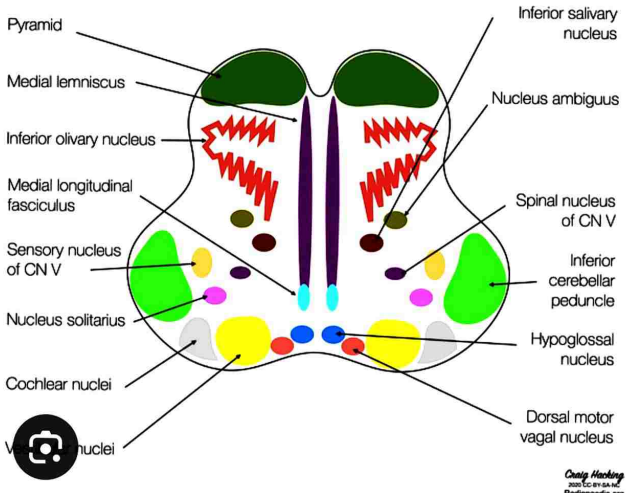
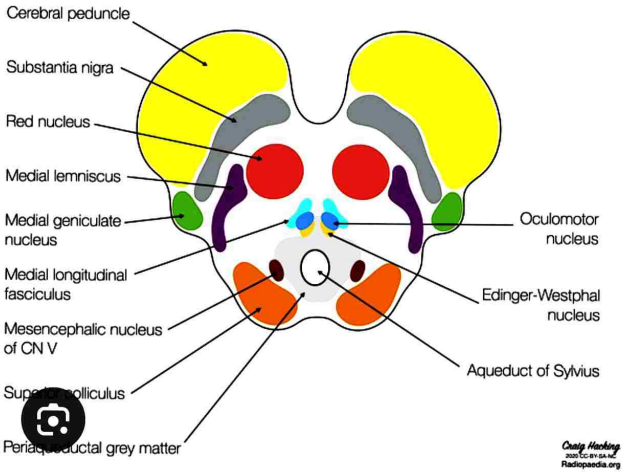
Medulla

Axial section at the level of the upper medulla



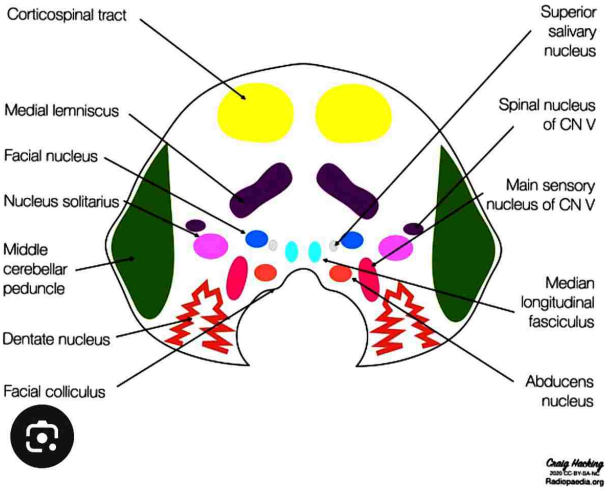
Midbrain

Axial section at the level of the superior colliculus



Pons

Axial section at the level of the lower pons



Mid Brain

DATE:-

- The Mid Brain is a upper most part of the Brain stem.
- Related to fore Brain above and Pons Below.
- develops from the Mesencephalon of the embryonic Brain.
- Length - 2 cm
- Located near the center of the Brain
- Lies in the Posterior cranial fossa
- Passes through the Tentorial Notch.
- External Relations

Ant. → Interpeduncular fossa.
Post. → Splenium of corpus callosum, Pulvinar of thalamus.
Lateral → Parel - Hippocampus gyrus & optic tract.

- Division of Mid Brain.

- Mid Brain is divided at the level of Cerebral Aqueduct.

- 1) Tectum (Post. Part)

- Loccated at Behind the aqueduct
- 4 corpora Quadrigemina (4 colliculi)

i) Superior → Visual Reflex → connected to Colliculi Lateral geniculate Body

ii) Inferior → Auditory Reflex → connected to Colliculi Medial geniculate Body

2. Tegmentum (Middle Part)

- Located in front of aqueduct.
- contains Nuclei + ascending Tracts
- Important Structures
  - Red Nucleus → motor coordination
  - Substantia Nigra → Motor control
  - Cranial nerve Nuclei
  - Ascending Sensory Tract

3. Crus cerebri (Ant. Part)

- also called Basis Pedunculi
- contains descending Motor tracts
- Fibres Present - corticospinal
  - corticonuclear

Function :- Voluntary Motor signals. from Brain to Body

- cerebral Peduncles

- 2 large bundles of nerve fibres on the front of MidBrain

- They are divide By Substantia Nigra

1. Ant Part → Crus cerebri
2. Post Part → Tegmentum

- Internal Structure

1. Superior Colliculs

White Matter	Grey Matter
- Crus cerebri tracts	- Red Nuclei
- Oculomotor Nerve	- Superior colliculs
- dorsal Tegmental decussion	- Substantia Nigra
- Ventral Tegmental decussion	- Oculomotor Nucleus

2. Inferior Colliculs

White Matter	Grey Matter
- Spinal lemniscus	- Inferior colliculs
- Medial lemniscus	- Substantia Nigra
- Lateral lemniscus	- Trigeminal Nerve
- Rubrospinal tract	

- Important Tract Passing to MidBrain

Ascending (sensory)	Descending Motor
- Medial lemniscus → Touch	- CorticoSpinal - Voluntary Movement
- Spinal lemniscus → Pain	- RubroSpinal - Posture
- Trigeminal → facial	- TectoSpinal - Reflex Head Movement

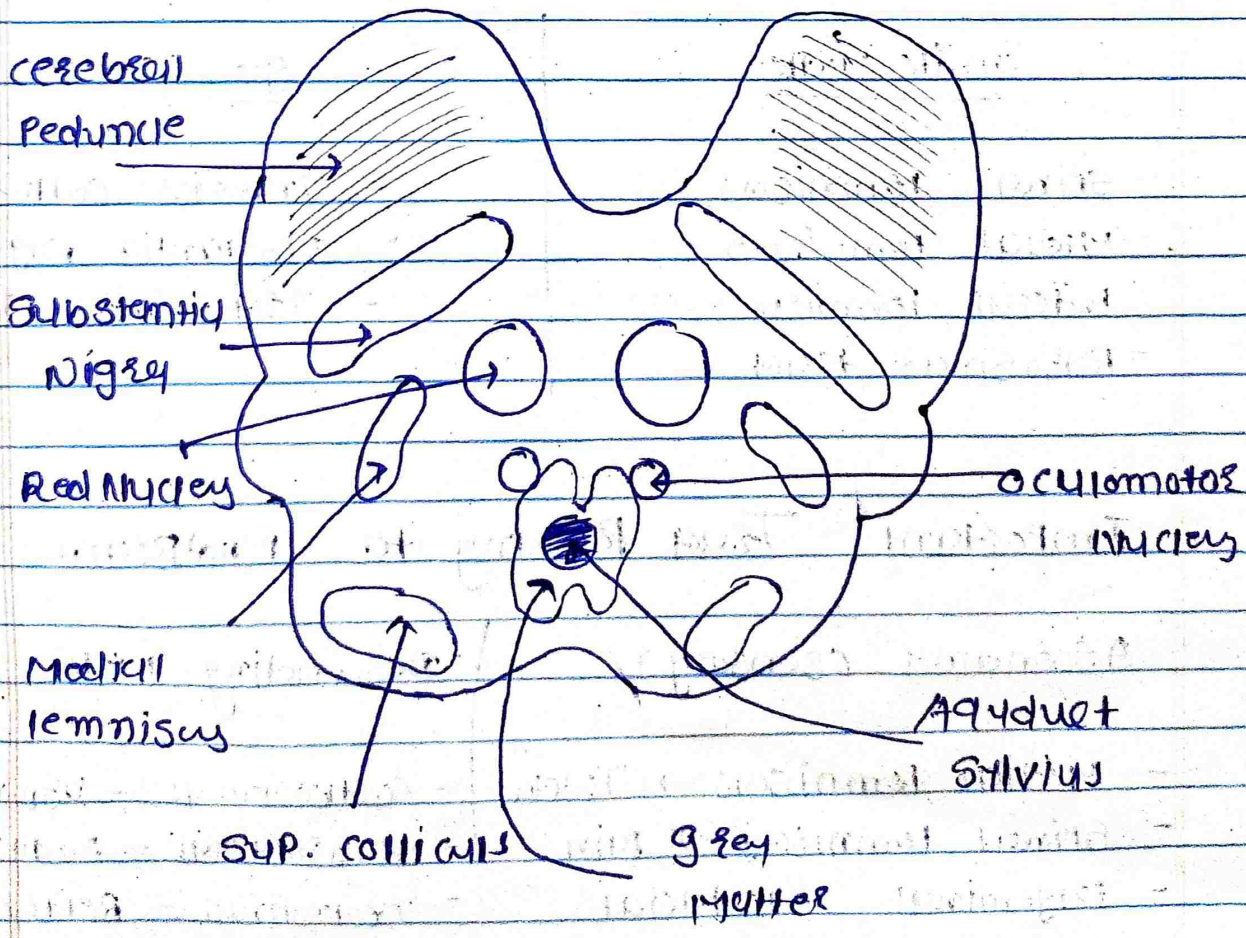
DATE:-

- Important Nuclei -

1. Oculomotor Nuclei → eye movement
2. Red Nucleus → Motor Coordination
3. Substantia Nigra → Movement control.

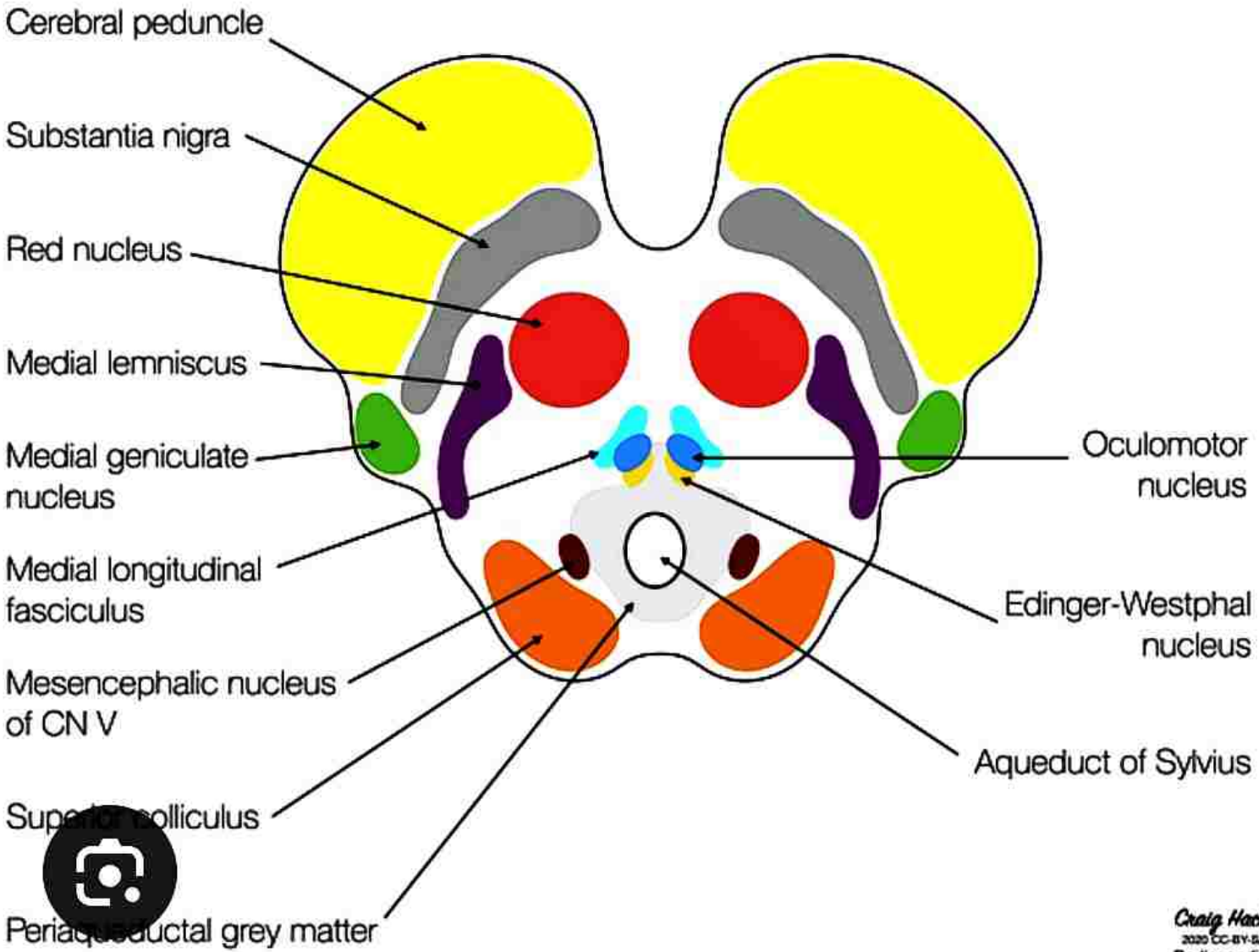
- Clinically

1. eye movement paralysis
2. Tremor -
3. Postural problems
4. Loss of vision
5. Parkinson



Midbrain

Axial section at the level of the superior colliculus



Stem

- Pons
- Mid Brain
- Medulla Oblongata

1. Medulla Oblongata (मेडुला ओब्लोंगेटा)

- extends from the lower Border of Pons to the level above the 1st pair of cervical Nerves.
- many Nuclei of Medulla Oblongata (M.O) control vital Body functions.
  - CVS centre
  - Respiratory centre
  - Vomiting
  - coughing
  - swallowing etc—

- Length :- 3 cm
- Diameter :- 2 cm

⊛ External features

- M.O is Divided into - Right & Left Half &
  - anterior & Posterior Median fissure
- each Half further Divided into - anterior lateral & Posterior Region By Sulci.
- Pyramid :- longitudinal elevation from ant. Region.
- Pyramidal Decussation :- lower Part of Medulla, many Fibres of Right & Left Pyramids cross in mid-line and forming —

Olives :- oval shaped bulges lateral to pyramids
- The rootles of hypoglossal N. emerge from the anterolateral sulcus b/w pyramid and olive

- cranial IX and X nerves emerge through posterolateral fissure behind the olive.

- upper part of posterolateral region marked by 'V'-shaped depression - which is lower part of the floor of 4th ventricle.

- cranial IX to XII nerves out this regions M.O

• Internal structure—

⊛ 3 parts of M.O

Lower (pyramidal decussation)	(Sensory decussations) midial lemniscus	upper olive
• White matter - 75-90% of pyramidal decussation • lateral corticospinal tract • ant. corticospinal tract • spinocerebellar tract.	• Internal arcuate fibers (arise form gracilis & cuneatus nuclei) • Pyramidal tracts are present • medio-longitudinal fasciculus are present (bundle)	• grey matter • Inf. olivary nucleus (olive = oval bulge) • cranial nerve nuclei CN9, 10, 11, 12 • Reticular formation nuclei for (heart rate, respiration)
• grey matter • Nucleus gracilis (lower body sensation receiving) • cuneatus nucleus. (upper body sensation)	• Dorsal column nuclei (nucleus gracilis & nucleus cuneatus) • vagus nucleus.	• white matter • Ant.- Inf. cerebellar peduncle. • olivocerebellar tract. • Ant. external arcuate fibers.

- **Arteries**

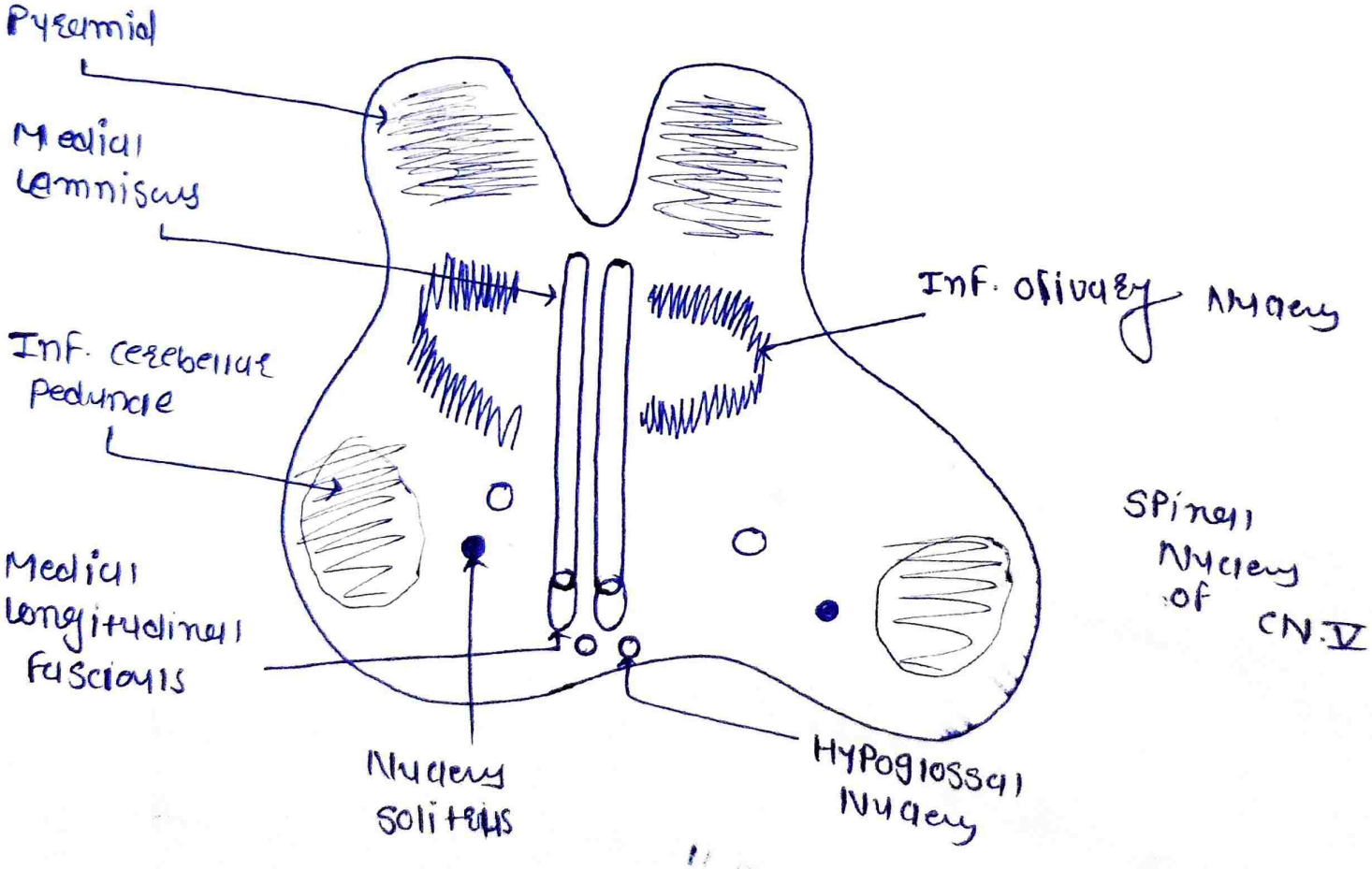
- Anterior & Posterior spinal arteries.
- Cerebellar arteries

- **Veins**

- Petrosal sinus & Transverse sinus

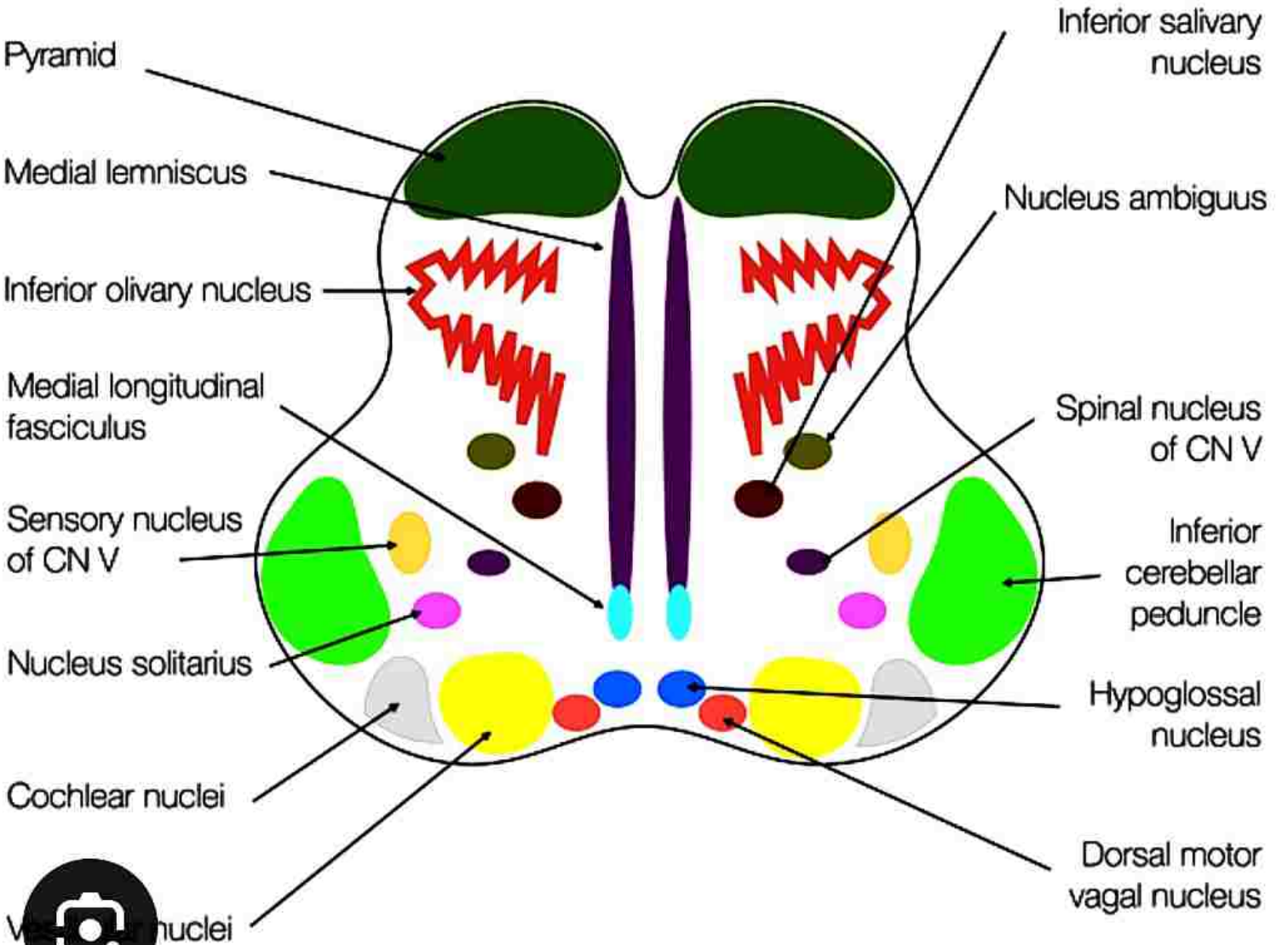
- **Clinical significance**

- Injury to the lower part of M.O is fatal because it has Respiratory & vasomotor centres.



Medulla

Axial section at the level of the upper medulla



2. Pons (अनुपथ)

→ Bridge connecting the Midbrain and M.O. and cerebellum
→ formed Nuclei & Tracts.
→ Cerebral cortex generates signals → of voluntary movement → through Pons Nuclei → cerebellum.
→ Helps to Regulation of Respiration

→ Location :- Antero-superior to the M.O.
→ Surface :- i) Ventral S. :- convex transverse
:- Middle cerebellar peduncle
ii) Dorsal S. :- under cover the cerebellum.

→ Borders i) Superior Border :- Runs Infero latterally
ii) Inferior Border :- Separates the Pons from M.O.
:- Related with - abducent N.,
- facial N.,
- Vestibulocochlear Nerve

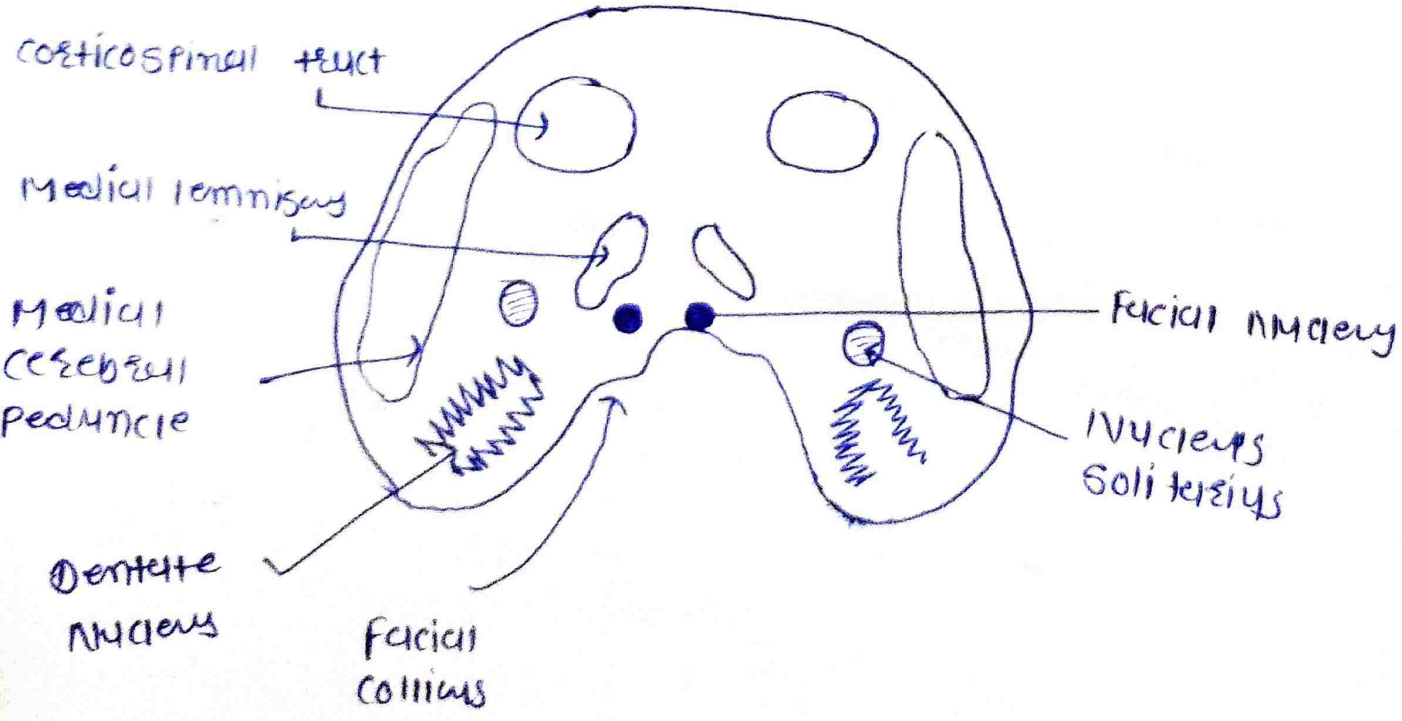
→ 2 Parts

1) Anterior Part - Basilar Part - Upper Part —
2) Posterior Part - Tegmentum Part - Lower Part —

Matter	Basilar Part	Tegmentum Part
White	• Longitudinal Fibers • Transverse Fibers	Lower Part Pons — • Trapezoid Body • Trigeminal lemniscus • Medial lemniscus • Abducent & Facial N. emerging Fibers • Upper Part Pons — → lateral & Medial lemniscus → Ant. Spinocerebellar tract.
Grey	• It Has Pontine Nuclei	• Cranial Nerve - abducent - facial - vestibular - cochlear - Spinal Nucleus & Tract of Trigeminal N.

• Artery :- Basilar A.
:- Sup. Cerebellar A.

• Vein :- Occipital Sinus
:- Transverse Sinus



Pons

Axial section at the level of the lower pons