

2012

Anatomy practical team

Neuroanatomy



The Human Brain

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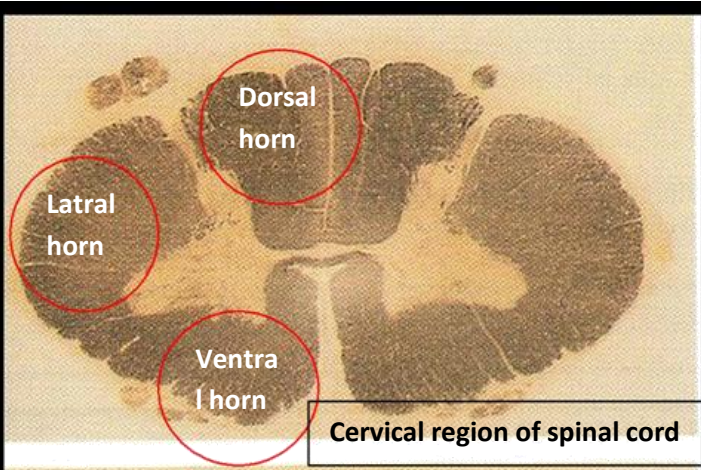
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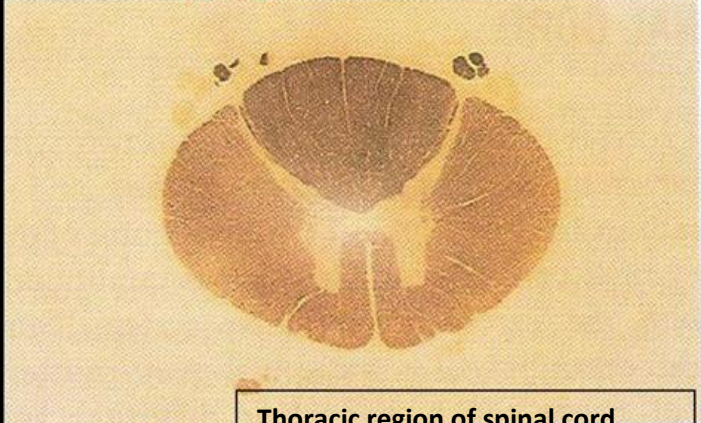
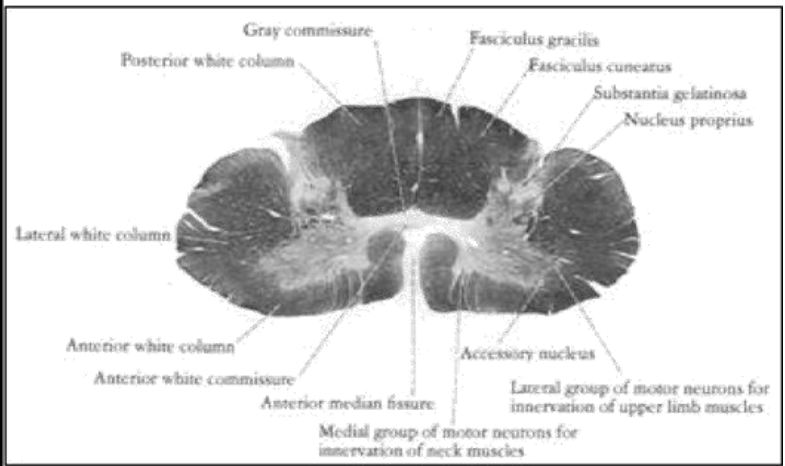
In general, doctor focuses on the identification of the section given and which level is involved. For example; a section of the spinal cord, the identification is (Spinal Cord) and the level will be either (Cervical, thoracic or lumbar). Or a section of the brainstem the identification is (Brain stem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

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

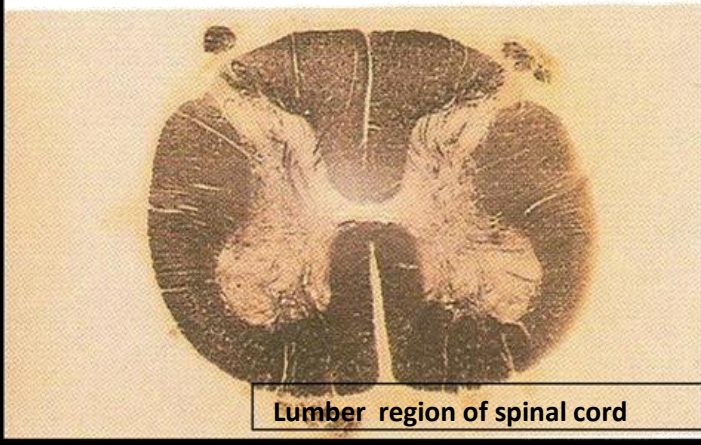
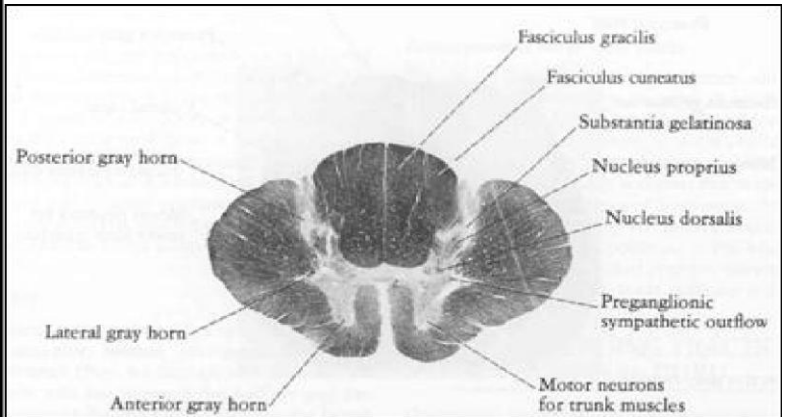
- **The identification**
- **The most important features**
- **The level**
e.g. (Cervical, thoracic or lumbar spinal cord). (Rostral, mid or caudal medulla).
- **The disorders or diseases related to the components of the section e.g. (Spinothalamic tract lesion leads to loss of pain and temperature).**



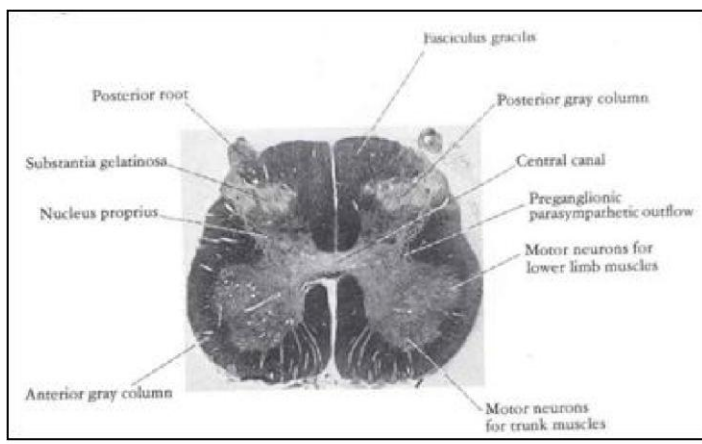
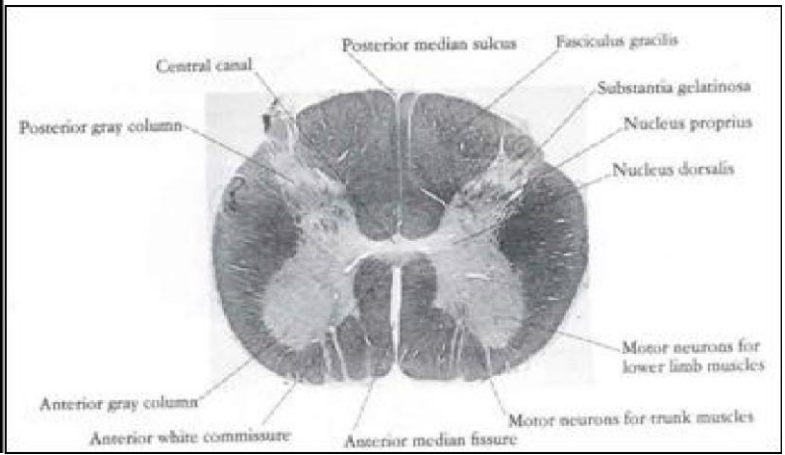
Cervical region of spinal cord



Thoracic region of spinal cord



Lumbar region of spinal cord



Sacral region of spinal cord

Proprioception sensation, fine touch	Dorsal column Tracts: Cuneate (upper limb) Gracile (lower limb)
crude touch and pressure pain, temperature	Spinothalamic tracts: 1-ventral spinothalamic tract 2-lateral spinothalamic tract

What is the level?

Identification for each section?

Internal structure?

Questions may come as a scenario for example

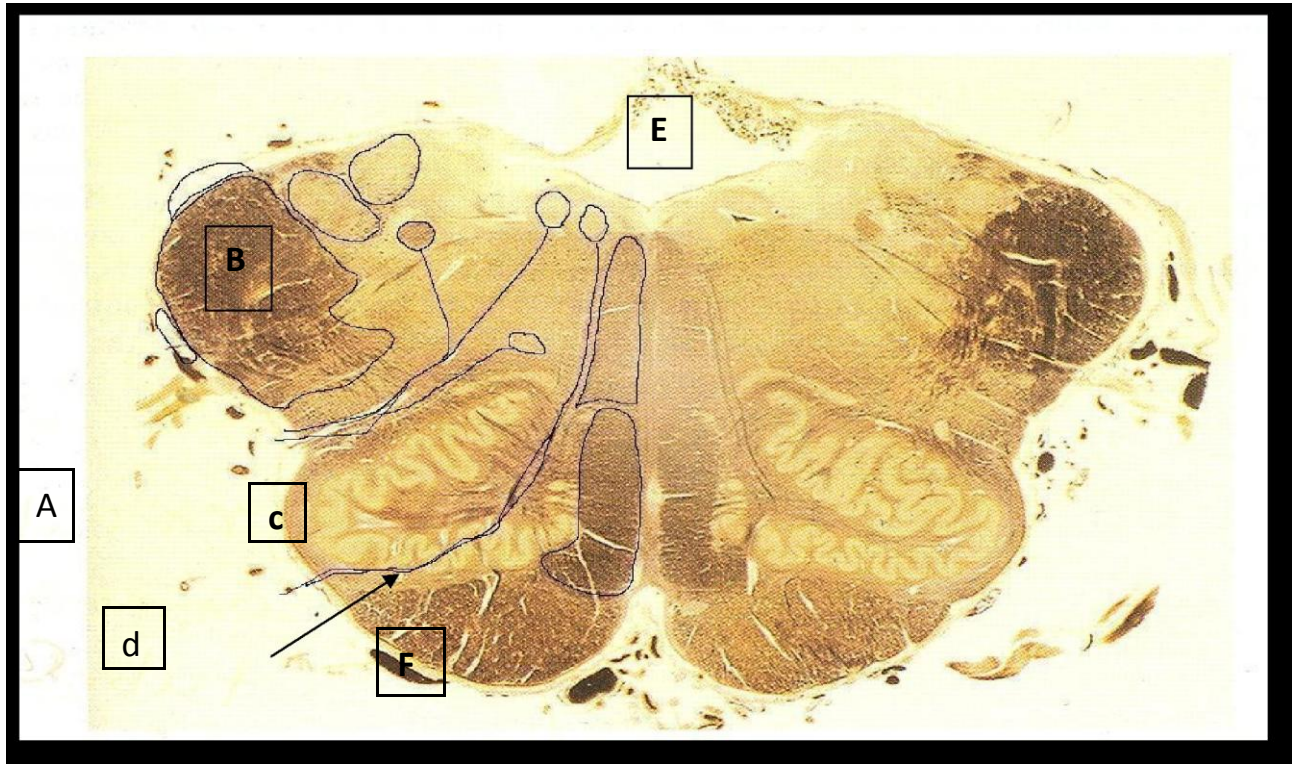
Q 1: A boy has lost proprioception sensation in lower limb. which tract is affected? gracile fasciculus Region? DORSAL COLUMN

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

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)

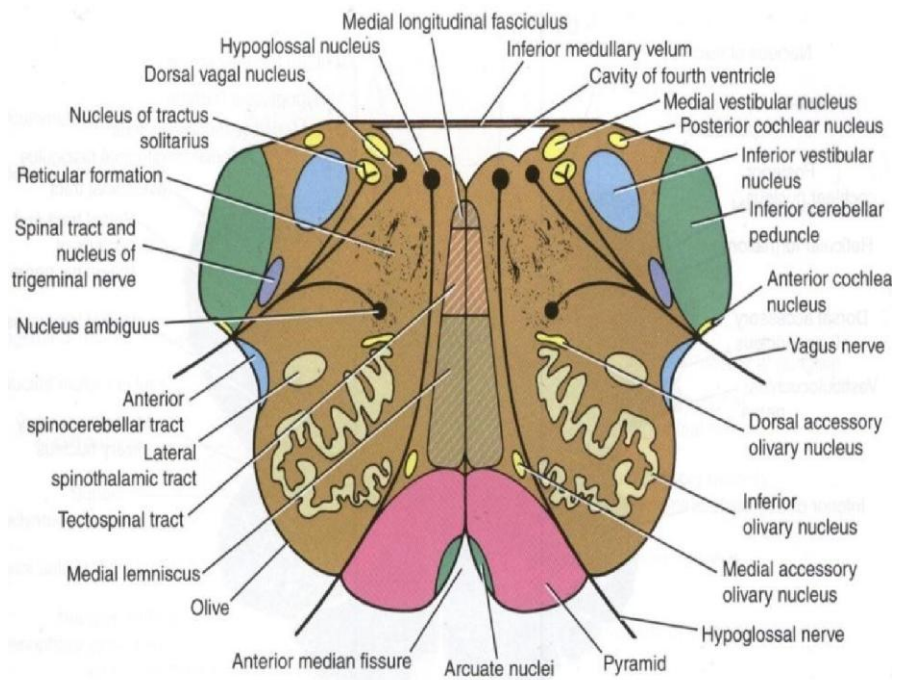
Answer is: Lateral spinothalamic tract.

open medulla

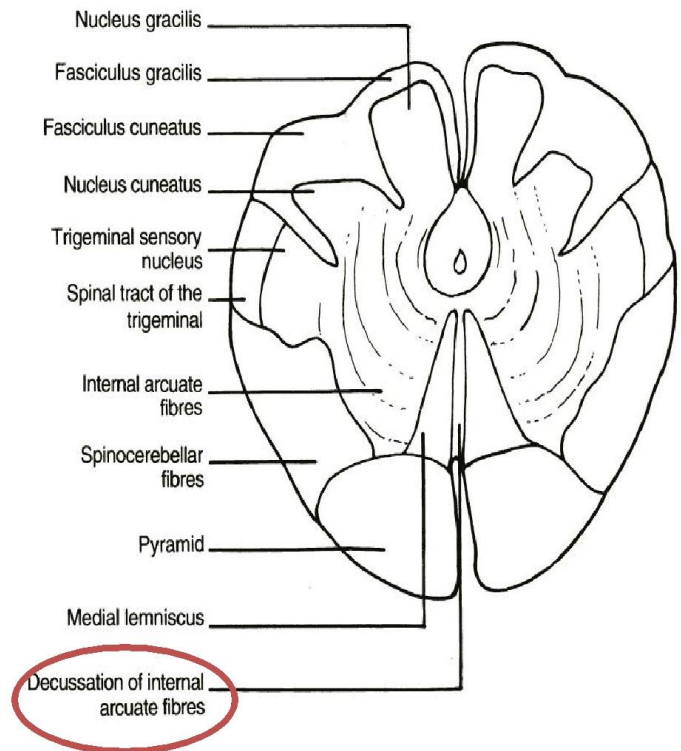
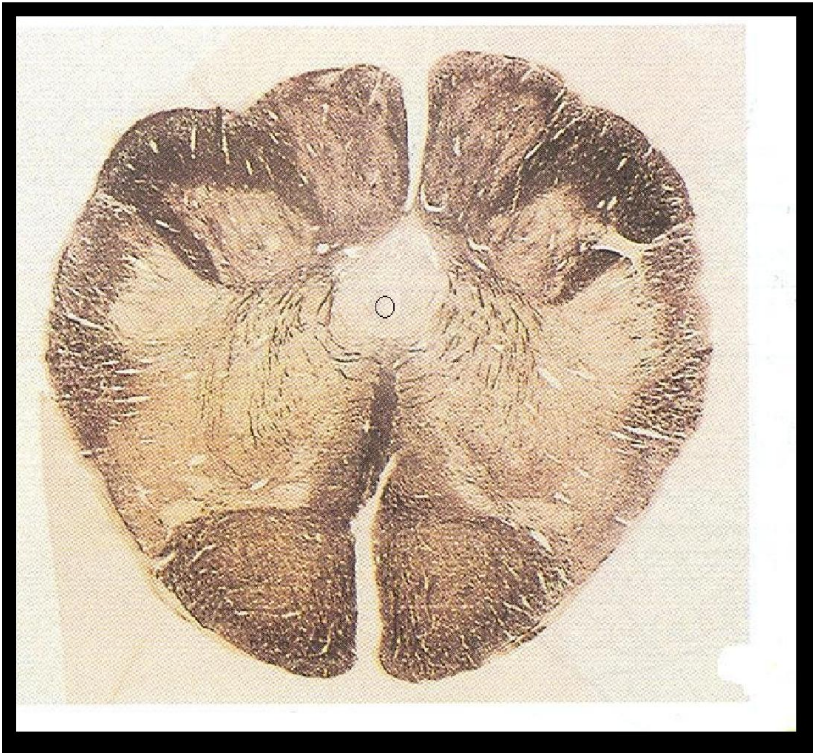


1. Identify A: medial lemniscus
2. Identify B: Inferior cerebellar peduncle
3. Identify C: inferior olivary nucleus
4. Identify D: pyramid (corticospinal tract)
5. Identify E: fourth ventricle
6. Identify F : hypoglossal nerve

Level: open medulla



Mid medulla

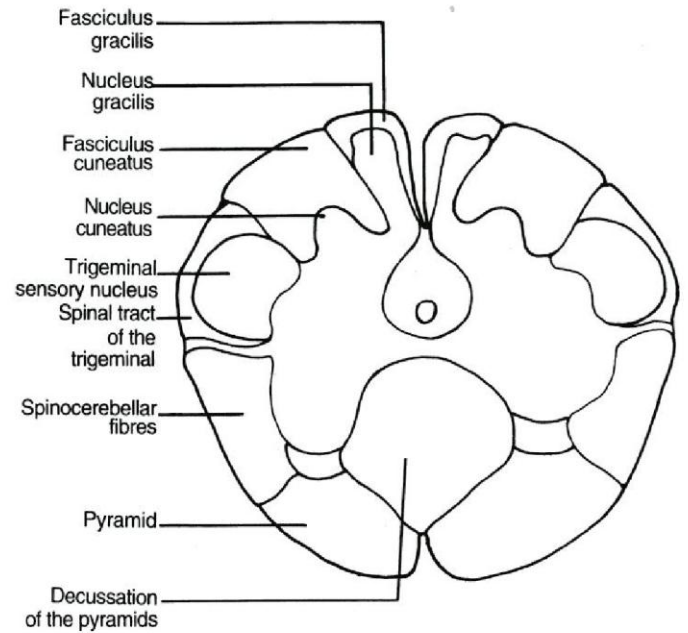
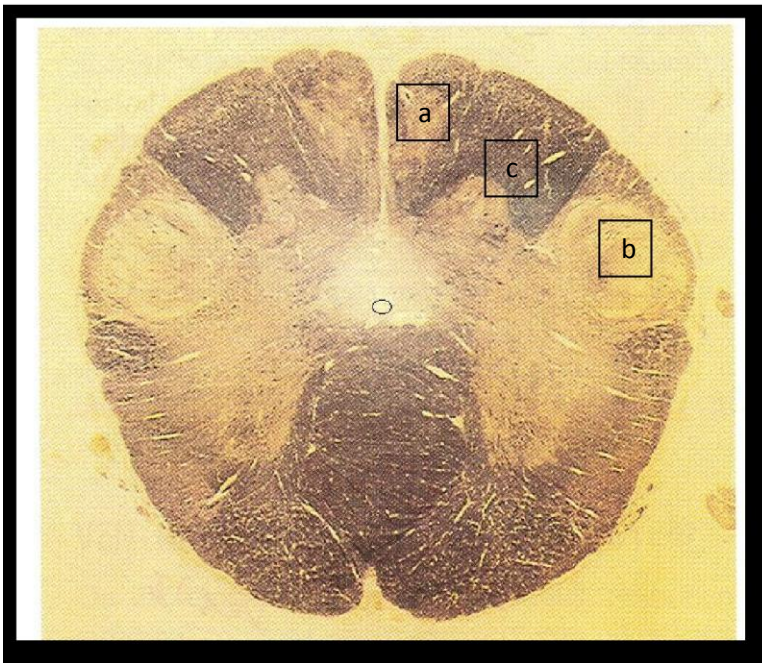


Transverse section of the mid medulla (Sensory Decussation)

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

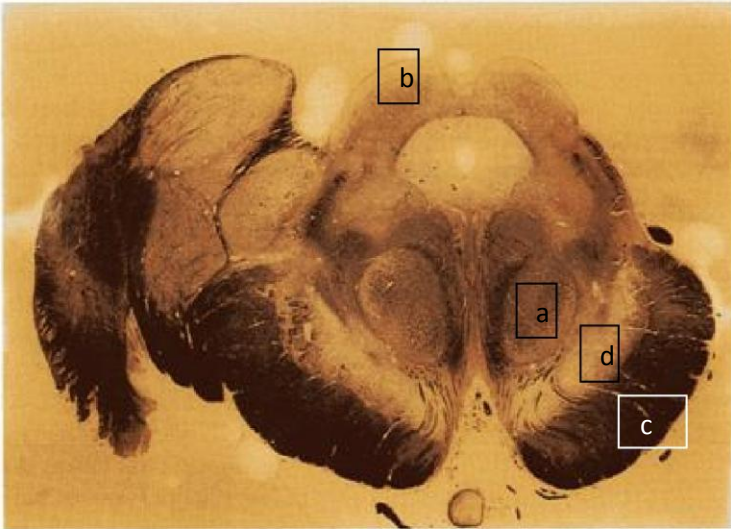
Transverse section of the caudal medulla

(Pyramidal Decussation) or (Motor Decussation)

Important structures:

- 1- Nucleus cuneatus
- 2- Nucleus gracilis
- 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

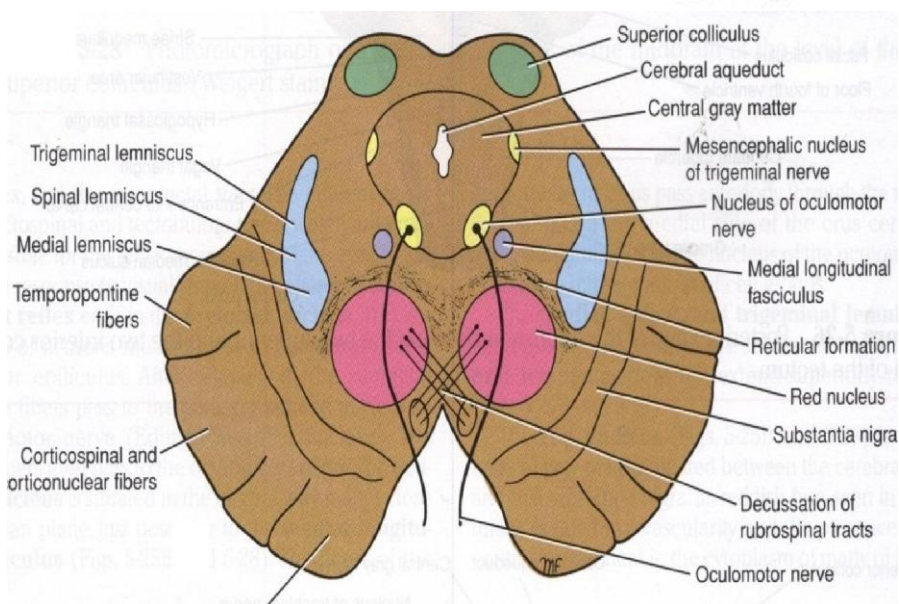
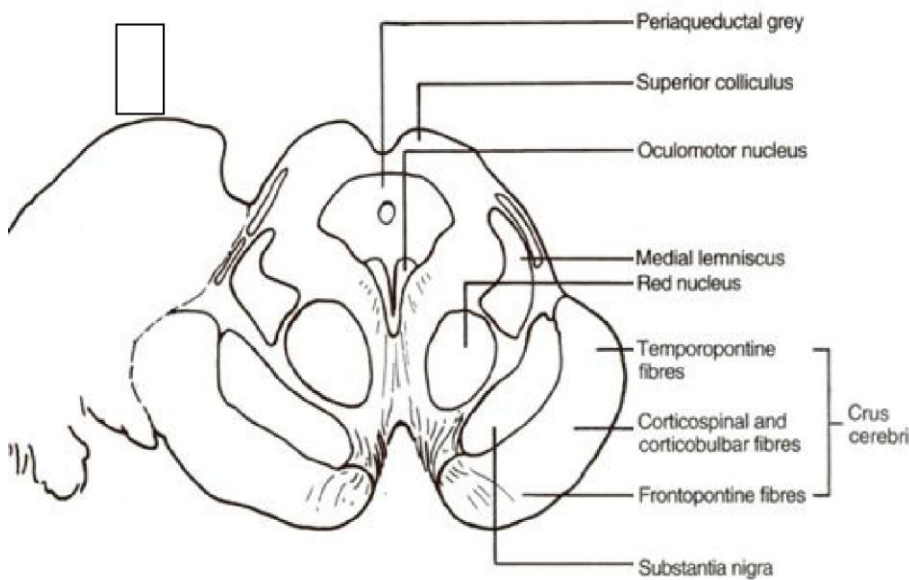
B :superior colliculus

C :crus cerebri and list its structure :
temporopontine fiber , corticobulbar ,
corticospinal , frontopontine fiber .

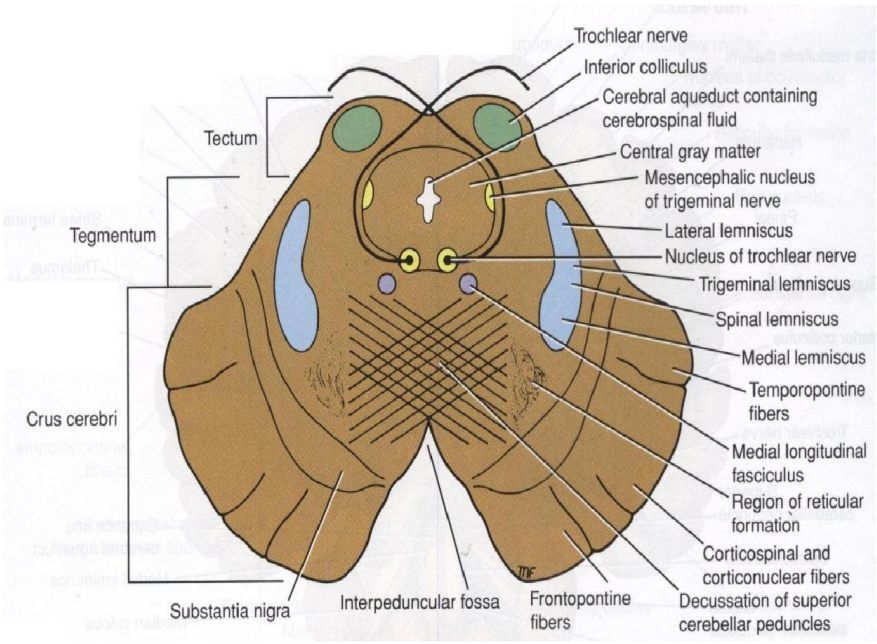
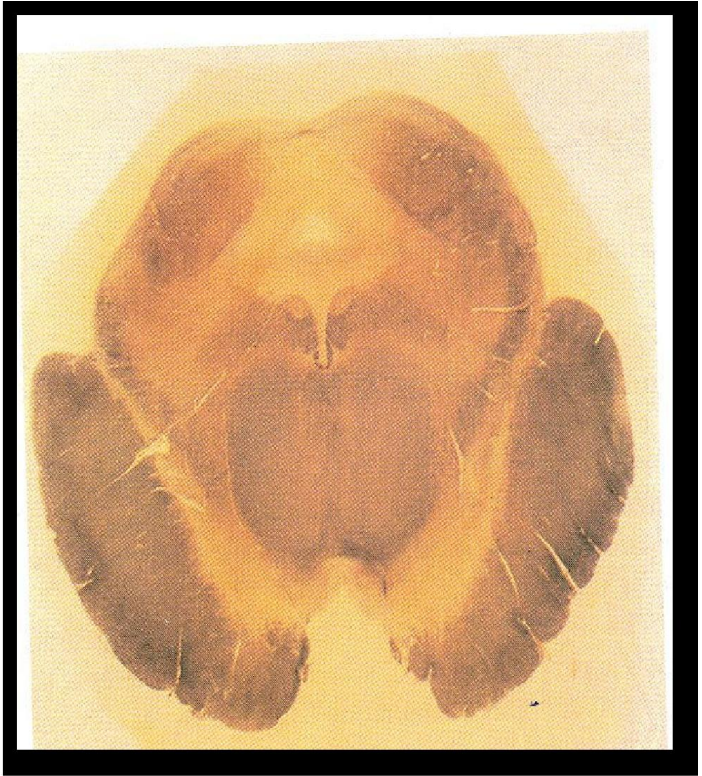
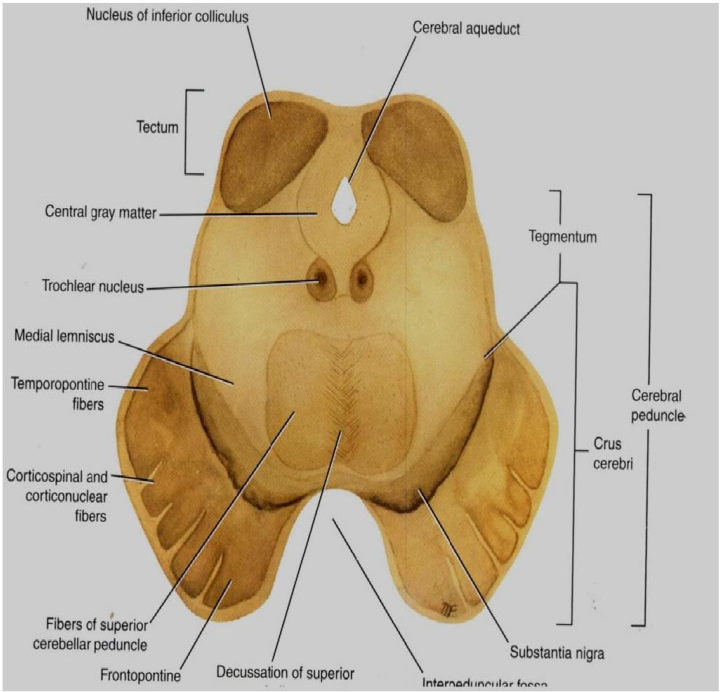
D :substantia nigra

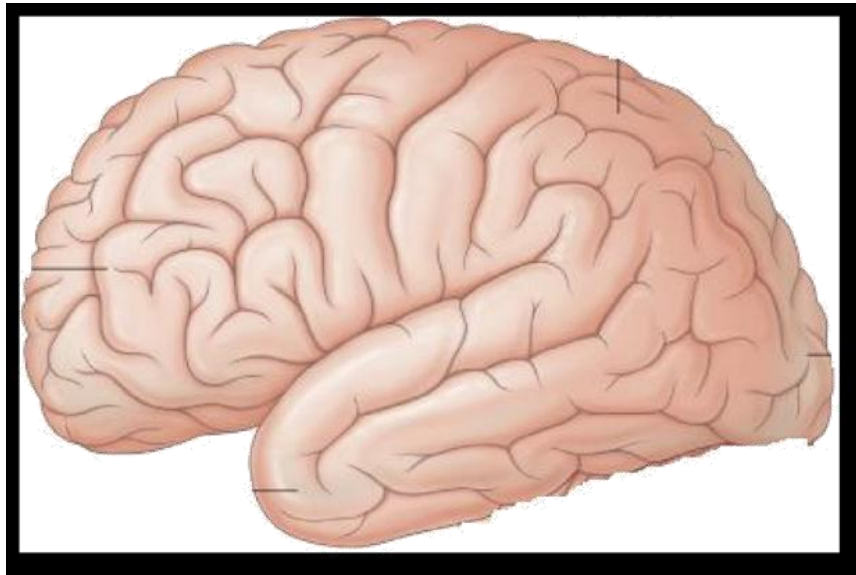
Q: Man came to the hospital with tremor, stiffness, cog wheel rigidity . the was parkinson disease .

Which of these letter show the affected part? D



Mid brain (inferior colliculus)





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

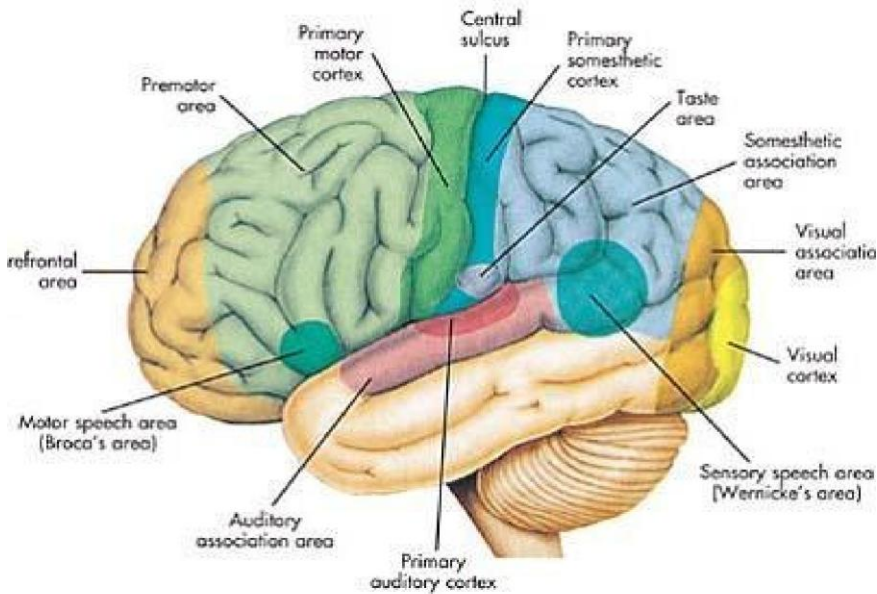
In the exam write the 2 names

e.g: precentral gyrus and primary motor cortex

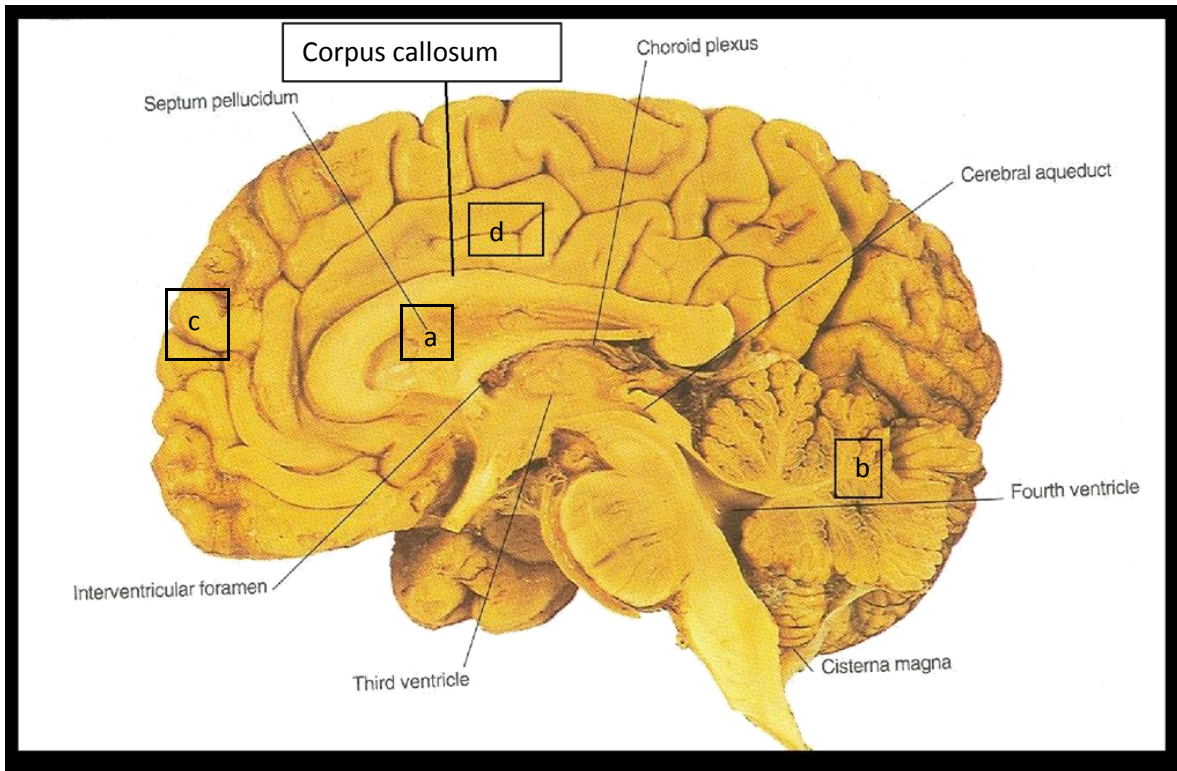
Q : man came to the hospital with inability to speak and weakness in the right side of the body . what are the area that affected? and its blood supply?

Broca's area , precentral gyrus

Blood supply middle cerebral artery



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



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

cerebellum

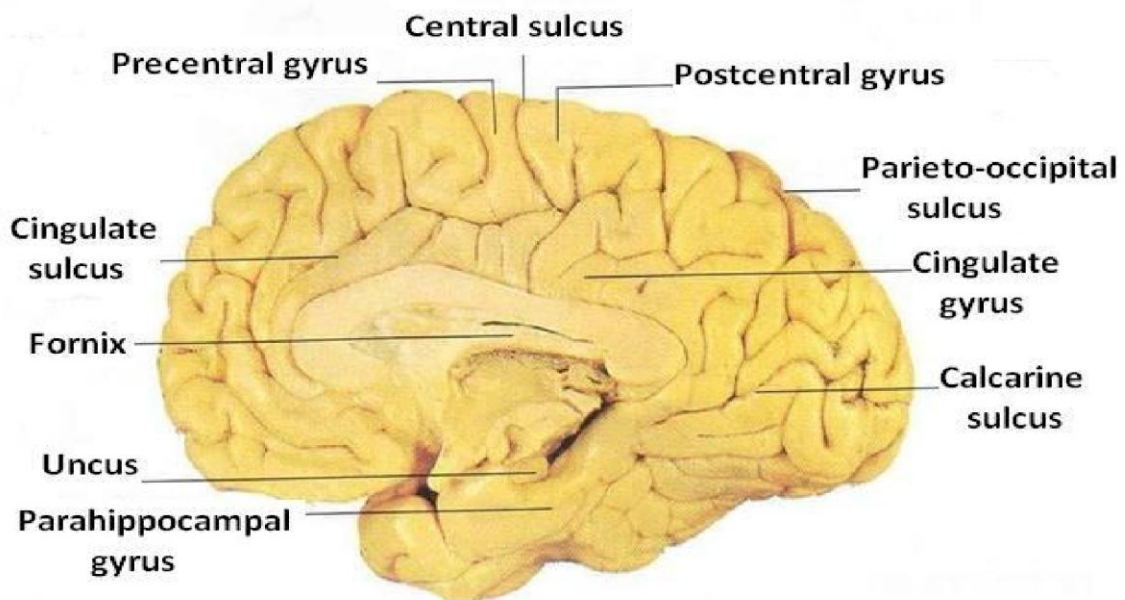
Corpus callosum : splenium , body, Rostrum, genu

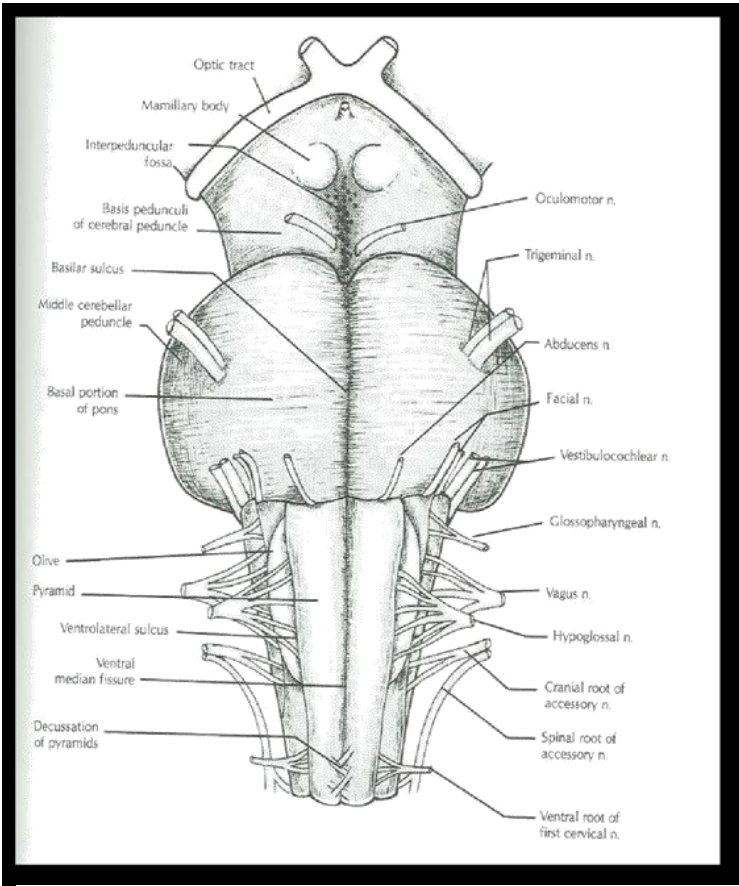
Identify

A : Splenium of corpus callosum

B : cerebellum

C: occipital lobe





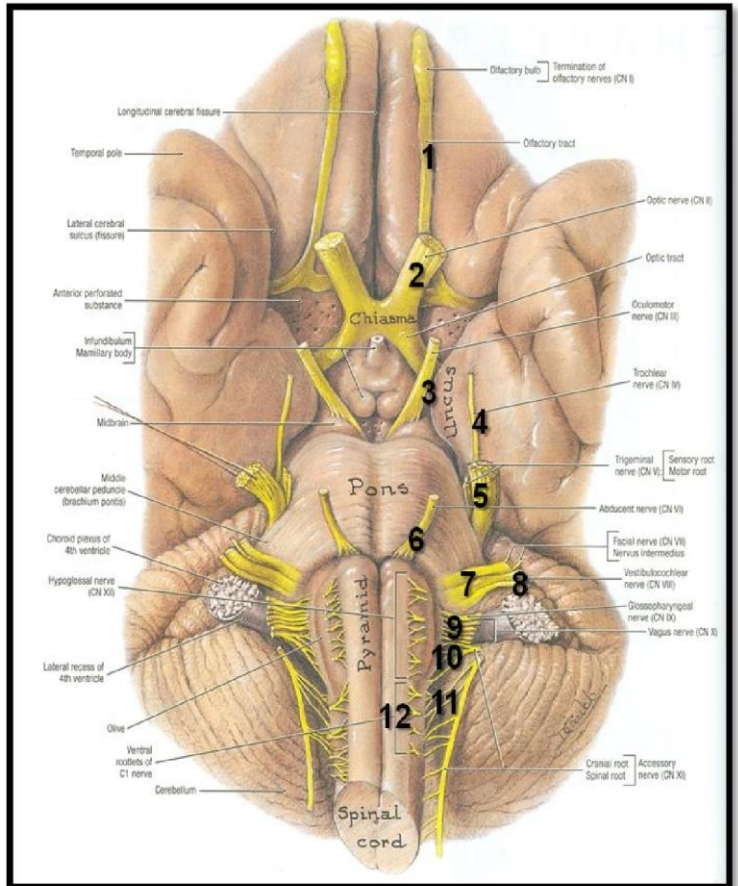
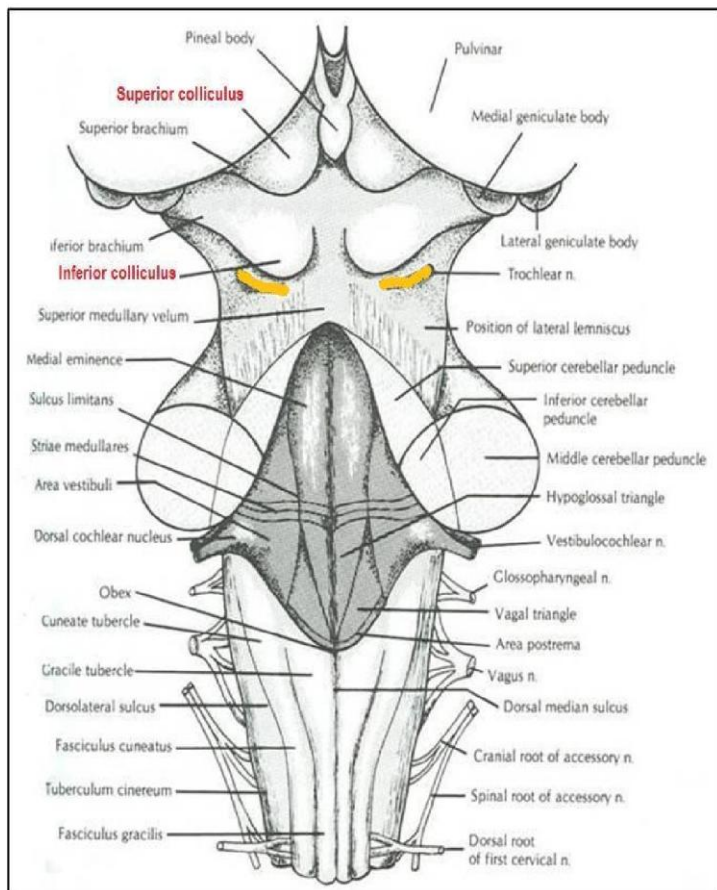
Brain stem

Case:

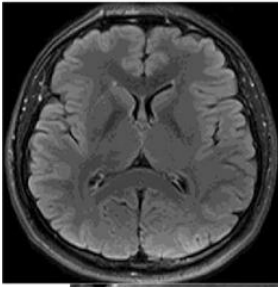
Q) patient has medial squint, which nerve is responsible?

a) abducent nerve

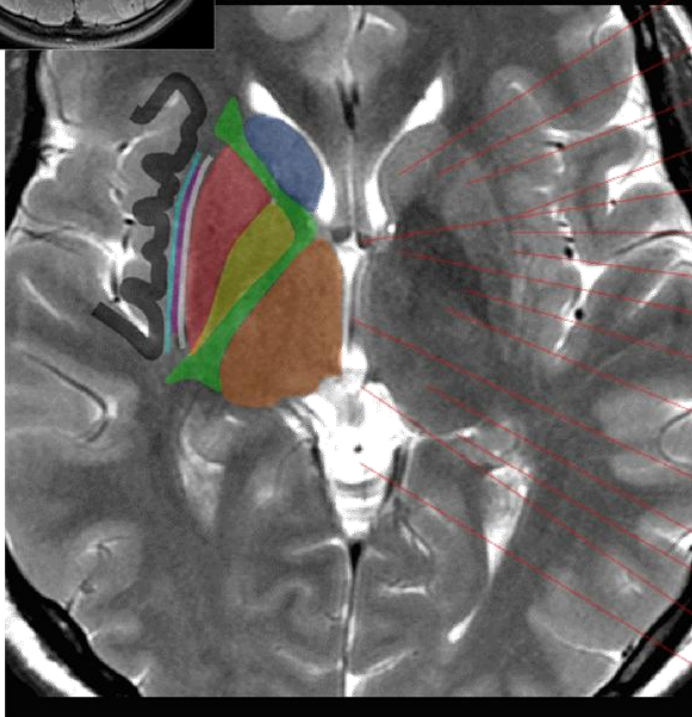
-identify cranial nerve and important structures.



Lesion	Nerve
<p>Lesion results in: visual field defects and loss of visual acuity, a defect of vision is called anopsia.</p> <ul style="list-style-type: none"> - 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 	Optic nerve
<ul style="list-style-type: none"> -Lateral squint. -Ptosis. -Diplopia. -Pupillary dilatation. -Loss of accommodation. <p>Impaired downward & inward movement of the eye ball on the damaged side</p>	Oculomotor nerve
<ul style="list-style-type: none"> -diplopia -Inability to rotate the eye infero-laterally. 	Trochlear Nerve
-trigeminal neuralgia or tic douloureux	Trigeminal nerve
-Inability to direct the affected eye laterally. (medial squint).	Abducent nerve
-Bell's Palsy	Facial nerve
-deafness ,tinnitus ,vertigo, dizziness, nausea, nystagmus, loss of balance and ataxia	vestibulocochlear nerve
- dysphonia, dysphagia and absence of the gag reflex.	GLOSSOPHARYNGEAL NERVE
-causes hoarseness or loss of voice, impaired swallowing, GI dysfunction, blood pressure anomalies	Vagus nerve
<ul style="list-style-type: none"> -Difficulty in swallowing and speech -Inability to turn the head -Inability to shrug (raise) the shoulder -Winging of scapula 	Accessory Nerve
<ul style="list-style-type: none"> -Loss of tongue movements -Difficulty in chewing and speech -The tongue paralyses 	Hypoglossal Nerve

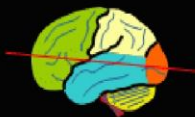
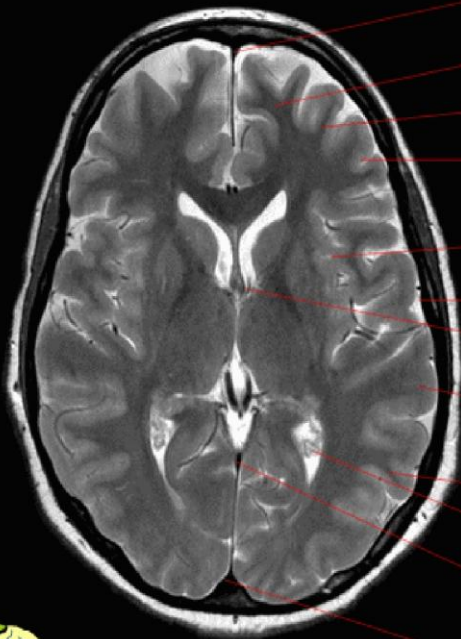


Brain
Axial T2



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

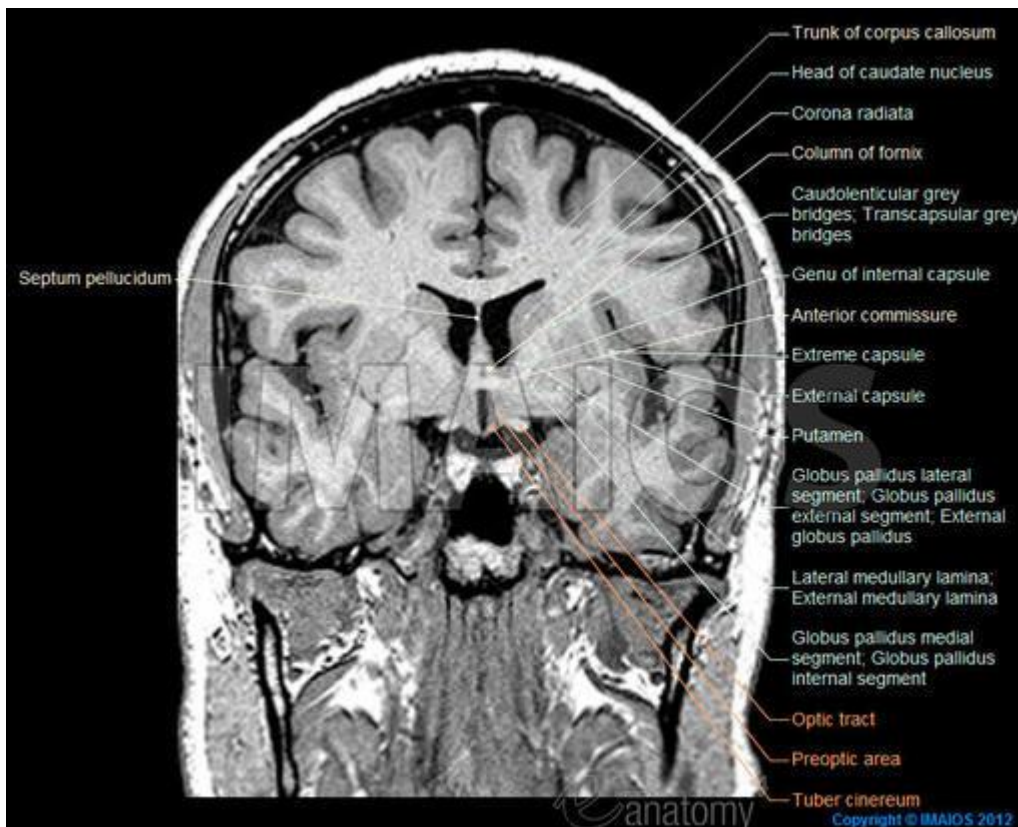
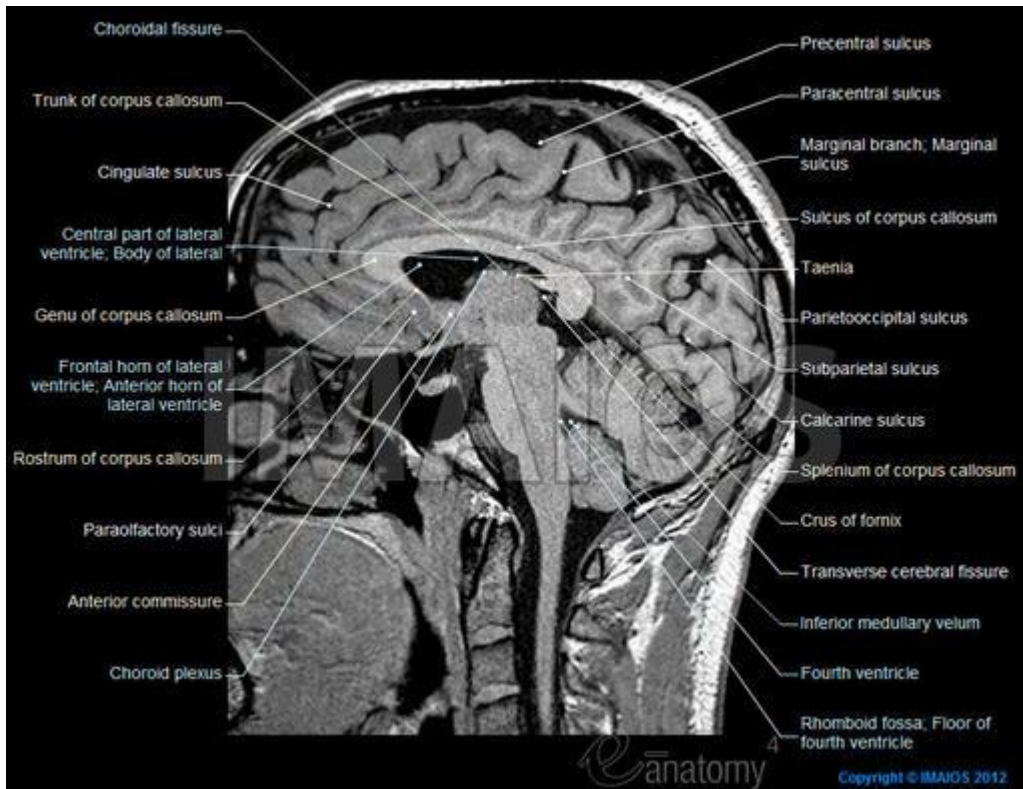
Brain
Axial T2

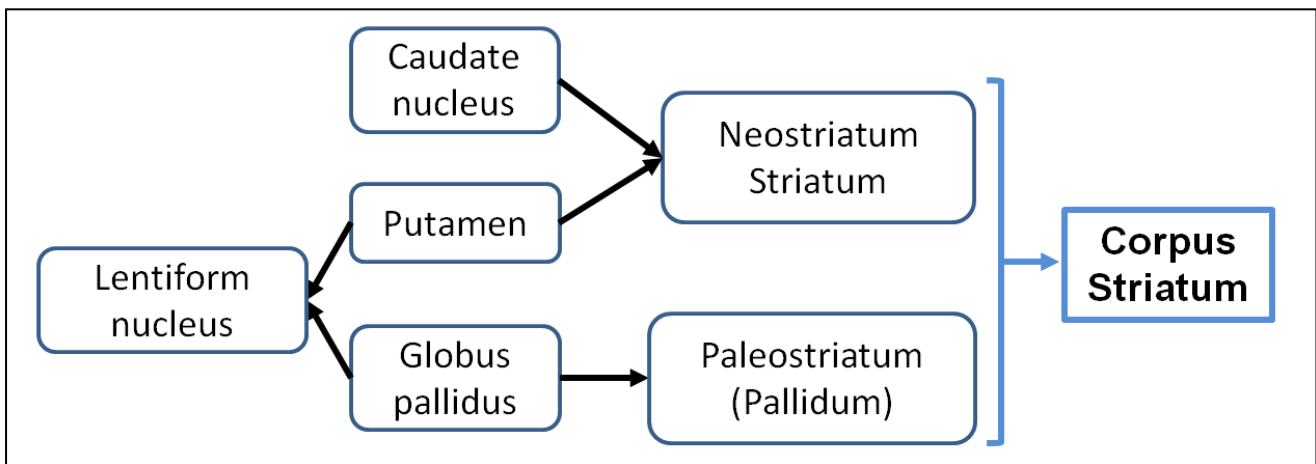
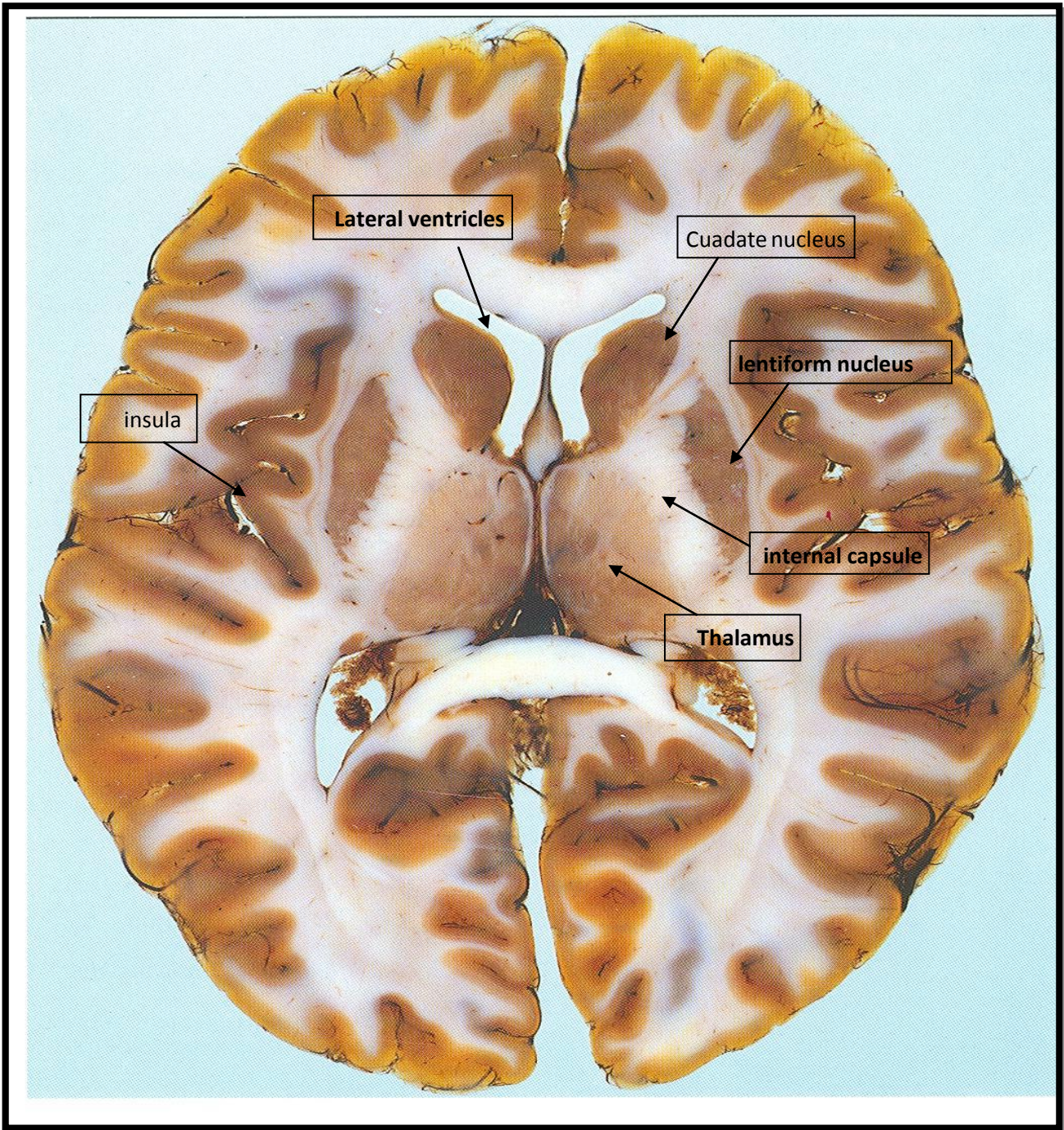


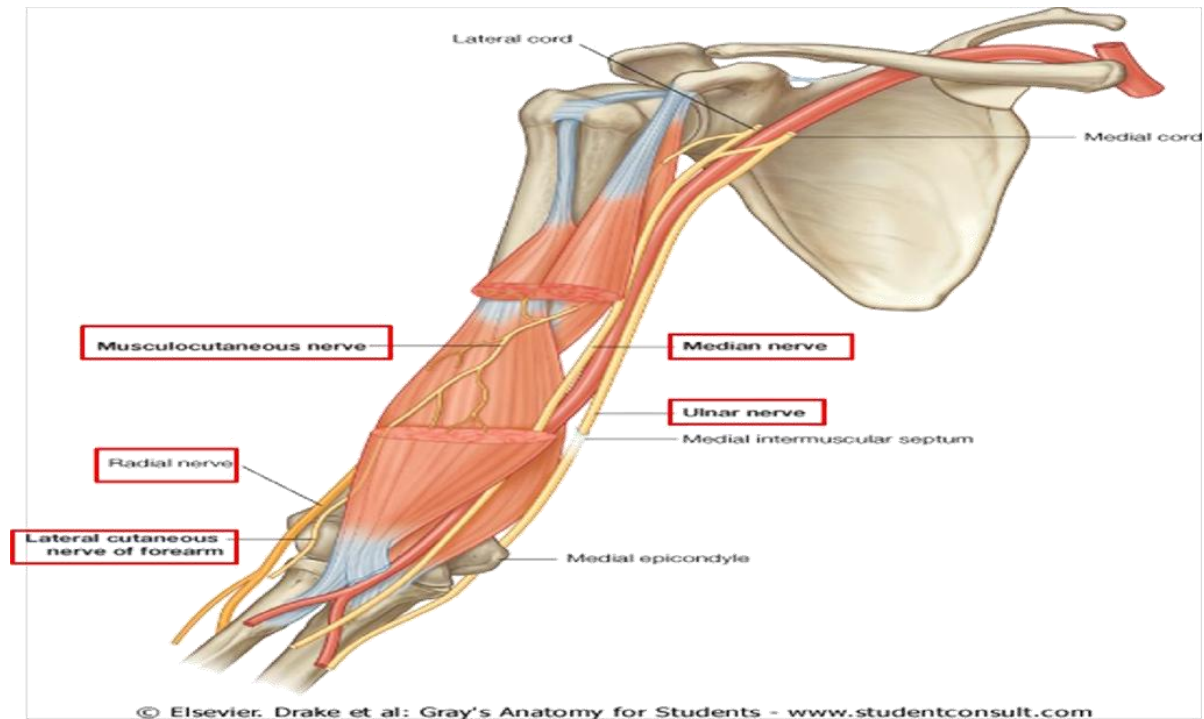
- Superior sagittal sinus
- Superior frontal gyrus
- Middle frontal gyrus
- Inferior frontal gyrus
- Insula
- Lateral sulcus
- Foramen of Monro
- Superior temporal gyrus
- Middle temporal gyrus
- Choroid plexus
- Straight sinus
- Superior sagittal sinus

Note :

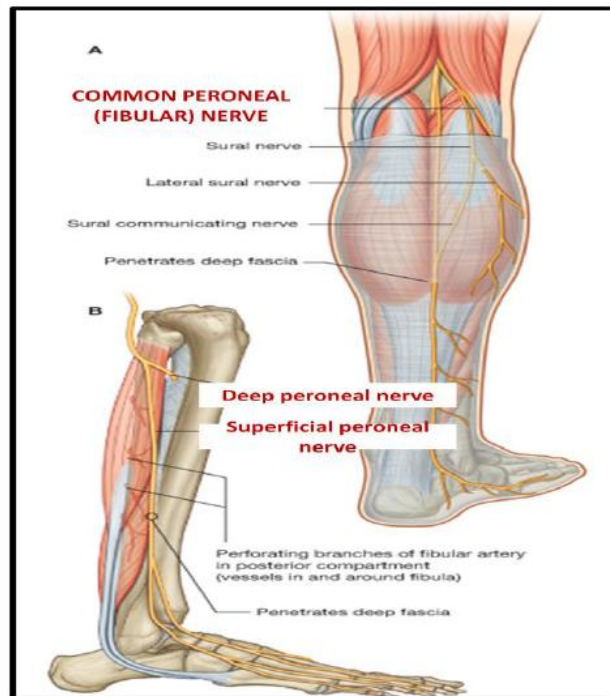
Take a general look in many section of radiology







ULNAR NERVE	MEDIAN NERVE	Radial Nerve	Nerve
C7, 8 & T1	C5,6,7&T1	C5, 6, 7, 8, & T1	Roots
From the medial cord of the brachial plexus.	By 2 roots from the medial and lateral cords of brachial plexus.	It is a continuation of the posterior cord of brachial plexus.	Origin
1- LESION OF ULNAR NERVE ABOVE ELBOW: partial claw hand.- Atrophy of -hypotenar muscles 2- LESION OF ULNAR NERVE ABOVE WRIST: - claw hand	1- APE HAND 2- CARPAL TUNNEL SYNDROME: It results from compression of median nerve in the carpal tunnel.	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.	Injuries



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.



