



BRAIN STEM III

Dr Ashraf Sadek *PhD, MD, MRCPCH*

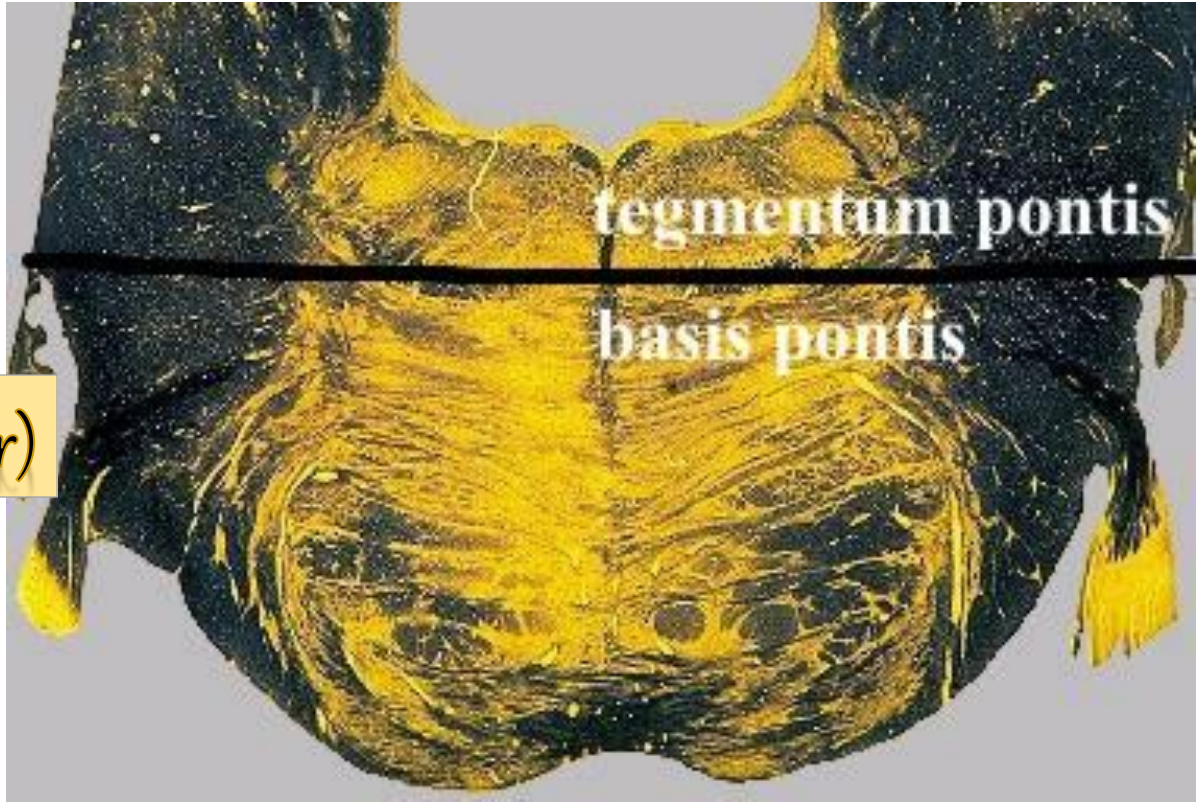
Assistant Professor of anatomy and embryology

Internal structure of Pons

Pons

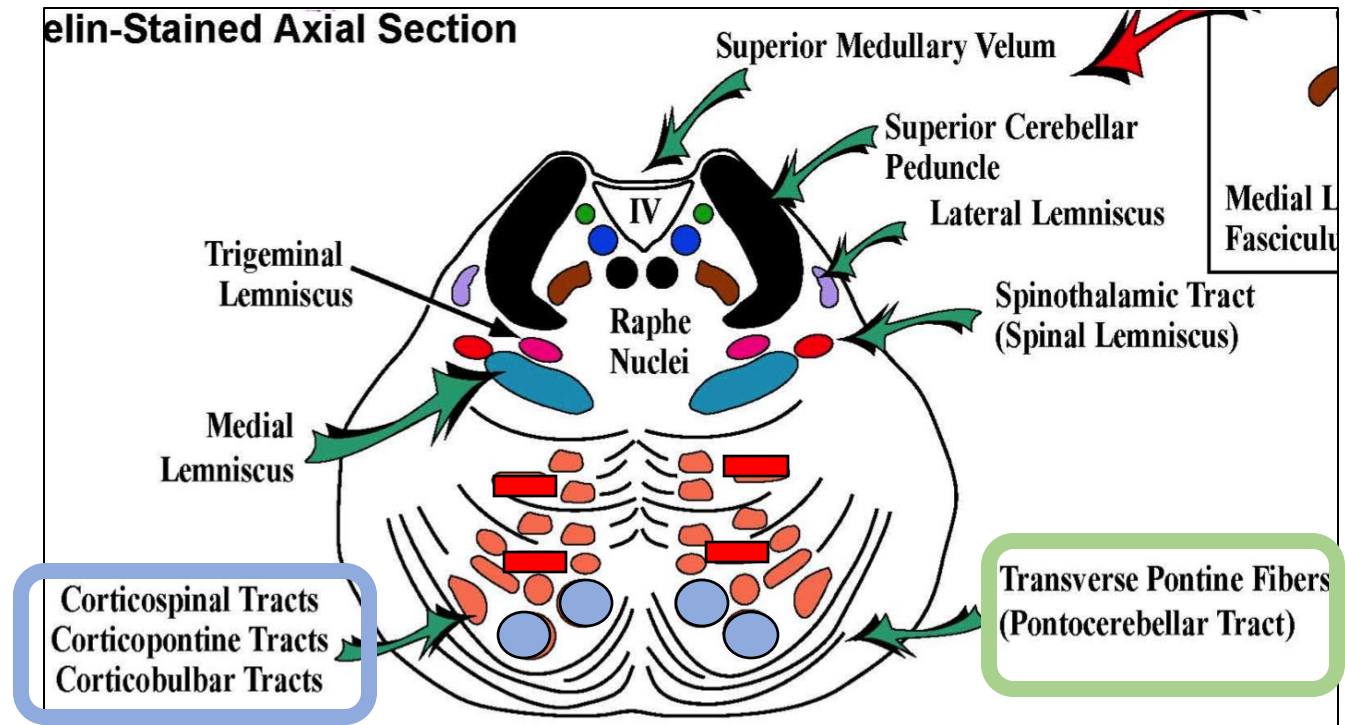


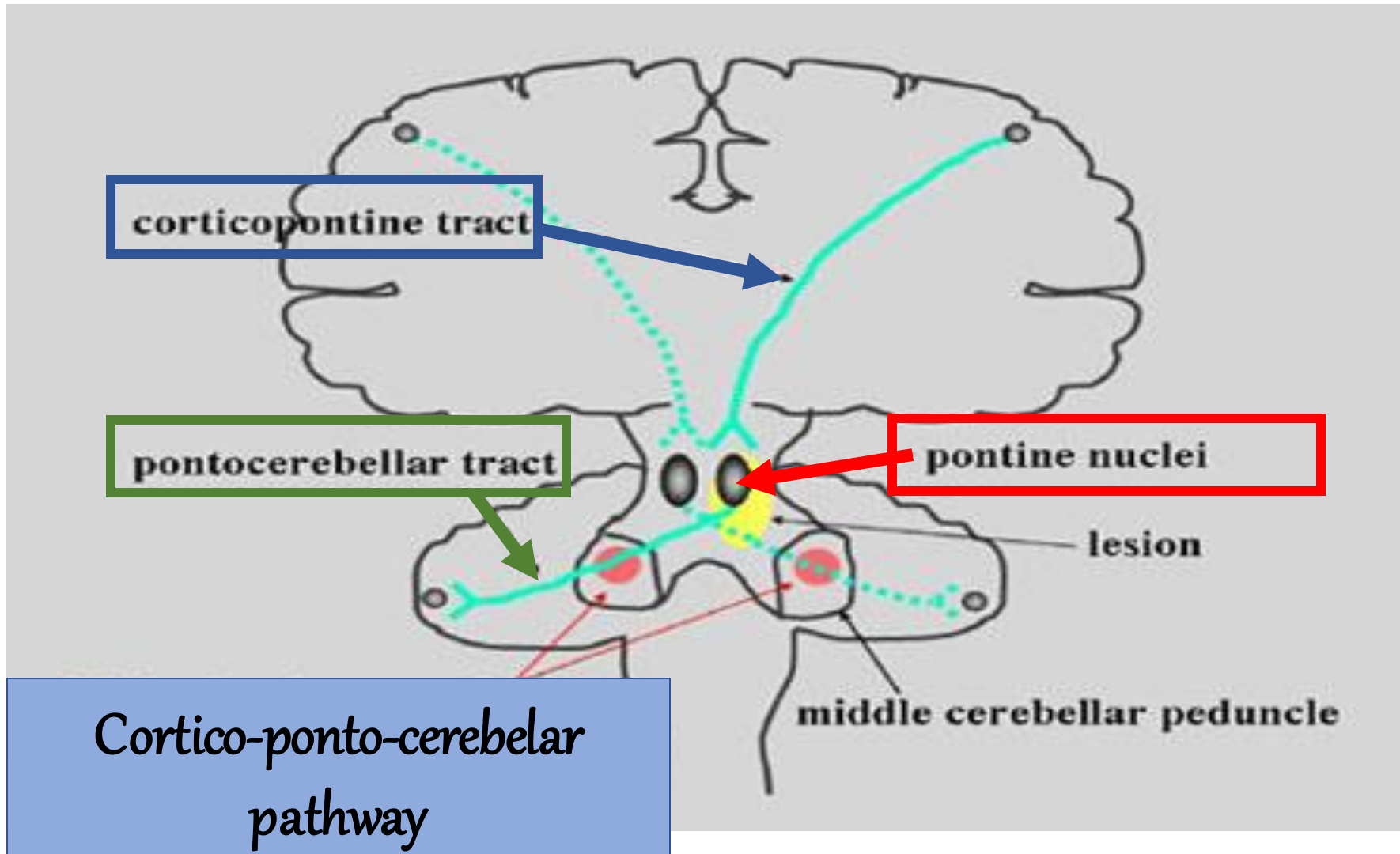
Basis Pontis (anterior) | Tegmentum (posterior)



BASIS PONTIS

- 1-Pontine nuclei:- scattered masses of neurons
- 2-Transverse pontine fibers:- axons of pontine nuclei, passing to the opposite MCP.
- 3-Descending cortical fibers:-
 - Cortico-pontine.
 - Cortico-spinal.
 - Cortico-nuclear fibers...
....motor nuclei of cranial nerves.





Function:-

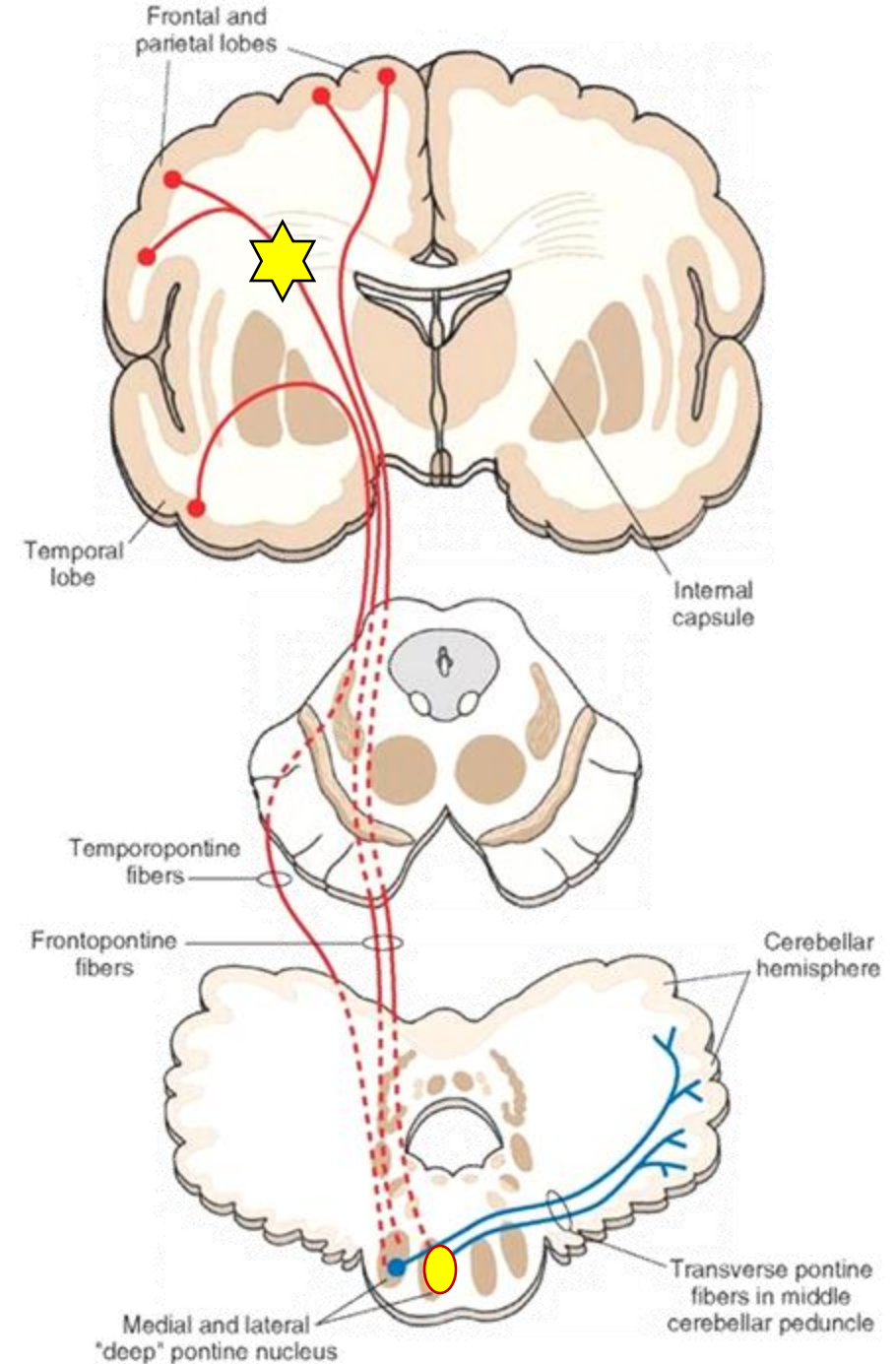
The neocerebellum (responsible for coordination of voluntary movement) is informed about the plane and sequence of the intended movement.

Cortico – pontine fibers

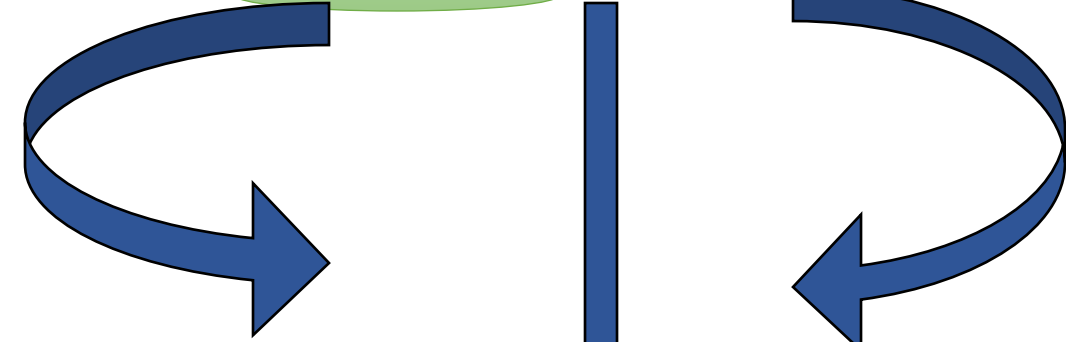
Descend in the internal capsule, crus cerebri.....pontine nuclei.

Pontocerebellar fibers

Axons of pontine nuclei forming transverse pontine fibers.....cross midline to form M.C.P.....contra lateral hemi cerebellum.



Tegmentum of pons



White matter

Grey matter

Longitudinal fibers
Ascending Lemnisci(4) the spinal & medial lemnisci, 2 more lemnisci are

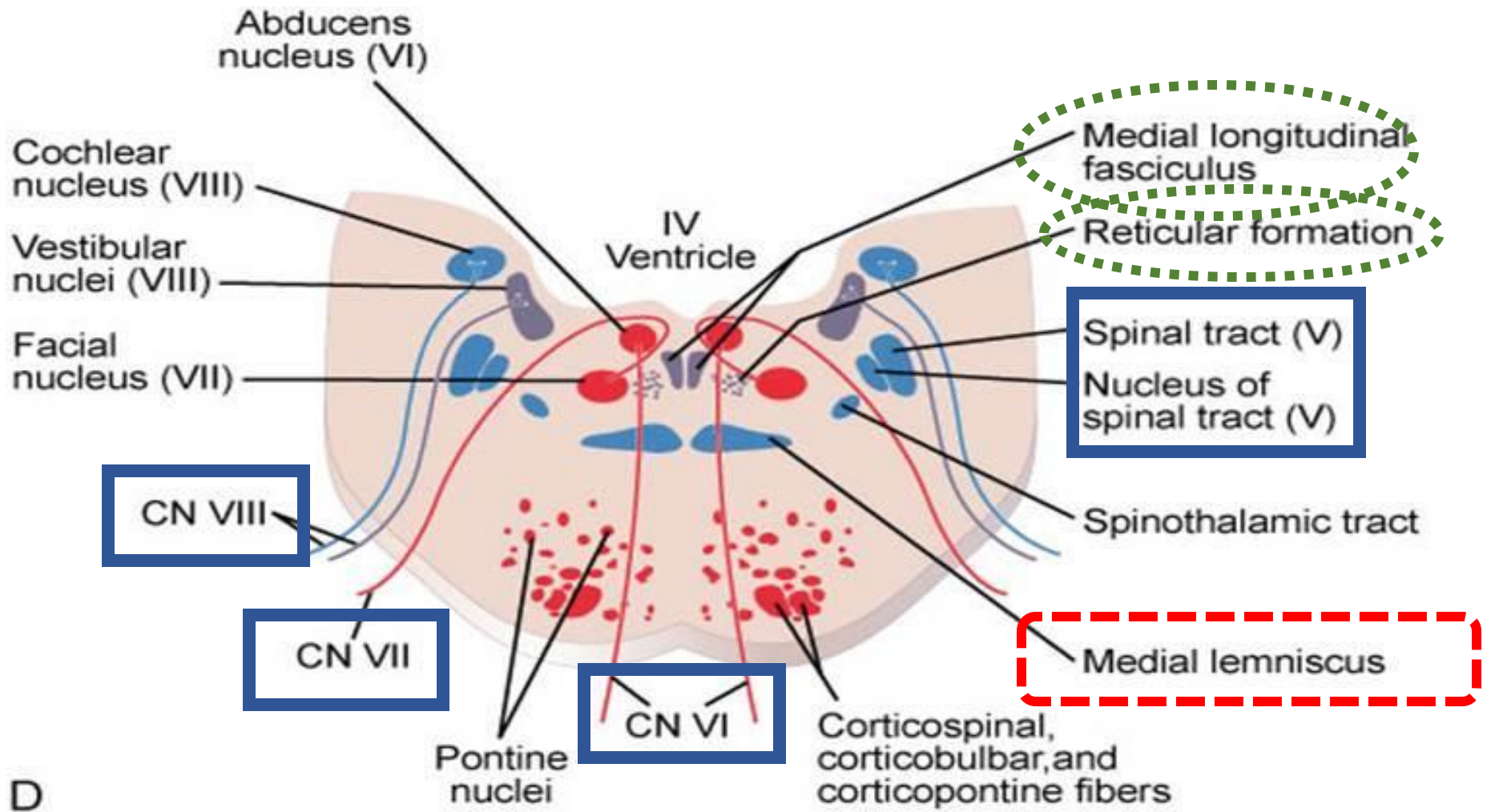
MLB

Horizontal fibers
Trapezoid body

Cranial nerve nuclei
V,VI,VII,VIII

Superior olive.
(Part of auditory pathway)

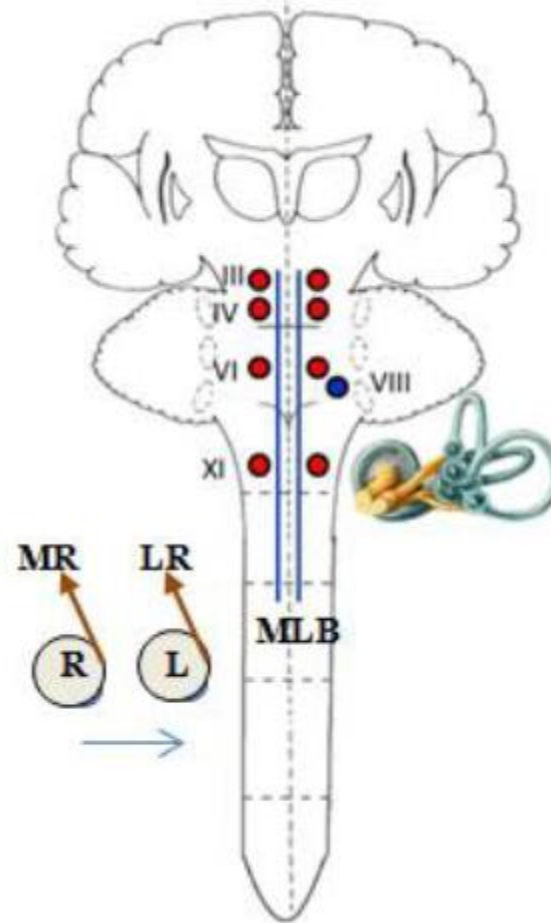
Reticular formation



Medial Longitudinal Bundle: MLB (fasciculus)

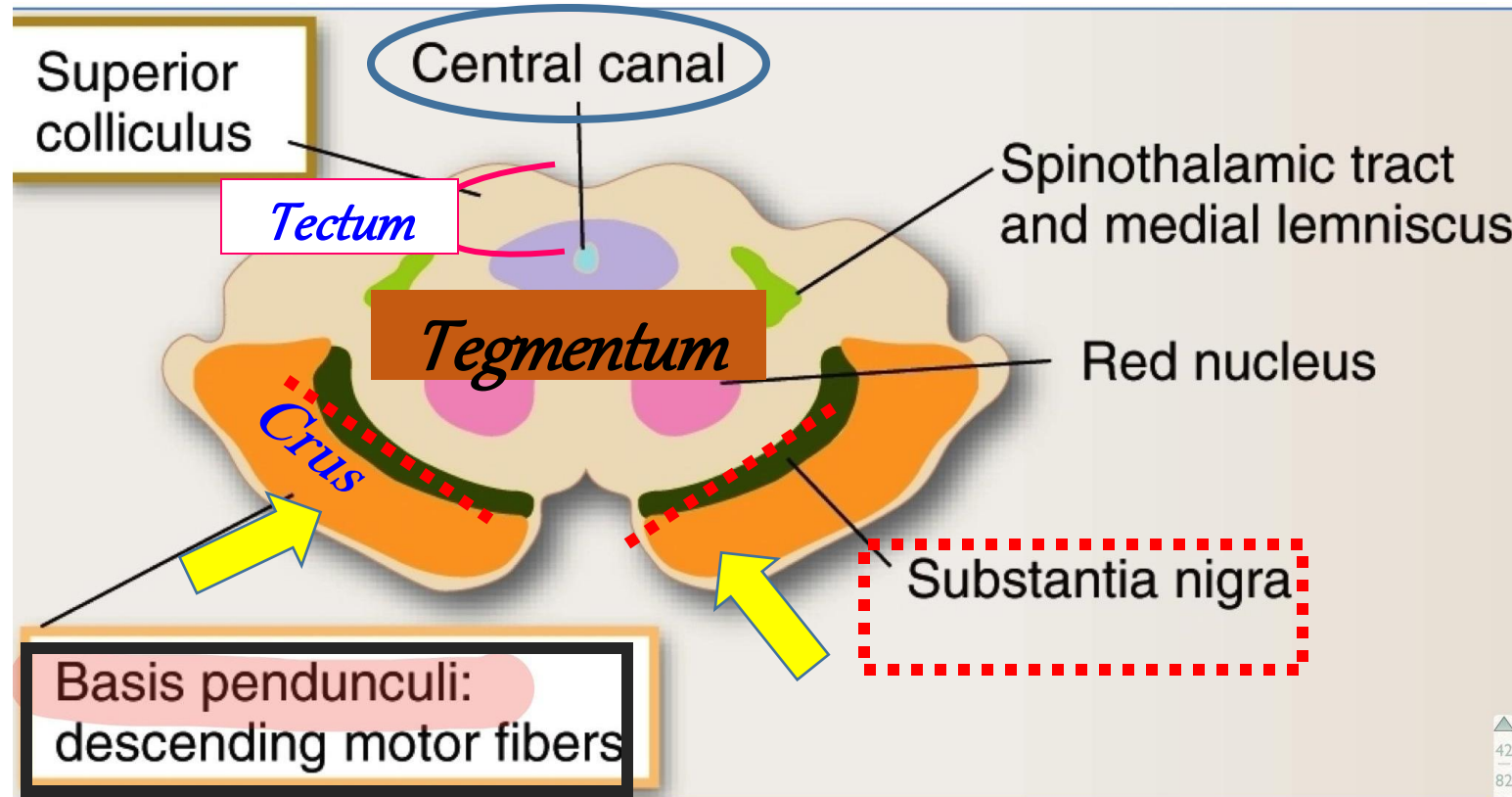
A bundle of fibers extending longitudinally in the brainstem on each side of the median plane

- It connects the vestibular and cochlear nuclei with motor nuclei of cranial nerves that move the eye III, IV, VI and with the spinal nucleus of accessory nerve that moves the neck.



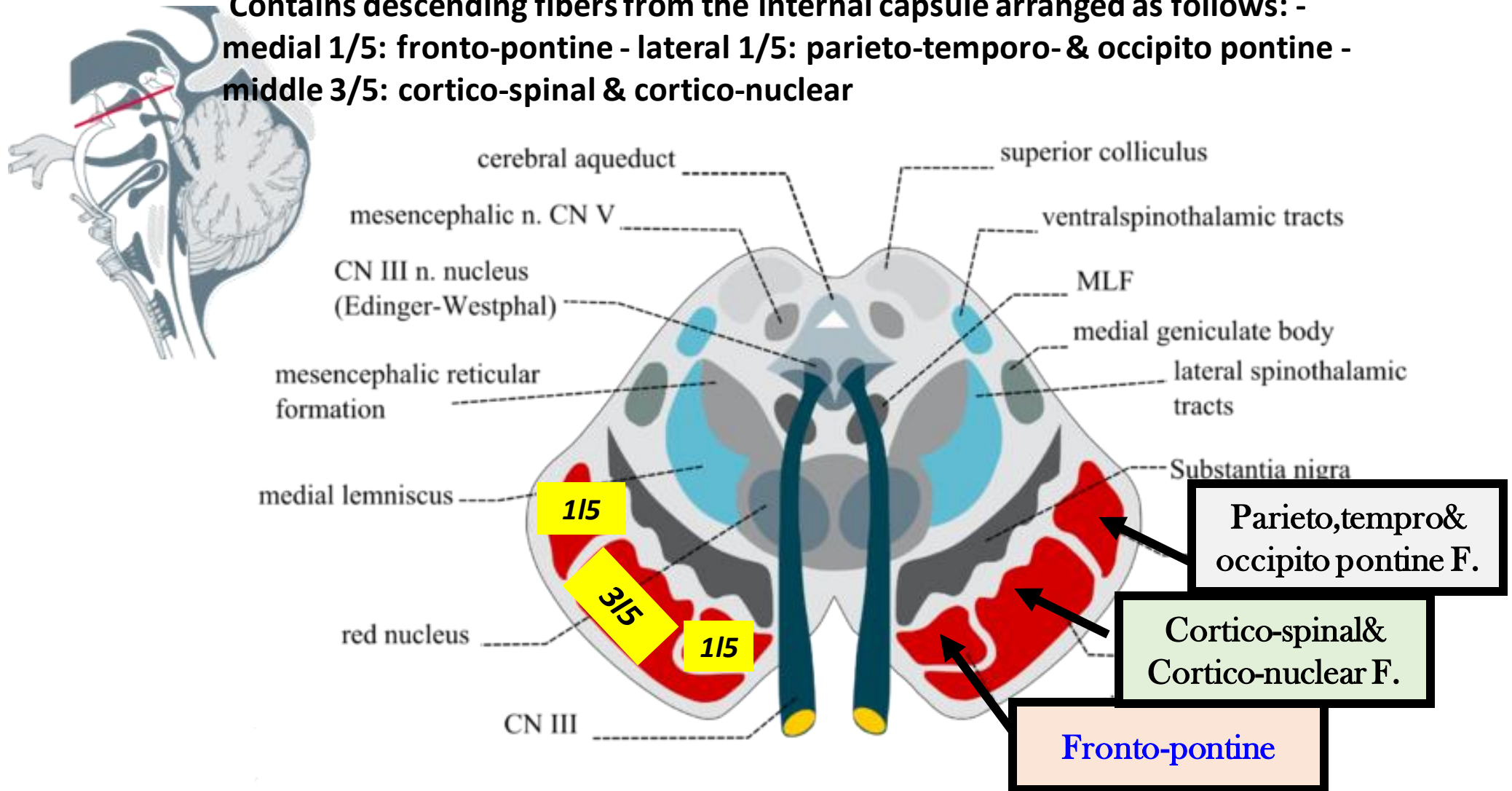
MIDBRAIN

It is traversed by the cerebral aqueduct of Sylvius which divides it into tectum (dorsally) and 2 cerebral peduncles (ventrally). Each cerebral peduncle is divided by a pigmented sheet of grey matter called substantia nigra into tegmentum (dorsally) and crus cerebri or basis pedunculi (ventrally).




1. Crus cerebri: Is the most anterior part.

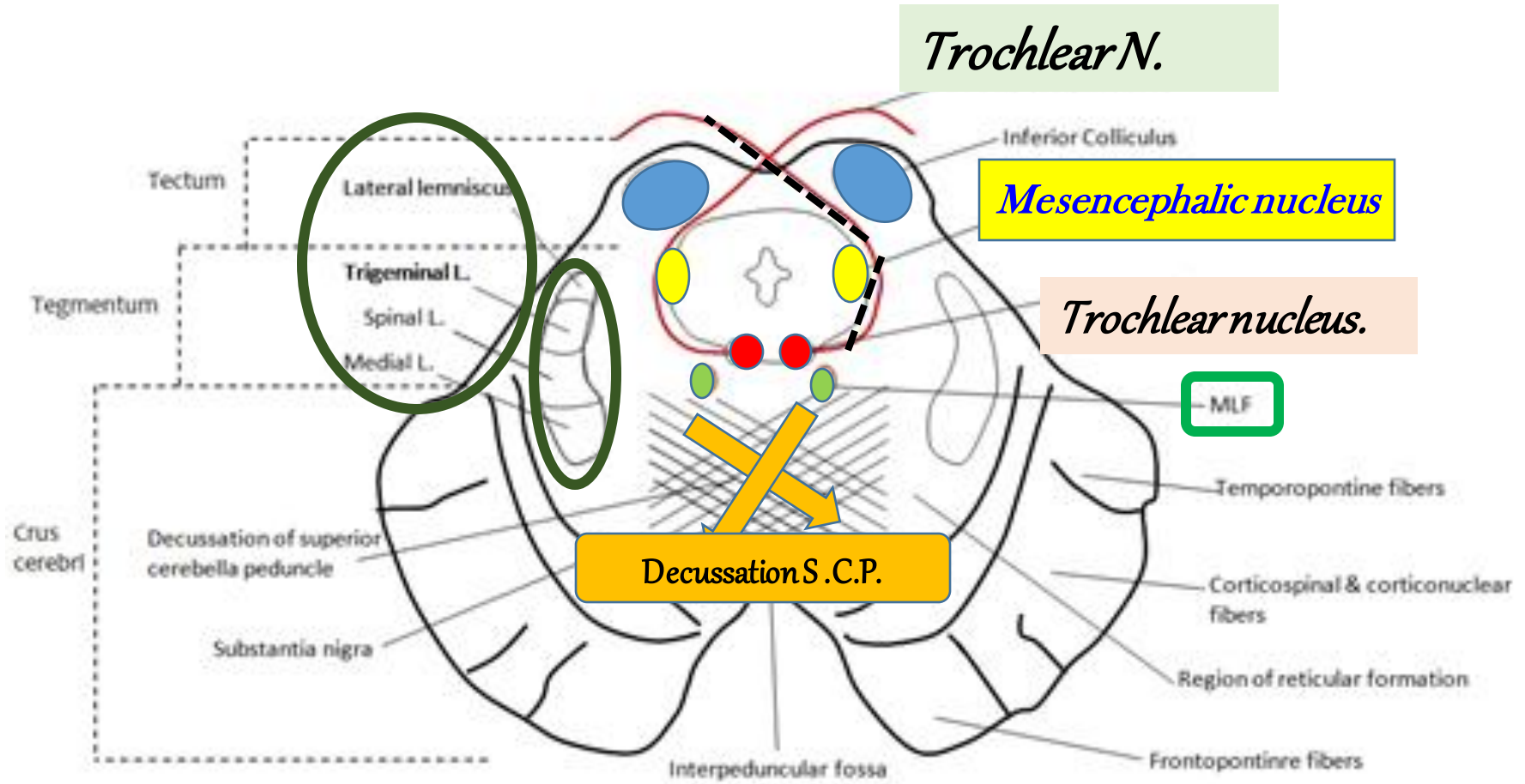
Contains descending fibers from the internal capsule arranged as follows: -
medial 1/5: fronto-pontine - lateral 1/5: parieto-temporo- & occipito pontine -
middle 3/5: cortico-spinal & cortico-nuclear



2. Substantia nigra: A pigmented sheet of grey matter between the crus cerebri and tegmentum. It is formed of neurons containing melanin pigment. It is connected to the corpus striatum by dopaminergic fibers; their lesion leads to Parkinsonism.

Tegmentum of midbrain At level of inferior Colliculus

1. *Mesencephalic nucleus.*
 2. *Trochlear nucleus.*
 3. *Medial, spinal, trigeminal and lateral lemnisci (end on inferior colliculus).*
 4. *Decussation of S.C.P.*
 5. *Medial longitudinal bundle (involved in coordinated movement of eye & head in response to vestibulo-cochlear stimuli).*
- 
- Grey matter**



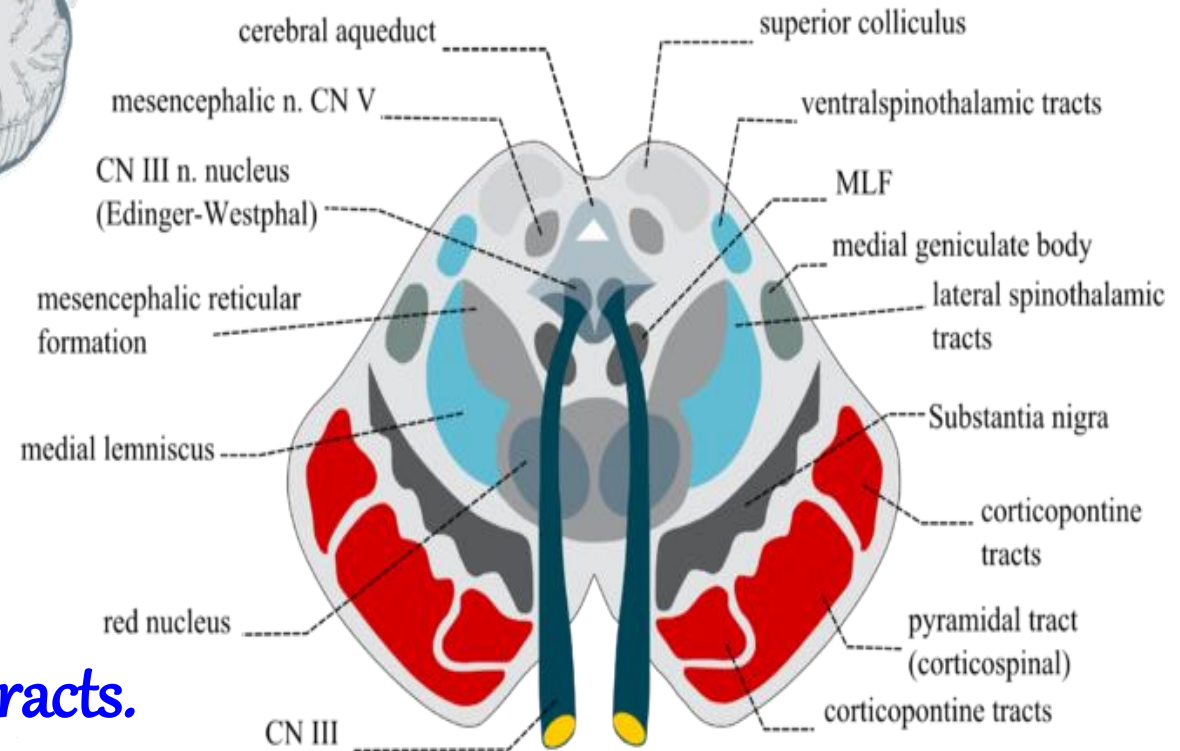
**Tegmentum of midbrain
At level of inferior Colliculus**

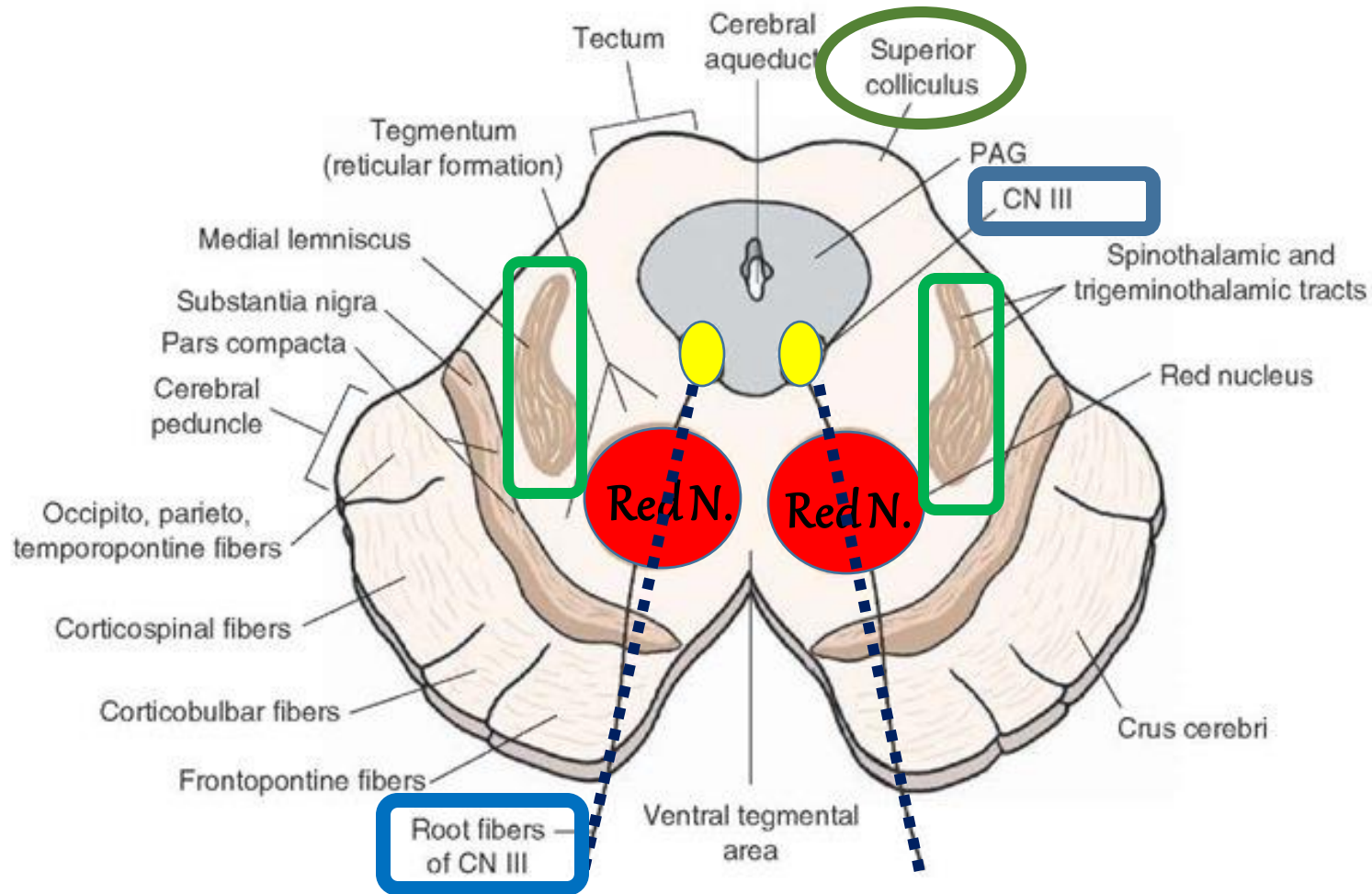
-Tegmentum of midbrain At level of superior Colliculus

Continuous below with the tegmentum of pons & above with the subthalamus.

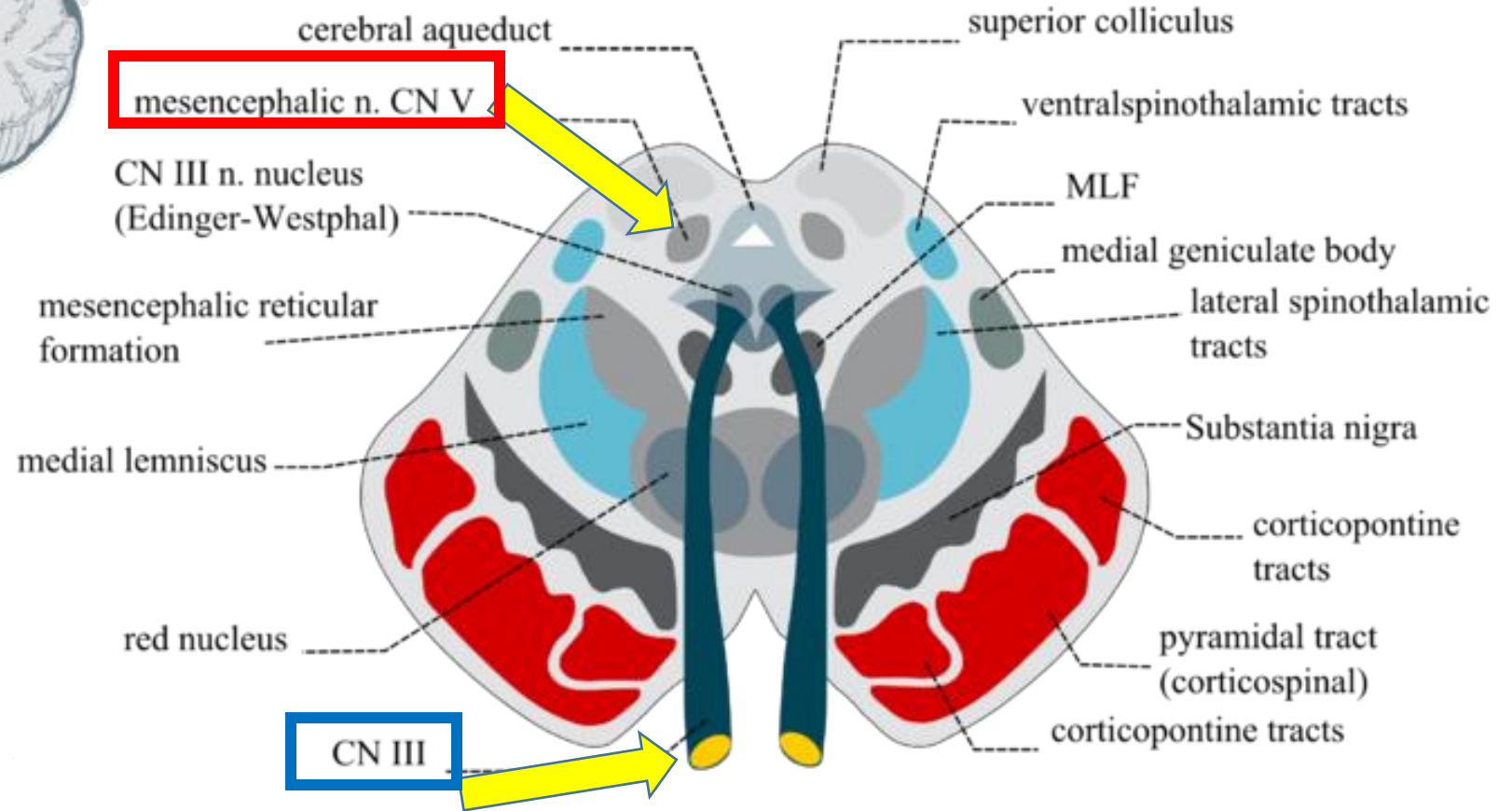
1. Mesencephalic Nucleus.
2. Red nucleus.
3. Nuclei of Oculomotor nerve.
4. Pretectal nucleus.
5. Trigeminal, spinal, and medial lemnisci.
6. MLB
7. Decussations of rubro-spinal & tecto-spinal tracts.

Grey matter





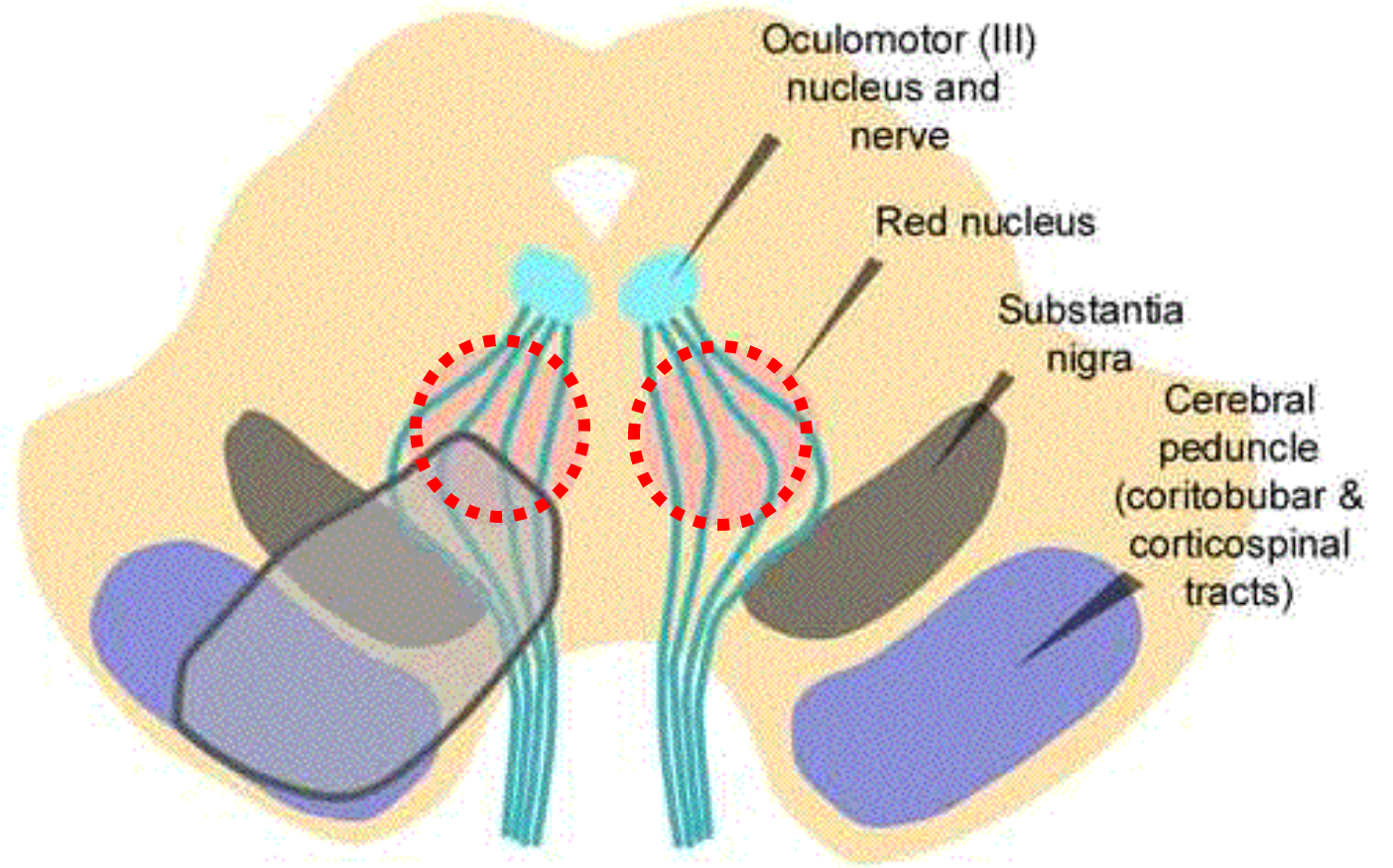
Tegmentum of midbrain At level of superior Colliculus



Tegmentum of midbrain
At level of superior Colliculus

Red nucleus.

Function:- facilitation of
muscle tone
Motor learning



Pretectal nucleus

Pupillary Light reflex



	Inferior colliculus	Superior colliculus
Function	Relay auditory pathway & auditory reflexes	Reflex turning of eyes & neck in response to visual, auditory & Cutaneous stimuli
Afferent	Lateral lemniscus	LGB, inf. colliculus & spinotectal tract
Efferent	MGB & Superior colliculus	Tectospinal & tecto nuclear... III, IV, VI