

Lecture 14

Anatomy of the Brain

- **Ventricles (4)**
  - o Chambers in the brain
  - o Fluid filled
    - Contain CSF
  - o  $PV=nRT$ 
    - By changing the volume of fluid we change the pressure
      - Increase n (amount of fluid) = increase pressure
    - Most common cause for headaches; often times it is a result of being dehydrated
      - Less water = less n = lower pressure
      - Any change in pressure causes a headache
- **Corpus Callosum**
  - o Massive bundle of axons
    - Connects two hemispheres
  - o Communication between the left and right half of the brain
  - o Communicate with axons, they are myelinated so that is why it looks like a big white band
  - o If it gets cut people might not be able to make the connection that a round orange object is a basket ball
- **Diencephalon**
  - o Figure 6-38
  - o Di = 2 cephalon = brain
  - o **Thalamus**
    - one part of the diencephalon
    - Major relay station of motor control; crude sensation
      - Hearing, seeing, feeling
      - Non-specialized use of senses (hearing but not necessarily understand words)
  - o **Hypothalamus**
    - Homeostatic regulation; links nervous and endocrine systems
- **Forebrain**
  - o Cerebrum + diencephalon (aka cerebrum + thalamus + hypothalamus)
- **Cerebellum**
  - o Balance, muscle tone, coordination
  - o Brainstem: key to life
    - If you lose the brain stem then you lose basic function
    - Cardiac
    - Respiration
    - Digestion
      - Swallowing – so food doesn't go into lungs and block respiration

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- Vomiting – coordinates not swallowing so we don't get acid content into lungs

#### Anatomy of the Spinal Cord

- Figure 6-41
  - o Bone points toward the belly
  - o Outside of spinal cord is white, inside is gray
- Gray matter
  - o Interneurons, cell bodies and dendrites of efferent neurons, axons of afferent, glials
- White Matter
  - o Bidirectional
    - Dorsal side = afferent
    - Ventral side = efferent
    - DAVE.
    - Signals are sent up on one side and signal are sent down on the other side

#### Anatomy of the PNS

- **Spinal Nerves**: exit via vertebral column
- **Cranial Nerves**: exit via skull openings (**foramen**)
- Clustered cell bodies = **ganglia**
  - o NOT nuclei
    - Same idea, but they have different names because they are in different places
- Grouped axons = **nerves**
  - o Pathways or tracts