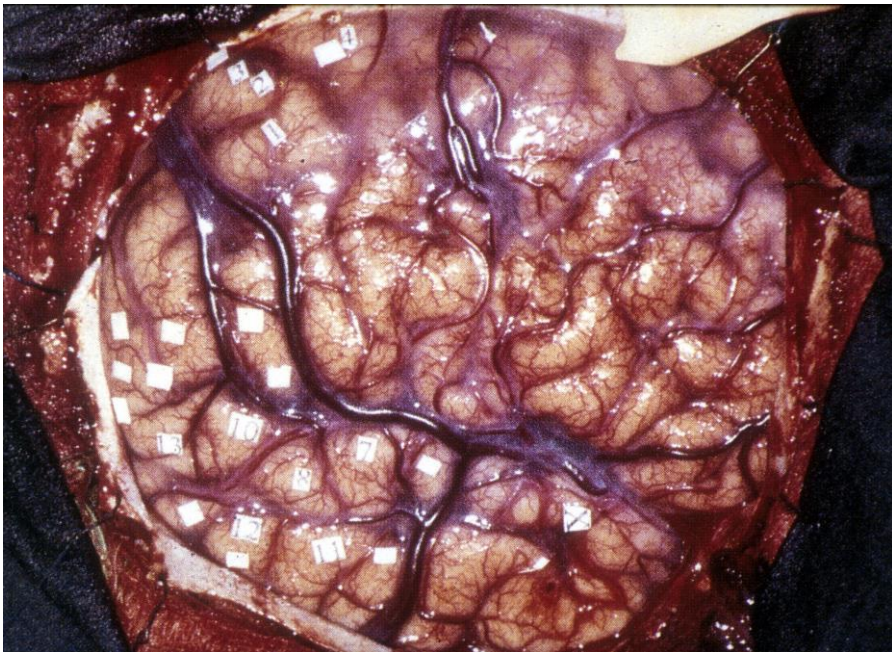


*Crown 85: Visual Perception:  
A Window to Brain and Behavior*



Lecture 2 Essential: Anatomy of the Brain



CROWN 85: Visual Perception:  
A Window to Brain and Behavior  
Lecture 2 summary

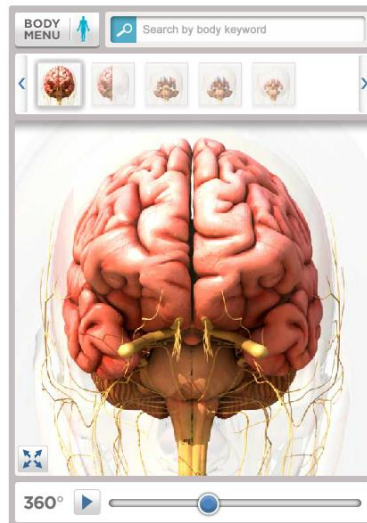
Crown 85 Winter 2016

Visual Perception: A Window to Brain and Behavior

Lecture 2- Neuroanatomy

- Reading:** [Brain Basics \(very basic !!\)](#)  
[Cold Spring Harbor \(≈ appropriate !!\)](#)  
[Healthline \(appropriate\)](#)  
[University of Texas Medical School \(very advanced !!\)](#)
- Looking:** [Basic Parts of the Brain - Part 1 - 3D Anatomy Tutorial \(anatomyzone\)](#)
- Enjoy:** [Friendly Guide to Human Brain Atlases \(history\)](#)

3



<http://www.healthline.com/human-body-maps/brain>

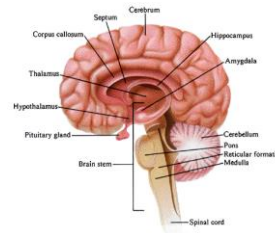
4

CROWN 85: Visual Perception:  
A Window to Brain and Behavior  
Lecture 2 summary

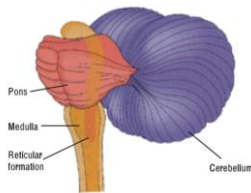
**brainstem**

a. Brainstem

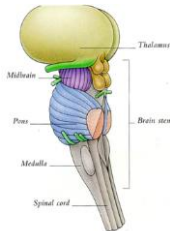
- i. reticular formation
- ii. medulla oblongata
- iii. pons
- iv. midbrain (substantia nigra, **including superior colliculi**)



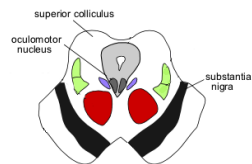
<http://www.csus.edu/indiv/w/wickelgren/psyc001/brain3.gif>



[http://scpsy101.com/home/chapter-3/section-4/brain\\_stem/](http://scpsy101.com/home/chapter-3/section-4/brain_stem/)



<https://psychlopedia.wikispaces.com/central+nervous+system>



"Midbrainsuperiorcolliculus". Licensed under CC BY-SA 3.0 via Commons - <https://commons.wikimedia.org/wiki/File:Midbrainsuperiorcolliculus.png#/media/File:Midbrainsuperiorcolliculus.png>

**brainstem**

a. Brainstem

- i. reticular formation
- ii. medulla oblongata
- iii. pons
- iv. midbrain  
(substantia nigra,

**reticular activating system: controls general level of wakefulness including sleep vs awake transition; injury may cause coma**

**controls autonomic functions: respiration, heart rate, blood pressure, digestion, sneezing, swallowing [and 'reverse' swallowing]**

**bridge or relay center; implicated in control of breathing sleep cycles**

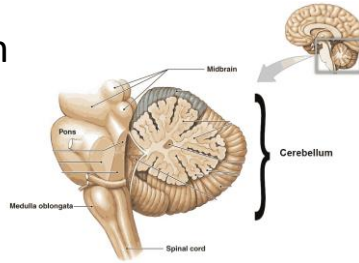
**source of dopaminergic neurons that then play important roles in motor planning [viz Parkinson's disease], emotion, reward seeking [pleasure], addiction**

**including  
superior colliculi)**

**part of old brain or 'tectum' in invertebrates; in humans contains control for eye movements; Edinger–Westphal nucleus [near oculomotor nucleus] controls pupil constriction and focusing of lens (accommodation) of the eye**

## cerebellum

### b. Cerebellum



<http://www.highlands.edu/academics/divisions/scipec/biology/faculty/harnden/2121/images/arbortvitee.jpg>



<http://ak4.picdn.net/shutterstock/videos/5366009/preview/stock-footage-medical-animation-showing-the-cerebellum.mp4>

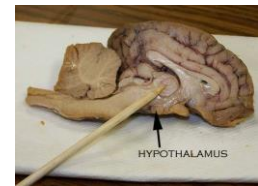
The cerebellum coordinates voluntary movements such as posture, balance, coordination, and speech, resulting in smooth and balanced muscular activity. It is also important for learning motor behaviors

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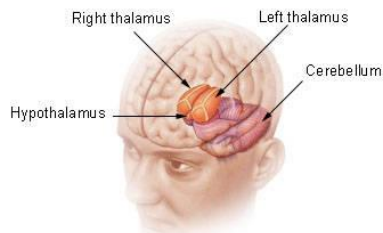
## Diencephalon

### c. Diencephalon

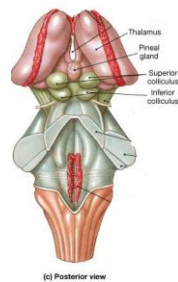
- i. thalamus (including lateral geniculate nuclei)
- ii. hypothalamus
- iii. pineal gland



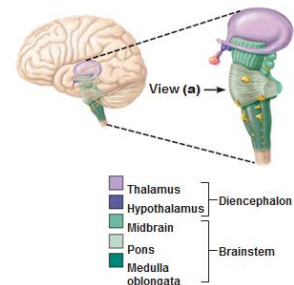
#### Diencephalon



<http://medicalterms.info/anatomy/Diencephalon/>



[http://droualb.faculty.mjc.edu/Lecture%20Notes/Unit%205/midbrain\\_posterior.jpg](http://droualb.faculty.mjc.edu/Lecture%20Notes/Unit%205/midbrain_posterior.jpg)



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## Diencephalon

### c. Diencephalon

#### i. thalamus (**including lateral geniculate nuclei**)

relay station for fibers coming into brain from sensory organs such as those for vision, audition, touch (but not olfaction). **lateral geniculate nucleus (LGN) gets input from the eyes via the optic nerve and sends information to visual cortex**

#### ii. hypothalamus

controls homeostasis, which is to maintain the body's status quo system-wide; links the nervous system to the endocrine system producing hormones that govern physiologic functions such as temperature regulation, thirst, hunger, sleep, mood, sex drive.

#### iii. pineal gland



produces melatonin, which helps maintain circadian rhythm and regulate reproductive hormones; the pineal gland was once known as the "third eye."; **newly discovered retinal "melanopsin" containing ganglion cells project to pineal gland**

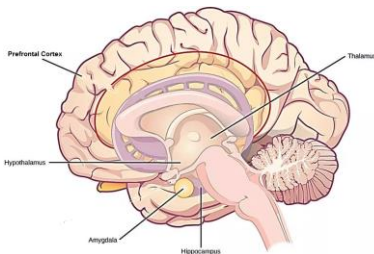
9

## hippo

### d. "very generally" the basal ganglia and the limbic stem

#### i. hippocampus

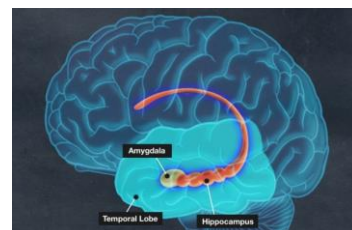
#### ii. amygdala



<http://www.strengthofawarrior.org/ptsd-and-the-brain>



<http://www.wisegeek.com/what-is-the-relationship-between-the-amygdala-and-hippocampus.htm#>



<http://worthit2bme.com/post-traumatic-stress-the-brain/>

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## *hippocampus and amygdala function*

---

d. “very generally” the basal ganglia and the limbic stem

i. hippocampus

**long term memory and navigation**

ii. amygdala

**fear and preservation responses**

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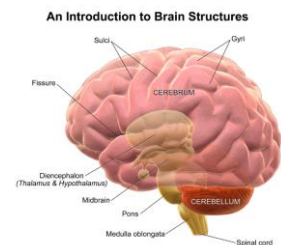
## *cerebral hemispheres*

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a. Cerebral Hemispheres

- ✓ i. cerebral cortex = gray matter
- ✓ ii. connections among cortical regions = white matter
- ✓ iii. gyri and sulci
- iv. frontal lobe
- v. parietal lobe
- vi. temporal lobe
- vii. occipital lobe

**gyri (gyrus)=ridges, hills,  
sulci (sulcus)= furrows, valleys**



Blausen.com staff. "Blausen gallery 2014". Wikiversity Journal of Medicine. DOI:10.15347/wjm/2014.010. ISSN 20018762. [https://en.wikipedia.org/wiki/Sulcus\\_\(neuroanatomy\)#/media/File:Blausen\\_0115\\_BrainStructures.png](https://en.wikipedia.org/wiki/Sulcus_(neuroanatomy)#/media/File:Blausen_0115_BrainStructures.png)

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## *lobes of the cerebrum*

### a. Cerebral Hemispheres

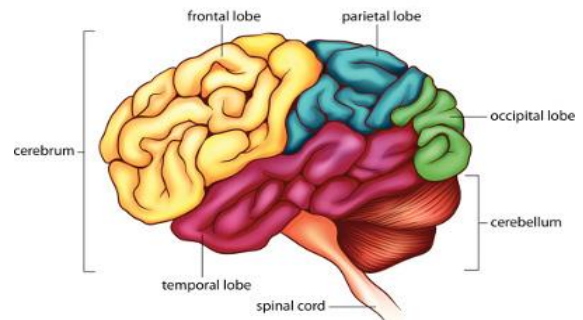
- i. cerebral cortex = gray matter
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#### iv. frontal lobe

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#### vii. occipital lobe

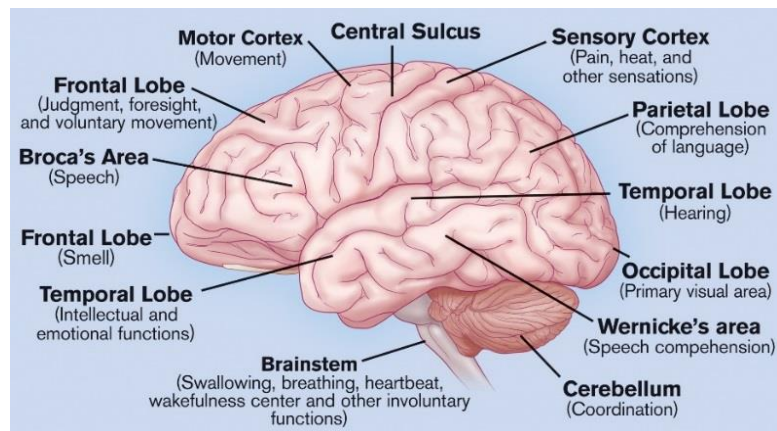


<http://www.buzzle.com/articles/cerebrum-function.html>

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## *generalized functional areas of cerebral cortex*

### e. Functional areas



Functional areas (<http://www.alzheimerstreatment.space/tag/parts-of-the-brain-and-its-function>)

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**FINIS**