2012

Anatomy practical team

Neuroanatomy

The Human Brain

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1/1/2012

In general, doctor focuses on the identification of the section given and which level is involved. For example; a section of the spinal cord, the identification is (Spinal Cord) and the level will be either (Cervical, thoracic or lumbar). Or a section of the brainstem the identification is (Brain stem – Medulla) and the level will be either (Open, mid or caudal medulla).

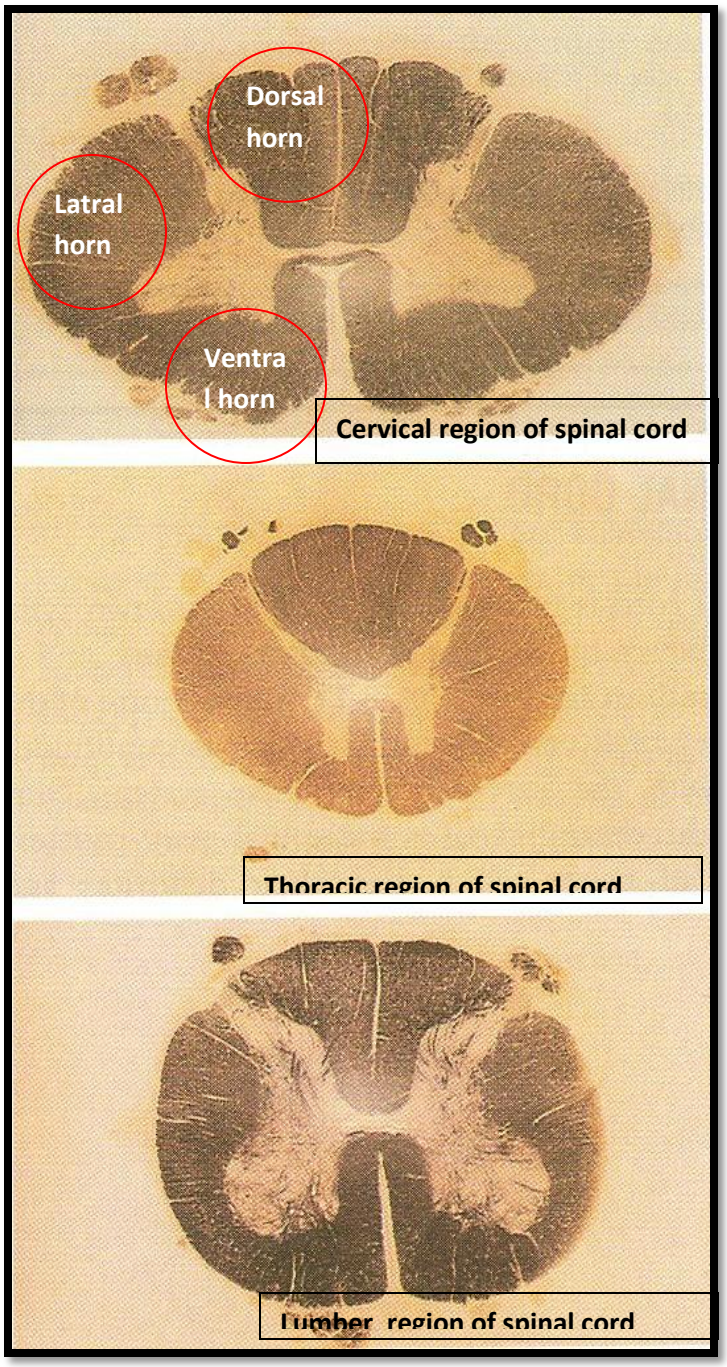
So the most important things to know in a given section are:

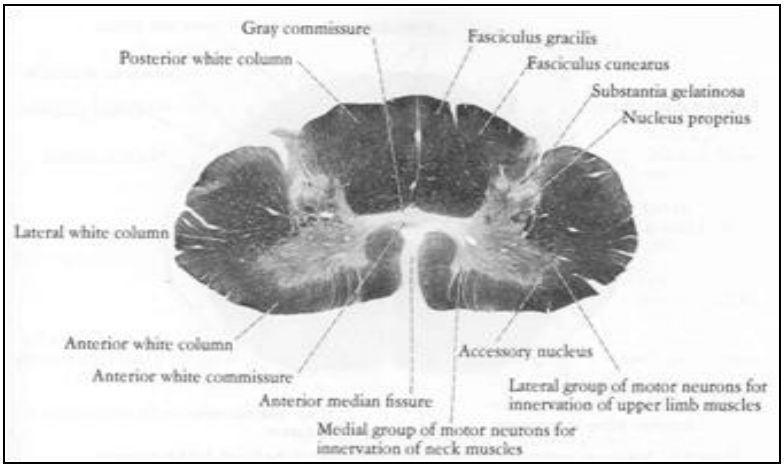
- **The identification**
- **The most important features**
- **The level**

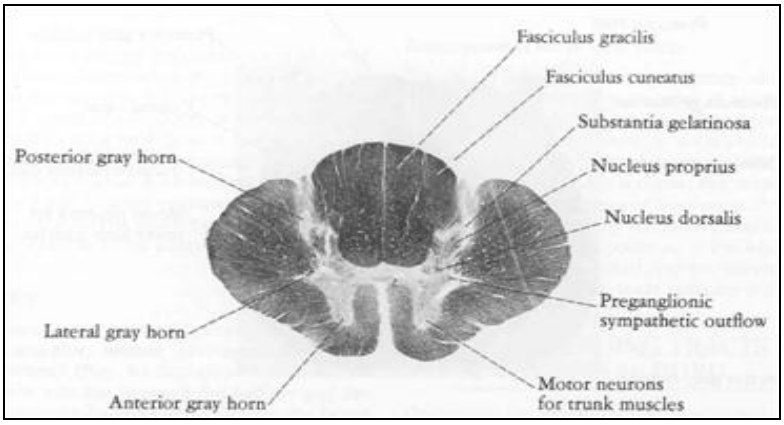
  e.g. (Cervical, thoracic or lumbar spinal cord).

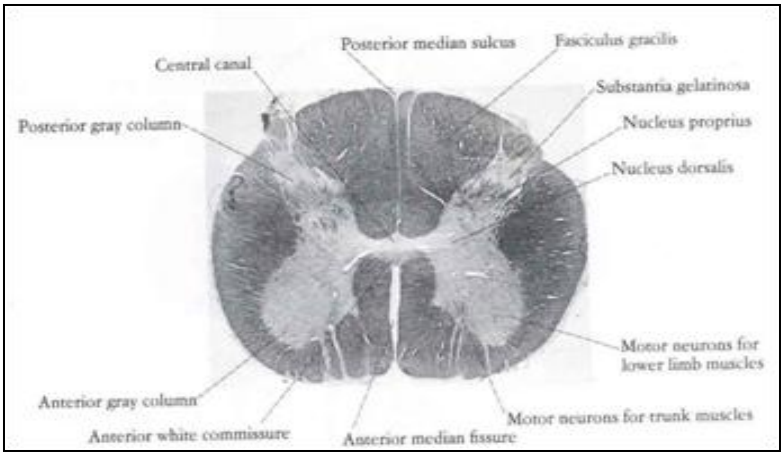
  (Rostral, mid or caudal medulla).
- **The disorders or diseases related to the components of the section**

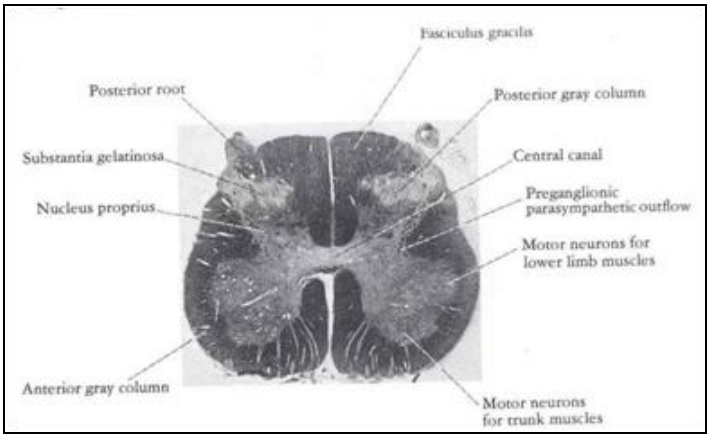
  e.g. (Spinothalamic tract lesion leads to loss of pain and temperature).











Sacral region of spinal cord

Dorsal column Tracts: **Cuneat (upper limb)** **Gracile (lower limb)**	**Prproception sensation, fine touch**
Spinothalamic tracts: **1-ventral spinothalmic tract** **2-latral spinothalmic tract**	 **crude *touch and pressure*** **pain , temprture**

What is the level?

Identification for each section?

Internal structure?

Questions may come as a scenario for example

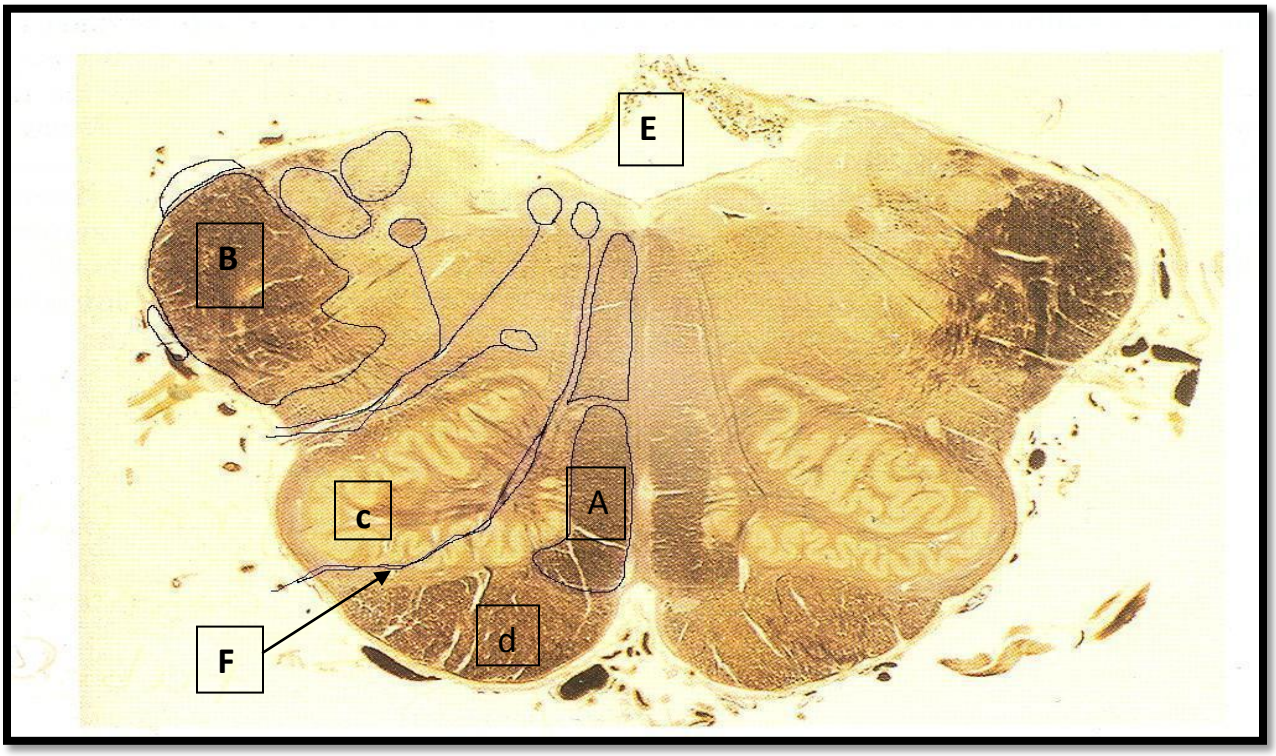
Q 1:A boy has preconception sensation in lower limb. which tract is affected ? gracile fasiculus Region? dorsal horn

Q2- A patient is presented with loss of sensation in the upper limb, what is the affected structure? Cuneat fasiculus

Q2- Loss of pain and temperature is because of a lesion in which of the labeled areas ? (The section will be divided into areas – A,B,C and D)

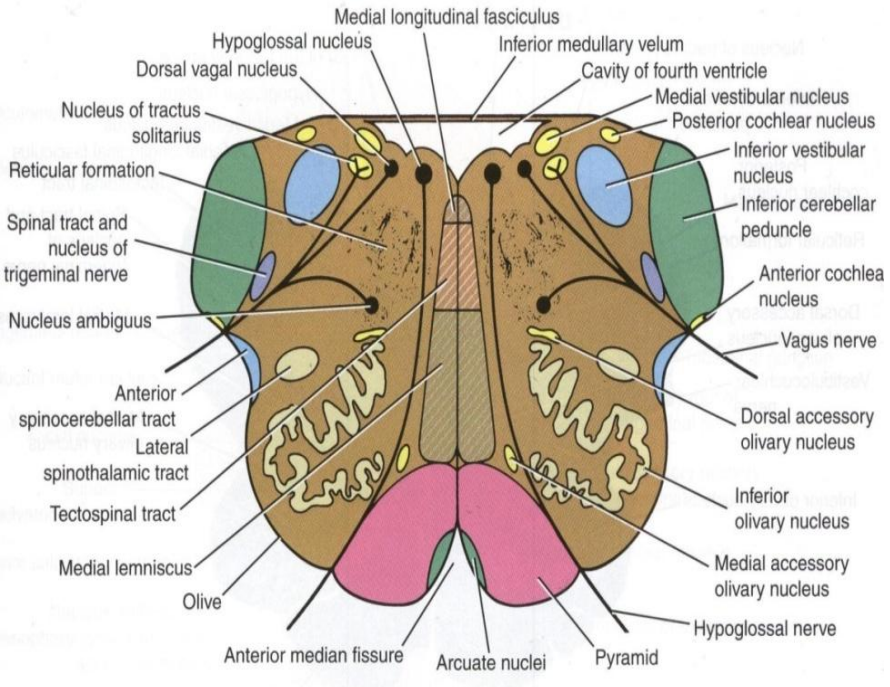
Answer is: Lateral spinothalammic tract.

open medulla

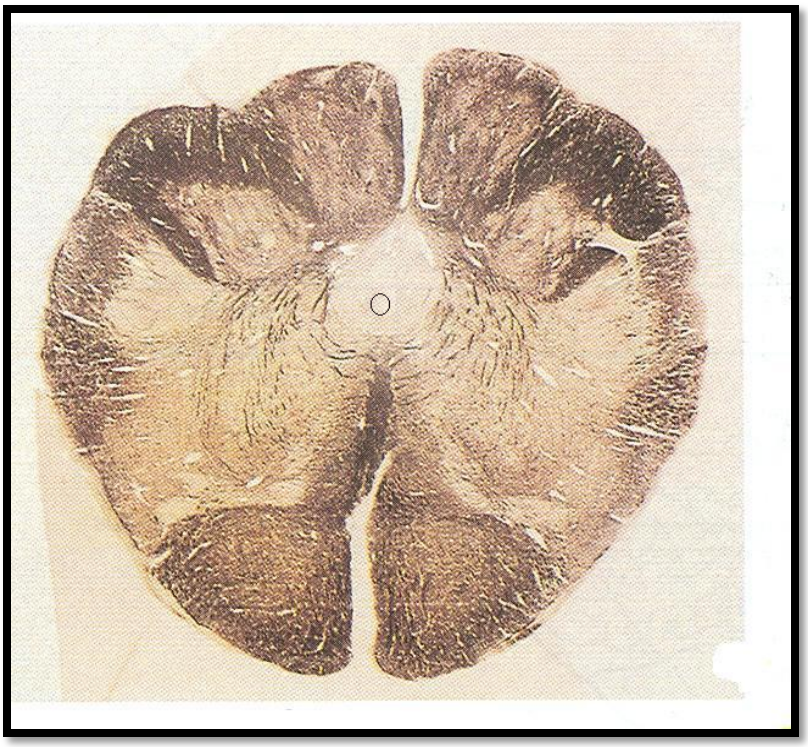


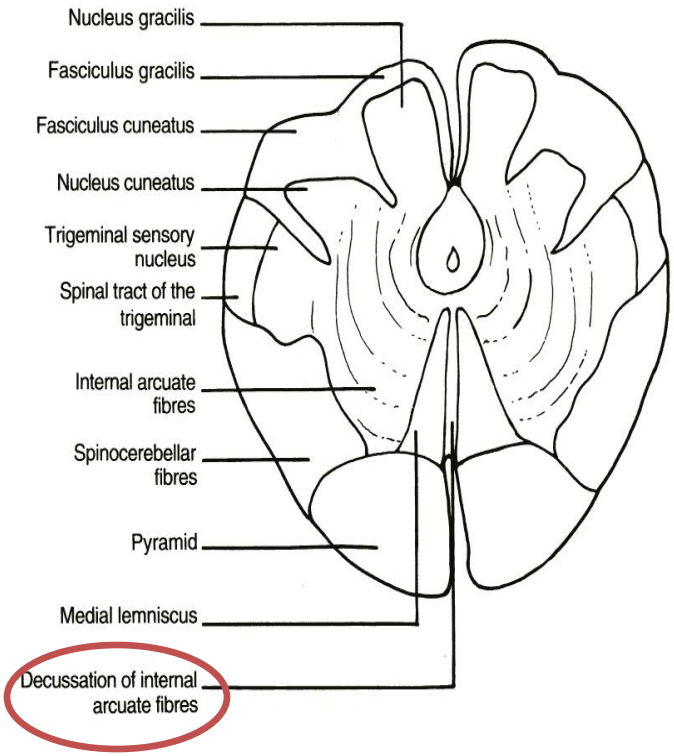
1. Identify A: medial lemniscus
2. Identify B: Inferior cerebellur peduncle
3. Identify C: inferior olivary nucleus
4. Identify D: pyramid (corticospinal tract)
5. Identify E: fourth vintrical
6. Identify F : hypoglossal nerve

Level: open medulla



Mid medulla

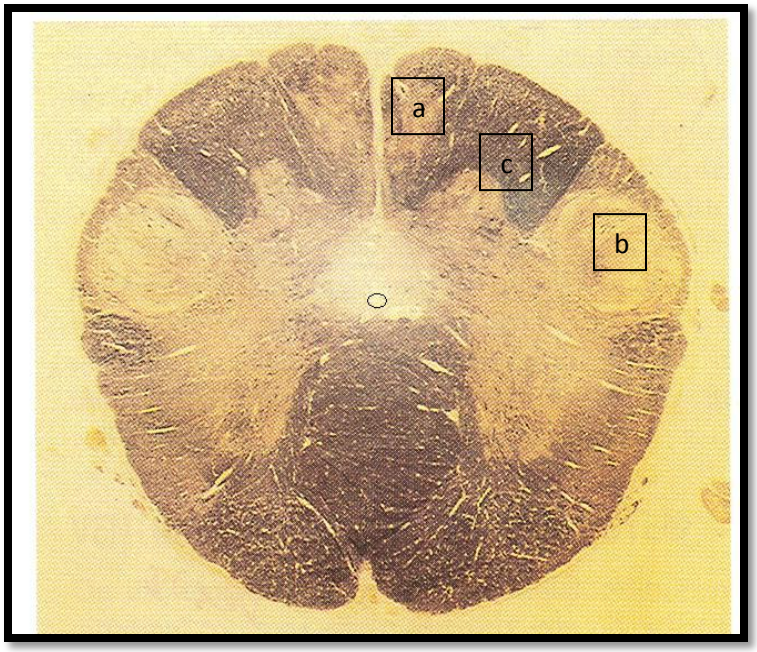


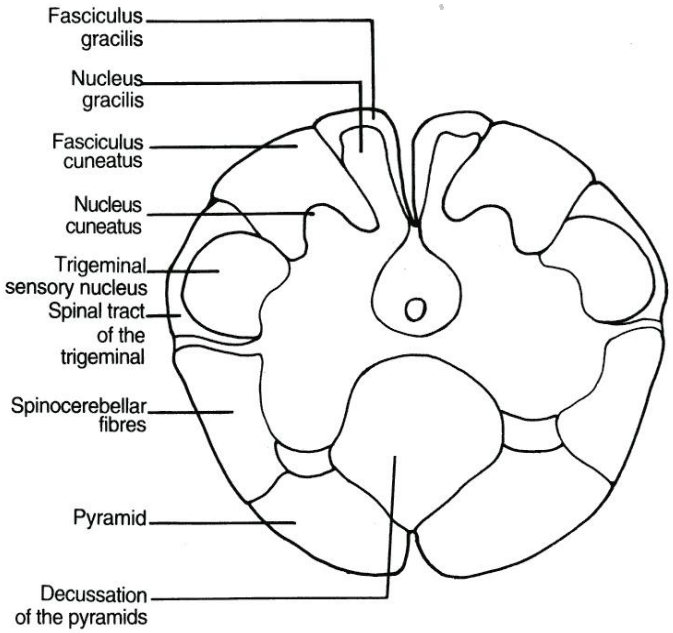


Transverse section of the mid medulla
(Sensory Decussation)
Important structures:

1- **Nucleus gracil**
2- **Nucleus cuneat**
3- **Nucleus of spinal tract of trigeminal**
4- **Internal arcuate fibers (Axons of Gracil & Cuneat)**
5- **Decussation of internal arcuate fibers**
6- **Medial lemniscus**
7- **Pyramid**

Closed medulla(caudal)





Identify

A: gracilis fasciculus

C : cuneatus fasciculus

B : trigeminal nucleus

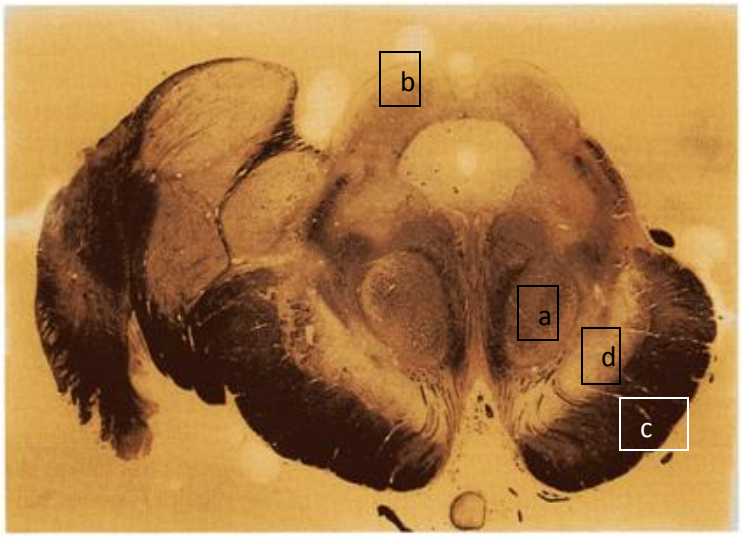
Transverse section of the caudal medulla

(Pyramidal Decussation) or (Motor Decussation)

Important structures:

1- **Nucleus cuneatus**
2- **Nucleus gracillis**
3- **Decussation of pyramids**
4- **Nucleus of the spinal tract of trigeminal**
5- **Central grey**
6- **Central Canal**
7- **Pyramid**

Mid brain (superior COLLICULUS)



Identify :

A: red nucleus

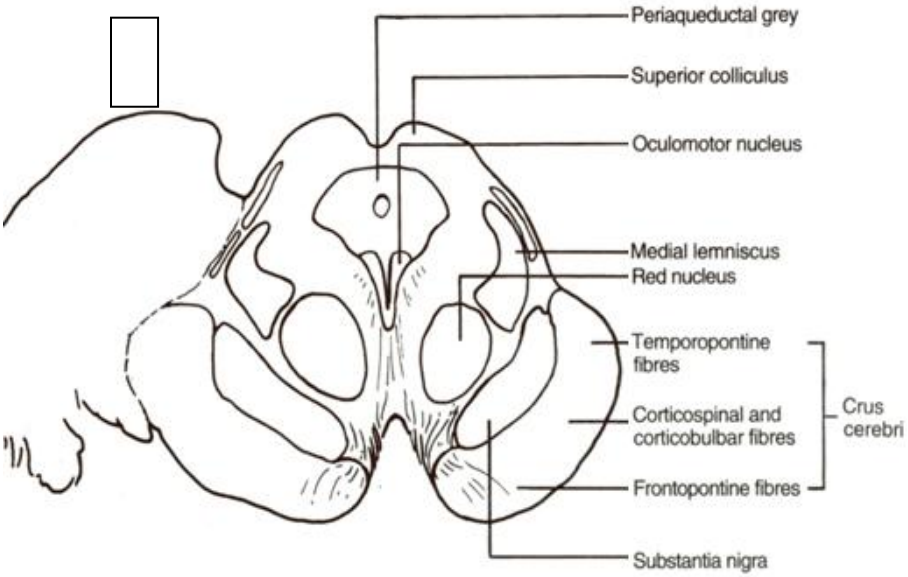
B :superior colliclus

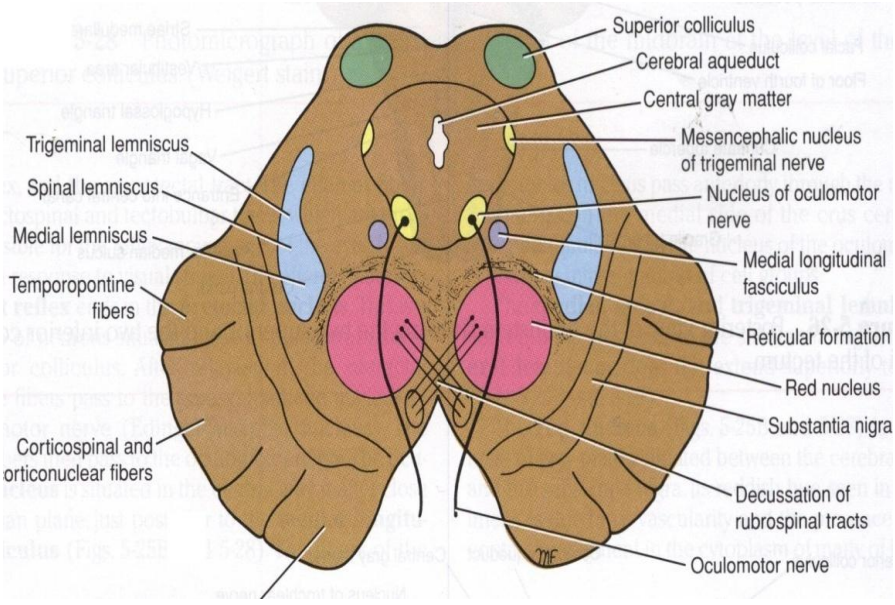
C :crus cerebri and list it is sructure : temporopontine fiber , corticobulbar , corticospinal , frontopontine fiber .

D :substantia nigra

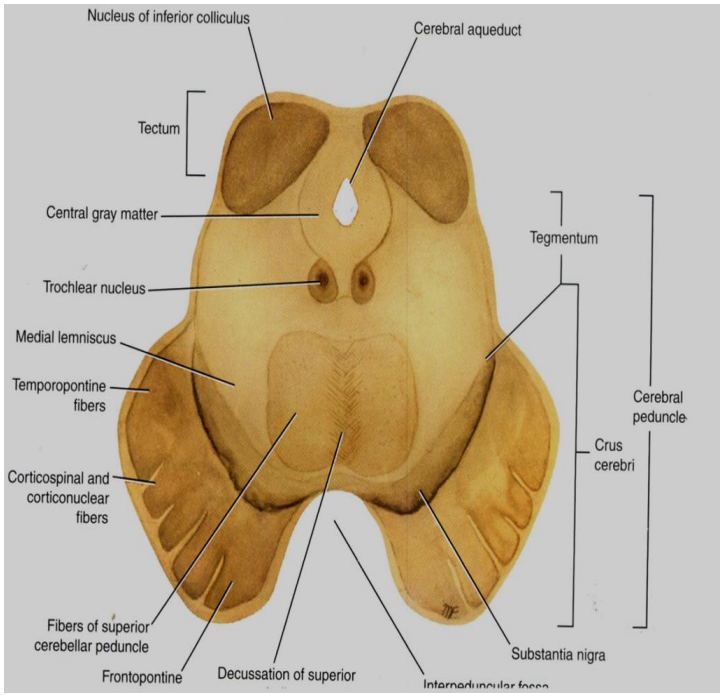
Q: Man came to the hospital with tremor, stiffness, cog wheel rigidity . the was parkinson disease .

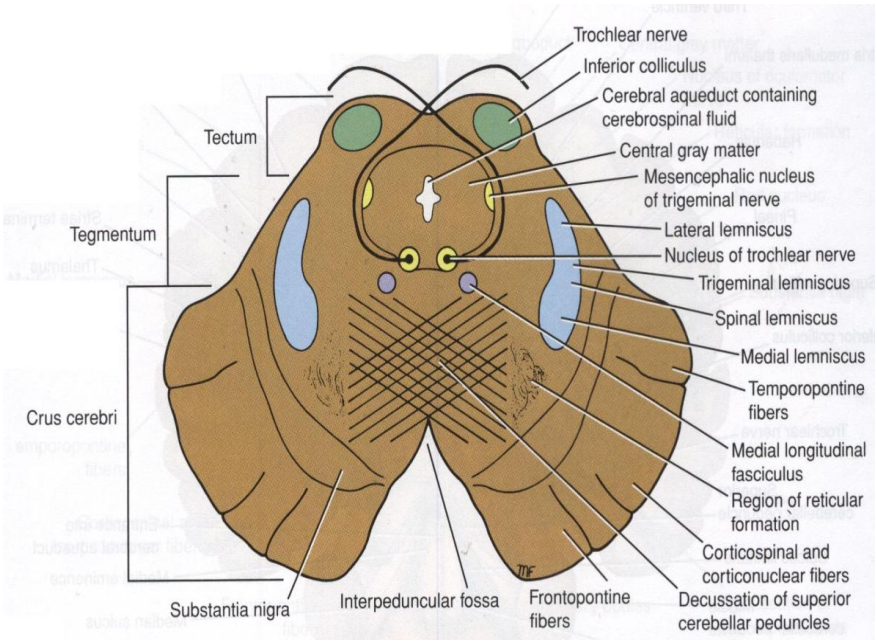
Which of of these letter show the affected part? D

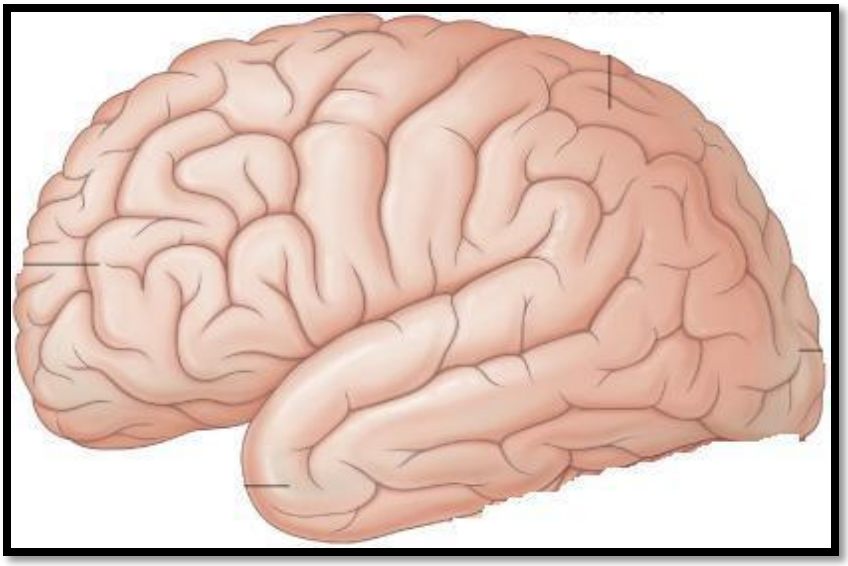




Mid brain (inferior collicolus)







All name of culci and gyri (the functional name and anatomical) +blood supply

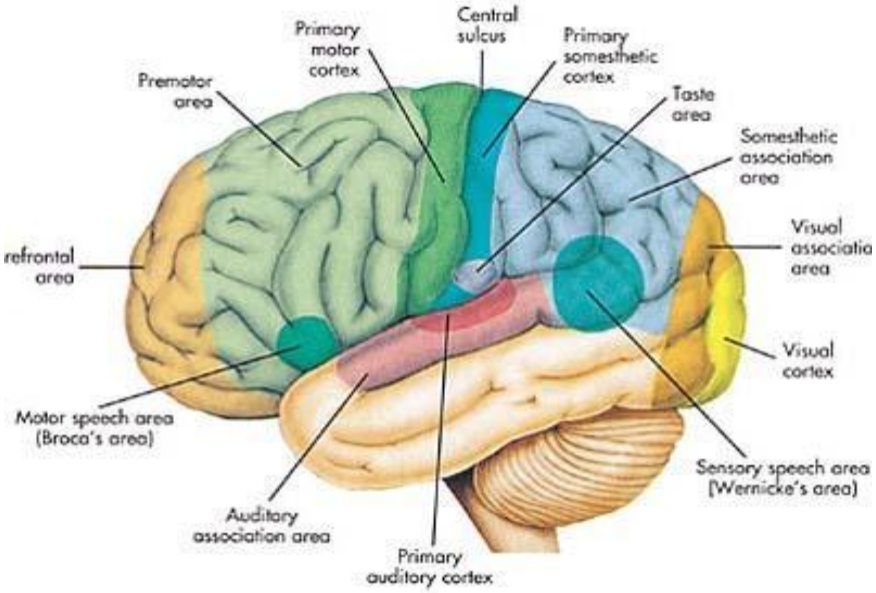
In the exam write the 2 names

e.g: precentral gyrus and primary motor cortex

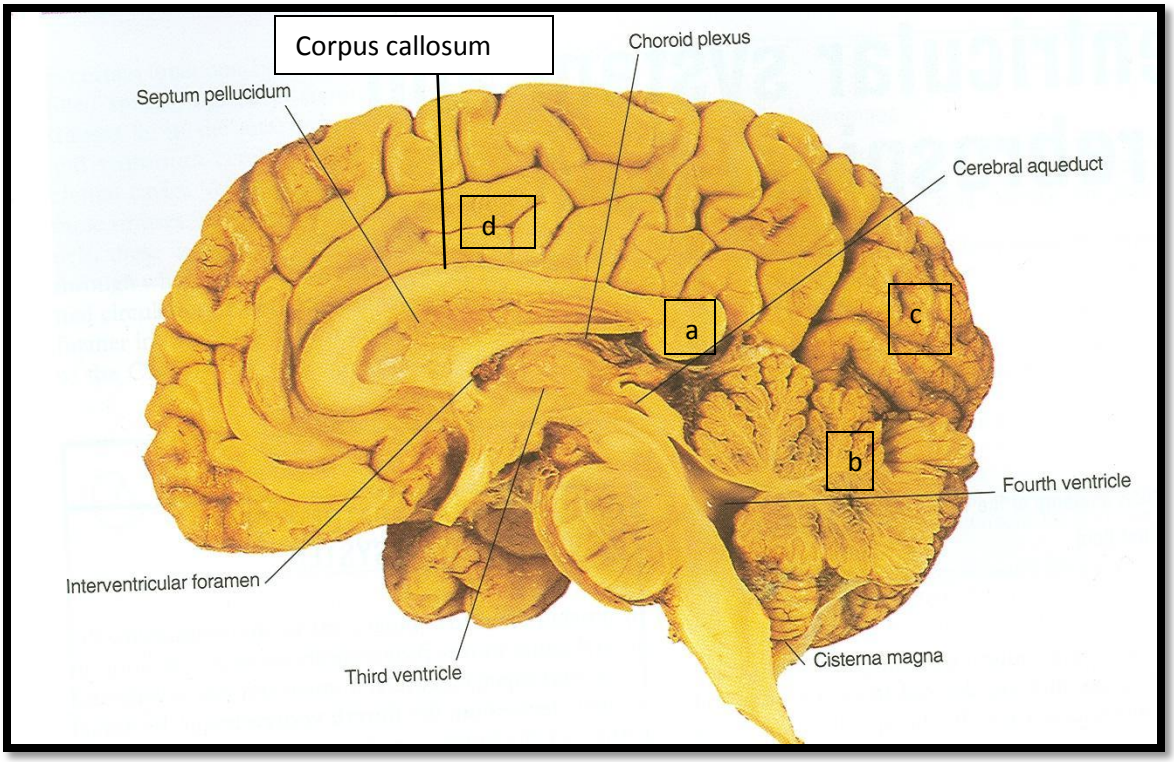
Q : man came to the hospital with inability to speak and weakness in the right side of the body . what are the area that affected? and its blood supply?

Broca's area , precentral gyrus

Blood supply middle cerebral artery



Anterior cerebral artery	medial surfaces of frontal and parietal lobes
Middle Cerebral Artery	**Somatosensory Cortex** , **Motor Cortex** , **<u>Speech area:</u>** Broca's area Wernicke's Area
Posterior Cerebral Artery	temporal lobe , Uncus ,Occipital lobe



Identify

A : Splenium of carpus callosum

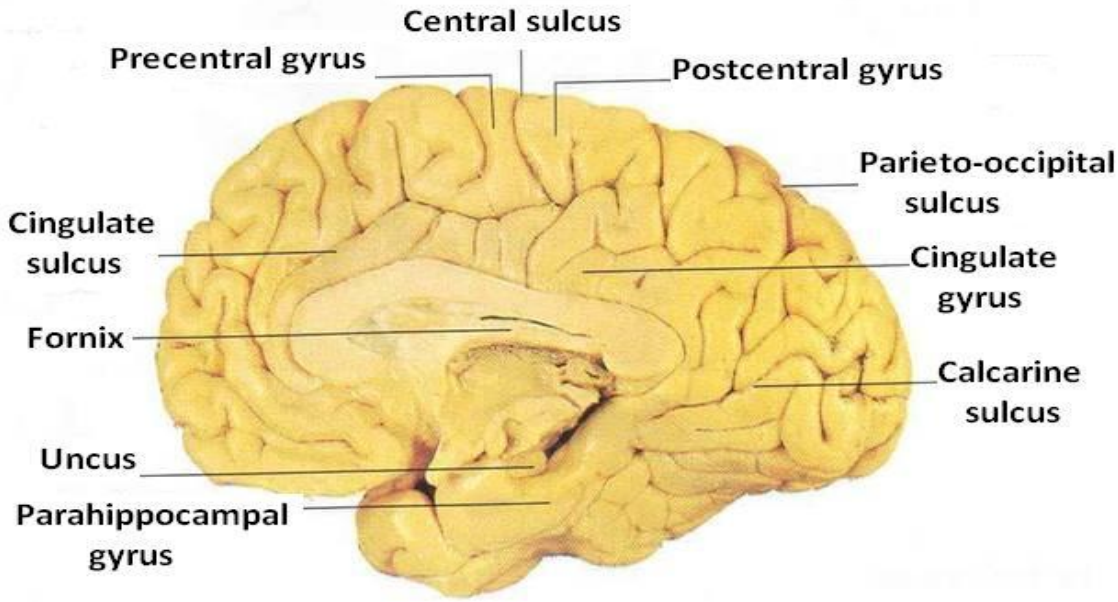
B : cerebellum

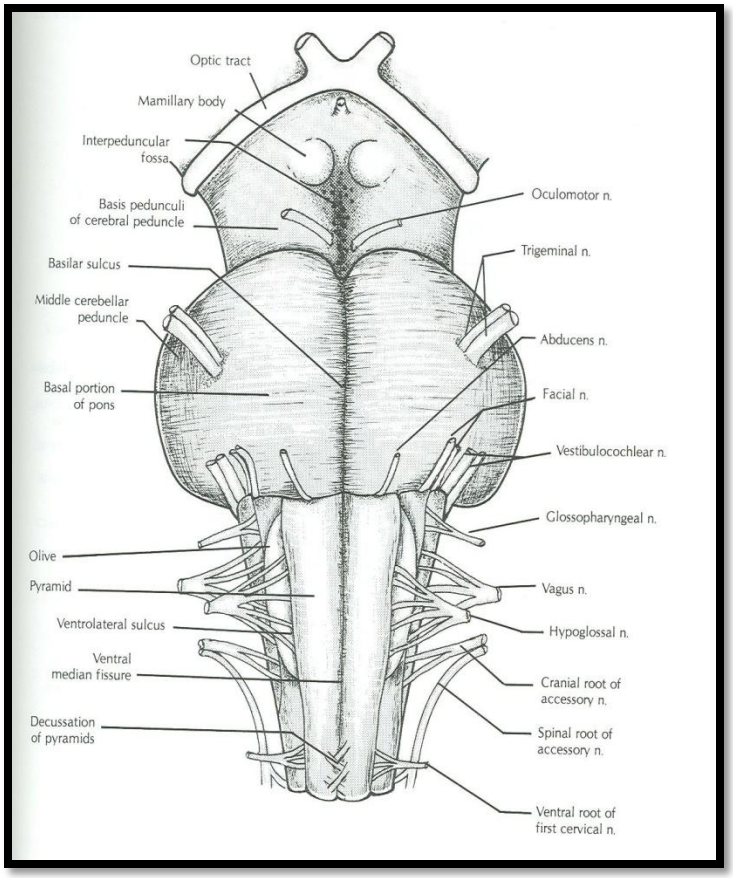
C: occipital lobe

Patient with unsteady gate , tremor, ataxia which part will be affected ?

cerebellum

Corpus callosum : spelinium , body, Rostrum, genu





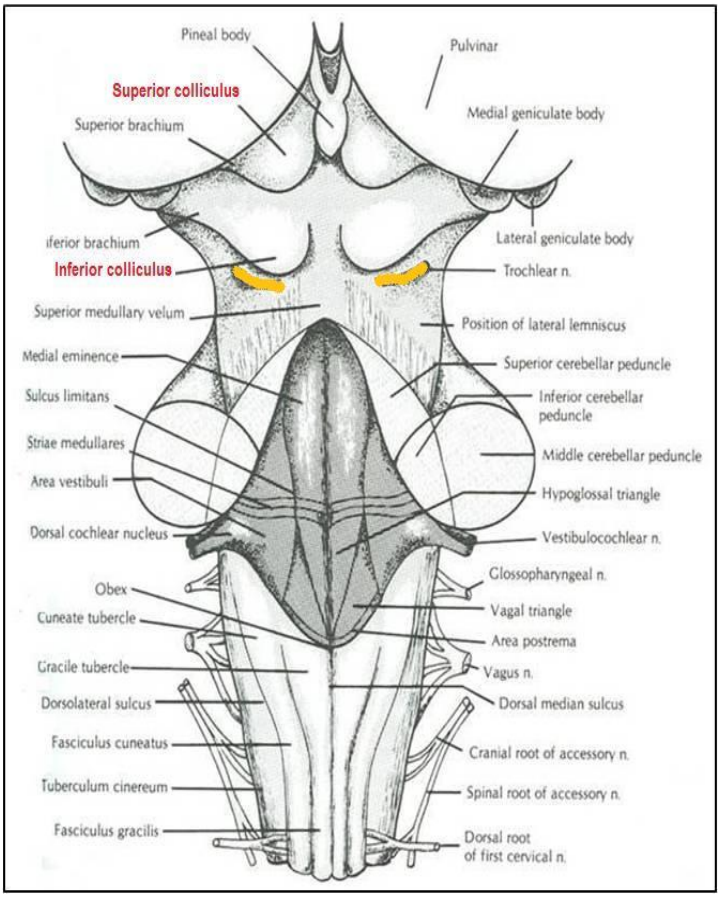
Brain stem

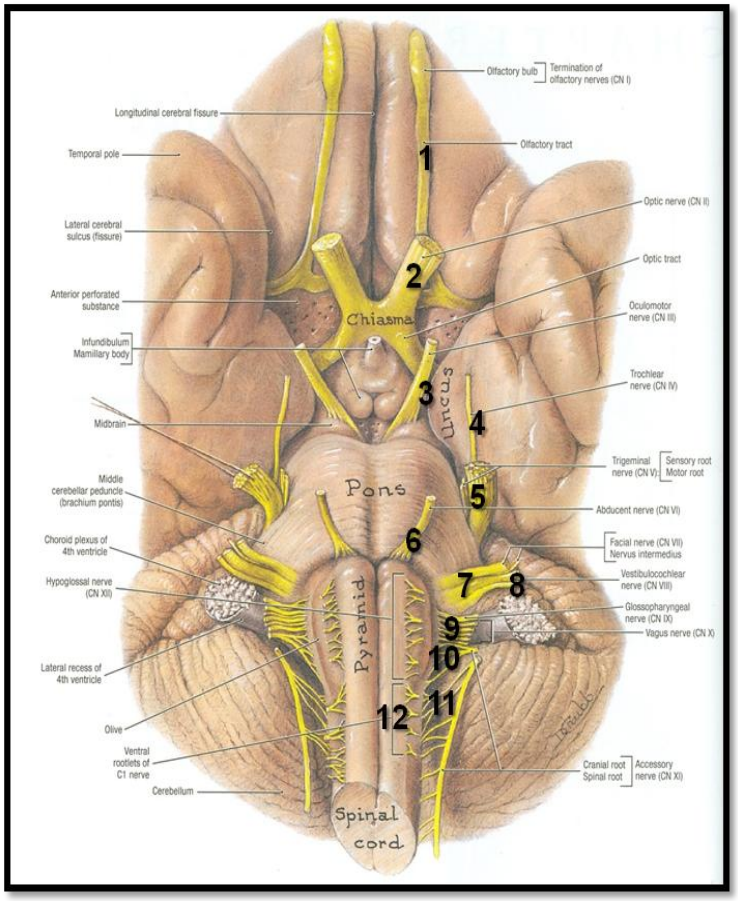
Case:

Q)patient has medial squint , which nerve is responsible?

a) abducent nerve

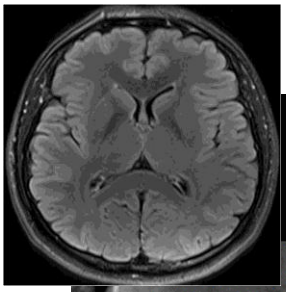
-identify cranial nerve and important structures.

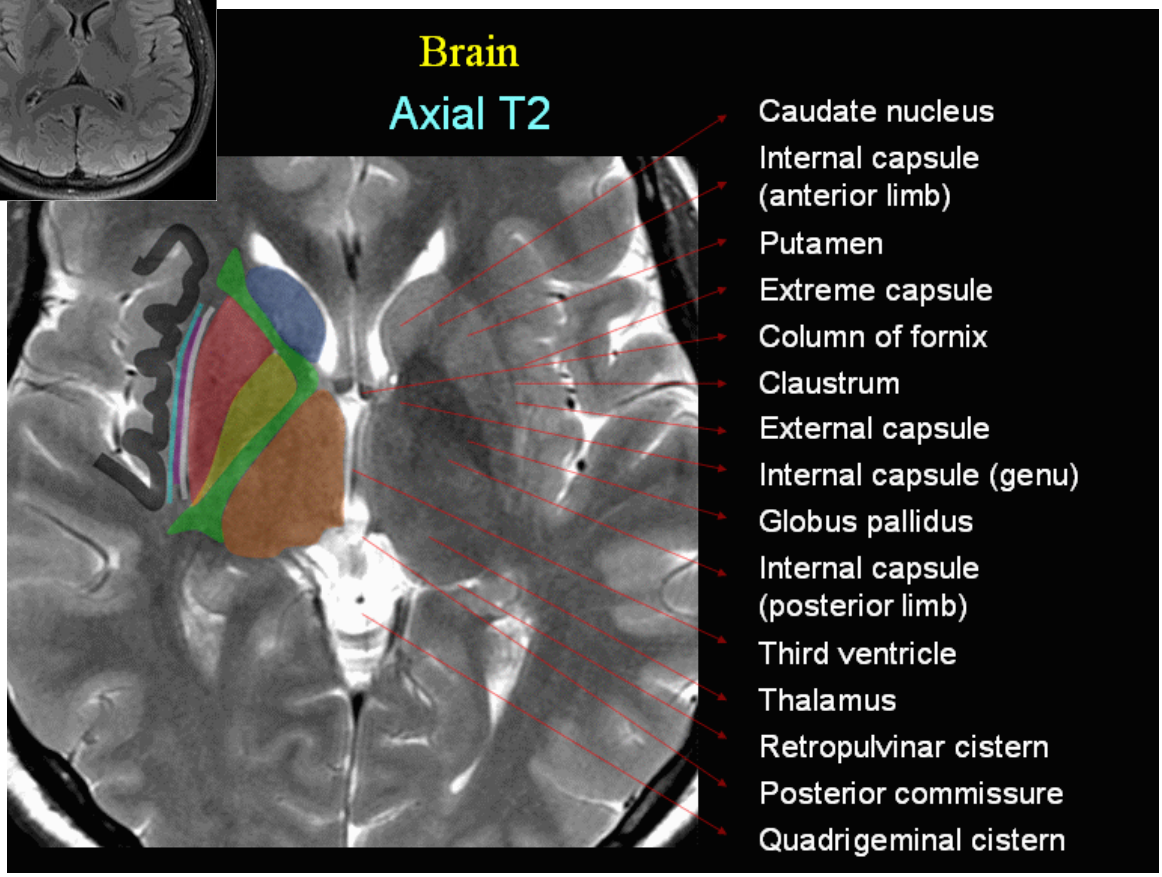


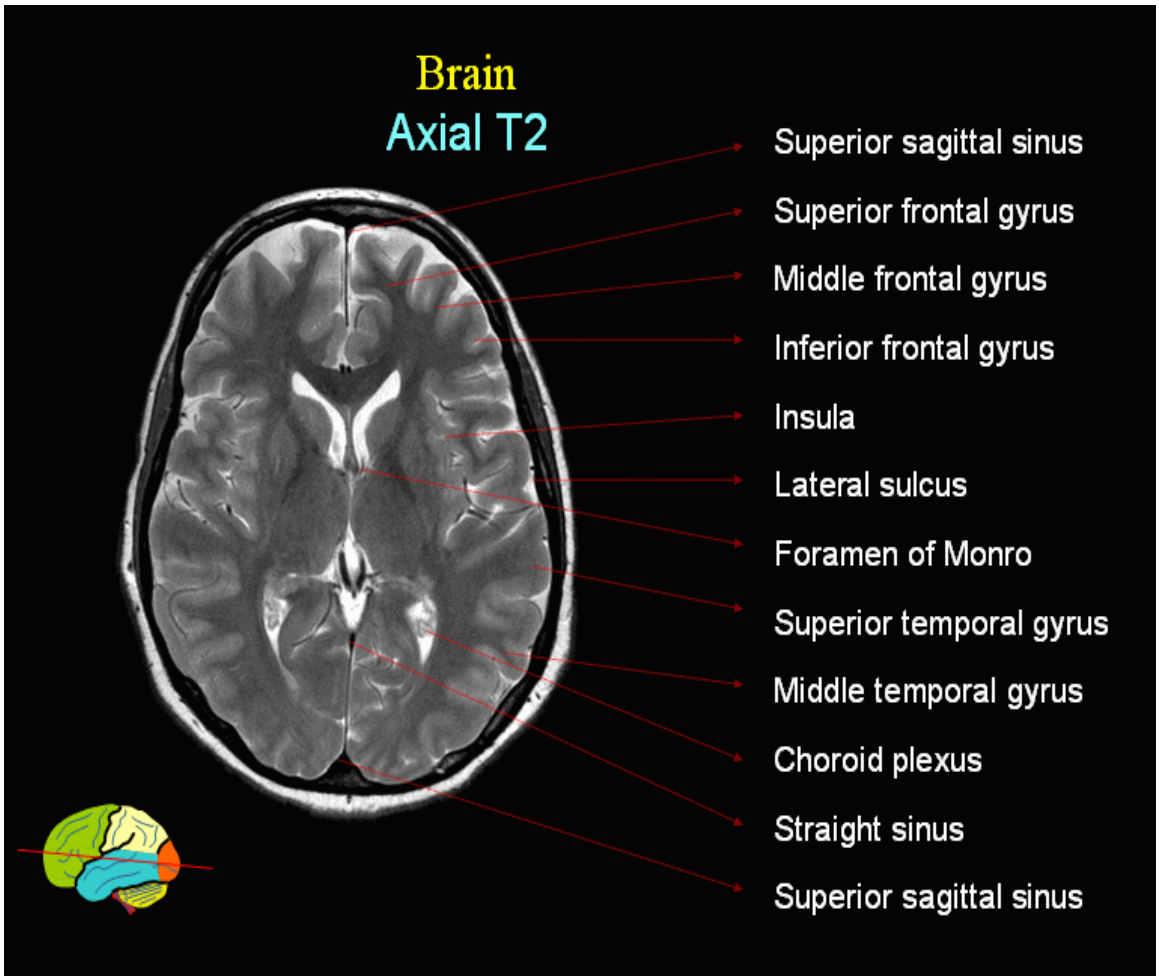


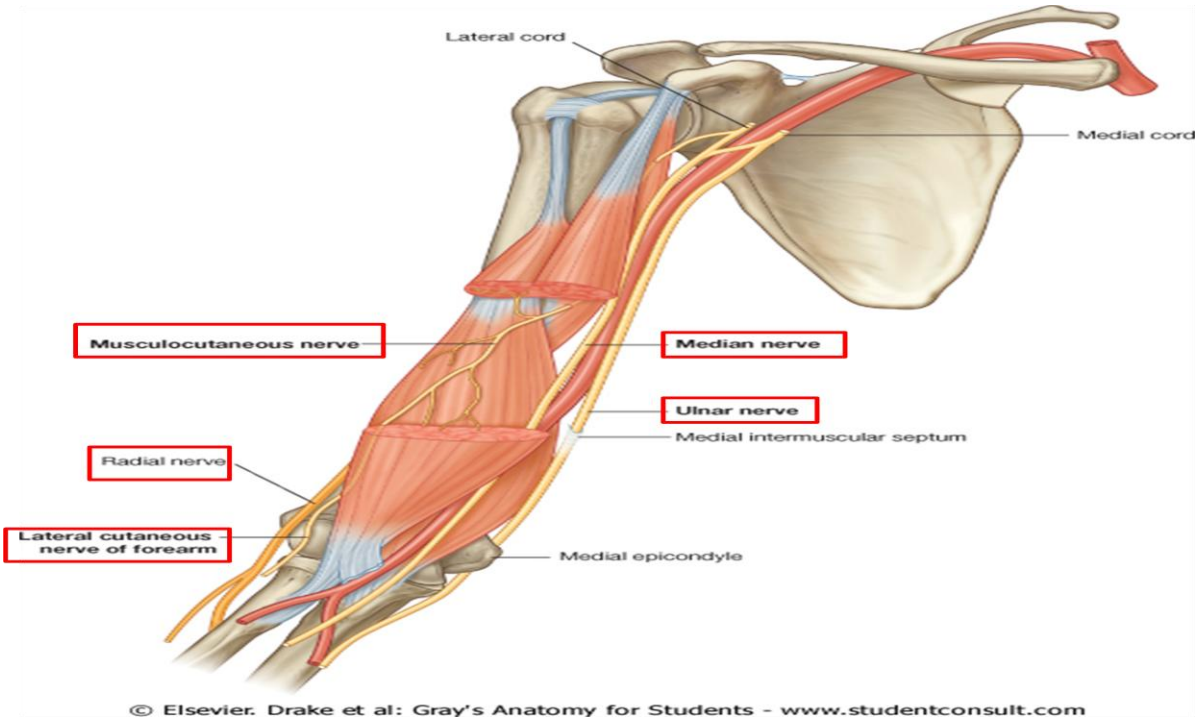
Nerve	Lesion
Optic nerve	Lesion results in: visual field defects and loss of visual acuity, a defect of vision is called anopsia. - A lesion of the right optic nerve-> loss of vision in the right eye - A lesion of the optic chiasm -> bitemporal hemianopsia. -A lesion of the right optic tract & right optic radiation -> contralateral homonymous hemianopsia. - A lesion of both visual cortices -> complete blindness
Occulomotor nerve	-Lateral squint. -Ptosis. -Diplopia. -Pupillary dilatation. -Loss of accommodation. Impaired downward & inward movement of the eye ball on the damaged side
Trochlear Nerve	-diplopia -Inability to rotate the eye infero-laterally.
Trigeminal nerve	-trigeminal neuralgia or tic douloureux
Abducent nerve	-Inability to direct the affected eye laterally. (medial squint).
Facial nerve	-Bell's Palsy
vestibulocochlear nerve	-deafness ,tinnitus ,vertigo, dizziness, nausea, nystagmus, loss of balance and ataxia
GLOSSOPHARYNGEAL NERVE	- dysphonia, dysphagia and absence of the gag reflex.
Vagus nerve	-causes hoarseness or loss of voice, impaired swallowing, GI dysfunction, blood pressure anomalies
Accessory Nerve	-Difficulty in swallowing and speech -Inability to turn the head -Inability to shrug (raise) the shoulder -Winging of scapula
Hypoglossal Nerve	-Loss of tongue movements -Difficulty in chewing and speech -The tongue paralyses

MRI

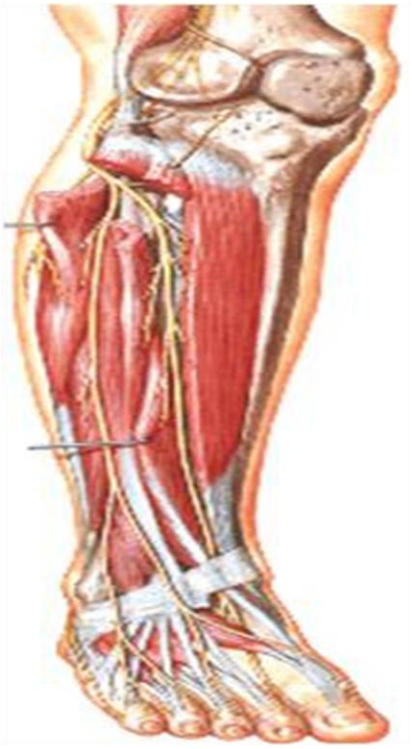


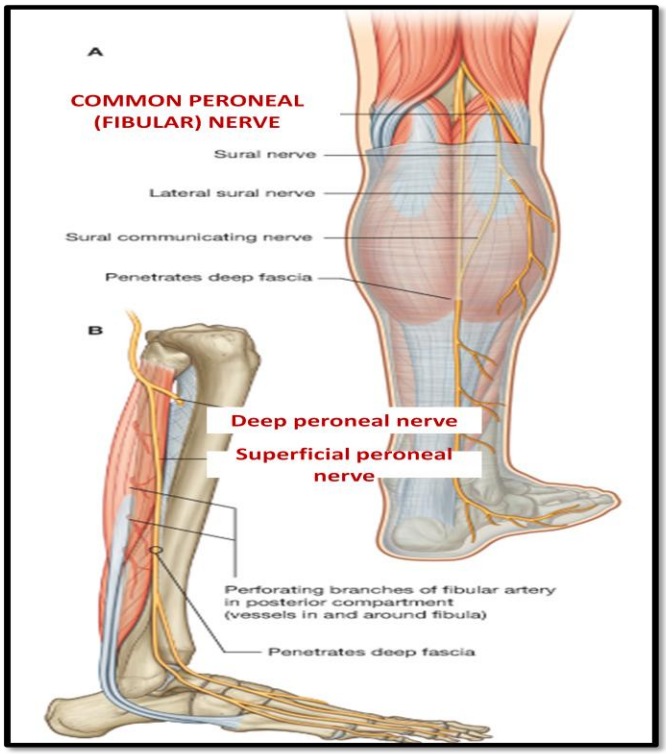

Brain
Axial T2
Caudate nucleus
Internal capsule (anterior limb)
Putamen
Extreme capsule
Column of fornix
Claustrum
External capsule
Internal capsule (genu)
Globus pallidus
Internal capsule (posterior limb)
Third ventricle
Thalamus
Retropulvinar cistern
Posterior commissure
Quadrigeminal cistern


Brain
Axial T2
Superior sagittal sinus
Superior frontal gyrus
Middle frontal gyrus
Inferior frontal gyrus
Insula
Lateral sulcus
Foramen of Monro
Superior temporal gyrus
Middle temporal gyrus
Choroid plexus
Straight sinus
Superior sagittal sinus



Nerve	Radial Nerve	MEDIAN NERVE	ULNAR NERVE
Roots	***C5, 6, 7, 8, & T1***	***C5,6,7&T1***	***C 7, 8 &T1***
Origin	It is a continuation of the **posterior cord** of brachial plexus.	By 2 roots from the **medial and lateral cords** of brachial plexus.	From the **medial cord** of the brachial plexus.
Injuries	The patient is **unable to extend the elbow joint, the wrist joint**, and the **fingers**. So The characteristic deformity is **Wrist drop**, or flexion of the wrist.	1- **APE HAND** 2- **CARPAL TUNNEL SYNDROME**: It results from compression of median nerve in the carpal tunnel.	1- LESION OF ULNAR NERVE **ABOVE ELBOW**: **partial claw hand.-** Atrophy of -hypothenar muscles 2- LESION OF ULNAR NERVE **ABOVE WRIST**: **- claw hand**





Extra picture for better understanding

Common Peroneal Nerve Injury

The muscles of the anterior and lateral compartments of the leg are paralyzed,
As a result, the opposing muscles, the plantar flexors of the ankle joint and the invertors of the subtalar joints, cause the foot to be ***Plantar Flexed*** **(Foot Drop)** ***and Inverted,*** an attitude referred to as **Equinovarus.**

Tibial Nerve Injury

Complete division results in the following clinical features:
All the muscles in the back of the leg and the sole of the foot are paralyzed.
The opposing muscles Dorsiflex the foot at the ankle joint and Evert the foot at the subtalar joint, an attitude referred to as **Calcaneovalgus.**