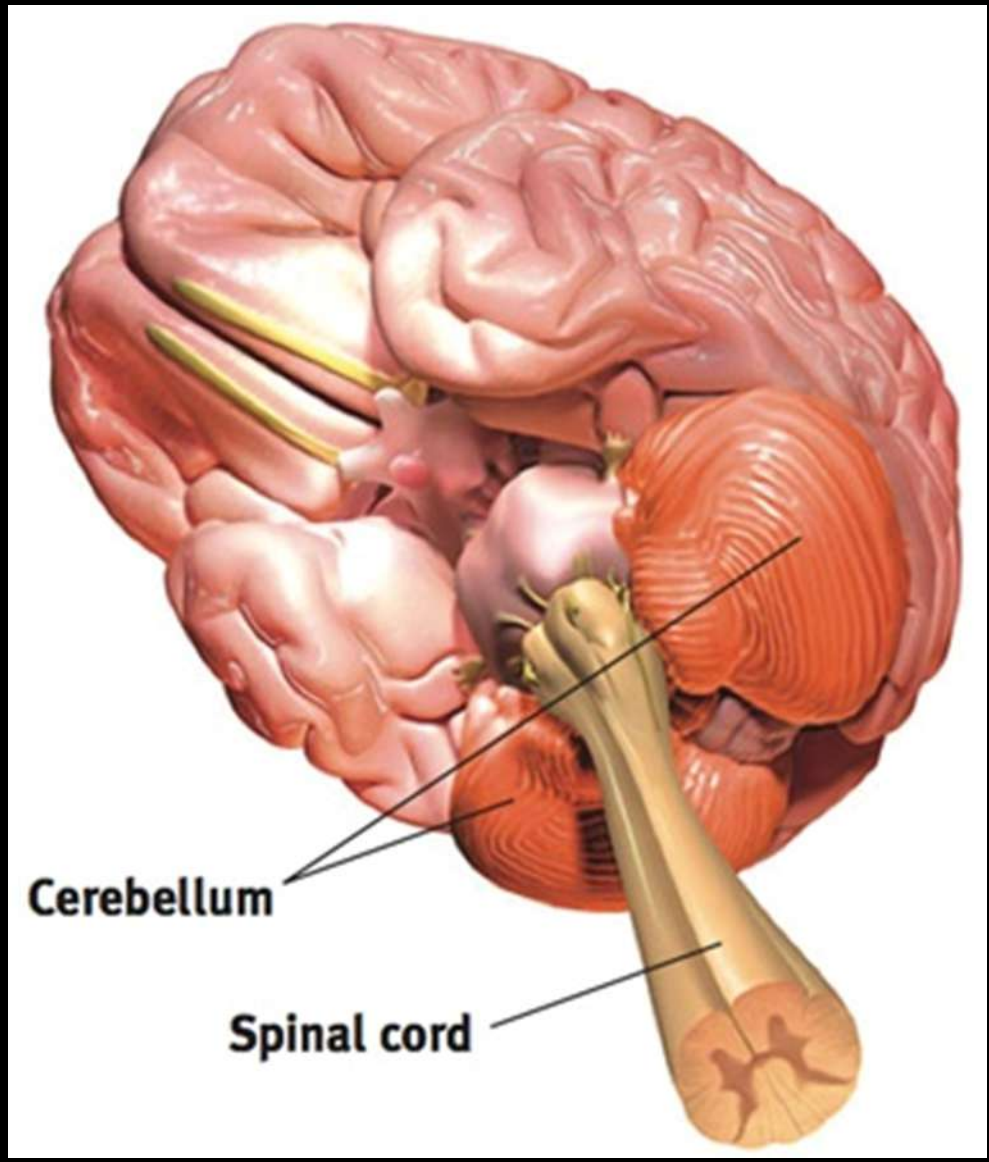
Older Brain Structures - Thalamus

- Thalamus
  - ALL SENSES EXCEPT SMELL
  - the senses switchboard and routes the info to the higher brain regions that deal with seeing, hearing, tasting, and touching
  - It's like the airport, all the planes come there and then it tells them where their new destination is
  - EX: see the foot→ send it to the Occipital Lobe



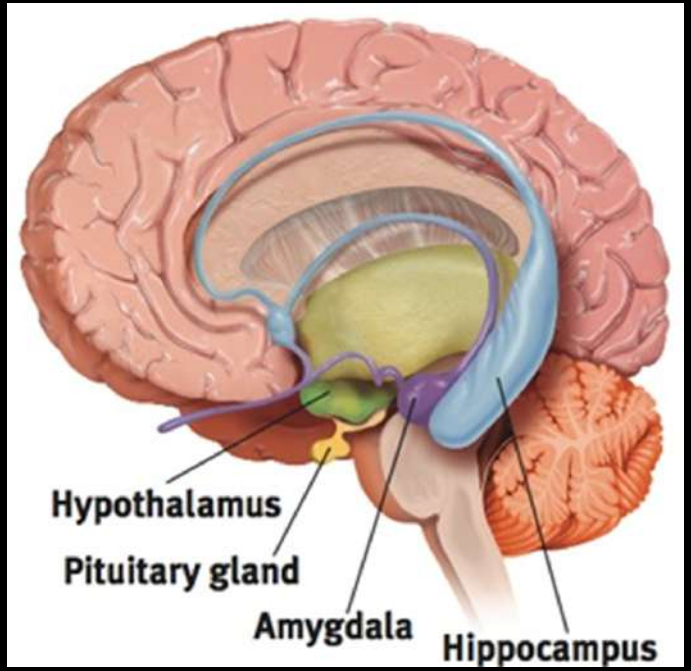
Older Brain Structures - Cerebellum

- Cerebellum
  - processes taking in sensory info and putting out movement and balance
  - The Little Brain
  - EX: if damaged may not be able to walk in a straight line



Older Brain Structures – Limbic System

- Limbic System
  - Made up of amygdala, hippocampus, & hypothalamus
  - Associated with emotions and drives
  - If you were to split your brain in half, the limbic system is in the middle



Limbic System - Amygdala

- Amygdala
  - Aggression & fear
  - Includes the perception of these emotion and the processing of emotional memories
  - EX: Tumor on this structure could make someone fight more

Limbic System - Hypothalamus

- Hypothalamus
  - Both monitors blood chemicals (the endocrine system) and takes orders from other parts
  - Influences pituitary gland
  - Reward centers
  - EX: tells pituitary to tell testicles to release testosterone

Important Facts

- Remember that the brain is a network, each piece is a link in an integrated system
- All of these older brain functions occur without any conscious effort, our process most information outside out awareness