

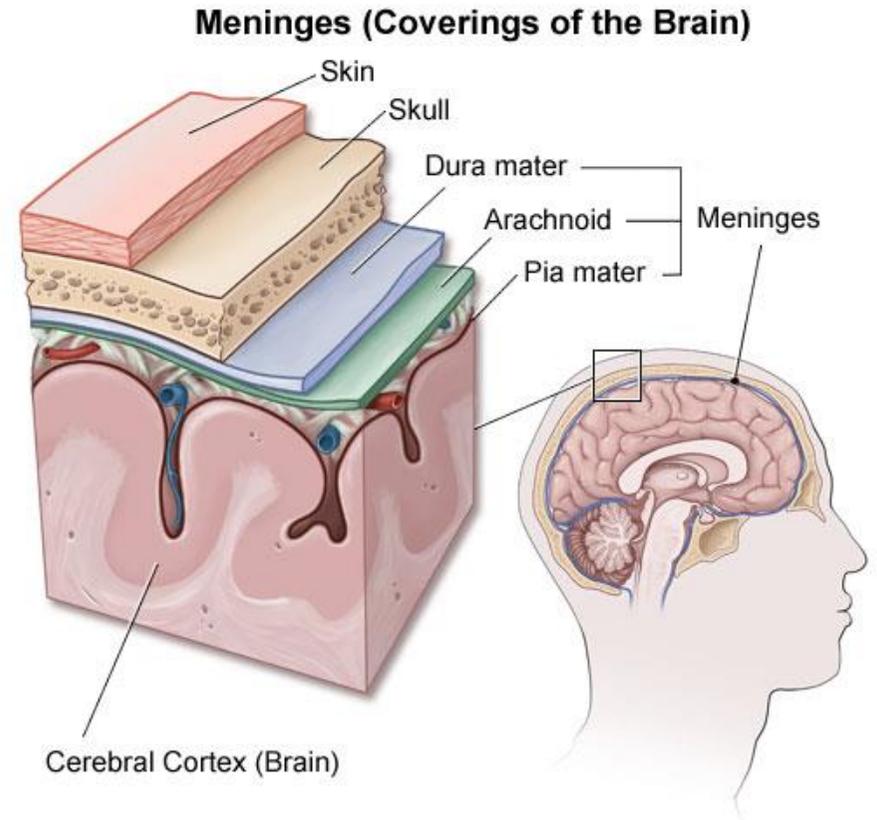
The Meninges

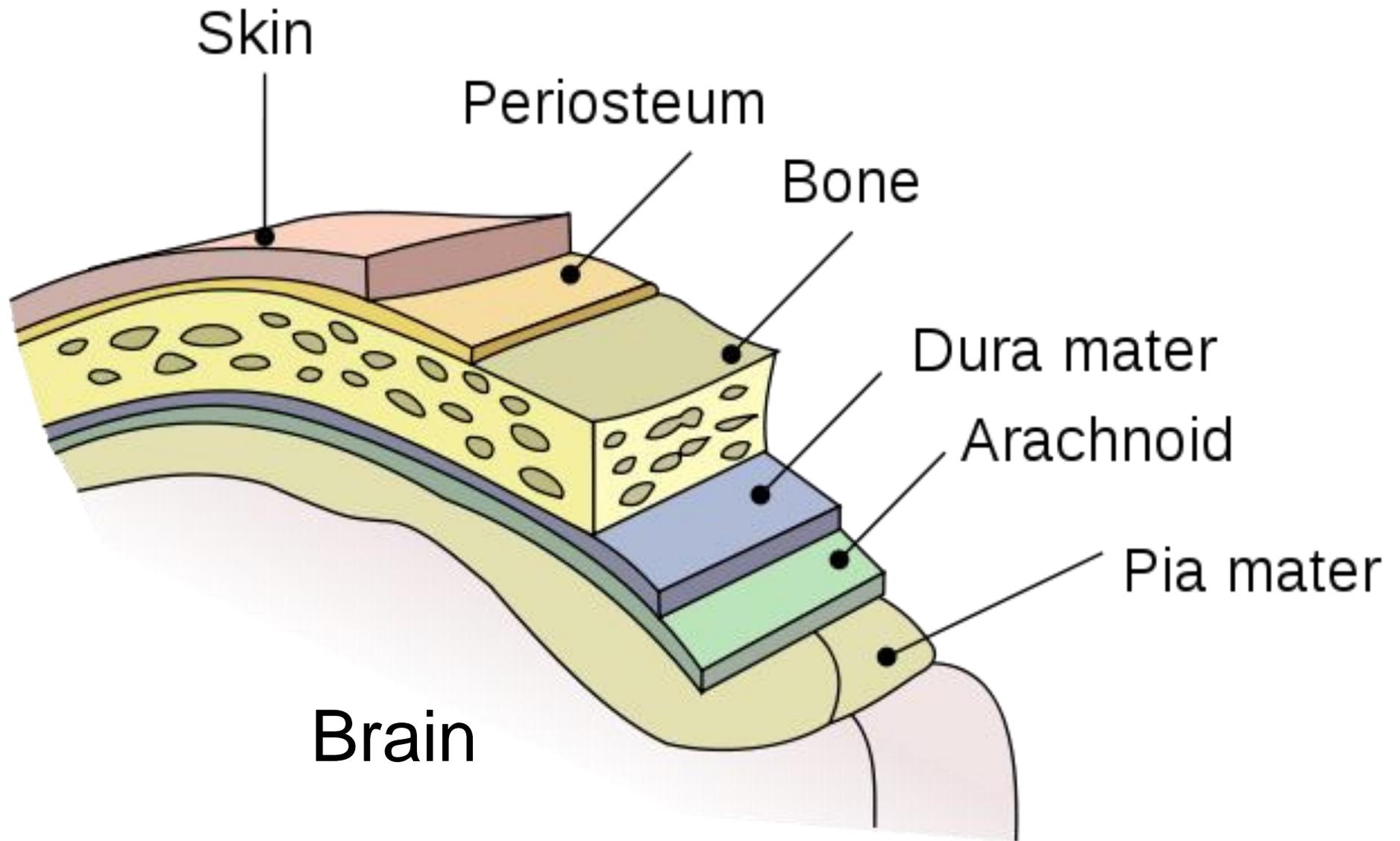
= membranes located between bone and soft tissues of the nervous system

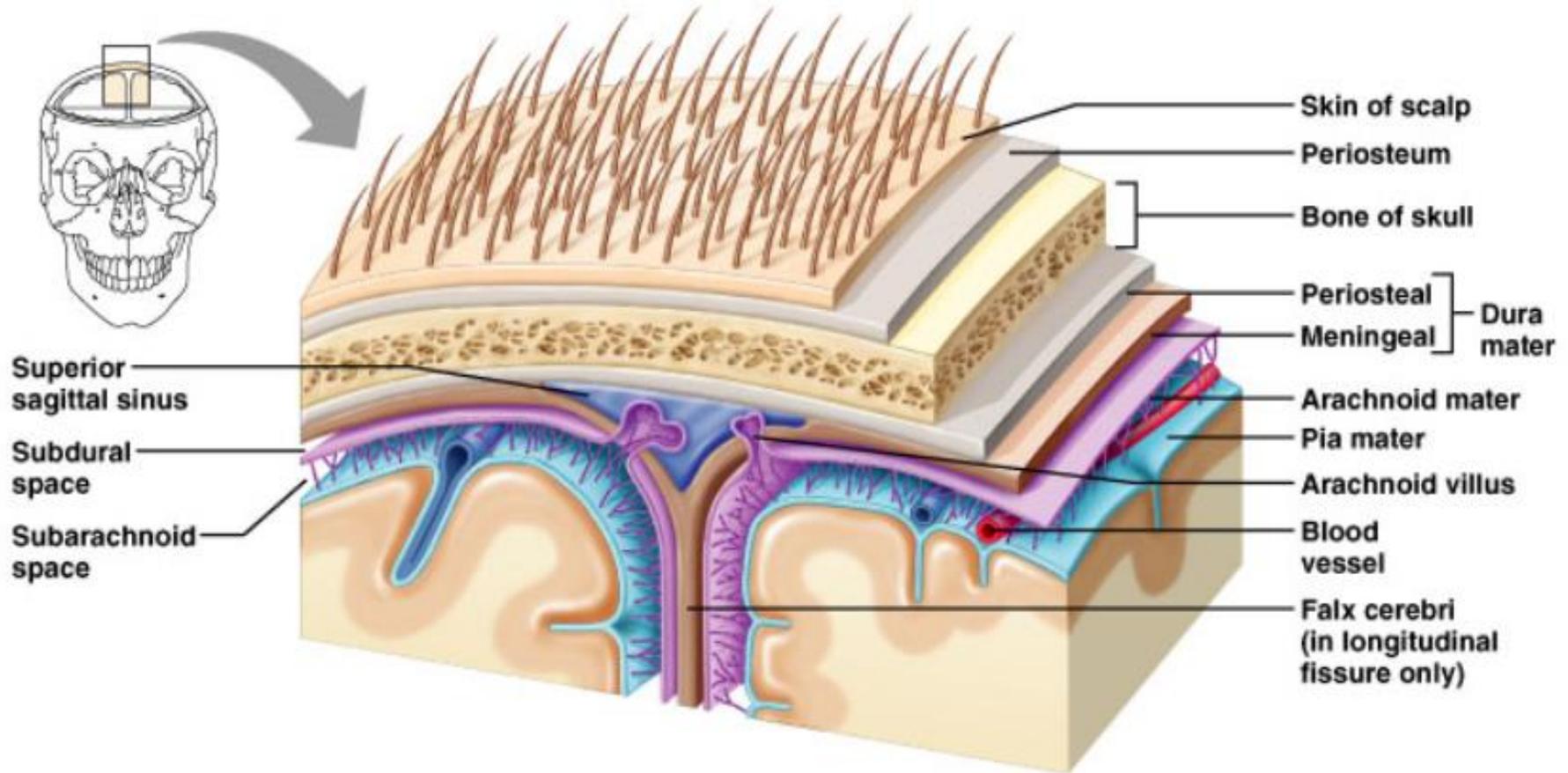
Dura mater - outermost layer, blood vessels

Arachnoid mater - no blood vessels, in between layer (resembles a spider web)

Pia mater - inner membrane, contains nerves and blood vessels to nourish cells



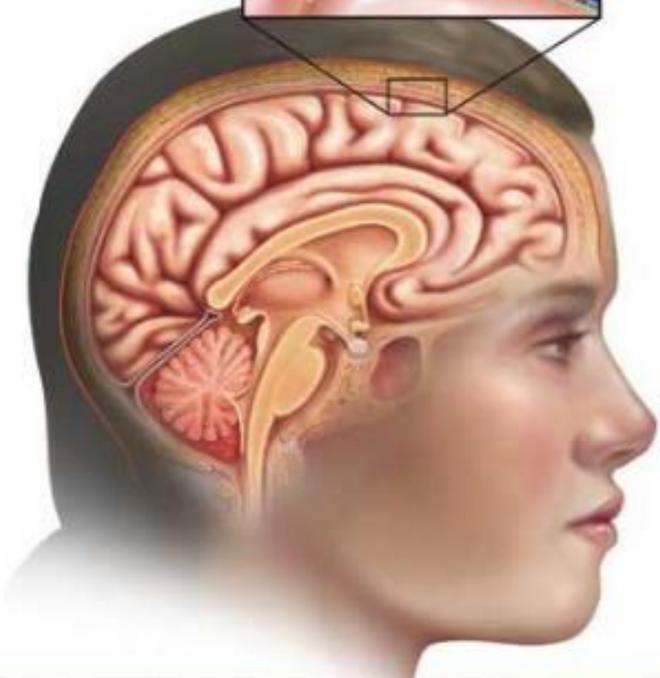
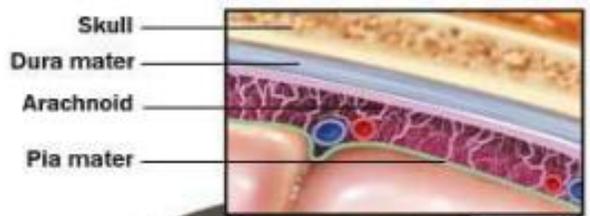




(a)

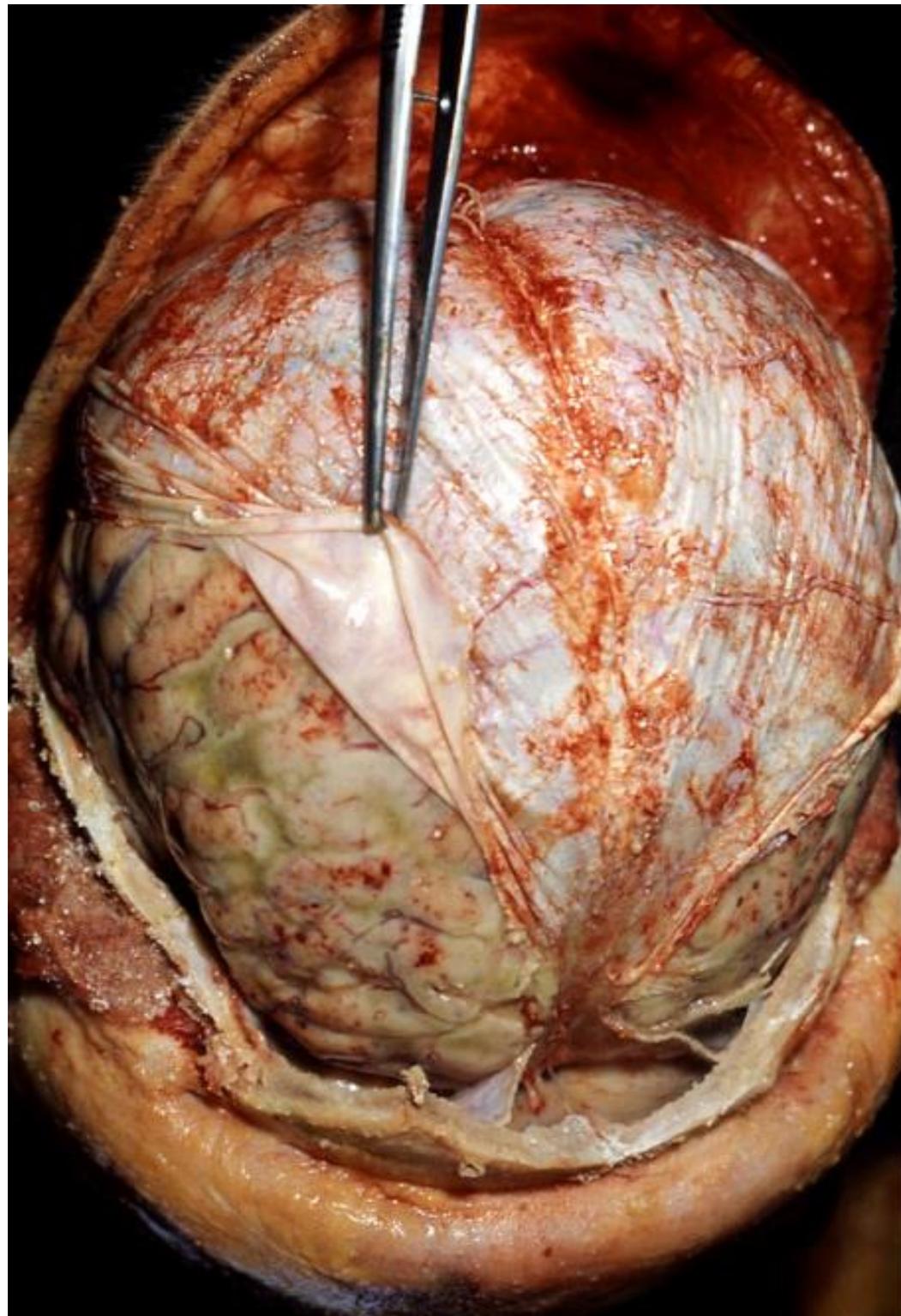
CSF - cerebrospinal fluid - between arachnoid and pia maters

See video of a spinal tap: <http://youtu.be/yYZxNsnf18Y>

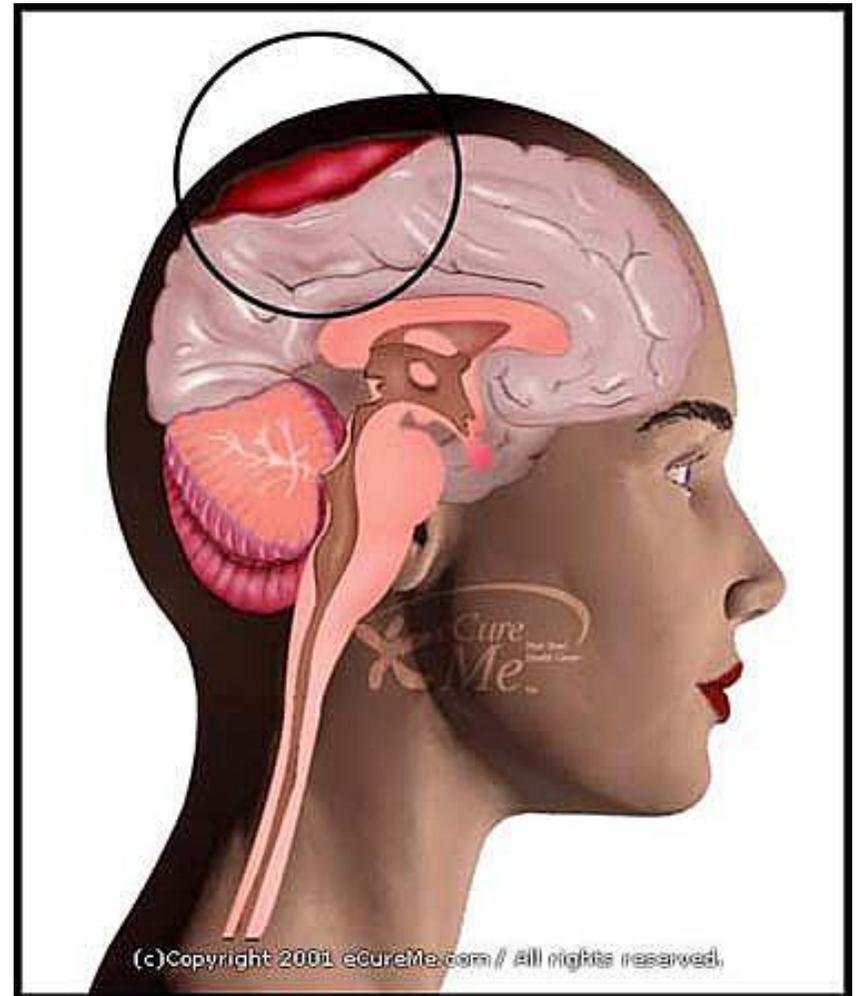
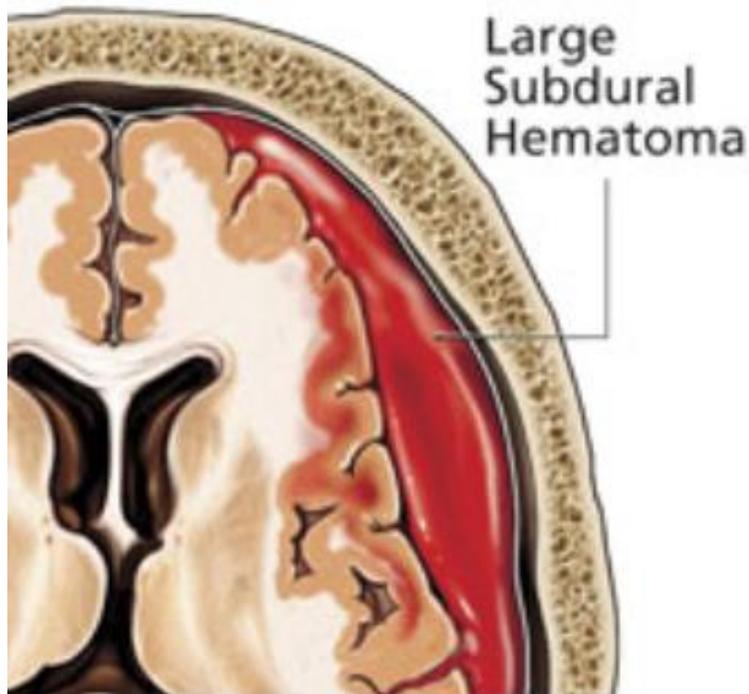


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Dura mater is being peeled away in this photo.



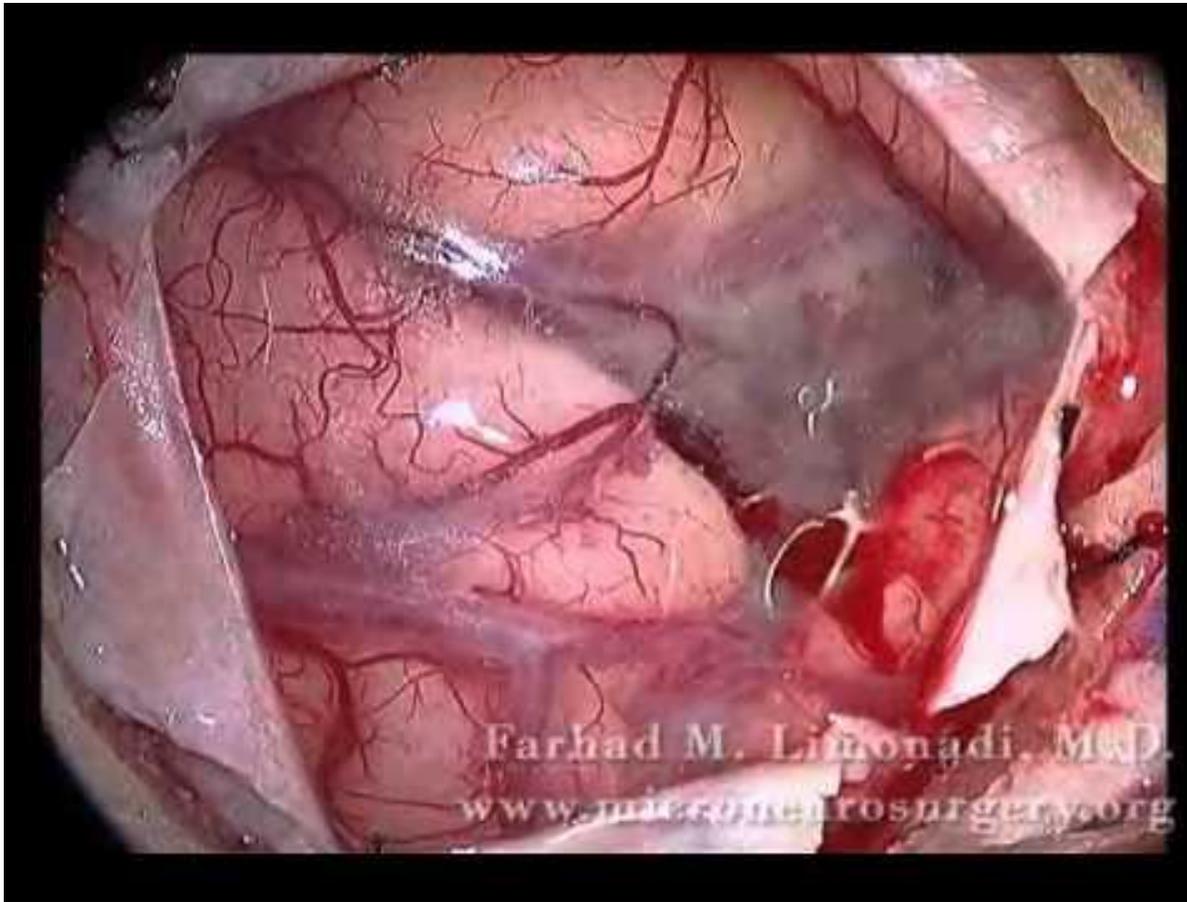
Subdural Hematoma



a type of hematoma, usually associated with traumatic brain injury. Blood gathers between the dura mater, and the brain, putting pressure on brain.



"Whoa! *That* was a good one! Try it, Hobbs — just poke his brain right where my finger is."



CNN Video
Showing cognitive
tasks during brain
surgery as a tumor
is removed.

[Natgeo Brain
Surgery Video](#)
- removal of
tumor

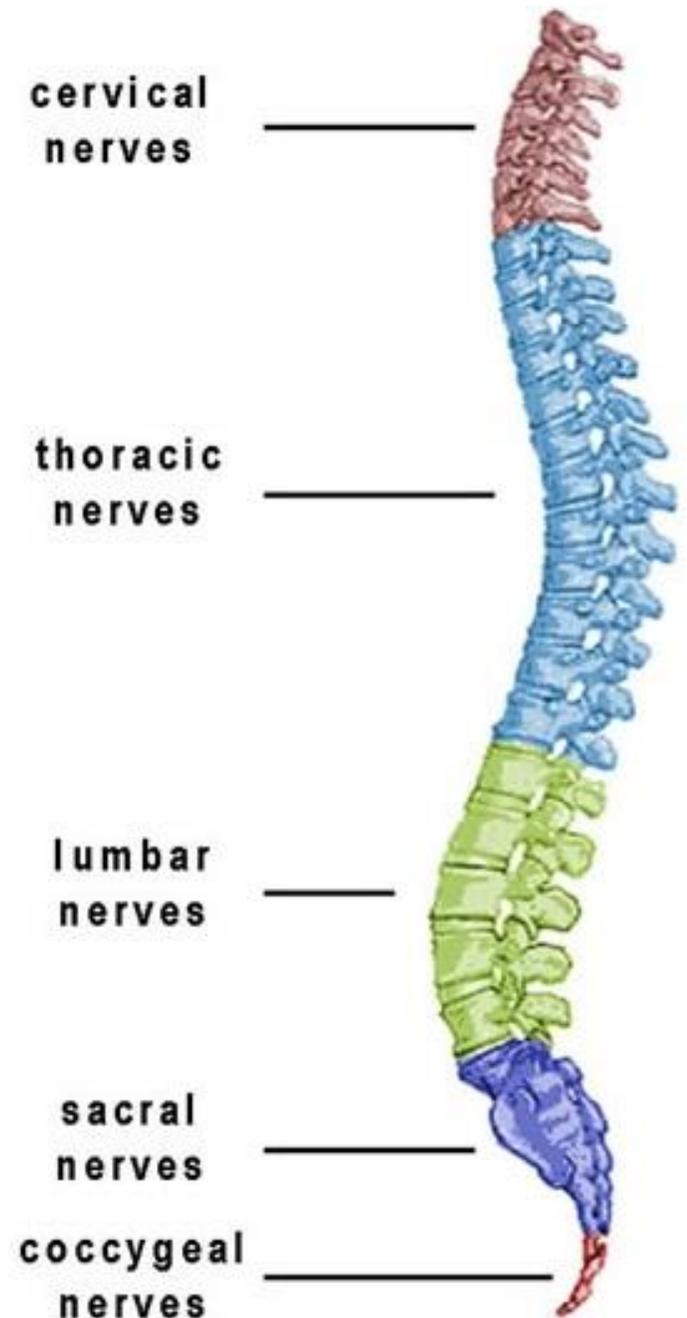


Spinal Cord

passes down the vertebral canal,
has 31 segments (each with a
pair of spinal nerves)

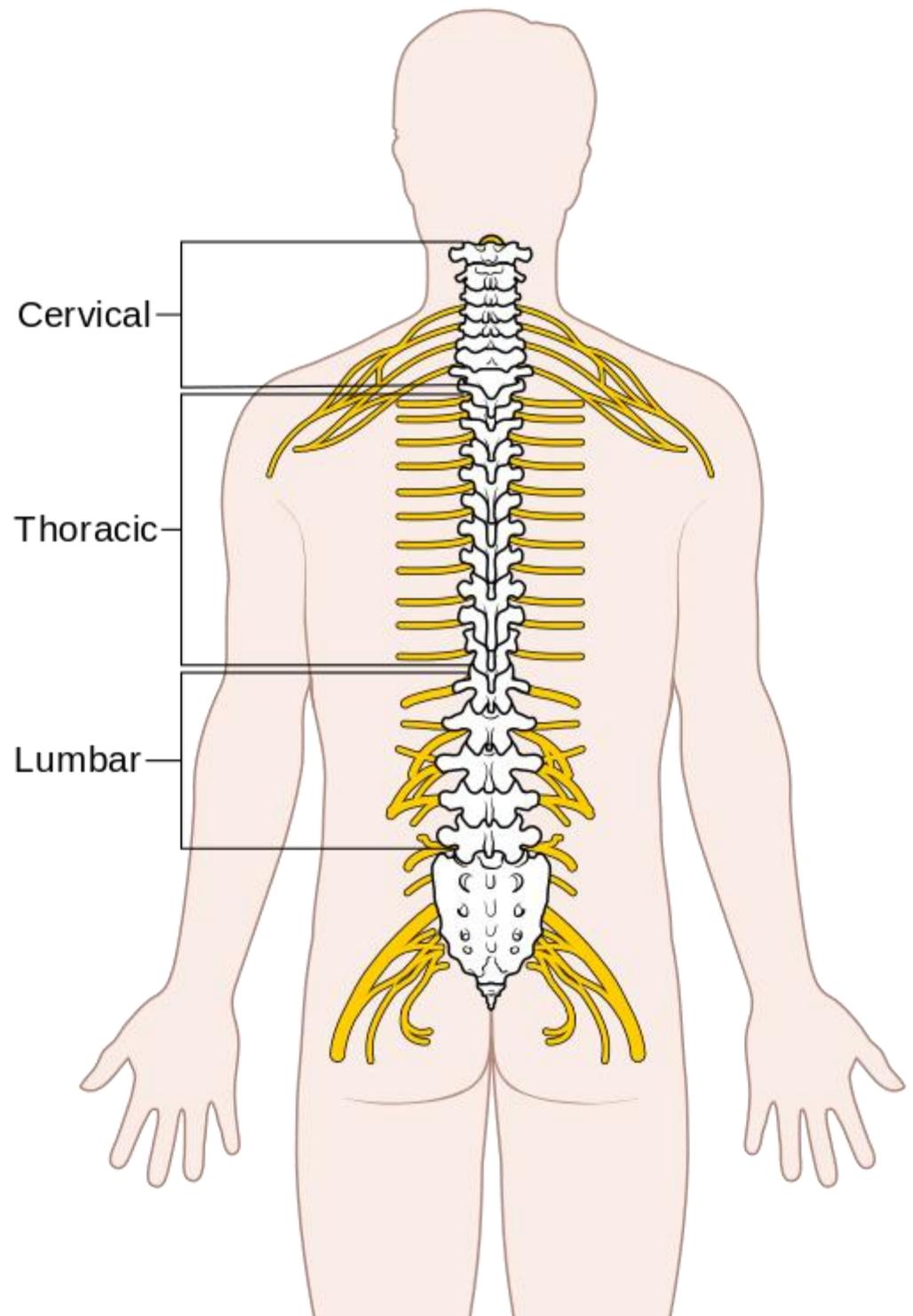
Cervical enlargement = supplies
nerves to upper limbs (neck)

Lumbar enlargement = supplies
nerves to the lower limbs (lower
back)



ASCENDING -
impulses travel to the
brain (sensory)

DESCENDING -
impulses travel to the
muscles (motor)

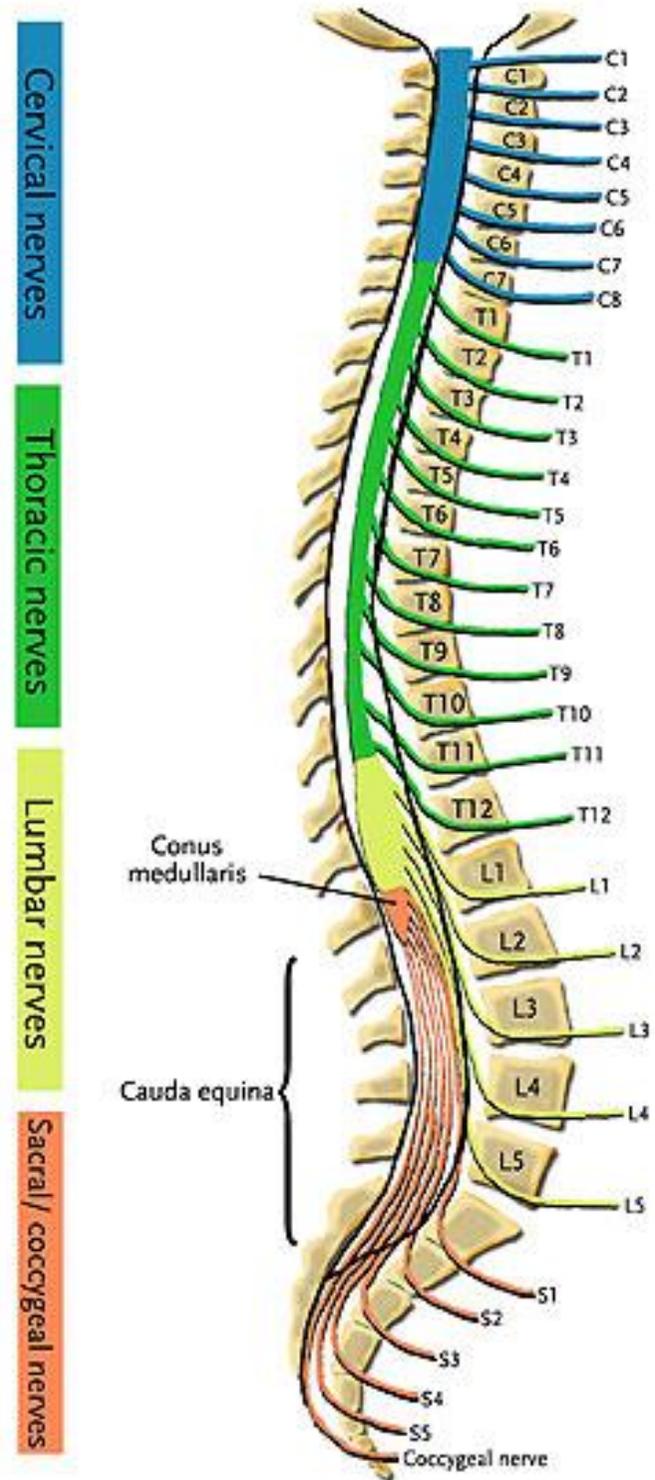


The nerves are numbered based on their location

C1 - C8

T1 - T12

L1 - L5



MENTAL HOSPITAL PHONE MENU

Please select from the following options menu:

If you are obsessive-compulsive, press 1 repeatedly.

If you are co-dependent, please ask someone to press 2 for you.

If you have multiple personalities, press 3, 4, 5 and 6.

If you are paranoid, we know who you are and what you want, stay on the line so we can trace your call.

If you are schizophrenic, listen carefully and a little voice will tell You which number to press.

If you are manic-depressive, hang up. It doesn't matter which number you press, nothing will make you happy anyway.

If you are dyslexic, press 9-6-9-6.

If you are bipolar, please leave a message after the beep or before the beep or after the beep. But Please wait for the beep.

If you have low self-esteem, please hang up. Our operators are too busy to talk with you.

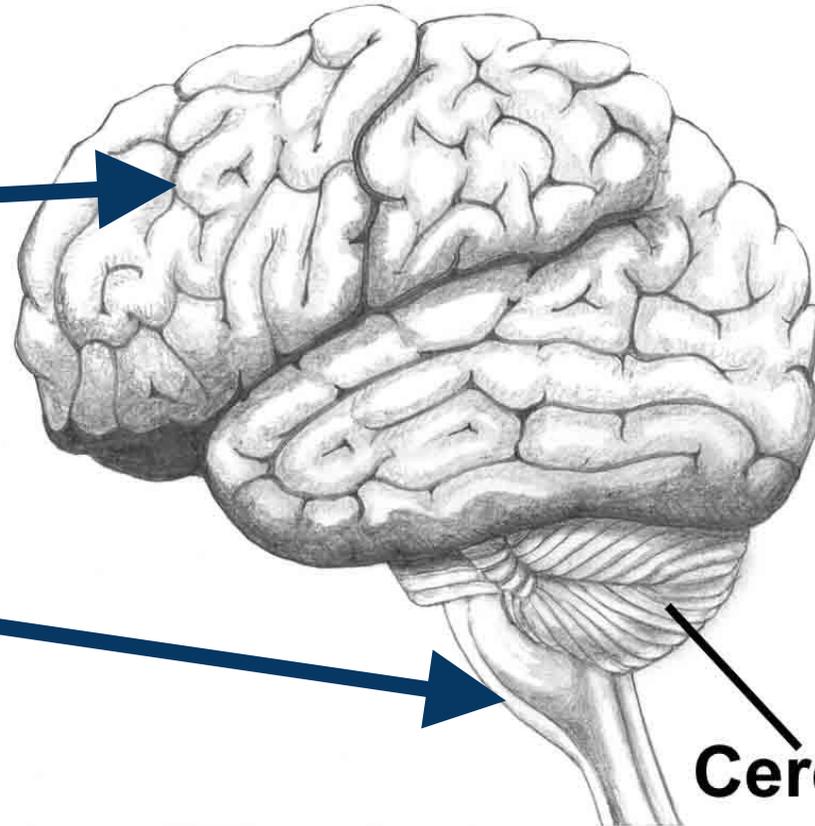
THE BRAIN

3 Major Parts

Cerebrum

Cerebellum

Brain Stem

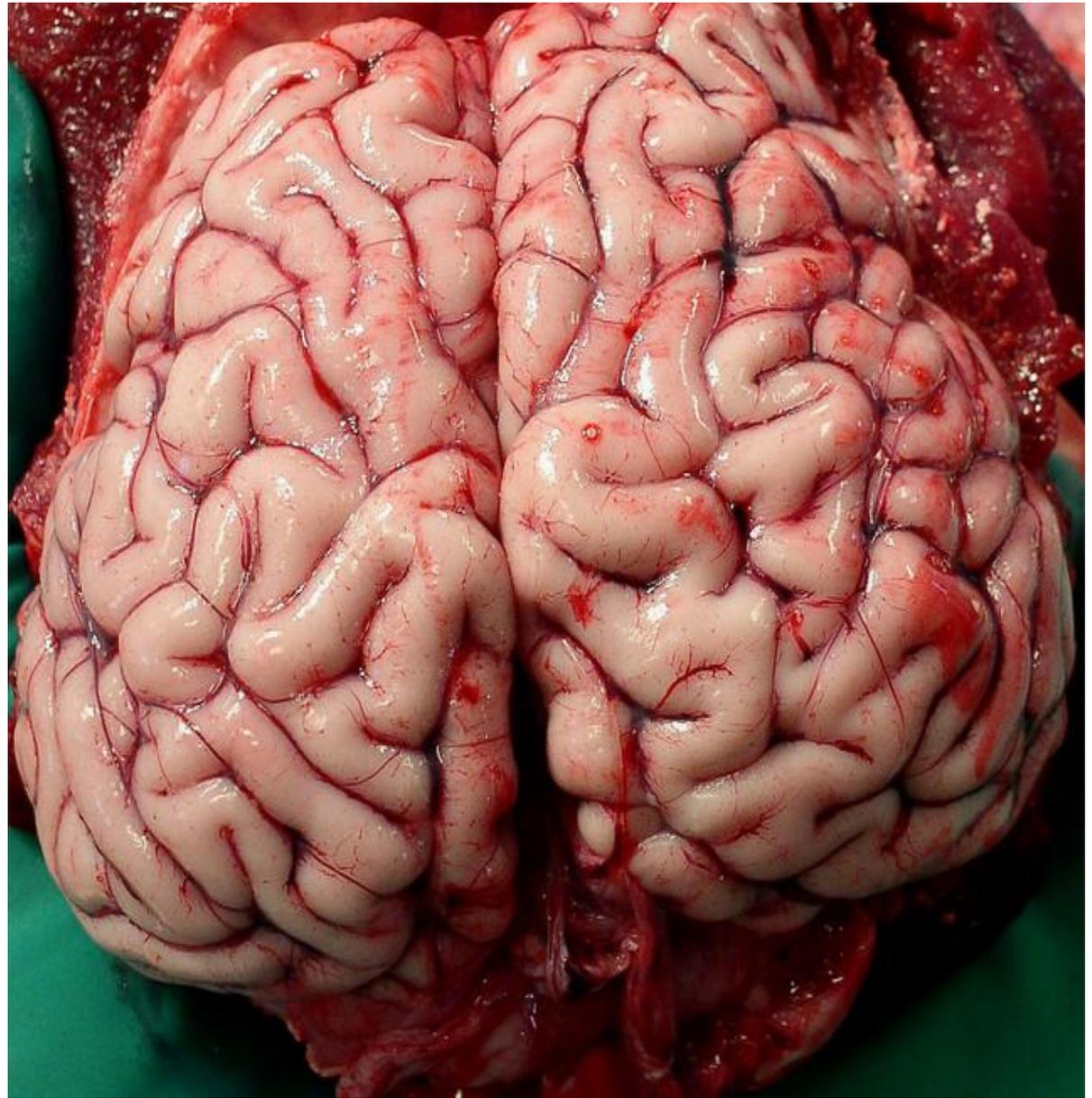


Cerebellum

CEREBRUM

- wrinkly large part of the brain

higher mental function,
solving problems

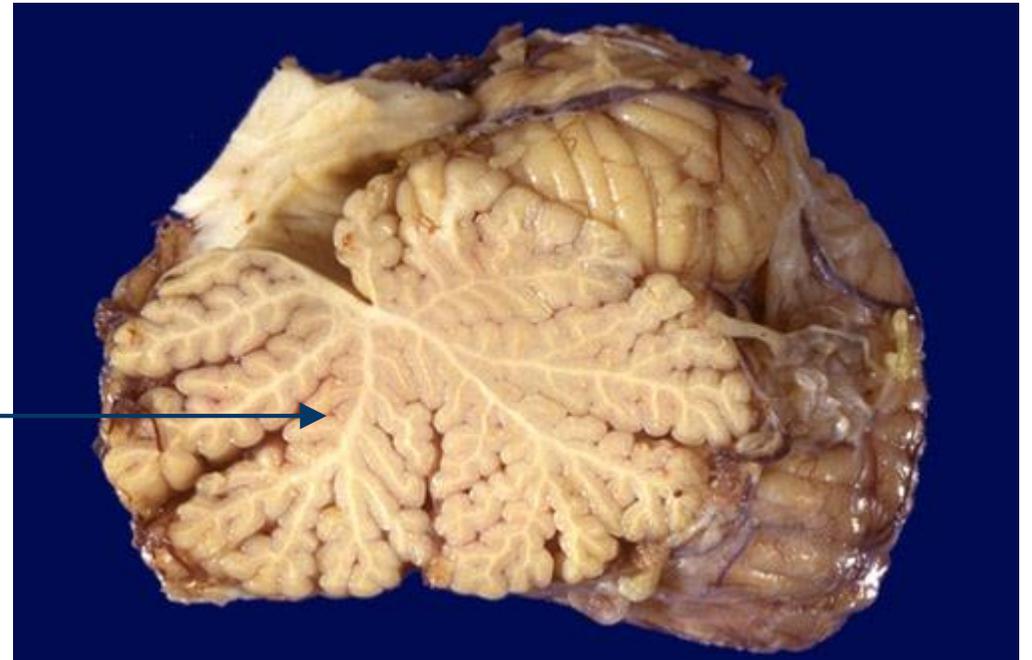
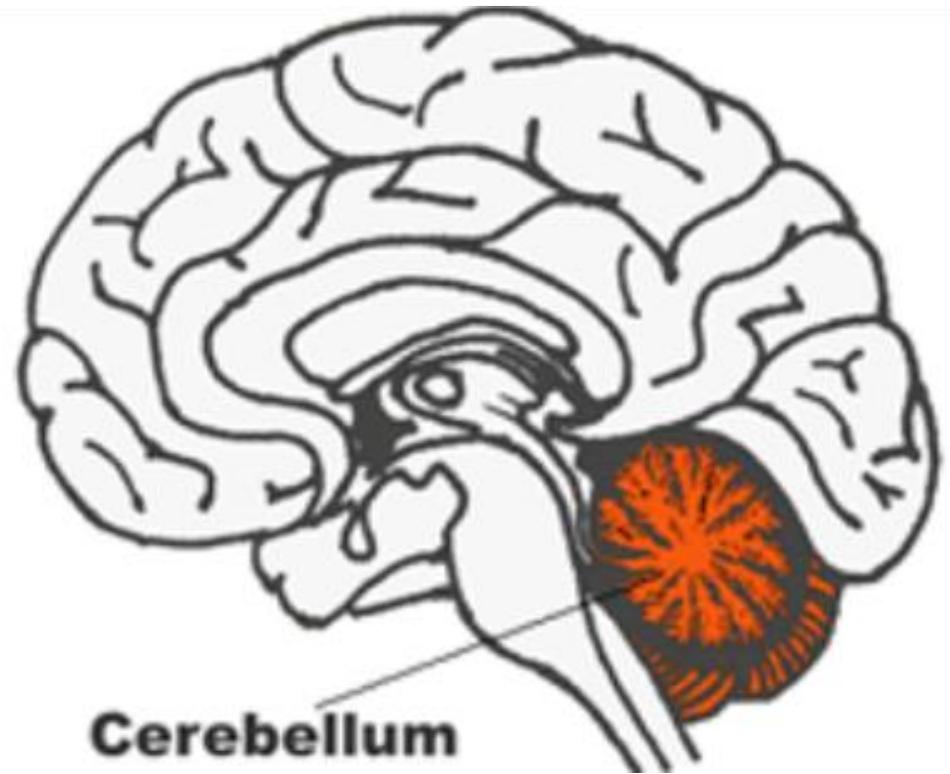


CEREBELLUM

Balance and
coordination

White matter within the
cerebellum give it a
tree-like appearance -
this is called the

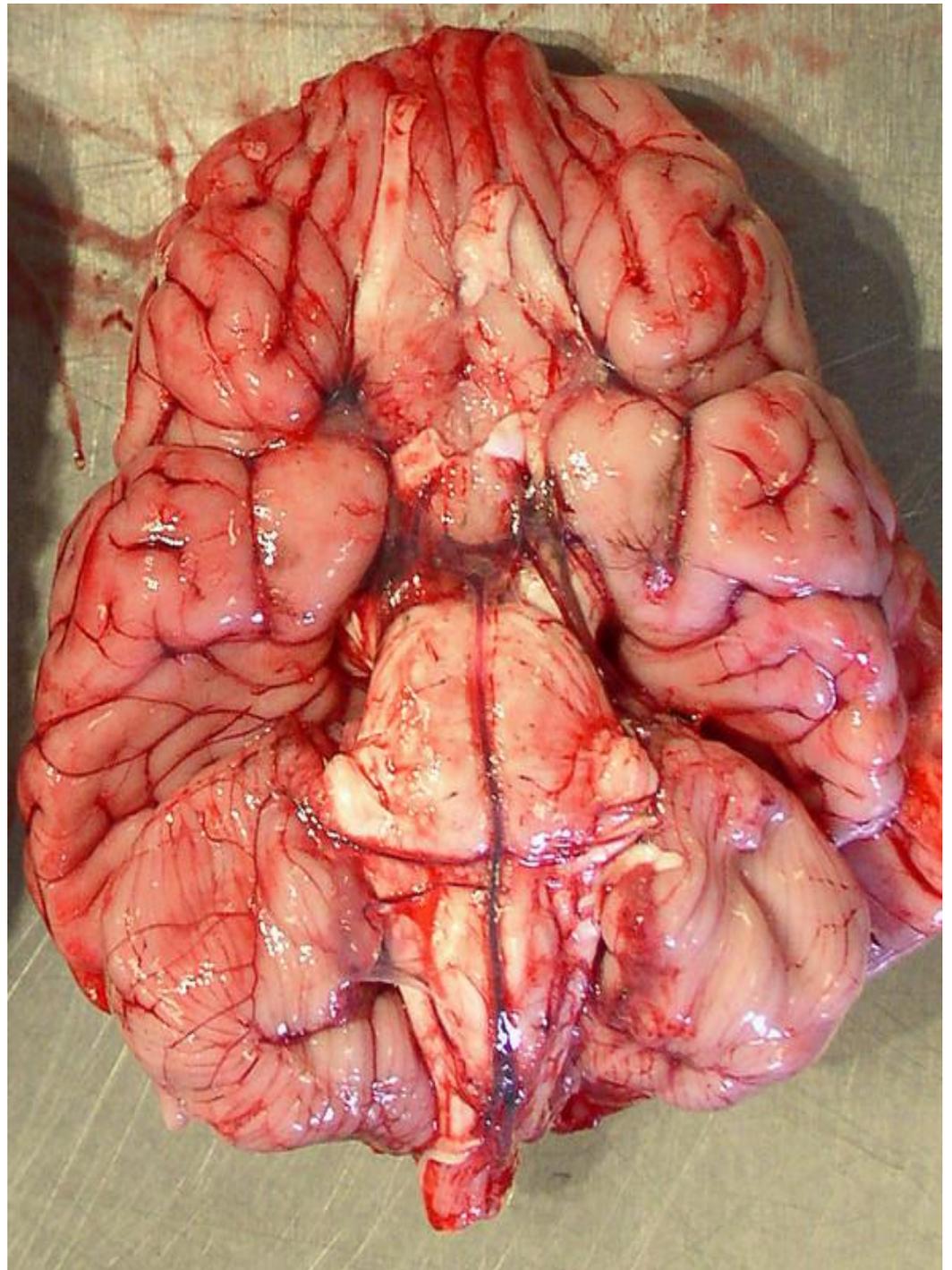
ARBOR VITAE

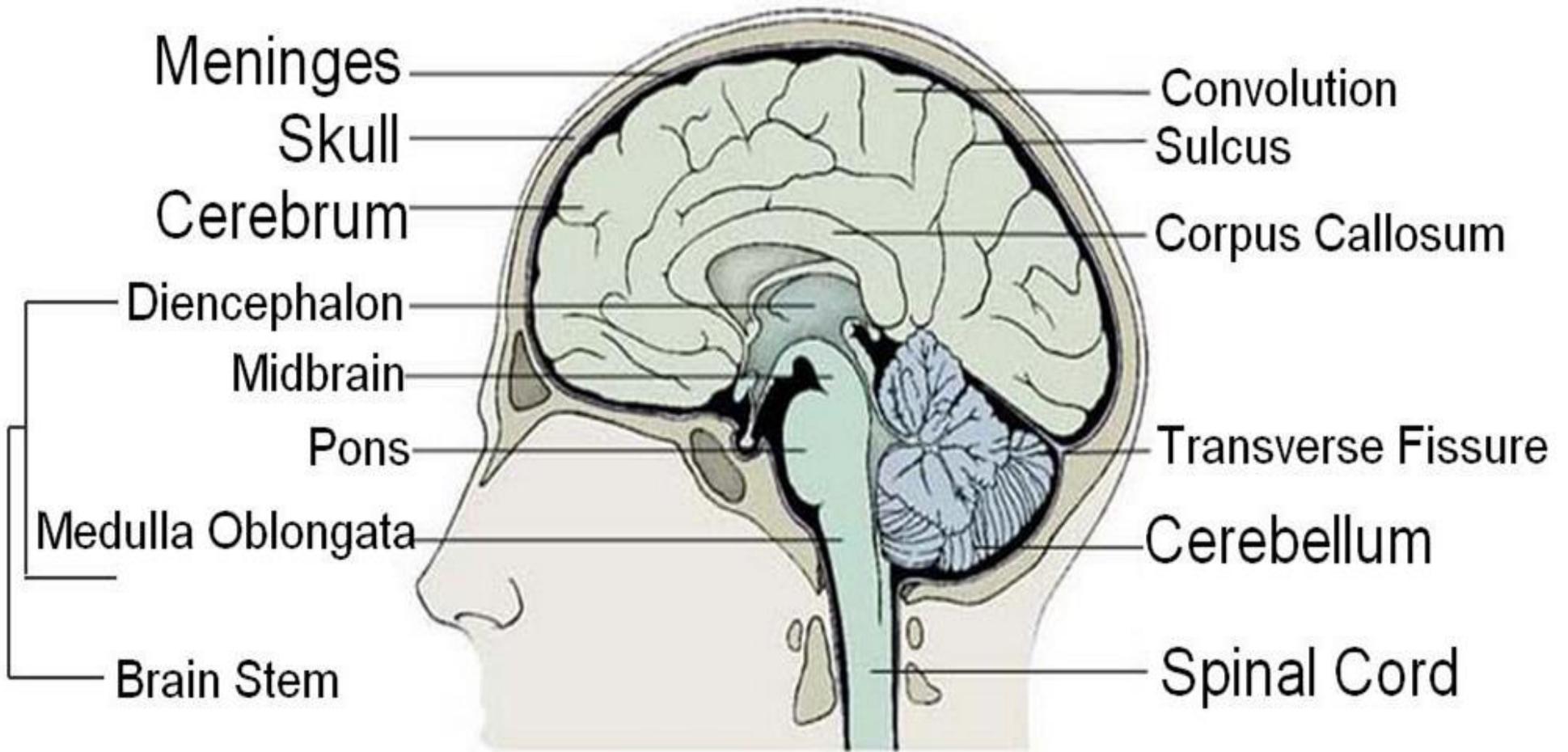


Brain Stem -

regulates
visceral
functions

(autonomic
system)



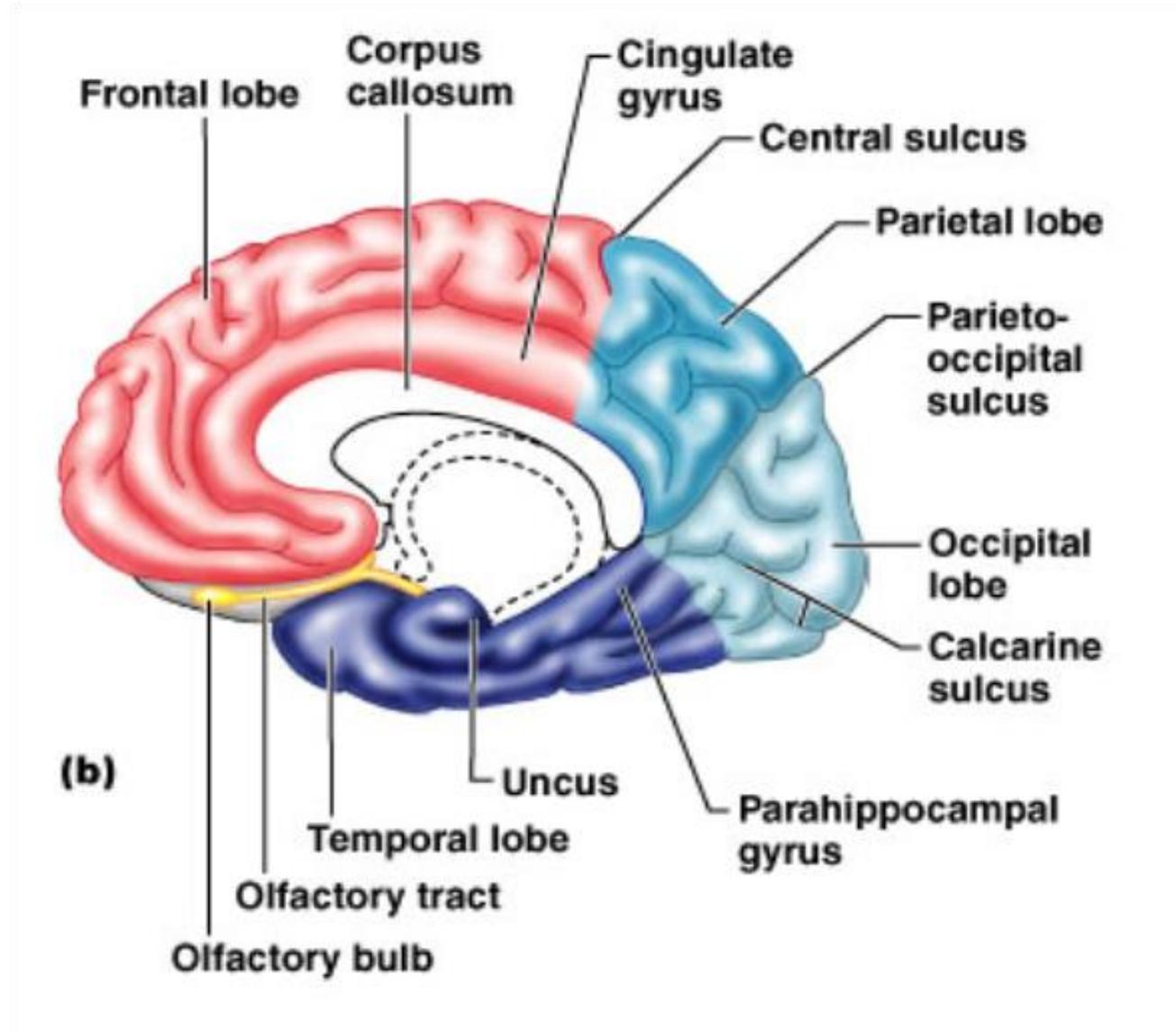


1. Cerebral Hemispheres

- left and right side separated by the

2. Corpus Callosum

- connects the two hemispheres



The Cerebral Hemispheres

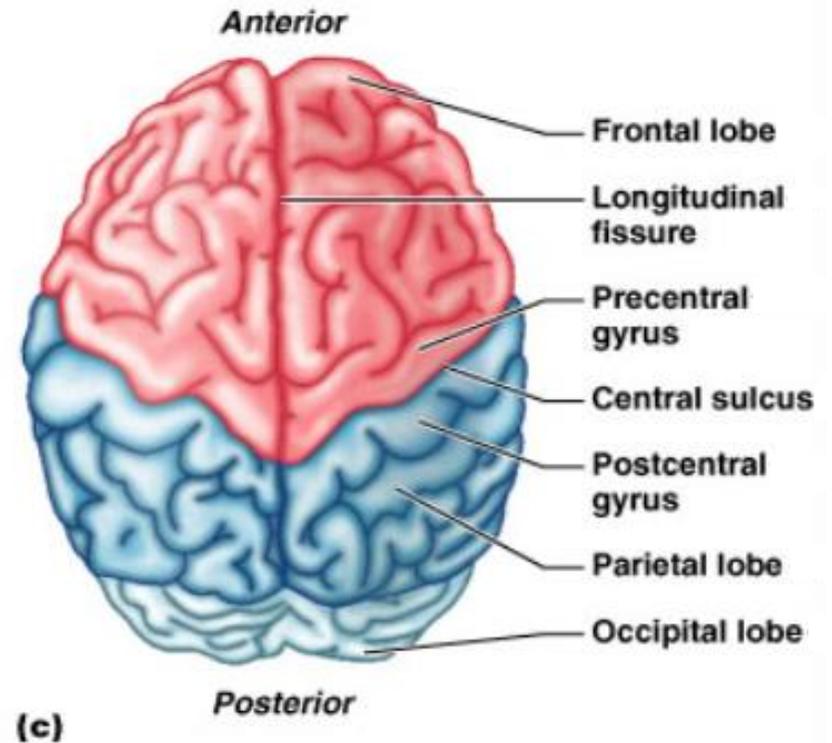
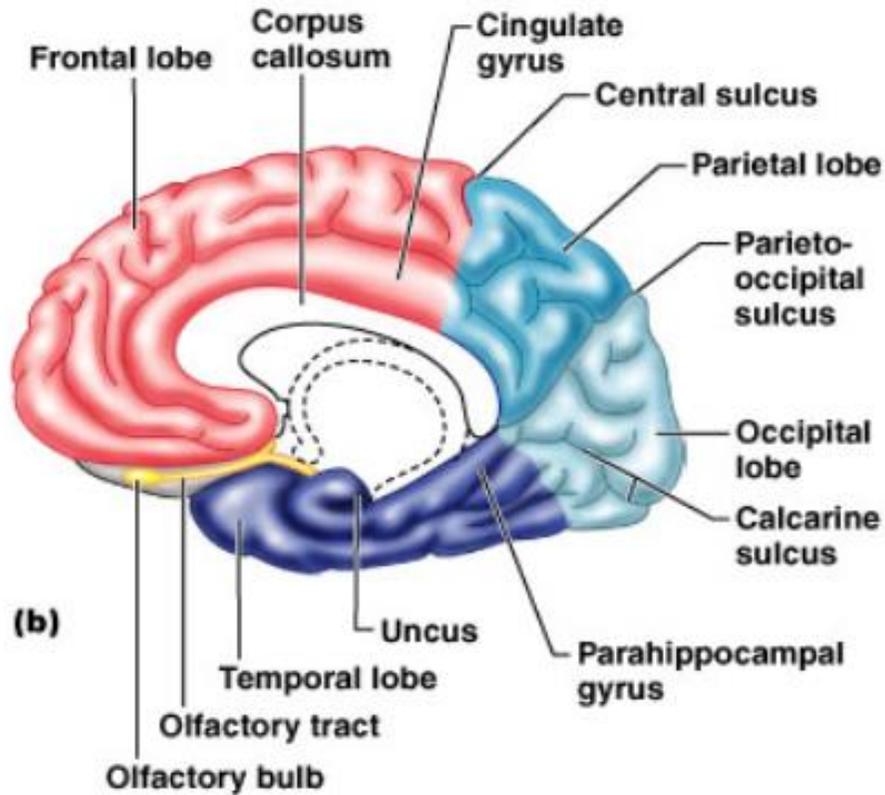


Figure 13.7b, c

Corpus callosum



3. Convolutions of the Brain

- the wrinkles and grooves of the cerebrum

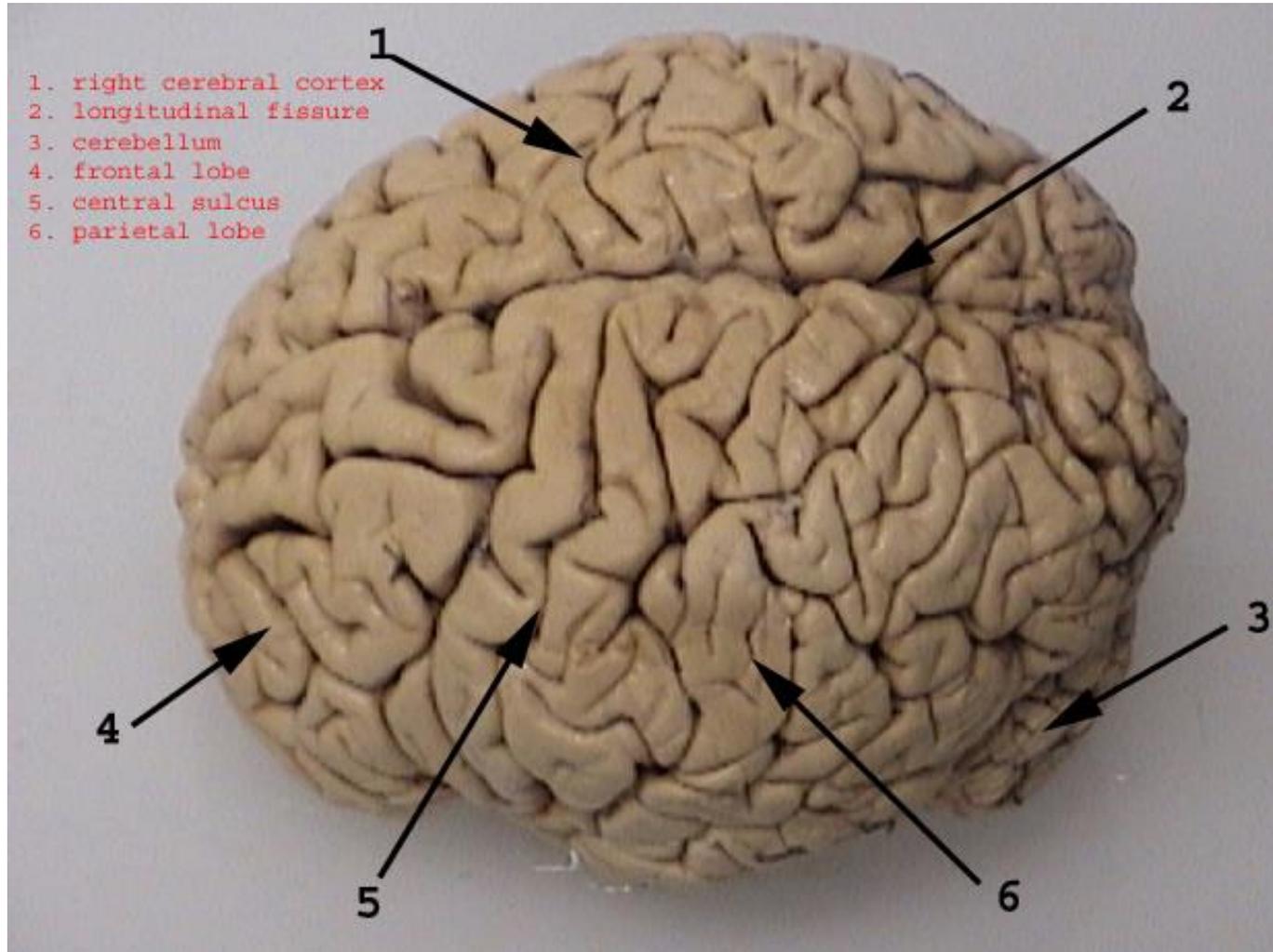
Fissures = deep groove

Sulcus = shallow groove

Gyrus = bump



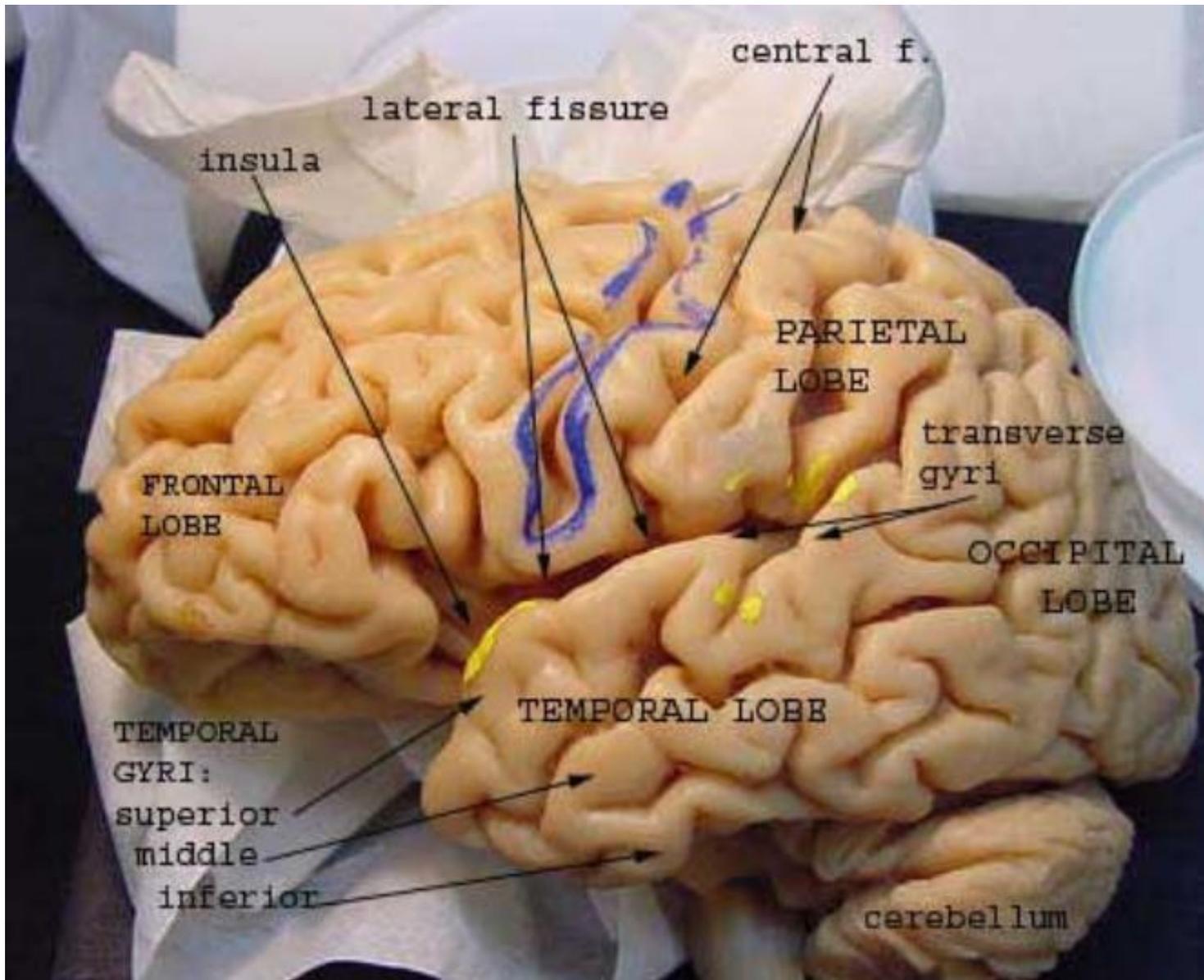
4. Fissures – separate lobes



Longitudinal fissure - separate right and left sides

Transverse Fissure - separates cerebrum from cerebellum





Lateral Fissure separates the temporal lobe from the Frontal and Parietal lobes



5/15



Lobes of the Brain

5.

Frontal lobe

Executive functions, thinking, planning, organising and problem solving, emotions and behavioural control, personality

9.

Motor cortex

Movement

10.

Sensory cortex

Sensations

6.

Parietal lobe

Perception, making sense of the world, arithmetic, spelling

8.

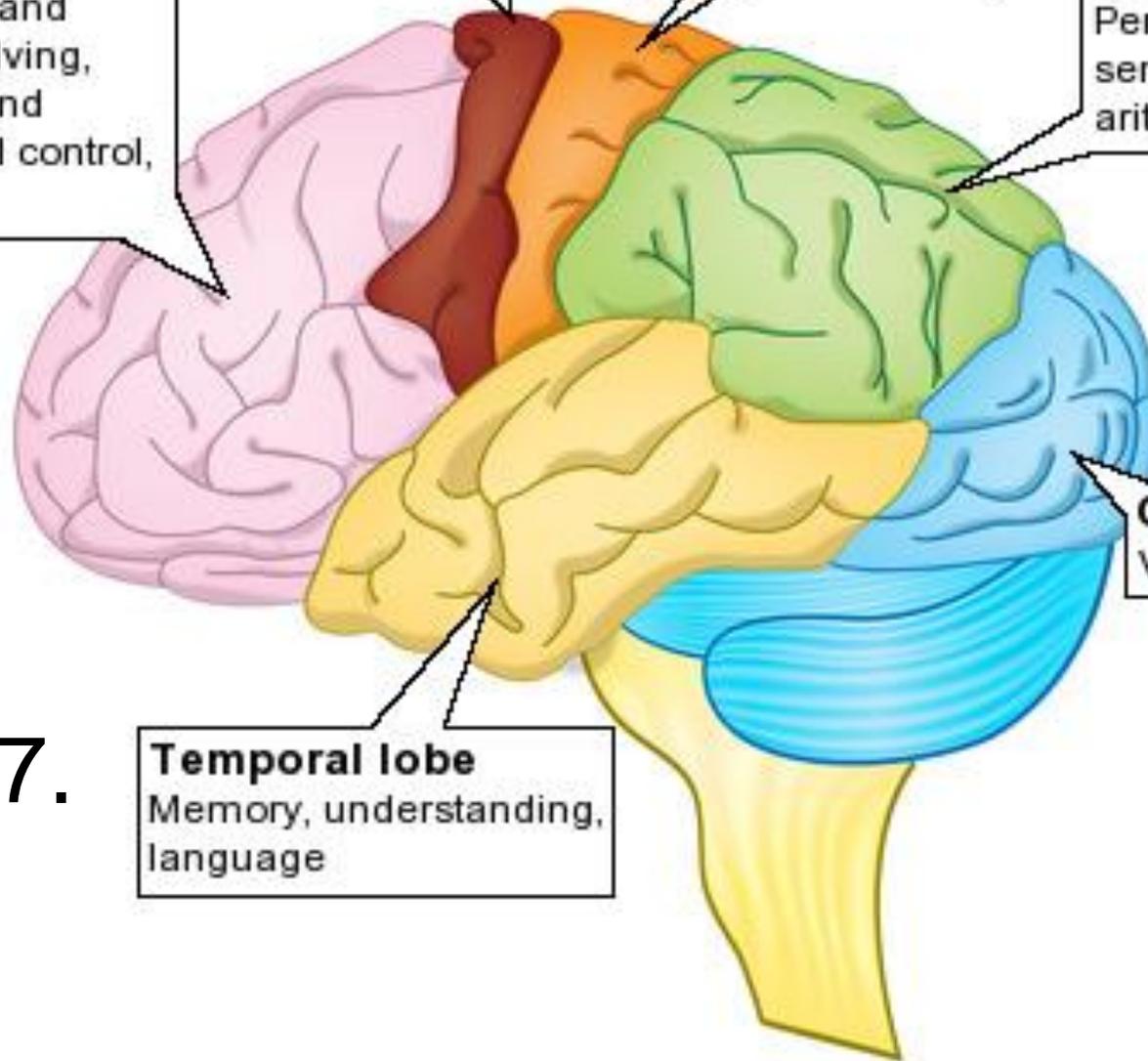
Occipital lobe

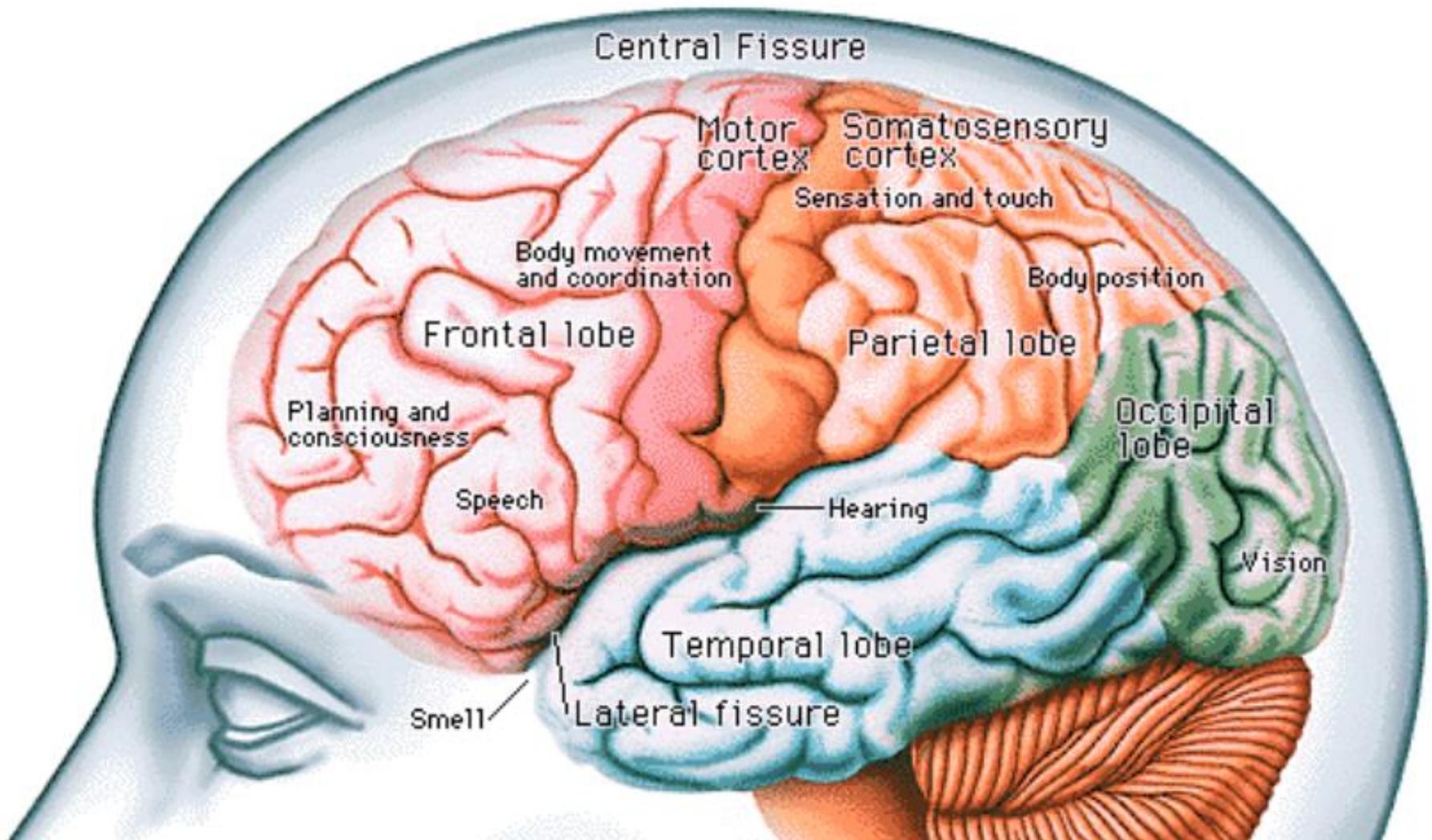
Vision

7.

Temporal lobe

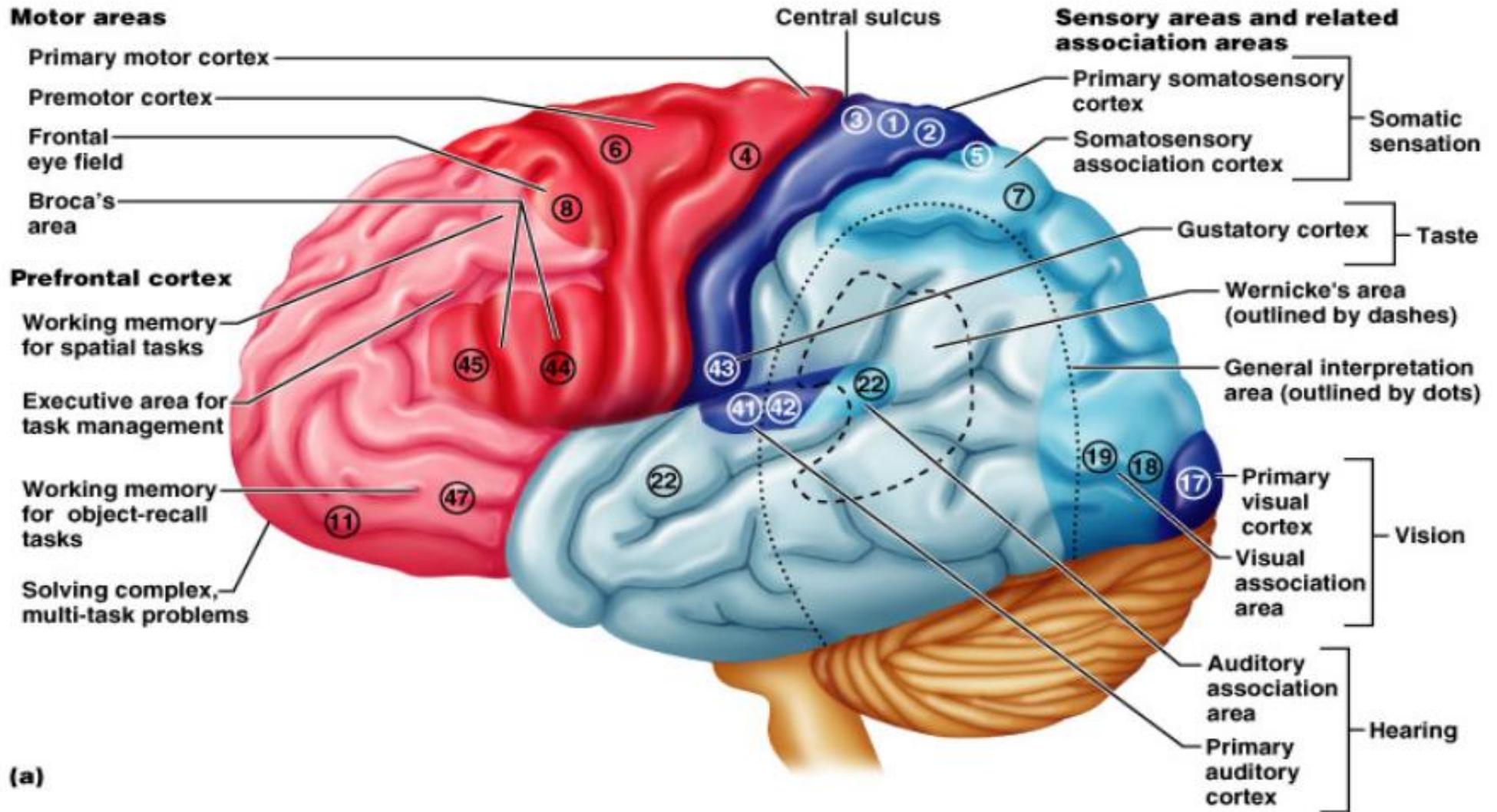
Memory, understanding, language



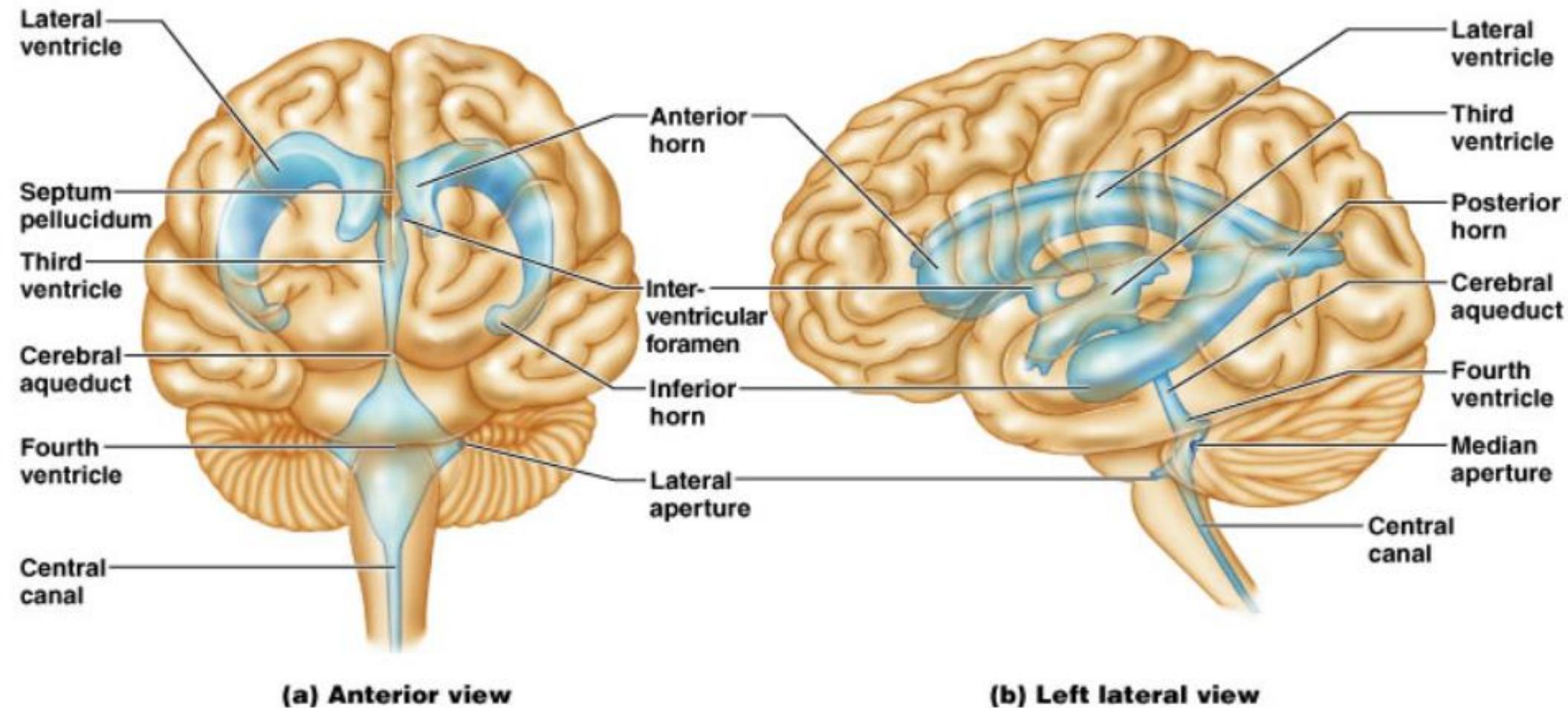


11. Cerebral Cortex - outermost portion of cerebrum, the part with all the wrinkles

Functional and Structural Areas of the Cerebral Cortex

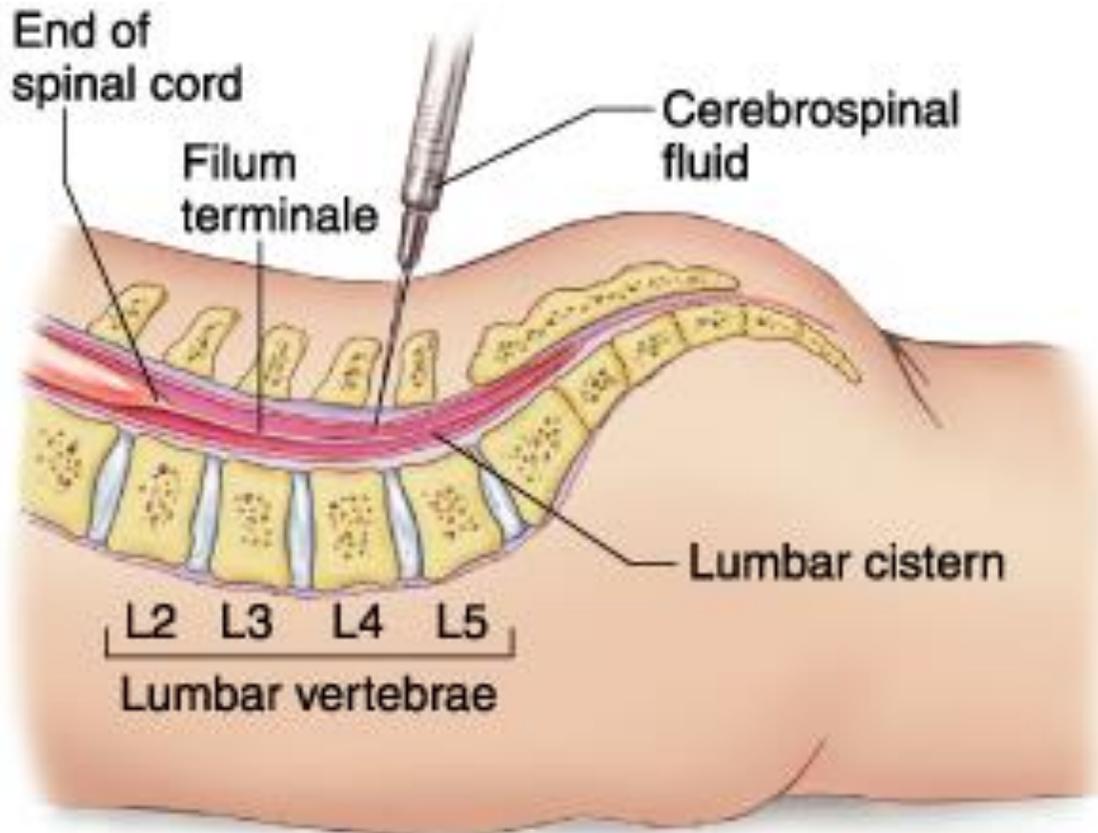


11. VENTRICLES OF THE BRAIN



Fluid filled cavities, contain CSF

12. Cerebrospinal Fluid (CSF) - fluid that protects and supports brain



Lumbar puncture (spinal tap) is performed in your lower back, in the lumbar region. During lumbar puncture, a needle is inserted between two lumbar bones (vertebrae) to remove a sample of cerebrospinal fluid .

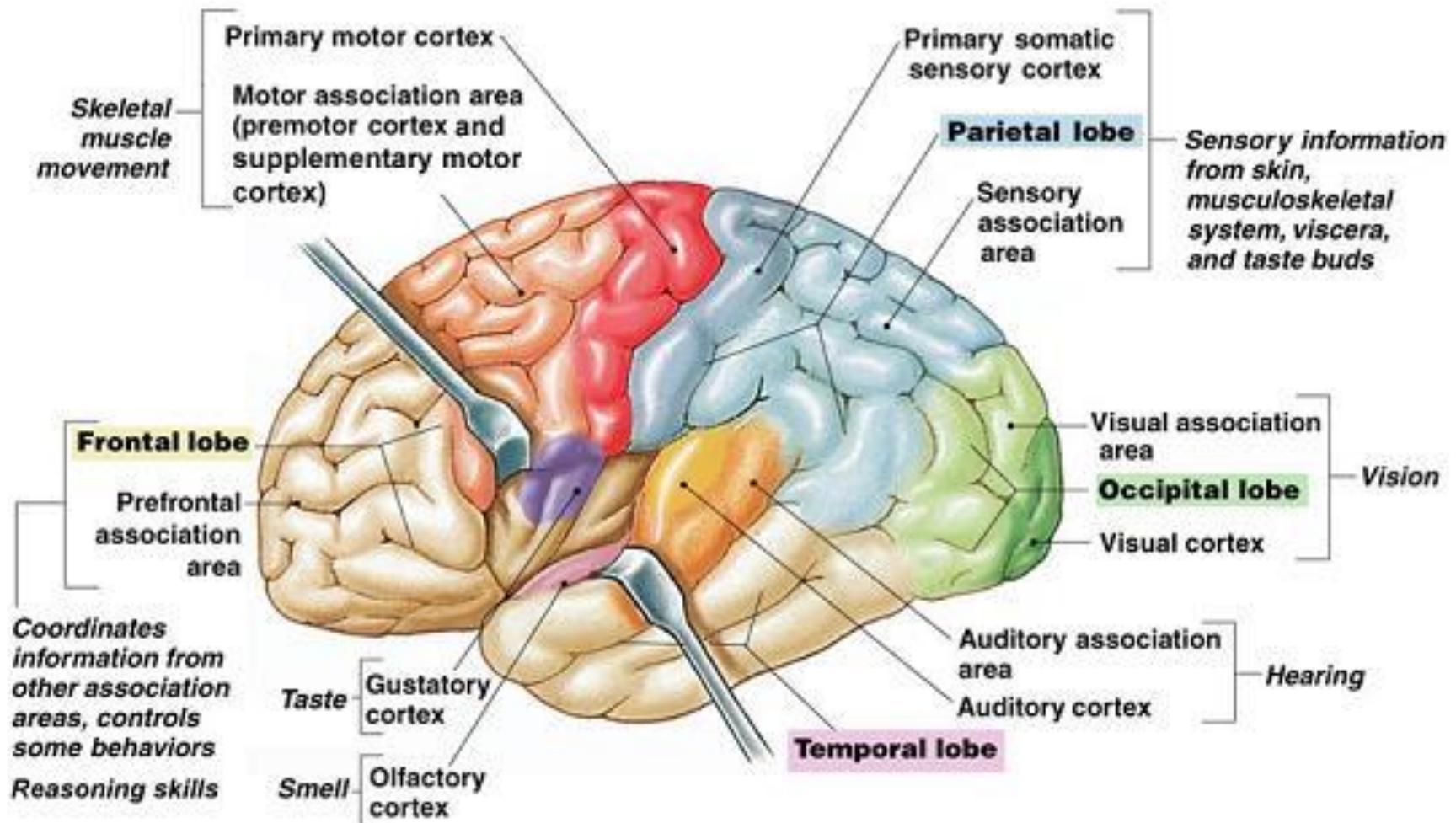
This can diagnose infections, such as meningitis; disorders of the central nervous system, such as multiple sclerosis; or cancers of the brain or spinal cord.

See procedure at

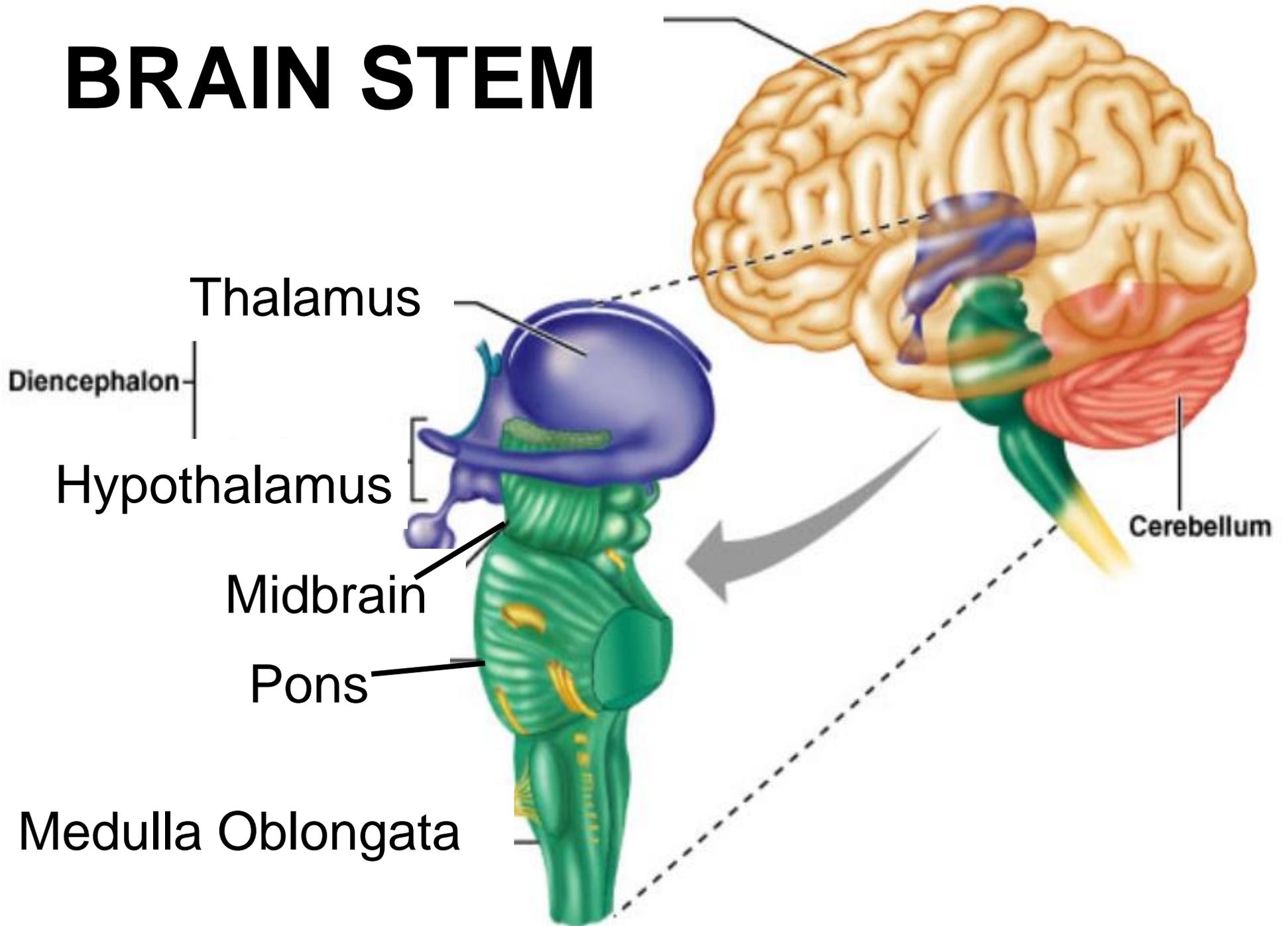
<http://youtu.be/yYZxNsnf18Y>

13. Association Areas

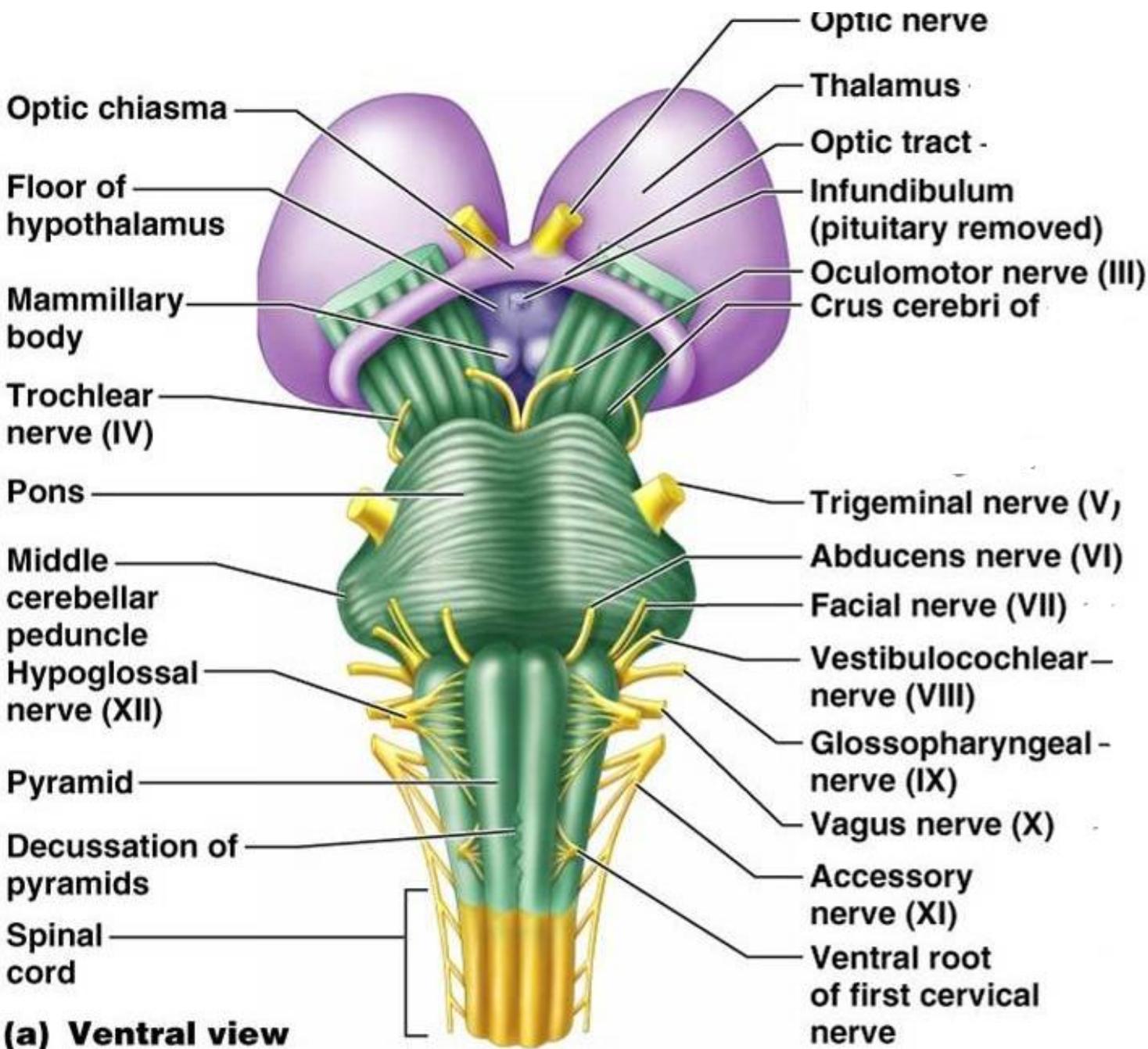
- higher levels of thinking, interpreting and analyzing information



BRAIN STEM



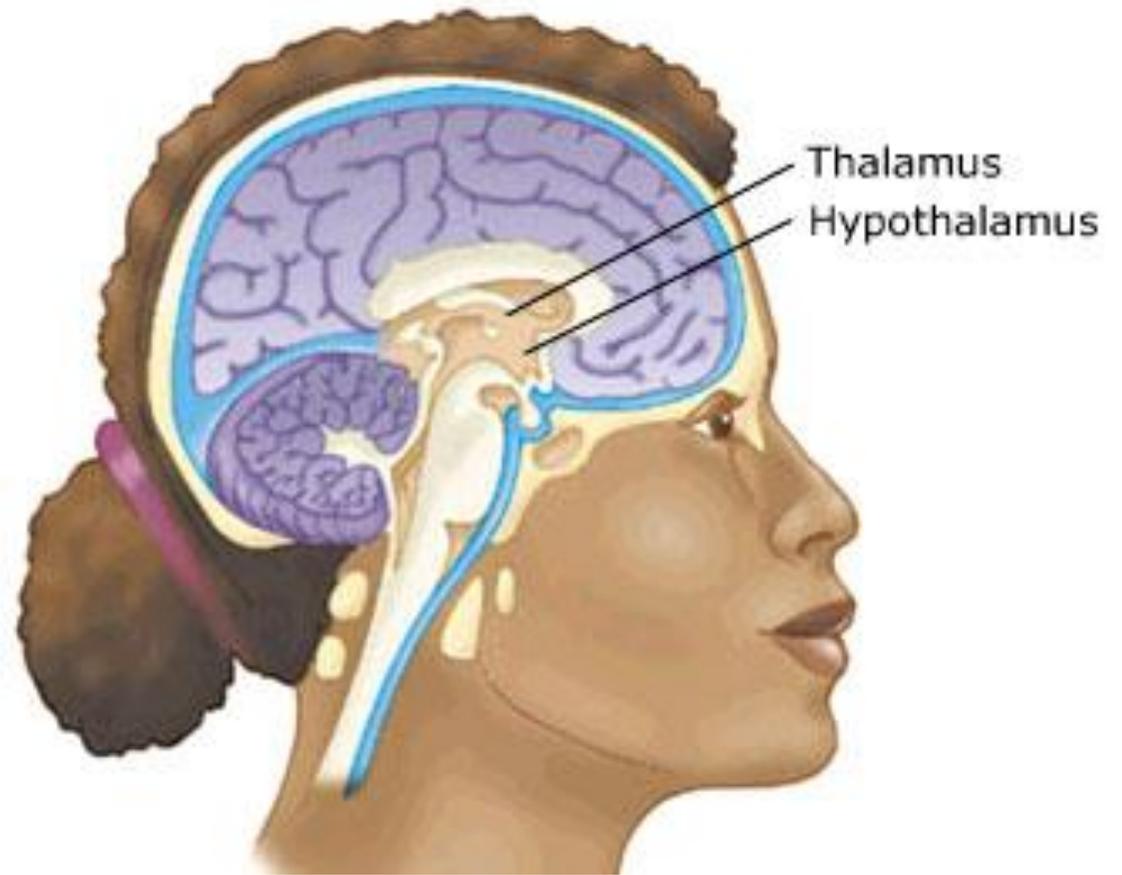
Brain Stem - from a different angle and showing the nerves



(a) Ventral view

1. Diencephalon

has 2 parts.....

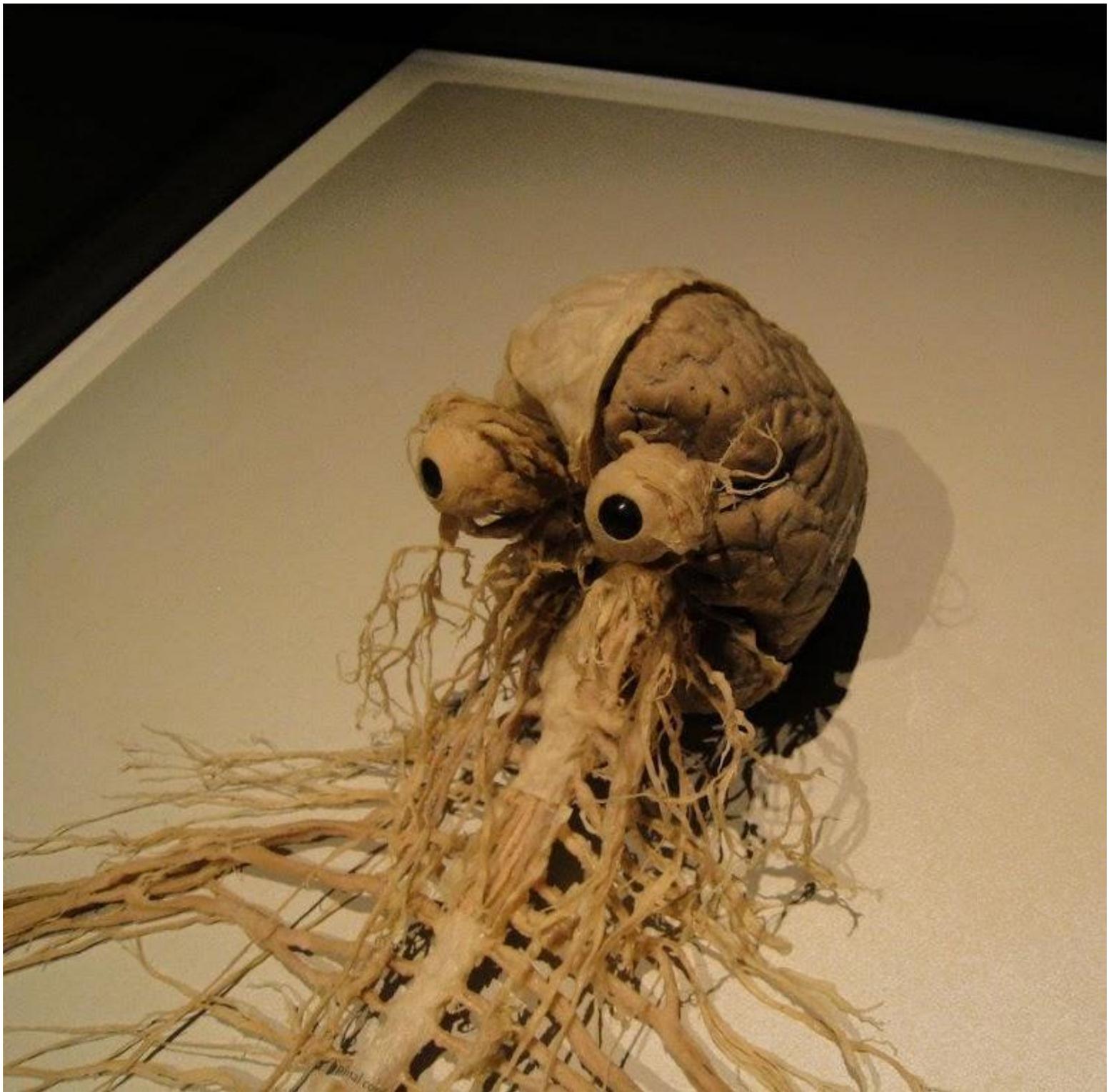


Hypothalamus - hormones, heart rate, blood pressure, body temp, hunger

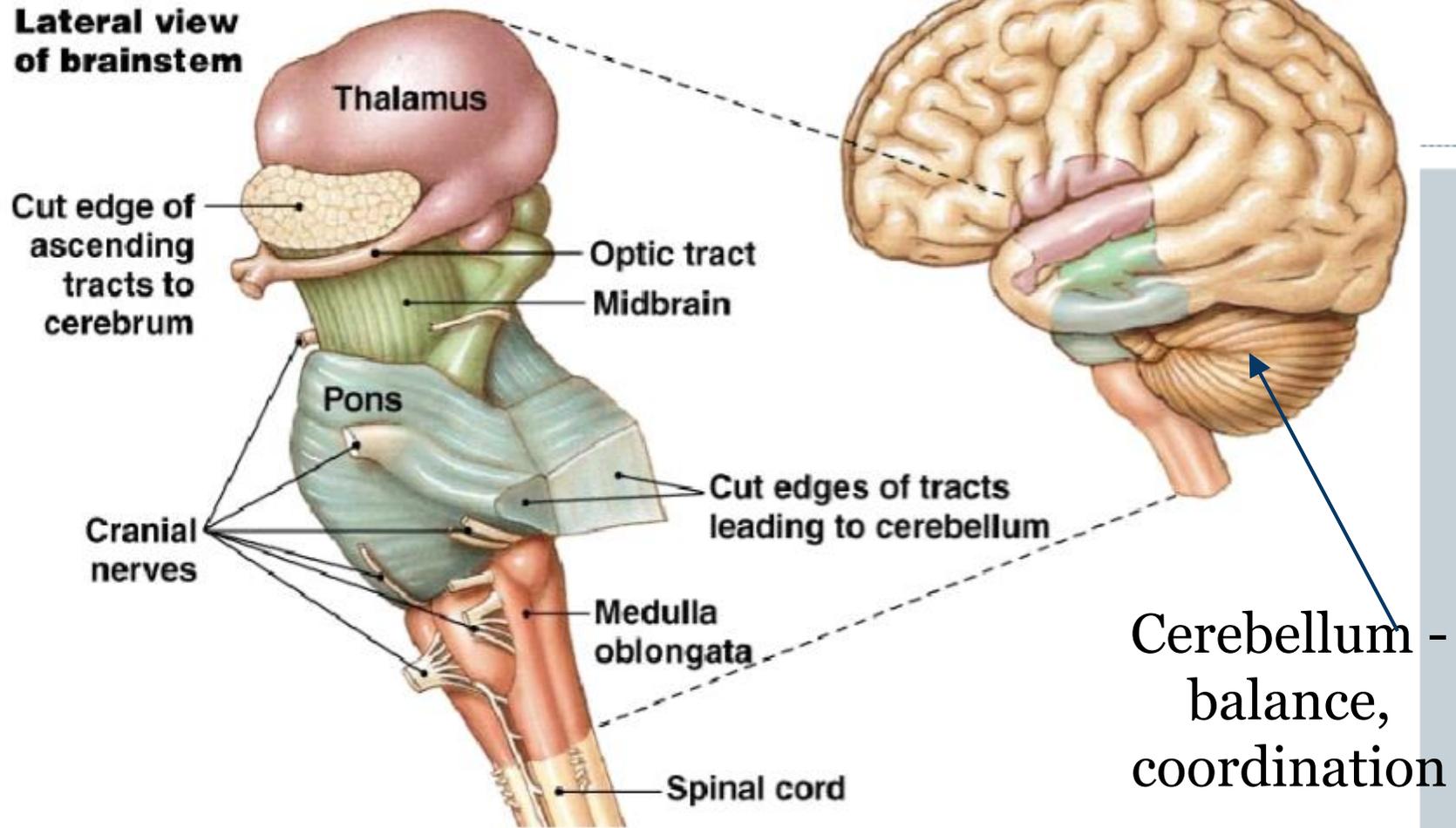
Thalamus - relay station

4. Optic Tract / Chiasma - optic nerves cross over each other

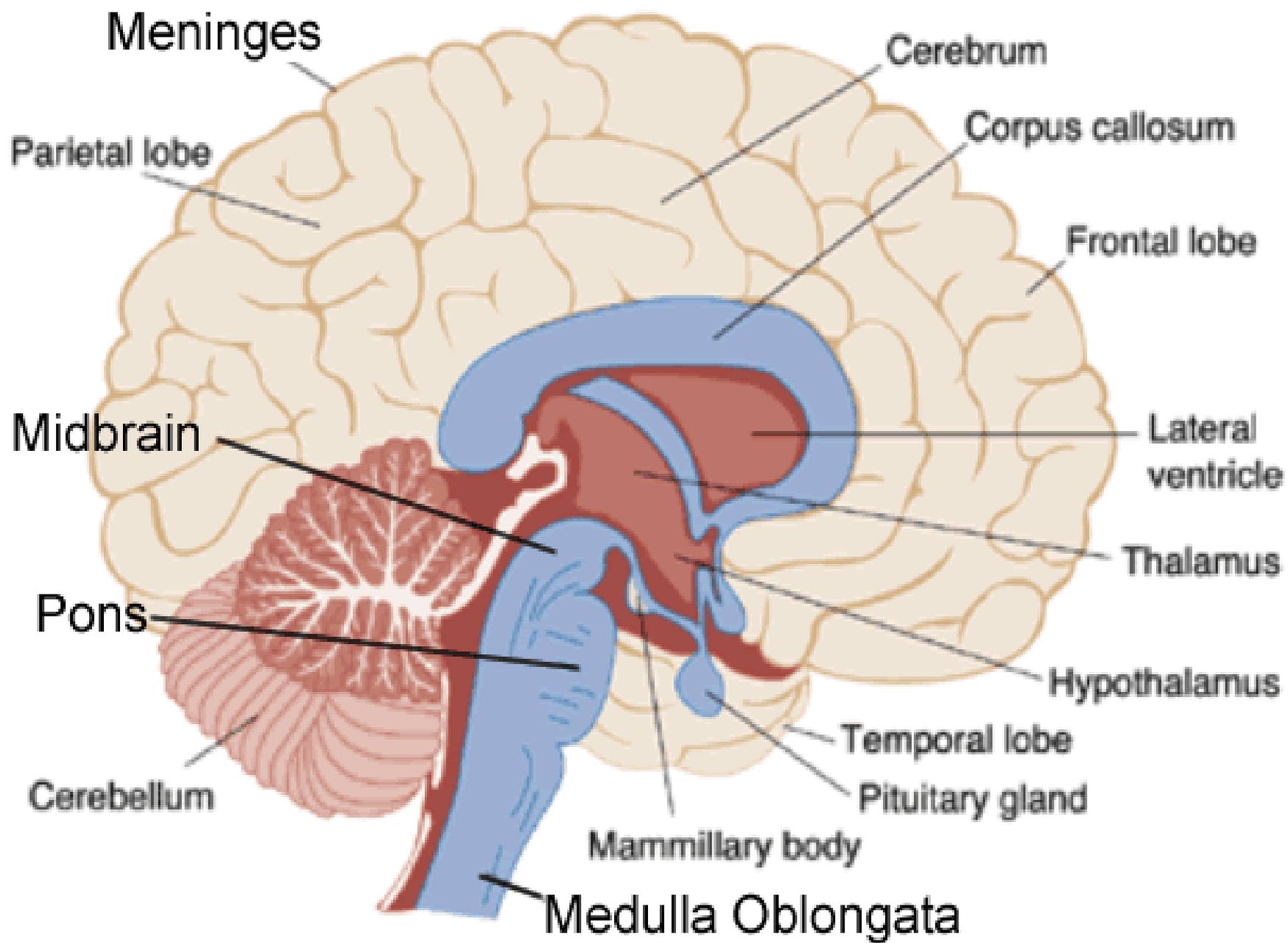




**Lateral view
of brainstem**

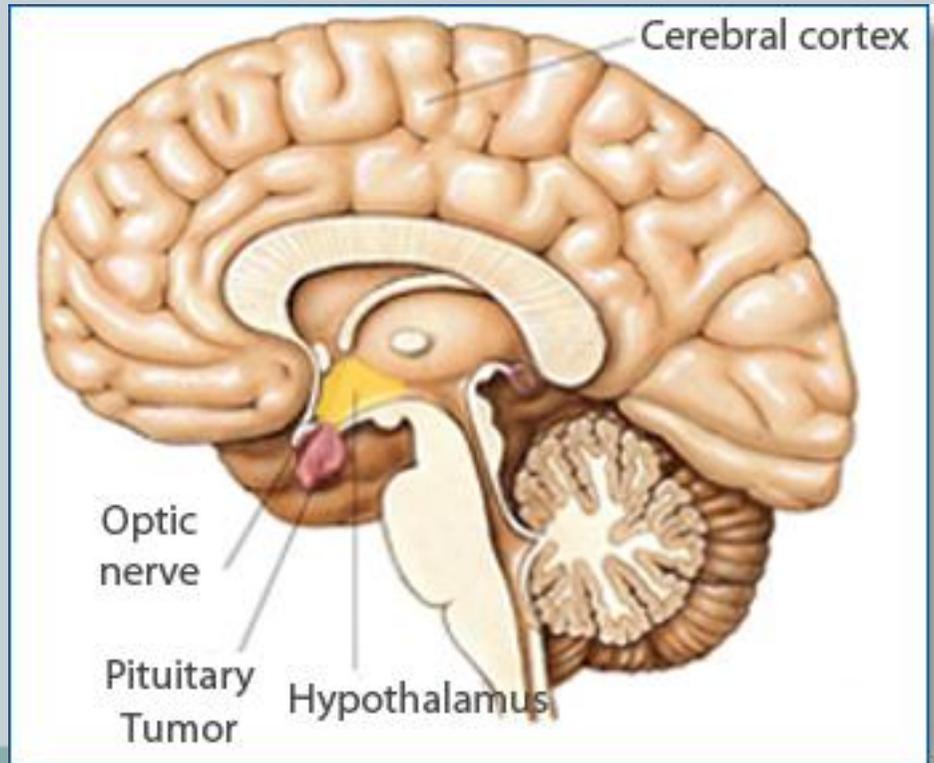
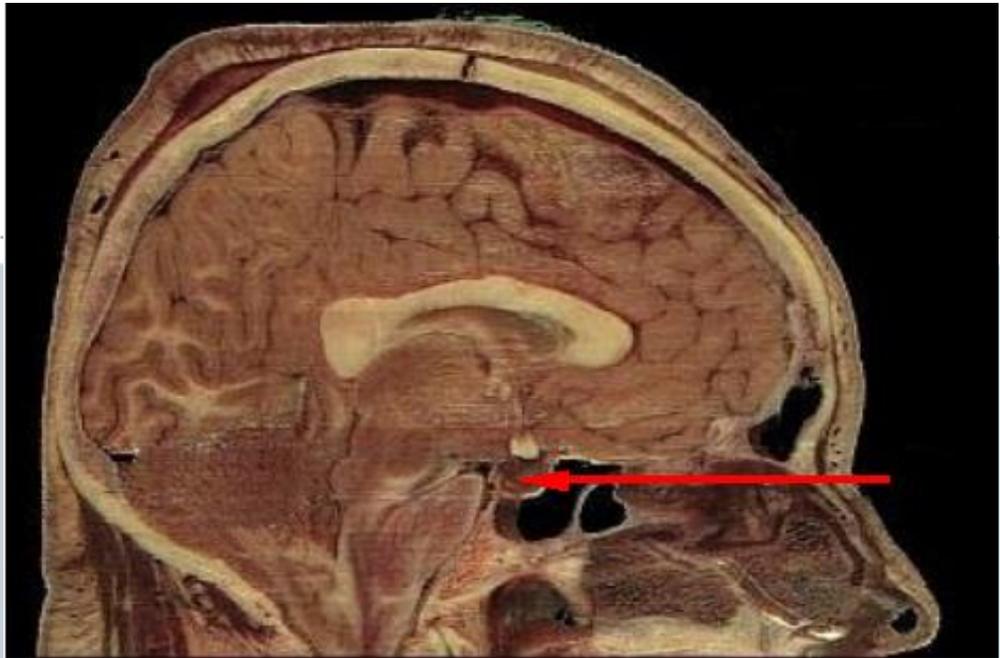


5. Midbrain – visual reflexes, eye movements
6. Pons - relay sensory information
7. Medulla – heart, respiration, blood pressure

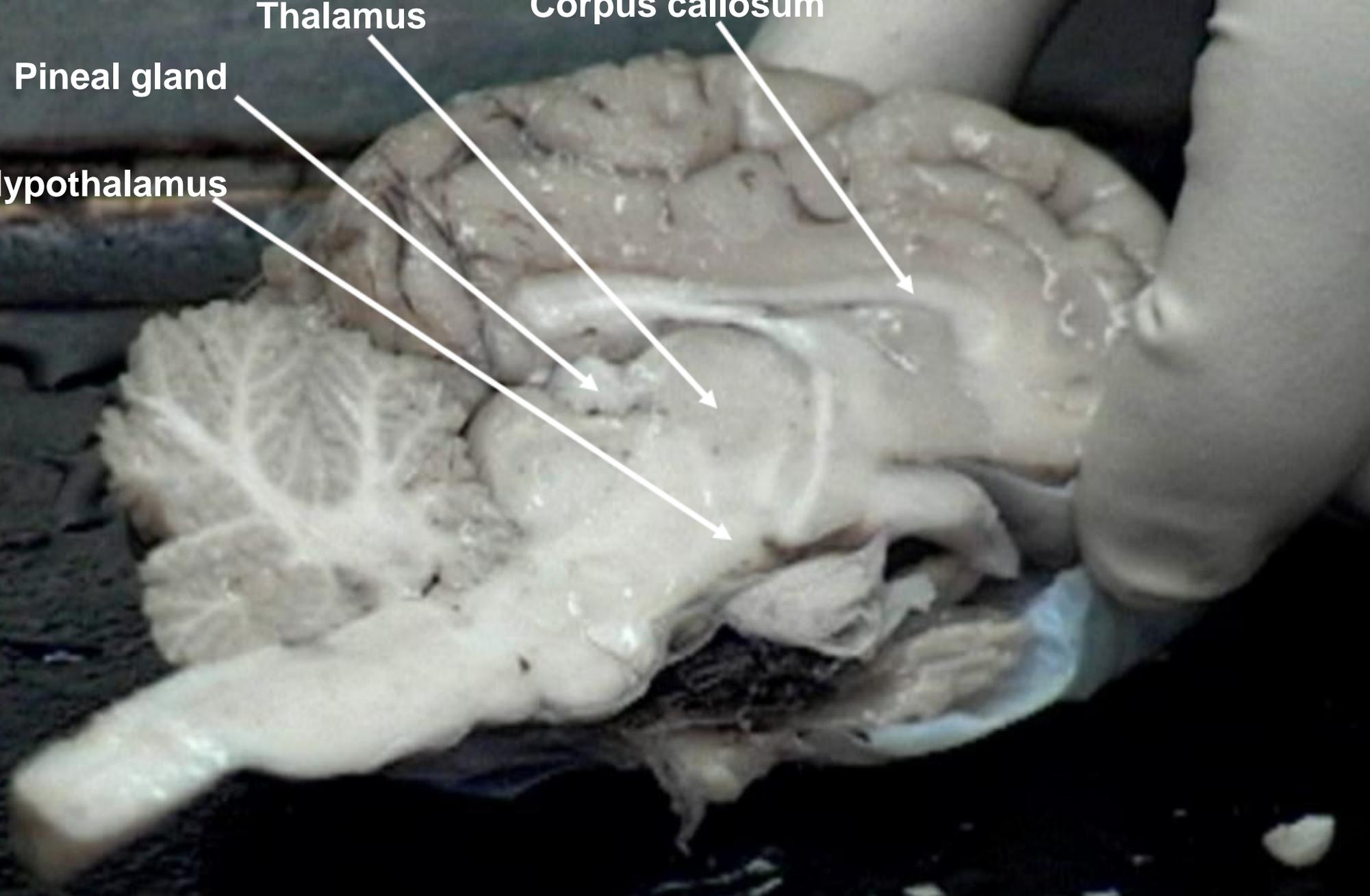


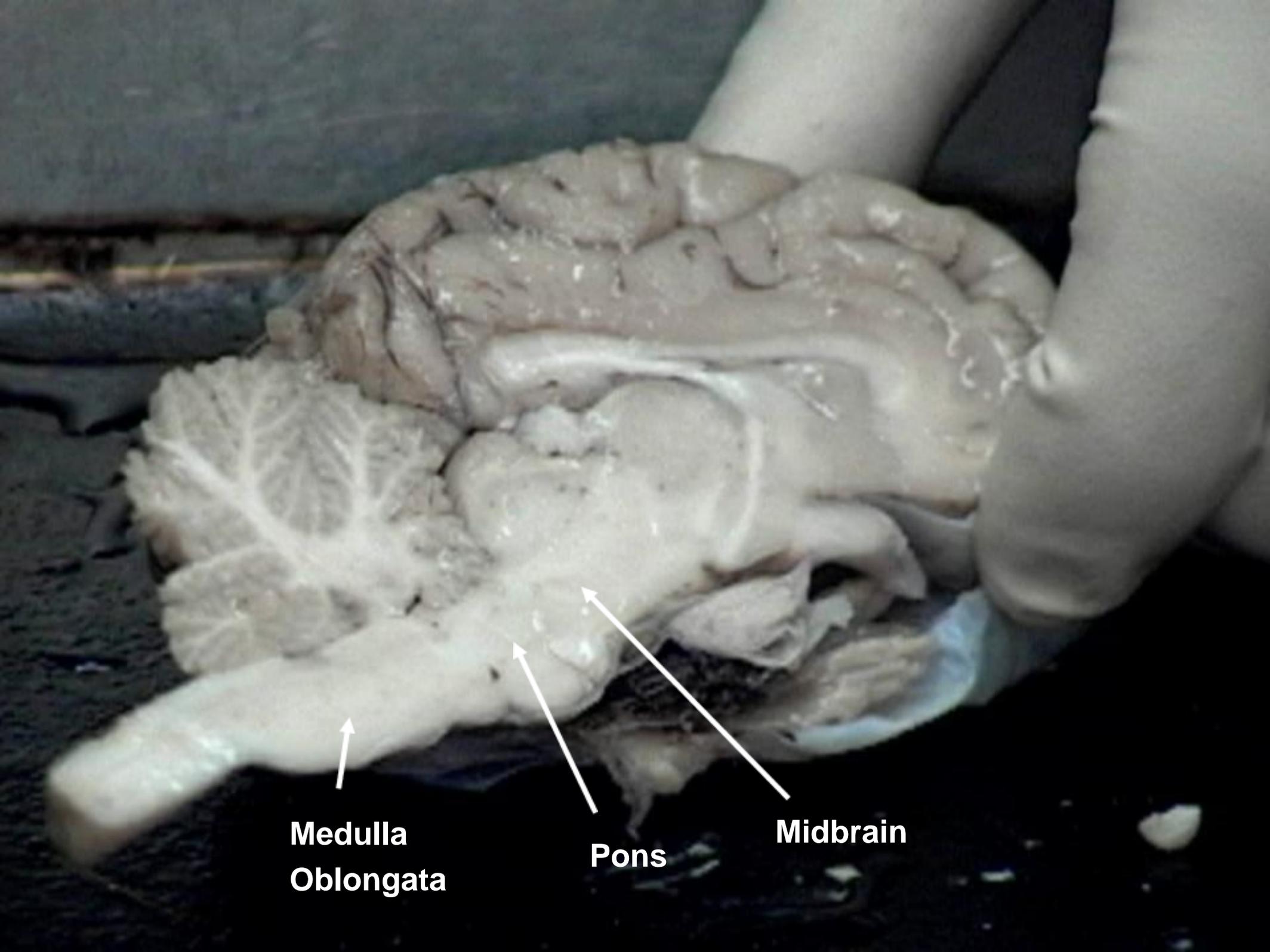
Pituitary Gland

The "master gland" of the endocrine system. It controls hormones.



Thalamus
Corpus callosum
Pineal gland
Hypothalamus





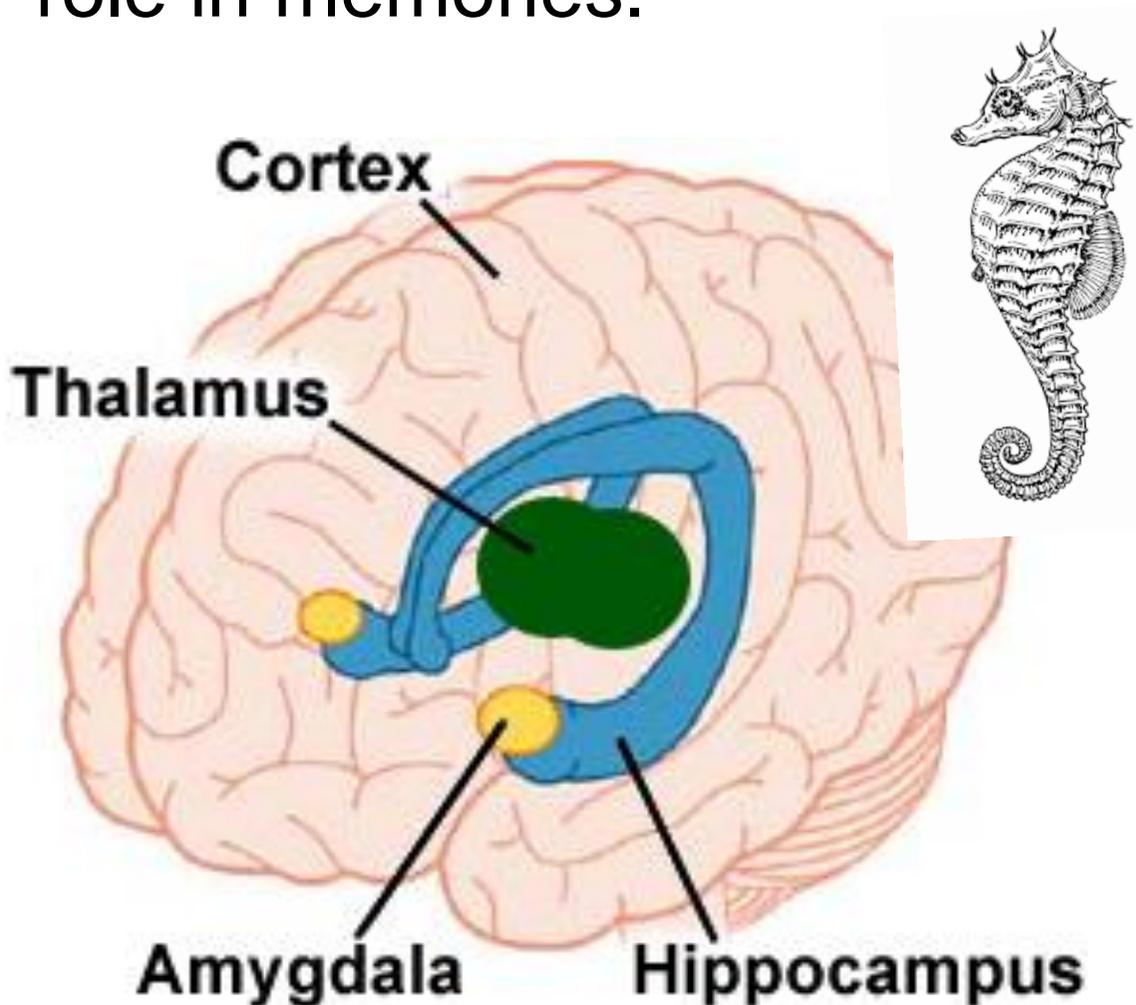
**Medulla
Oblongata**

Pons

Midbrain

9. HIPPOCAMPUS

Memory is controlled by the **HIPPOCAMPUS** (“sea horse”; that’s its shape). The hippocampus plays a major role in memories.

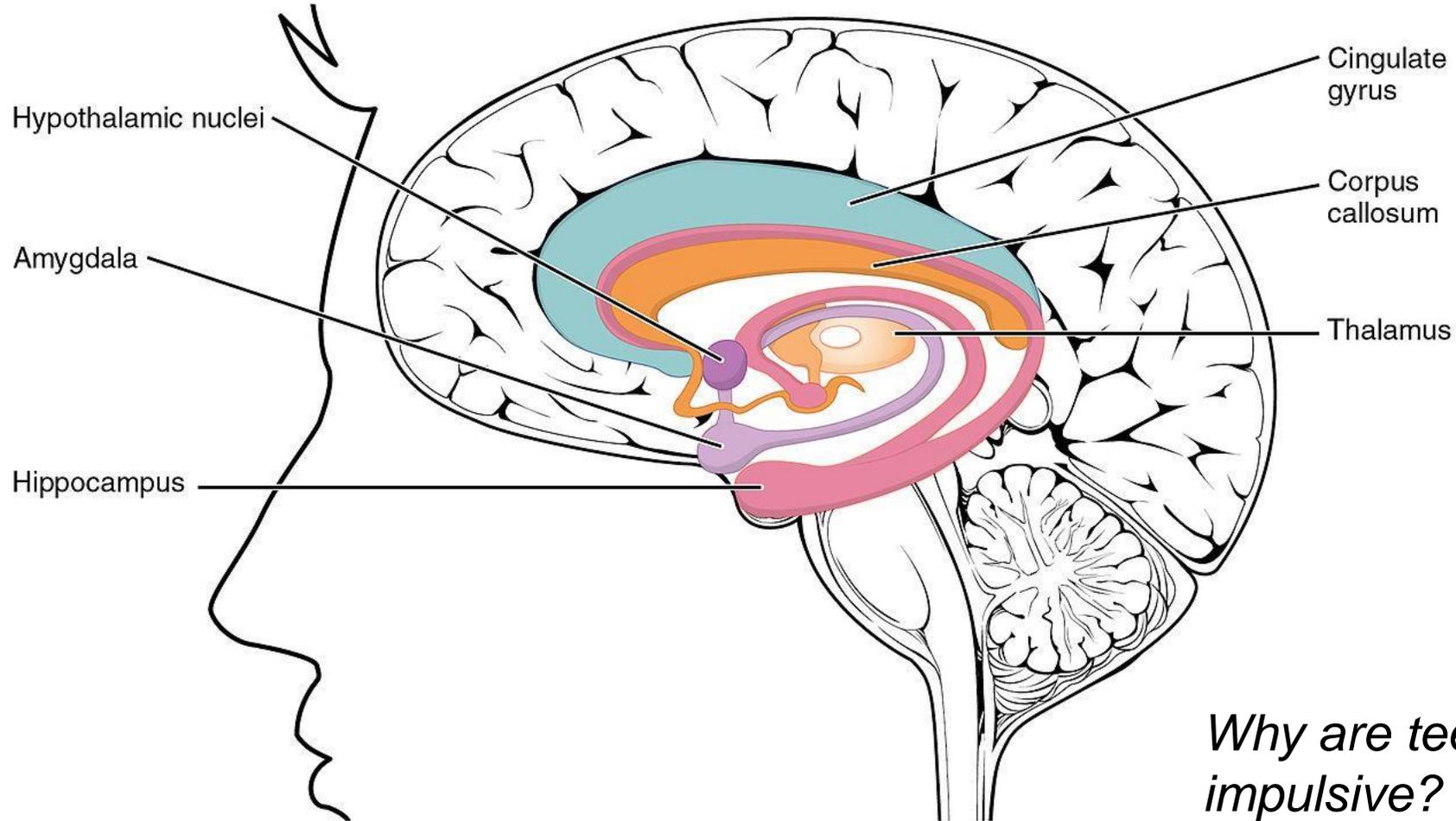


10. Amygdala - storage of memories associated with emotional events.

~Also associated with **fear** response and **aggression**

11. The LIMBIC SYSTEM

- hypothalamus, hippocampus, amygdala (and several other nearby areas)
- main function is in **emotions**



Why are teenagers impulsive?

MEMORY



We used to classify memory as being long-term or short-term. The new classification is four memory systems that process information for storage and retrieval:

Types of Memory:

Short vs Long Term

Human Memory

Sensory Memory
(< 1 sec)

Short-term Memory
(Working Memory)
(< 1 min)

Long-term Memory
(life-time)

Explicit Memory
(conscious)

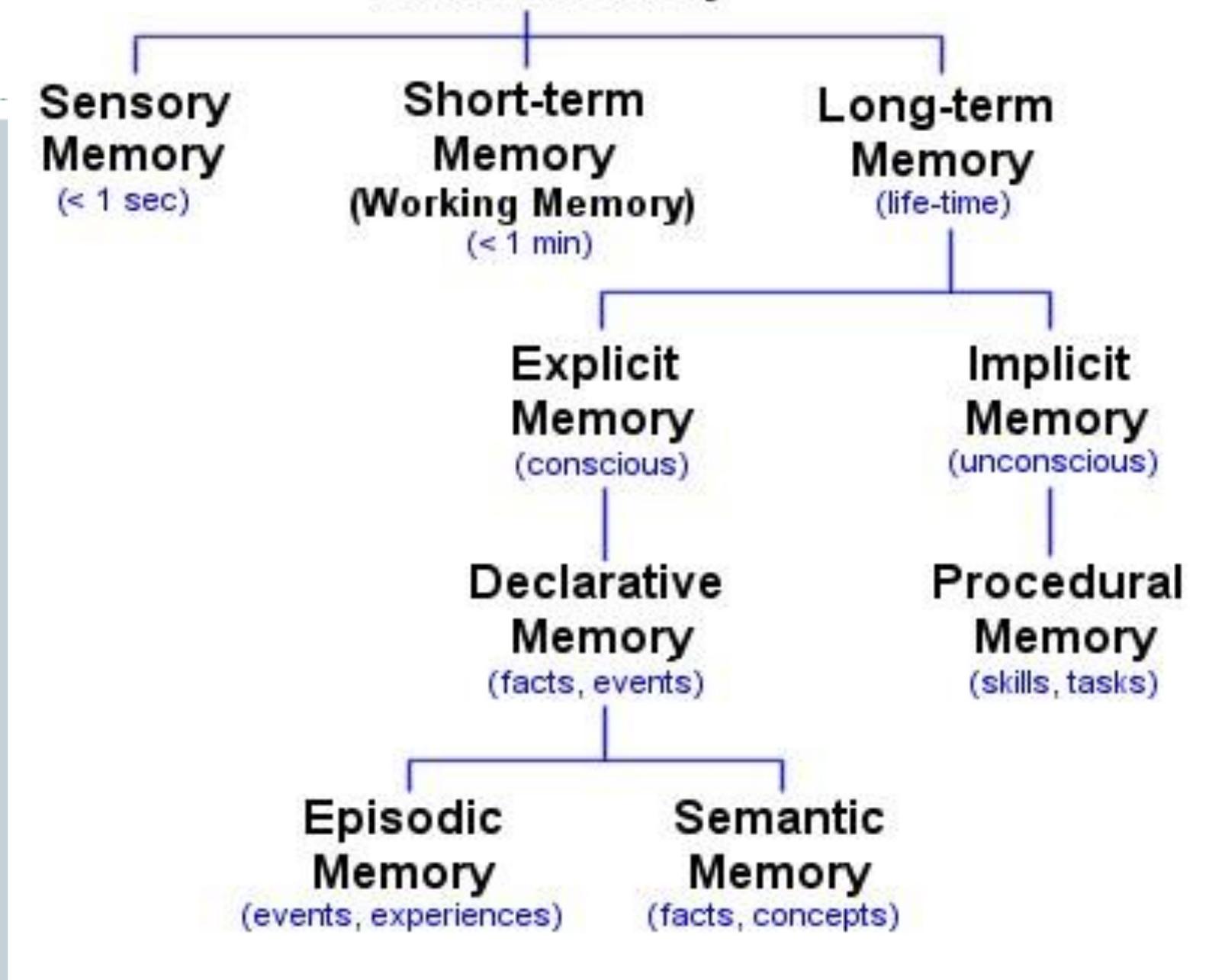
Implicit Memory
(unconscious)

Declarative Memory
(facts, events)

Procedural Memory
(skills, tasks)

Episodic Memory
(events, experiences)

Semantic Memory
(facts, concepts)



How important are your memories?

If you were involved in a traumatic event, such as a rape or a terrorist attack, would you take a pill that would make it so that you did not remember the event?

<http://psychcentral.com/news/2011/05/27/drug-metyrapone-to-erase-bad-memories/26532.html>



Episodic Memory



Involved in remembering personal experiences, such as a phone conversation you had yesterday or the movie you watched last week.

Challenge:

Do you remember the first Harry Potter movie? What was the story? How many details do you remember?

Semantic Memory

Manages the storage and retrieval of general knowledge of facts, such as the number of days in a year or the colors in a rainbow.

Naming objects is semantic memory.

Semantic Memory Tasks

1. *What do you call this thing?*
2. *Where do Kangaroos live?*
3. *What actor played Bella in Twilight?*
4. *Who is the vice president?*



Procedural Memory



Allows us to learn activities and skills that will then be performed automatically with little or no conscious thought.

Examples are riding a bicycle or driving a car.

Challenge:

1. Can you make a teacup with a length of string?
2. Do you know how to use a can opener?

Working Memory



provides temporary storage of information necessary for such complex cognitive tasks as language comprehension, learning, and reasoning.

[Working Memory Test](#)



Your poll will show here

1

Install the app from
pollev.com/app

2

Make sure you are in
Slide Show mode

Still not working? Get help at pollev.com/app/help

or

[Open poll in your web browser](#)



Memory - Sometimes it's good to forget things.. why?



<http://www.scientificamerican.com/article.cfm?id=memory-brain-tour-video>

Video on memory and where memories are stored and retrieved.

Check out these [brain images!](#)

