

وسهلا



أهلا

يُمنع أخذ السلايدات بدون
إذن المحرر واي اجراء
يخالف ذلك يقع تحت طائلة
المسؤولية القانونية
جميع المعلومات للاستخدام
التعليمي فقط

الأستاذ الدكتور يوسف حسين

كلية الطب - جامعة مؤتة - الأردن

دكتورة من جامعة كولونيا المانيا

Prof. Dr. Youssef Hussein Anatomy - YouTube

الواتس (أي استفسار)
00201224904207

The image features a central graphic consisting of a red starburst shape with many sharp points. This starburst is set against a background that is a gradient of green and yellow, also with a starburst-like pattern. The text "Cranial Nerve Nuclei" is written in white, bold, sans-serif font across the center of the red starburst.

Cranial Nerve Nuclei

• Cranial Nerve Nuclei

1. **Olfactory nerve** (Purely sensory), responsible for the sense of smell (Brain),
2. **Optic nerve** (Purely sensory), which transmits visual information (Brain)
3. **Oculomotor nerve** (motor and parasympathetic) = Midbrain
4. **Trochlear nerve** (purely motor) = Midbrain
5. **Trigeminal nerve** (motor and general sensation) = Pons
6. **Abducent nerve** (purely motor) = Pons
7. **Facial nerve** (motor, parasympathetic and taste sensation) = Pons
8. **Vestibulocochlear nerve** (Purely sensory), = Pons
9. **Glossopharyngeal nerve** (motor, parasympathetic and taste sensation) = medulla oblongata
10. **Vagus nerve** (motor, parasympathetic and taste sensation) = medulla oblongata
11. **Accessory nerve** (purely motor) = medulla oblongata
12. **Hypoglossal nerve** (purely motor) = medulla oblongata

- **Motor nuclei (9th, 10th, 11th and 12th) of Medulla Oblongata**

1- Nucleus Ambiguus (S.V.E = pharyngeal arch)

- **Upper** part → **glossopharyngeal** nerve to stylopharyngeus muscle.
- **Middle** part → **vagus** nerve.
- **Lower** part → **cranial part of accessory** nerve.

vagus and cranial part of accessory form **pharyngeal plexus** supply all muscles of pharynx **except stylopharyngeus muscle**, all muscles of larynx and palate **except tensor palati** (mandibular N).

2- Hypoglossal Nucleus (G.S.E). all muscles of the tongue except palatoglossus (supplied by the pharyngeal plexus).

- **Parasympathetic nuclei (G.V.E) of Medulla Oblongata**

1- Inferior salivary nucleus, → **glossopharyngeal** nerve → relay in the **otic ganglia** → to the parotid gland.

2- Dorsal Nucleus of Vagus, parasympathetic fibers to the smooth muscles and glands of the digestive, respiratory tracts and cardiac muscle.

- **Sensory nuclei of Medulla Oblongata**

1- Solitary Nucleus (S.V.A): It receives **taste sensation** from:

a- **Anterior 2/3** of the tongue through **facial nerve** (chorda tympani) and oral surface of the soft palate (greater petrosal nerve).

b- **Posterior 1/3** of the tongue through **glossopharyngeal nerve** (lingual nerve).

c- **Root** of tongue through **vagus nerve** (internal laryngeal nerve).

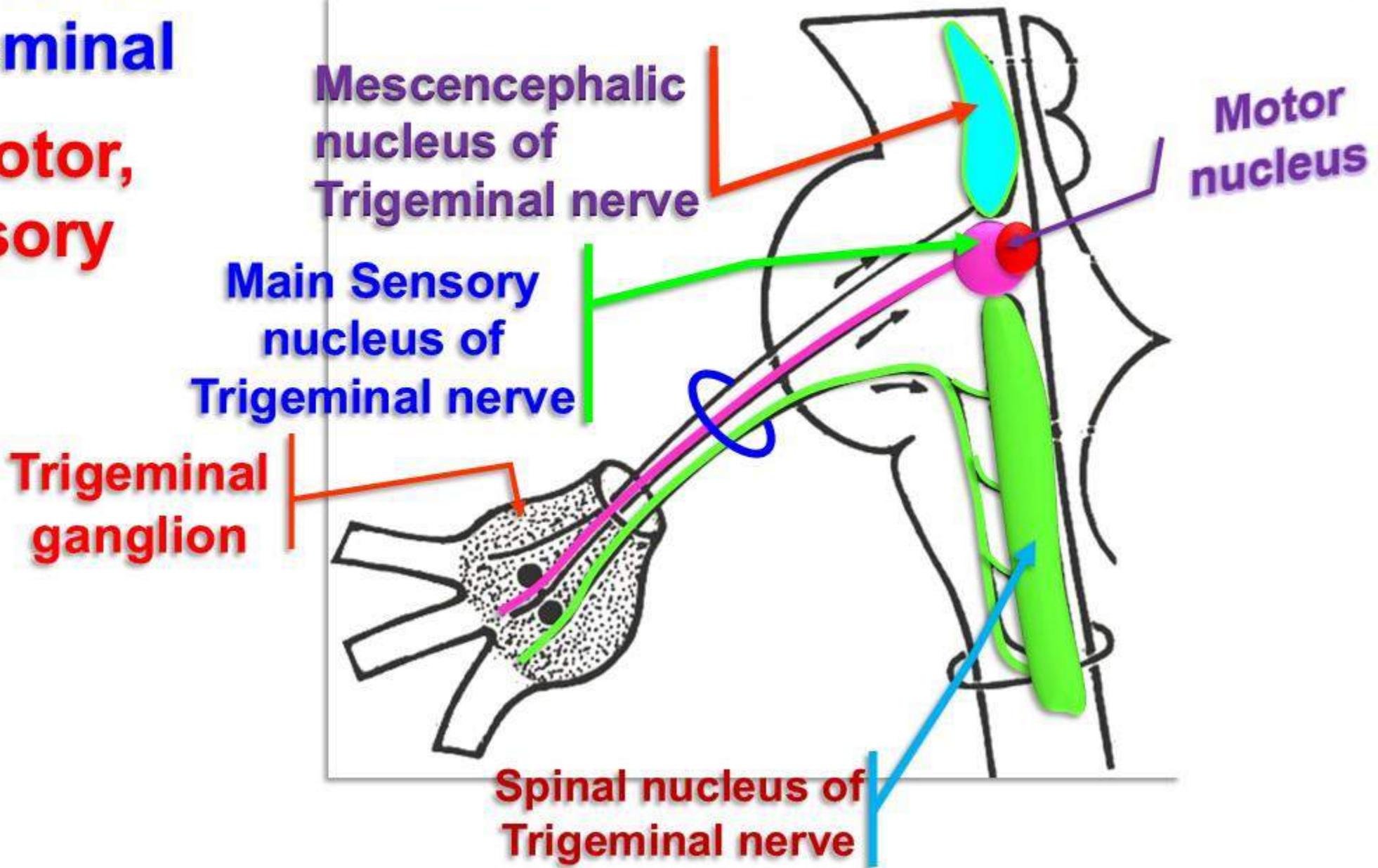
2- Spinal nucleus of trigeminal nerve (general sensation) (G.S.A): It receives **pain, and temperature sensations** from the face and scalp.

3- Inferior Vestibular Nuclei (S.S.A): It receives the vestibular organs of the inner ear.

Cranial nerve nuclei of Pons

Nuclei of trigeminal

One motor,
3 sensory



▪ **Nuclei of the trigeminal nerve**

1- Motor nucleus (S.V.E); for the muscles developed from the **1st pharyngeal arch.**

2- Main sensory nucleus (G.S.A);

- It receives sensory fibers of **touch sensation** from the face and scalp.

3- Spinal tract (nucleus) of trigeminal (G.S.A);

- It lies in the **lower** part of the pons and descends along the whole length of the medulla oblongata to be continuous with **SGR** in the spinal cord.

- It receives **pain, and temperature sensations** from the face and scalp.

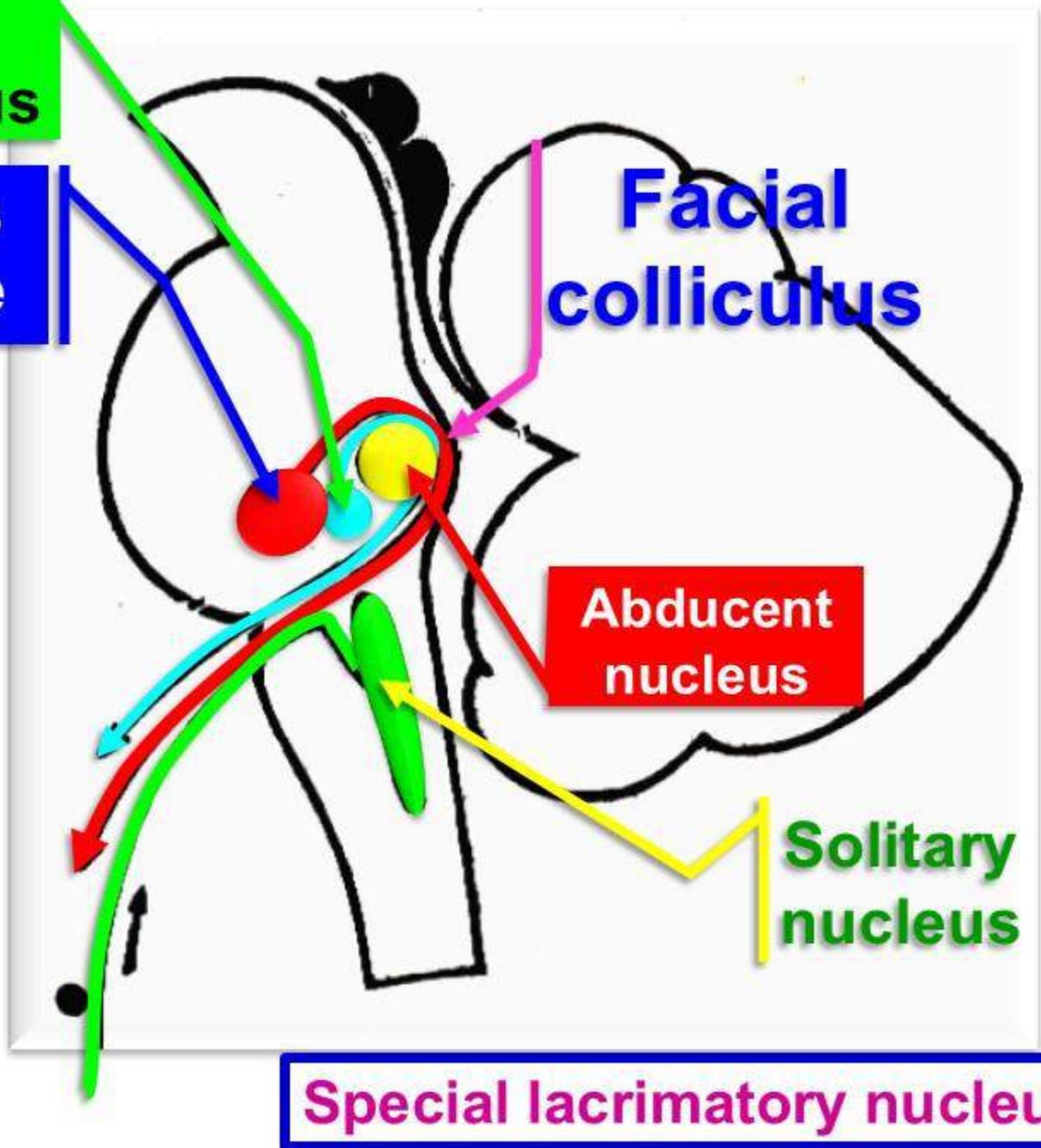
4- Mesencephalic nucleus (G.S.A): extends up to the midbrain

-It receives **proprioceptive sensations** from the face and scalp and muscles of mastication.

Superior salivary nucleus

motor nucleus of Facial nerve

Nuclei of abducent and Facial nerves



Special lacrimatory nucleus

- **Abducent Nucleus (G.S.E)**

- It is the motor nerve for the **lateral rectus muscle**.

- **LR6 (SO4)3 Nerve supply of extraocular muscles**

- **Facial Nuclei**

1- Motor nucleus (S.V.E); muscles developed from the **2nd pharyngeal arch**. The motor fibres circle around the abducent nucleus forming facial colliculus.

- **Upper part** receives fibers from **both sides of** corticobulbar tracts

- **Lower part** receives fibers from **opposite side** of corticobulbar tract.

2- Parasympathetic nuclei (G.V.E)

a- Superior Salivary Nucleus; (SSS) submandibular ganglion → submandibular & sublingual glands

b- Special lacrimatory nucleus (SSL) sphenopalatine ganglion → lacrimal, nasal, palatine and pharyngeal glands.

3- Solitary nucleus (SVA), receives taste sensation from anterior 2/3 of the tongue.

- **Vestibulocochlear nerve**

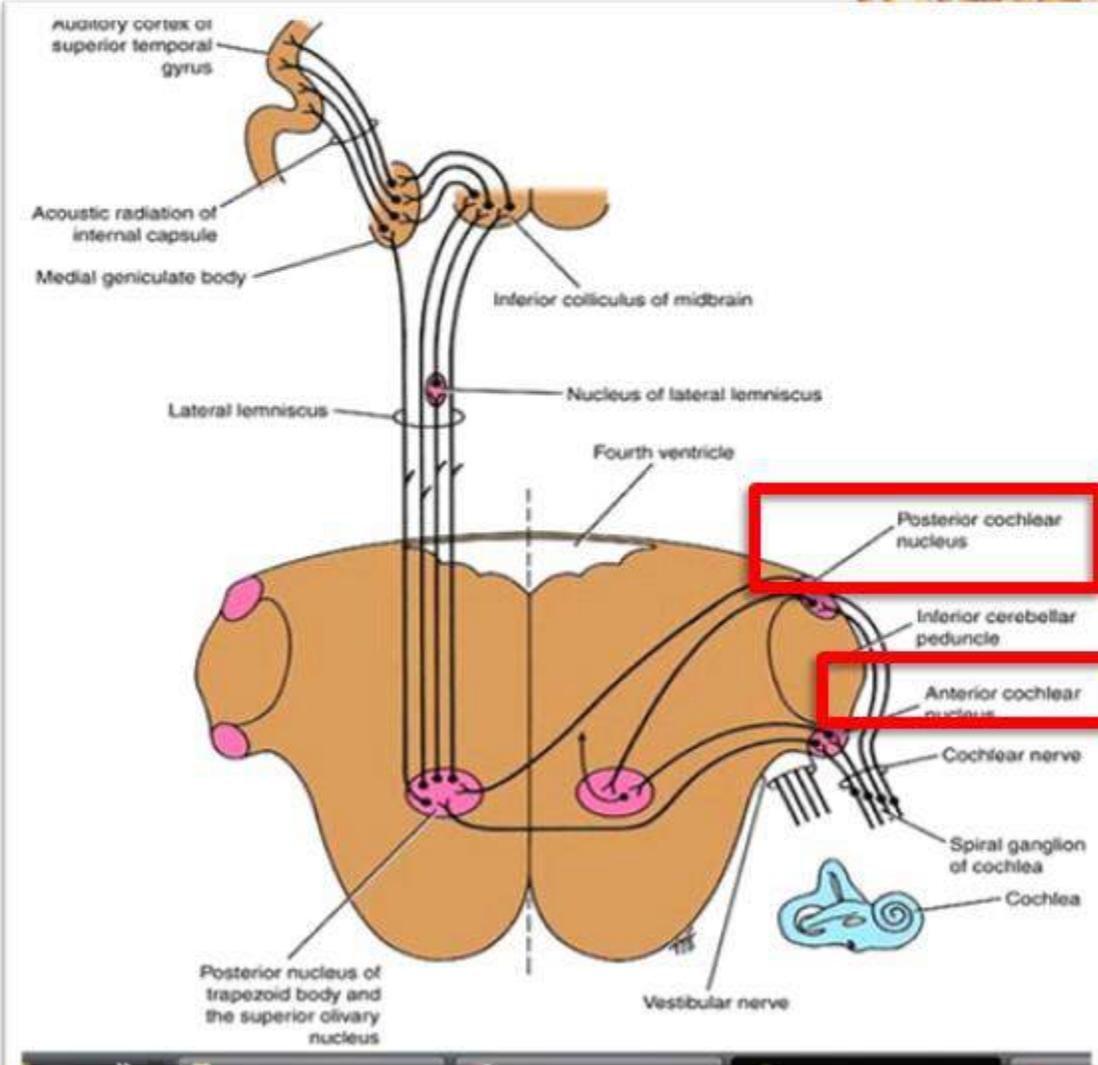
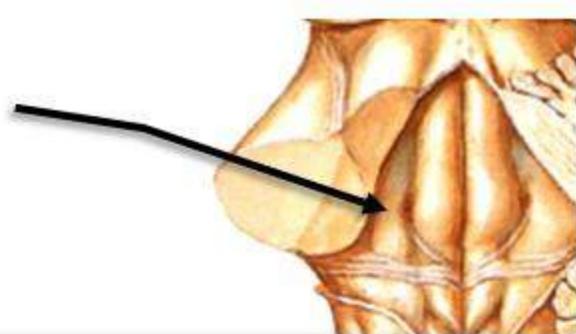
a- Vestibular Nuclei (S.S.A) superior, medial and lateral

- They receive **equilibrium** from inner ear along vestibular nerve
- Vestibulocerebellar tract – ICP (of the same side)- **cerebellum**;

b- Cochlear Nuclei (S.S.A) dorsal and ventral

- They receive hearing impulses from the **cochlea** of the **inner** ear through the cochlear nerve.
- The fibres cross to the opposite side as **auditory decussation** (trapezoid body) and ascend as **lateral lemniscus** (a- most of the fibers terminate in the **inferior colliculus** (midbrain). b- The remainder of fibres end in the medial geniculate body (thalamus) → auditory area in the cerebral cortex

Superior vestibular area



Cranial nerve nuclei of the Midbrain

- **Nuclei of oculomotor nerve:**

a- Motor nucleus (G.S.E) for all the extra ocular muscles **except** lateral rectus (6) and superior oblique (4).

b- Parasympathetic (Edinger-westphal nucleus) (G.V.E) → **ciliary ganglia** → to ciliary muscle and constrictor pupillae muscle.

- **Motor nucleus of the trochlear nerve (G.S.E):**

- It supplies the **superior oblique** muscle of the eyeball.

- **LR6 (SO4)3**

- **Mesencephalic nucleus of trigeminal nerve.**

- It receives the **proprioceptive sensation** from the muscles of mastication.

A red starburst shape with a yellow-green gradient background. The text "Non-Cranial nerve Nuclei" is written in white, bold, sans-serif font across the center of the starburst.

Non-Cranial nerve Nuclei

**Posterior surface
of medulla
oblongata**

اليوثيوب د. يوسف حسين

Hypoglossal area

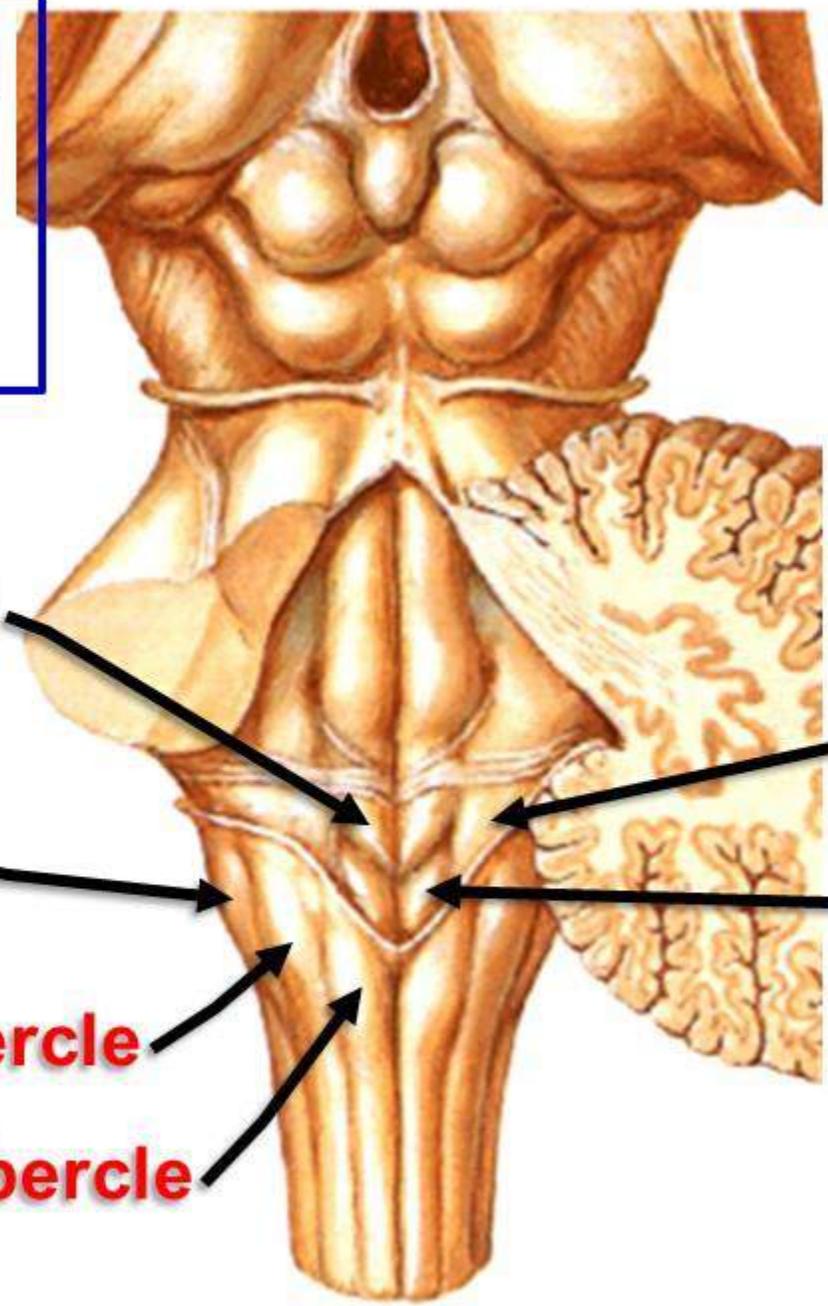
**Spinal tract of
trigeminal N**

Cuneate tubercle

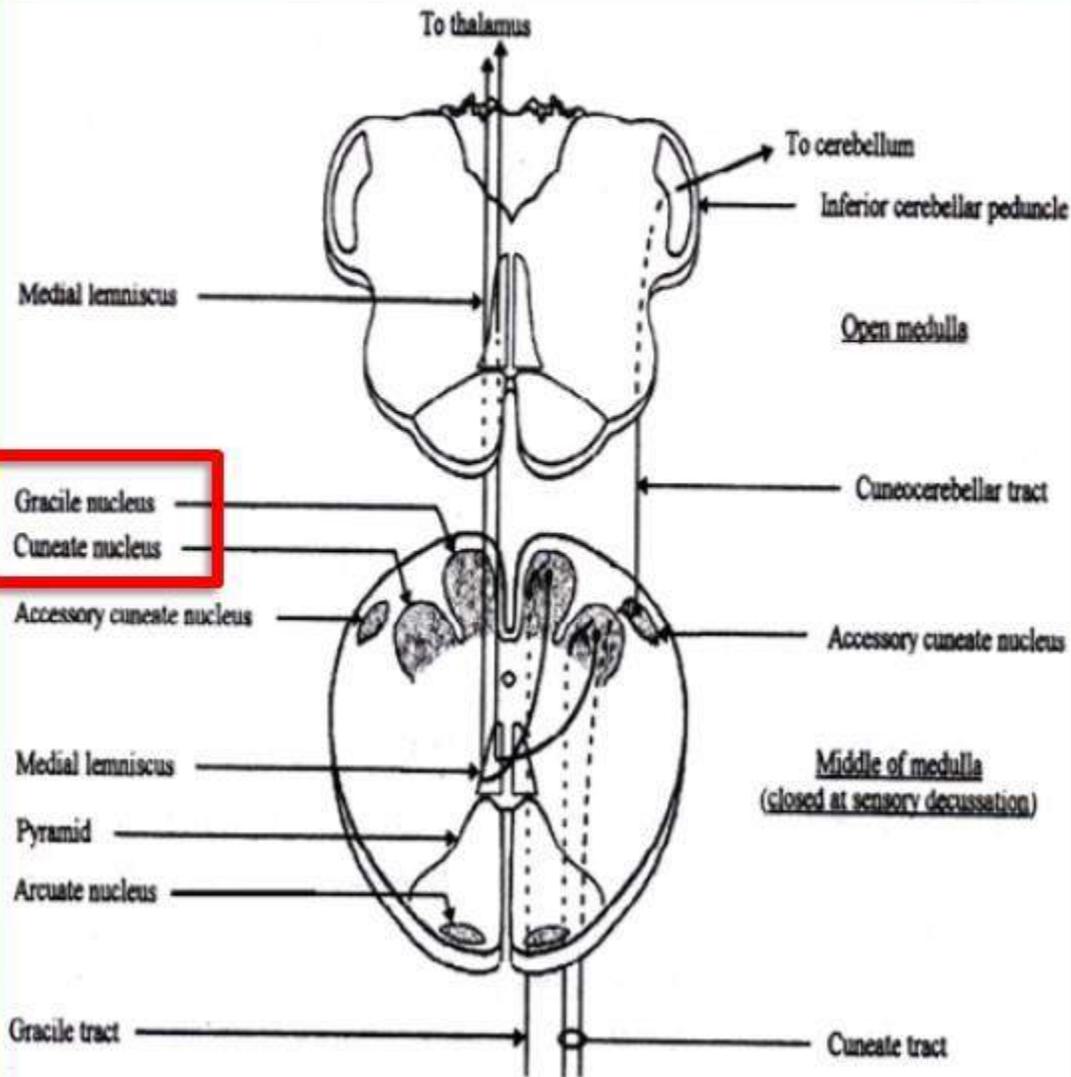
Gracile tubercle

Vestibular area

Vagal area



Non-cranial nuclei of the Medulla Oblongata

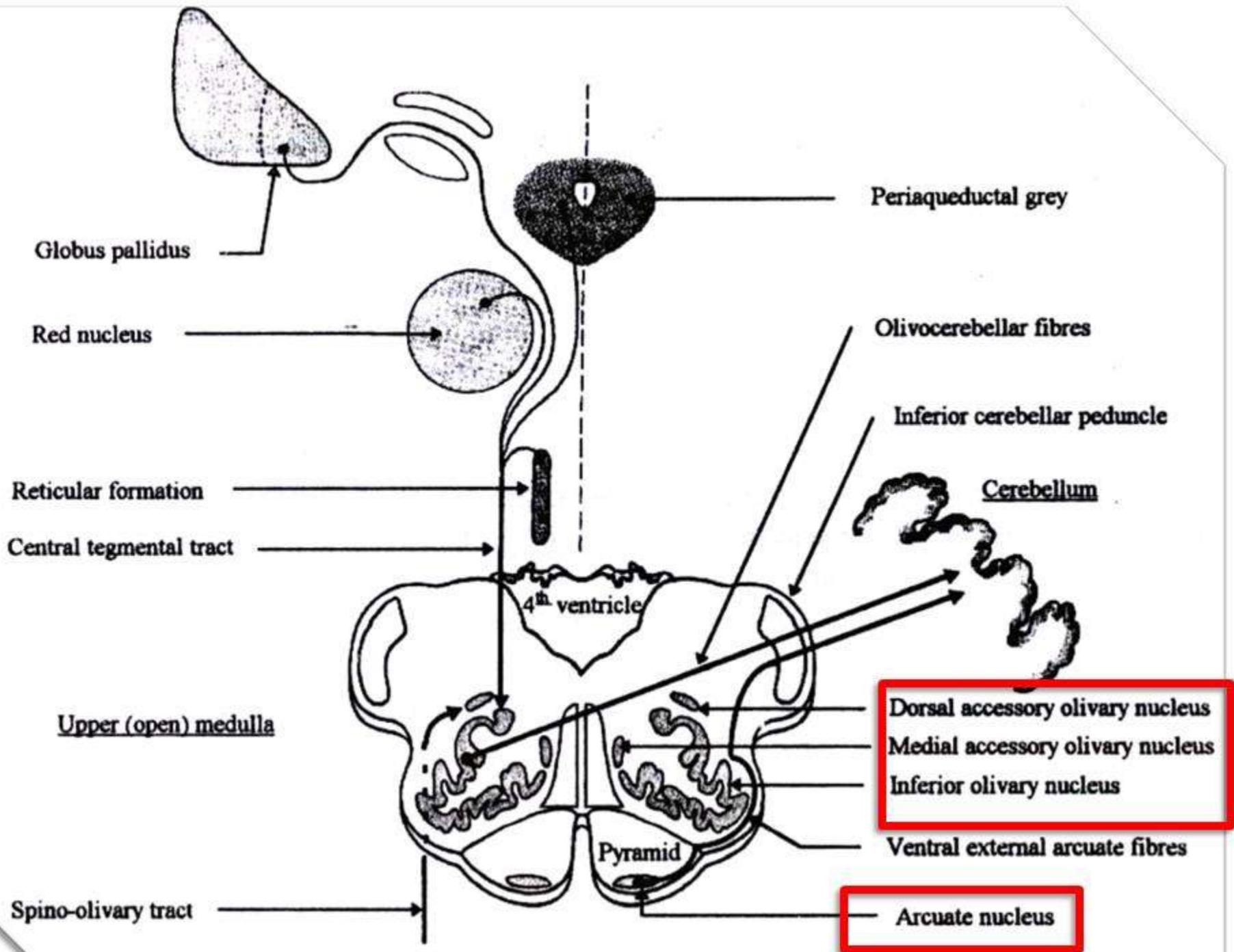


1- Gracile Nucleus

- ** Site; under gracile tubercle (posterior surface).
- ** Afferent; gracile tract which carry fine touch, pressure and proprioceptive sensation from the Lower limbs and lower 1/2 of the trunk.
- ** Efferent; Axons of the gracile nucleus formed the **internal arcuate fibers** → sensory decussation → **medial lemniscus** → the thalamus → Sensory area of cerebral cortex..

2- Cuneate Nucleus

- ** Site; under the cuneate tubercle .
- ** Afferent; cuneate tract which carry which carry fine touch, pressure and proprioceptive sensation from the upper limbs and upper 1/2 of the trunk
- ** Efferent; As the Gracile Nucleus.



3. Olivary complex Nuclei

(large corrugated sac with its opening directed medially):

- It forms an elevation on the front of the medulla called the olive.
- Its function is **motor coordination and learning** by relaying information between the spinal cord and the cerebellum.

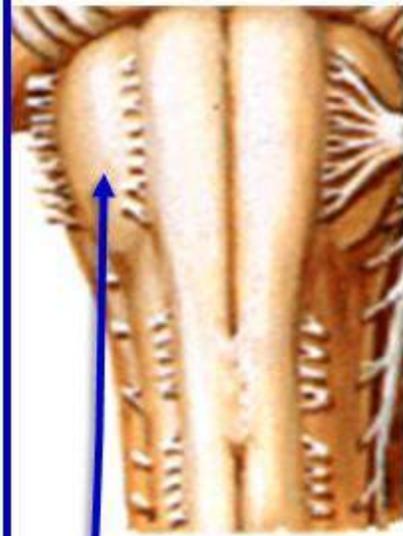
** Afferent from (SRRG)

- | | |
|------------------------|------------------------------------|
| 1- Spinal cord. | 2- Red nucleus (midbrain) |
| 3- Reticular formation | 4- Globus pallidus (basal ganglia) |

** **Efferent**; Olivo-cerebellar the fibers cross to the **opposite** side to the cerebellum through the inferior cerebellar peduncle.

4. Arcuate Nucleus: ventral external arcuate fibres → **ICP** of the same side → cerebellum

5. Accessory Cuneate Nucleus: dorsal external arcuate fibres → → ICP of the same side → cerebellum



Olive

Corticospinal tract

- In the upper part of the medulla oblongata; the fibres collect forming the pyramid.

- In the lower part of the medulla;

a- 80%- 85% of the fibers of the pyramid cross to the opposite side in the **motor decussation** and forming **Lateral corticospinal tract** in the spinal cord.

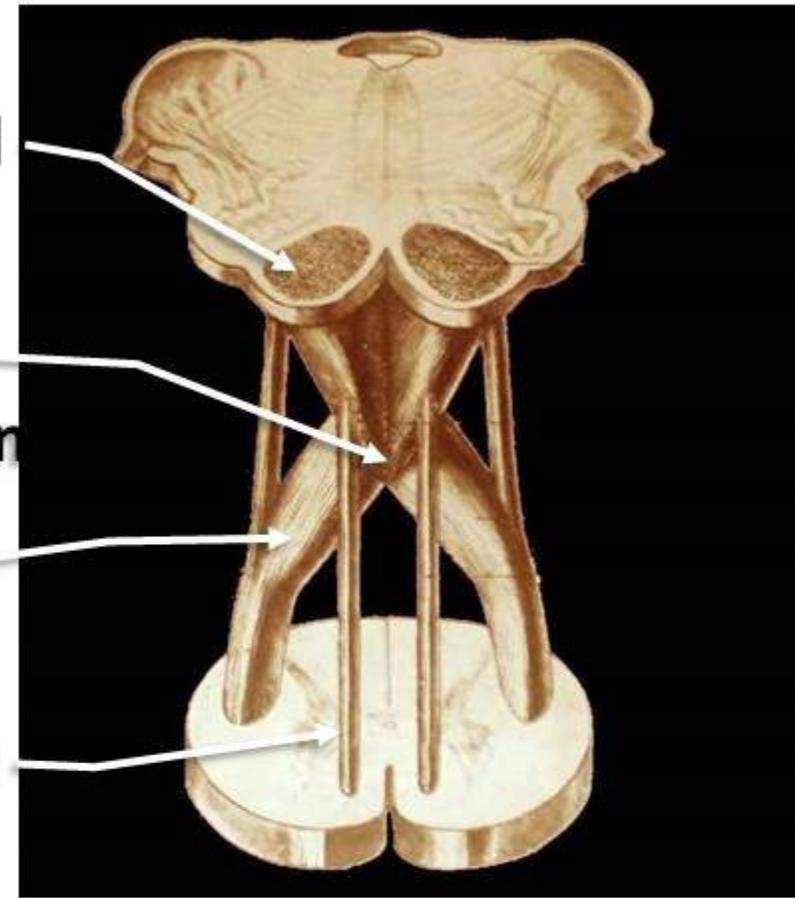
b- 15- 20% of the fibers of the pyramid descend on the same side forming the **anterior corticospinal tract** in the spinal cord.

Pyramid

Motor decussation

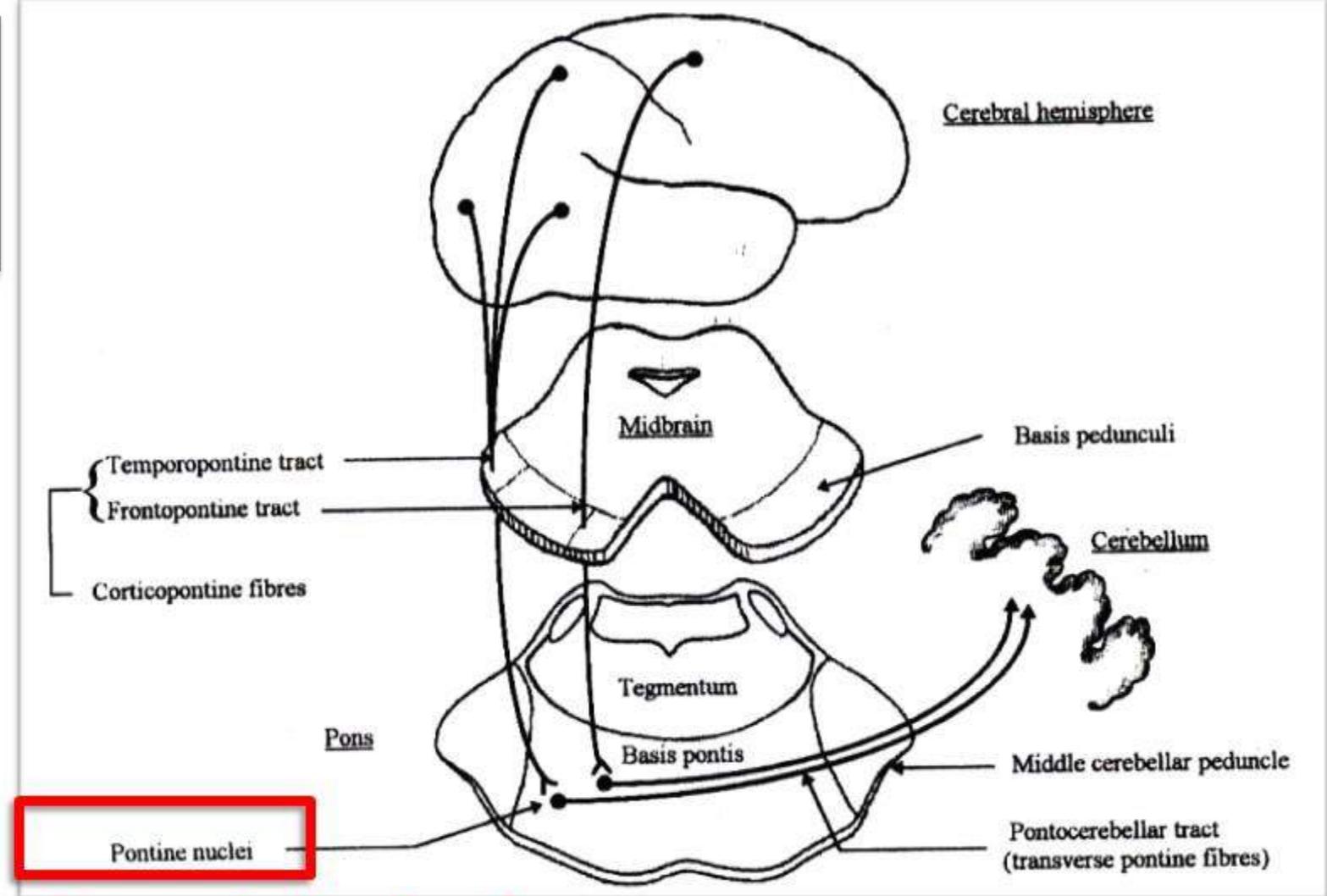
Lateral

Anterior



Pontine nuclei

Noncranial



1- Pontine nuclei: Cortico-ponto-cerebellar tract

- Cerebral cortex (same side) ----- **Pontine nuclei** ----- cross to the **opposite** side ----- middle cerebellar peduncle ----- to the cerebellum

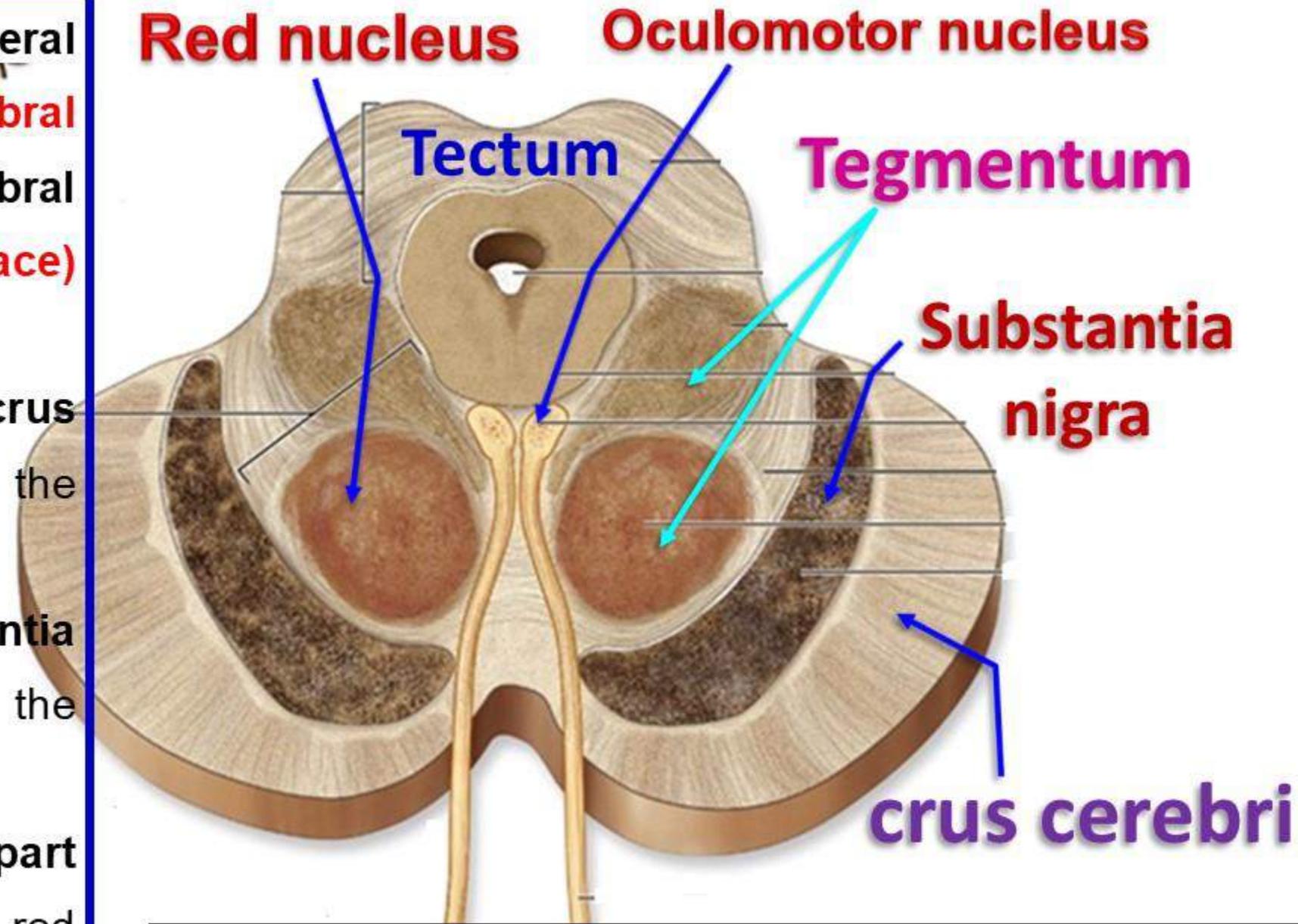
2- Reticular formation nuclei.

Midbrain comprises two lateral halves, called cerebral peduncles; Each cerebral peduncle (anterior surface) consists of 3 parts,

a- Anterior part (crus cerebri); It is formed by the fibres of pyramidal tract.

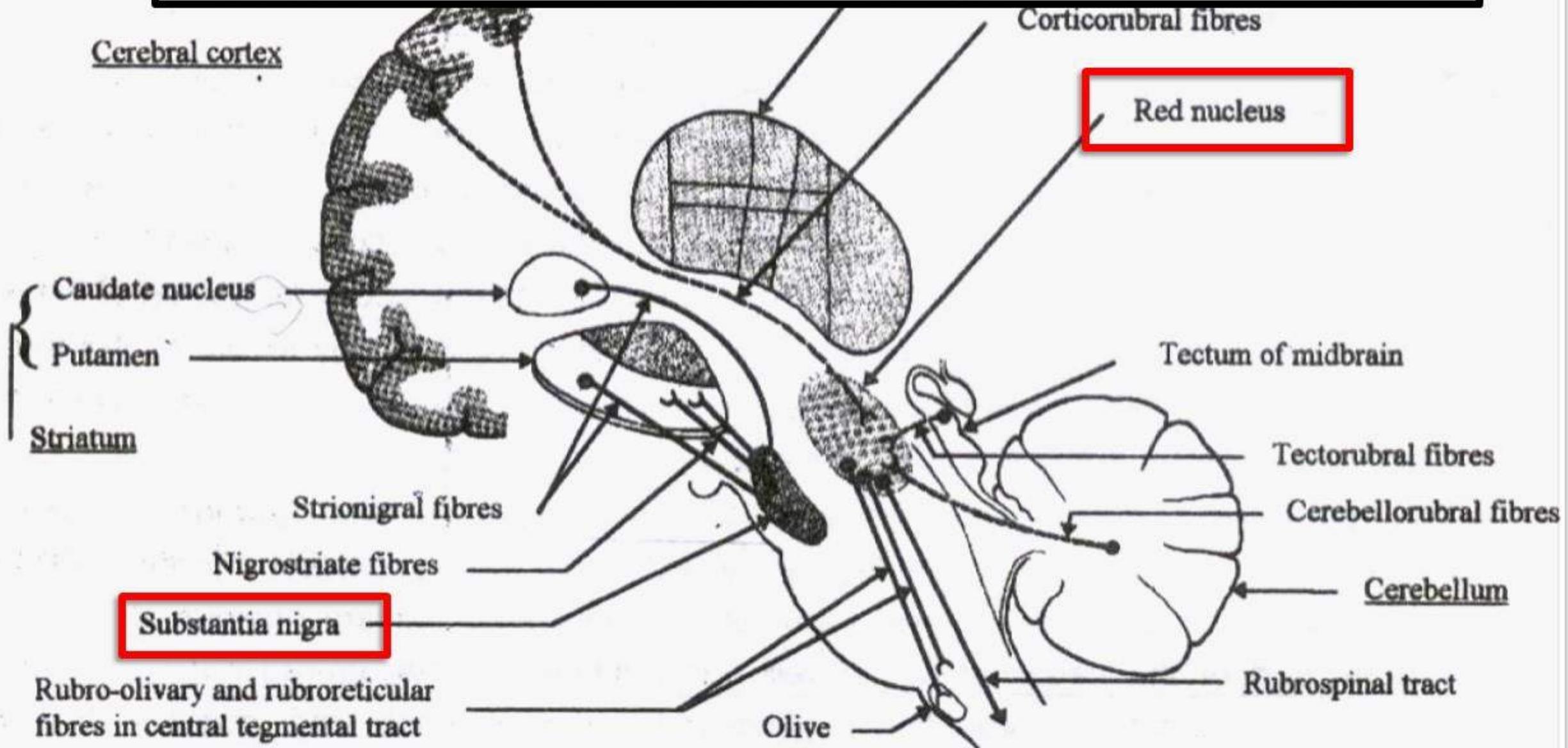
b- Middle part (substantia nigra); It is one of the extrapyramidal nuclei.

c- Posterior part (tegmentum); contains red nucleus, nuclei for III and IV



Non-cranial nerve nuclei of MB

Connection of substantia nigra & Red nucleus

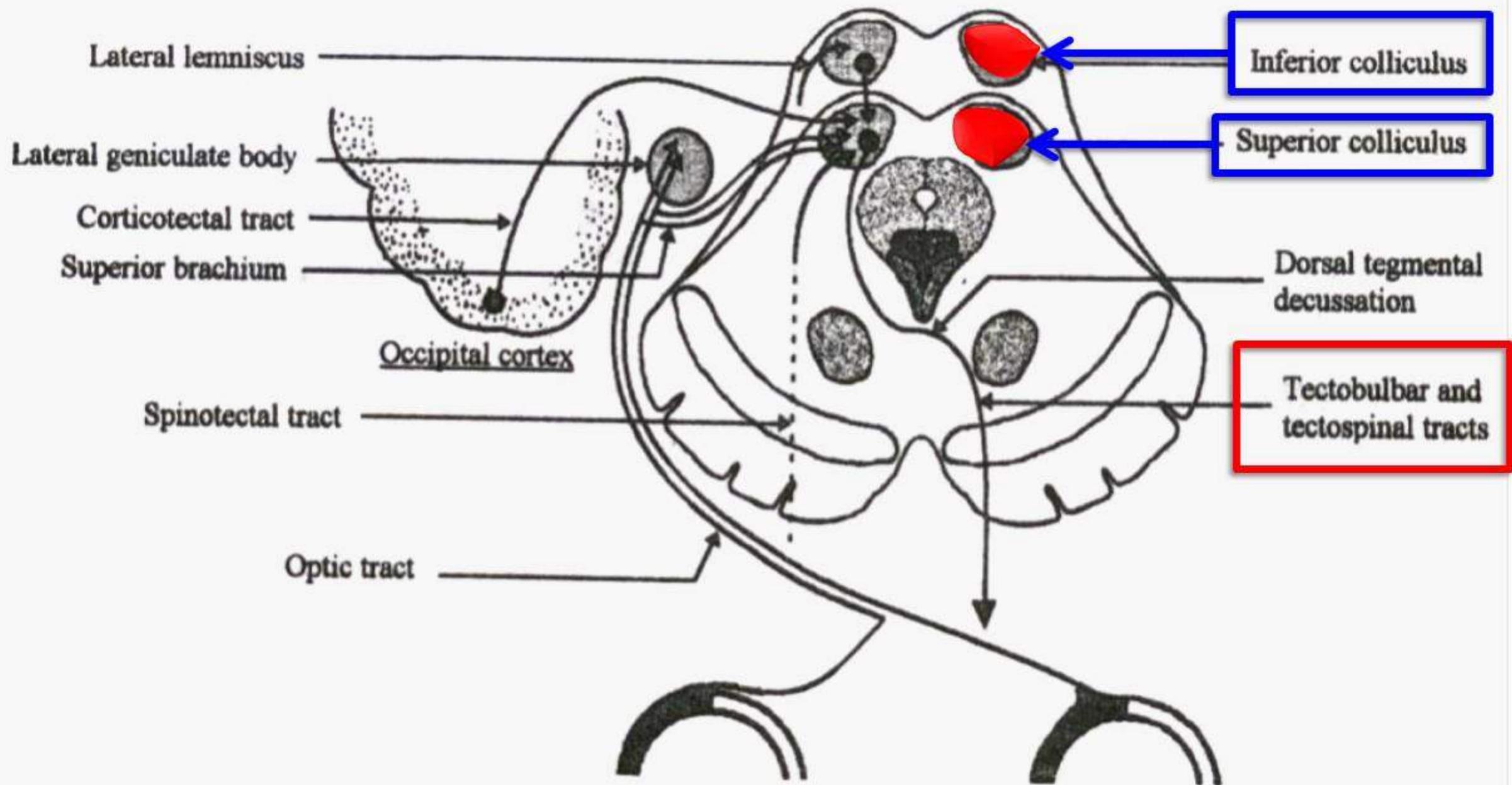


1. Substantia Nigra (extrapyramidal system)

- It contains **melanin pigment**, hence its name nigra (black).
- is concerned with **regulating muscle tone**
- ** **Afferent** = From **corpus striatum** (Strionigral tract, same side)
- ** **Efferent** : To the **corpus striatum** (Nigrostriate tract, same side).

2. Red nucleus:

- It is so called because it has a **pink color** in fresh sections due to the presence of **iron pigment**. - It is an important station of **extrapyramidal system**.
- It plays a crucial role in **motor control and coordination**.
- **Afferent (C.T)**
 - 1- From the **cerebral cortex** (Corticorubral).
 - 2- From **cerebellum** (Cerebellorubral) **SCP, the opposite side**
 - 3- **Superior colliculus** (Tectorubral).
- **Efferent (SIR)**
 - 1- to the **spinal cord** (Rubrospinal)
 - 2- to the **inferior olivary nucleus, MO** (Rubroolivary).
 - 3- to the **reticular formation** (Rubroreticular).



3- Superior Colliculus (visual reflex centers)

* Afferent

a- Corticotectal from the visual area in the occipital lobe of the cerebral cortex

b- Lateral geniculate body (L.G.B) by superior brachium. C- Red nucleus

4- Inferior Colliculus (auditory reflex centers)

, connected to the medial geniculate body (M.G.B) by inferior brachium.

* Afferent

a- Corticotectal from auditory area in the temporal lobe of the cerebral cortex

b-.From the lateral lemniscus.

* Efferent of superior and inferior colliculus to:

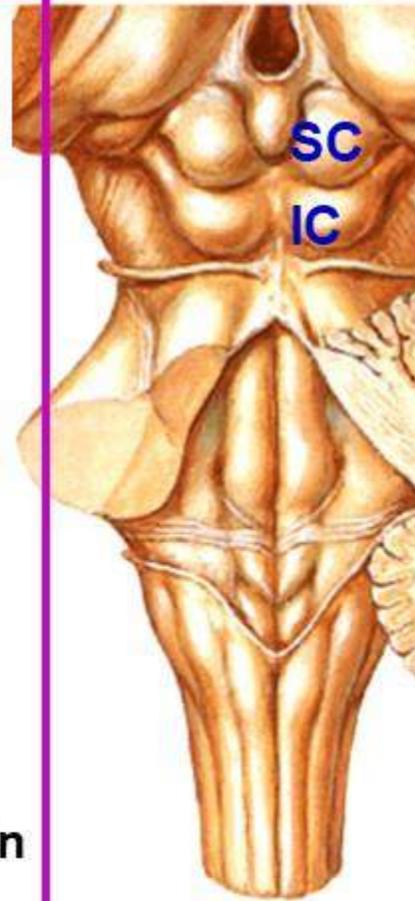
- Tectobulbar: (3rd, 4th, 6th cranial nerves nuclei) responsible for movement of the eyes in relation to the visual and auditory stimuli.

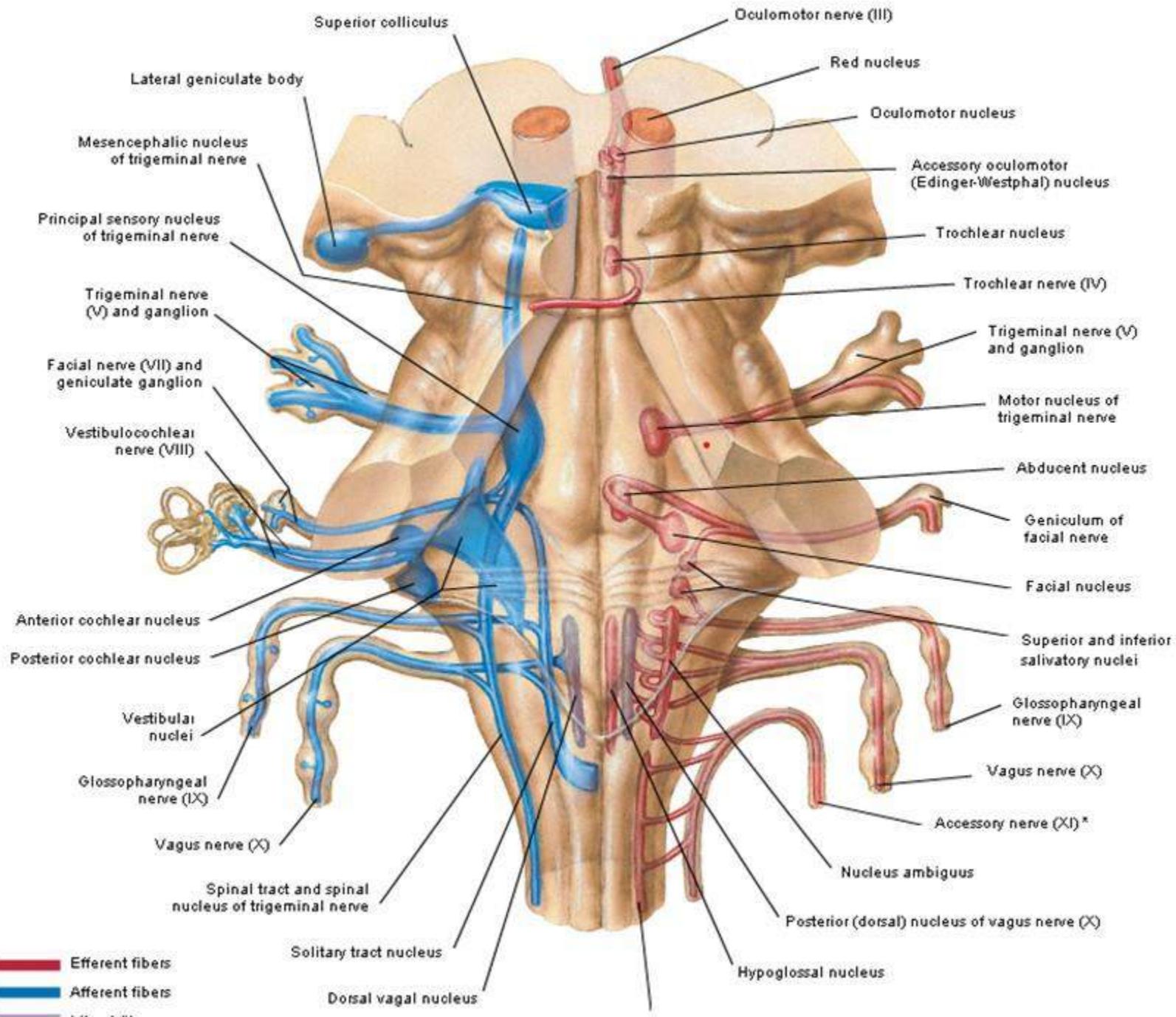
- Tectospinal: upper segments of spinal cord responsible for movement of head in relation to visual and auditory stimuli (Spinal part of accessory nerve).

5- Pretectal Nucleus for pupillary light reflex

- * Afferent from the optic tract

- * Efferent to the Edinger-westphal nucleus of oculomotor of both sides.





█ Efferent fibers
█ Afferent fibers
█ Sensory fibers

Solitary tract nucleus
 Dorsal vagal nucleus

Hypoglossal nucleus

Posterior (dorsal) nucleus of vagus nerve (X)

Nucleus ambiguus

Accessory nerve (XI)*

Vagus nerve (X)

Glossopharyngeal nerve (IX)

Superior and inferior salivatory nuclei

Facial nucleus

Geniculum of facial nerve

Abducent nucleus

Motor nucleus of trigeminal nerve

Trigeminal nerve (V) and ganglion

Trochlear nerve (IV)

Trochlear nucleus

Accessory oculomotor (Edinger-Westphal) nucleus

Oculomotor nucleus

Red nucleus

Oculomotor nerve (III)

Superior colliculus

Lateral geniculate body

Mesencephalic nucleus of trigeminal nerve

Principal sensory nucleus of trigeminal nerve

Trigeminal nerve (V) and ganglion

Facial nerve (VII) and geniculate ganglion

Vestibulocochlear nerve (VIII)

Anterior cochlear nucleus

Posterior cochlear nucleus

Vestibular nuclei

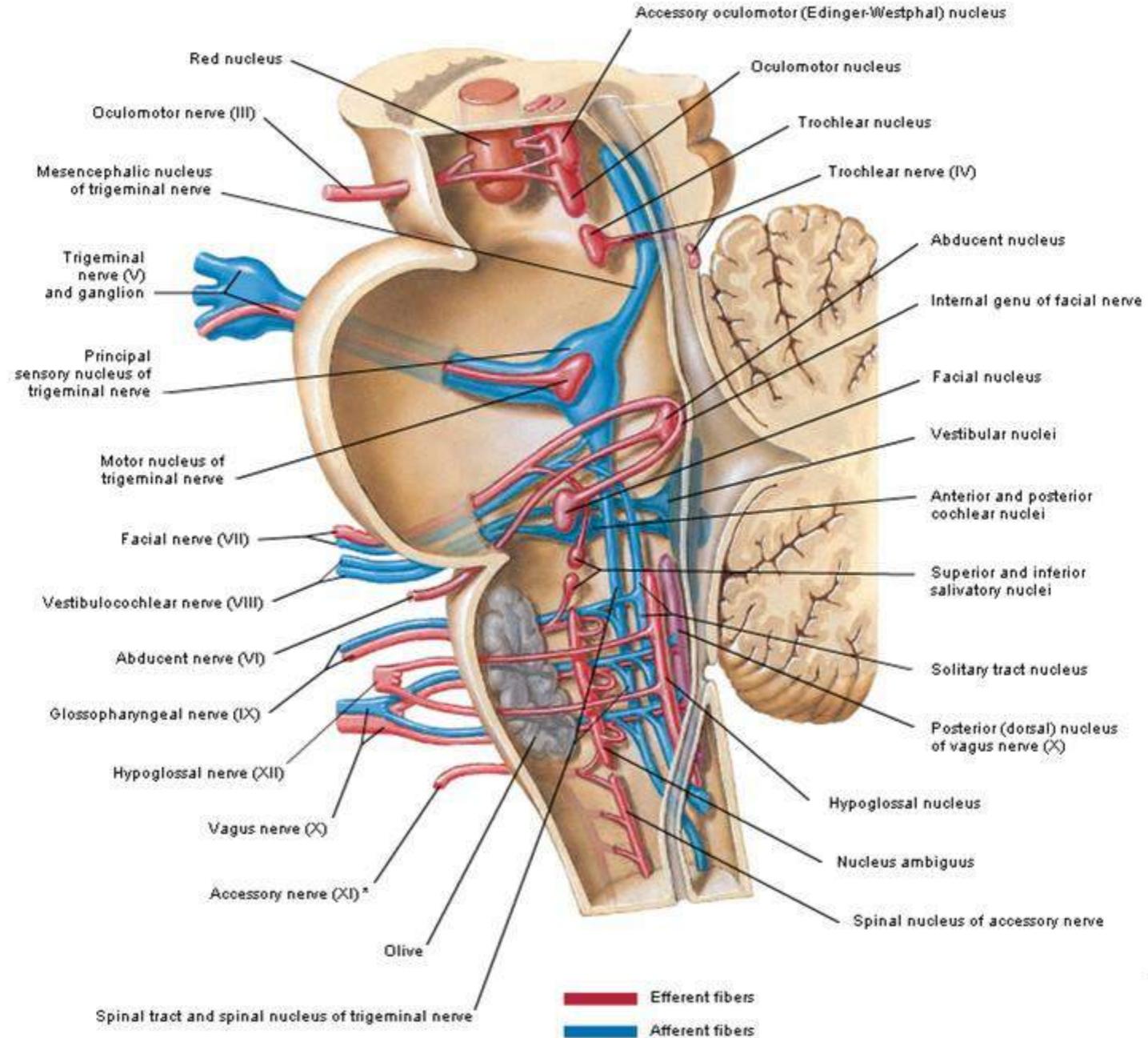
Glossopharyngeal nerve (IX)

Vagus nerve (X)

Spinal tract and spinal nucleus of trigeminal nerve

Cranial Nerve Nuclei in Brainstem

Schema - Medial Dissection



https://www.youtube.com/channel/UCVSNqbibj9UWYaJdd_cn0PQ

يُمنع أخذ السلايدات بدون
إذن المحرر واي اجراء
يخالف ذلك يقع تحت طائلة
المسؤولية القانونية
جميع المعلومات للاستخدام
التعليمي فقط

اليوتيوب د. يوسف حسين



Thank You

Questions

<https://www.youtube.com/@ProfDrYoussefHusseinAnatomy/playlists>