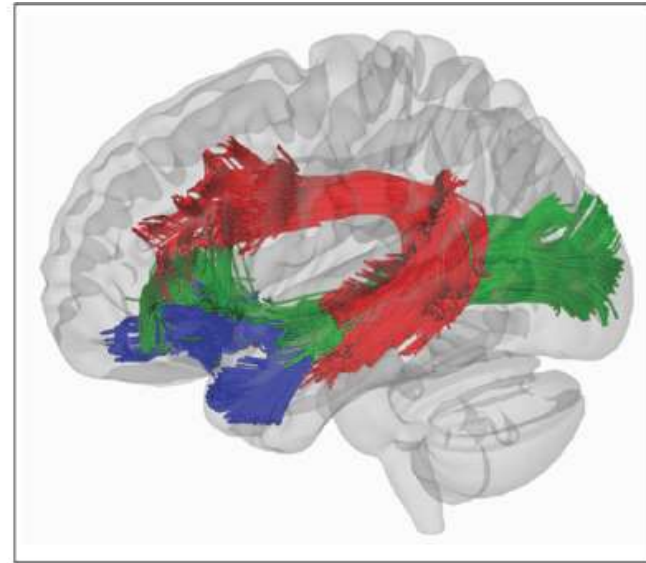
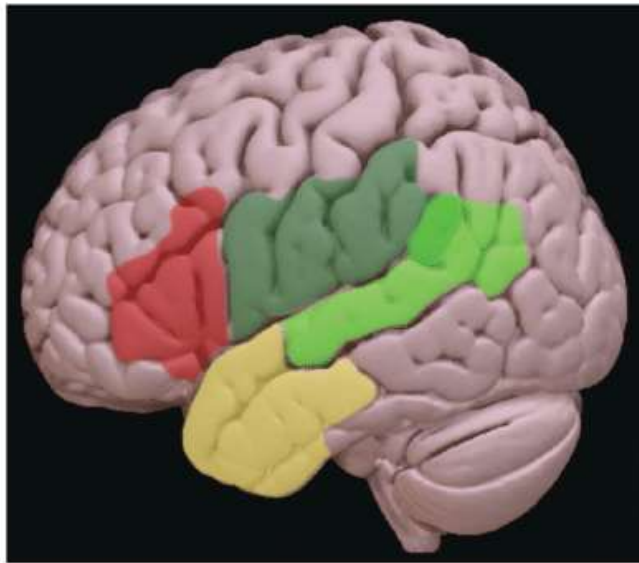


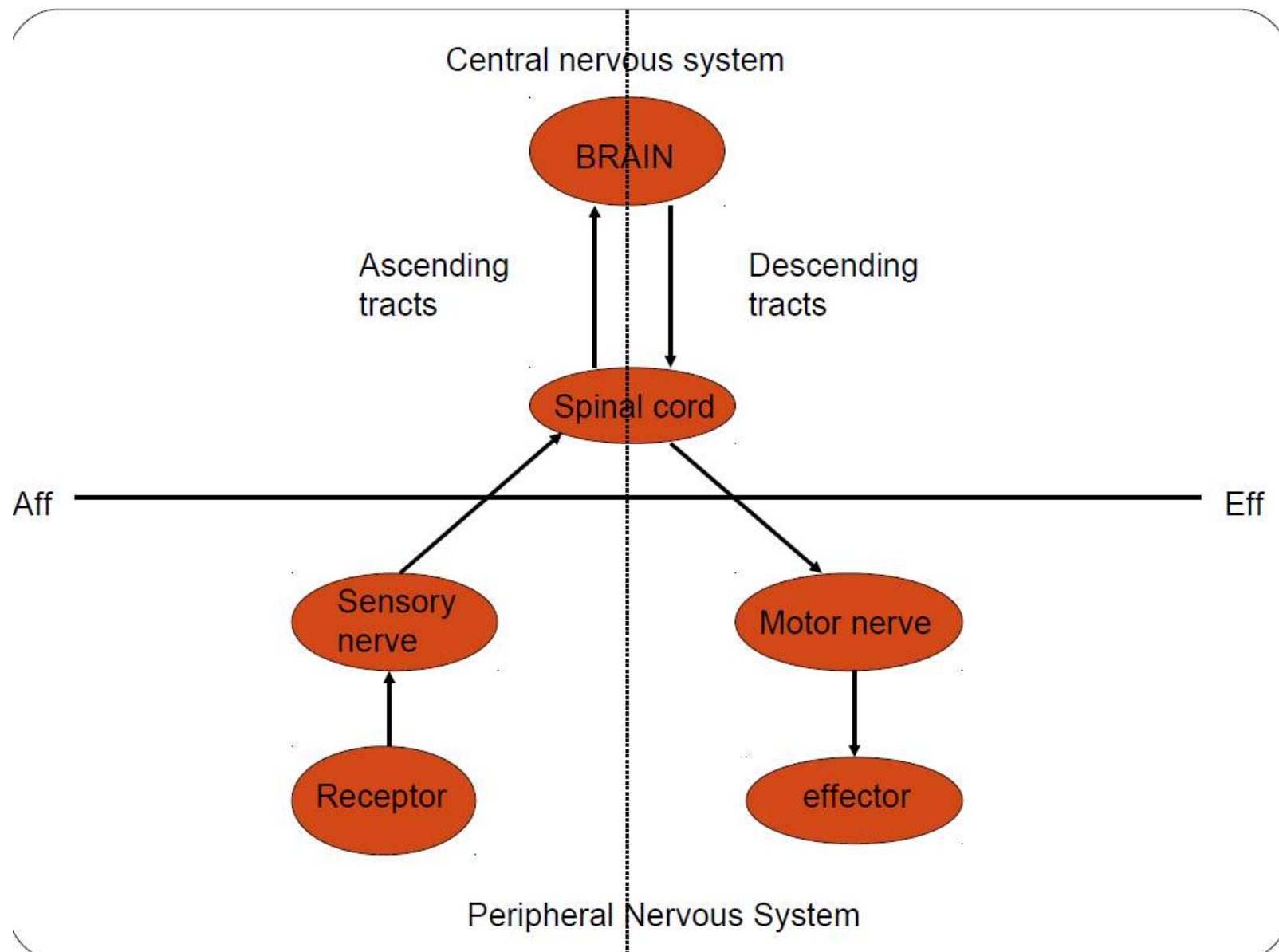
Clinical Neuro-anatomy

(A problem based approach)



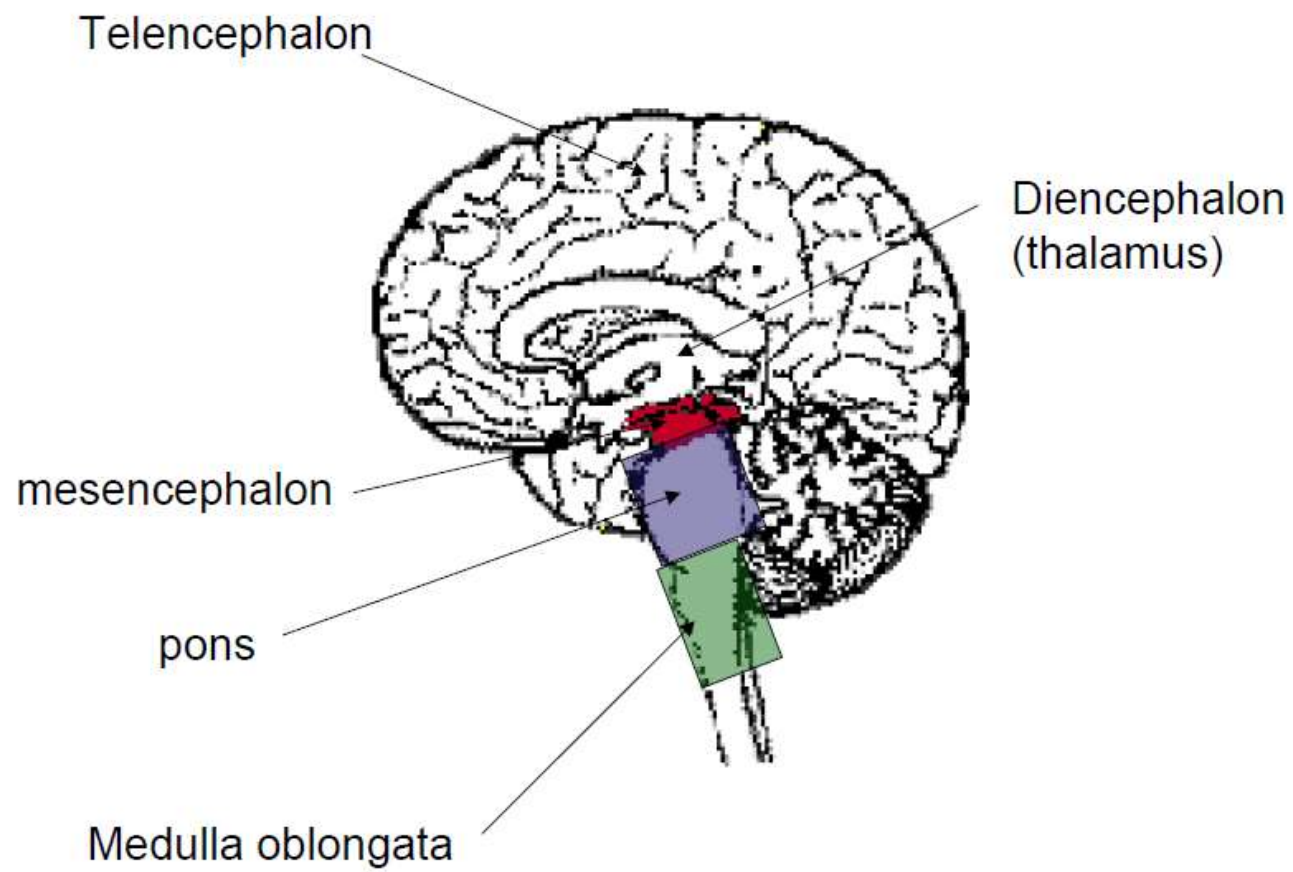
Department of Surgery
Hamdard Institute of Medical Sciences and Research

Dr Bhoopendra singh
Mch Neurosurgery

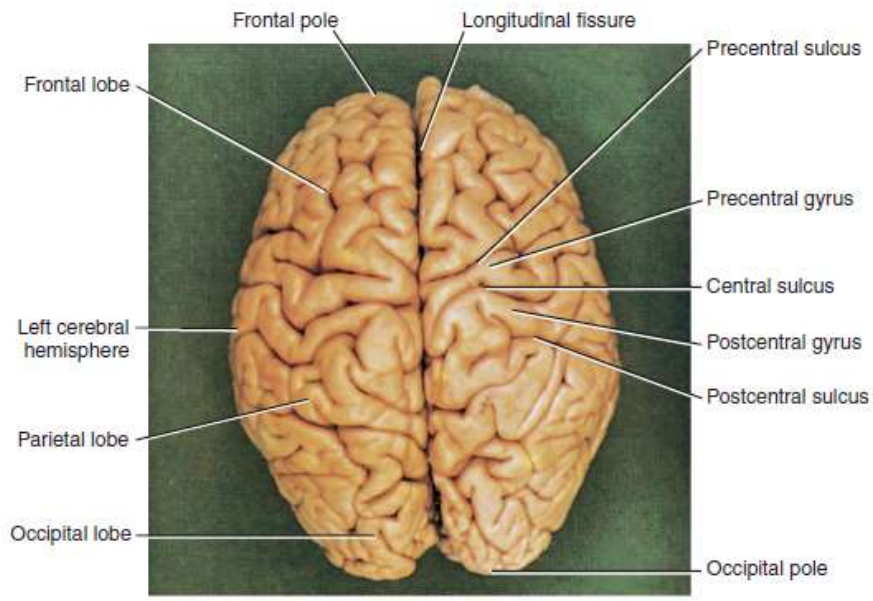


Divisions of the Brain

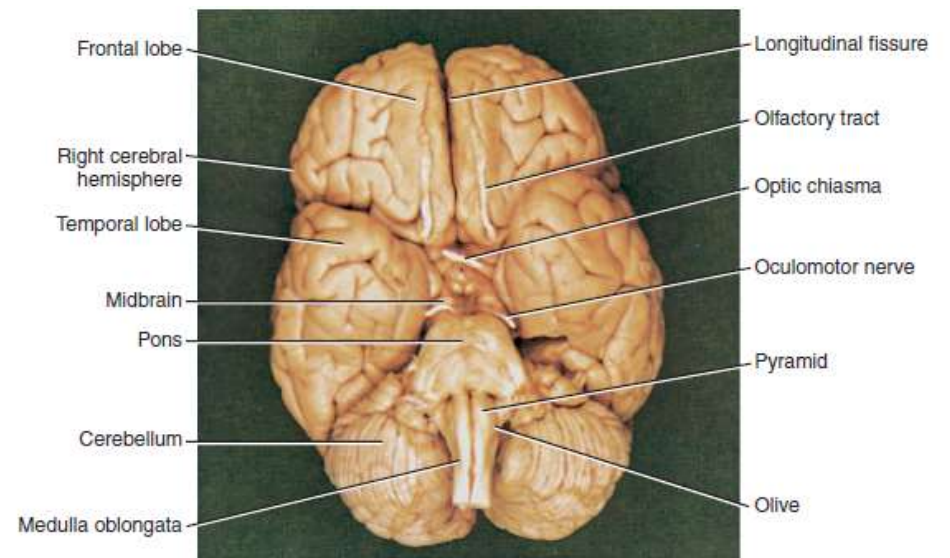
<u>Major Division</u>	<u>Subdivision</u>	<u>Structures</u>
Prosencephalon (Forebrain)	Telencephalon	Neocortex; Basal Ganglia; Amygdala; Hippocampus; Lateral Ventricles
	Diencephalon	Thalamus; Hypothalamus; Epithalamus; Third Ventricle
Mesencephalon (Midbrain)	Mesencephalon	Tectum; Tegmentum; Cerebral Aqueduct
Rhombencephalon (Hindbrain)	Metencephalon	Cerebellum; Pons; Fourth Ventricle
	Myelencephalon	Medulla Oblongata; Fourth Ventricle

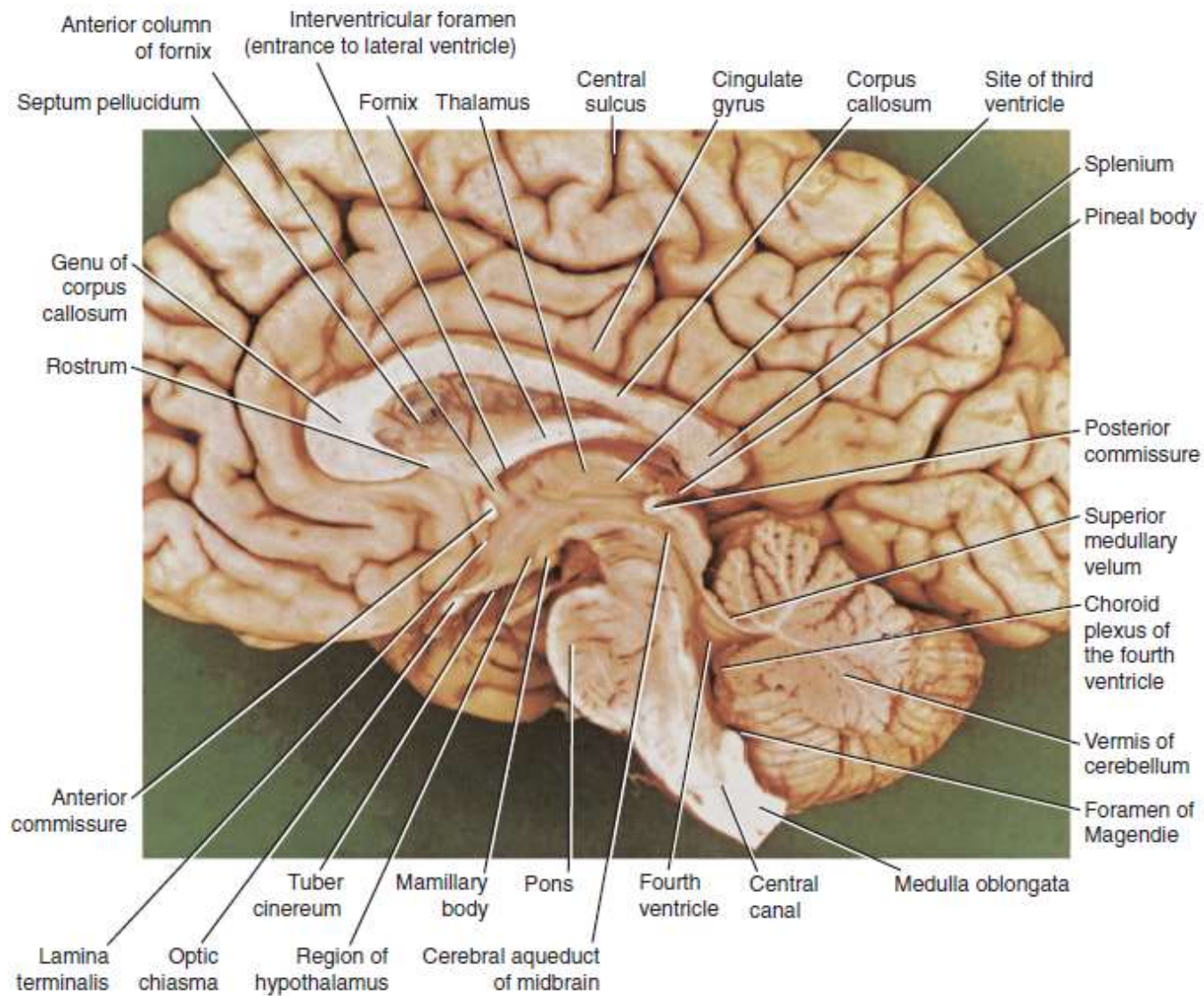


SUPERIOR VIEW



INFERIOR VIEW





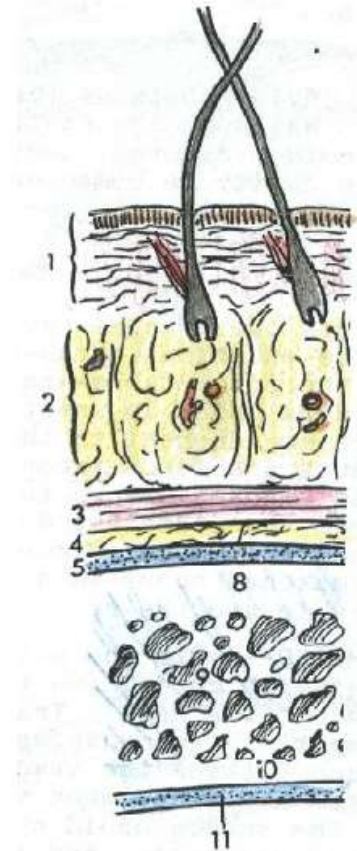
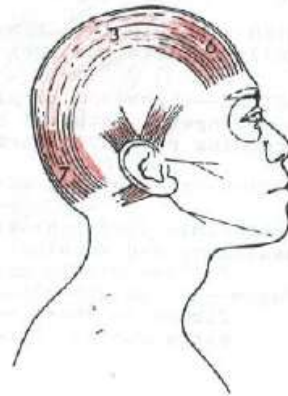
What happen if your head got injured?

- ☐ Subcutaneous haematoma
- ☐ Epidural haematoma
- ☐ Subdural hameatoma
- ☐ Subarachnoid bleeding/haemorrhage
- ☐ Contusions

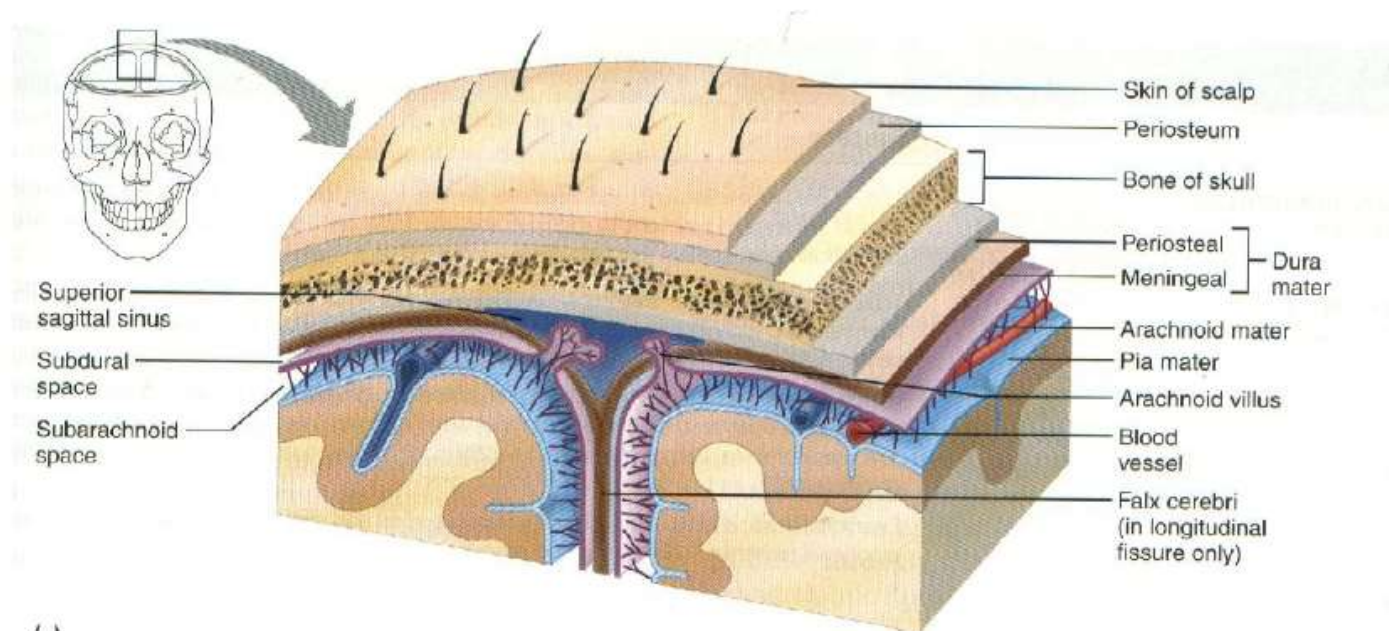
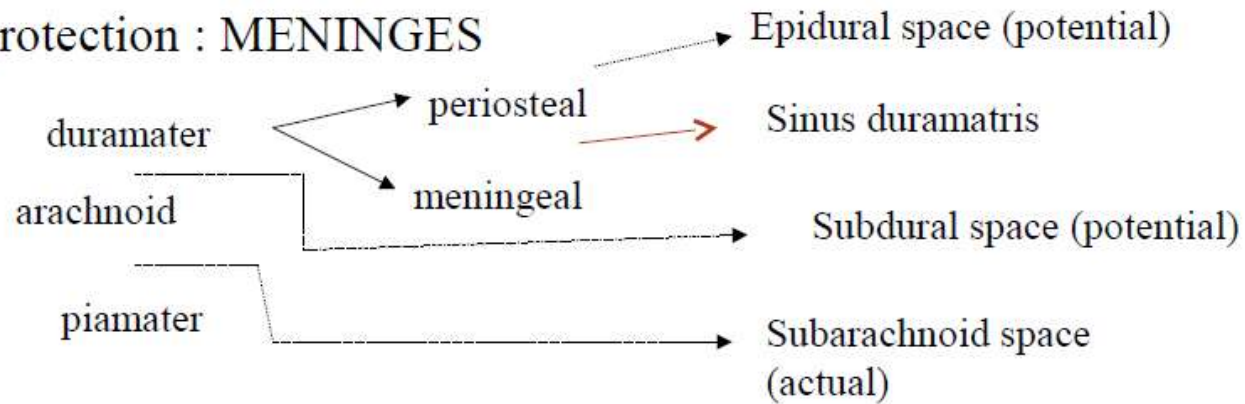
Protection of CNS :

Extracranial protection :SCALP :

1. Skin :
2. Connective tissue: contains a/v/n
3. Aponeurosis (Galea aponeurotica): tendon of frontal and occipital epicranius
4. Loose connective tissue : enabling movement of the above layer
5. Periosteum



Intracranial protection : MENINGES

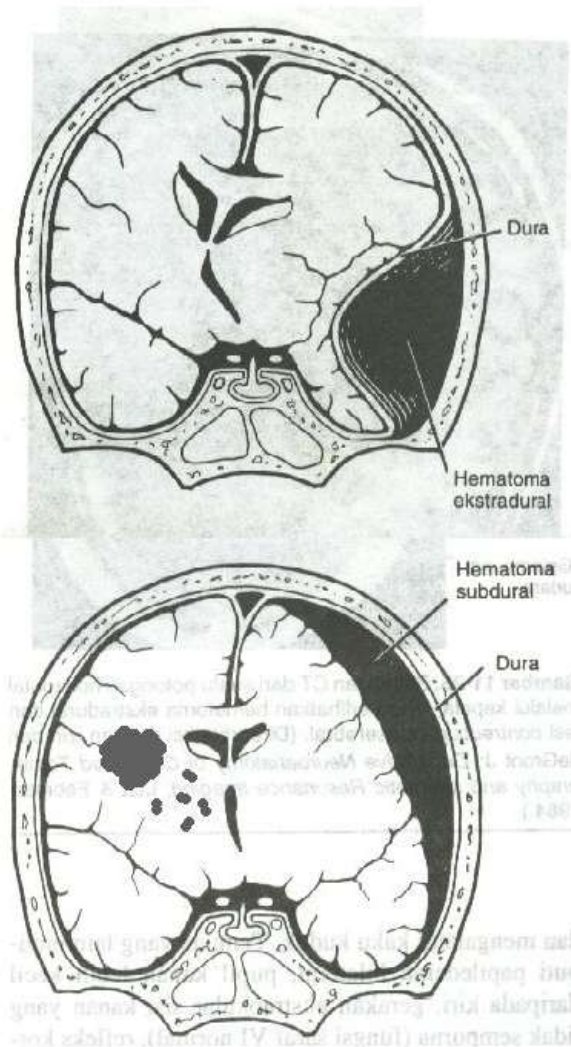


Epidural Haematom : occurred when a.meningea media is ruptured. The blood will fill the epidural space

Subdural haematom : occurred when bridging vein (connects cerebral vein to sinus sagitalis superior) is ruptured..

Subarachnoid bleeding : occurred when an aneurism of large artery of the brain is ruptured. The blood fills the subarachnoid space → usually no space occupying lesion (SOL)

Intracerebral haemorrhage (cerebrovascular accident) occurred when small branch of artery is ruptured.



Have you seen a newborn baby with a very big head?

- What do you think that cause this abnormality?

Ventricles (located inside the brain)

Lateral ventricles are located in cerebral hemispheres and have several horns

- Anterior horn (frontal lobe)
- Posterior horn (occipital lobe)
- Inferior horn (temporal lobe)

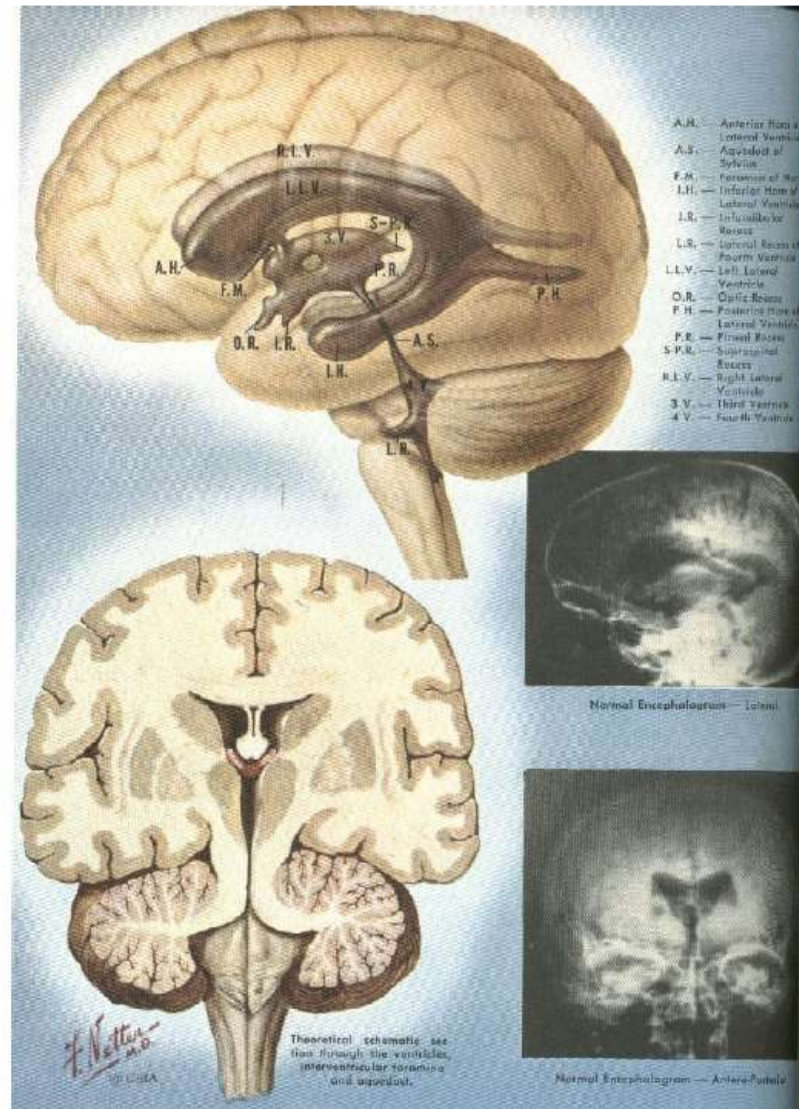
Third ventricle : located in thalamus

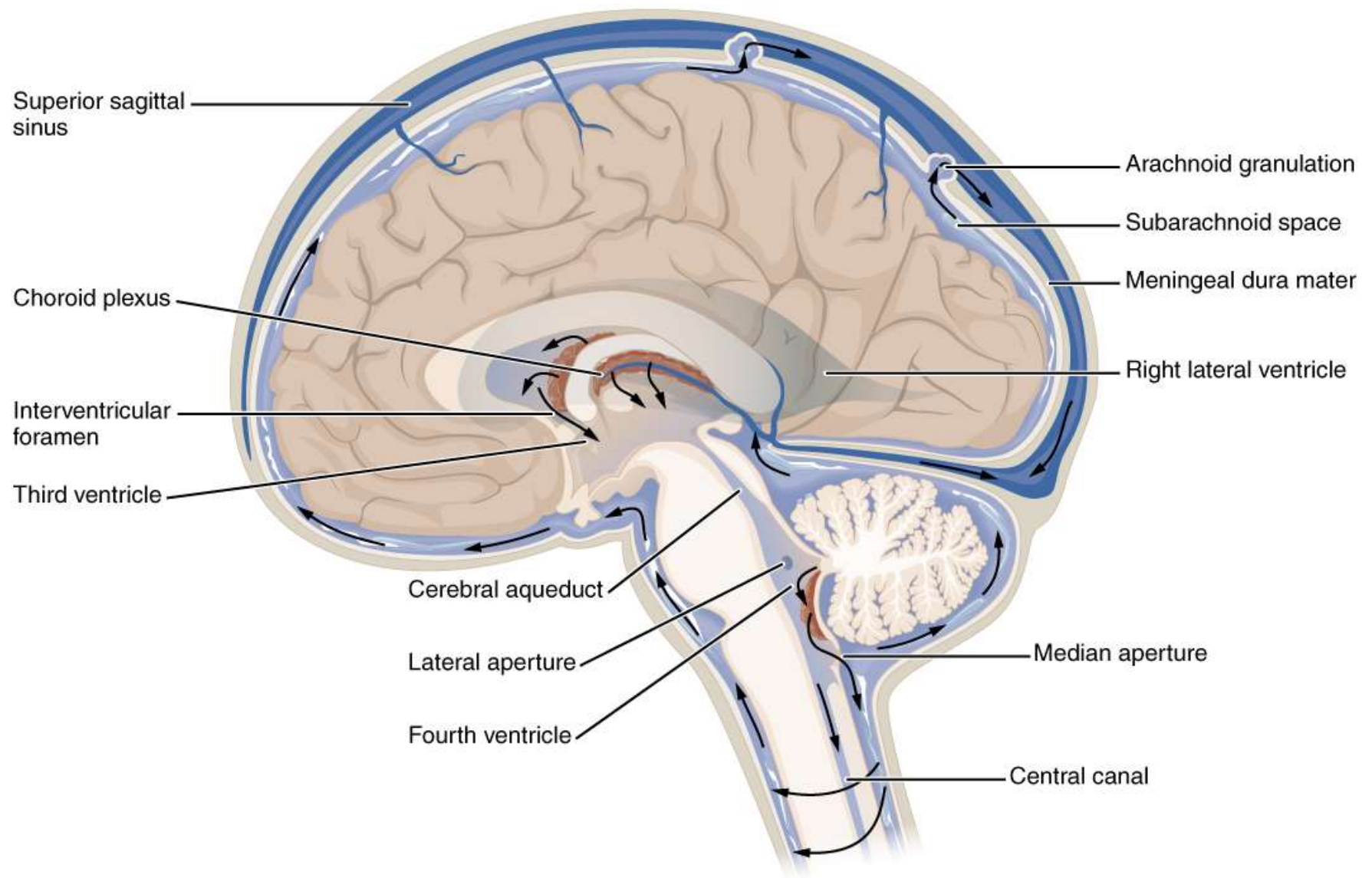
Aqueductus cerebri Sylvii (cerebral aquaduct)

Fourth ventricle → foramen luscha and foramen Magendie

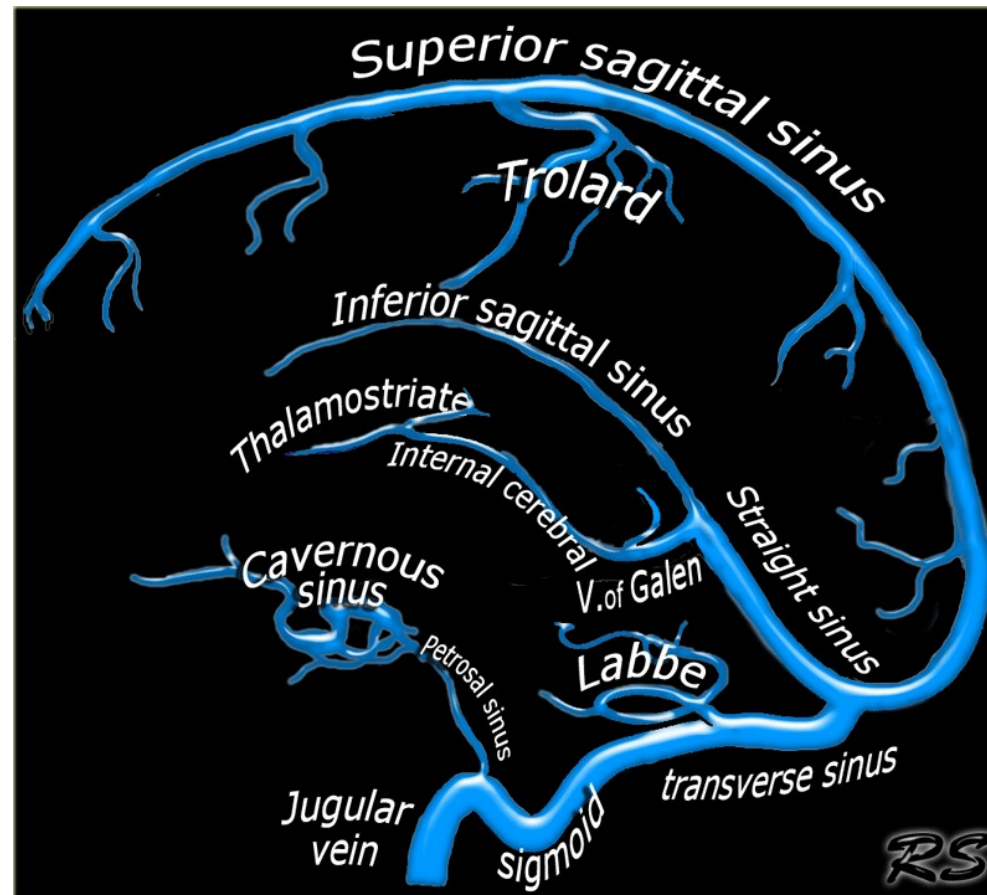
Central canal : along the spinal cord but usually undergo obliteration

* On the wall of each ventricle there are choroidal plexus which produce cerebrospinal fluid/CSF





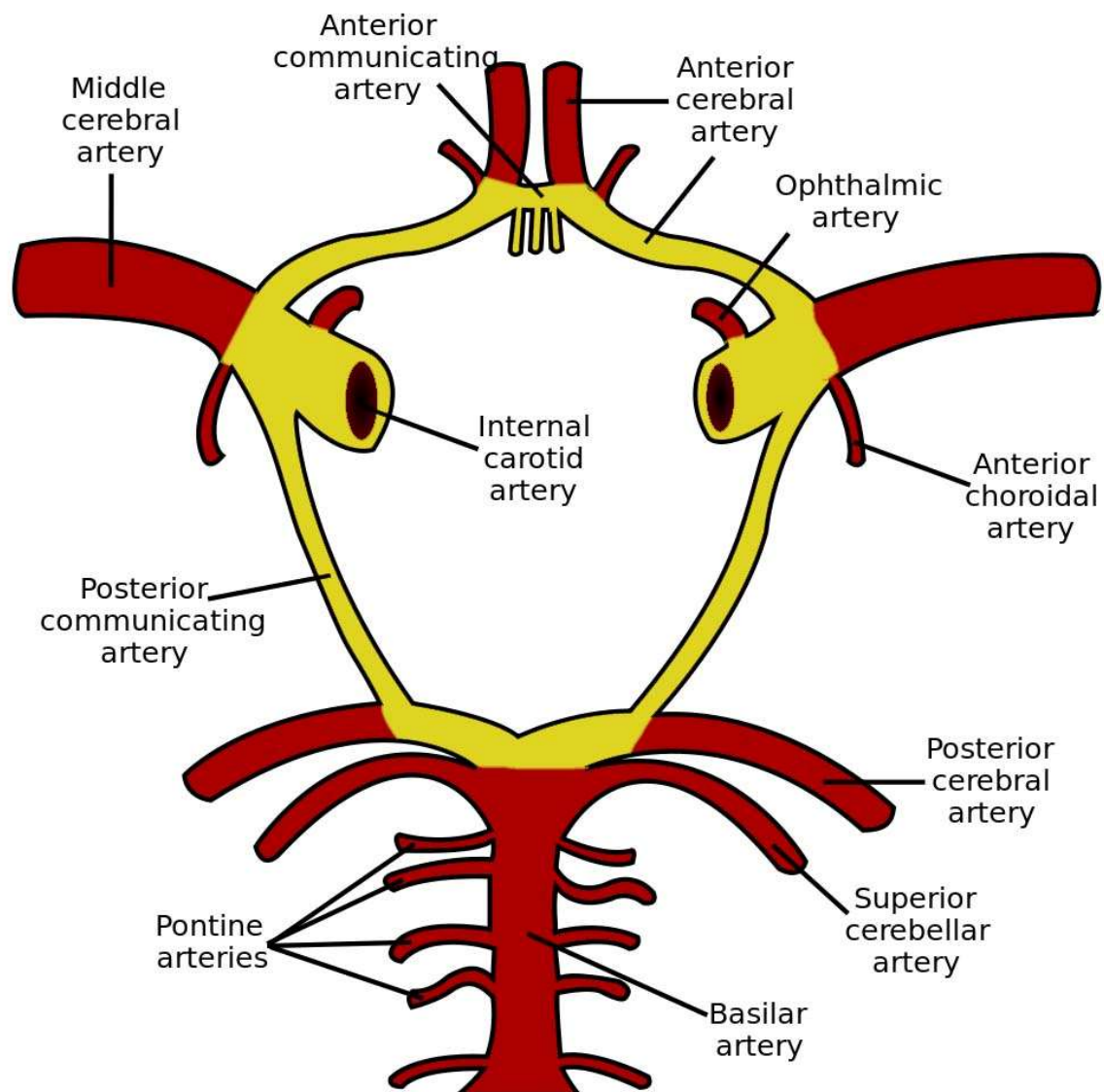
Venous drainage of brain



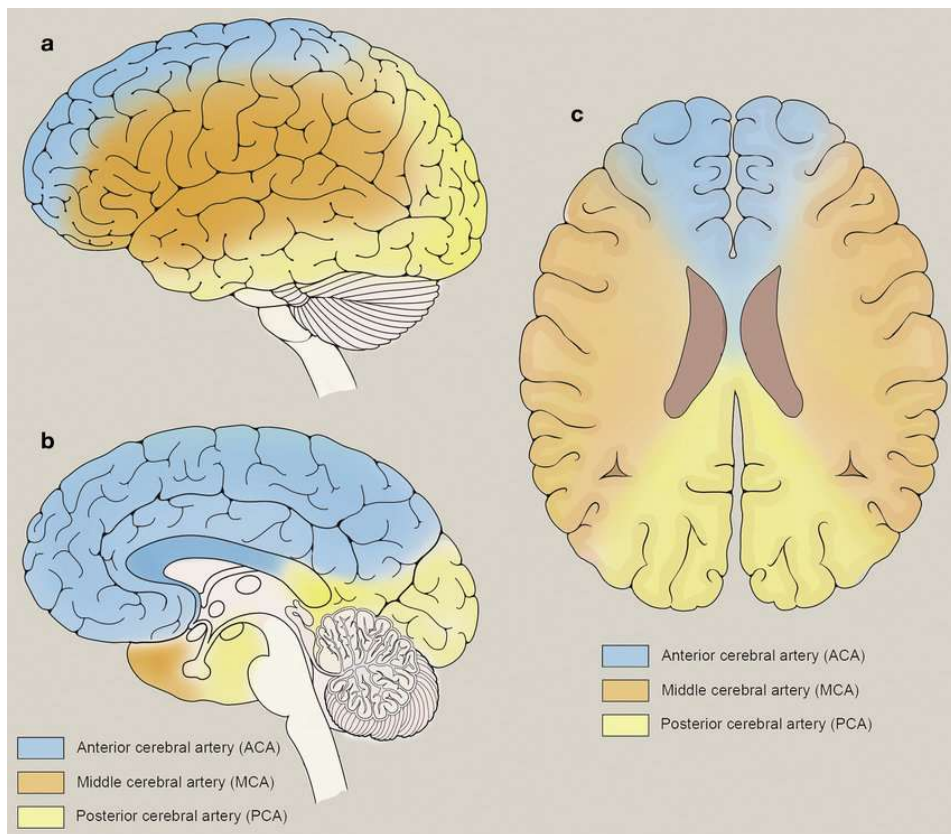
Brain arterial supply

- You know that if a patient get cerebrovascular accident he usually get paralysis. However, can you explain why patient A get arm and facial paralysis meanwhile patient B get leg paralysis only. How can it be

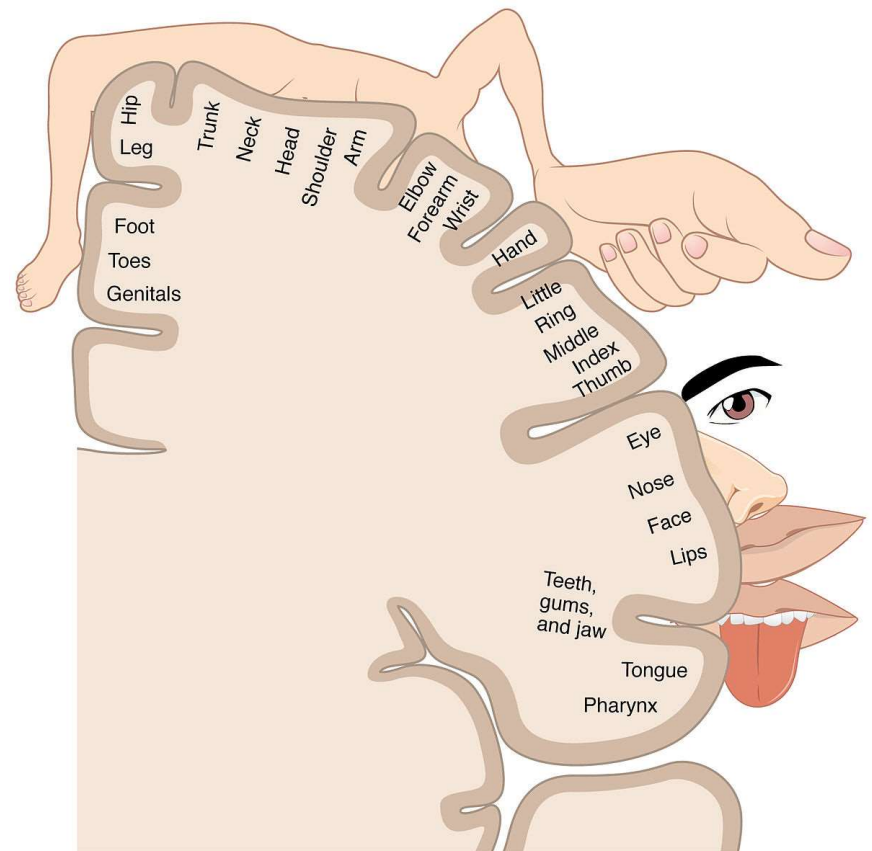
?????????



Territorial distribution



homunculus



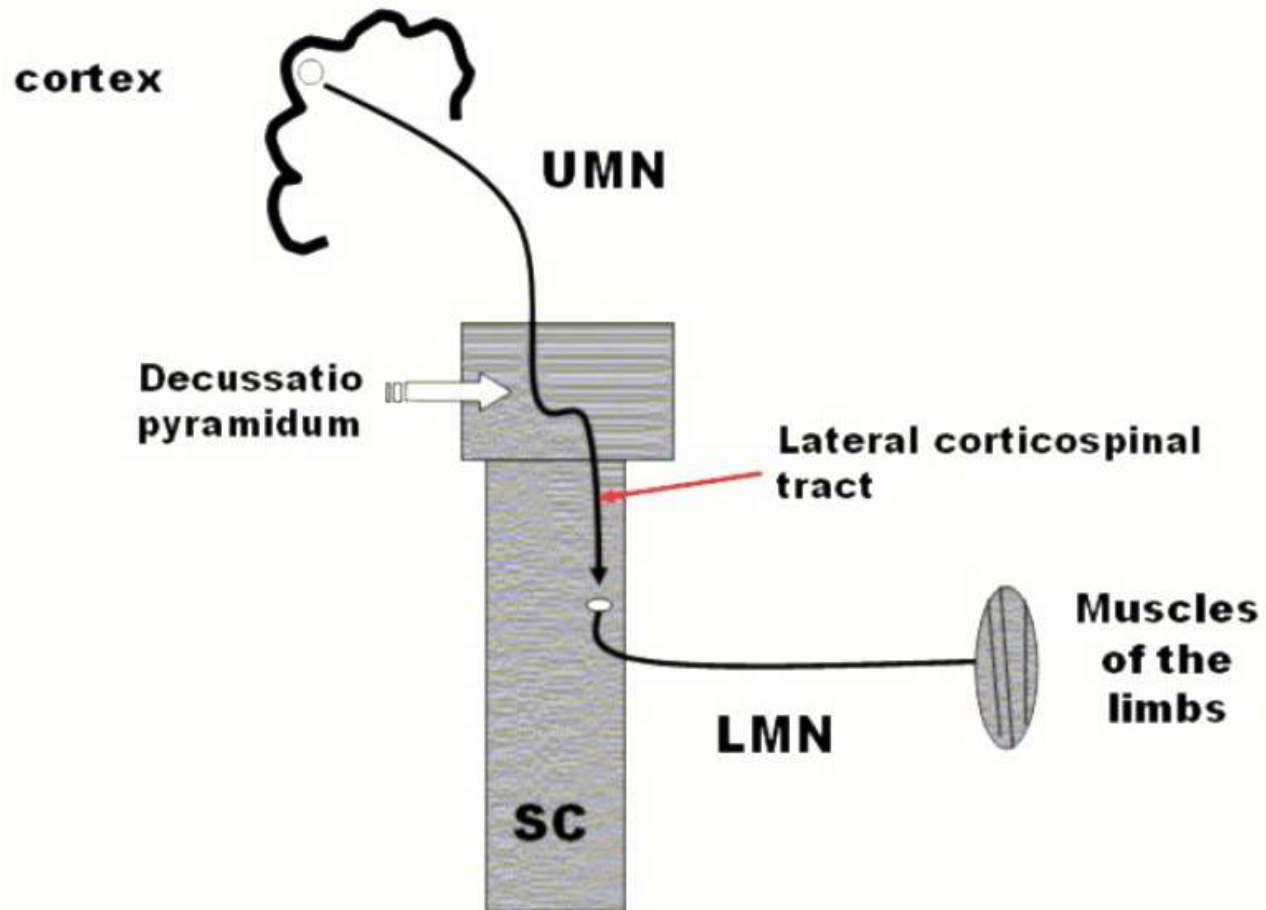
Locate the lesion

❑ Mr. X fell down in the bathroom and got paralysis of his left arm and left leg. His facial muscles also got paralysis on the right side! Thus, the facial muscles got paralysis on the right side meanwhile the limb muscle got paralysis on the left side.

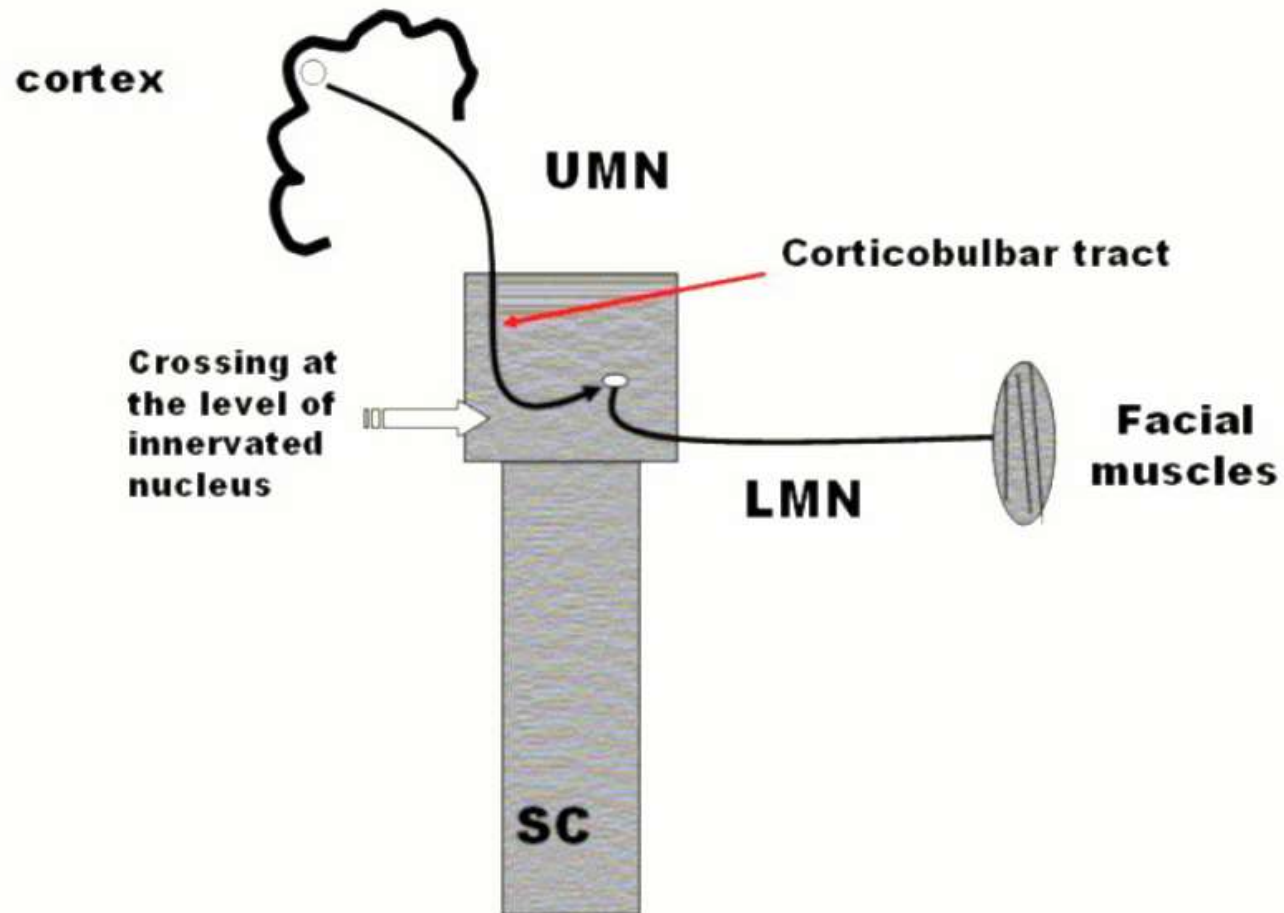
❑ Where is the location of the affected area?

❑ Cerebral cortex – brainstem – spinal cord?

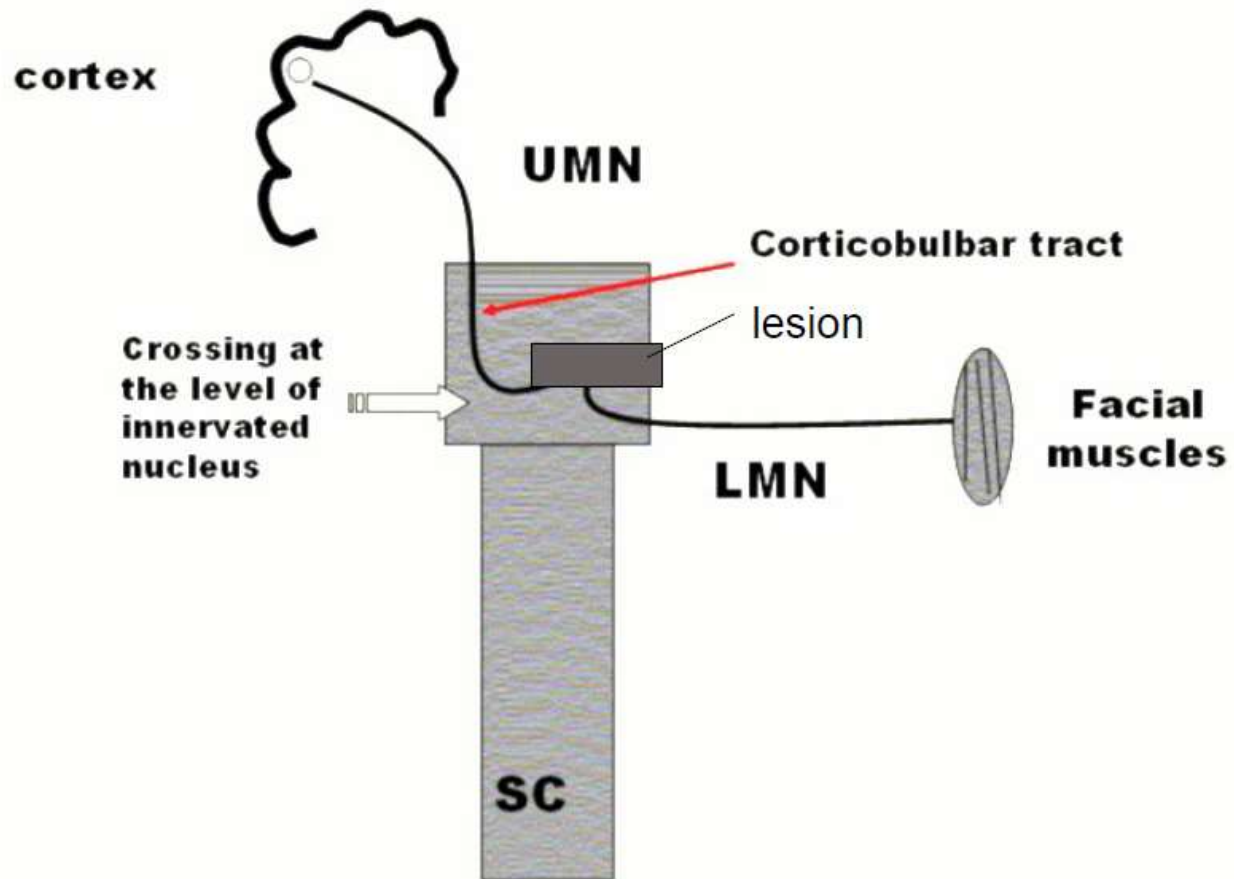
DESCENDING TRACTS



DESCENDING TRACTS

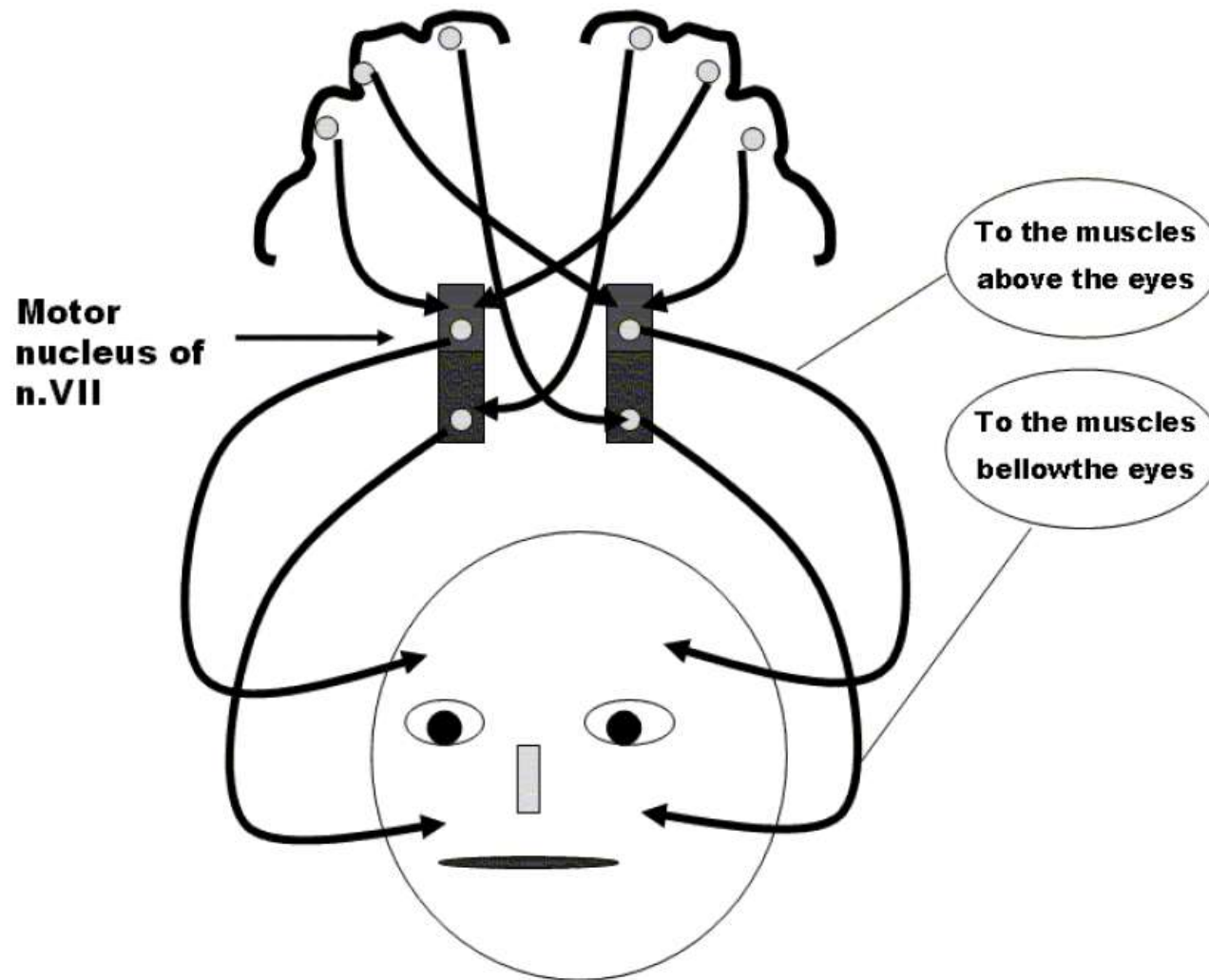


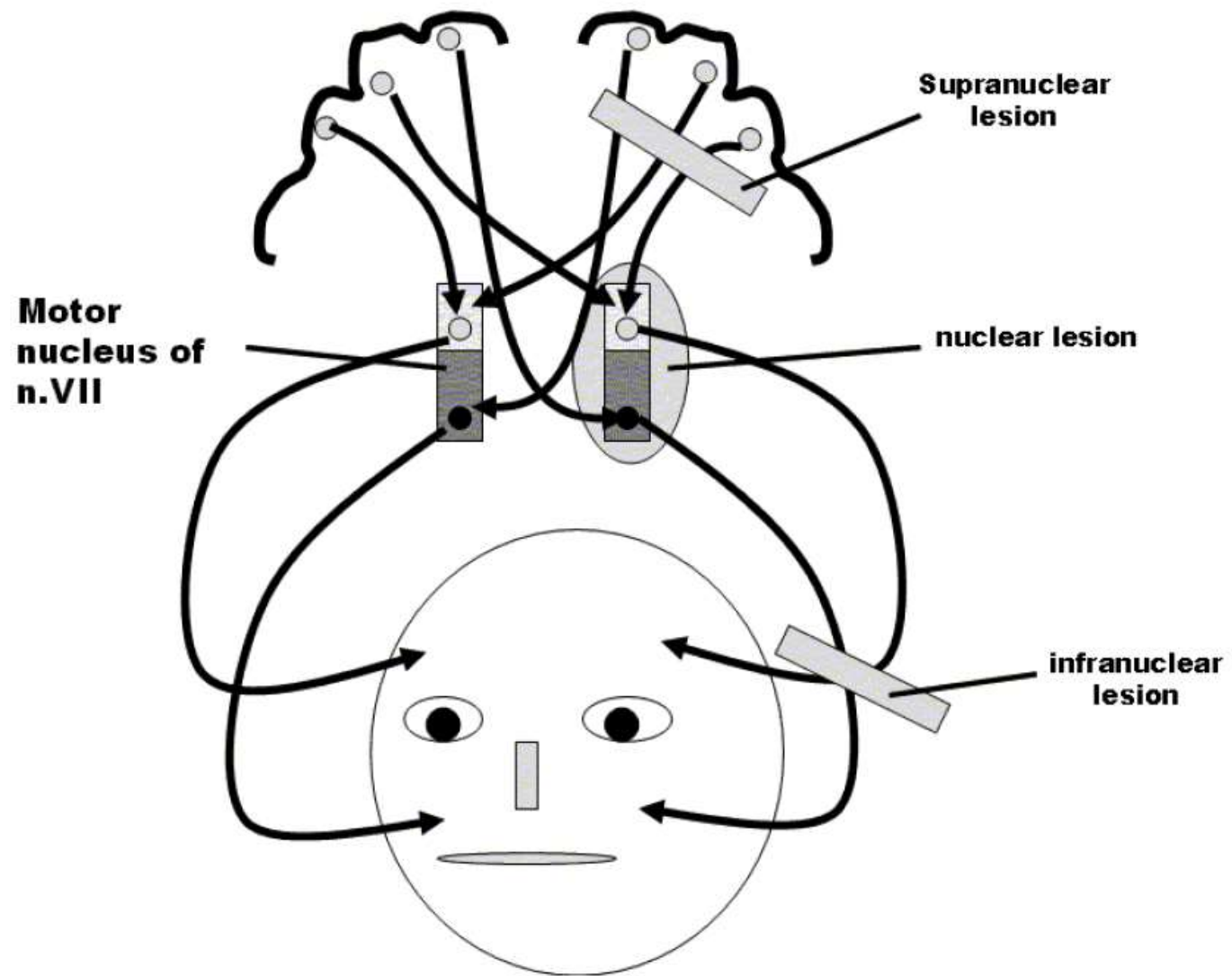
DESCENDING TRACTS



Locate the lesion ?/? (facial nerve injury/
palsy)

- Mr. Y ride a motorcycle in a very long distance. After he got off his bike he found that his facial muscle was retracted to the left side. He couldn't close his right eye. What happen to Mr.Y?



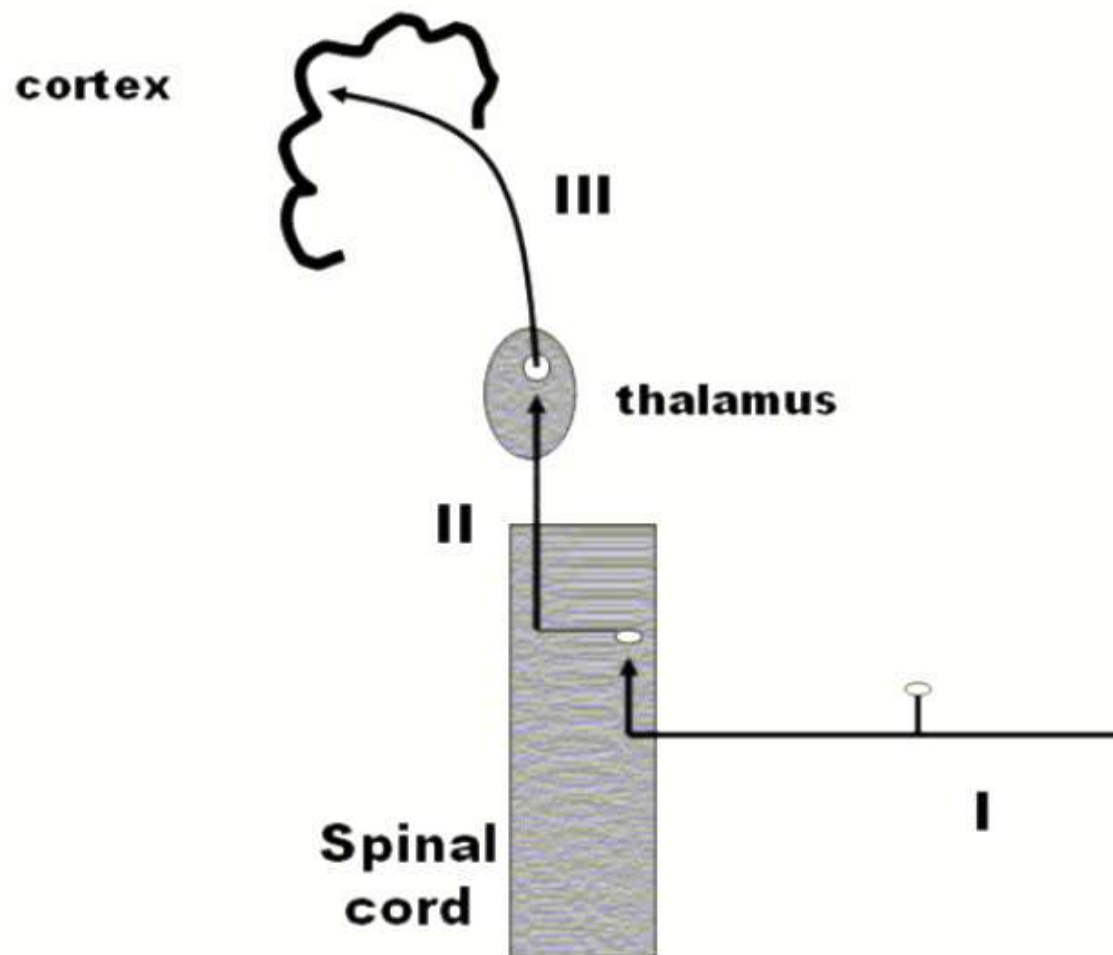


Spine cord injury (localisation)

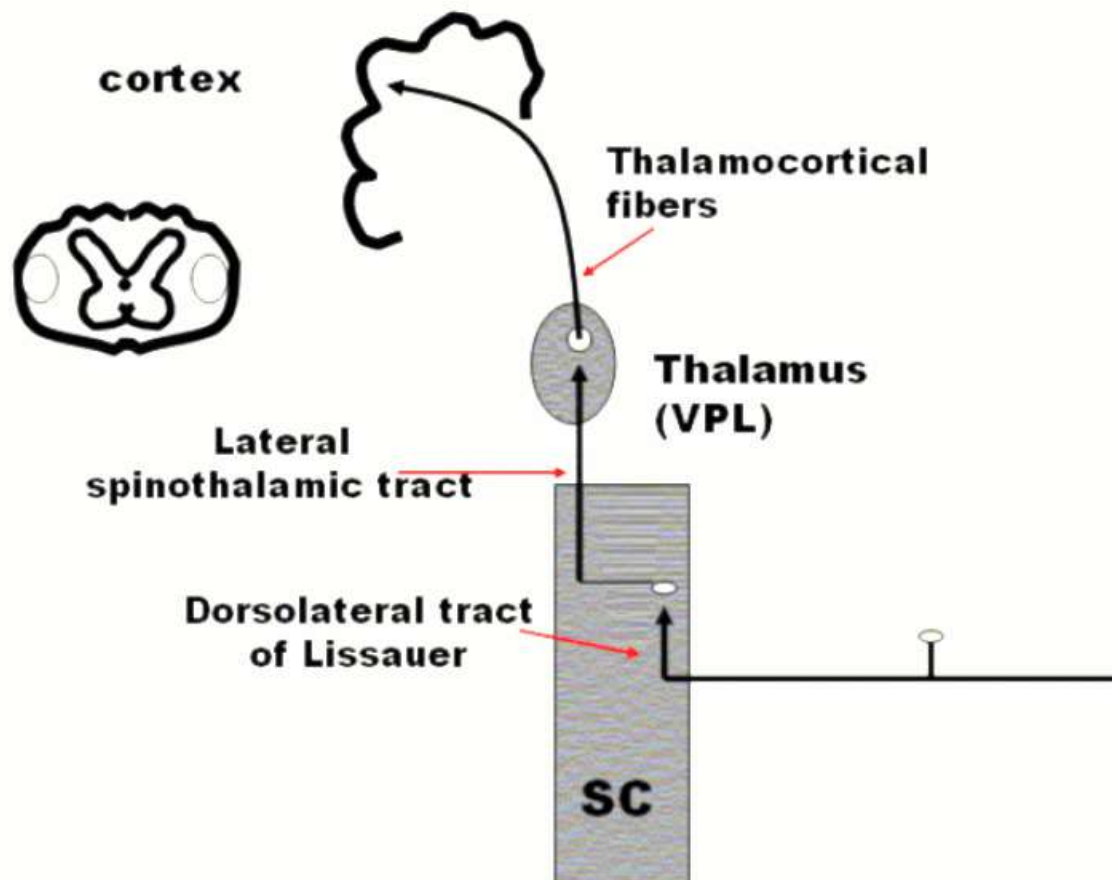
- Mr. A, fell down the stairs and got a back injury. He complained that his right leg up to his right belly under the navel was numb. It was proven by the absence of pain when the doctor pinched the skin of the affected vigorously.
- When he was ordered to lift his two legs, he could only lift his right leg meanwhile his left leg was paralyzed.

- ✓ According to the attending doctor Mr. A got hemisection of the spinal cord.
- ✓ Which segment of the spinal cord was injured?
- ✓ Mention the injured pathways!
- ✓ What were the result of the reflect examination of the patient?
- ✓ What were the results of the discriminative tactile examination of his both leg?

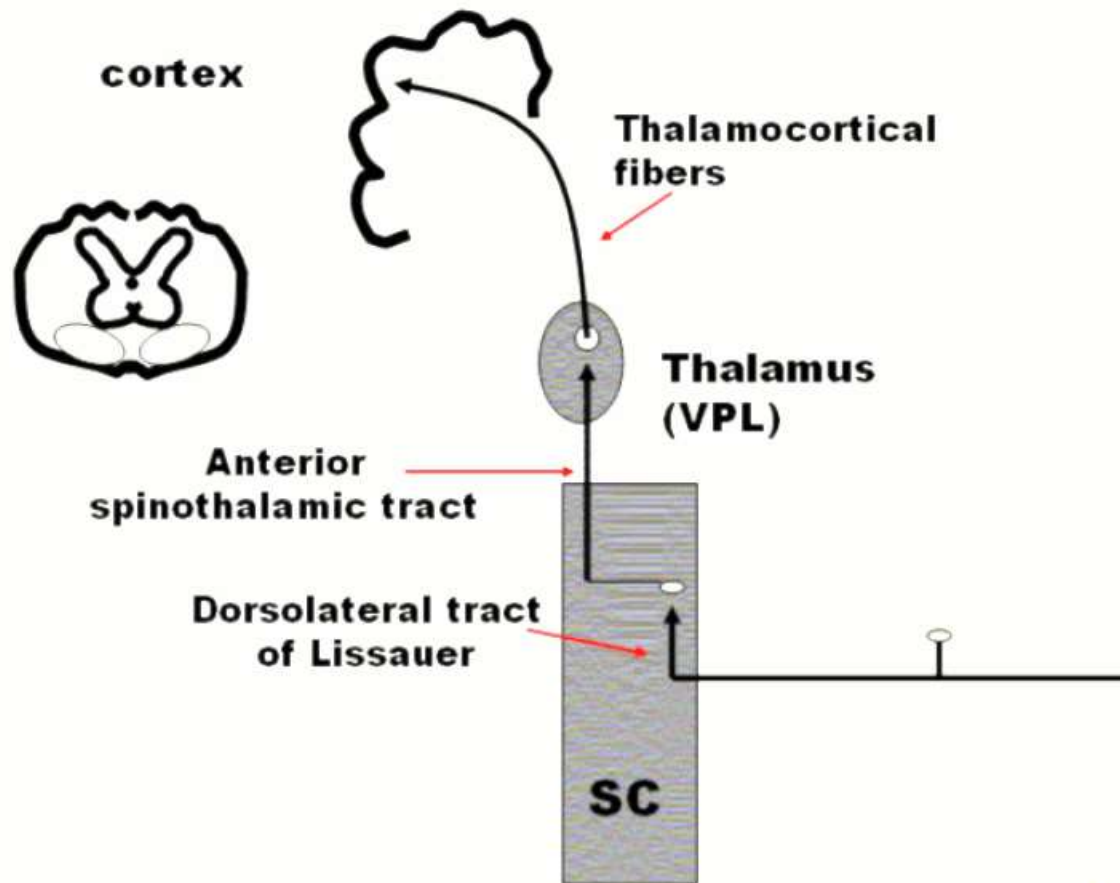
ASCENDING TRACTS



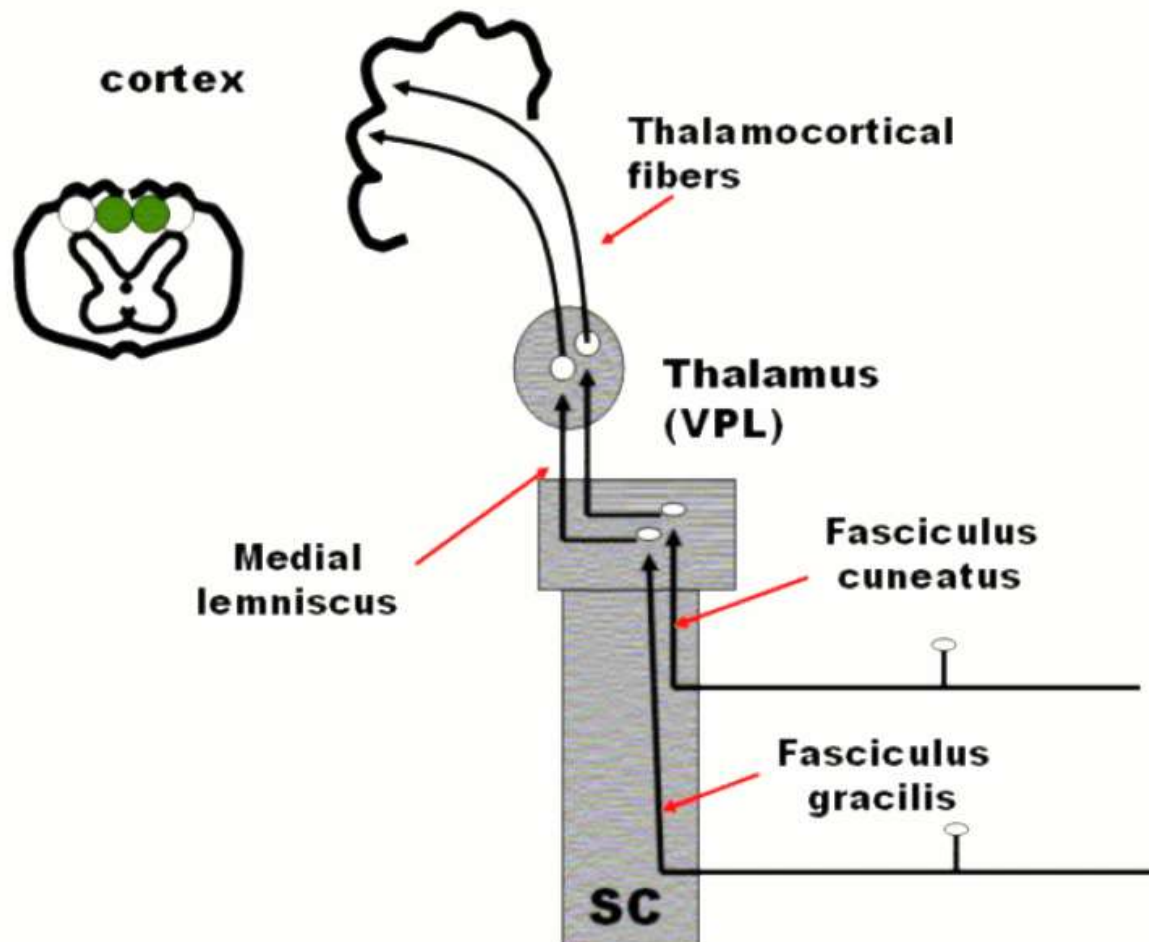
Pain and Temperature

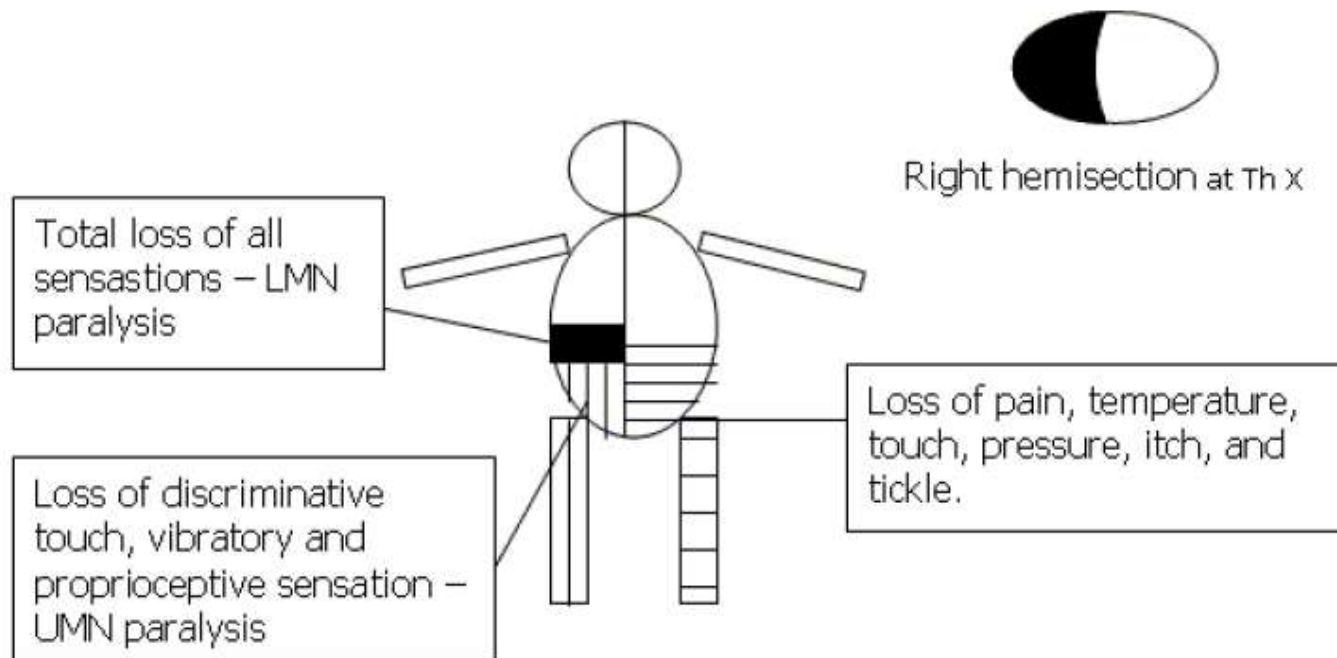


Touch and Pressure



Proprioception and Discriminative Touch





Thank you