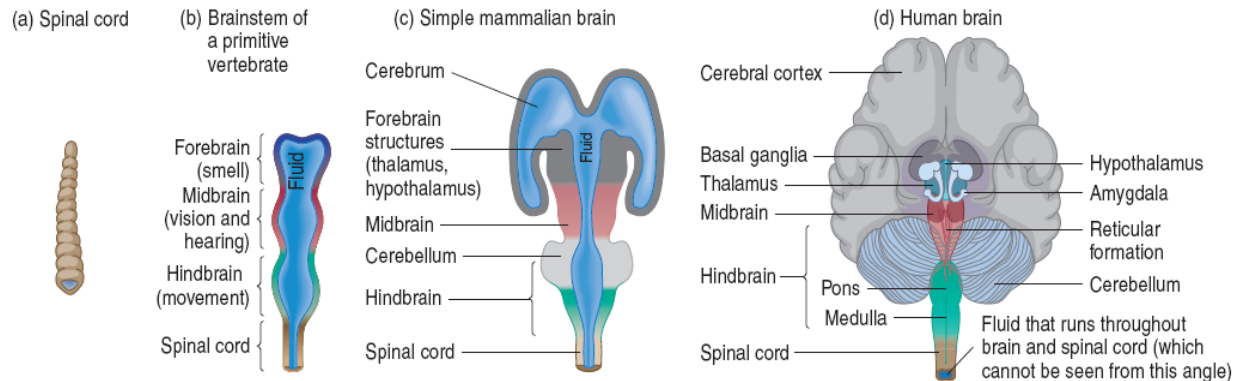
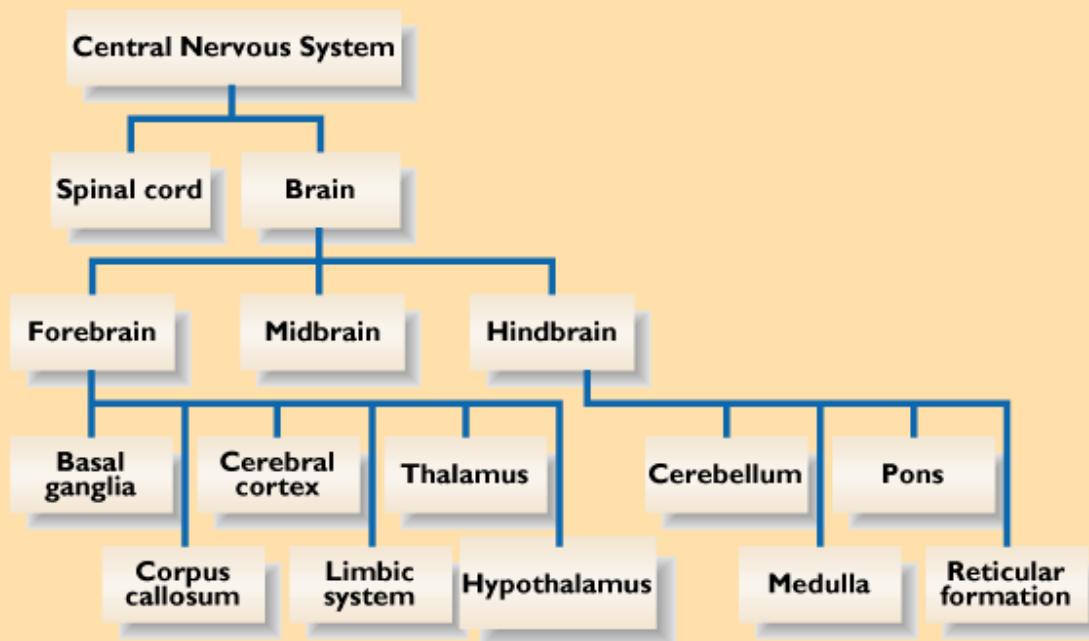


Evolution of brain:



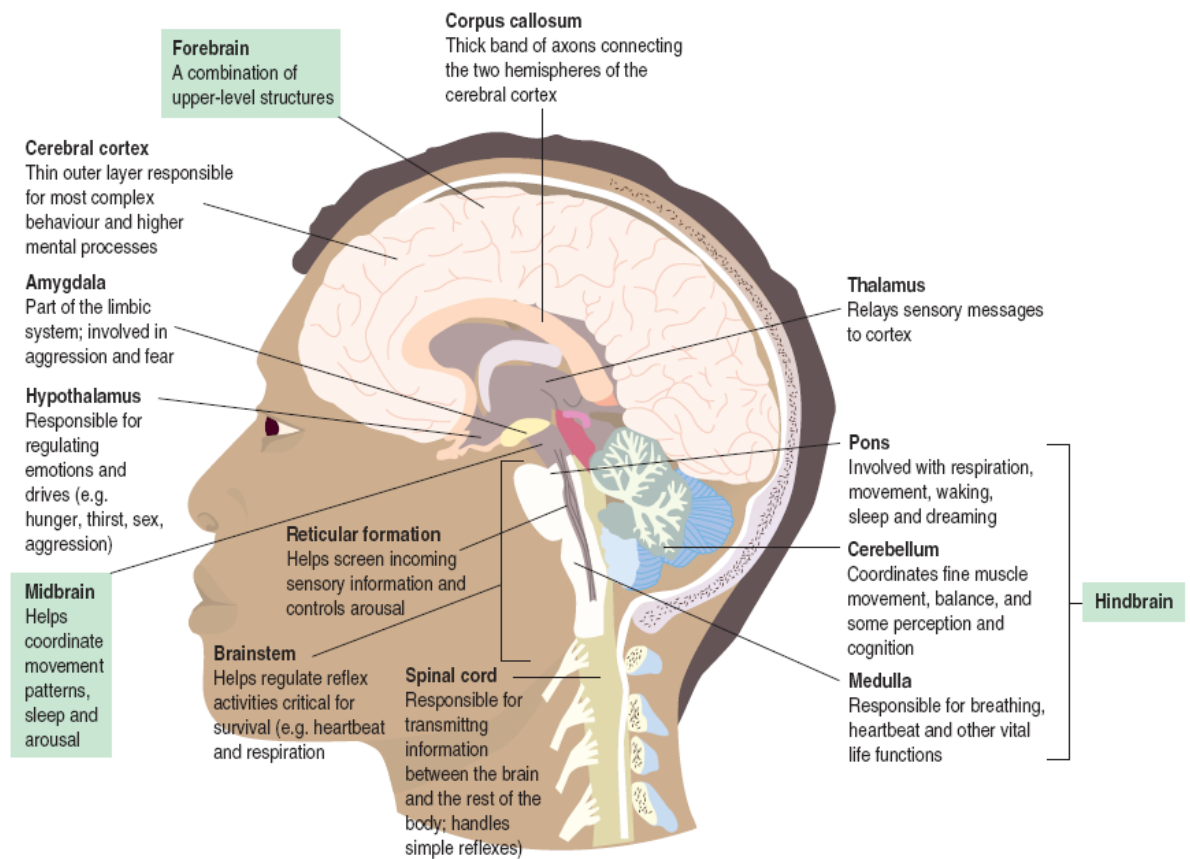
Major Subdivisions of the Human Nervous System (Part II)



1. Forebrain, midbrain, & hindbrain different brain regions that carry out different types of processing
2. Identifiable neural pathways projecting from one area to next

- Each part of brain projects to next in an orderly fashion creating organized regions that can be mapped

Hindbrain functions:

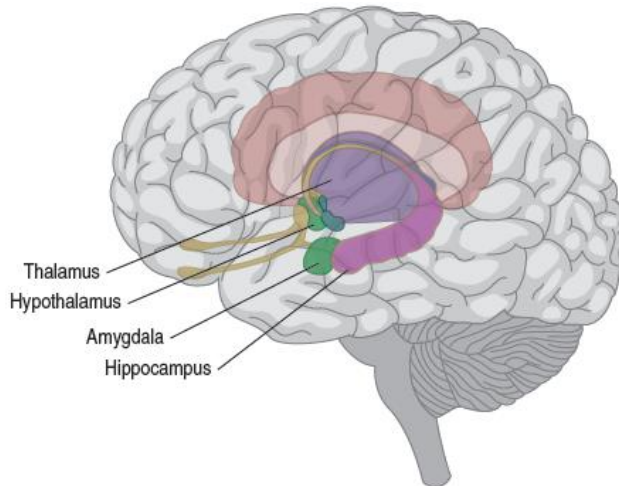


- ✱ Regulates arousal
- ✱ Relay station

Midbrain:

- ✱ *Tectum*: involved in orienting to visual and auditory stimuli
- ✱ *Tegmentum*: is involved in movement and arousal
- ✱ Play an important role in learning to produce behaviours that minimise unpleasant (aversive) consequences and maximise pleasant (rewarding) consequences

Subcortical (below cortex) areas of the brain



Forebrain:

The *Forebrain* is involved in complex 'higher order' sensations and behaviours

- ✱ *Hypothalamus*: Helps regulate eating, sleeping, sexual activity and emotional experiences
- ✱ *Thalamus*: Processes incoming sensory information and transmits it to higher brain areas
- ✱ *Basal Ganglia*: Involved in the control of movement and also plays a part in 'automatic' responses and judgements

-Limbic System

- ✱ *Septal* area: involved in pleasure, relief from pain, emotionally-significant learning
- ✱ *Amygdala*: involved in learning and remembering emotionally significant events, and recognition of fear
- ✱ *Hippocampus*: involved in the storage of new memories

Interconnected group of structures

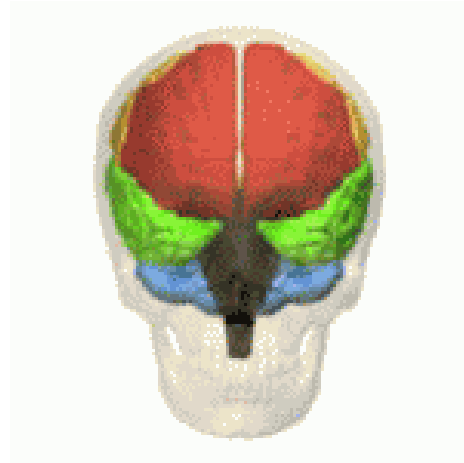
- Parts of cortex
- Thalamus
- Hypothalamus
- Hippocampus
- Amygdala
- Influences emotions, memory, & social behavior
- Emotionally charged memories

-Basal ganglia (what is it made up of important)

- ✱ Series of nuclei located deep within forebrain, left & right of thalamus
 - ✱ Controls movement & posture
 - ✱ Degeneration of basal ganglia associated with Parkinson's disease

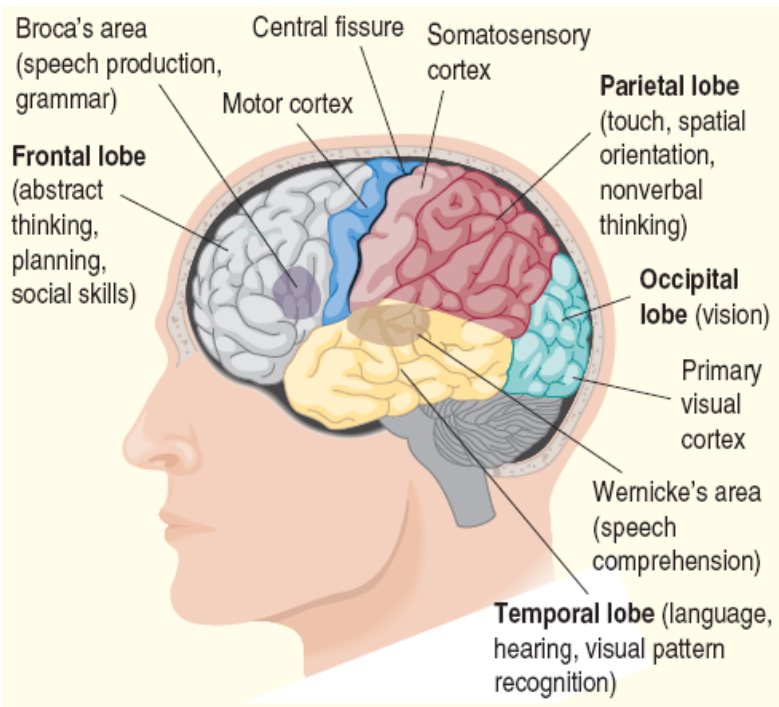
Cerebral cortex

- Frontal lobe (red)
- Temporal lobe (green)
- Parietal lobe (yellow)
- Occipital lobe (under yellow)
- Cerebellum (blue)



- Functions of cerebral cortex:
 - Provides for flexible control of patterns of movement
 - Permits subtle discrimination among complex sensory patterns
 - Makes possible symbolic thinking
- Cortex is divided into two sections:
 - Primary areas
 - Association areas

Lobes of the cerebral cortex



Frontal lobe damage and personality

- ✱ Frontal lobe function in personality is evident in the case of Phineas Gage
 - ✱ Gage suffered frontal lobe damage after an accident involving a dynamite tamping rod
 - ✱ Gage was a railroad supervisor prior to the damage; after the damage he became childish and irreverent, could not control his impulses, and could not effectively plan.

Cerebral cortex

- ✱ Each hemisphere controls opposite side of the body (contralateral)
- ✱ Corpus callosum is major connection between left & right hemispheres of cerebral cortex

Brain specialization

(In most people)

- ✱ Left hemisphere specialized for processing Speech & Language
- ✱ Right hemisphere appears specialized for spatial, musical, & drawing tasks

Cerebral lateralization

- ✱ Hemispheric specialization
 - ✱ Left hemisphere is dominant for language, logic and complex motor behaviour.
 - ✱ Right hemisphere is dominant for non-linguistic functions including forming visual maps of the environment.

