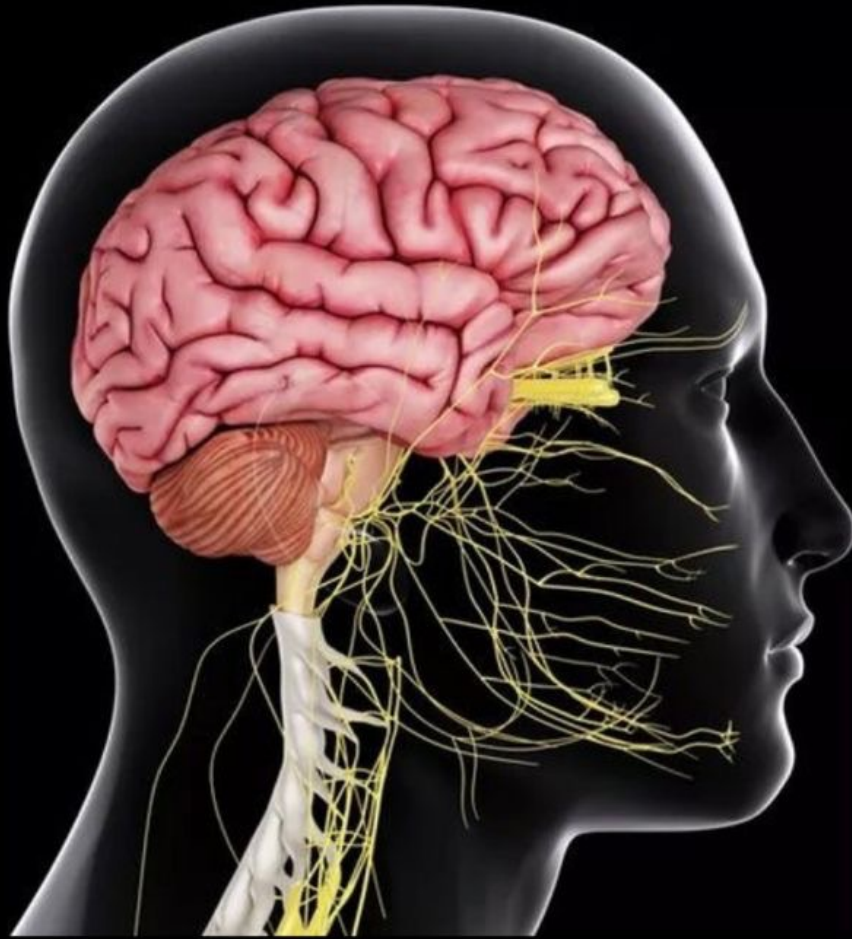




CENTRAL NERVOUS SYSTEM



SUBJECT : Anatomy

LEC NO. : 7

DONE BY : Batool ALzubaidi & Hashem Ata

وَقُلْ رَبِّ زِدْنِي عِلْمًا



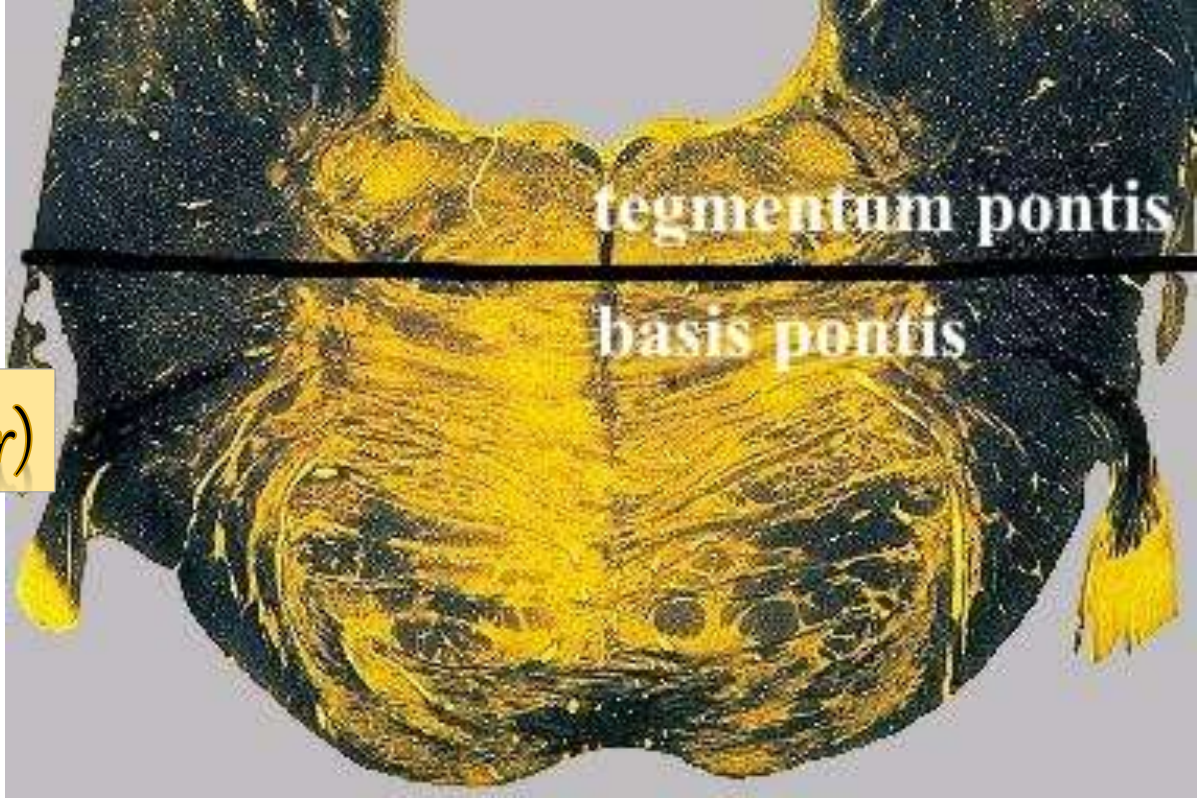
BRAIN STEM III

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Internal structure of Pons

Transverse section / silver stain



Pons

Basis Pontis (anterior) ^{حسو} Tegmentum (posterior)

الجزء الامامي من ال
pones and midbrain

الجزء الخلفي من ال
pones and midbrain

التقسيمة حسب ال function .. ال basis مسؤولة عن ال
sensation اما ال tegmentum مسؤولة عن ال motor

في الامام بشوف الاشياء ال ascending

BASIS PONTIS

ال cortex بنزل عليها fibers

1- **Pontine nuclei**:- scattered masses of neurons

2- **Transverse pontine fibers**:- axons of pontine nuclei, passing to the opposite MCP.

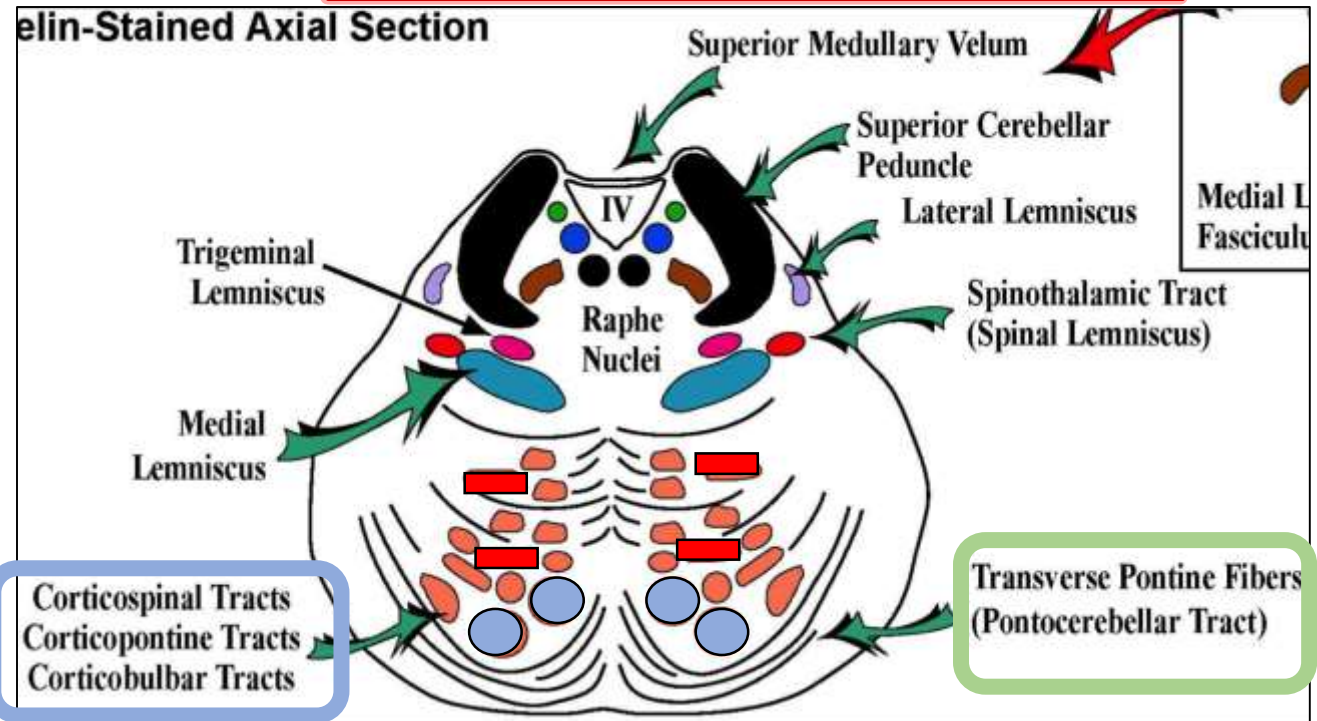
3- **Descending cortical fibers**:-

- Cortico-pontine.
- Cortico-spinal.
- Cortico-nuclear fibers...

....motor nuclei of cranial nerves.

تتذكروا حكيينا انه ال cortico spinal and cortico nuclear لما كانوا نازلين على ال pones صارلهم scattering عشان كان في transverse pontine fibers و pontine nuclei

باختصار شديد في pontine nuclei طالعة منها transverse ridges و بنزل من ال brain حاجات الي هم : cortico pentile, cortico spinal, cortico nuclear



ال cortico pontine tract من ال cortex نزل على ال
 pones و اكيد بعدي على ال midbrain قبلهم و بعدين
 بصيرلهم crossing للجهة الثانية بال cerebellum



corticopontine tract

pontocerebellar tract

pontine nuclei

lesion

middle cerebellar peduncle

Cortico-ponto-cerebellar pathway

ال cerebellum مسؤول
 عن نفس الجهة بالجسم
 اما ال cortex مسؤولة
 عن الجهة الثانية

في tract من ال cortex لل
 pones بالاخص ال
 nuclei بتبع fibers بتعمل
 crossing لل opposite side
 بتعدي بال middle cerebral
 peduncle معناها هاد هو ال
 connection بين ال cortex and
 cerebellum هو ال cerebellum
 الي بعنل adjustment للحركات
 تاعتنا و هو الي يحتفظ بال
 plane movement الحركات الي
 خلص حفظتها مش محتاج كل
 مرة ال cortex تفكر كيف تعملها
 مثل ازي الكتابة و السواعة ..
 عشان هيك ال middle
 cerebellar peduncle هي اكبر
 peduncle عنا

Function:-

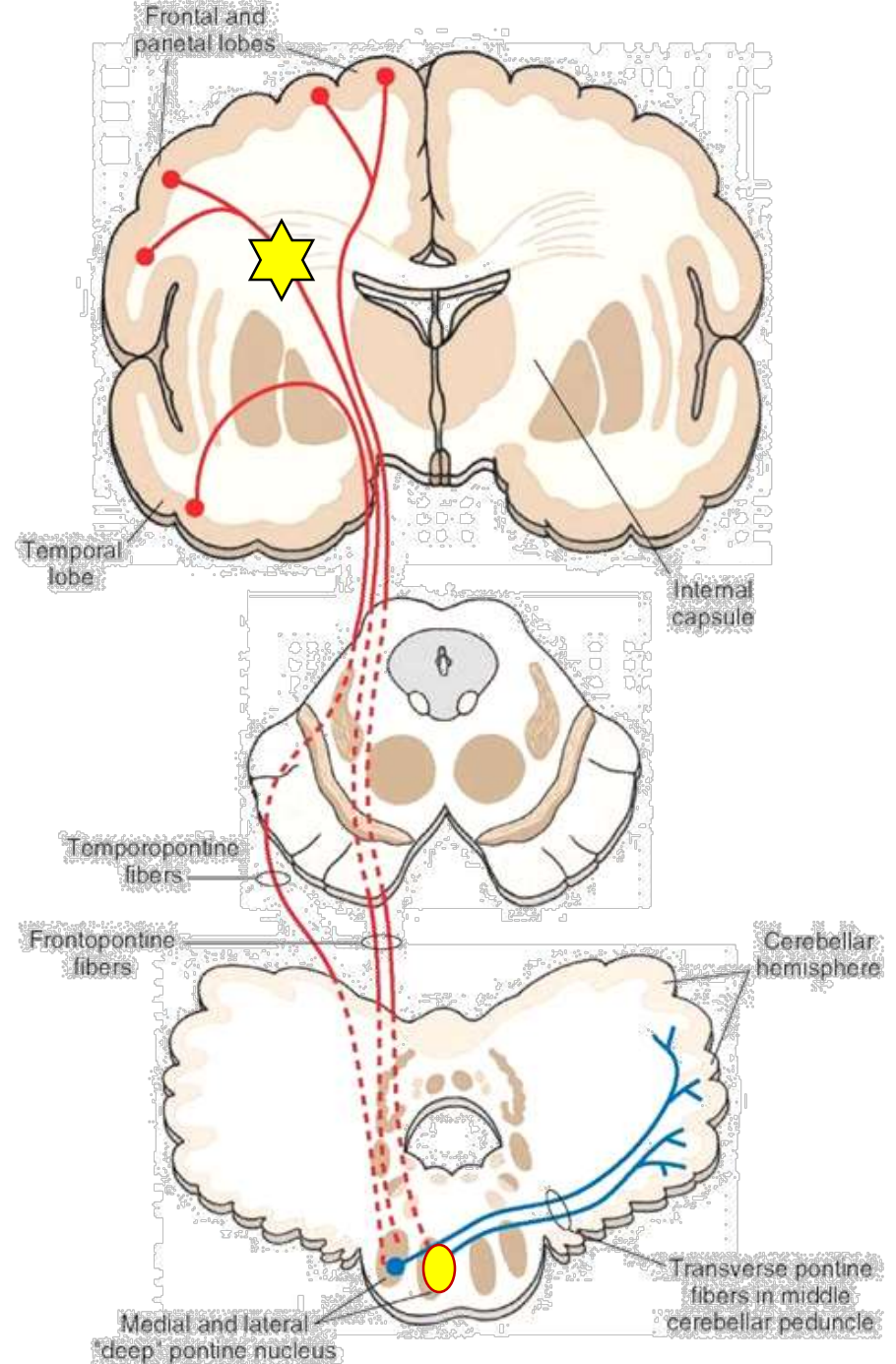
The neocerebellum (responsible for coordination of voluntary movement) is informed about the plane and sequence of the intended movement.

Cortico –pontine fibers

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

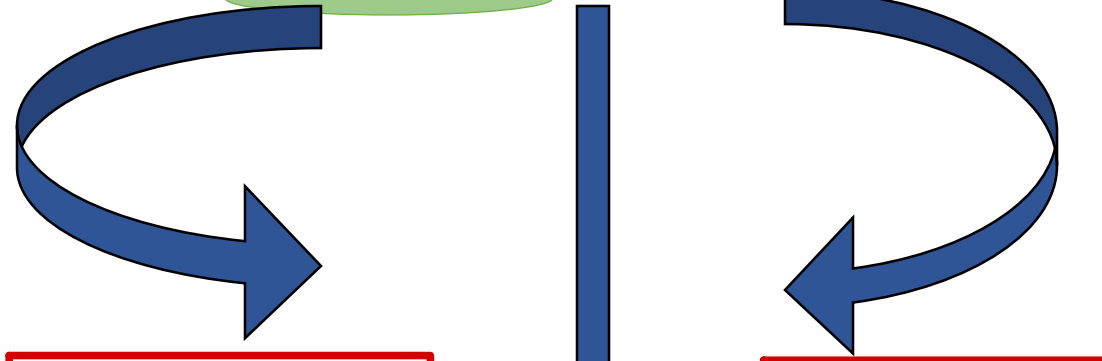
Pontocerebellar fibers

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



الحشورا دائما يكون معاه sensation

Tegmentum of pons



White matter

Grey matter

Spinal lemniscus » lateral spinothalamic tract
Medial lemniscus » gracile, cunata, ventral spinothalamic
Trigeminal lemniscus » trigeminothalamic tract
Lateral lemniscus » small part from cochlear in pons and ends in neophilo colliculus in the midbrain

ال trapezoid body الها علاقة بال pathway تا ع السمع راح ناخذها بال special senses بال PNS، السمع بينتقل من الجهتين يعني قوقعة الاذن بالاول بتتبعت للاذن الثانية بعدين لل brain عشان هيك صعب انه اخسره ب upper motor neuron lesion

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

MLB

Horizontal fibers
Trapezoid body

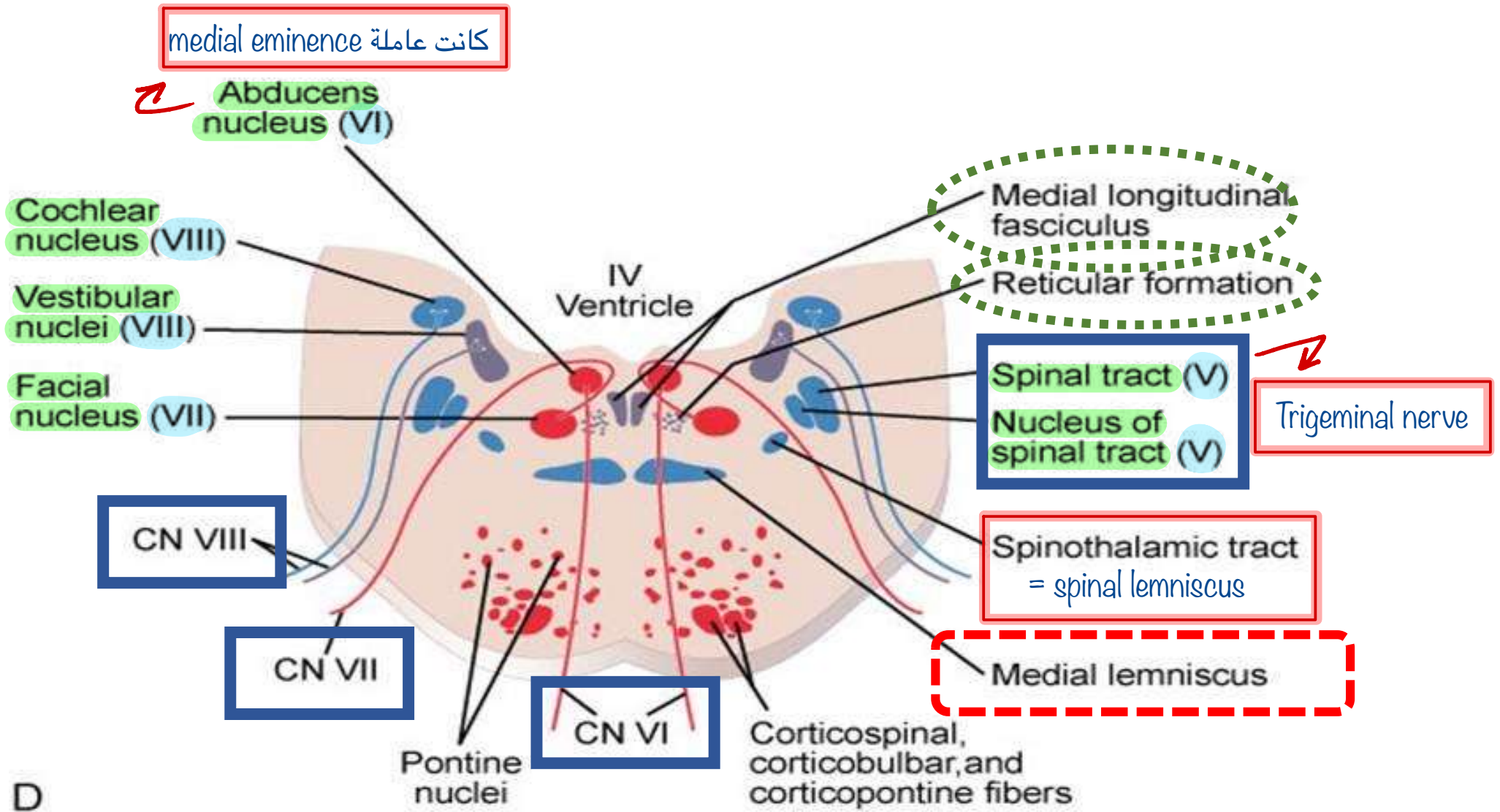
Cranial nerve nuclei
V,VI,VII,VIII

Superior olive.
(Part of auditory pathway)

Reticular formation

Wednesday added; lateral & From cochlear

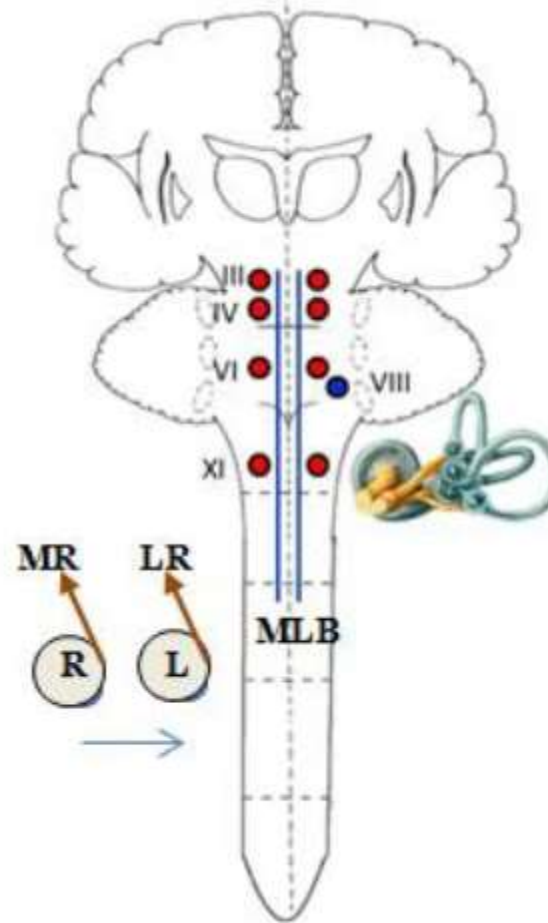
trigeminal



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.

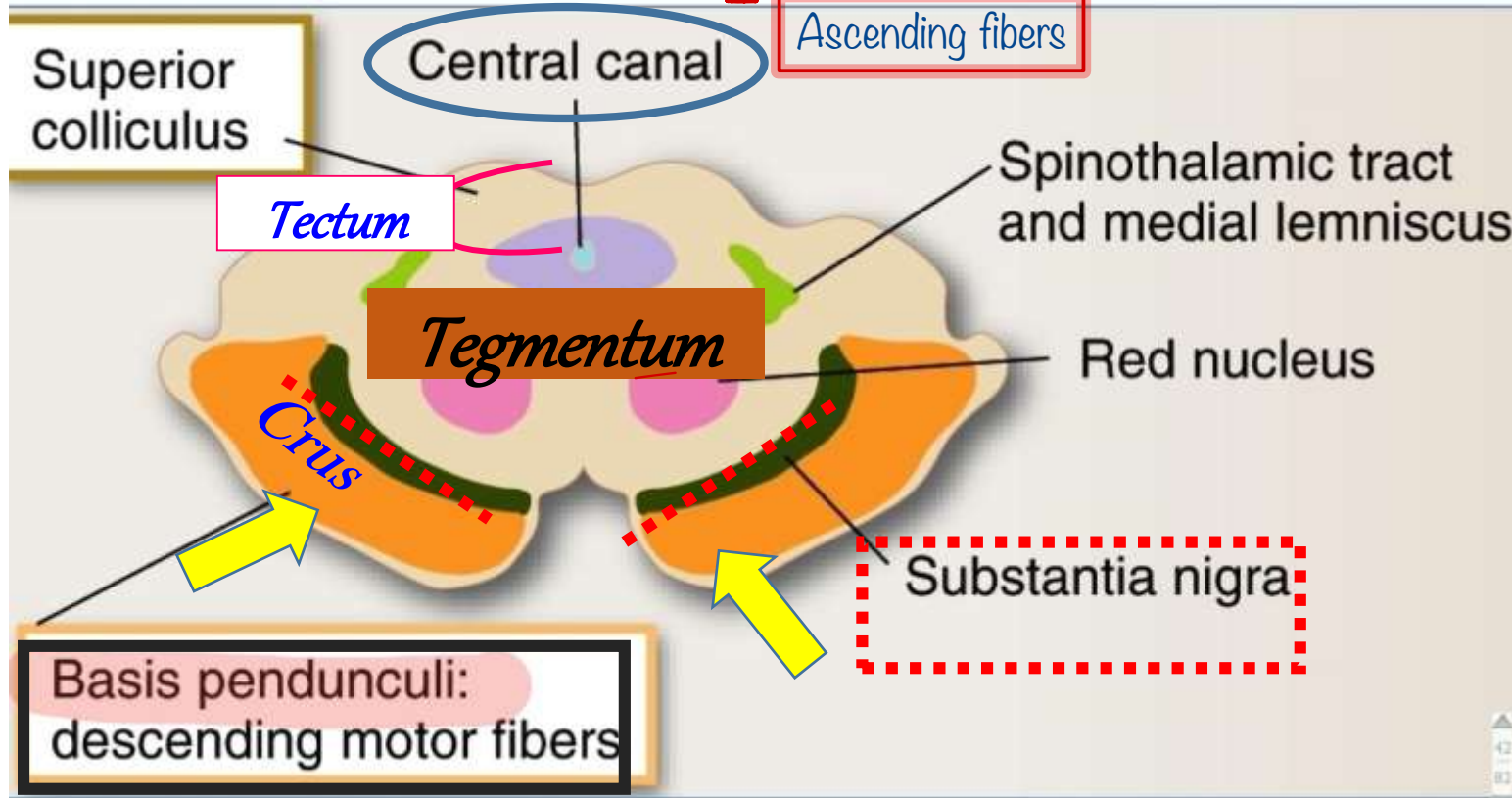


MIDBRAIN

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).

Just superior and inferior colliculus

Ascending fibers and nuclei



Ascending fibers

Superior colliculus

Tectum

Tegmentum

Crus

Spinothalamic tract and medial lemniscus

Red nucleus

Substantia nigra

Basis pedunculi: descending motor fibers

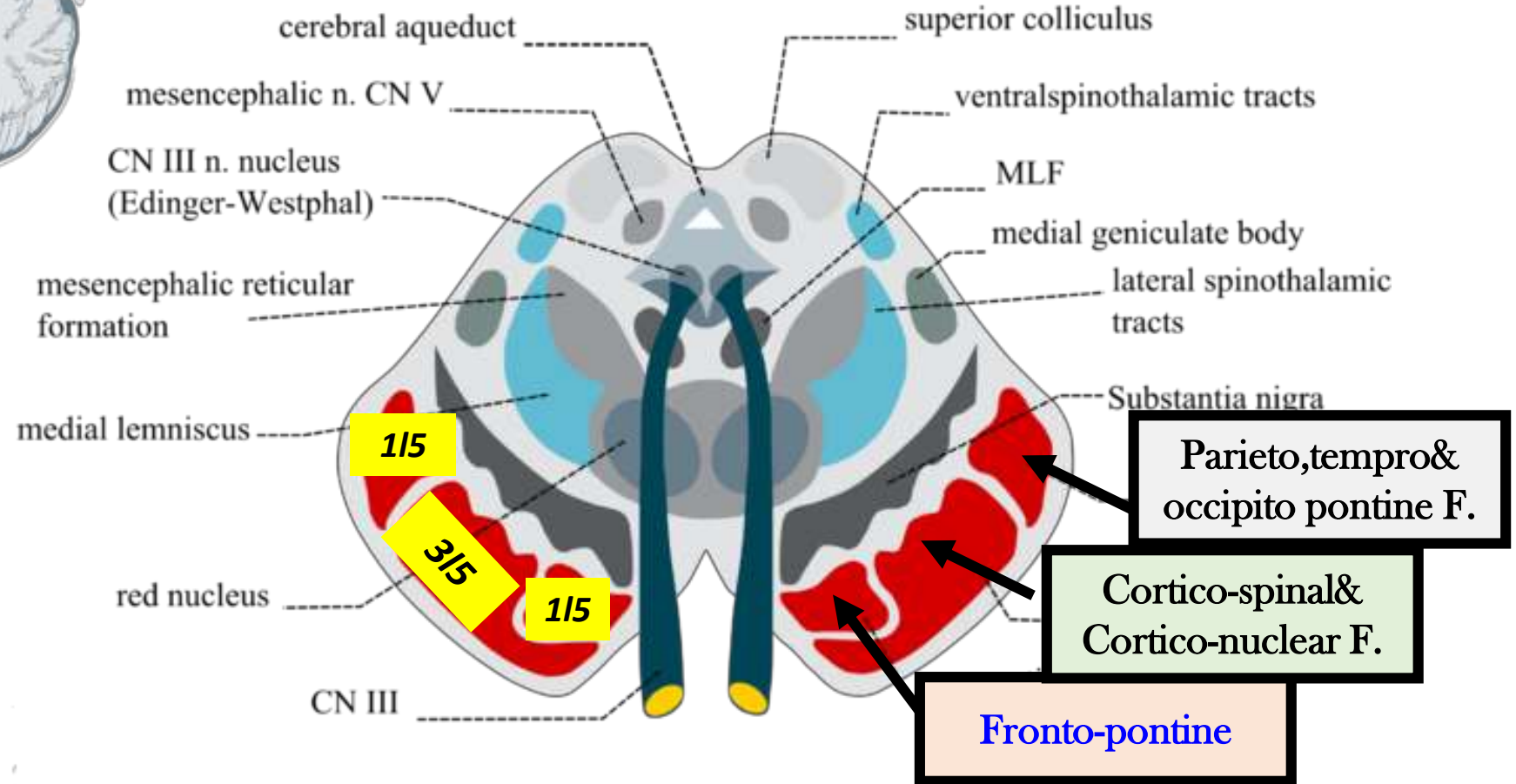
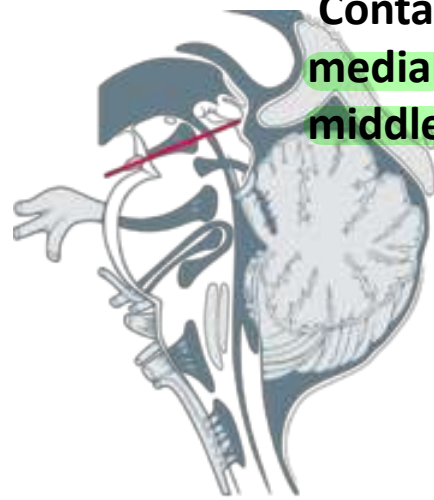
1. **Crus cerebri:** Is the most anterior part.

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

Pyramidal tract



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.

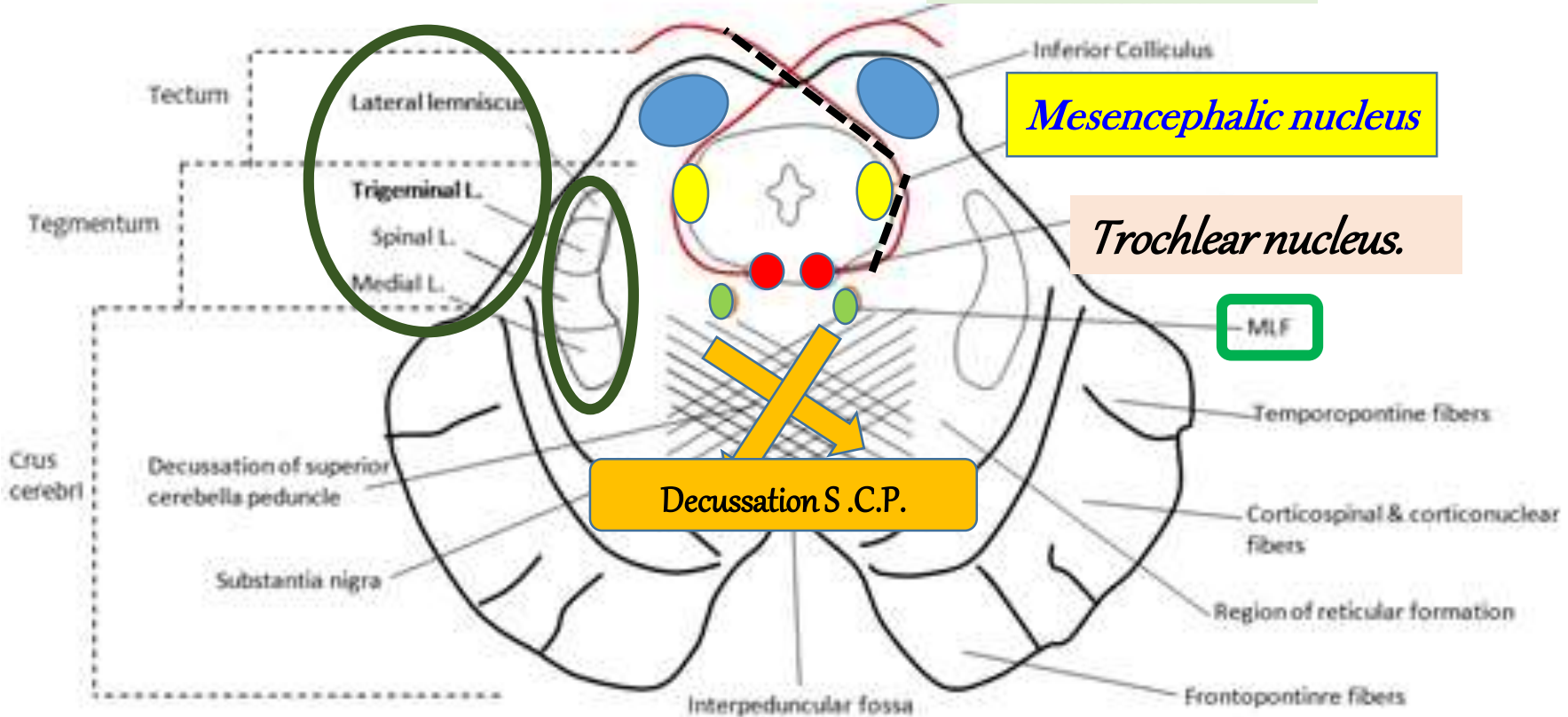
Tegmentum of midbrain At level of inferior Colliculus

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

ال trigeminal nerve كان قدامه بال
ال main sensory nucleus ال pones
نزل nucleus ناحية ال spinal cord
سميهاها ال spinal nucleus و طلع
وحدة فوق اتجاه ال midbrain اسمها ال
mesencephalic nucleus و هاي
وظيفتها ال proprioception تتذكروا بس
اخذنا ال gracile and cunate و وصلنا
لحد ال head and neck معقول هم ما
الهم proprioception اكيد الهم و حتاخذ
عن طريق ال mesencephalic nucleus

الوحيد الي طالع من ورا و بعمل decussation

Trochlear N.



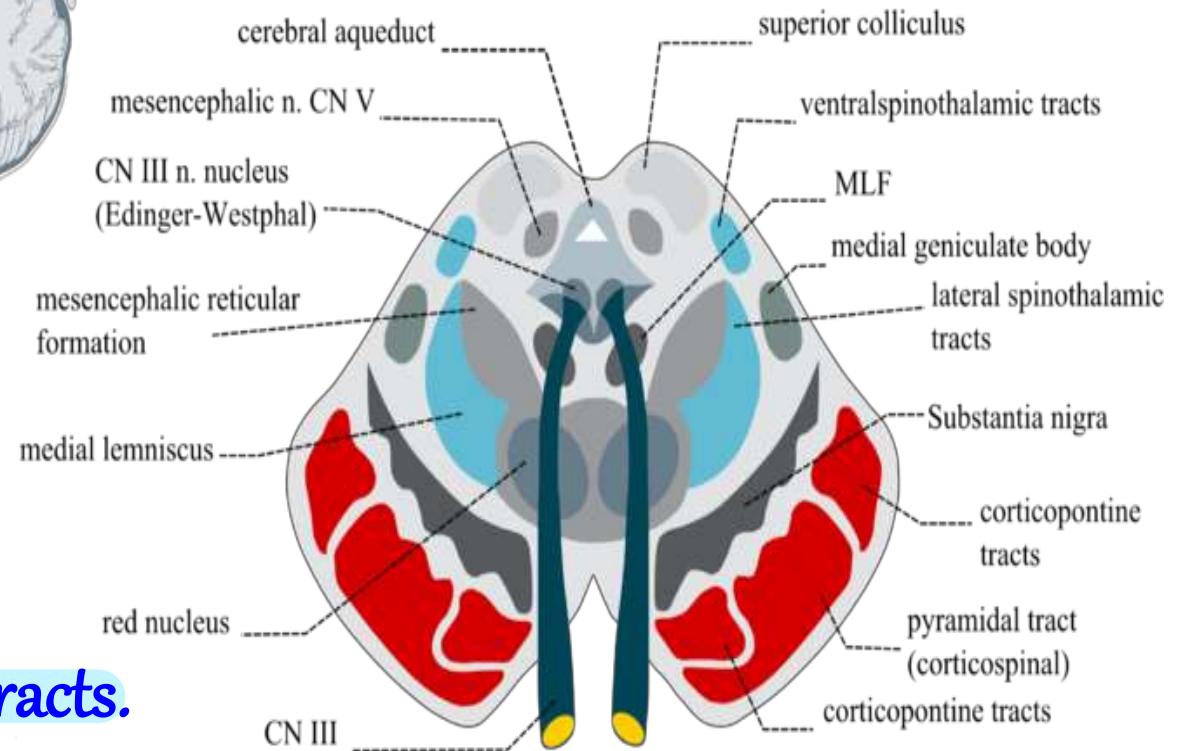
Tegmentum of midbrain
At level of inferior Colliculus

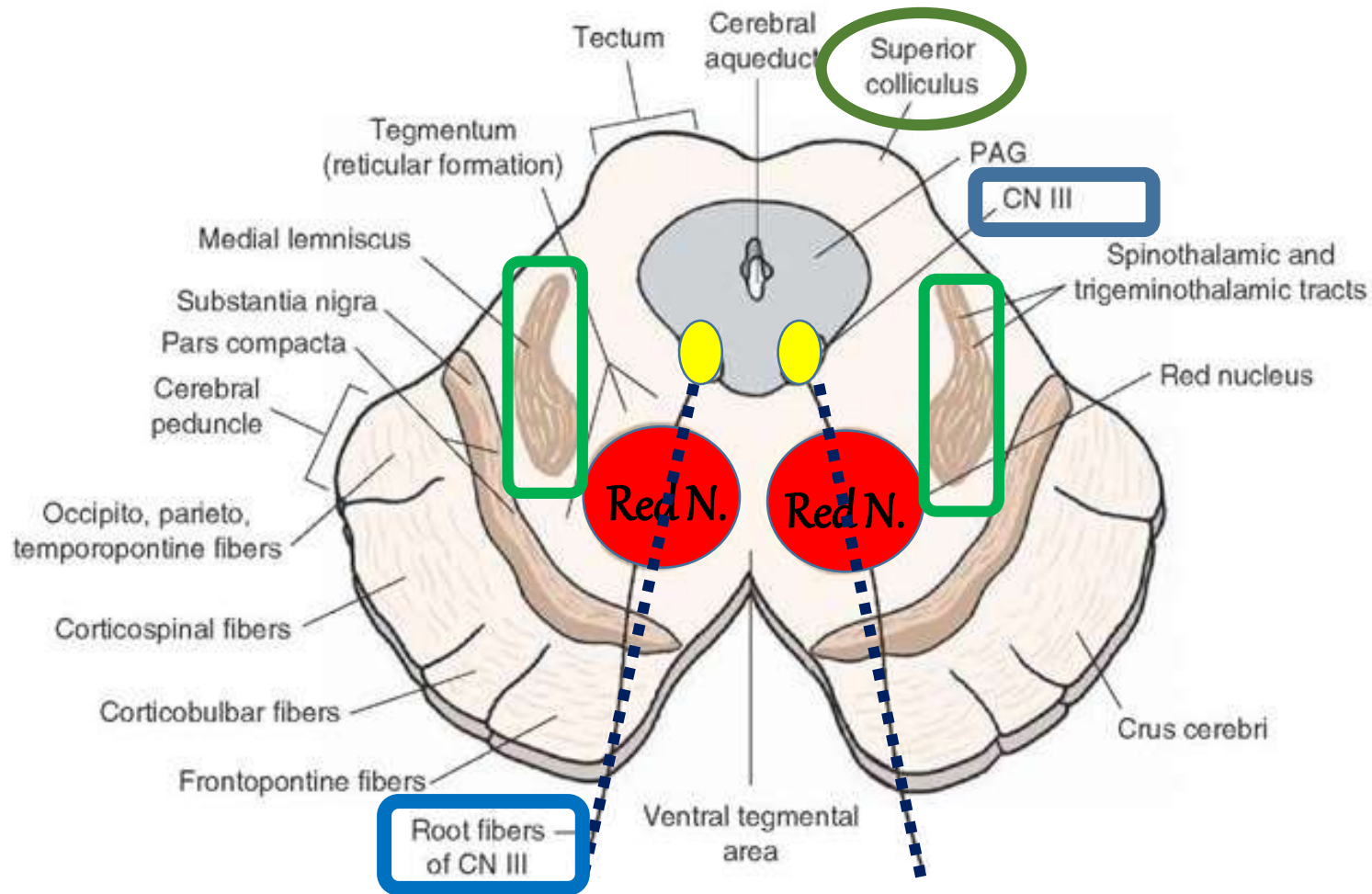
-Tegmentum of midbrain At level of superior Colliculus

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

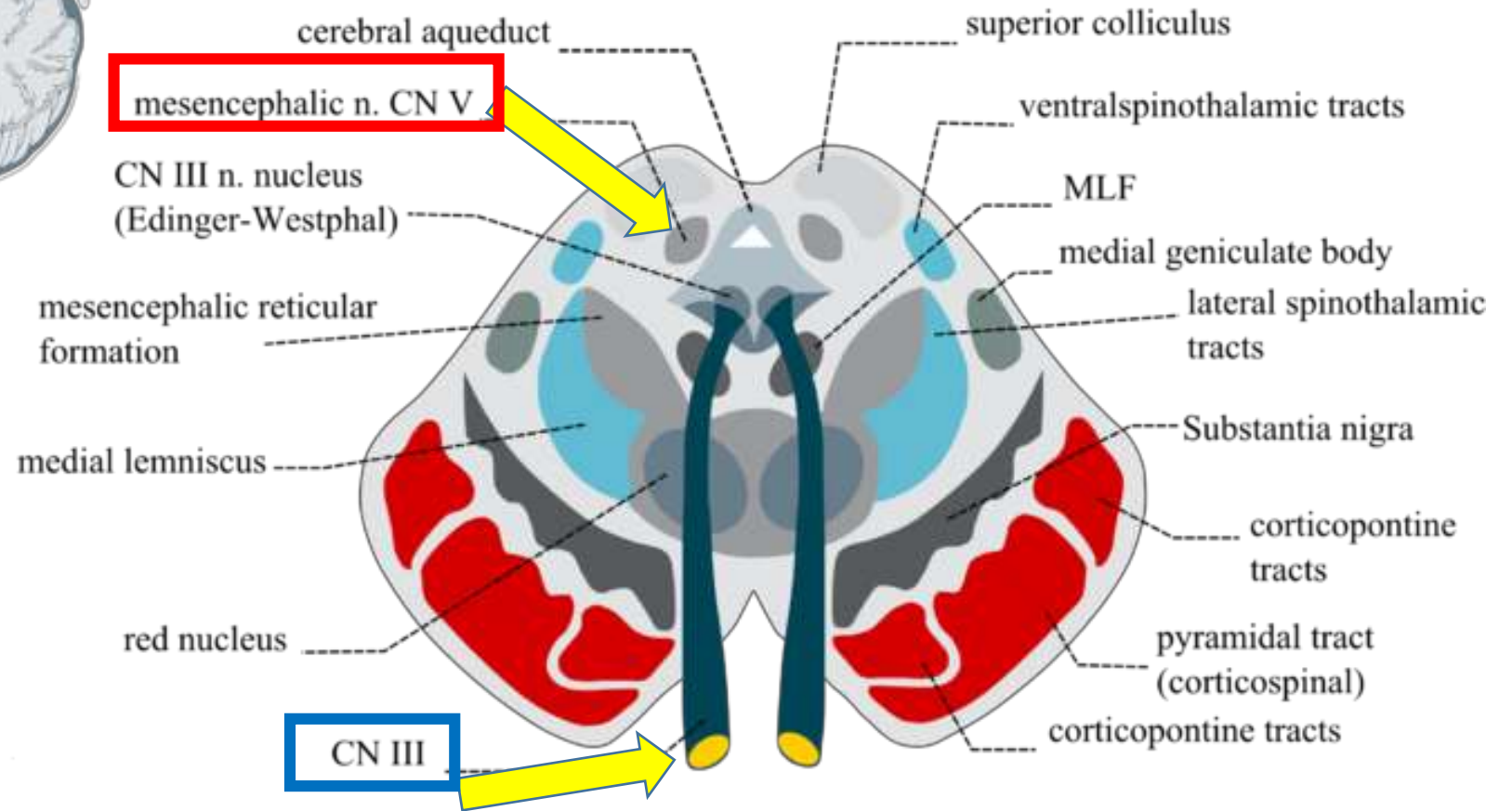
1. Mesencephalic Nucleus.
2. Red nucleus.
3. Nuclei of Oculomotor nerve.
4. Pretectal nucleus. → Pupillary reflex
5. Trigeminal, spinal, and medial lemnisci.
6. MLB
7. Decussations of rubro-spinal & tecto-spinal tracts.

Grey matter





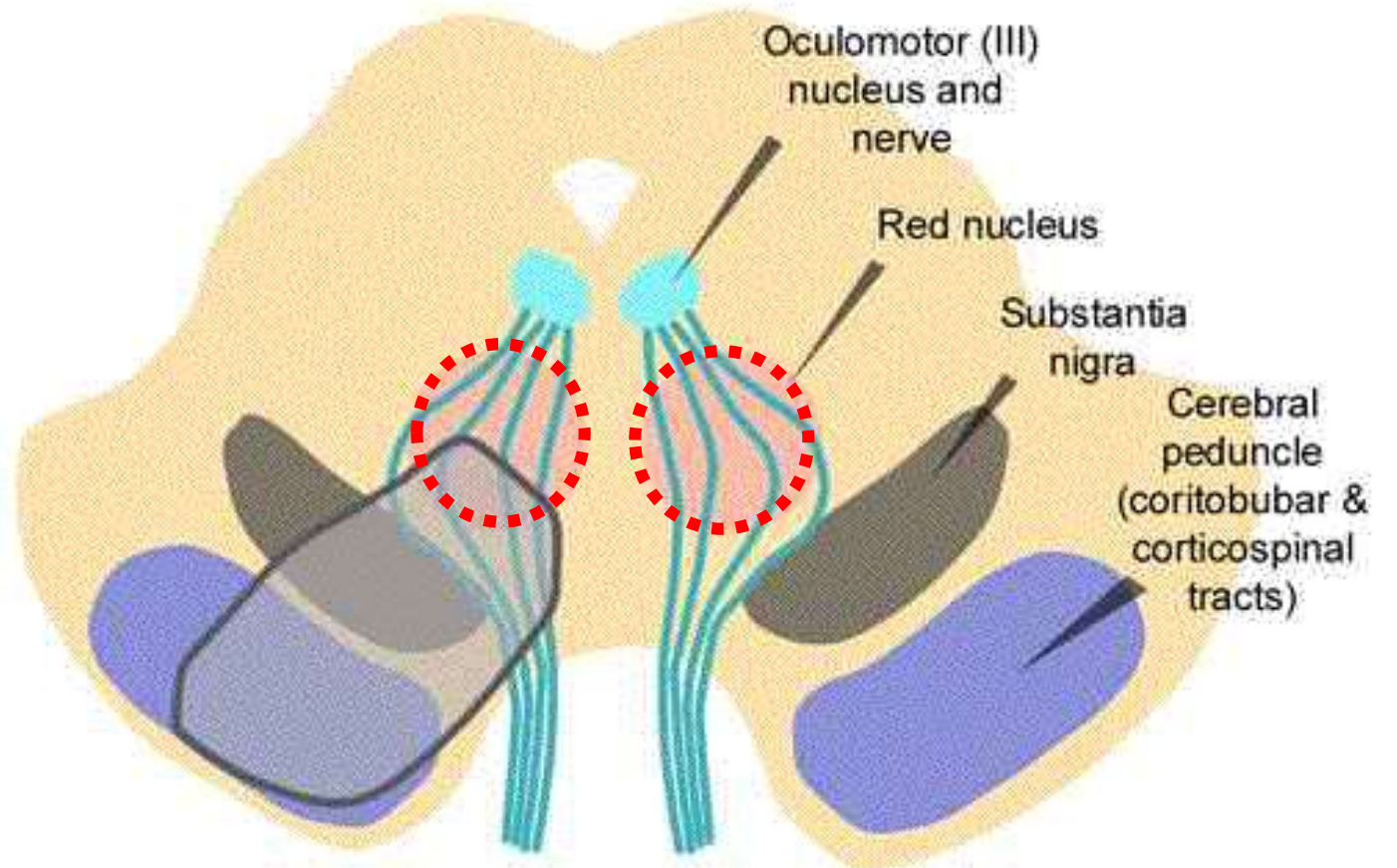
Tegmentum of midbrain At level of superior Colliculus



Tegmentum of midbrain
At level of superior Colliculus

Red nucleus.

1. **Function:** - facilitation of muscle tone
2. 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 & tectonuclear... III, IV, VI

Thank you