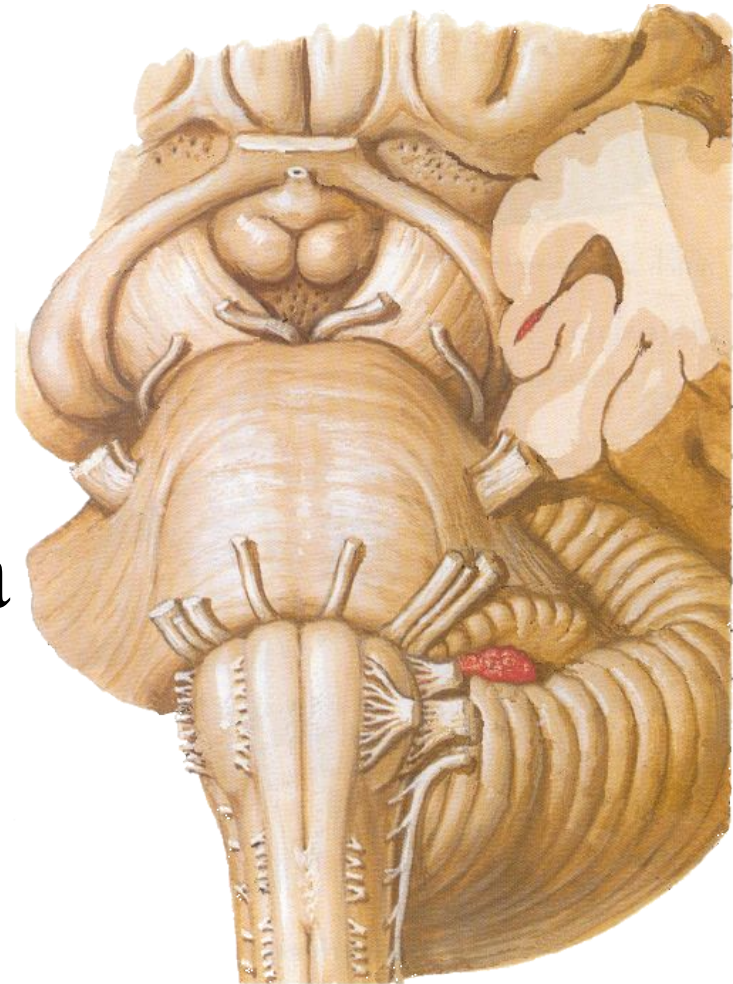

The brain stem



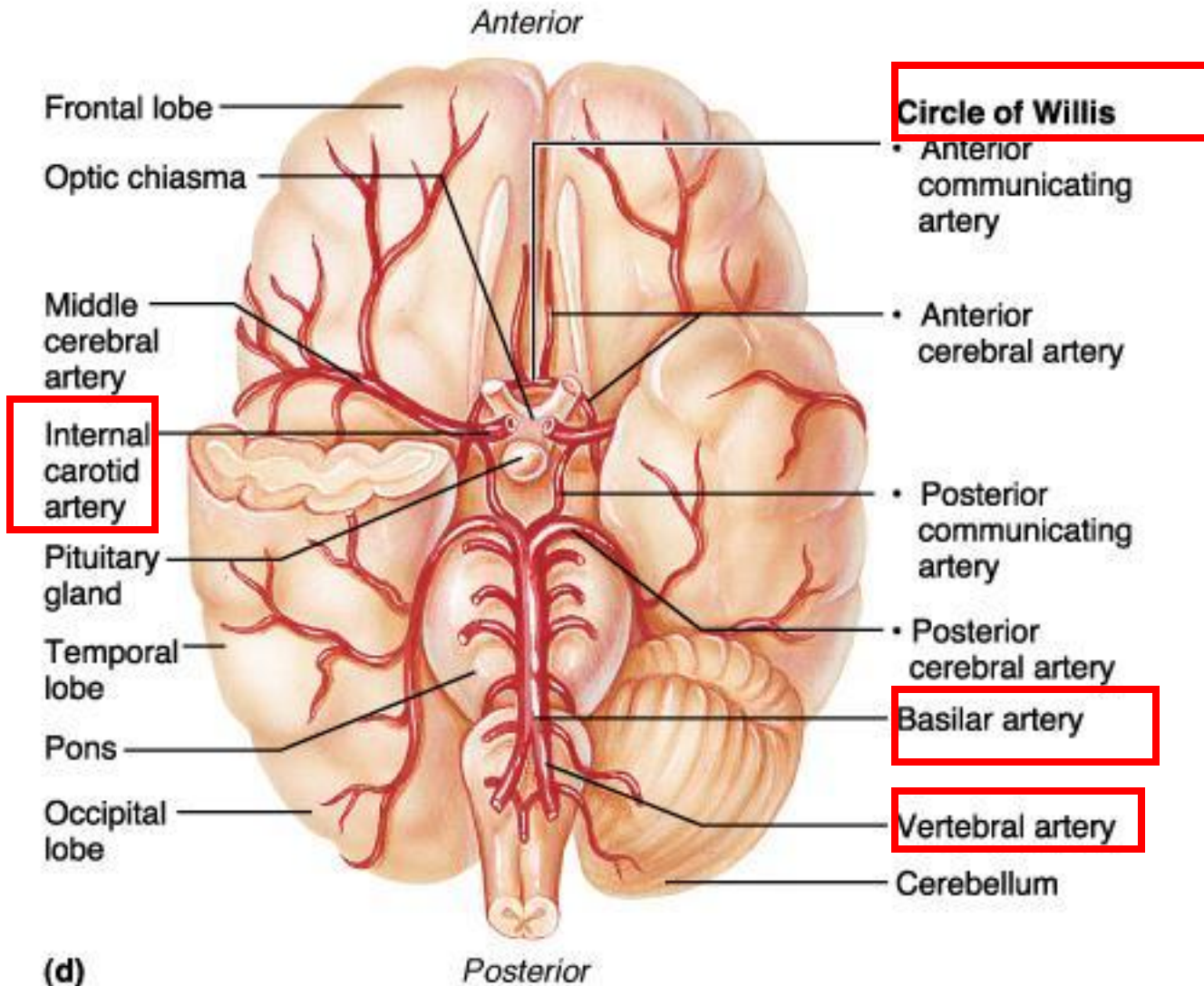
The brain stem

Consists of

- Midbrain
- **Pons**
- Medulla oblongata



Principle Brain Arteries

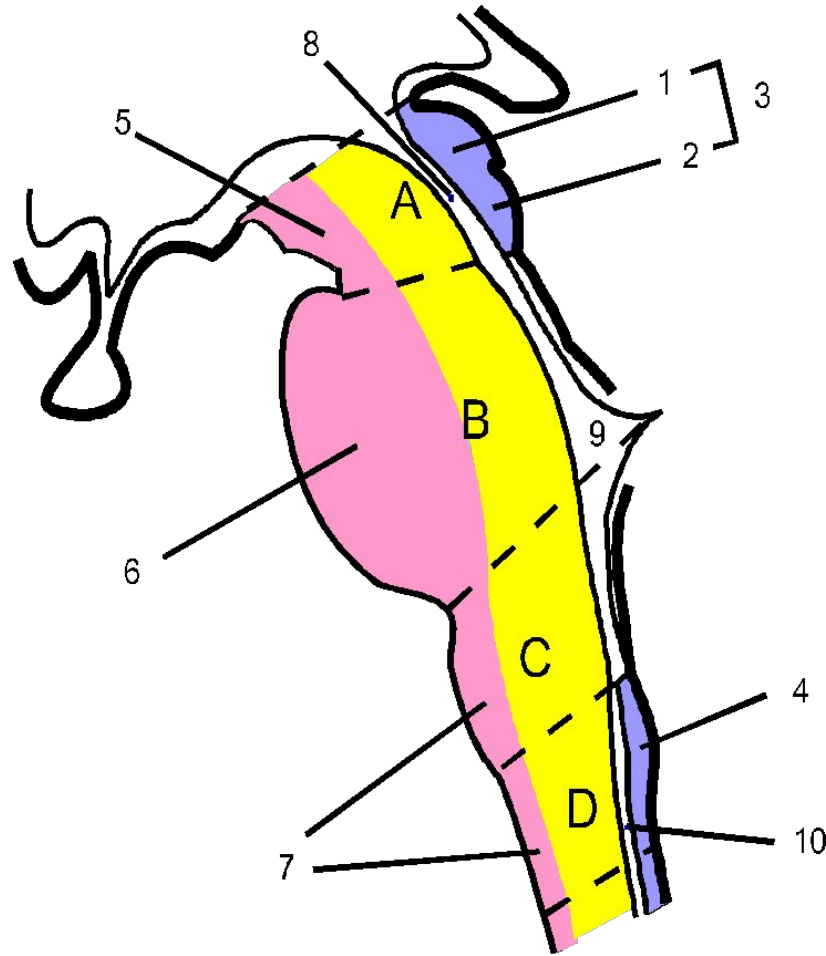


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Basic Structure of Brain Stem

- 1. Roof Plate**
- 2. Tegmentum**
- 3. Basal Portion**



Roof Plate

Tegmentum

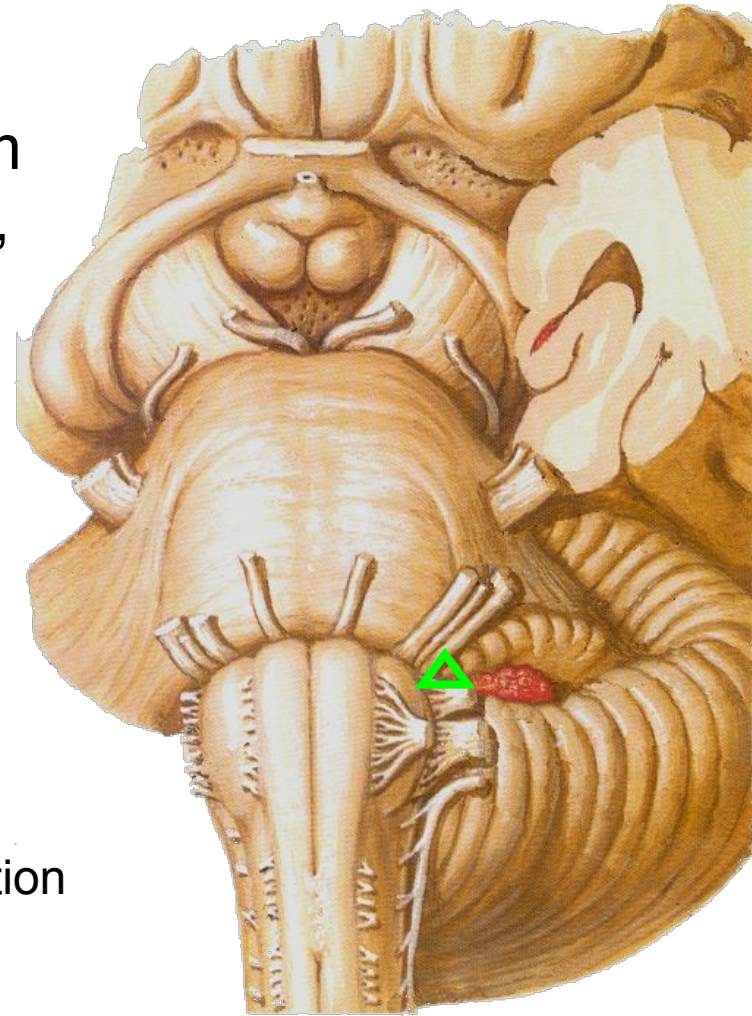
Basal Portion

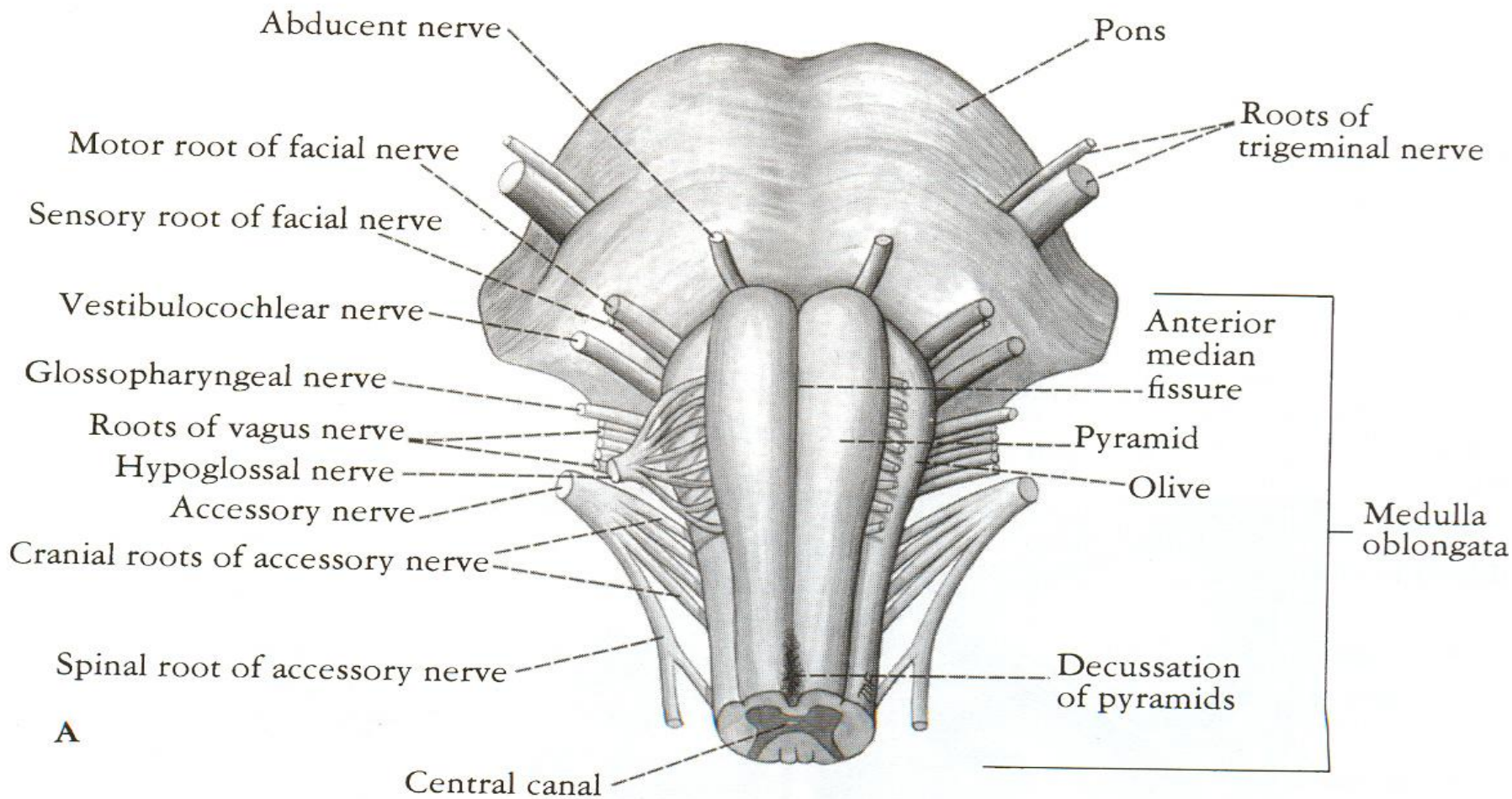


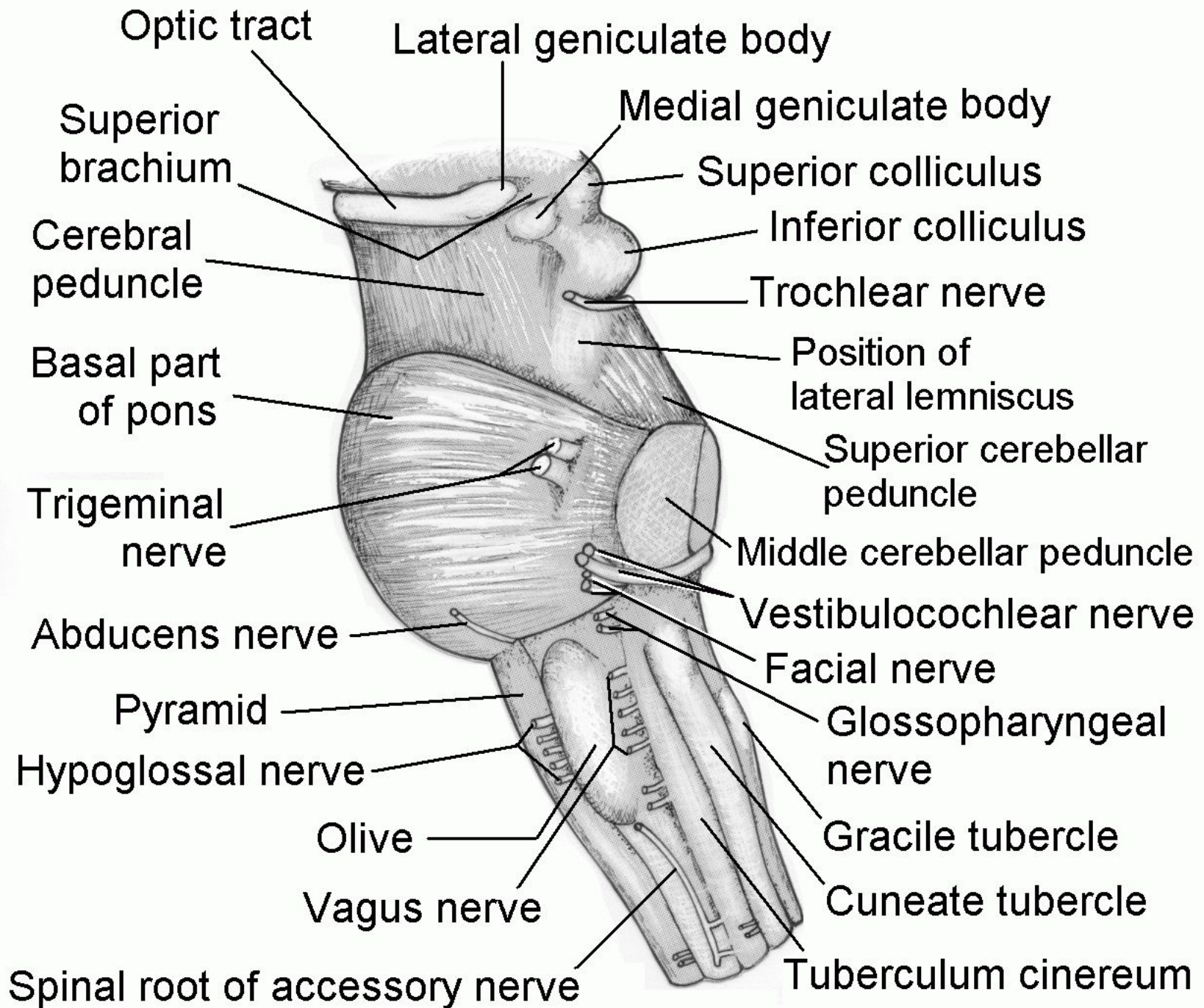
Pons

Ventral (Basilar) surface

- **Bulbopontine sulcus:** from medial to lateral, the **abducent**, **facial** and **vestibulocochlear** nerves appear
- **Pontopeduncular sulcus:** oculomotor N.
- **Basilar part:** pyramids
- **Basilar sulcus**
- **Middle cerebellar peduncle**
- **Trigeminal nerve**
- **Pontocerebellar trigone:** the junction of medulla, pons and cerebellum



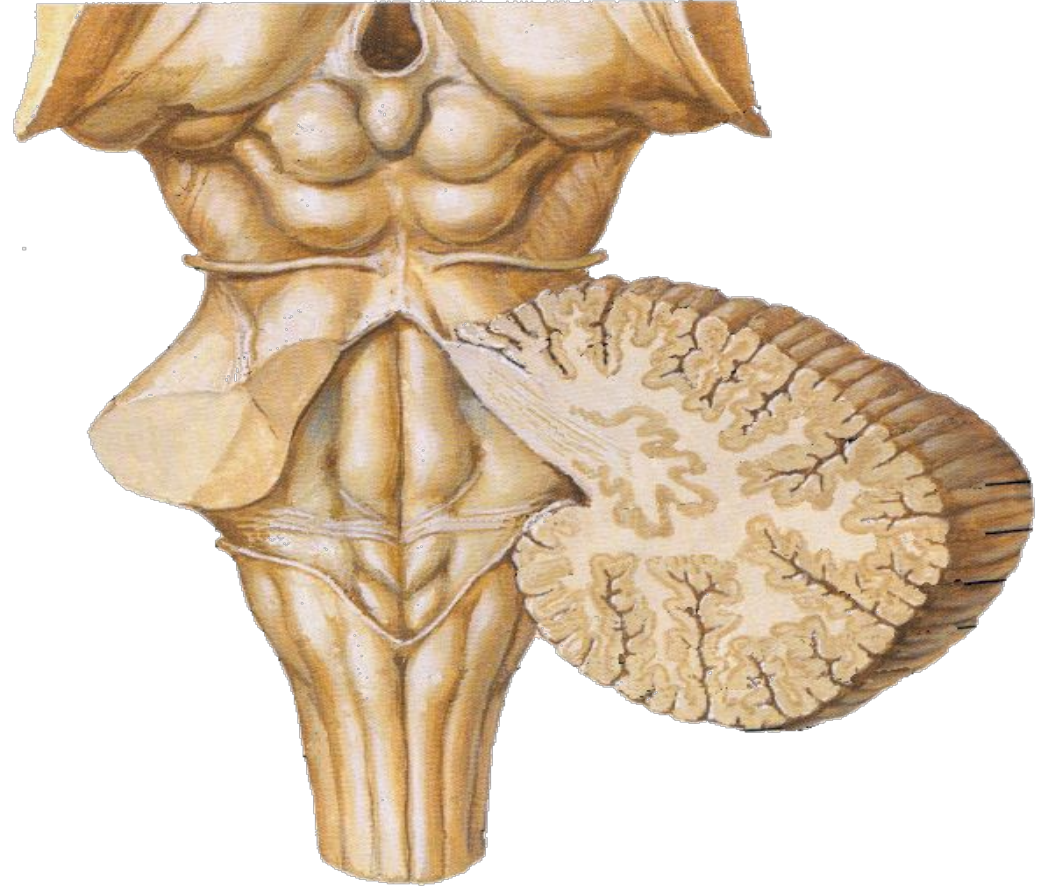




Pons

Dorsal surface

- Superior cerebellar peduncle
- Superior medullary velum
- Trochlear nerve



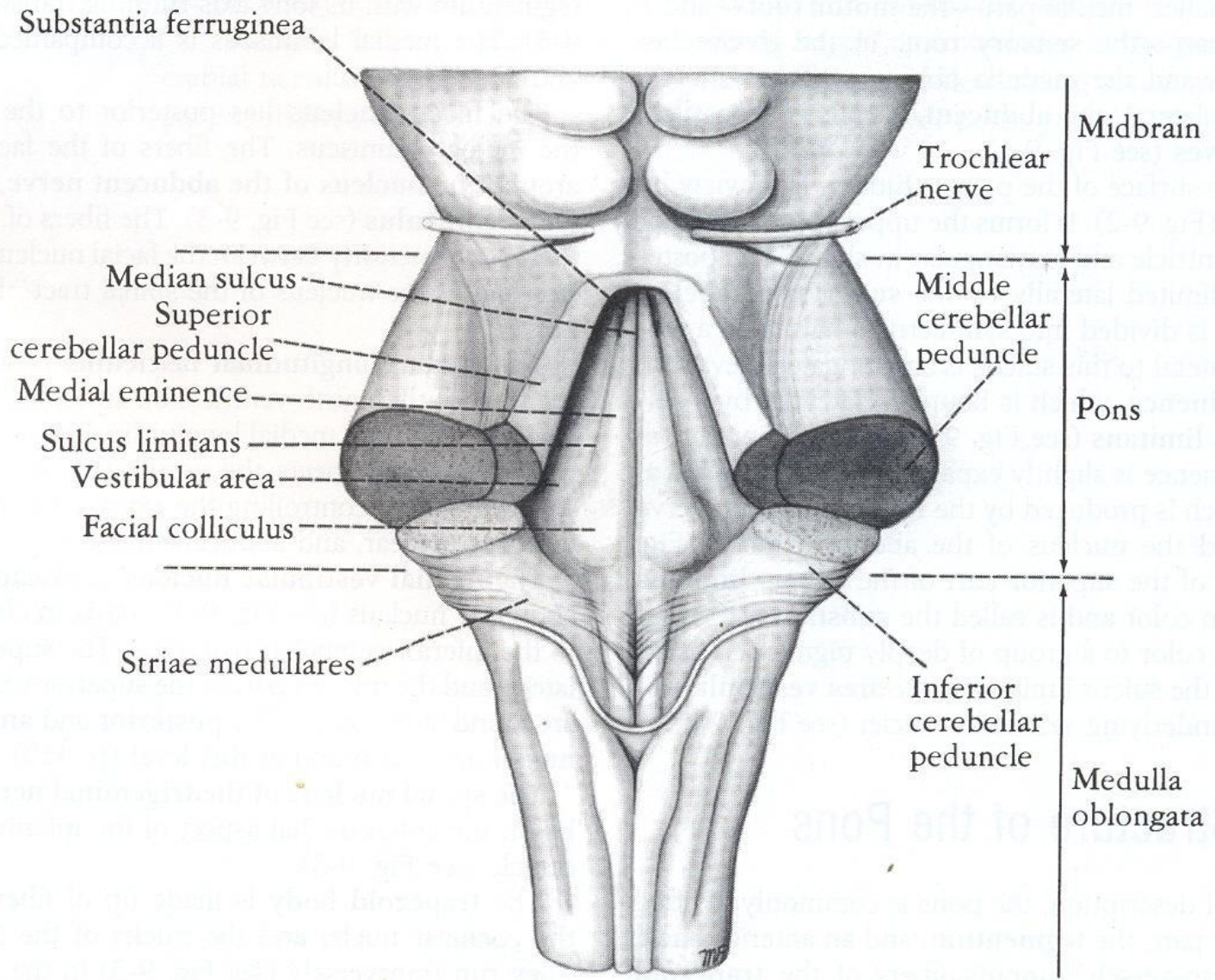


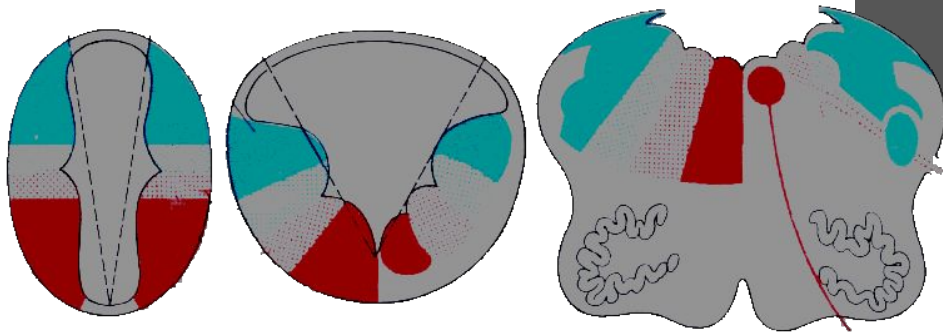
FIGURE 9-2 Posterior surface of the brainstem showing the pons. The cerebellum has been removed.



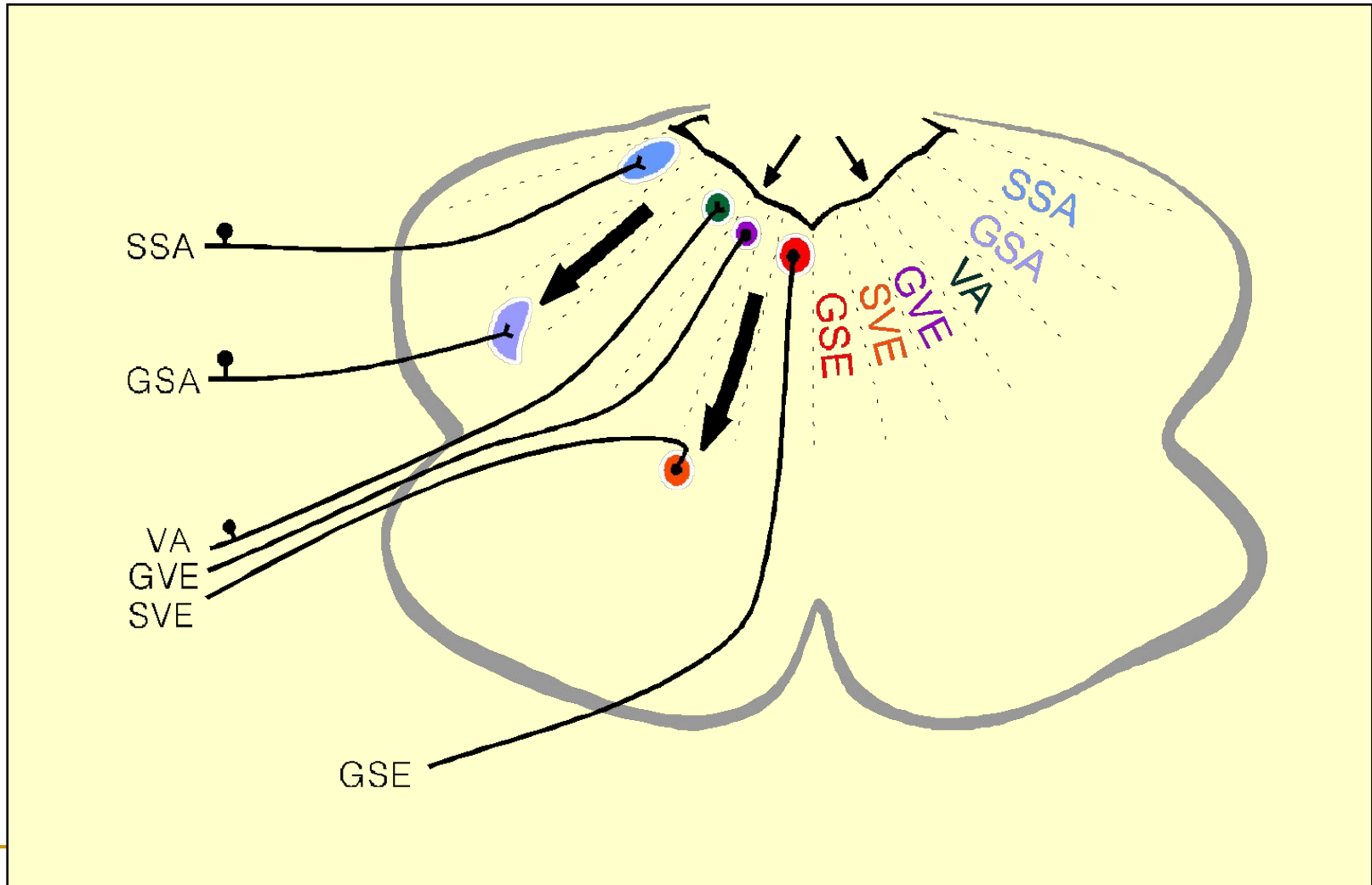
Internal structures

Gray matter

- Cranial nerve nuclei
- Relay nuclei



Components of Cranial Nerves



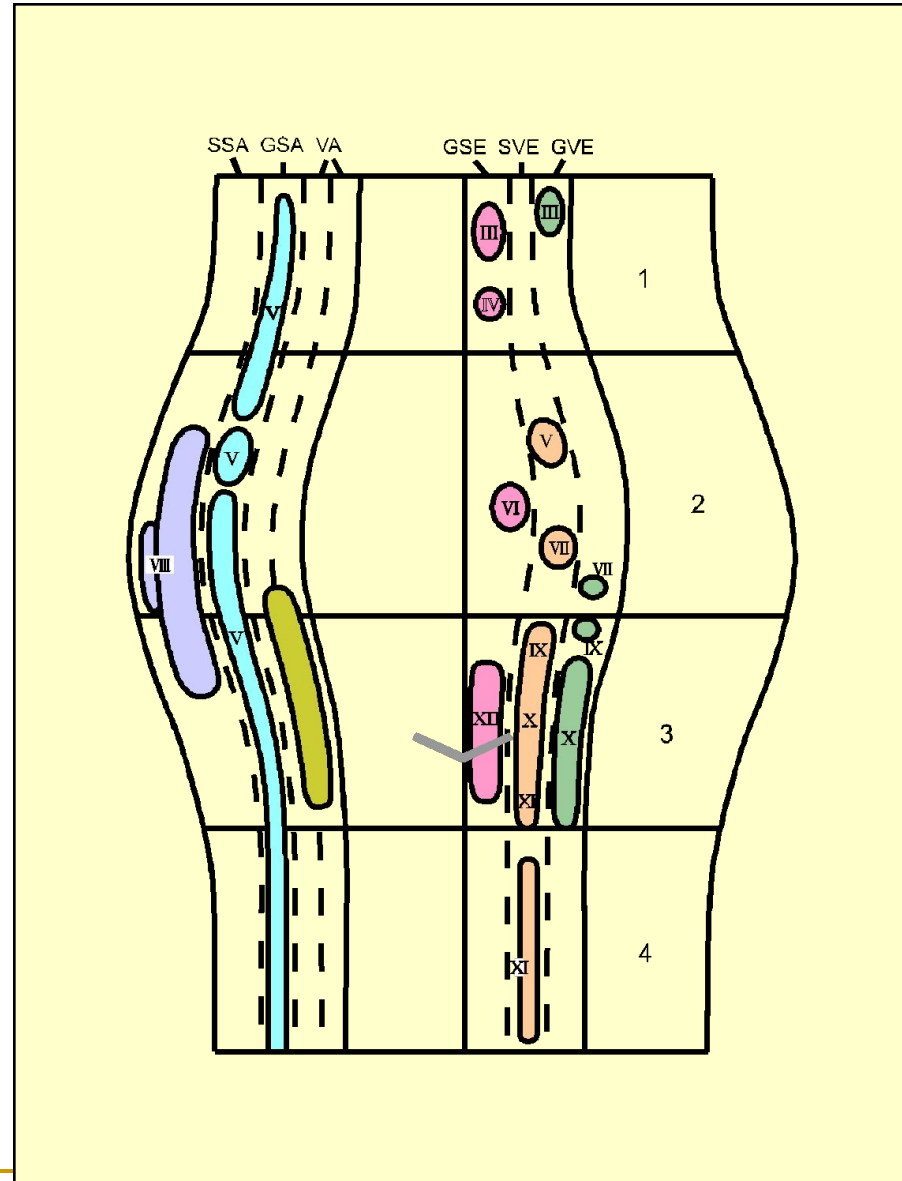
Cranial Nerves Columns of Brain Stem

Motor Column

1. GSE
2. SVE
3. GVE

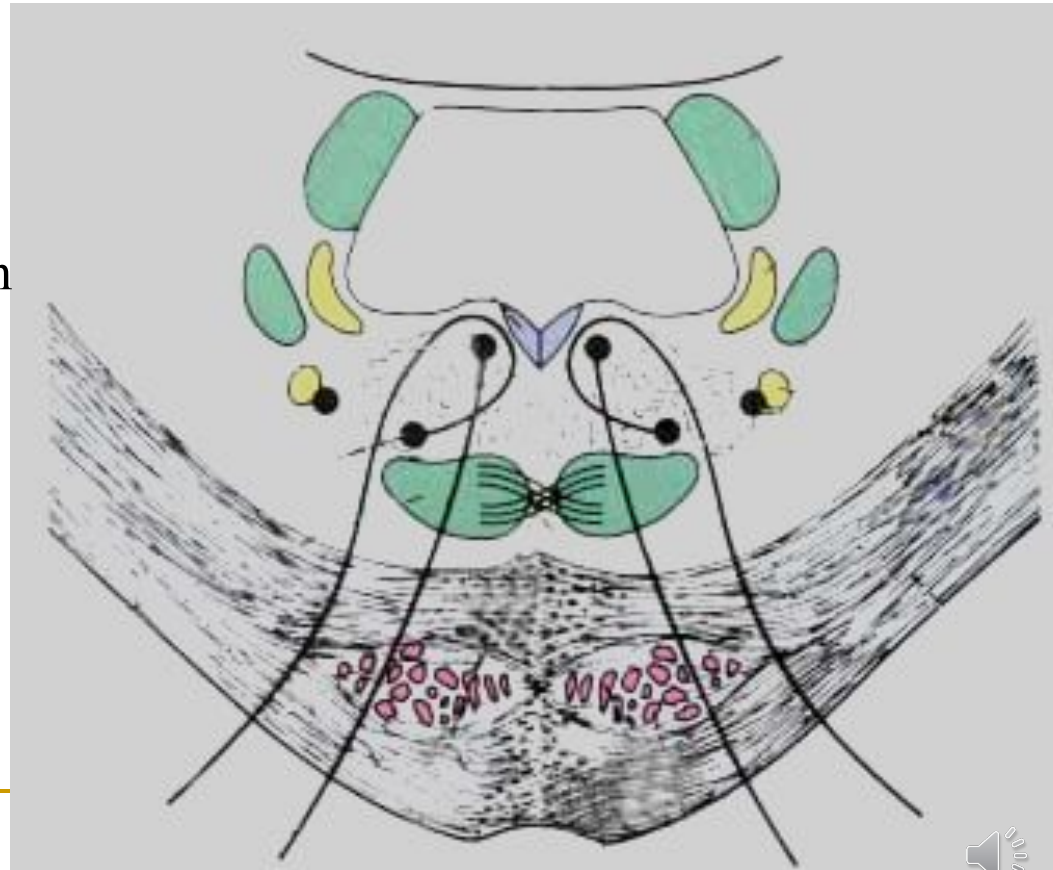
Sensory Column

4. VA (GVA & SVA)
5. GSA
6. SSA



Internal structures

- **Tegmentum of pons**
directed upward continuation of medulla oblongata
- **Basilar part**
contain both longitudinal and transverse fibers intermixed with pontine nuclei



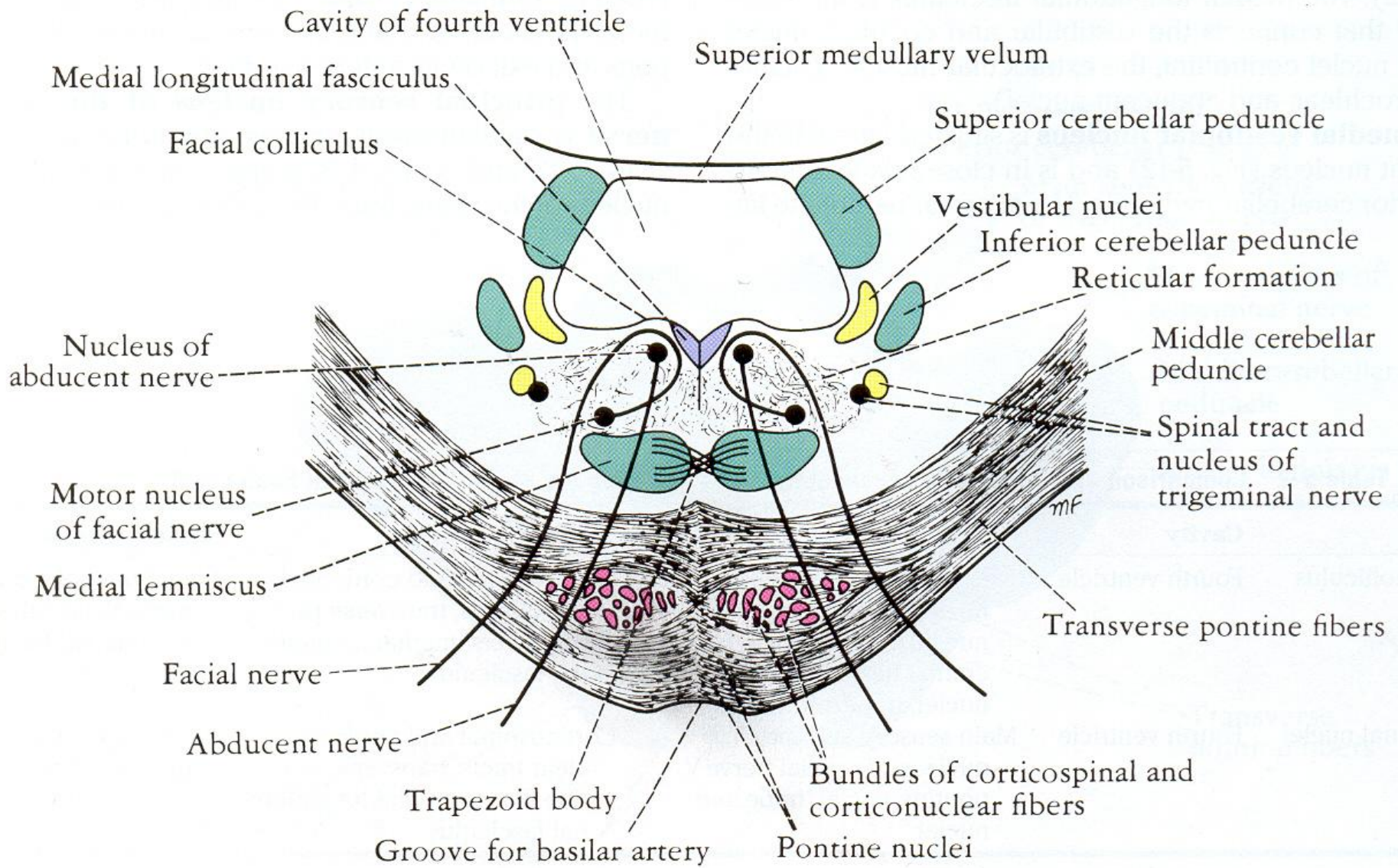
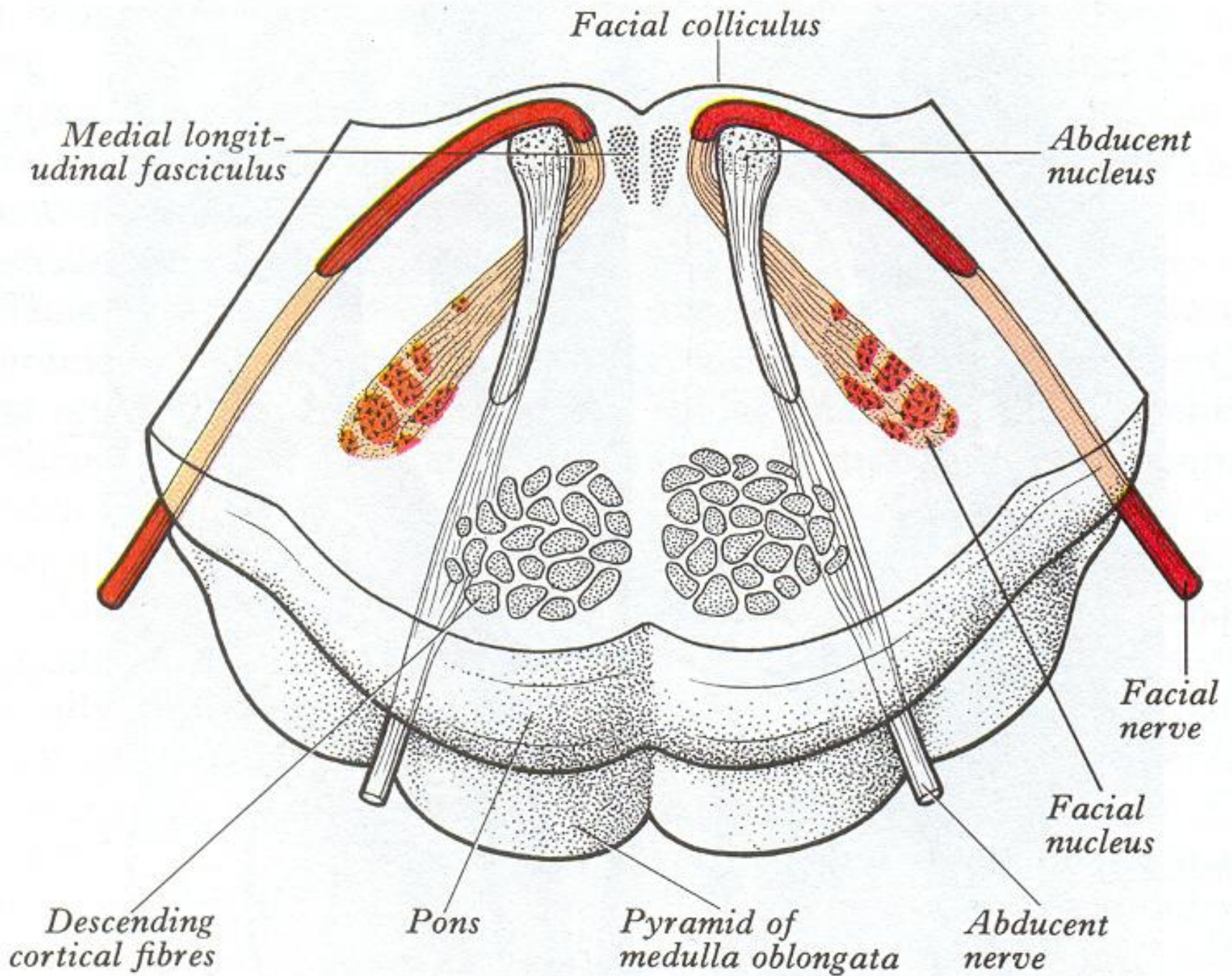
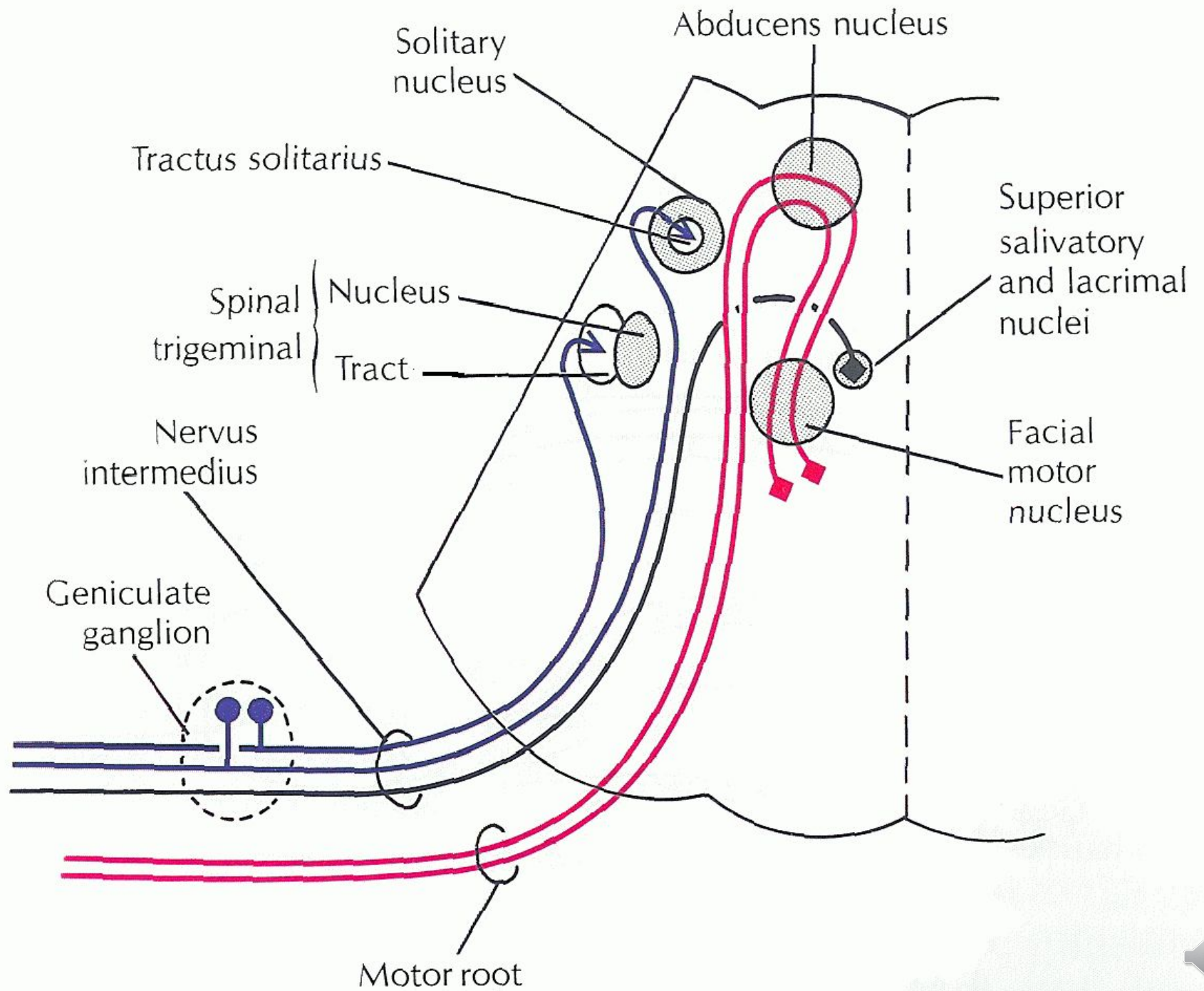
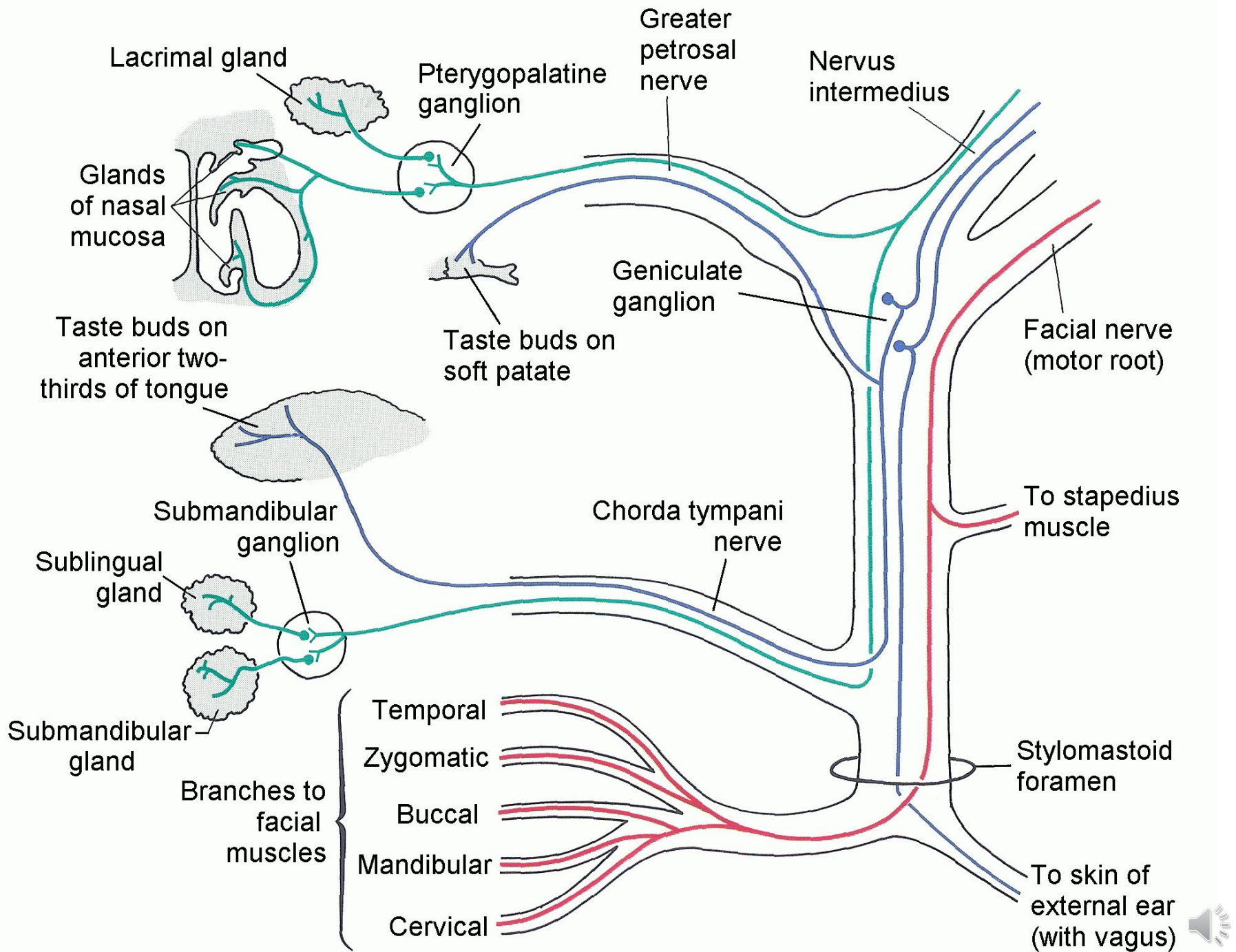


Figure 5-12 Transverse section through the caudal part of the pons at the level of the facial colliculus.









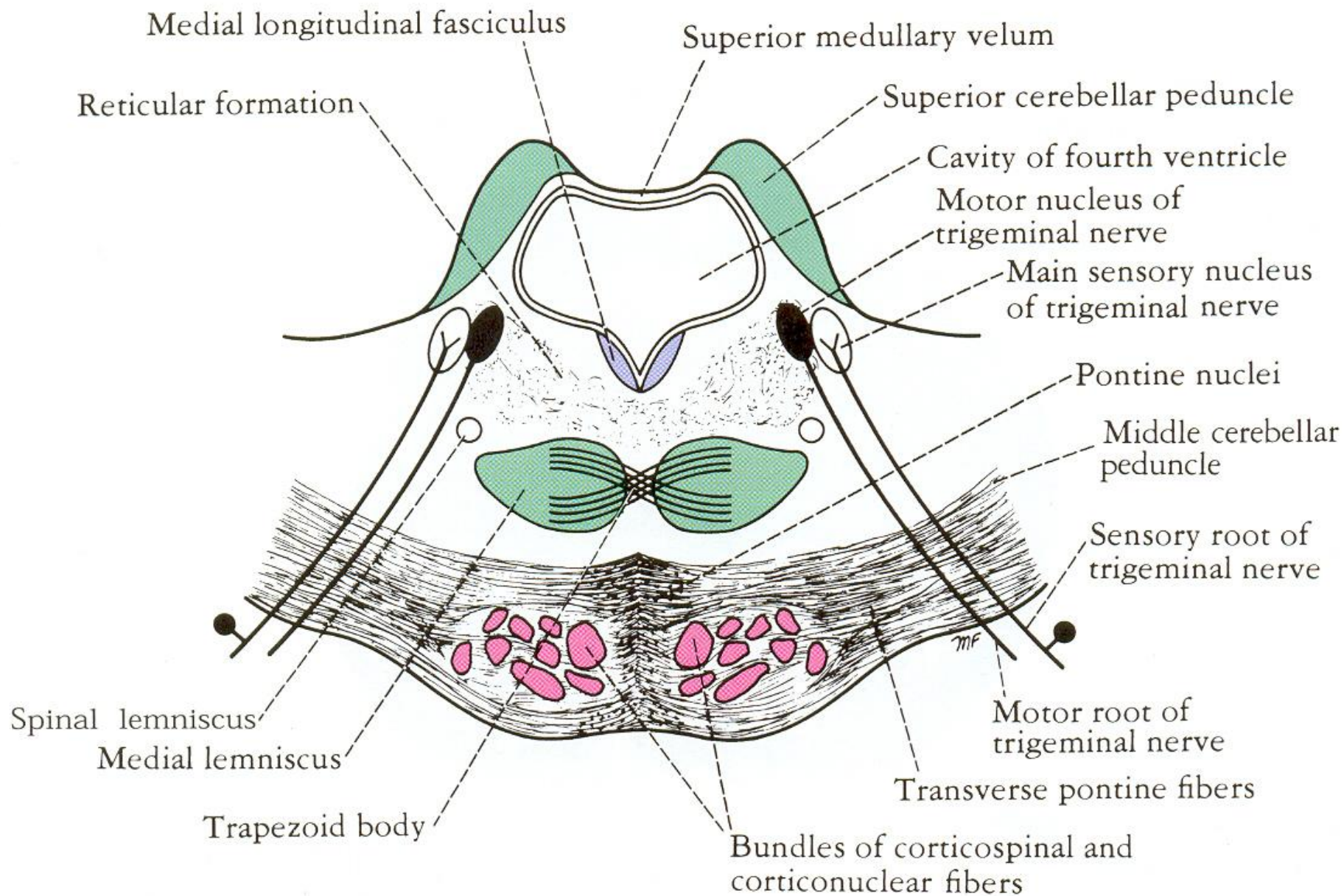
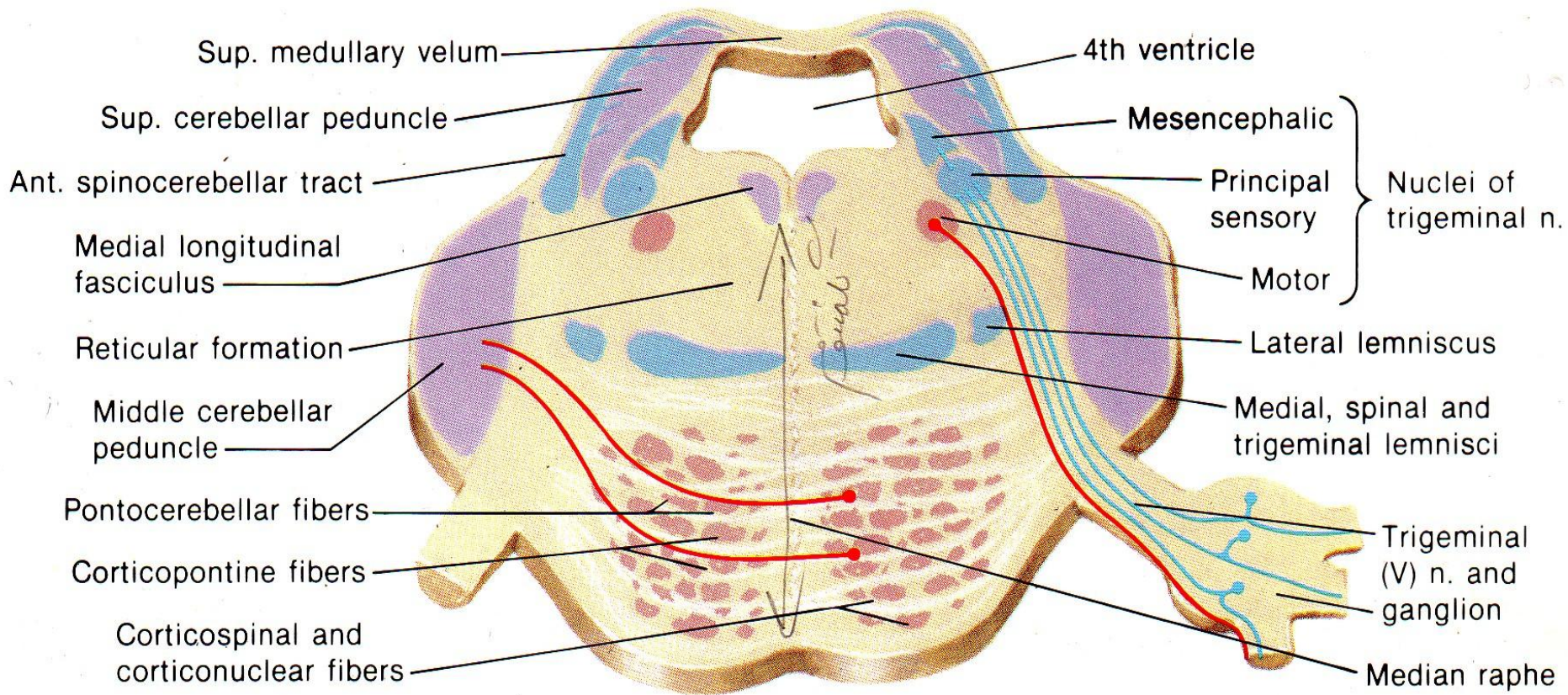


Figure 5-13 Transverse section through the pons at the level of the trigeminal nuclei.



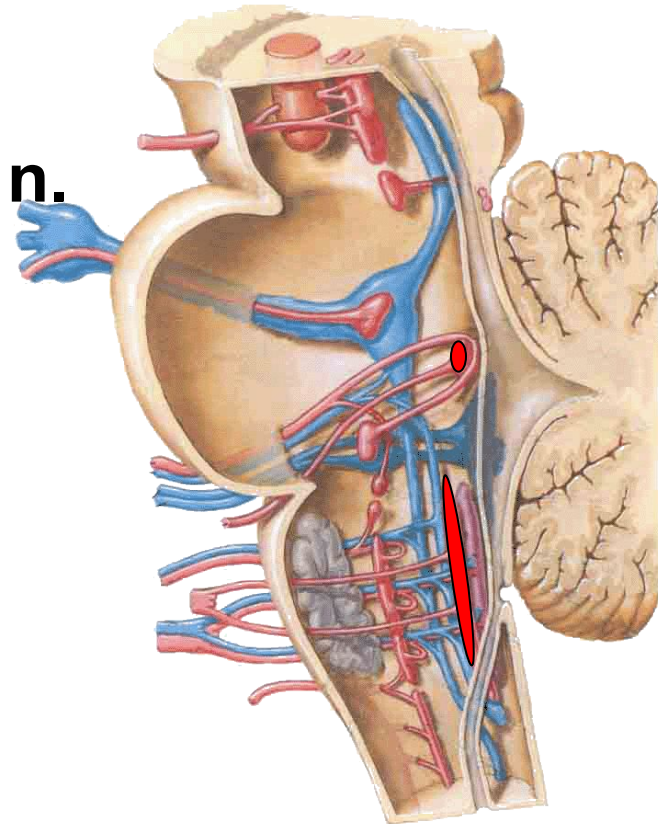


The characters of internal structure of brain stem



General somatic motor nuclei

- **Nucleus of abducent n.**
- **Nucleus of hypoglossal n.**



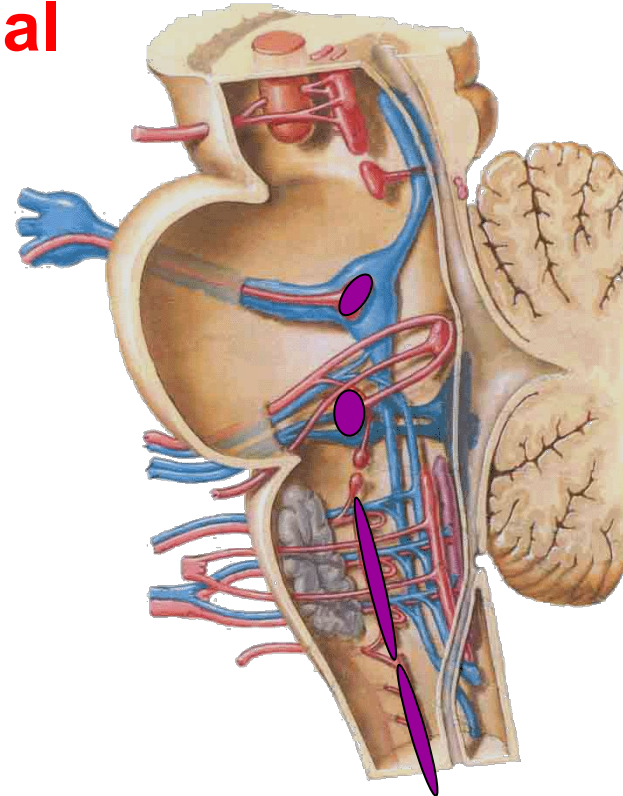
General somatic motor nuclei

Nucleus	Site	Cranial n.	Function
Nucleus of abducent n.	Pons	VI	Lateral rectus
Nucleus of hypoglossal n.	Medulla	XII	Muscles of tongue



Special visceral motor nuclei

- **Motor nucleus of trigeminal n.**
- **Nucleus of facial n.**
- **Nucleus ambiguus**
- **Accessory nucleus**



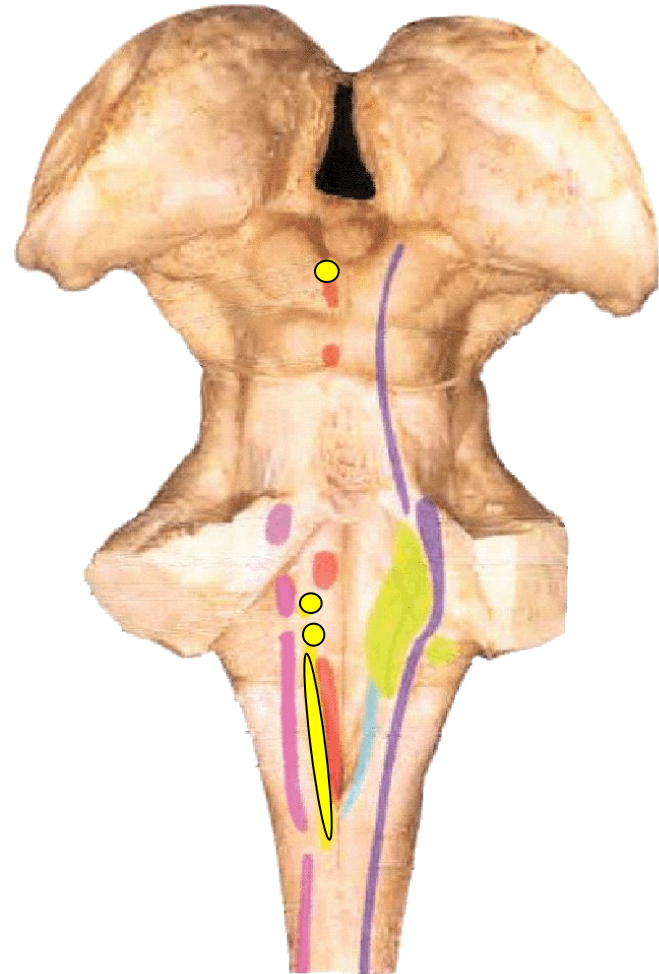
Special visceral motor nuclei

Nucleus	Site	Cranial n.	Function
Motor nucleus of trigeminal n.	Pons	V	Masticatory muscles
Nucleus of facial n.	Pons	VII	Facial m., platysma, posterior belly of digastric, stylohyoid, stapedius
Nucleus ambiguus	Medulla	IX, X, XI	Skeletal m. of pharynx, larynx and upper part of esophagus
Accessory nucleus	Medulla-cervical cord	XI	Sternocleidomastoid, trapezius



General visceral motor nuclei

- **Superior salivatory nucleus**
- **Inferior salivatory nucleus**
- **Dorsal nucleus of vagus n.**



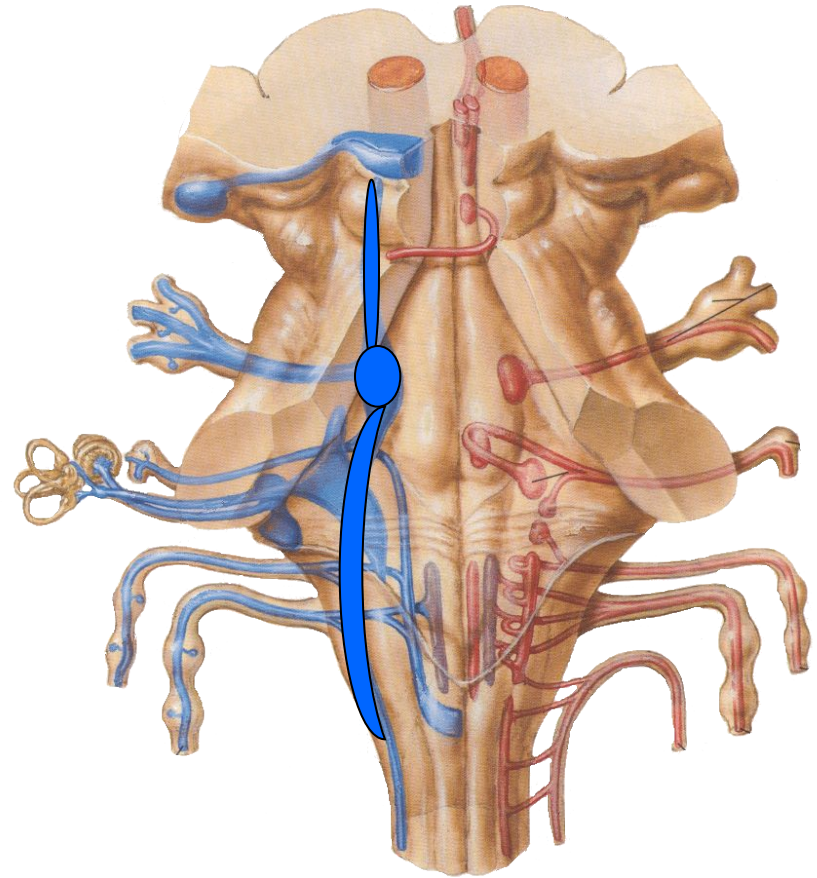
General visceral motor nuclei

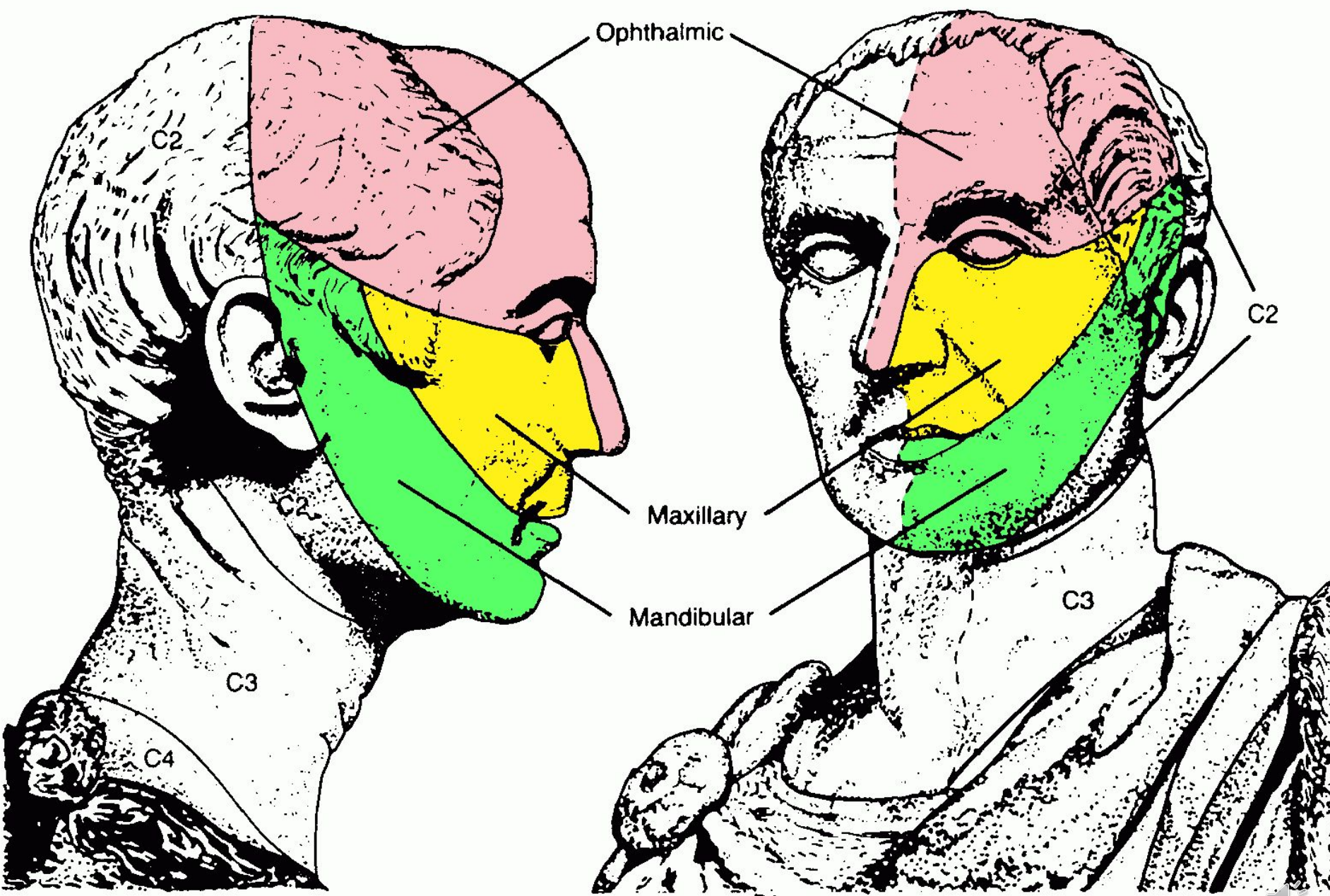
Nucleus	Site	Cranial n.	Function
Superior salivatory nucleus	Pons	VII	Submandibular, sublingual and lacrimal glands
Inferior salivatory nucleus	Medulla	IX	Parotid gland
Dorsal nucleus of vagus n.	medulla	X	Many cervical, thoracic and abdominal viscera



General somatic sensory nuclei

- **Pontine nucleus of trigeminal n.**
- **Spinal nucleus of trigeminal n.**

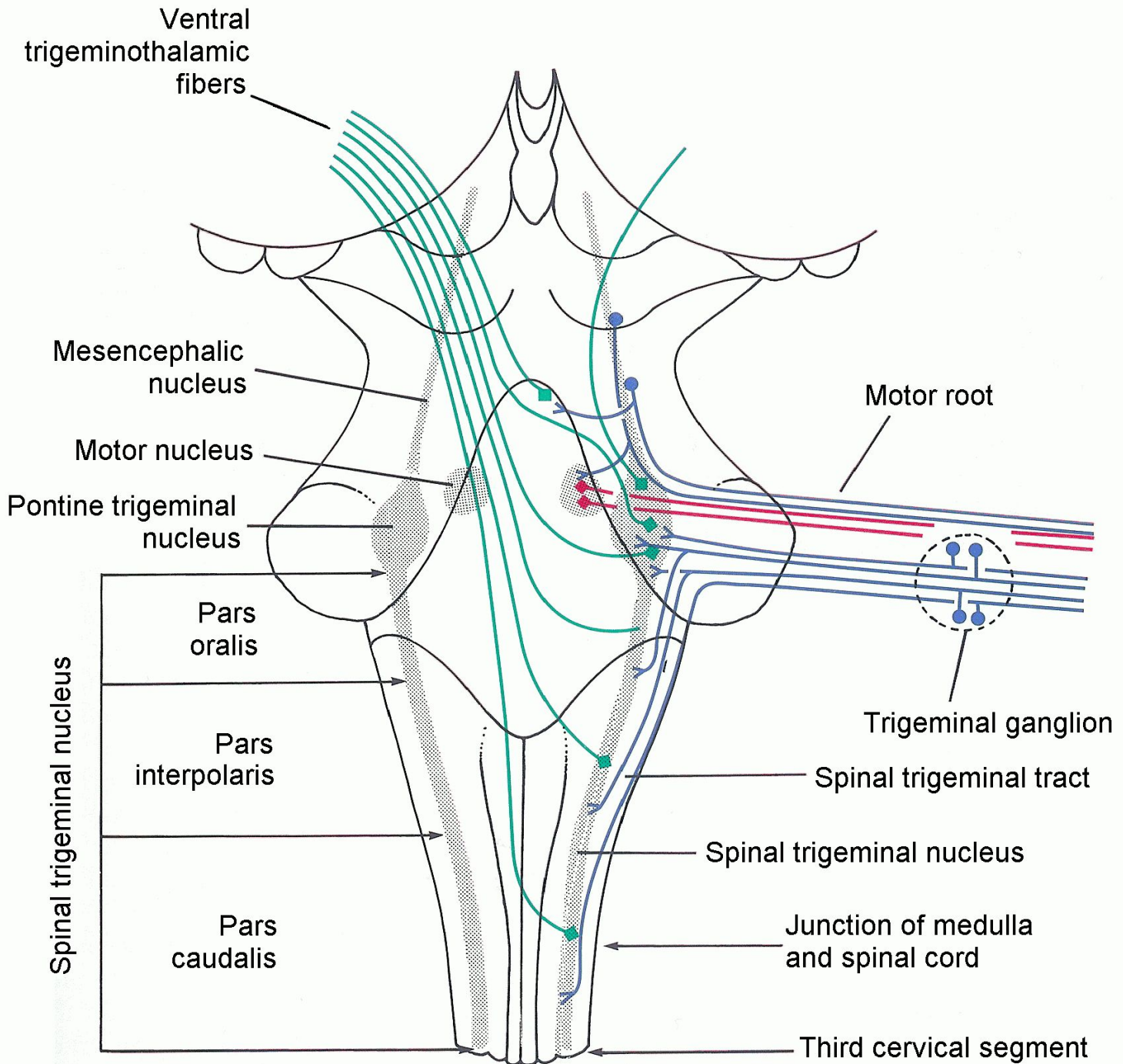




General somatic sensory nuclei

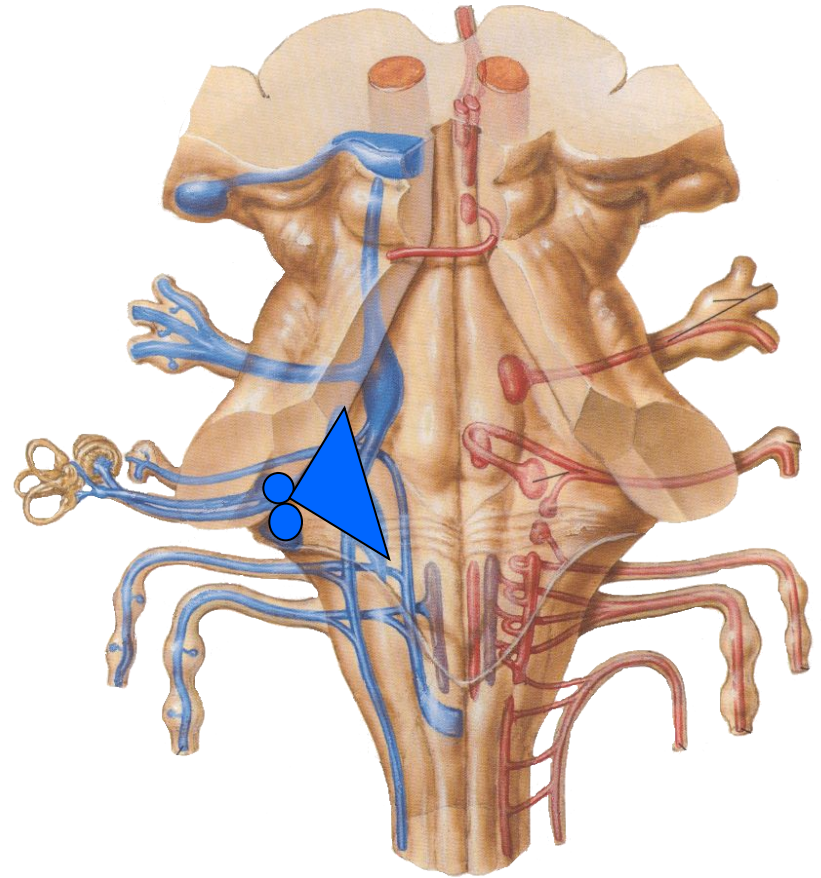
Nucleus	Site	Cranial n.	Function
Pontine nucleus of trigeminal n.	Pons	V	Tactile sensation of head
Spinal nucleus of trigeminal n.	Medulla	V	Pain and temperature sense of head

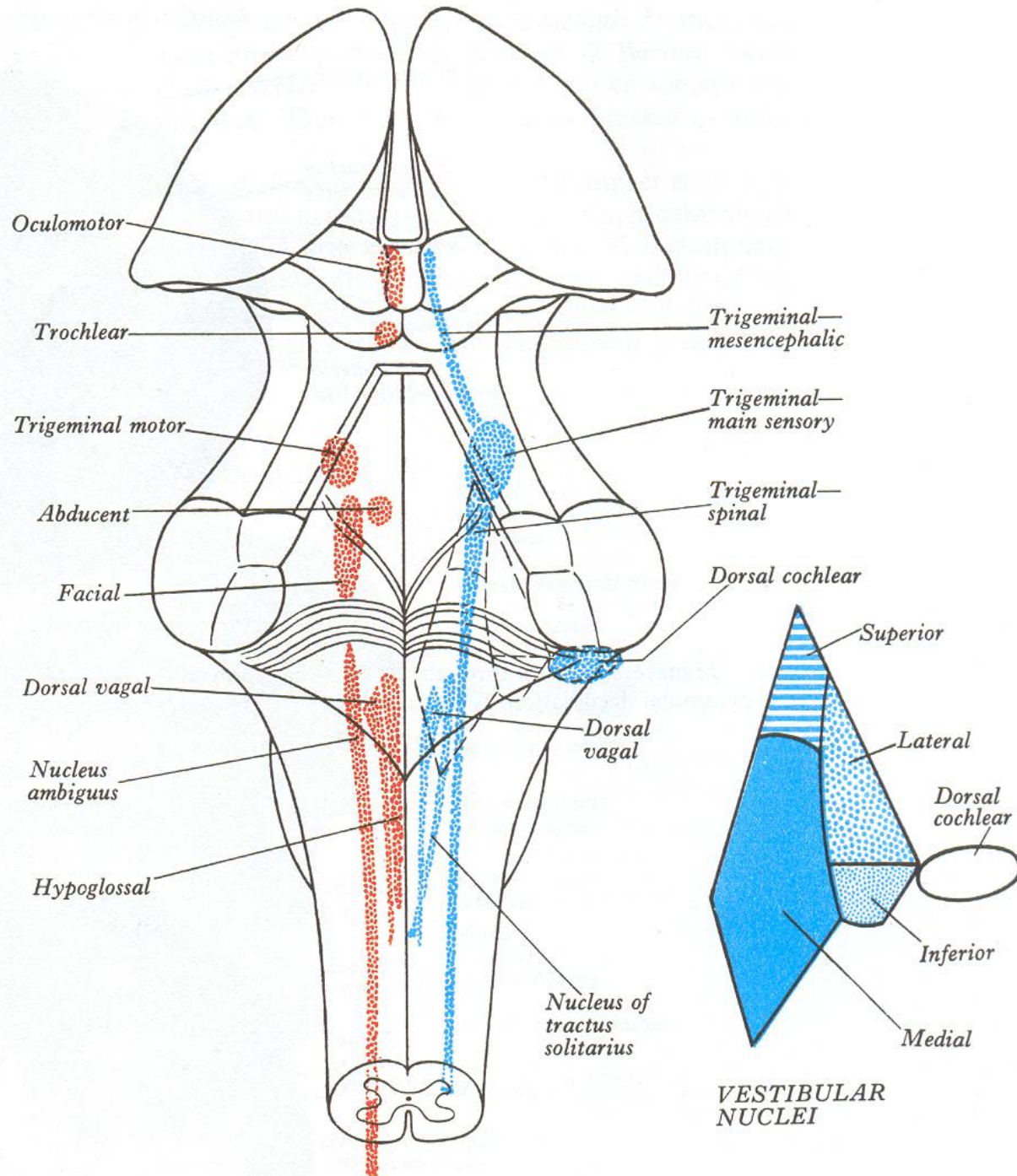




Special somatic sensory nuclei

- Cochlear nuclei
- Vestibular nuclei





VESTIBULAR NUCLEI



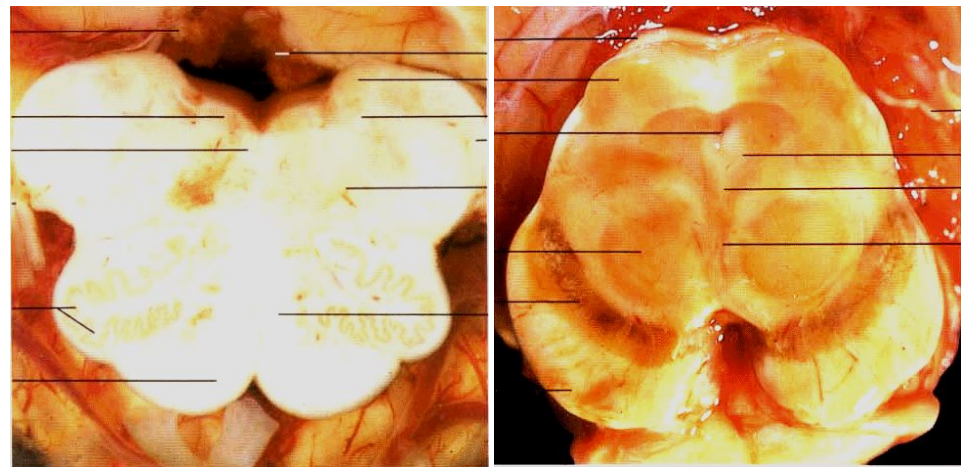
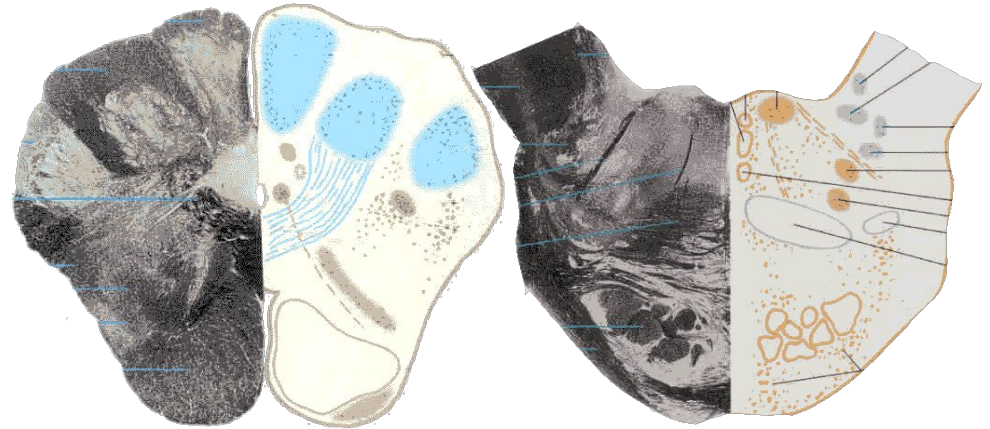
Special somatic sensory nuclei

Nucleus	Site	Cranial n.	Function
Cochlear nuclei	Pons and medulla	VIII	Sense of hearing
Vestibular nuclei	Pons and medulla	VIII	Sense of equilibrium



Relay nuclei

- Gracile nucleus
- Cuneate nucleus
- Inferior olivary nucleus
- Superior olivary nucleus
- Pontine nucleus



Non-cranial nerve nuclei

Nucleus	Site
Gracile nucleus	Medulla (underneath gracile tubercle)
Cuneate nucleus	Medulla (underneath cuneate tubercle)
Superior olivary nucleus	Pons
Pontine nucleus	pons



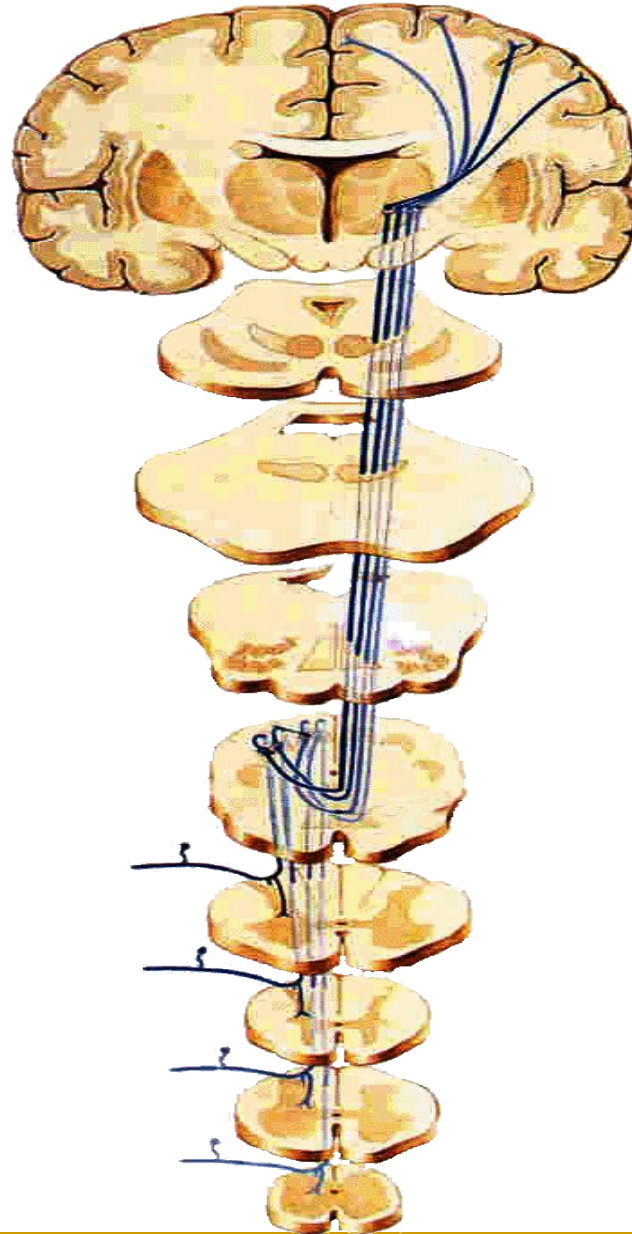
White matter

Ascending tracts

- **Medial lemniscus**
- **Spinal lemniscus**
- **Trigeminal lemniscus**
- **Lateral lemniscus**



Medial lemniscus



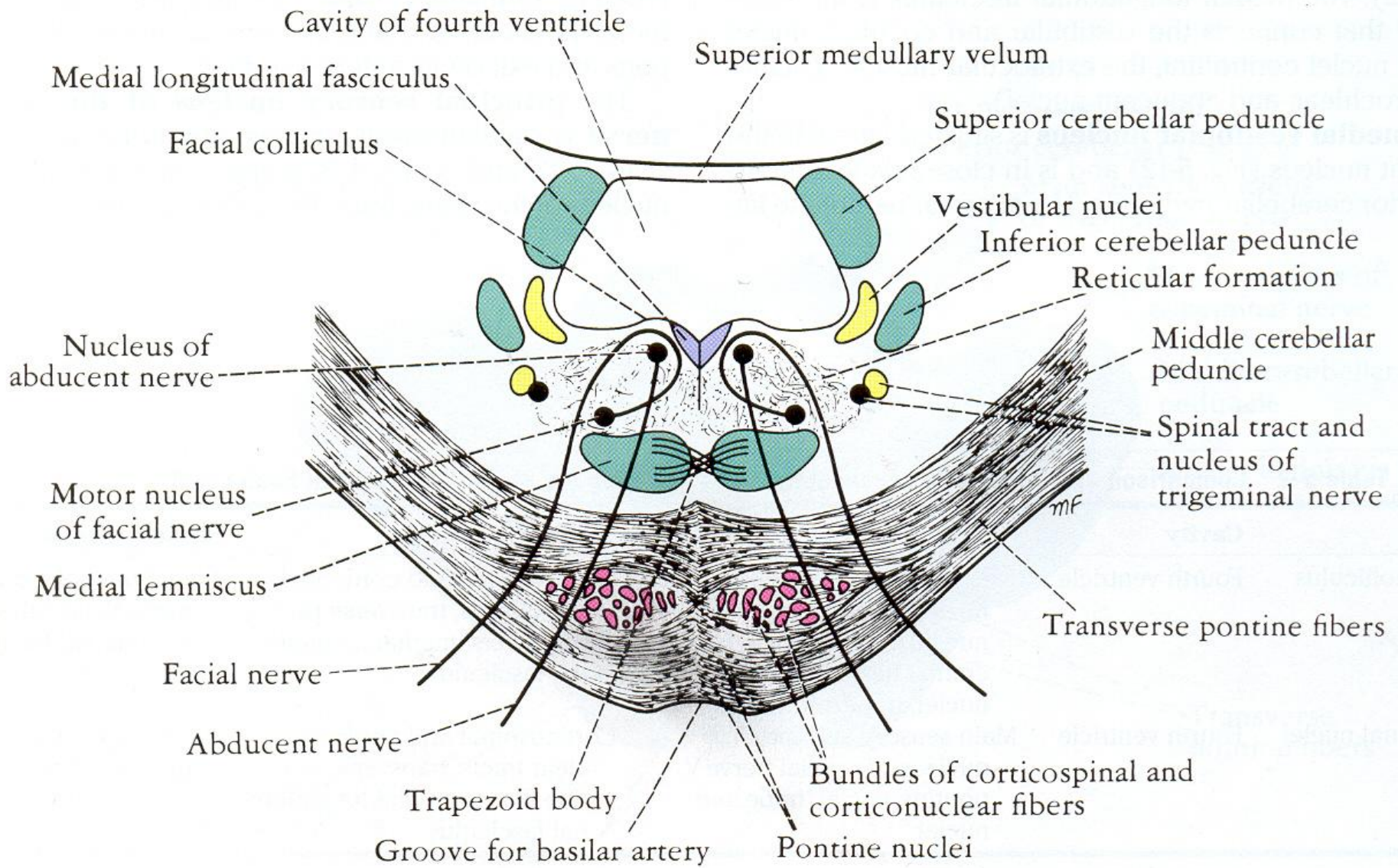
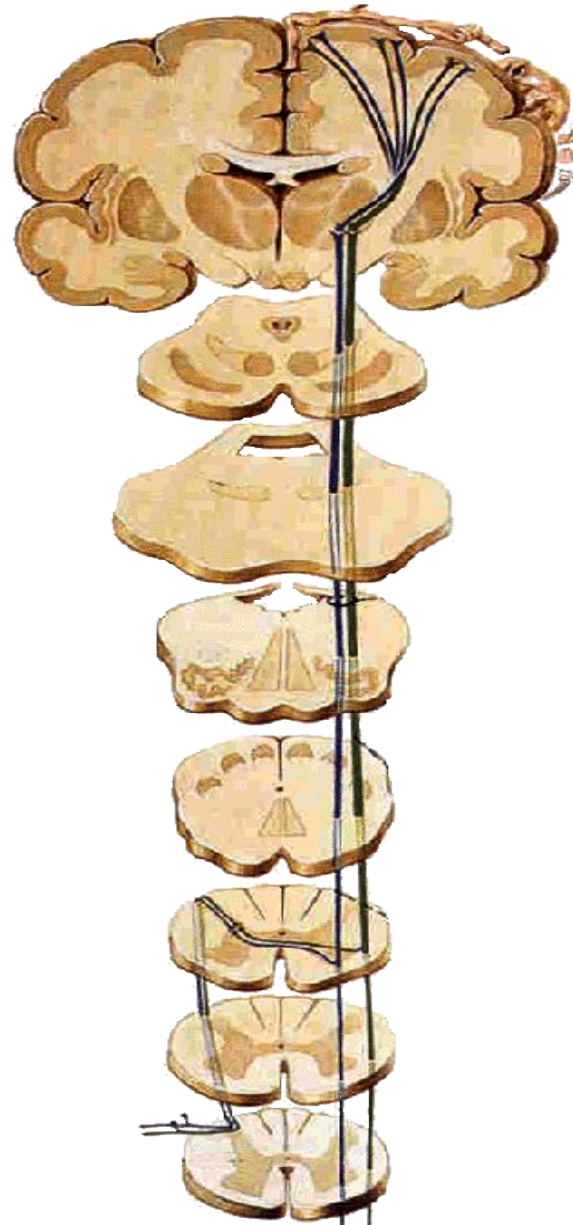


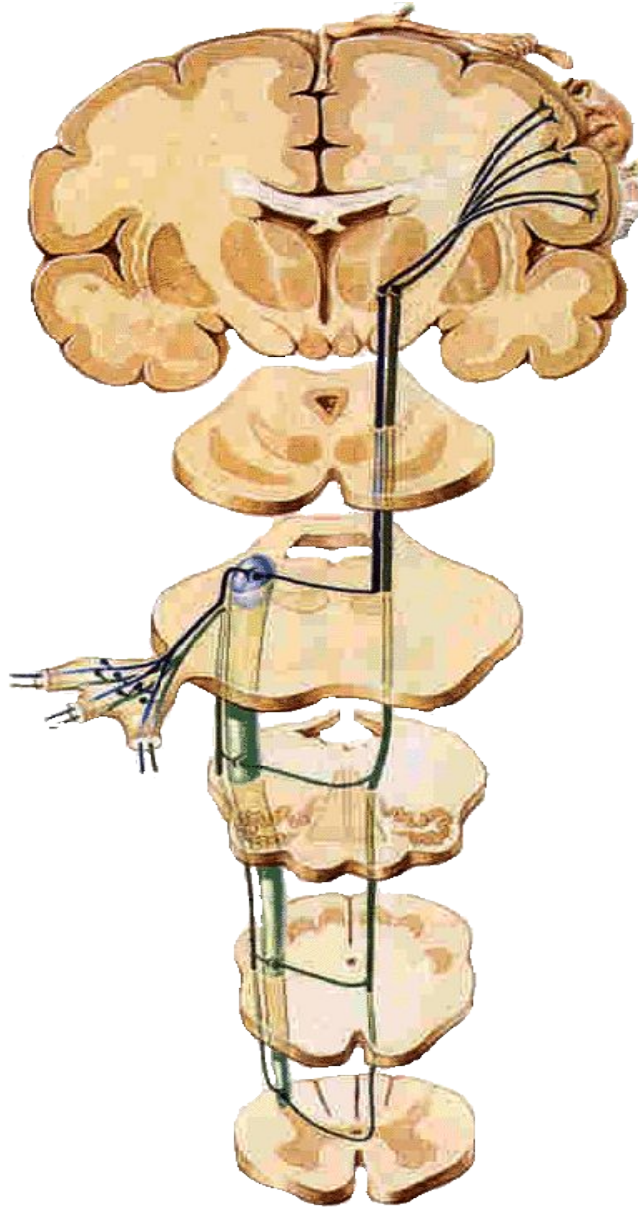
Figure 5-12 Transverse section through the caudal part of the pons at the level of the facial colliculus.



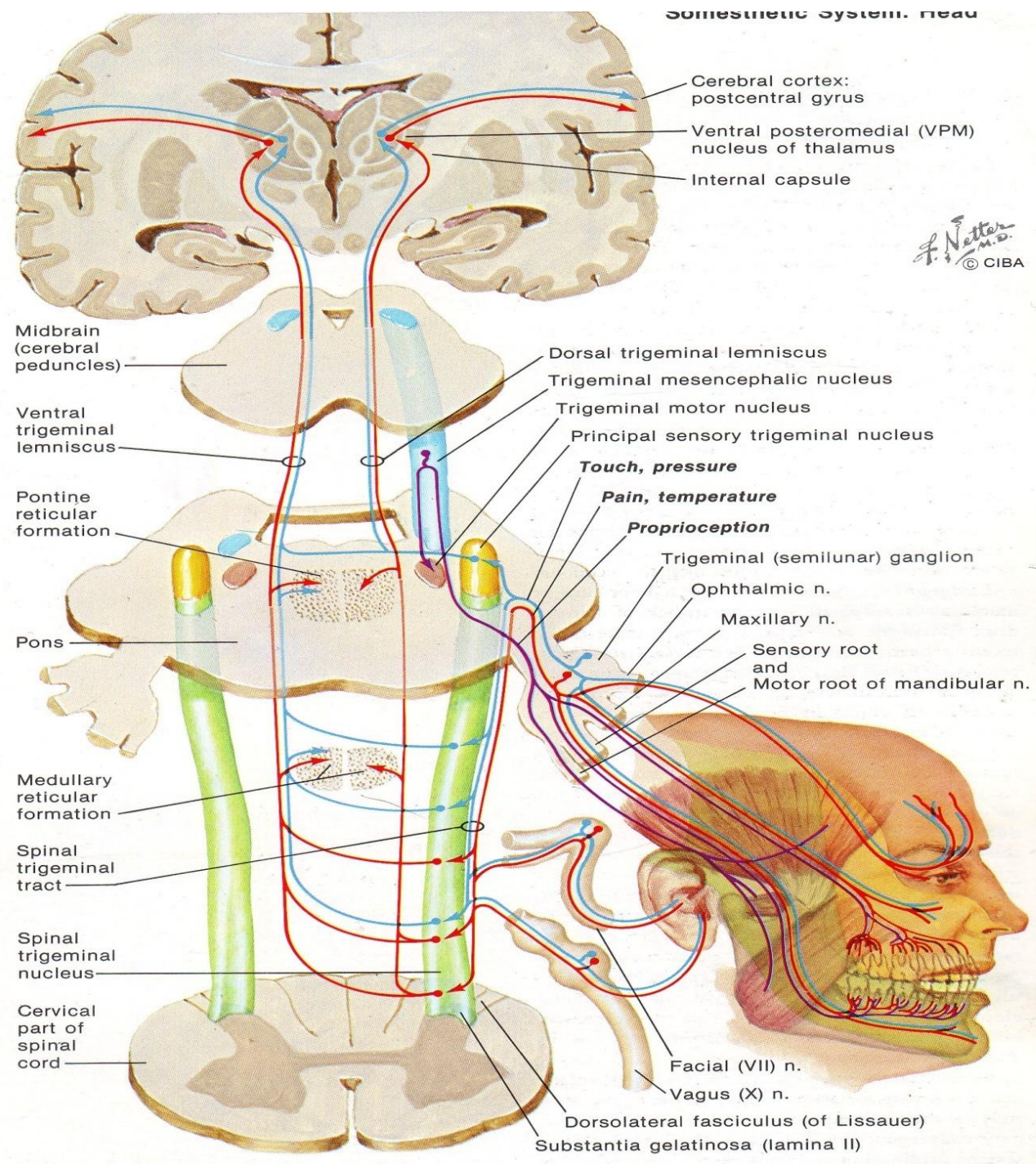
Spinal lemniscus



Trigeminal lemniscus



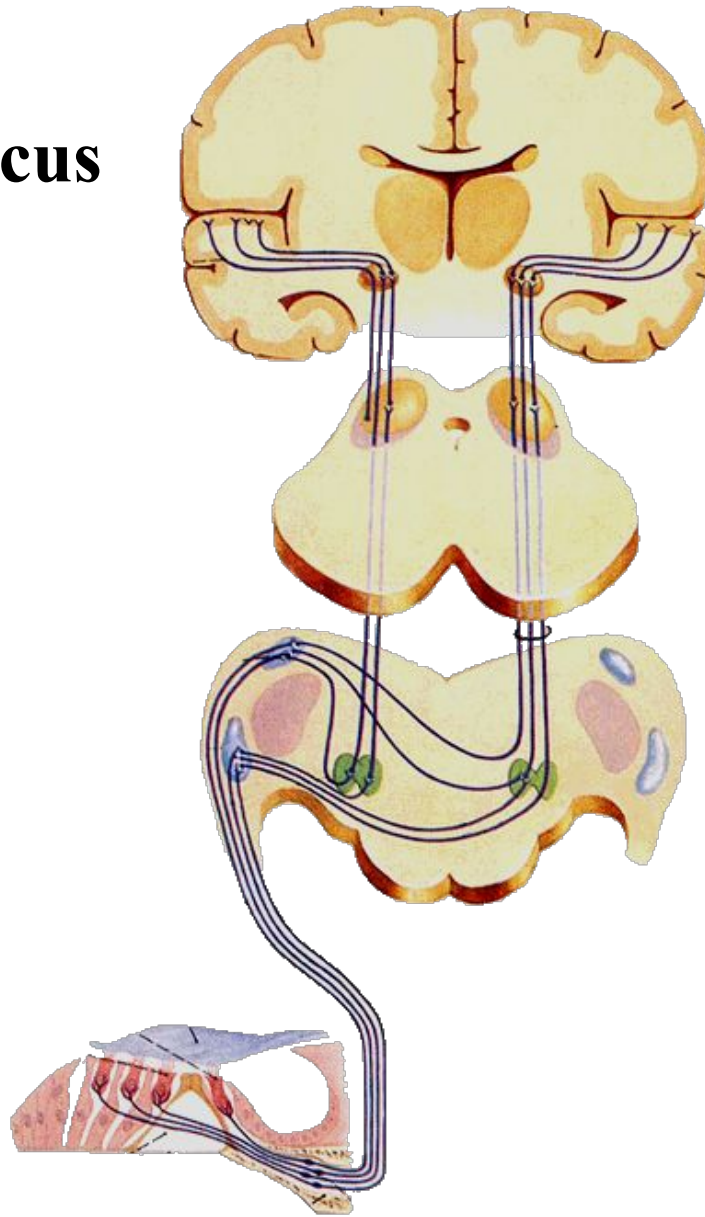
Somesthetic system. head

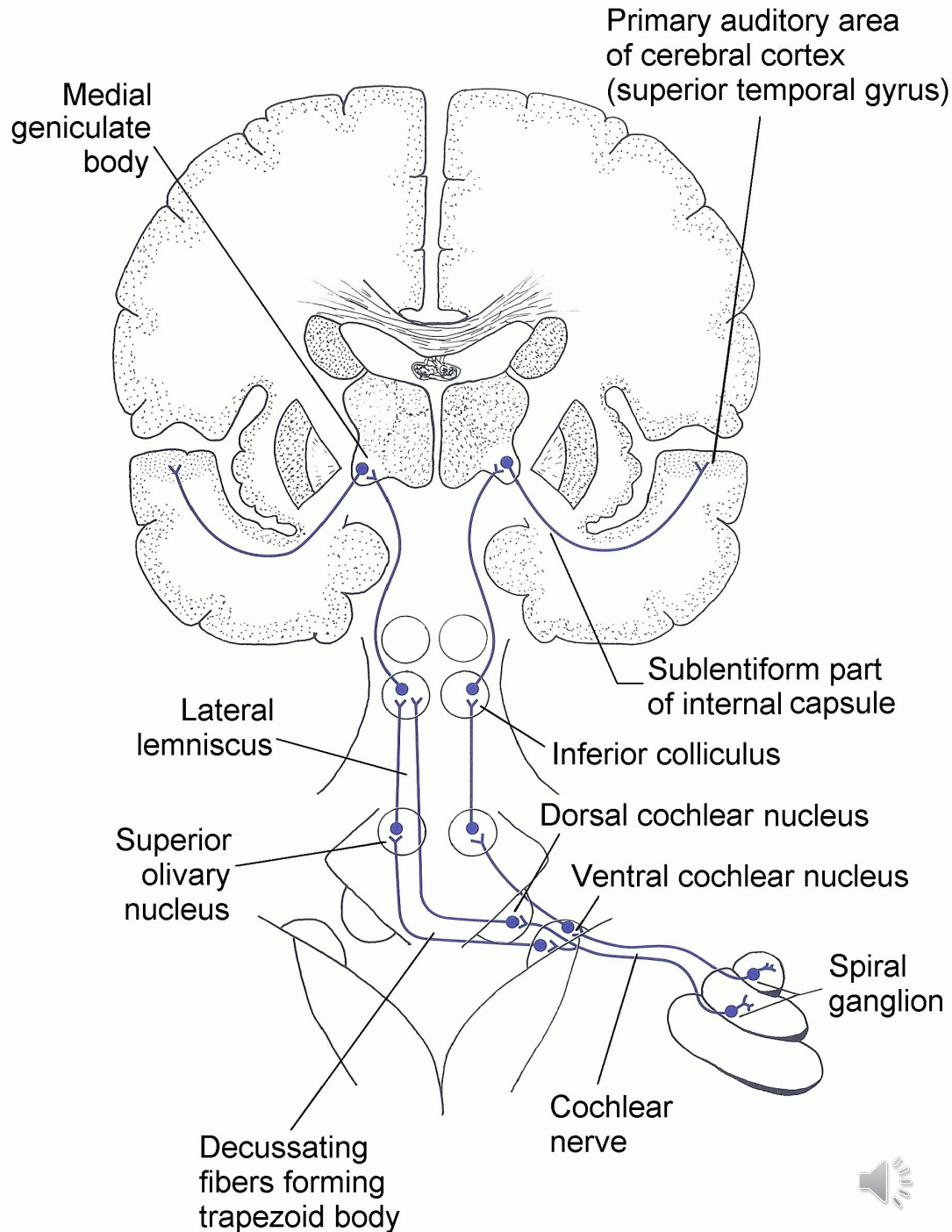
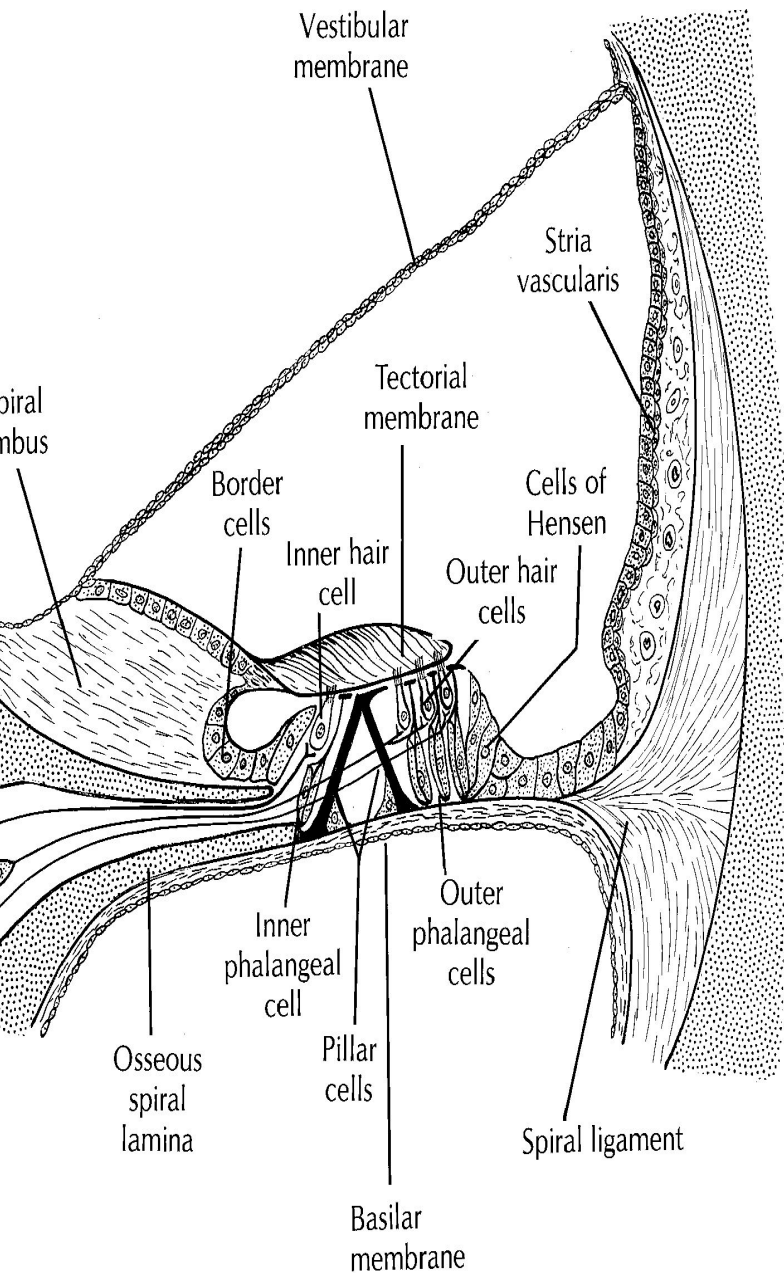


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Lateral lemniscus





Cochlear
 ganglion



Descending tracts

- **Corticospinal tract**
- Rubrospinal tract
- Tectospinal tract
- Vestibulospinal tract
- Reticulospinal tract

