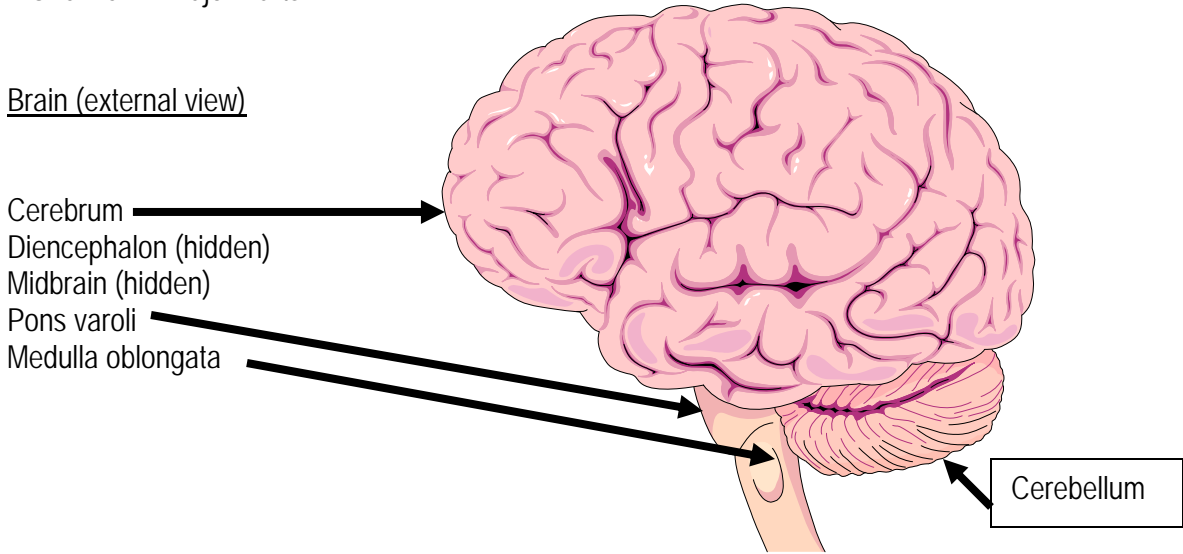


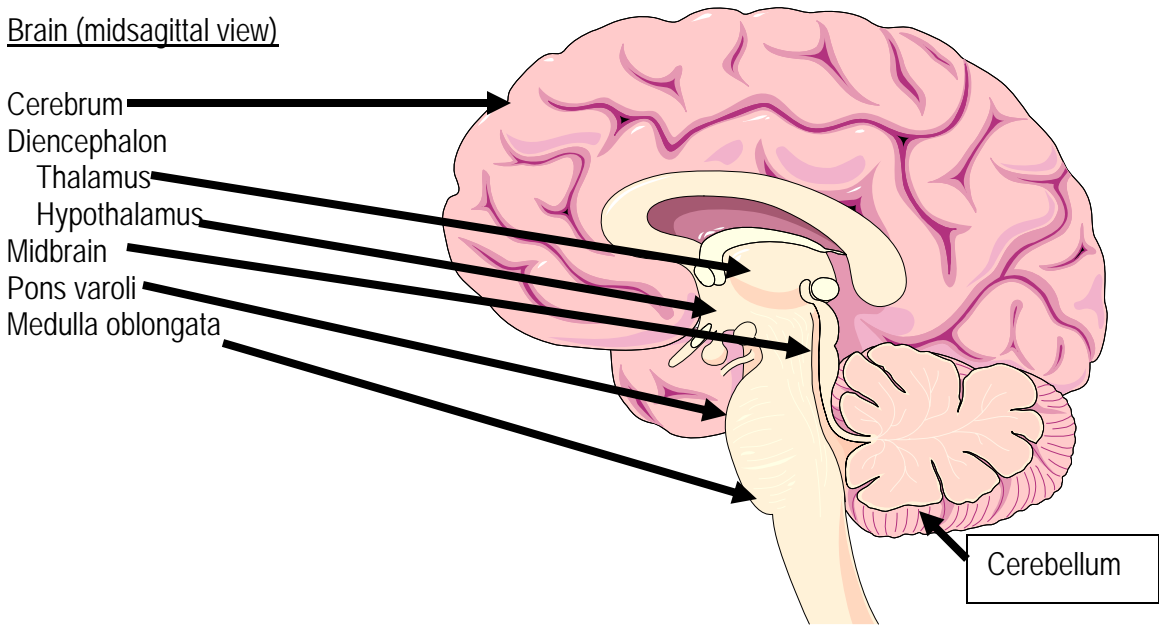
Reading Assignment: Read Chapter 12 of your text book. You may also read Chapter 7 of Dr. Hill's notes (**recommended reading online, not printing as it is long**). You may search for specific terms or topics using the Adobe Acrobat Reader search tool (binoculars).

I. Overview – Major Parts

Brain (external view)

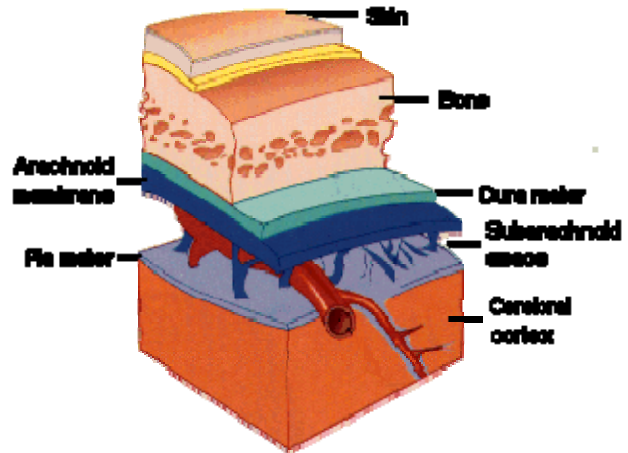


Brain (midsagittal view)



II. Anatomy of the Brain
A. Protection –

1) Meninges and Bone



2) Ventricles of the Brain –

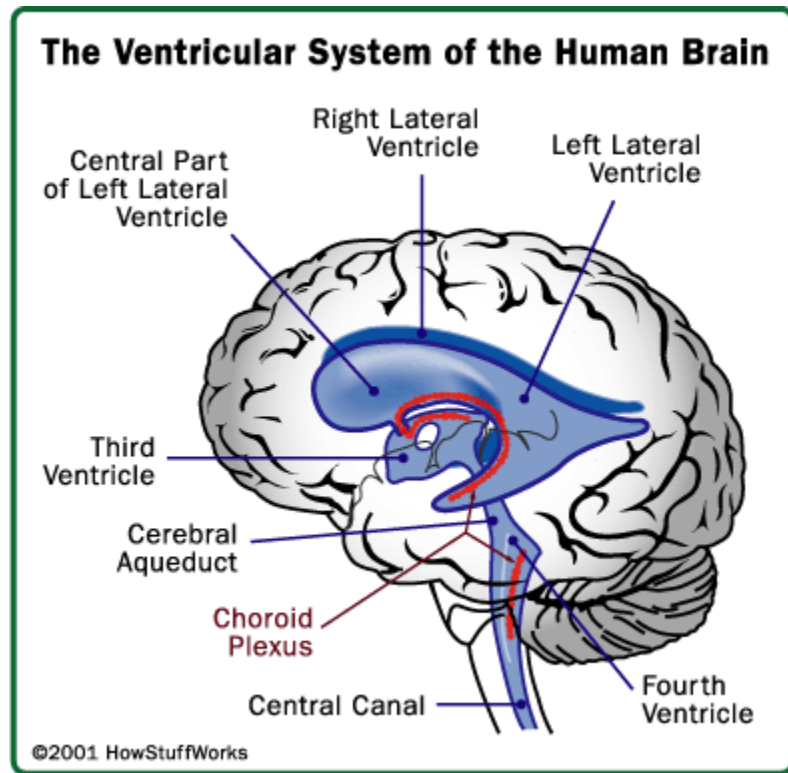
Lateral Ventricles (I & II)

Interventricular Foramen of
Monroe

Ventricle III

Cerebral Aqueduct of
Sylvius

Ventricle IV

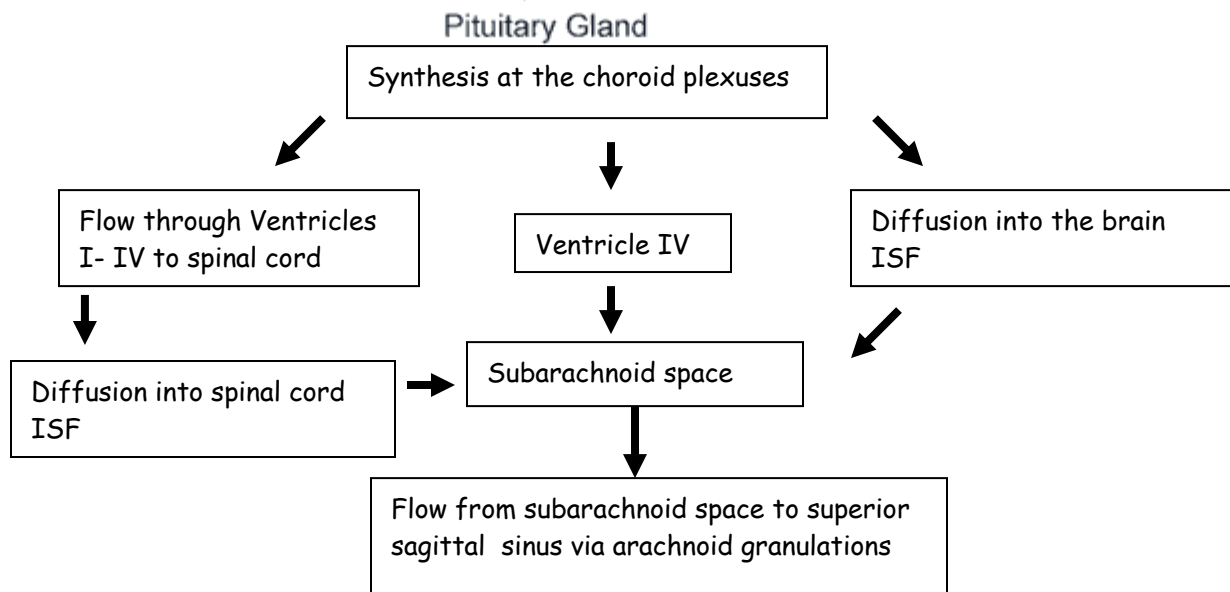
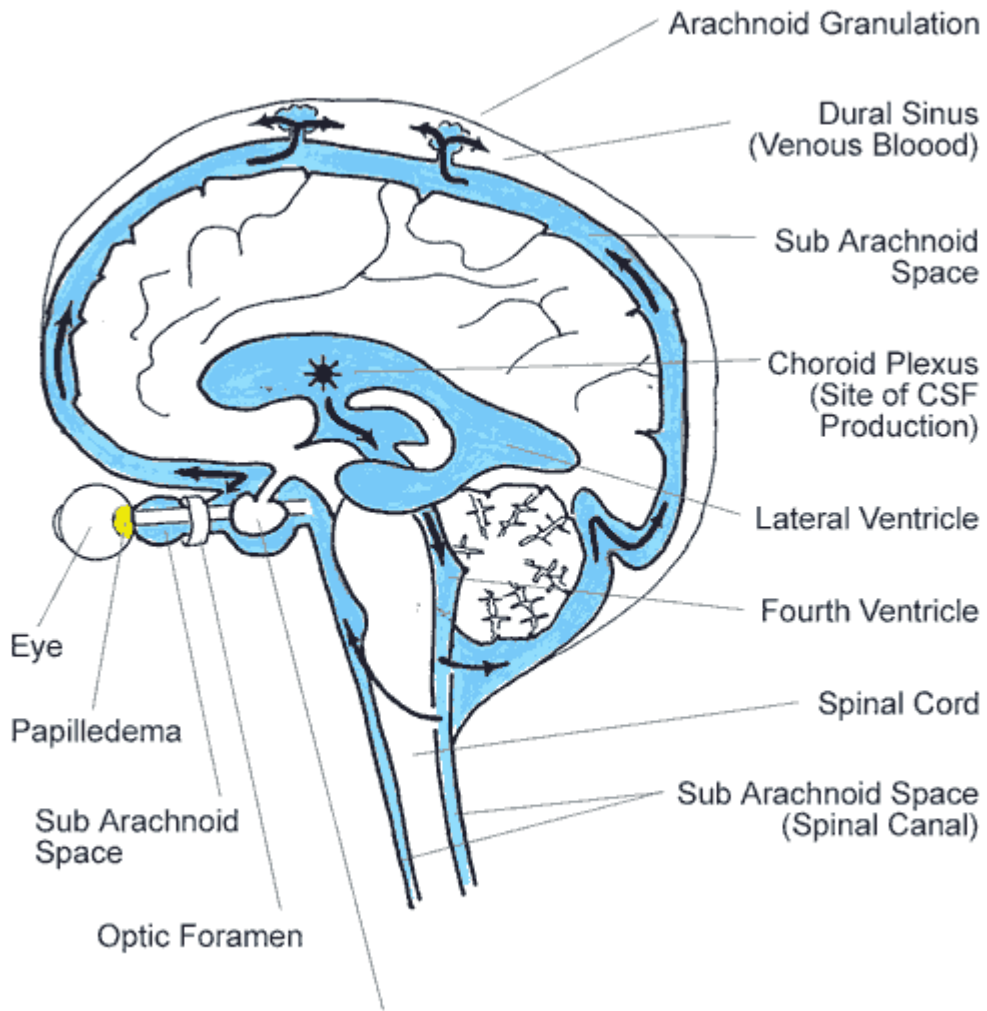


3) Cerebrospinal fluid (CSF) –

Composition –

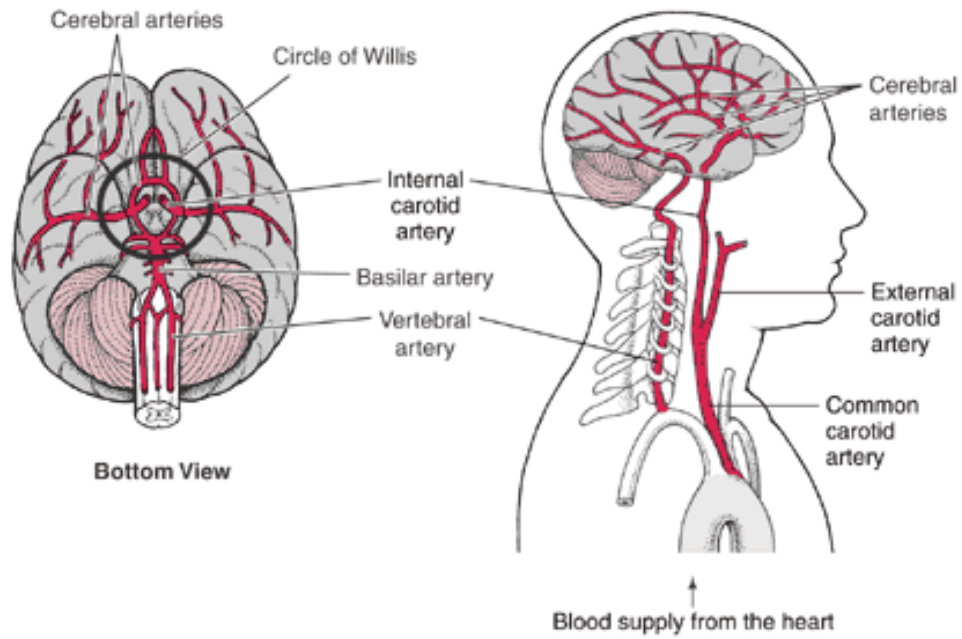
Functions –

4) Circulation of Cerebrospinal fluid (CSF) –

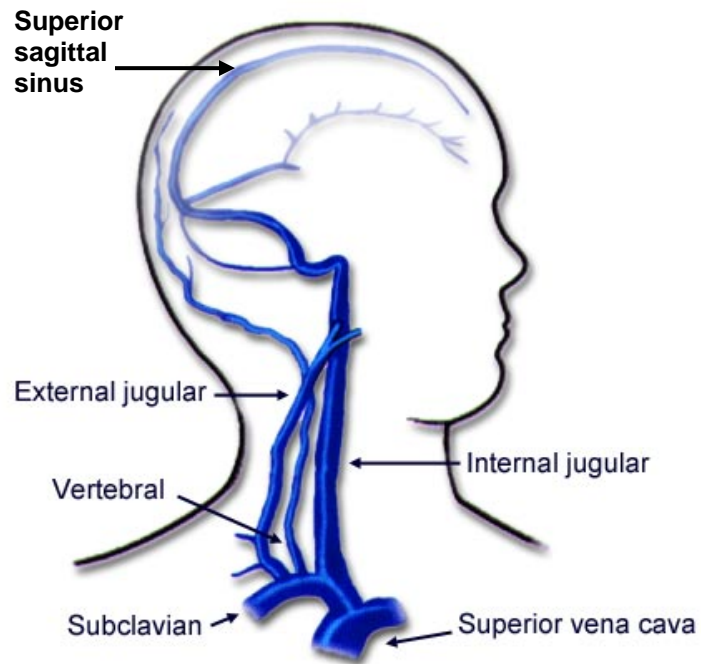


B. Blood Circulation in the Brain –

1) Arteries:



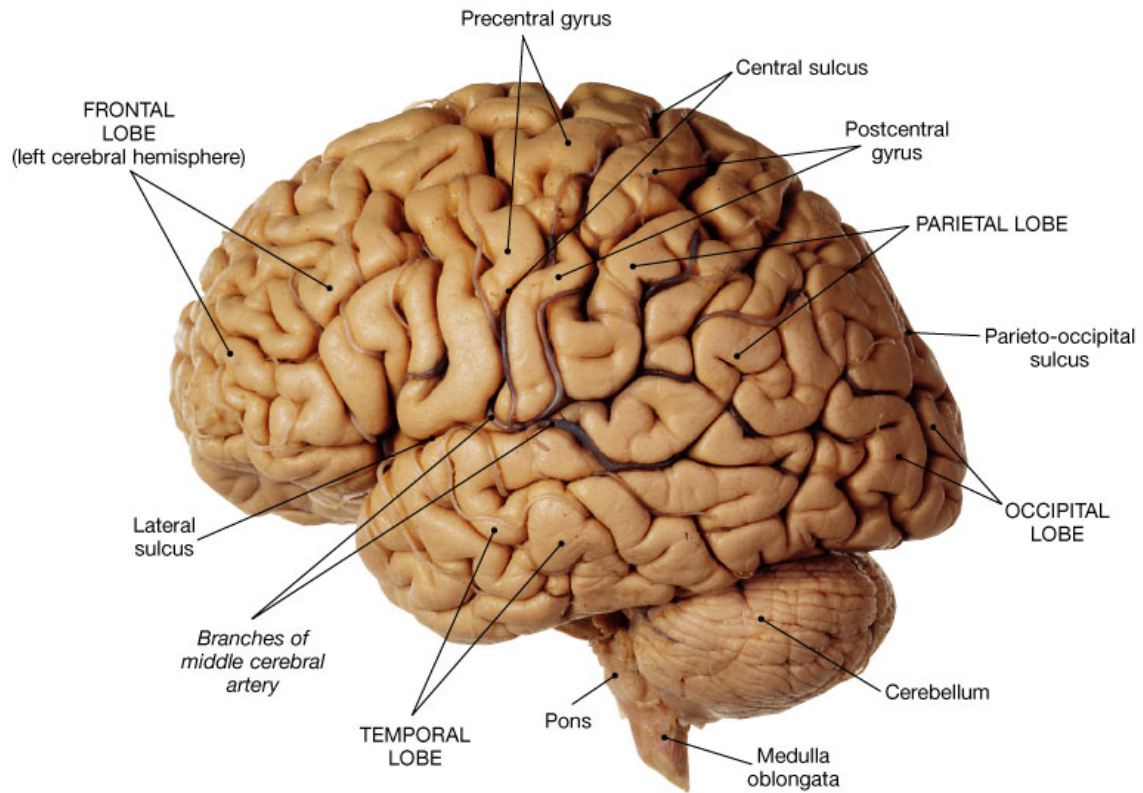
2) Veins –



C. Embryonic development of the brain –

Primary Brain Vesicles (3 weeks)		Secondary Brain Vesicles (6 weeks)		Brain Regions at Birth
	Proencephalon		Telencephalon	Cerebrum
			Diencephalon	Diencephalon
	Mesencephalon		Mesencephalon	Mesencephalon
	Rhombencephalon		Metencephalon	Cerebellum and Pons
			Myelencephalon	Medulla oblongata

D. General Features:



(d) Lateral view

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Gyrus(i) –

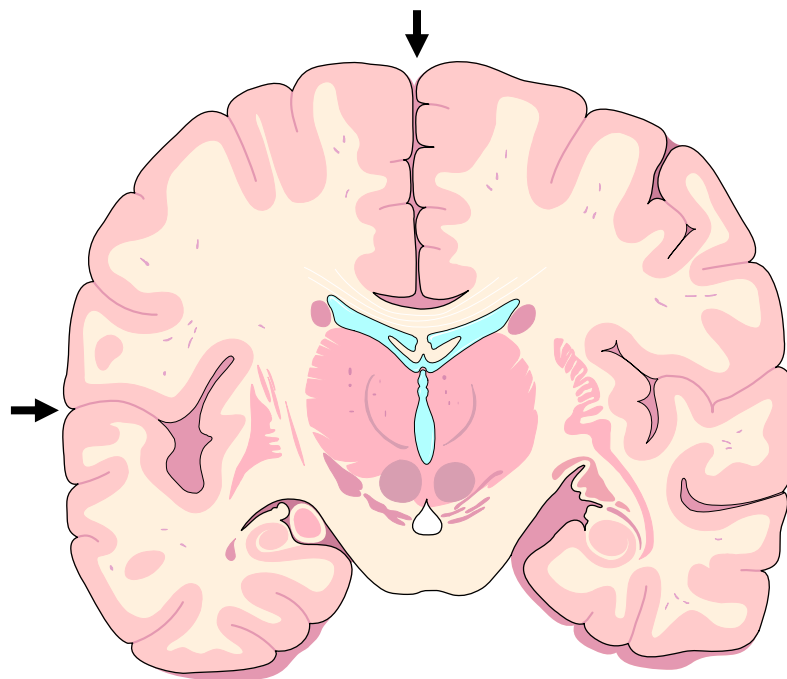
Sulcus(i) –

Fissures –

Surface gray matter –

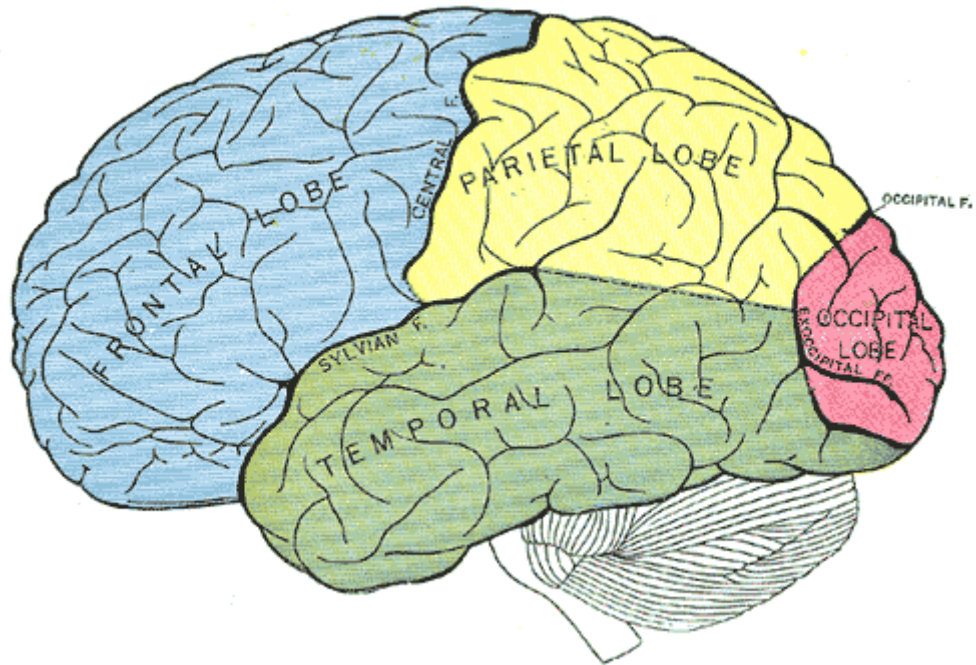
Deep gray matter –

White matter –



E. Lobes of the Cerebrum

1) Four Externally Visible Lobes of each hemisphere:



- Frontal
- Parietal
- Occipital
- Temporal
- Insula (not visible)

Important landmarks of the brain:

Precentral gyrus -

Central Sulcus -

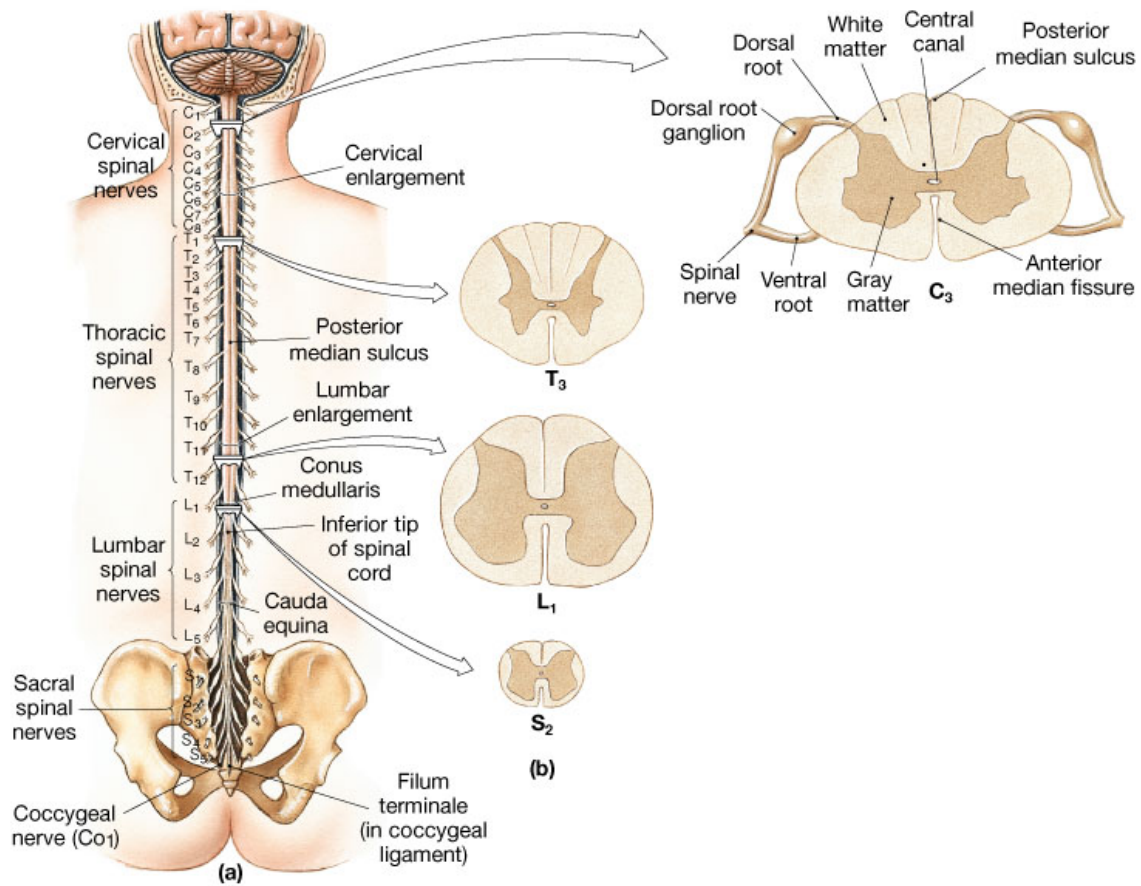
Postcentral gyrus -

E. Cranial Nerves -12 pairs of nerves that serve head and neck with one exception, the vagus nerve (C.N. X); some sensory, motor, and mixed nerves.

No.	Name	Category	Function(s)
I	Olfactory N.	Sensory	Sense of smell
II	Optic N.	Sensory	Vision
III	Oculomotor N.	Motor	Controls four of six eye muscles and pupil diameter
		Sensory	Proprioception
IV	Trochlear N.	Motor	Controls one eye muscle
		Sensory	Proprioception
V	Trigeminal N.	Sensory	Sensations of forehead, nose, teeth, lips, nasopharynx, and auditory tube
		Motor	Muscles of mastication, soft palate, digastric, mylohyoid, and tensor tympani
VI	Abducens N.	Motor	Controls one eye muscle
		Sensory	Proprioception
VII	Facial N.	Motor	Primary motor nerve to the facial, scalp, and neck muscles
		Sensory	Proprioception, taste from anterior 2/3 of tongue
VIII	Vestibulocochlear N.	Sensory	Auditory and equilibrium sensation
IX	Glossopharyngeal N.	Sensory	Taste from the posterior 1/3 of the tongue and pharynx, monitors pressure and chemoreceptors in the carotid artery
		Motor	Controls muscles of the pharyngeal arch III (stylopharyngeus, stylohyoideus)
X	Vagus N.	Sensory	Sensation from thorax (chest) and abdomen, receptors in carotid artery; proprioception
		Motor	Voluntary fibers to pharyngeal and laryngeal muscles from arch IV; parasympathetic fibers to respiratory passages, heart, lungs, and digestive system
XI	Accessory N.	Motor	Muscles of swallowing (pharynx, larynx, and soft palate); sternocleidomastoid, trapezius
XII	Hypoglossal N.	Sensory	Proprioception from tongue muscles
		Motor	Control of tongue muscles

How do you remember these?

III. Anatomy of the Spinal Cord



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Cervical enlargements –

Conus medullaris –

Cauda equina –

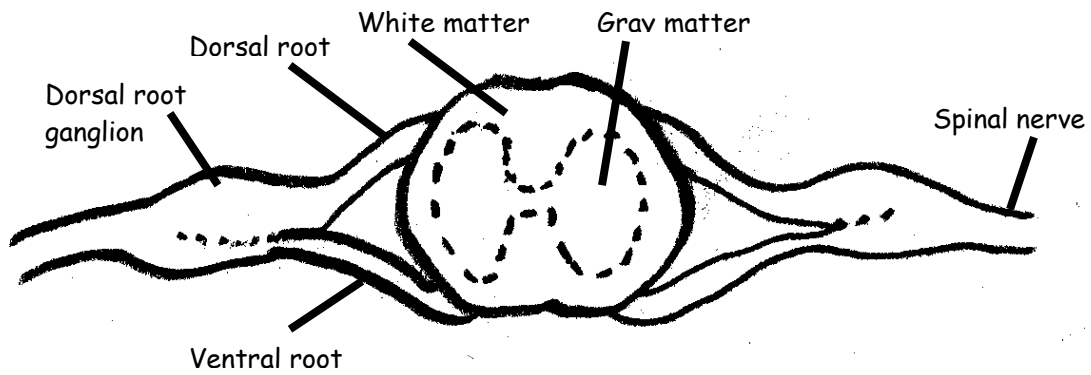
Filum terminale –

Central canal –

Ventral (anterior) fissure –

Dorsal (posterior) sulcus –

B. Spinal Nerves – 31 pairs, all mixed (sensory + motor).



1) Spinal Cord Anatomy

a) meninges –

dura mater:

arachnoid mater

pia mater:

b) gray matter –

c) white matter –

IV. Functions of the CNS

A. Brodmann's areas:

Projection areas – areas that receive sensory inputs

Association areas – areas that interpret sensory inputs, store memories, etc.

Prefrontal area = 10-11; risk assessment, conscience, short-term memory, general motor association,

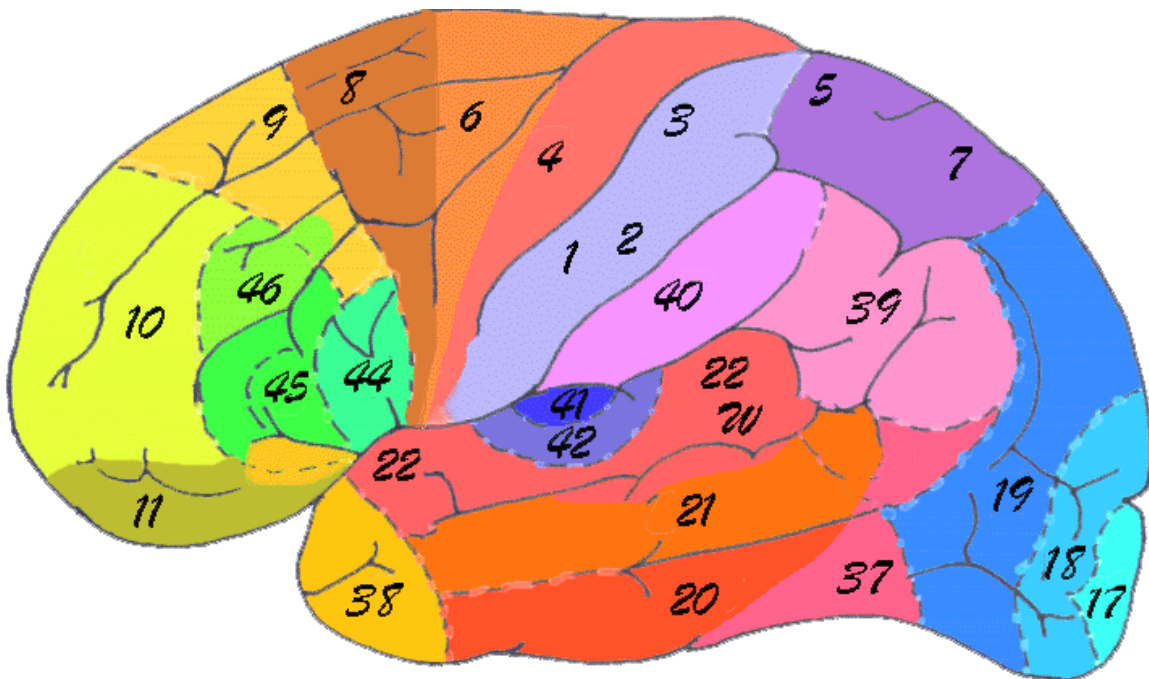
Broca's area = 44-46; motor association area specific to speech

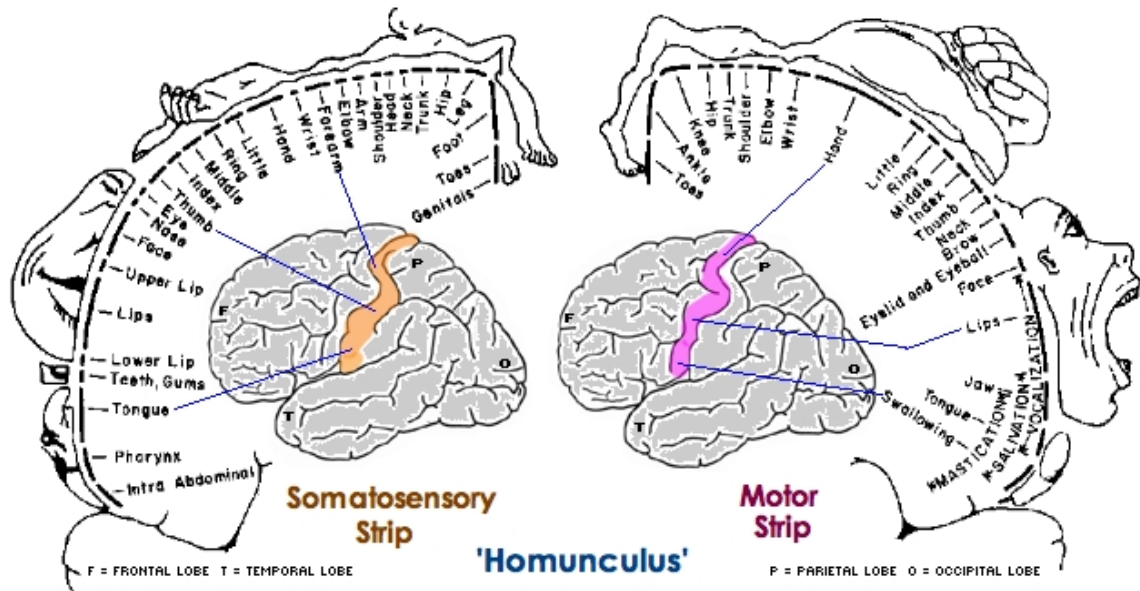
Wernicke's area = 40; word recognition and sound interpretation

Visual cortex 17=visual projection cortex; 18-19= visual association cortex

Heschle's area = 41; aural projection cortex

Primary motor cortex =4; area with motor neurons for each voluntary muscle of body.



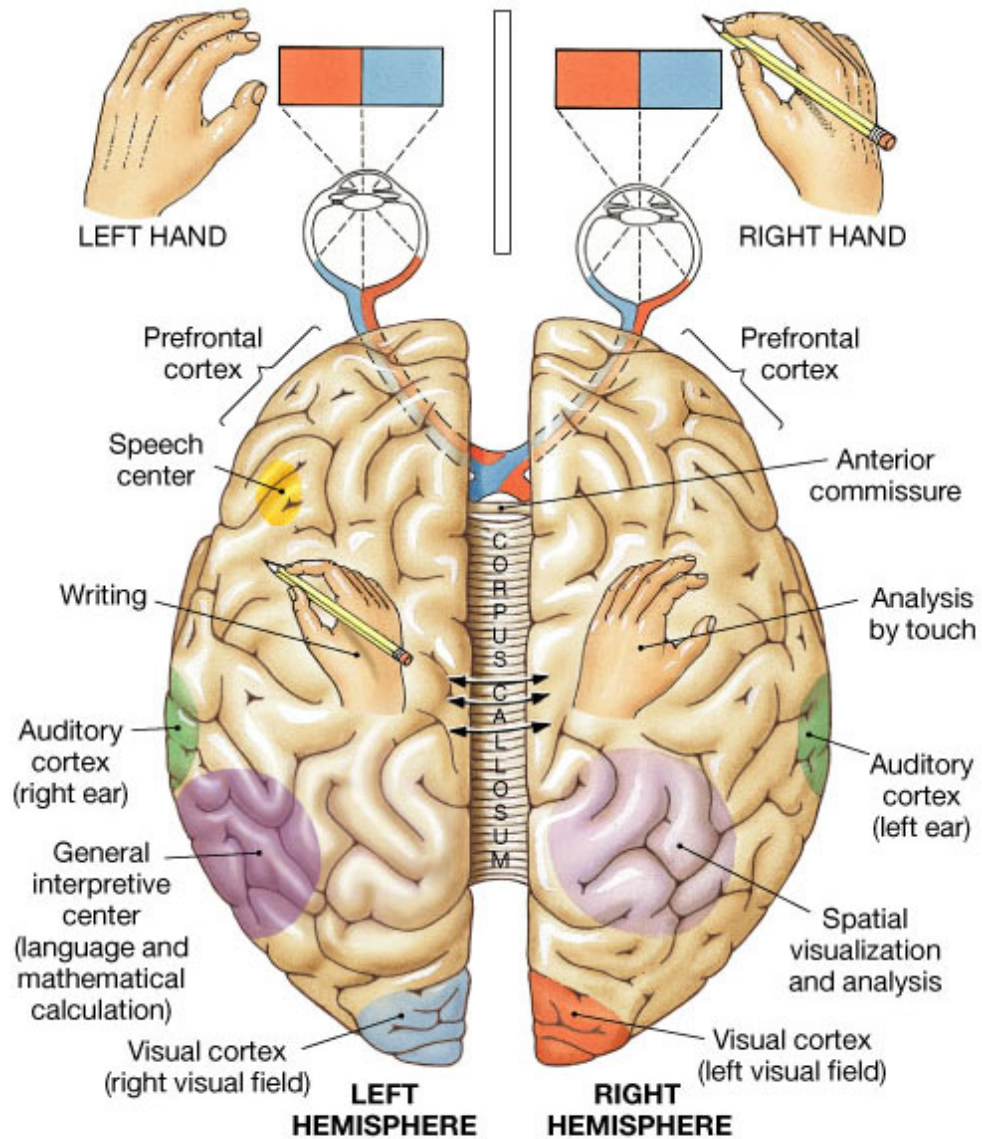


B. SPEECH PRODUCTION

1) Speaking a heard word:

2) Speaking a written word

C. Hemispheric dominance –

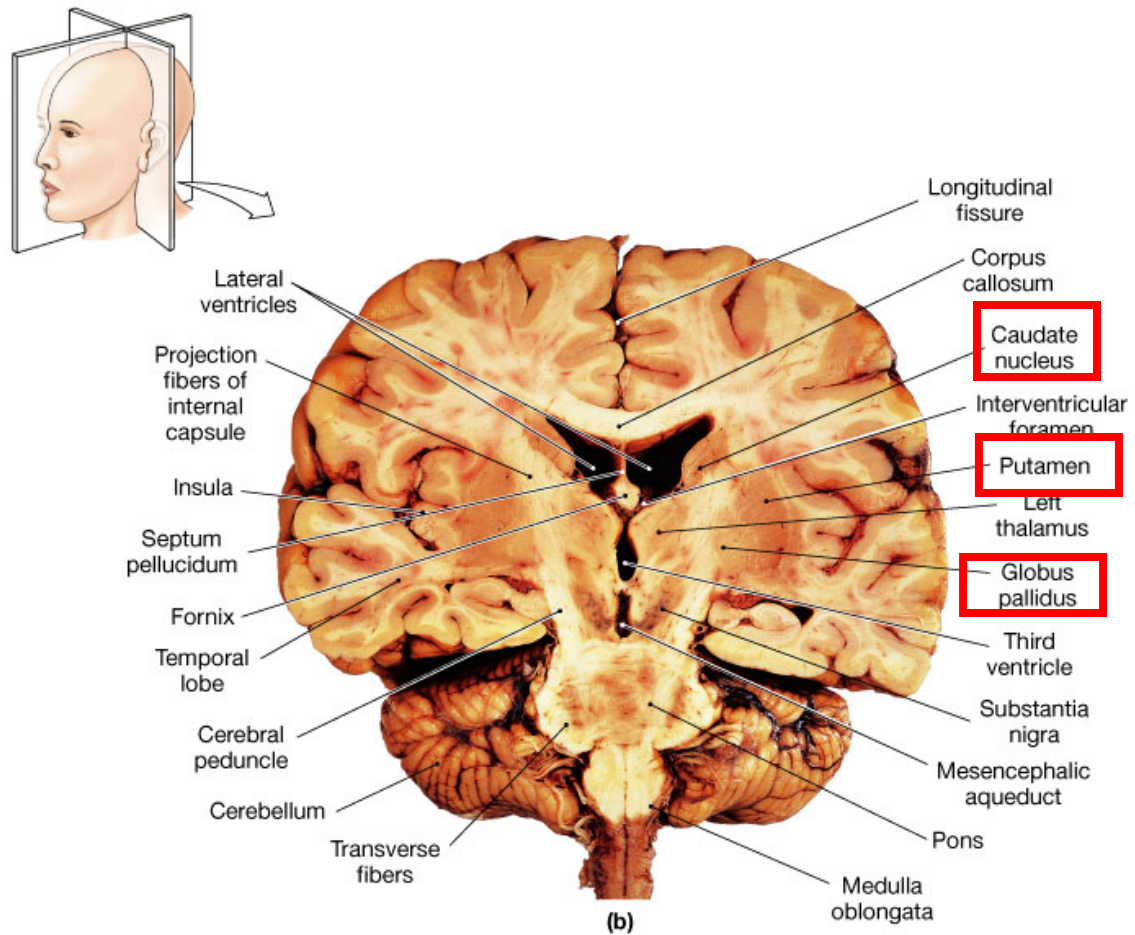


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LEFT HEMISPHERE DOMINANCE

RIGHT HEMISPHERE DOMINANCE

D. Cerebral Nuclei (basal ganglia) –



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Cerebral nuclei =

Caudate nucleus

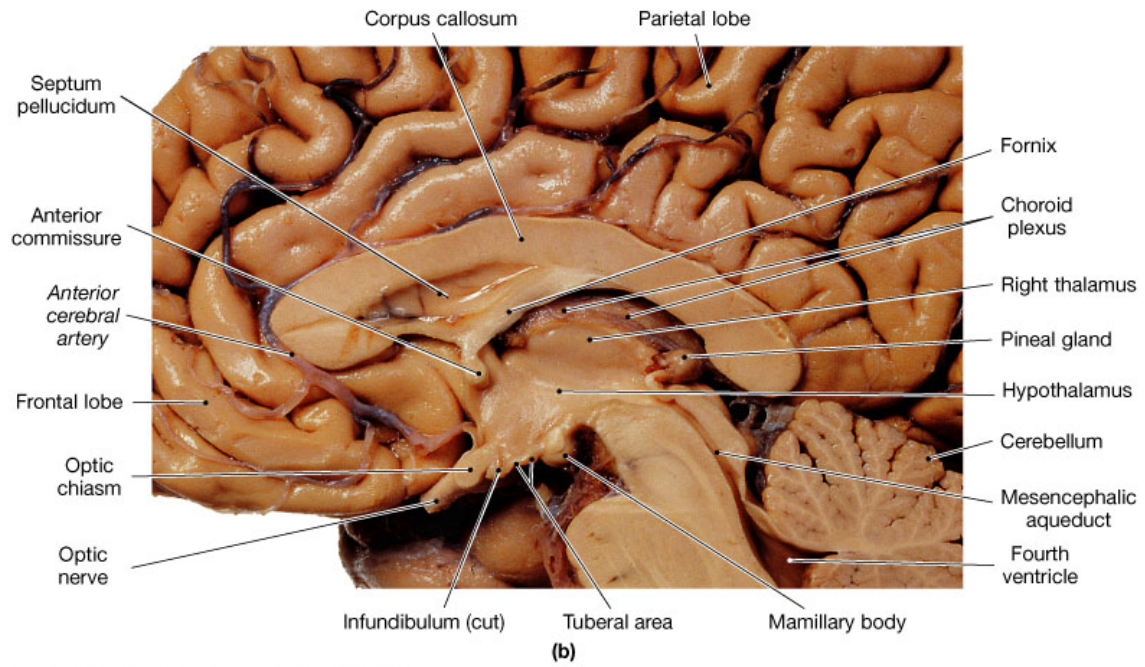
Lentiform nucleus

Putamen

Globus pallidus

Parkinson's Disease:

E. Diencephalon

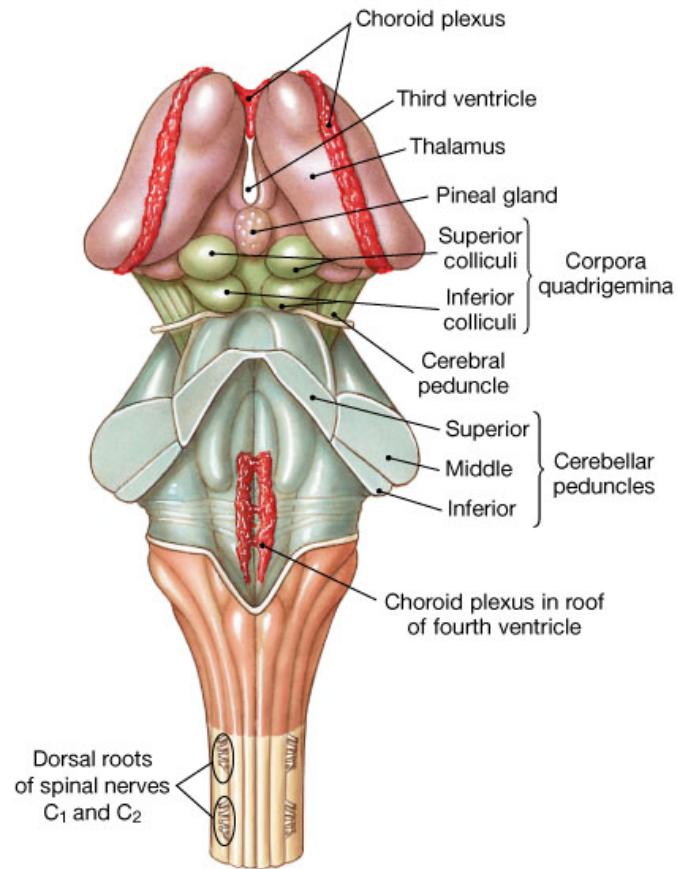


1) Thalamus –

2) Hypothalamus –

3) Pineal gland (epithalamus) –

F. Midbrain –



(c) Posterior view

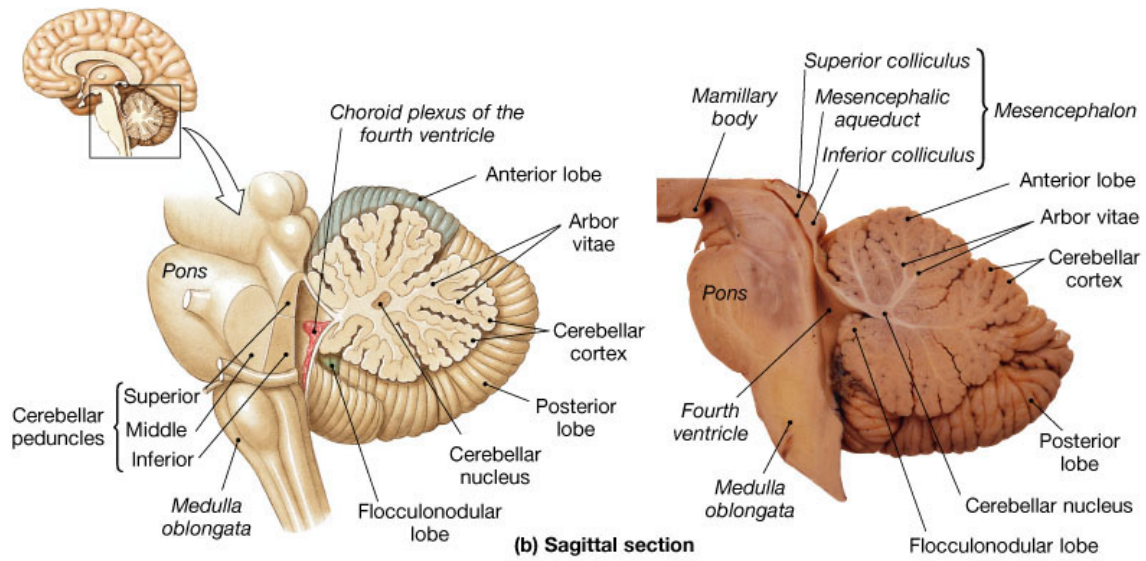
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Corpora quadrigemina -

Superior colliculi

Inferior colliculi

G. Hindbrain –



1) Cerebellum –

2) Medulla oblongata –

3) Pons –

K. Reticular Formation –

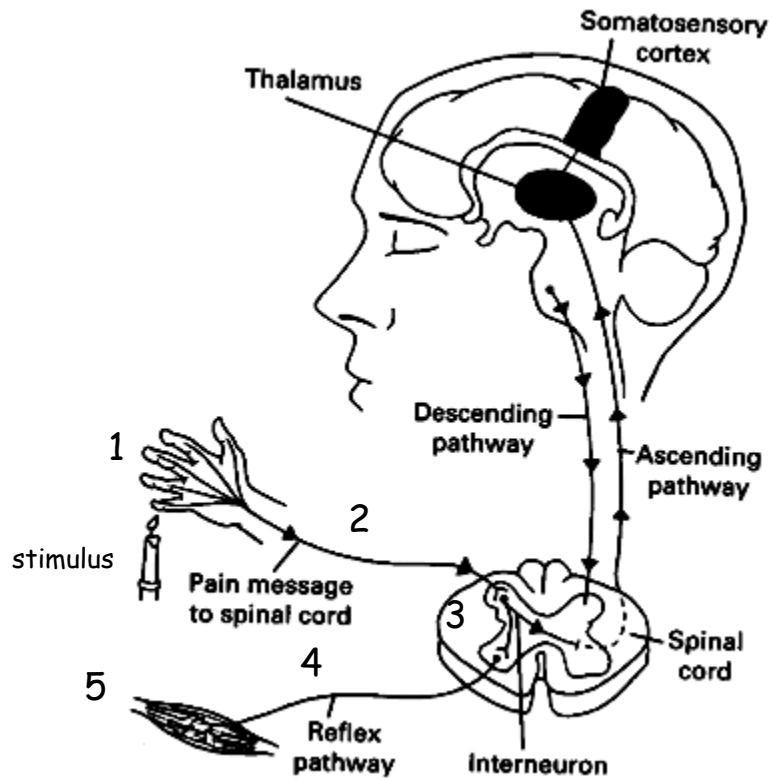
Reticular activating system (RAS):

H. A Simple Neural Circuit – The Reflex Arc

Reflex –

Reflex arc –

- 1) sensory receptor
- 2) sensory neuron
- 3) CNS neuron (interneuron)
- 4) motor neuron
- 5) effectors (muscles or gland)



Homework Assignment: Read the following pages in your text book and answer the questions that follow. This material will be on the exam. You may bring questions on this material to class for discussion or see me for help with these.

An Ounce of Prevention (p. 520)

What is TBI?

What are common causes?

Legions of the Vagus Nerve (X)

Read page 585 and answer the questions below. This material is being covered in lab in detail so your lab guide may help you answer these questions.

Indicate what functions/controls are lost with lesions to each of the branches below:

Pharyngeal Branch:

Superior laryngeal branch:

Recurrent laryngeal branch:

REVIEW QUESTIONS

1. Know the anatomy of the brain and be able to identify the following structures: cerebrum, diencephalon, thalamus, hypothalamus, midbrain, corpora quadrigemini, cerebral peduncles, corpus callosum, anterior commissure, hindbrain, pons varoli, medulla oblongata.
2. What are meninges? How many surround the brain? Besides the brain, how else is the brain protected?
3. Where is CSF synthesized? Be able to trace the path of CSF through the CNS.
4. What is the function of CSF? Describe the appearance of CSF. How is it different from blood?
5. Describe the arterial blood supply to the brain. How does blood leave the brain and return to the heart?
6. What is the blood-brain barrier? Why is it so strict in terms of the molecules that cross into the brain ISF?
7. Know the anatomy of the spinal cord. Be able to identify the meninges of the spinal cord, cervical enlargements, conus medullaris, cauda equina, filum terminale, gray matter, white matter, ventral fissure, dorsal sulcus, central canal.
8. What are the lobes of the cerebrum? What landmarks help you distinguish the different lobes?
9. What are the functional areas of the cerebrum? Be able to locate and describe each of the following areas: prefrontal cortex, primary motor cortex, Brocha's area, Wernicke's area, Heschle's area, visual projection area, visual association area.
10. How is a projection area different from an association area?
11. What is somatosensory homunculus? A motor homunculus? What does the relative size of a particular homunculus body structure indicate? Where are the areas for the pharynx, oral cavity, and larynx located on each map?
12. Do the right and left hemispheres of the brain have the same functions on either side? Which functions are left-brain? Right-brain?
13. Know the function of each of the structures: superior colliculi, inferior colliculi, pons, medulla, thalamus, hypothalamus, cerebral nuclei, corpus callosum, anterior commissure, cerebellum.
14. What is a reflex? Reflex arc? Can you voluntarily suppress a reflex?

Study Questions (p. 611)

Questions 1-12, 13, 15 (areas covered in class), 16,17

Anatessa CD-ROM:

Lecture: All exercises.

Lab: All exercises.