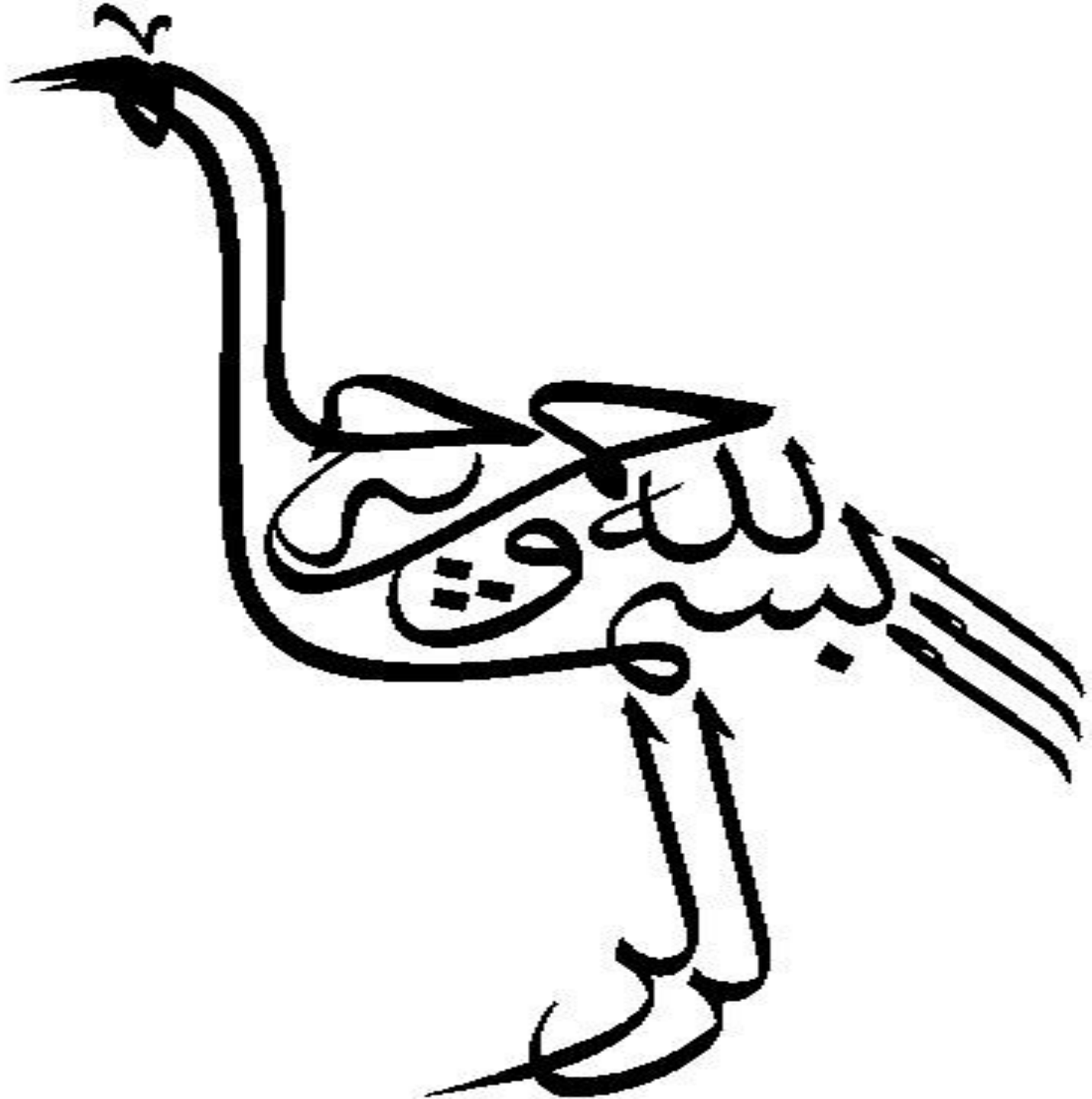
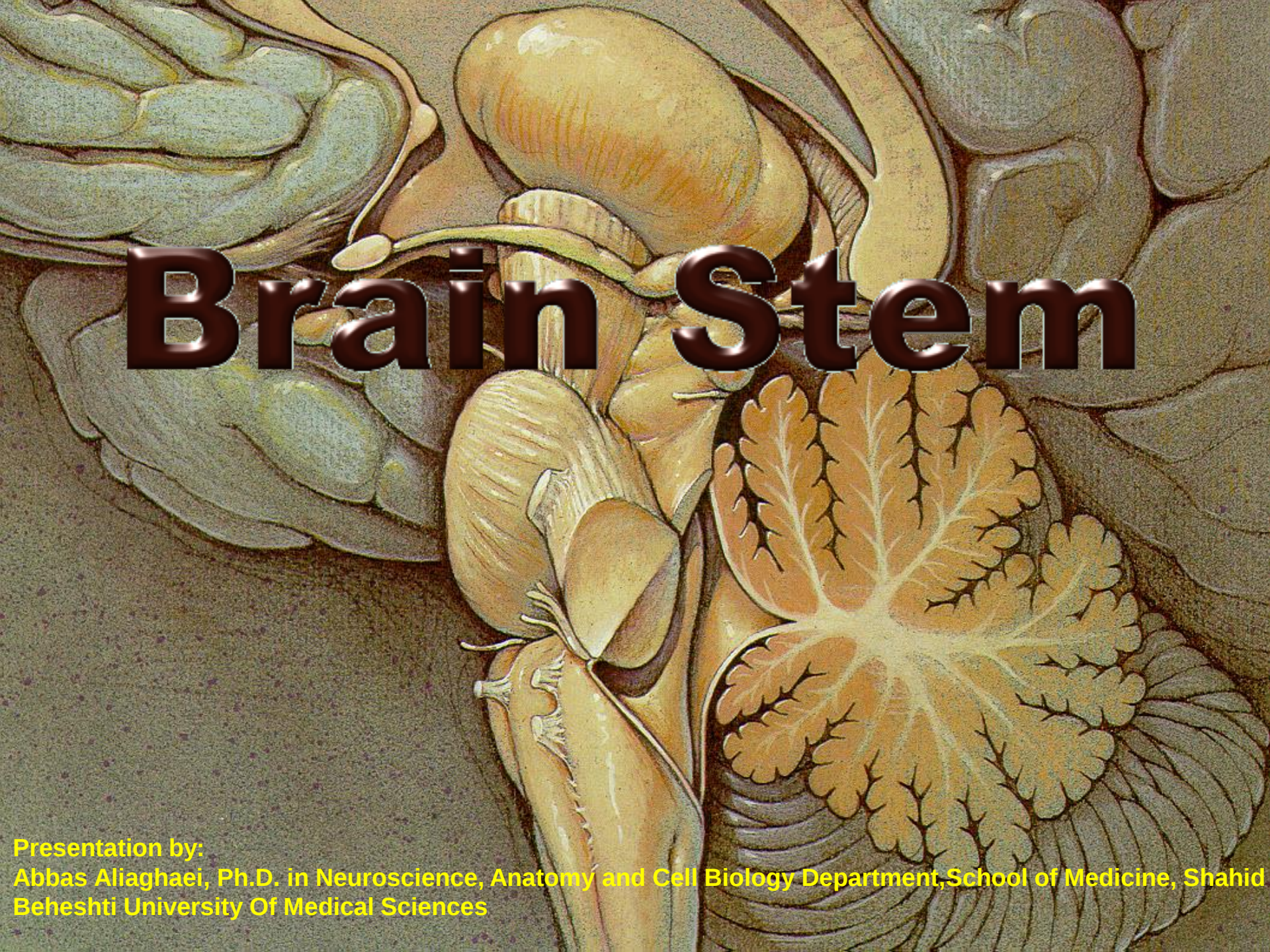


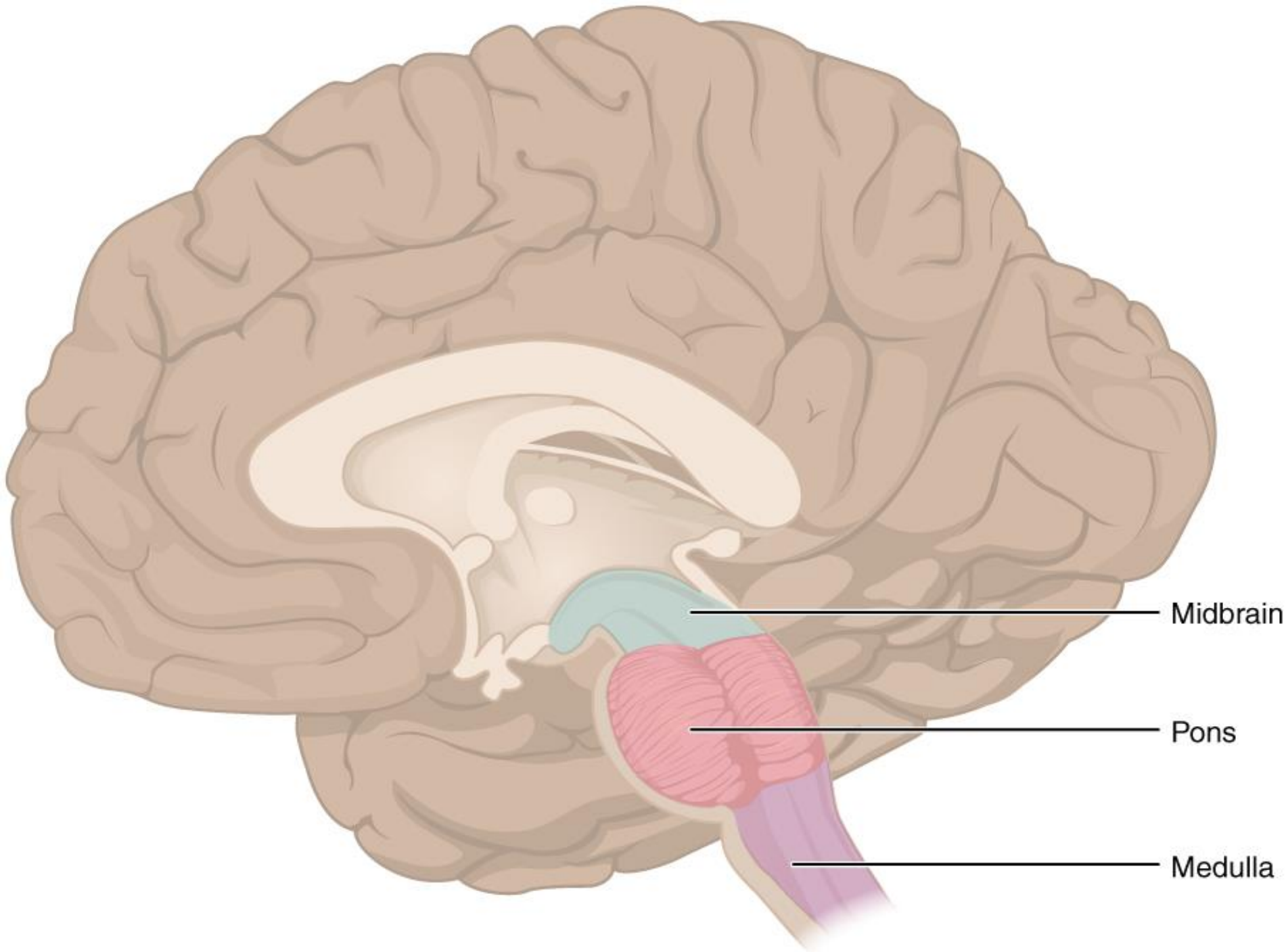


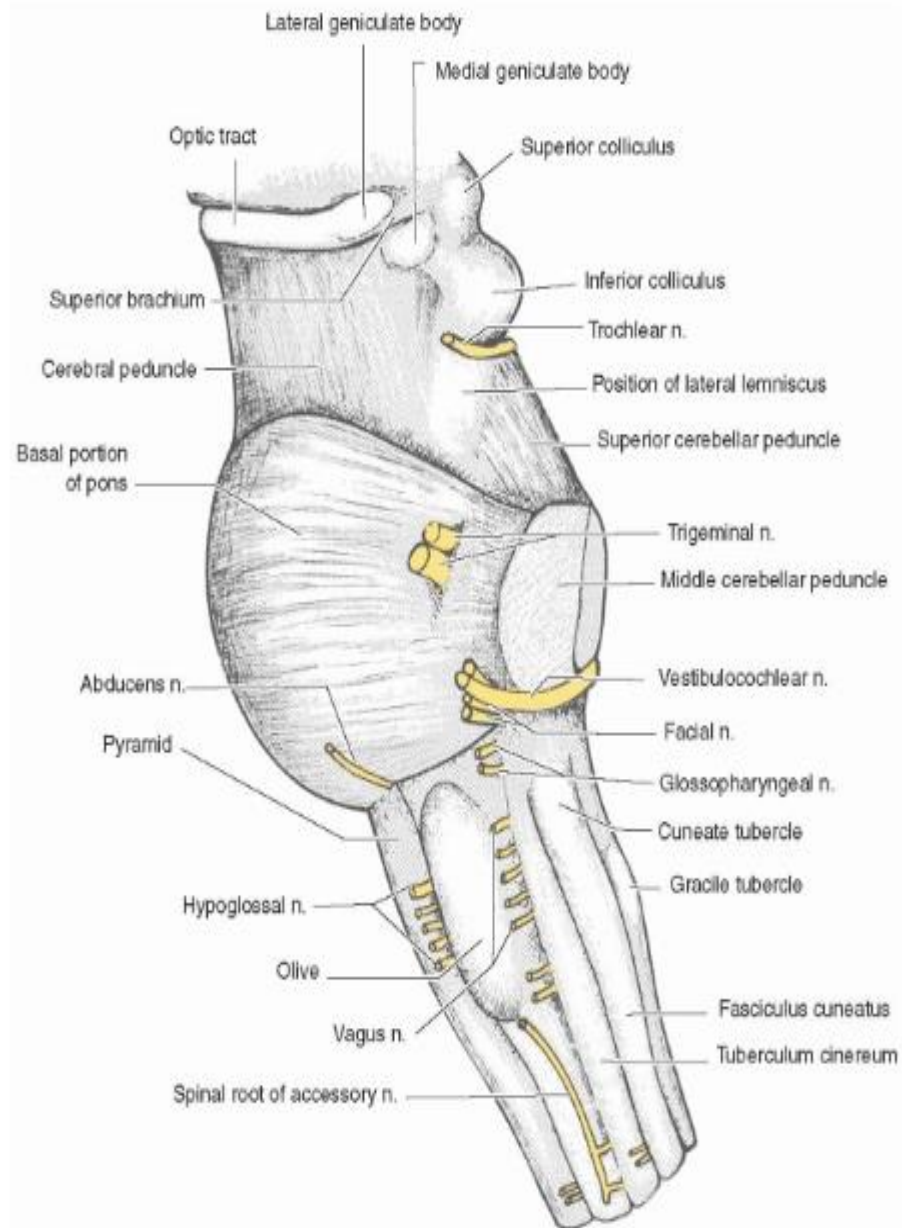
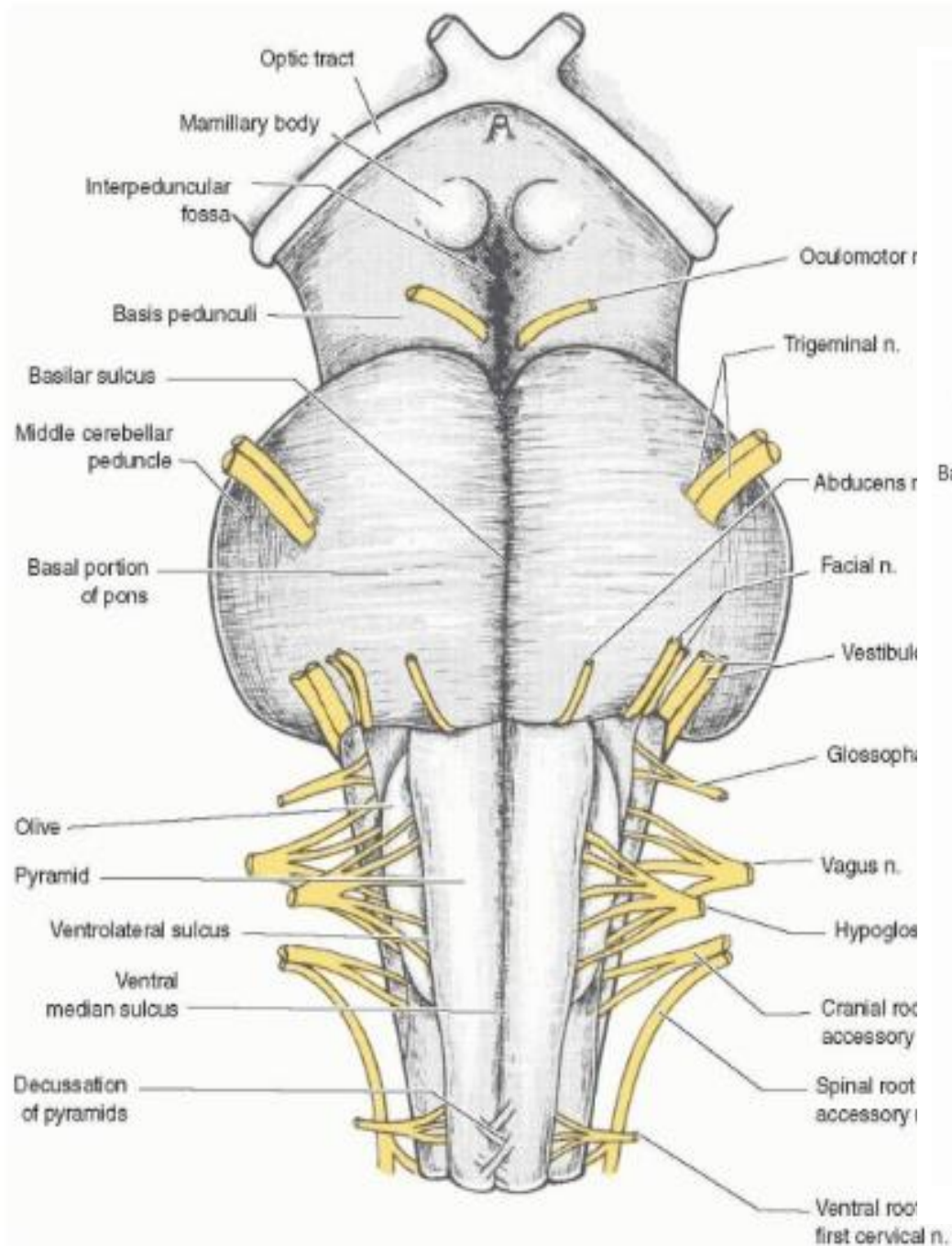
An anatomical illustration of the brainstem and surrounding structures. The brainstem is shown in a sagittal section, with the midbrain, pons, and medulla oblongata visible. The pons is a large, bulging structure in the center. The medulla oblongata is at the base, transitioning into the spinal cord. The cerebellum is shown on the left, with its characteristic folded surface. The brain is surrounded by meninges and cerebrospinal fluid. The illustration is in a classic anatomical style with detailed shading and color. The title "Brain Stem" is overlaid in a large, bold, dark red font with a slight 3D effect.

# Brain Stem

Presentation by:

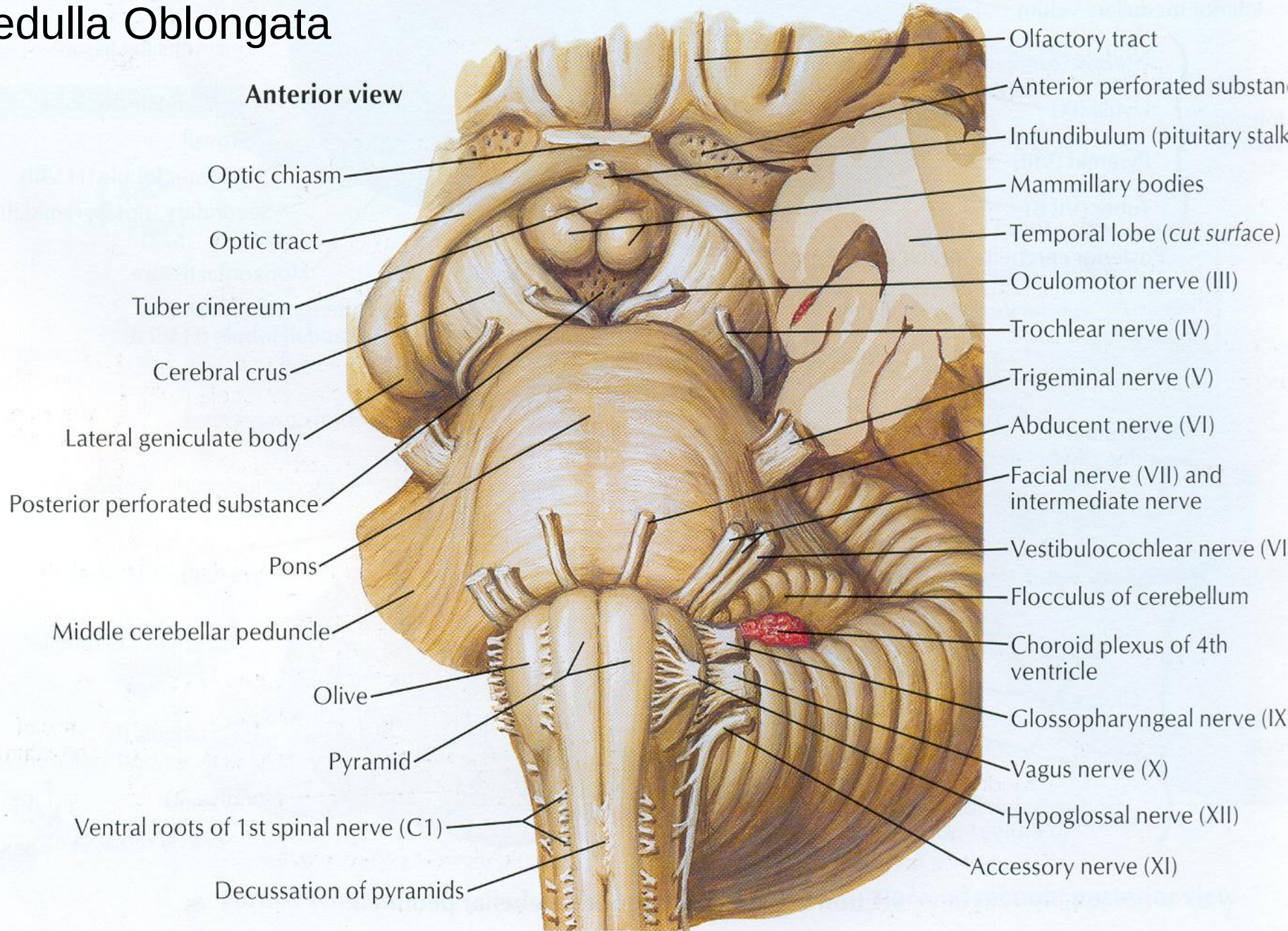
Abbas Aliaghaei, Ph.D. in Neuroscience, Anatomy and Cell Biology Department, School of Medicine, Shahid Beheshti University Of Medical Sciences

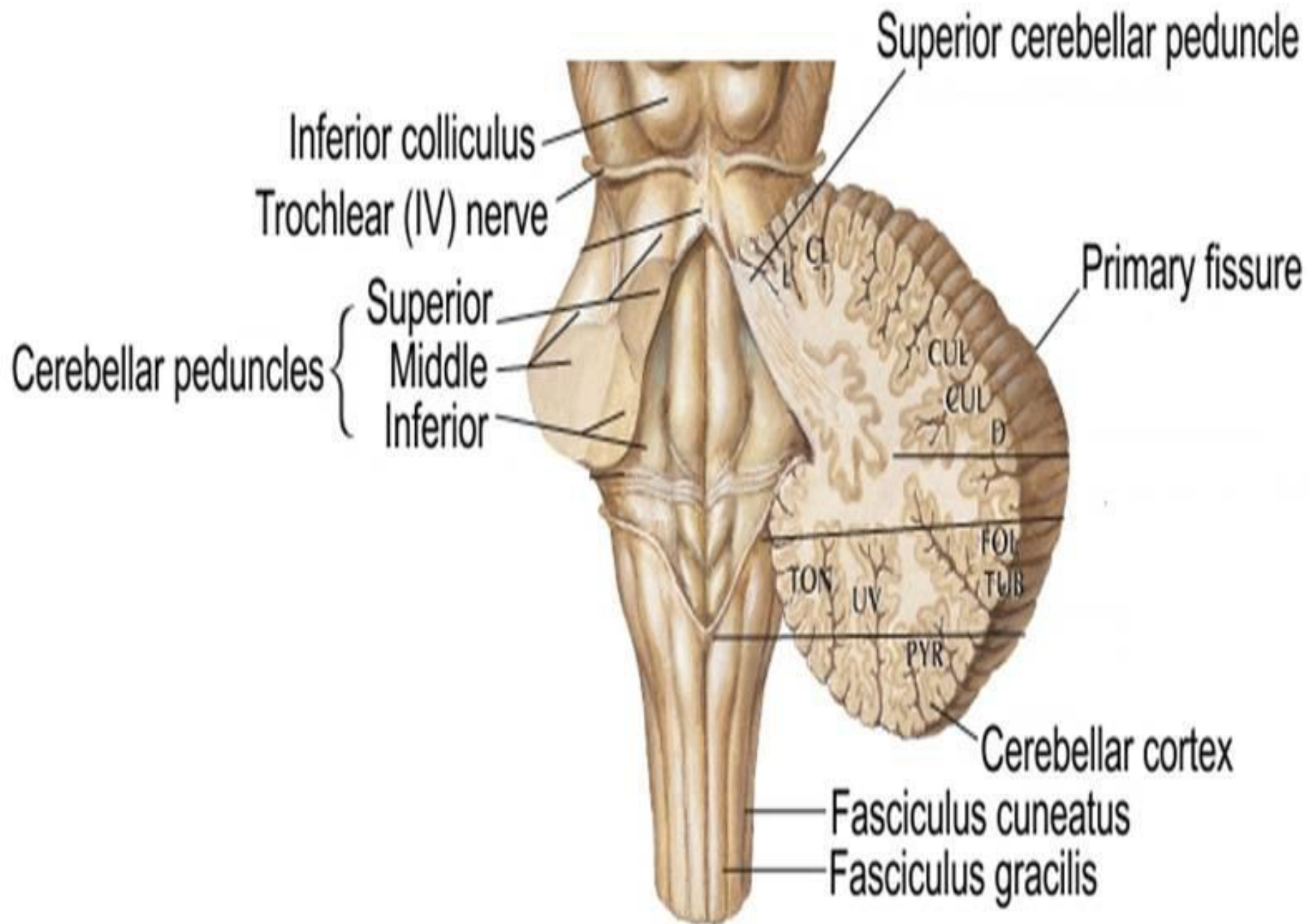




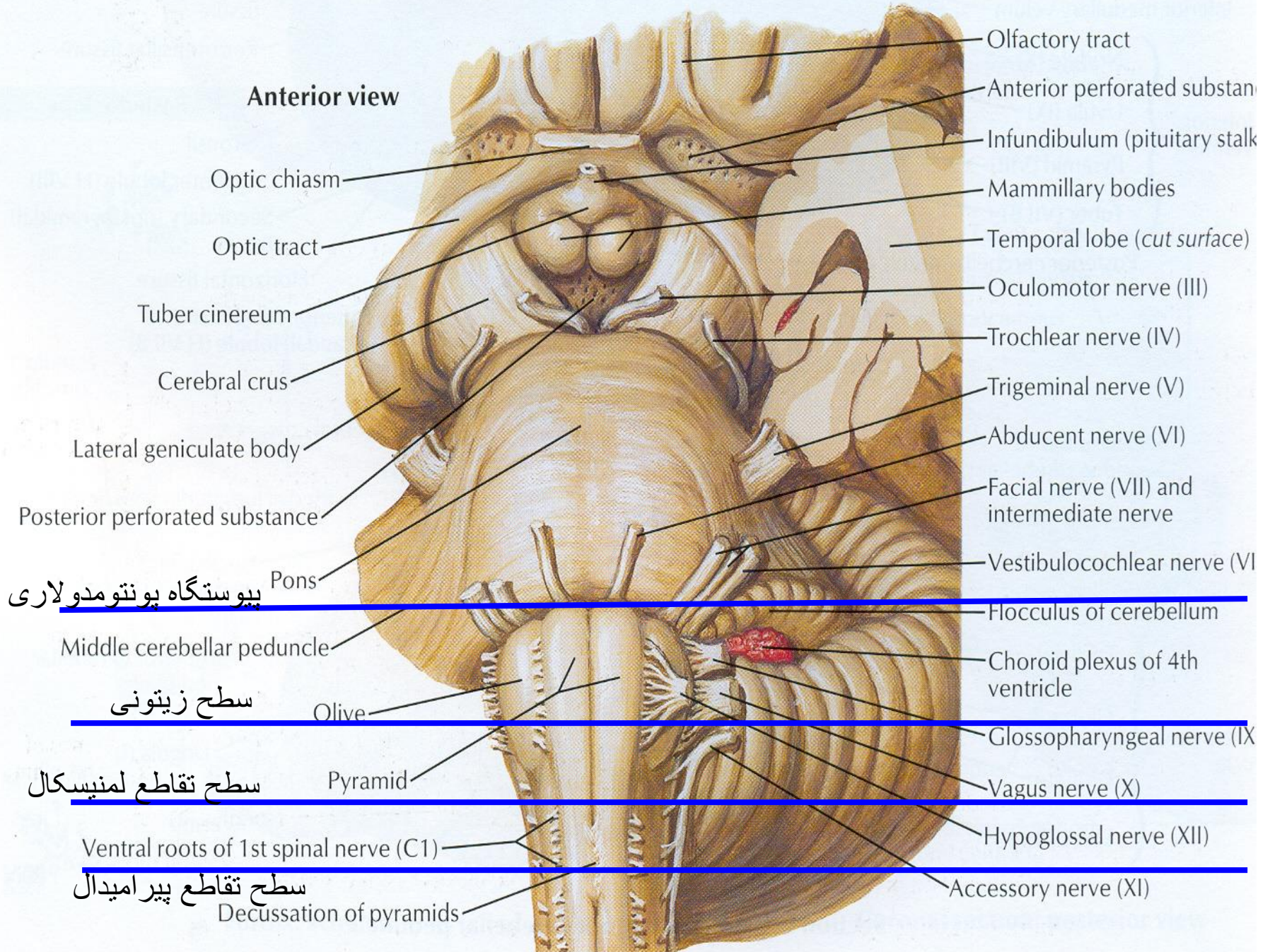
# Medulla Oblongata

## Anterior view

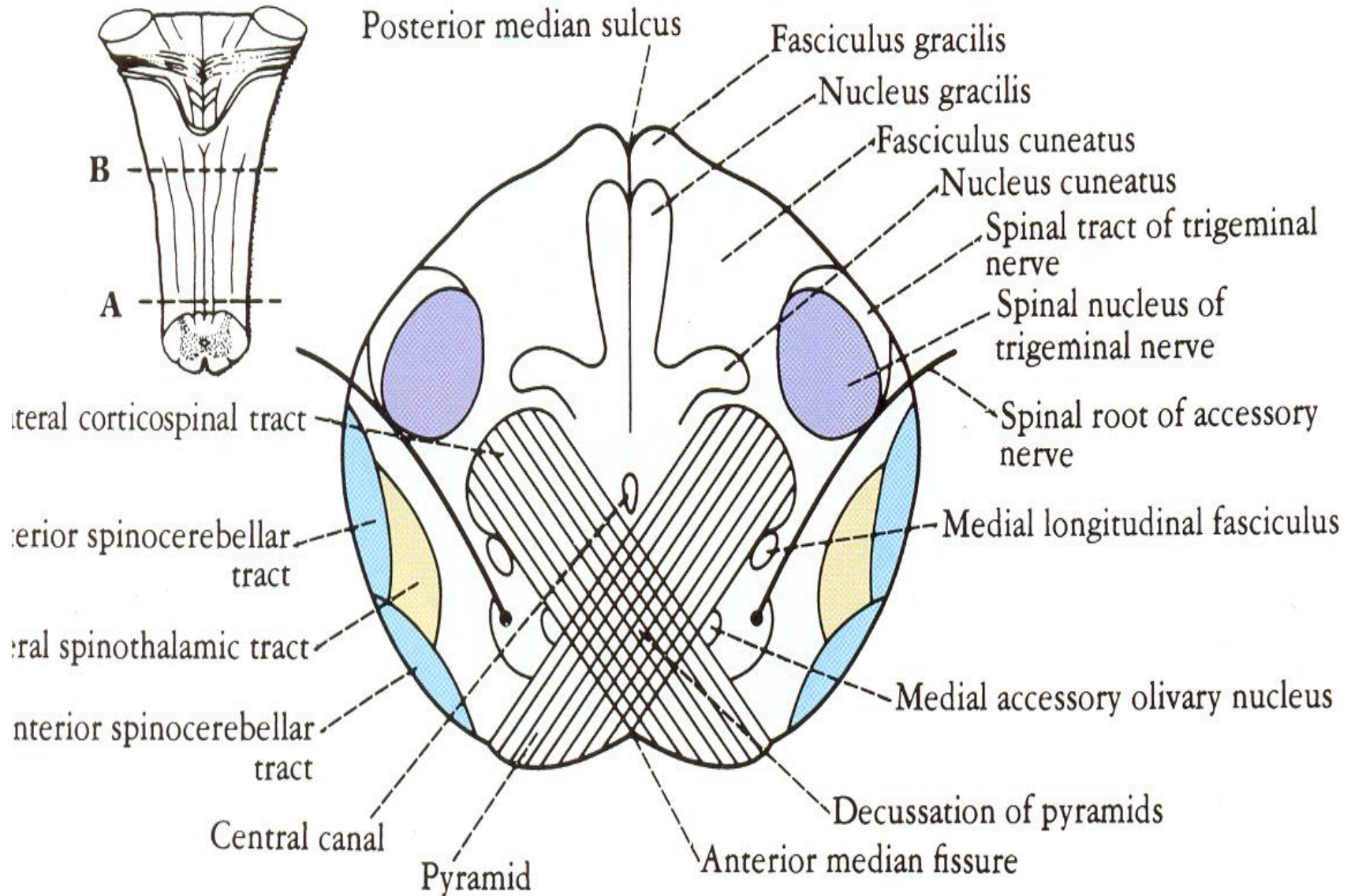


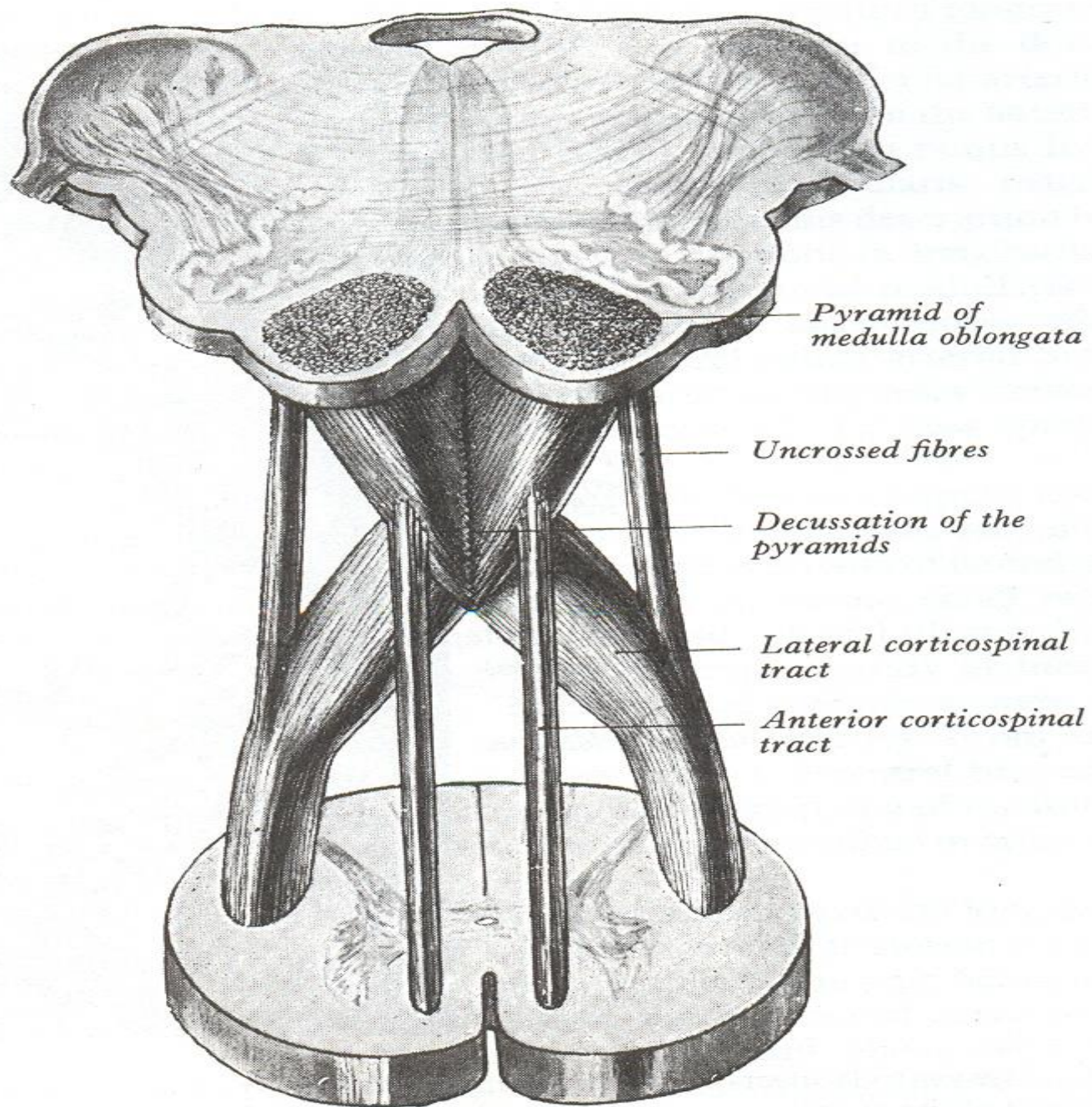


## Anterior view

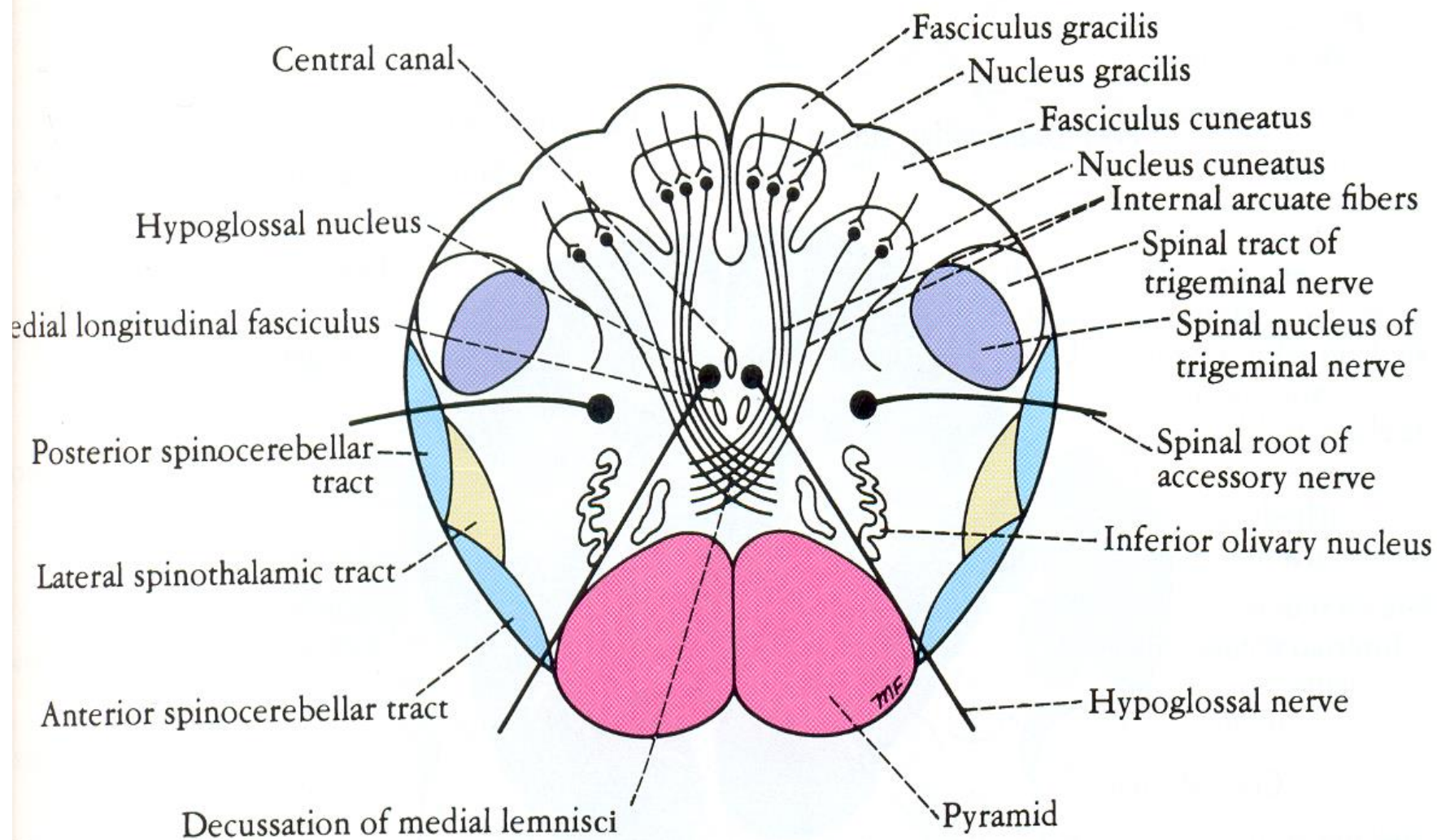


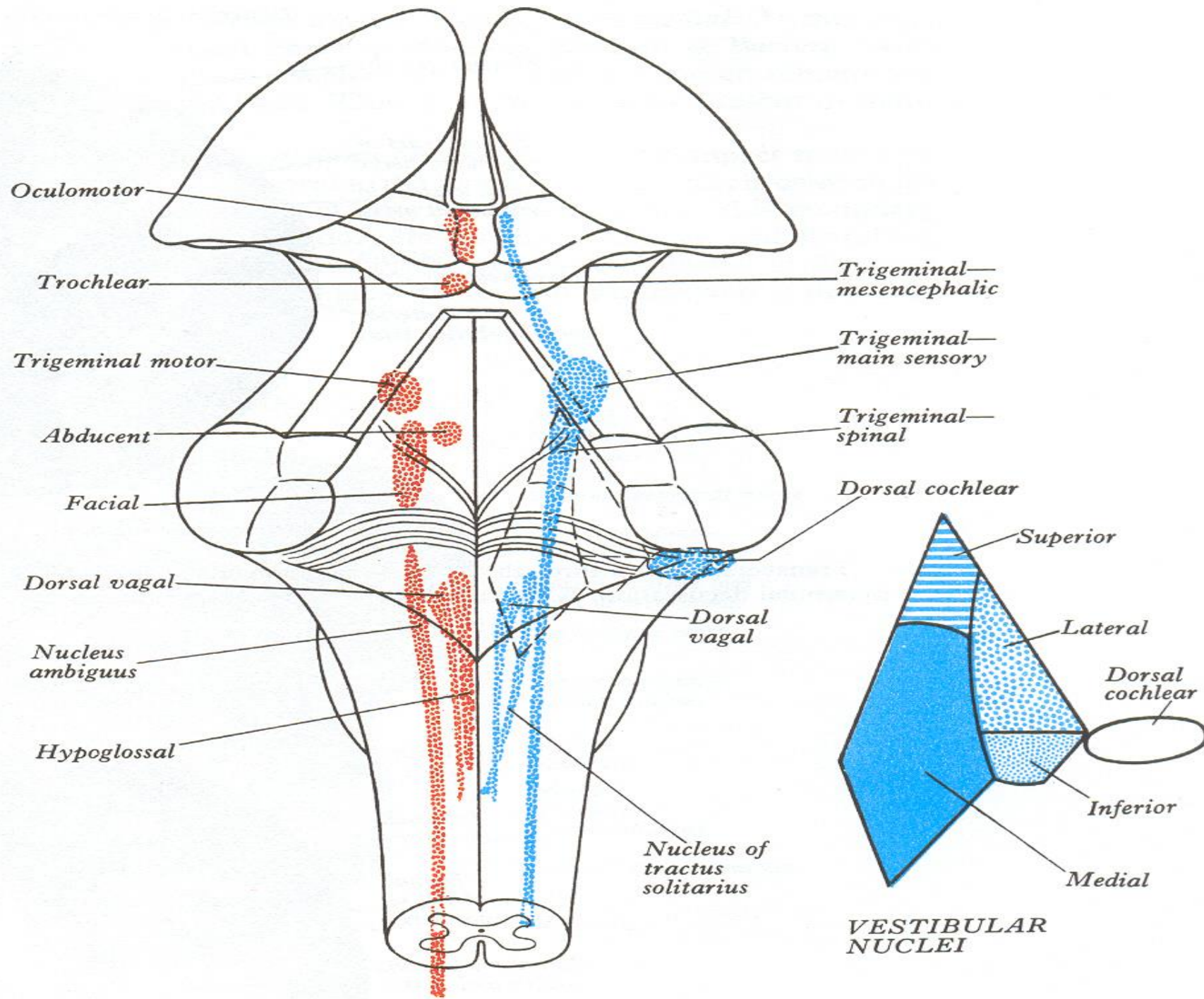
# تقاطع پیرامیدال



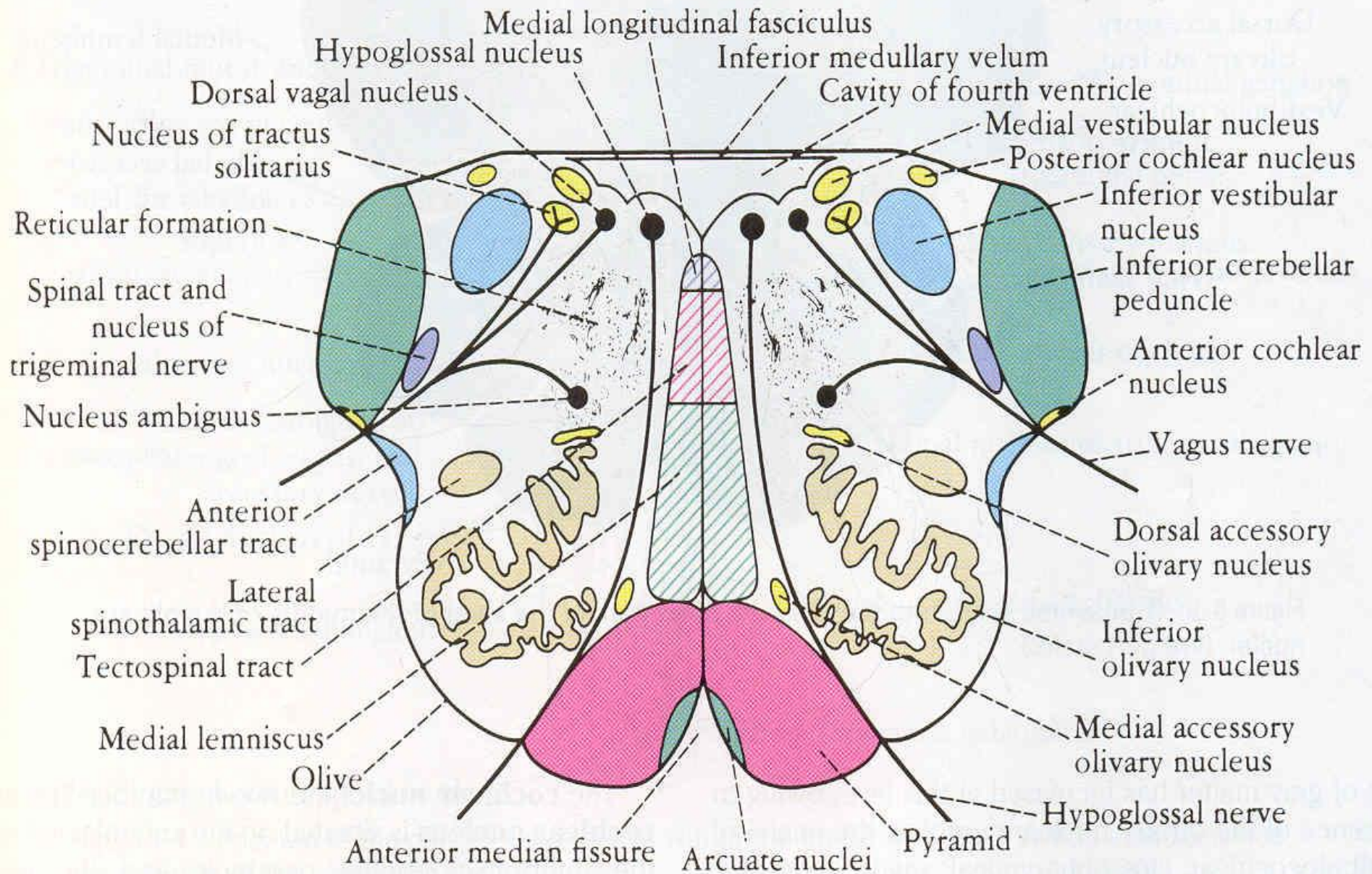


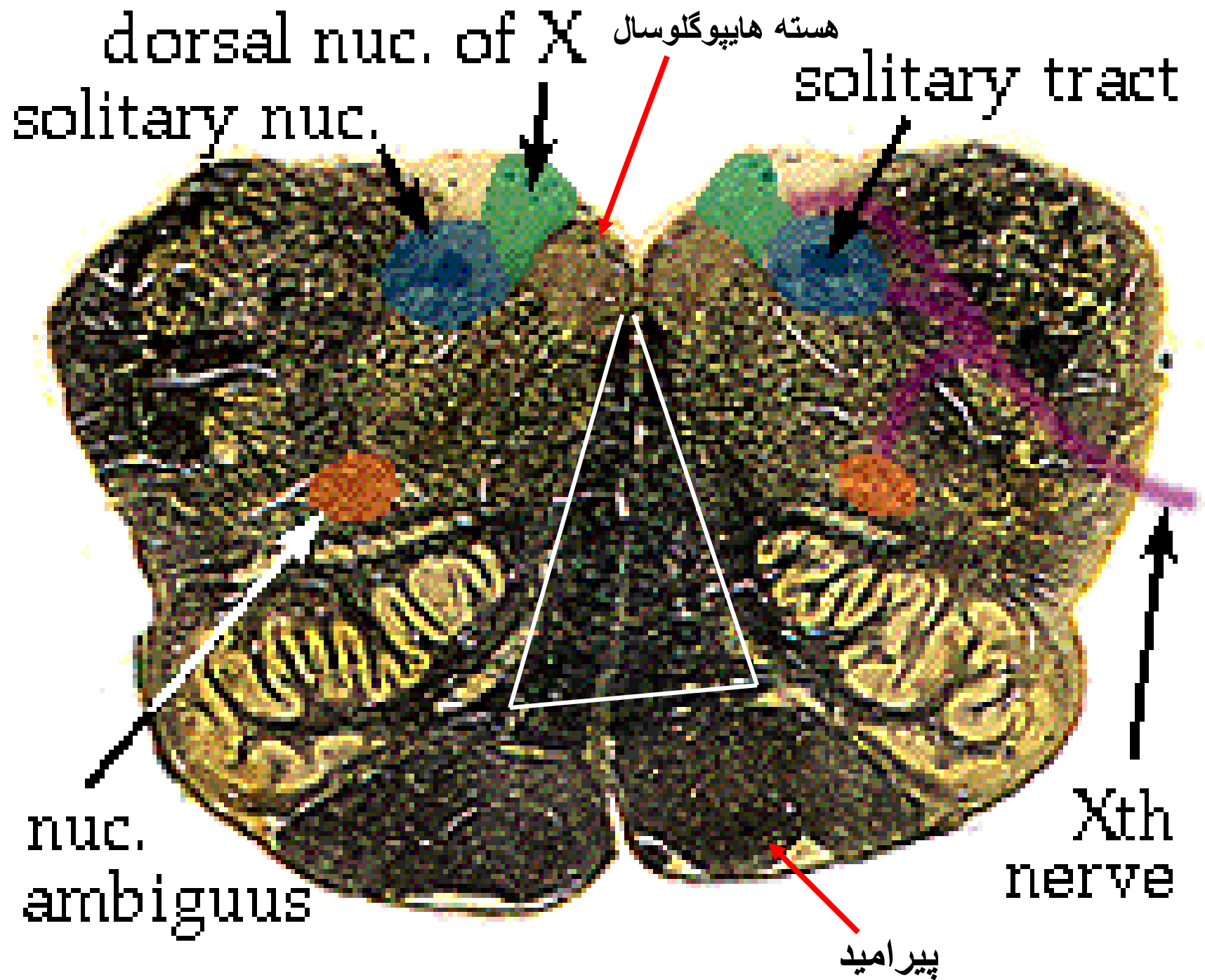
## سطح تقاطع لمبیسکال



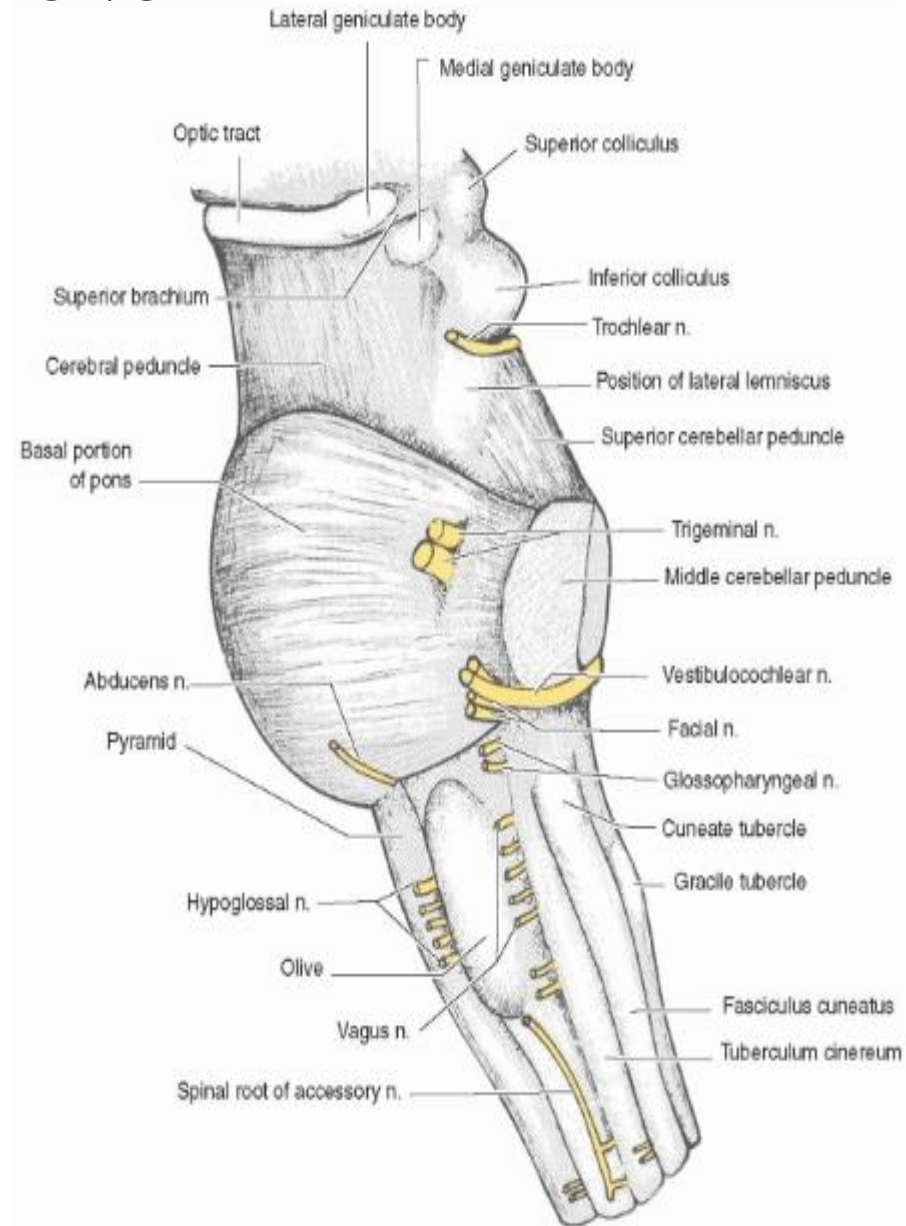
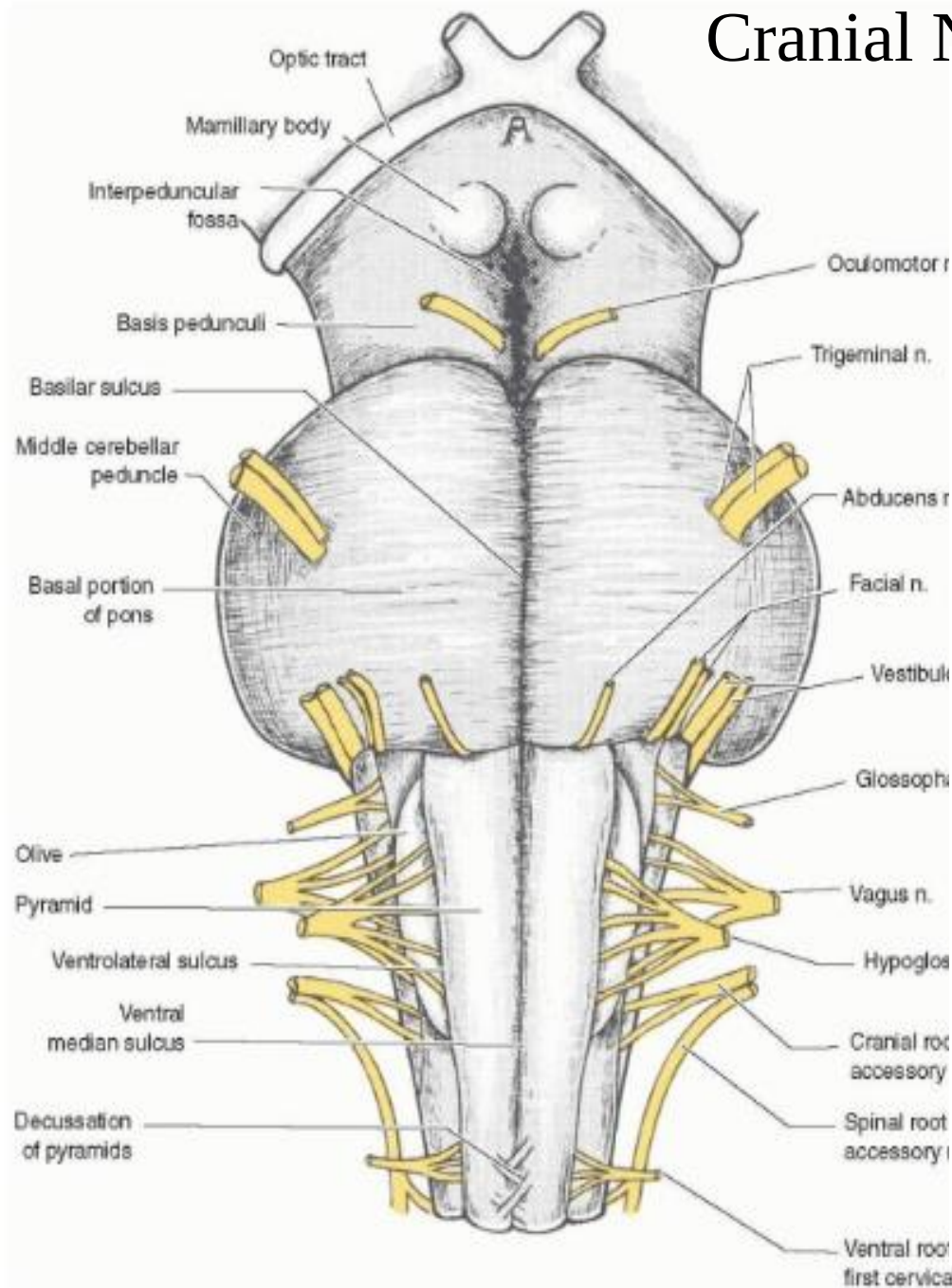


# سطح زیتونی



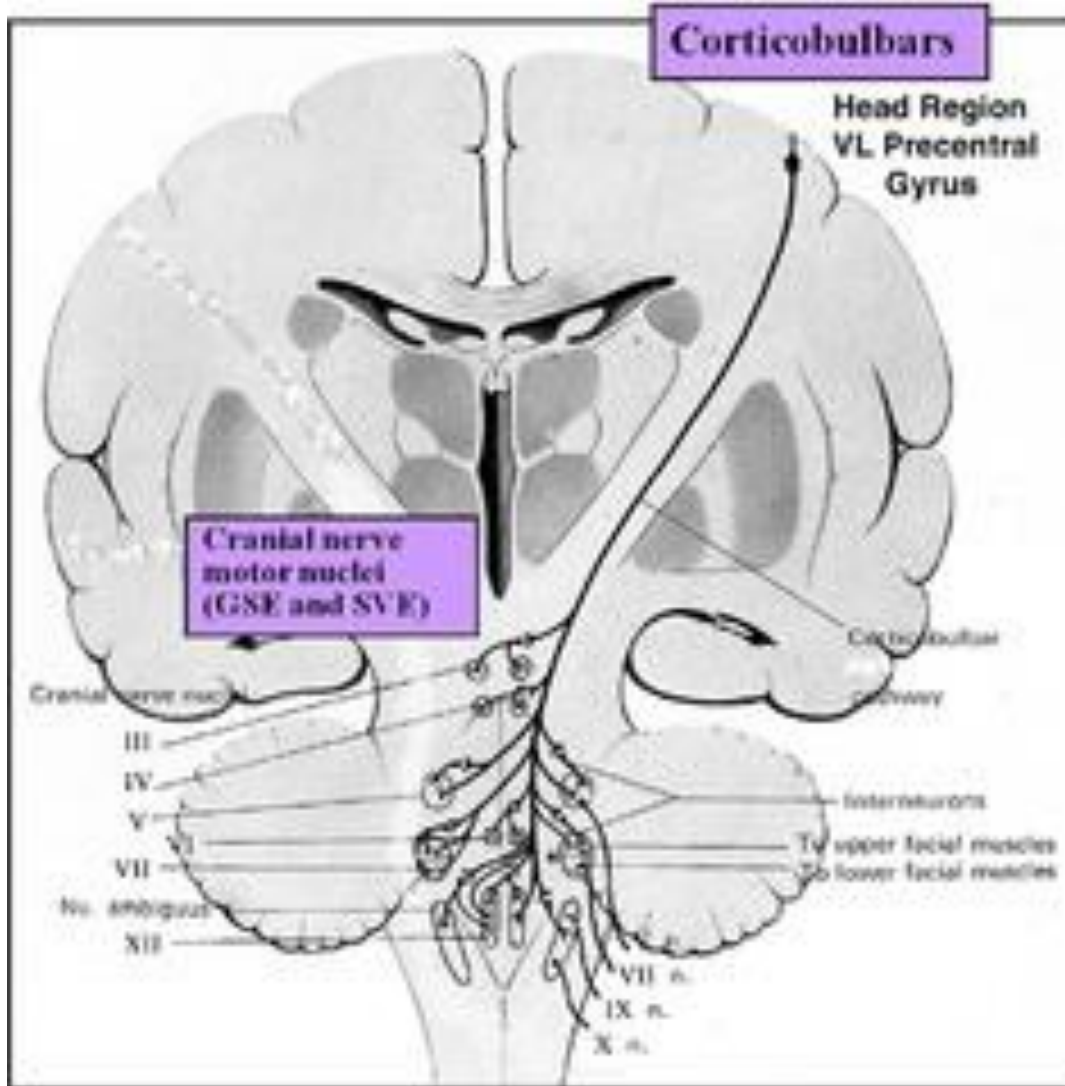


# Cranial Nerve



|                                 |             |
|---------------------------------|-------------|
| General somatic afferent (GSA)  | 5,7,9,10    |
| General visceral afferent (GVA) | 9,10        |
| Special somatic afferent (SSA)  | 2,8         |
| Special visceral afferent (SVA) | 1,7,9,10    |
| General somatic efferent (GSE)  | 3,4,6,11,12 |
| General visceral efferent (GVE) | 3,7,9,10    |
| Special visceral efferent (SVE) | 5,7,9,10,11 |

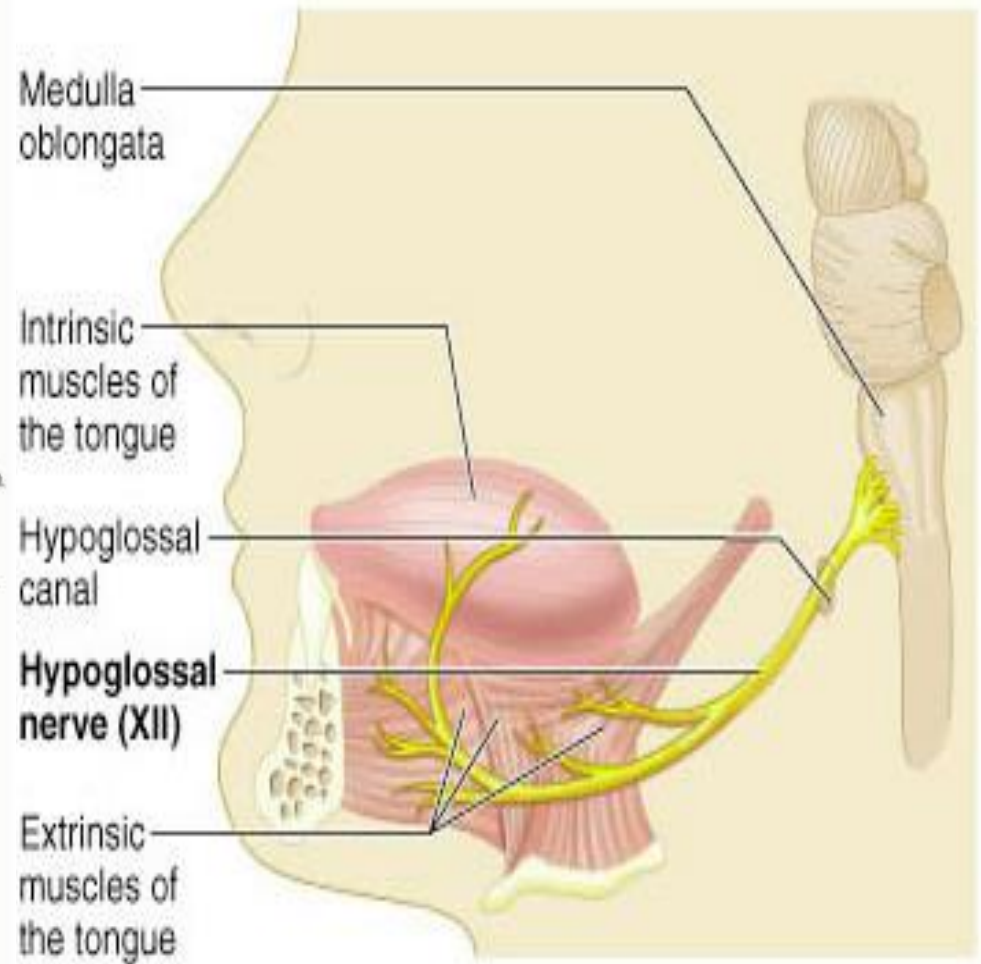
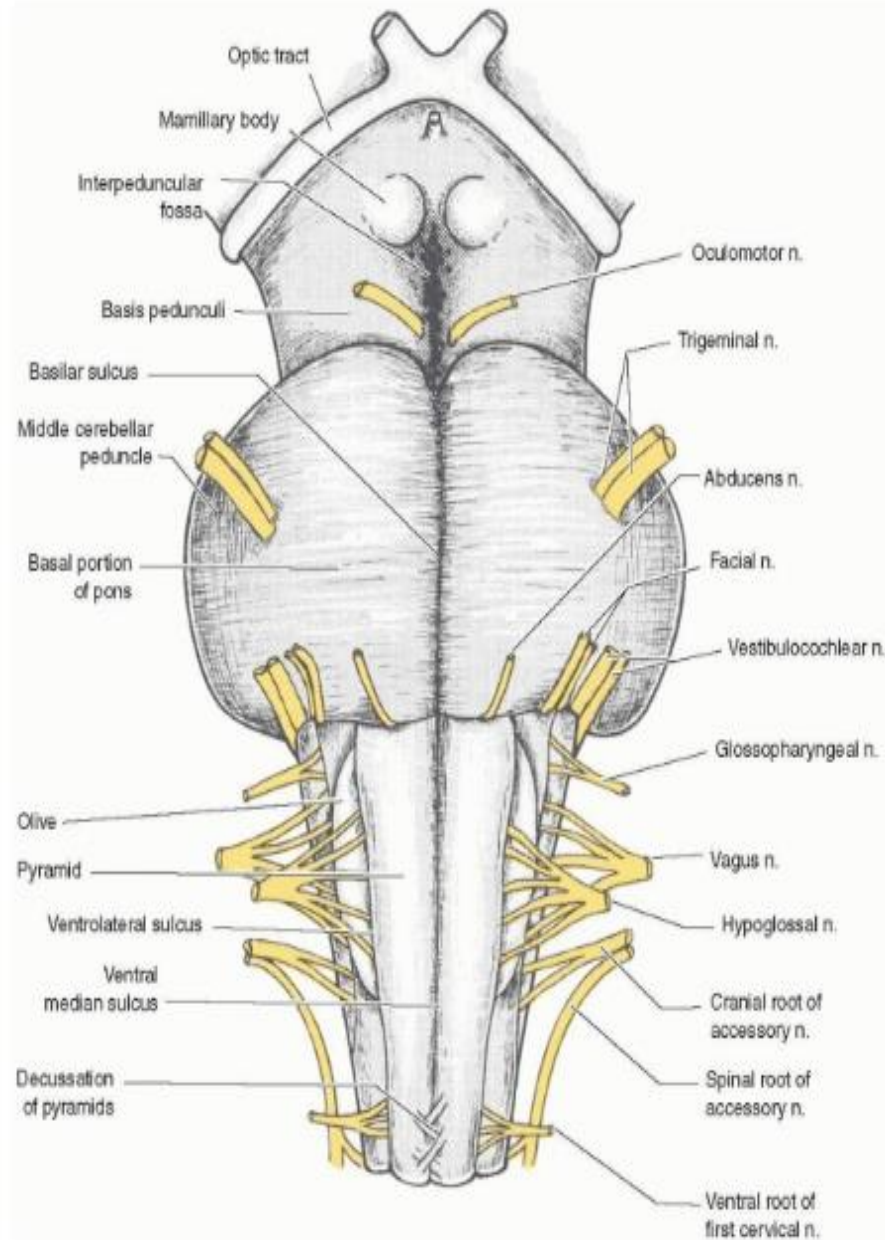
# Corticobulbar tract



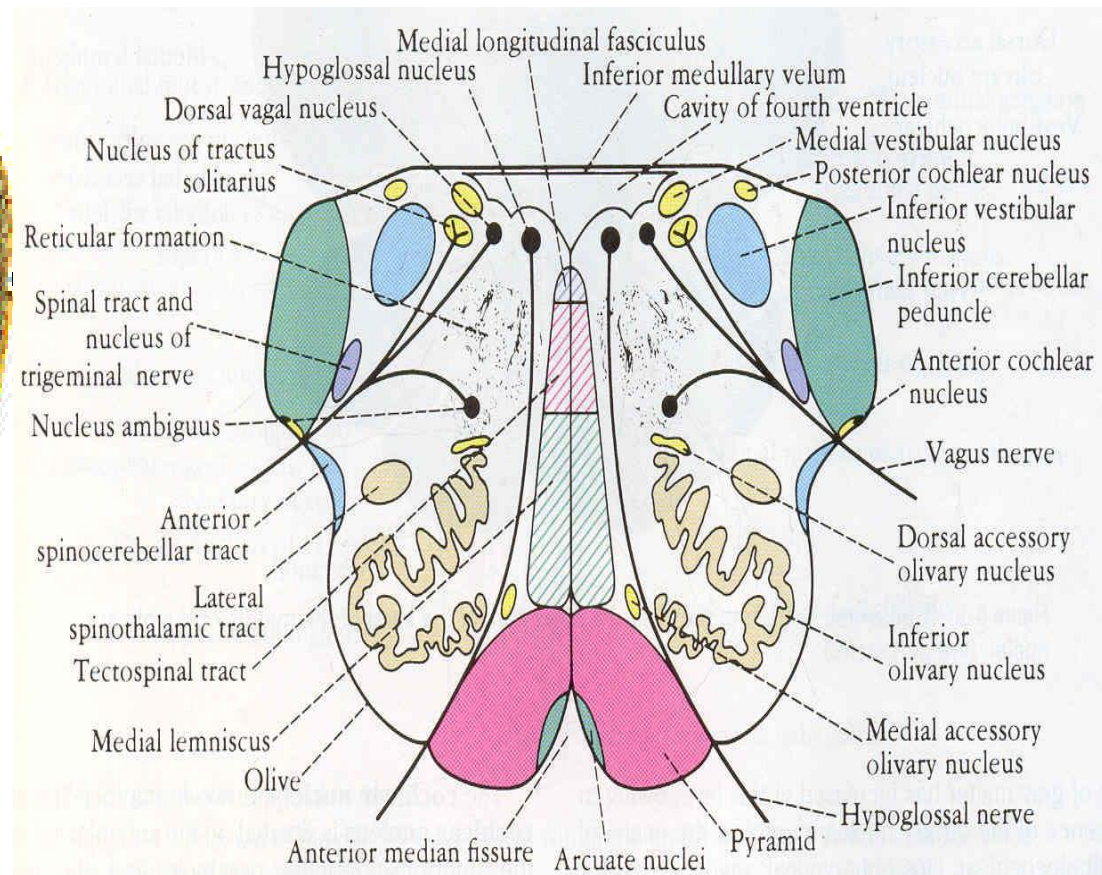
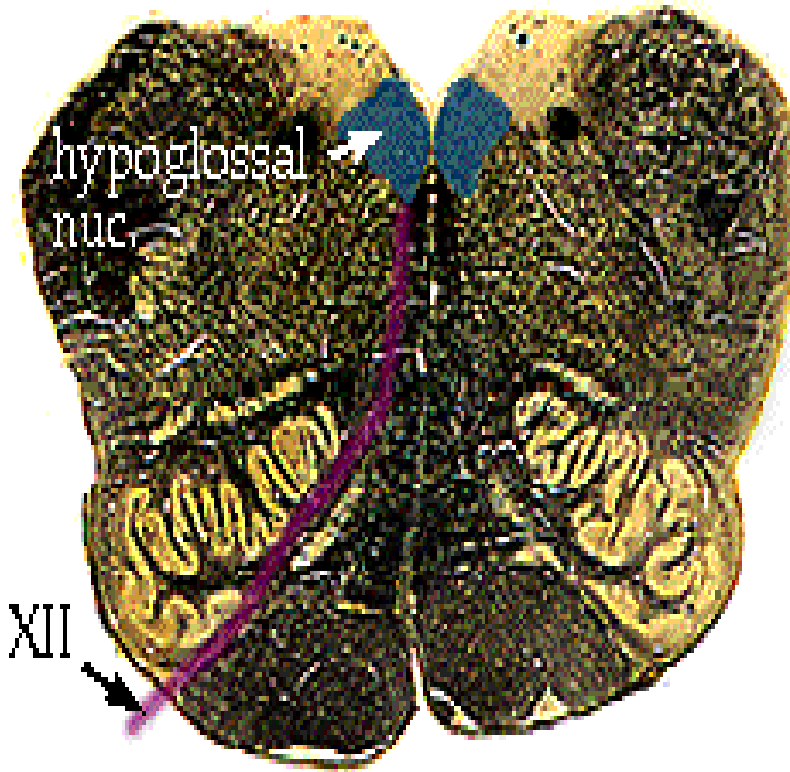
Hypoglossal N.  
Ambiguous nucleus  
Motor nucleus of facial  
Abducent N.  
Motor nucleus of trigeminal N.  
Trochlear N.  
Oculomotor N.

# عصب زوج ١٢

## GSE



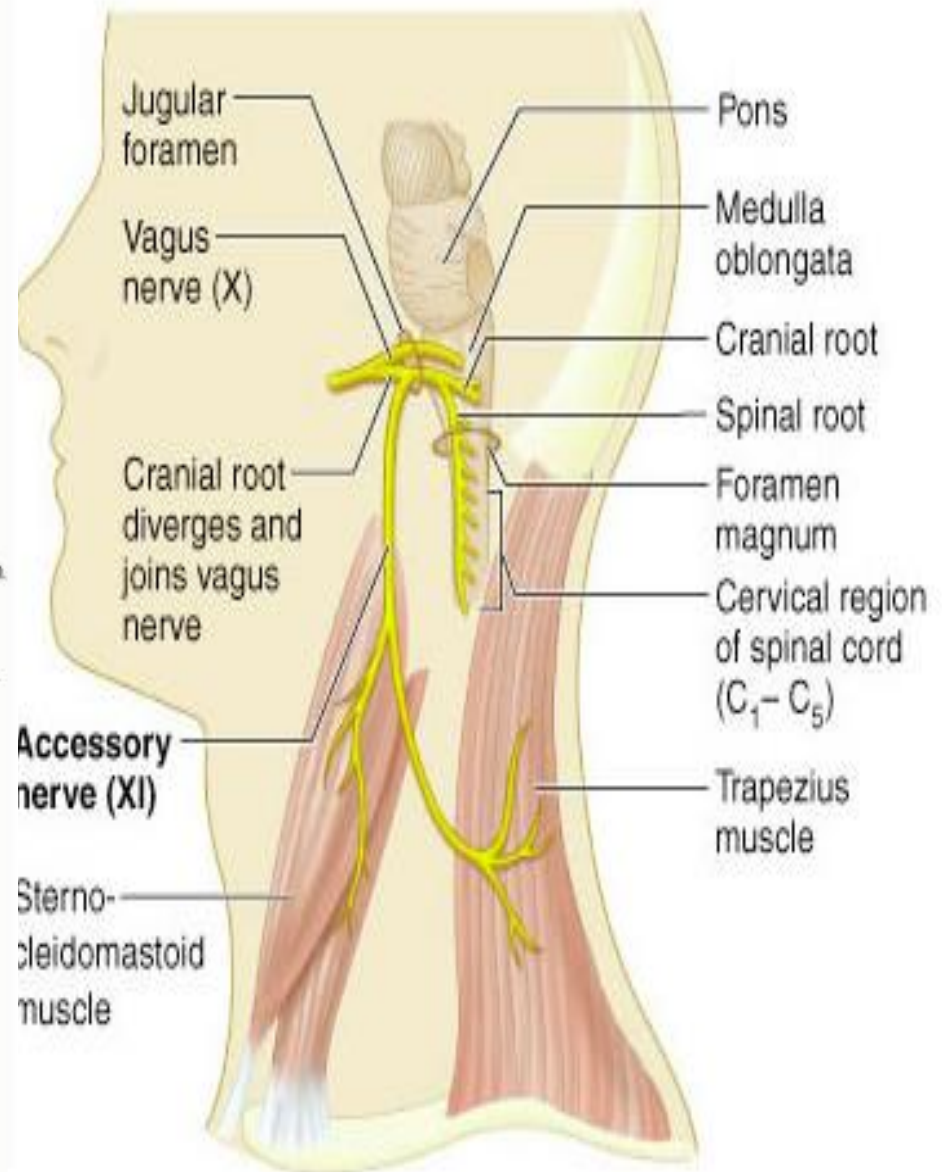
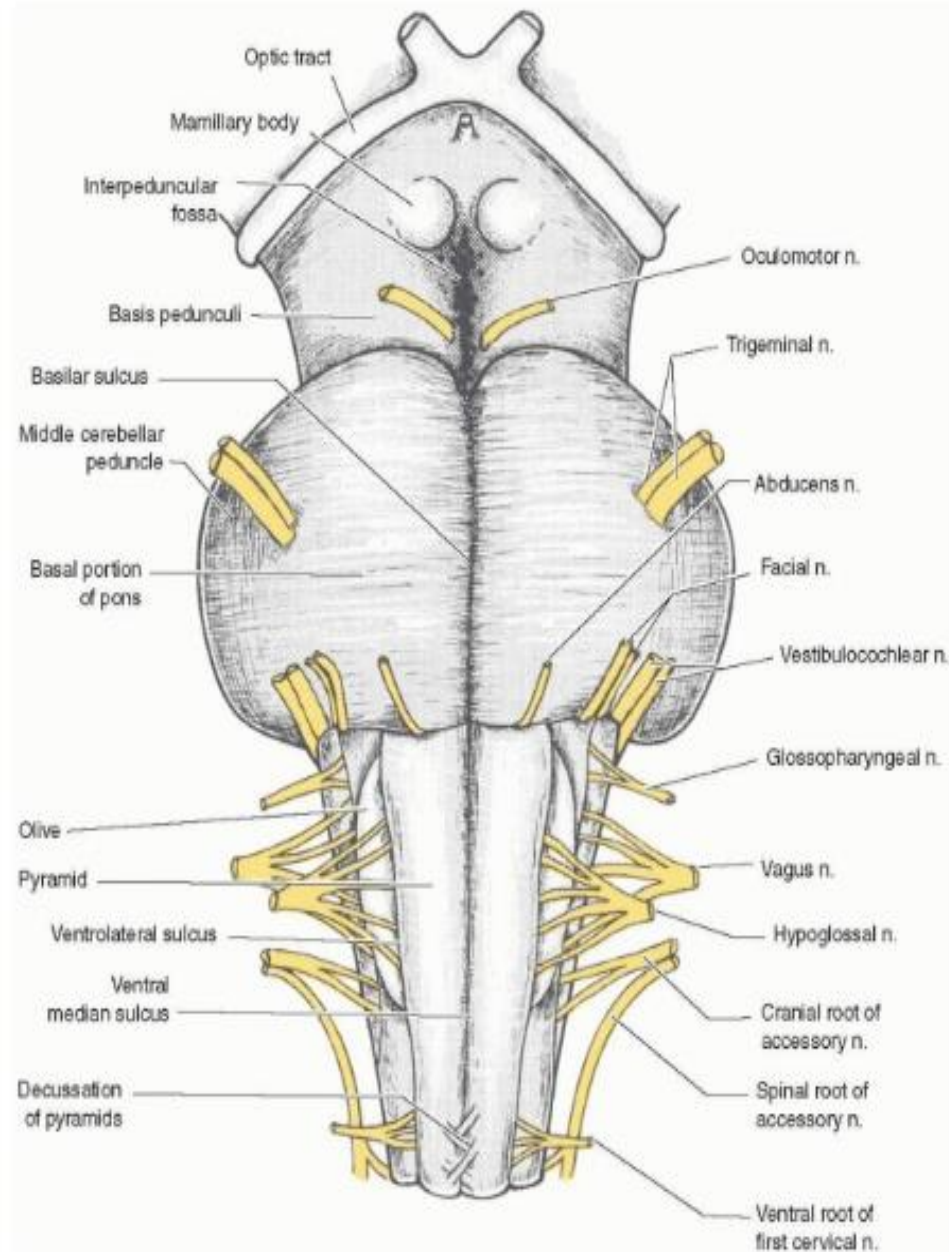
# Hypoglossal N.(GSE)

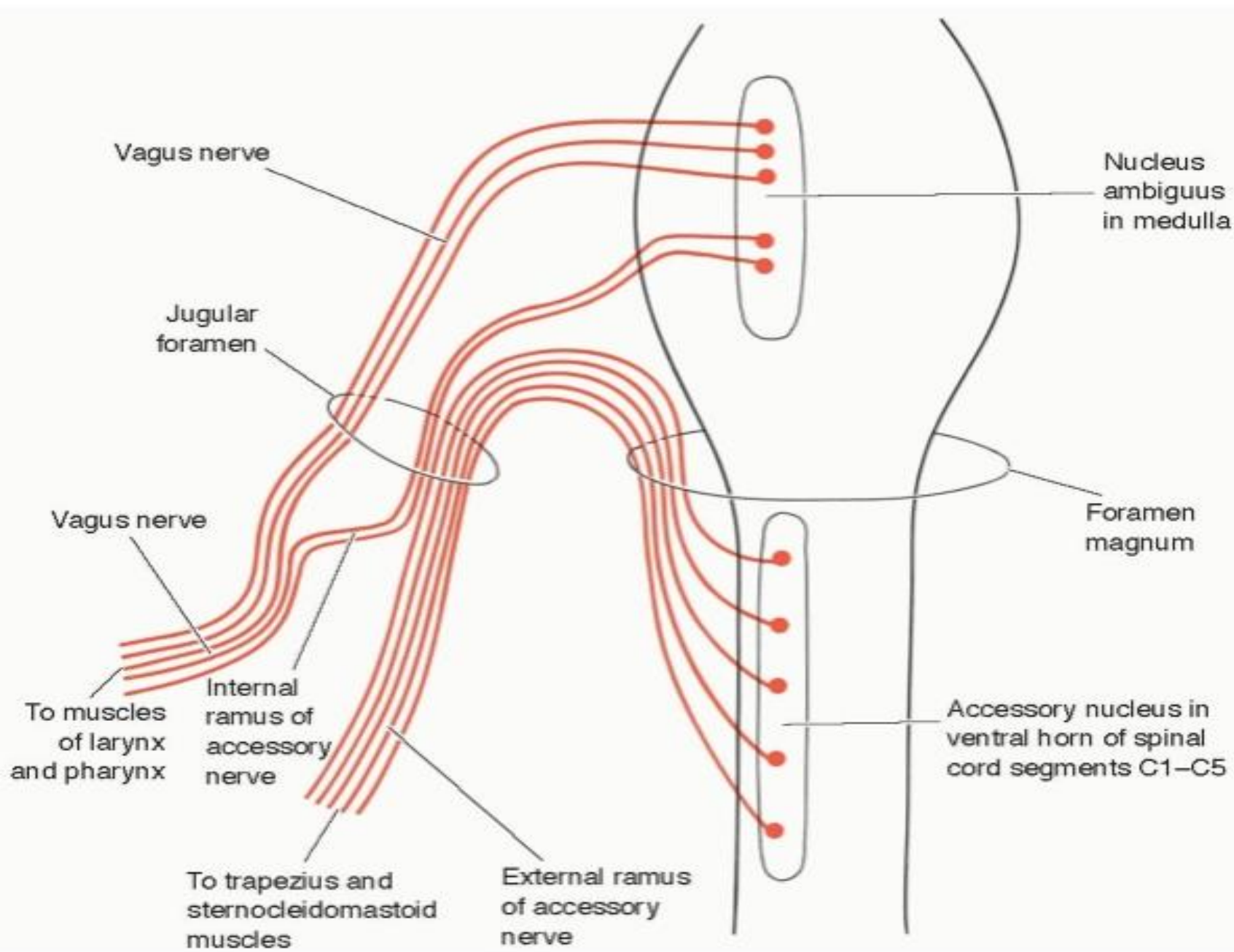


# Hypoglossal nerve palsy



# Accessory N.(SVE,GSE)



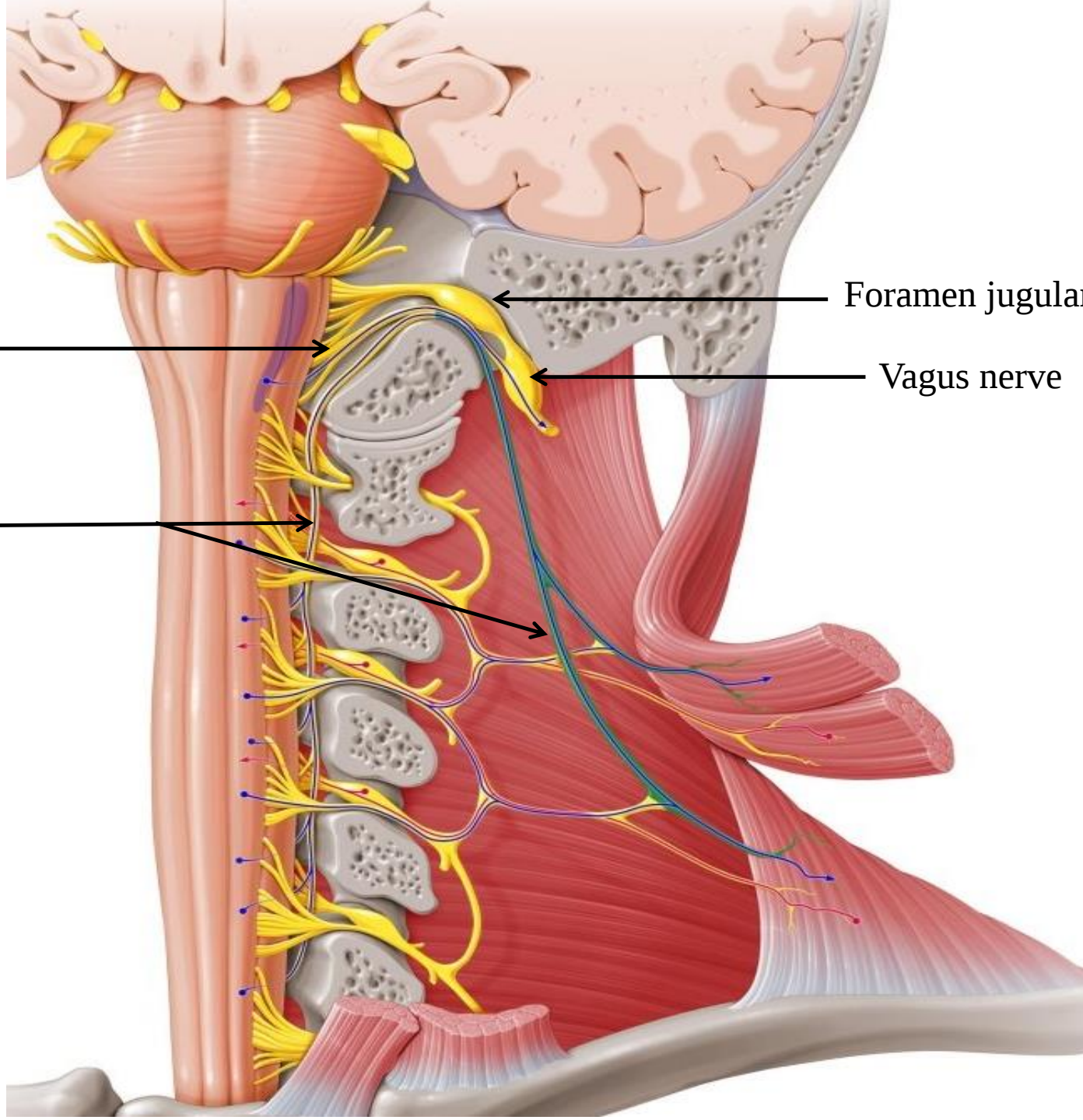


Cranial root

spinal root

Foramen jugulare

Vagus nerve

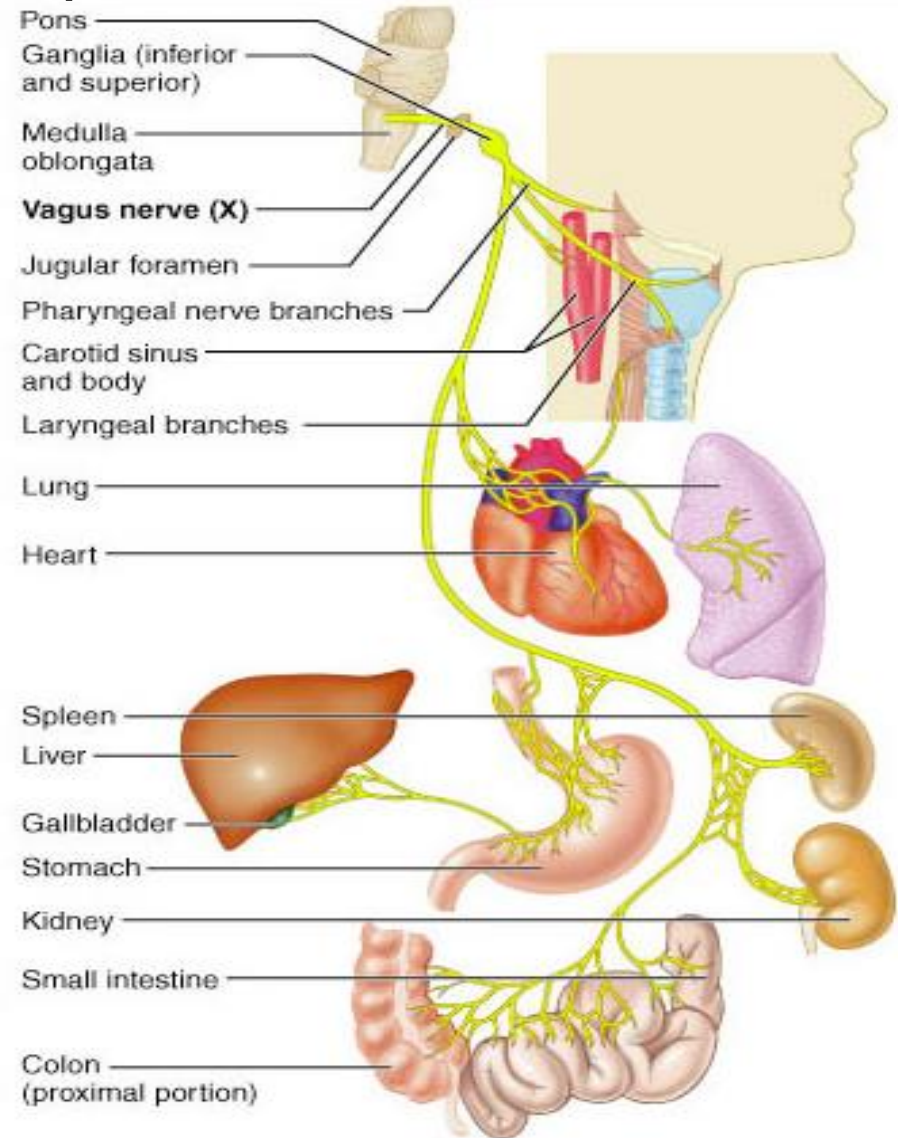
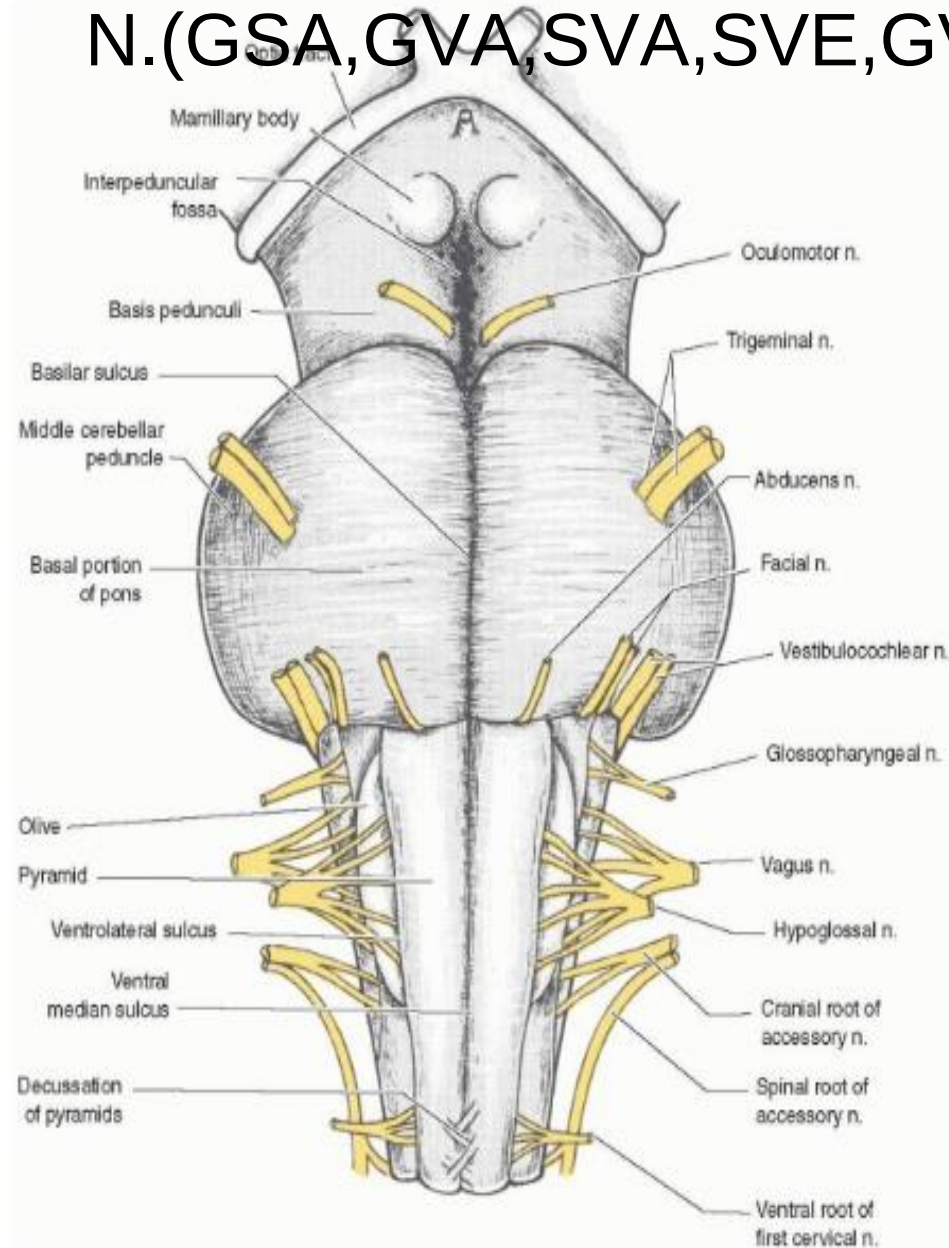


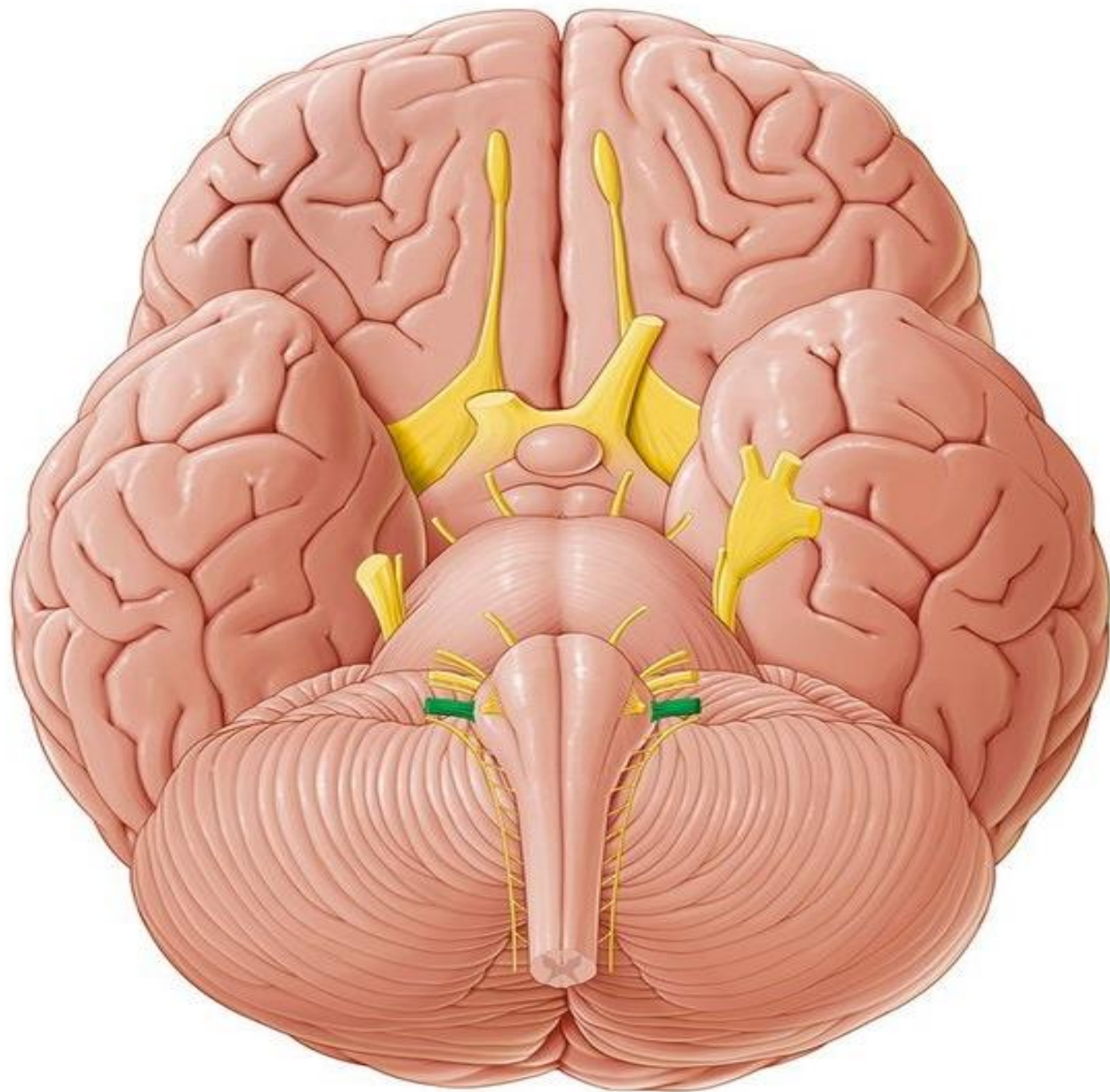
# Accessory nerve palsy

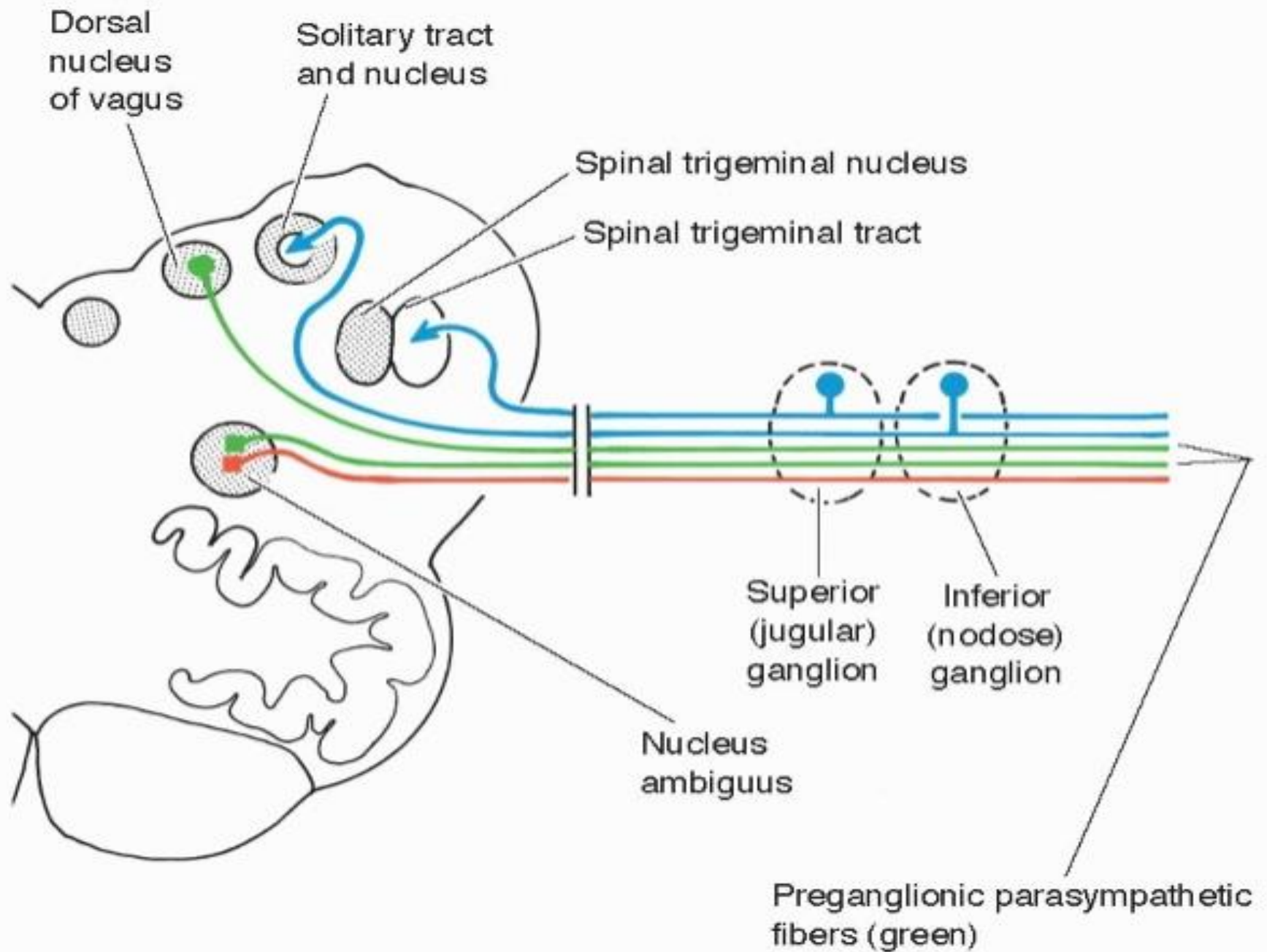


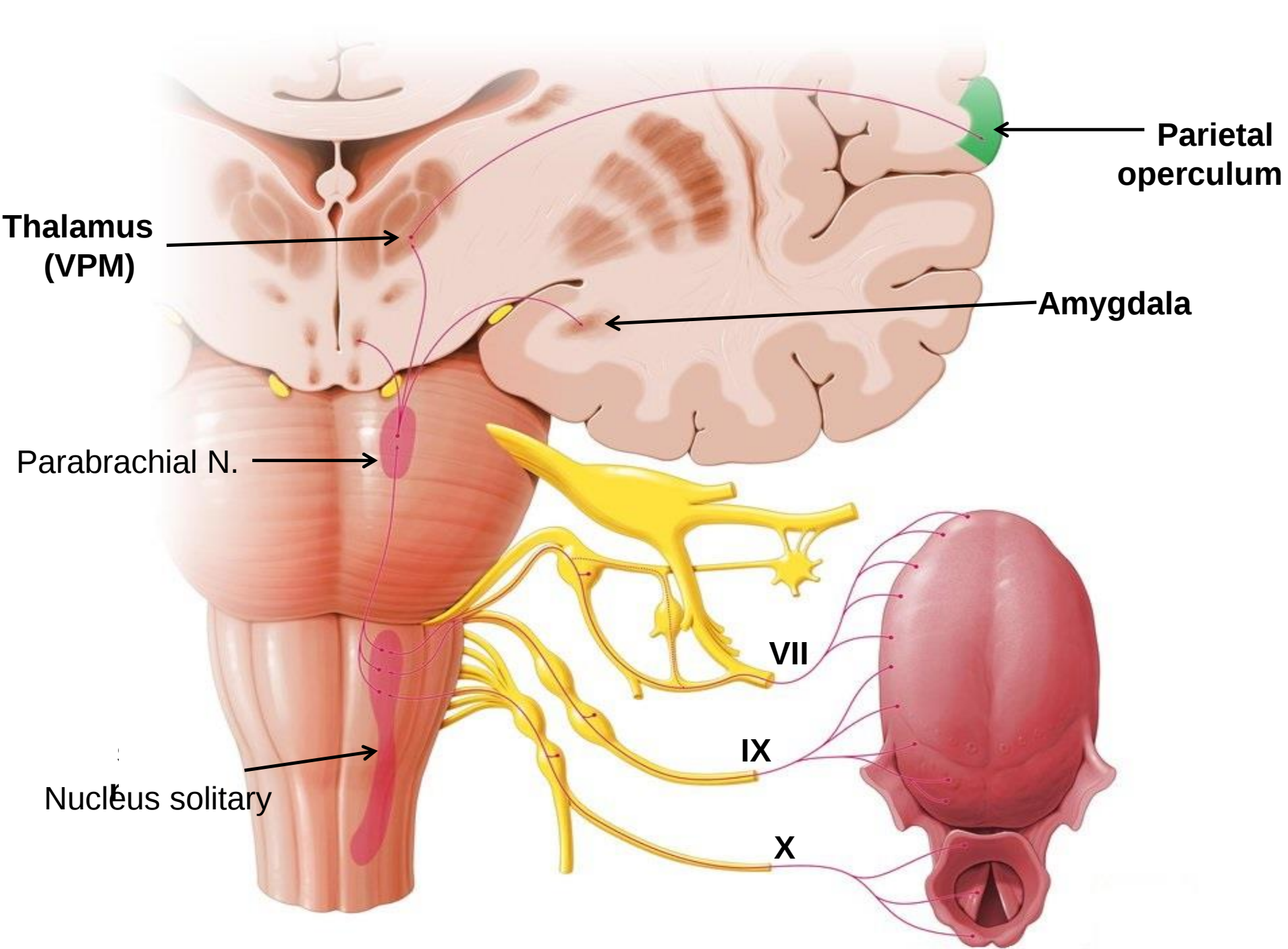
# Vagus

N.(GSA,GVA,SVA,SVE,GVE)

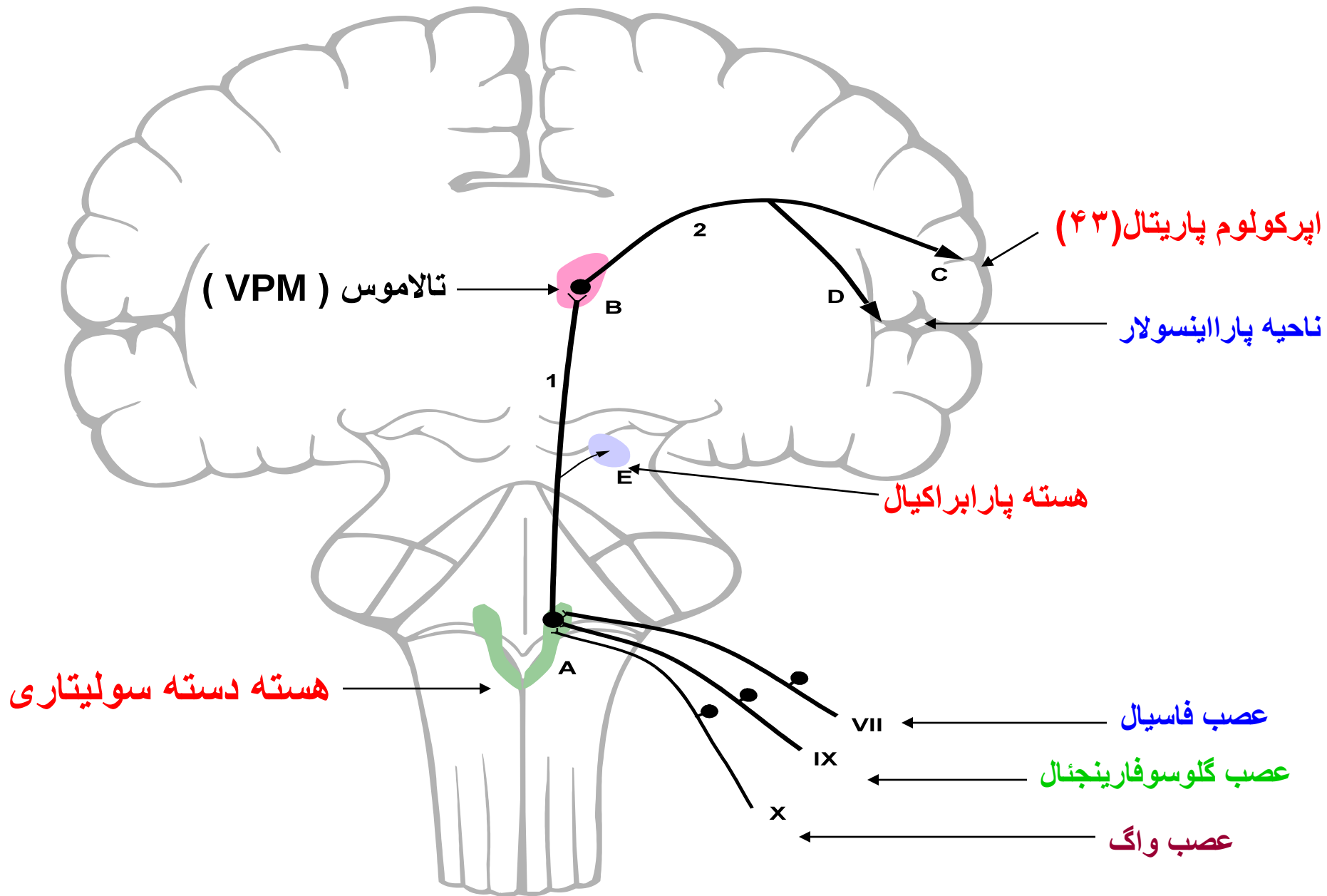




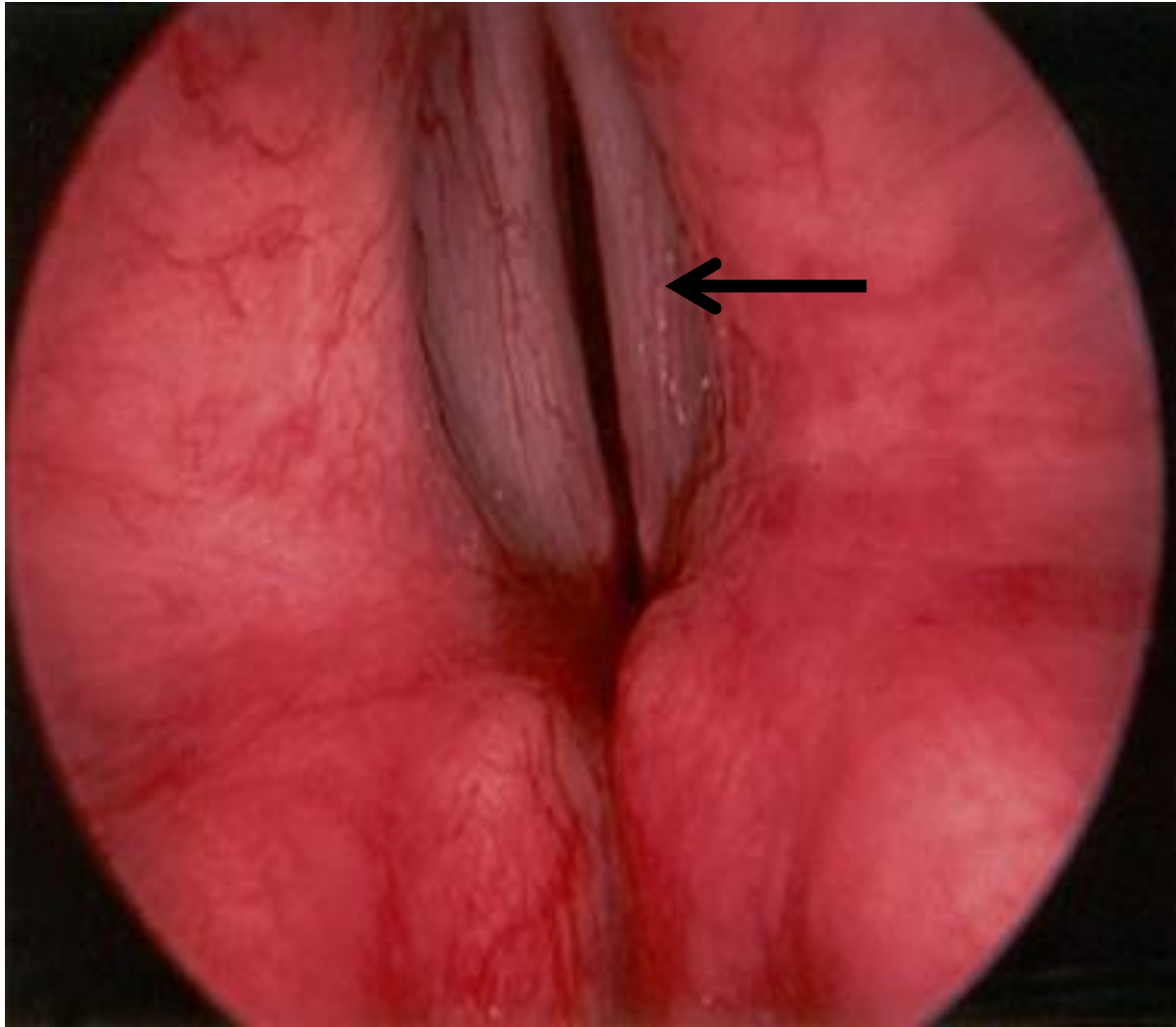




# هسته دسته سولیتاری

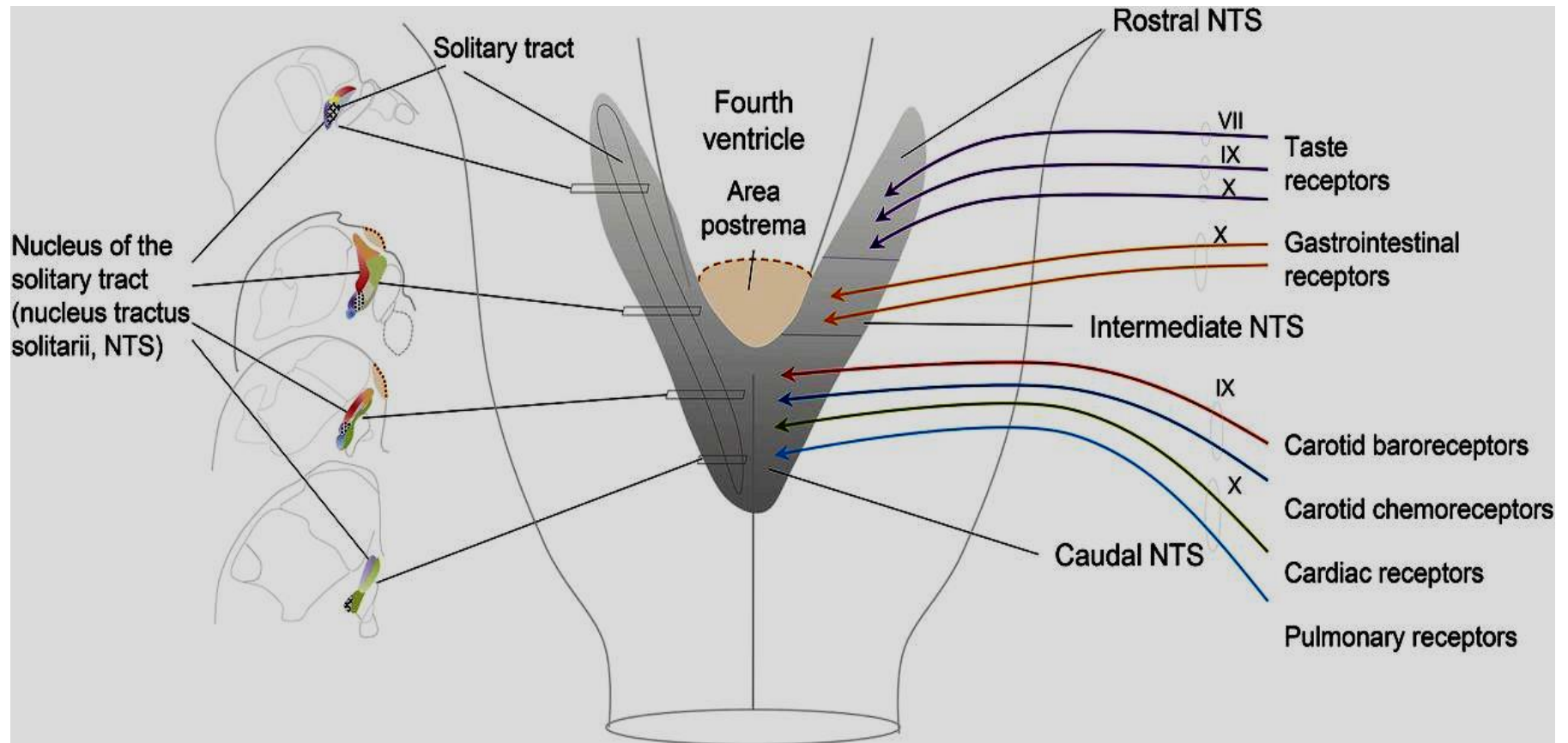


## Vagal nerve palsy(recurrent laryngeal nerve)

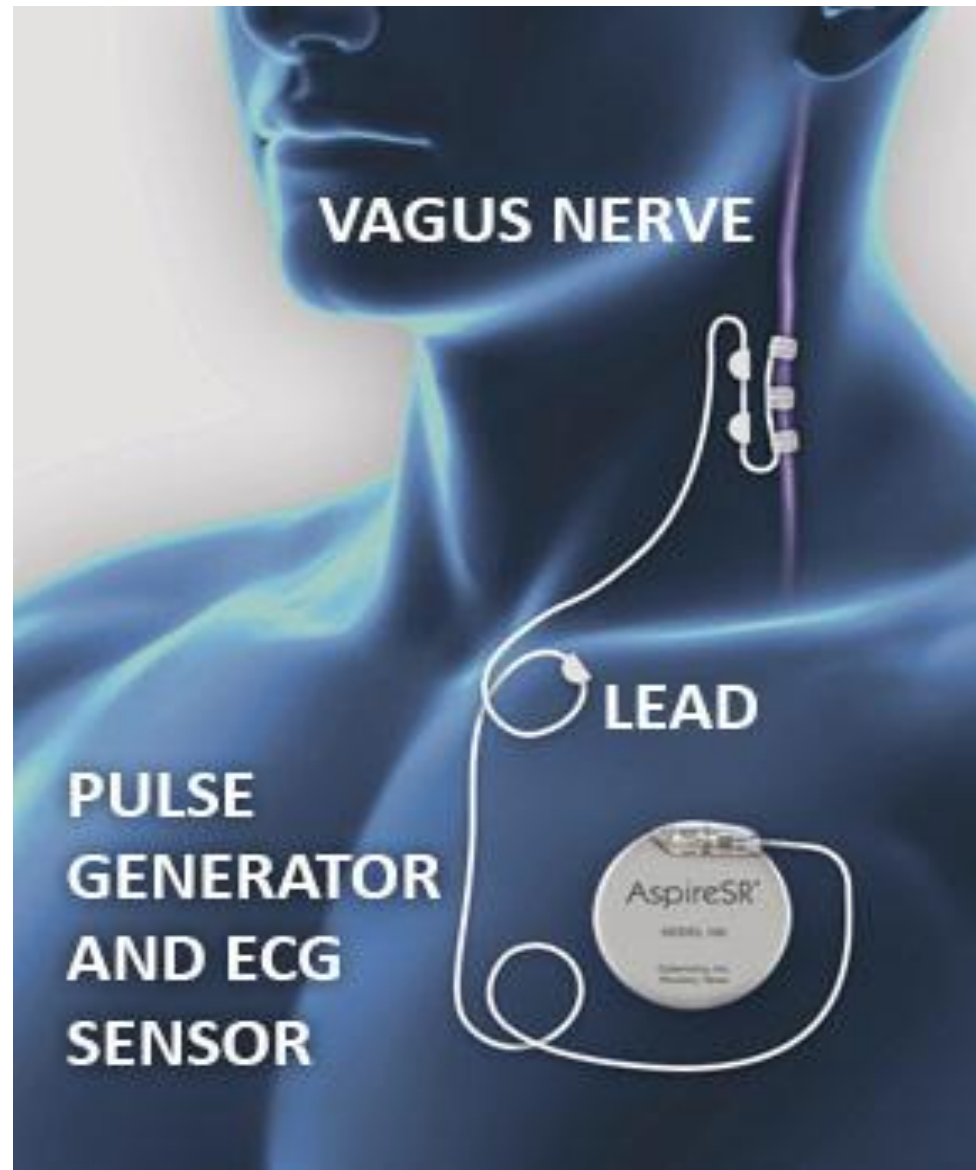


# General Visceral Afferent(GVA)

## Nucleus solitarius

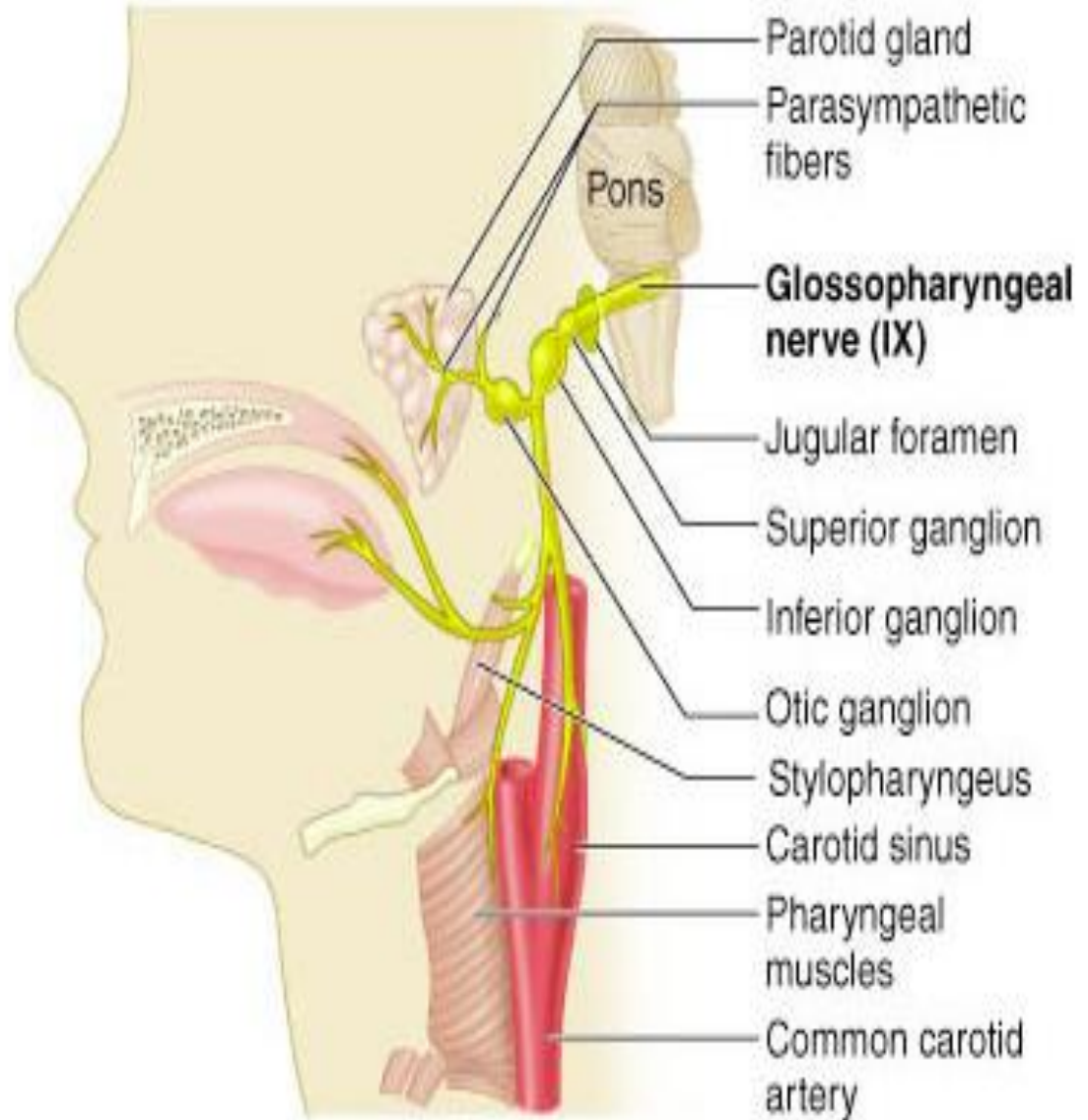
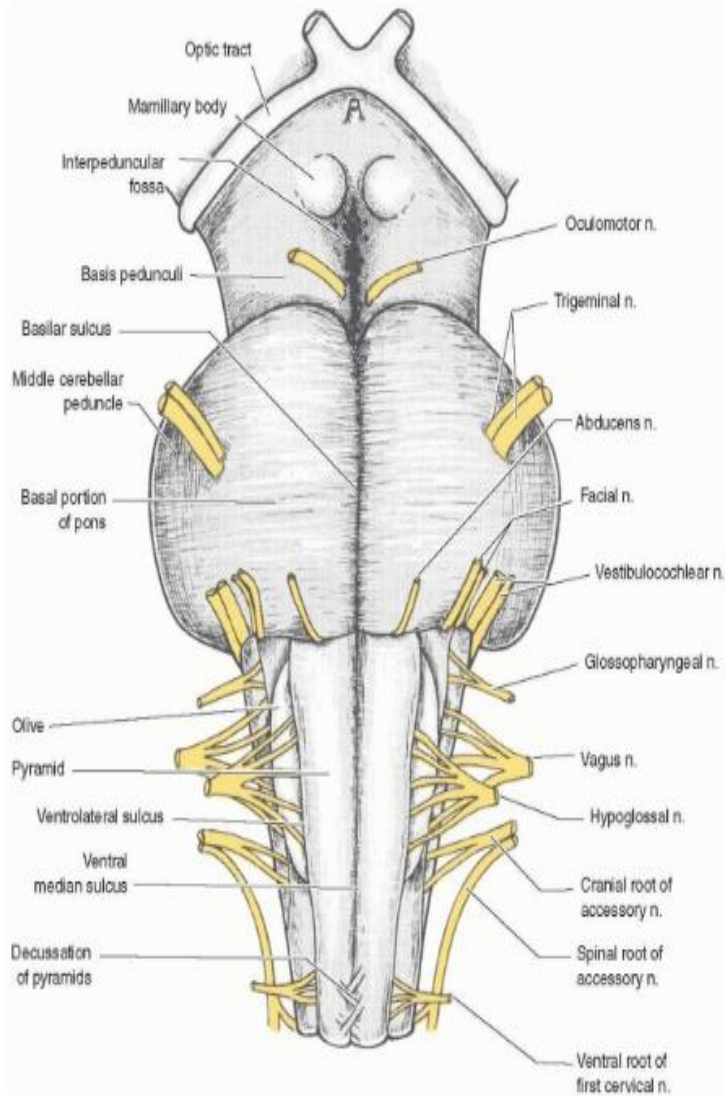


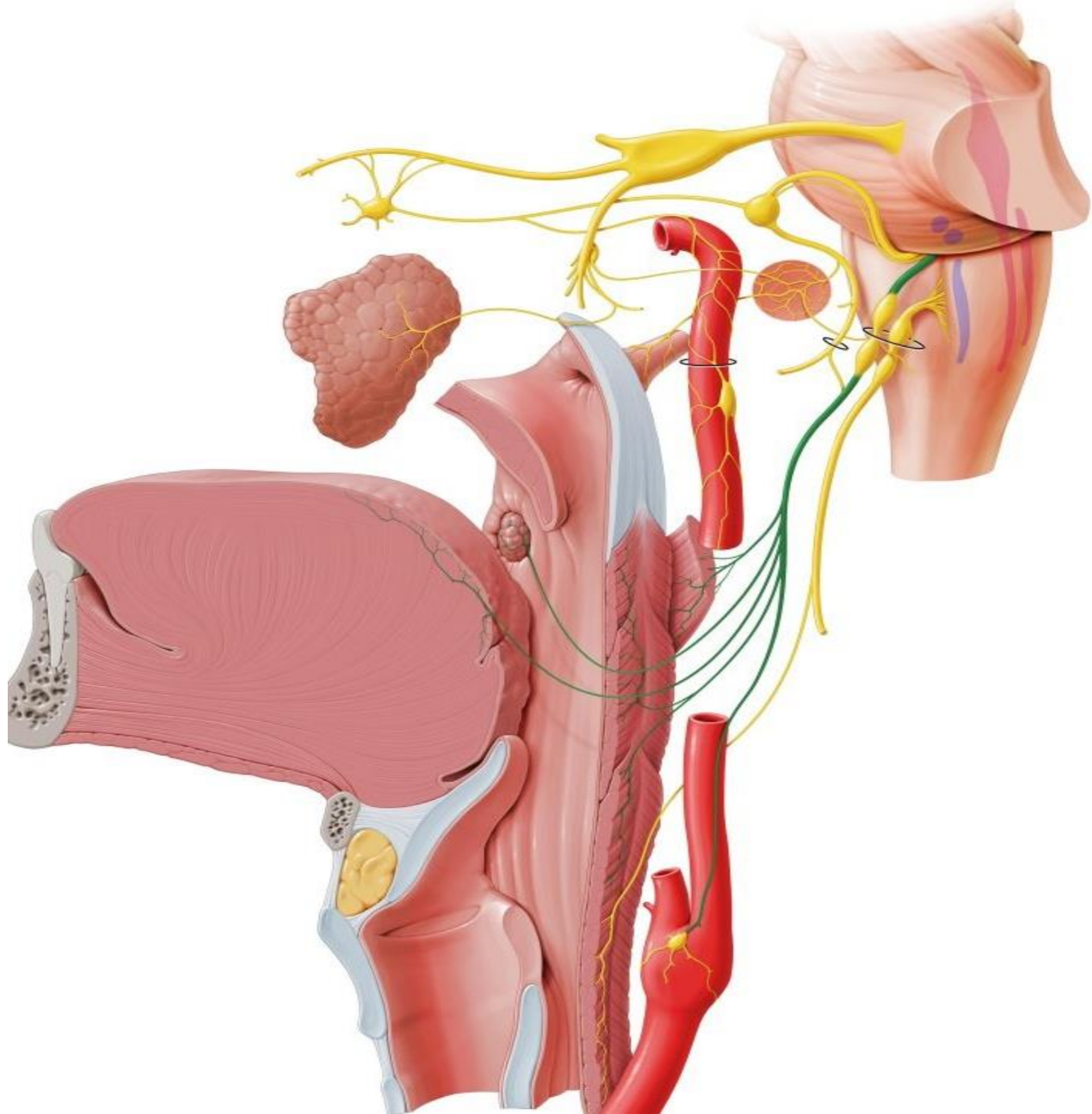
# Vagal stimulation

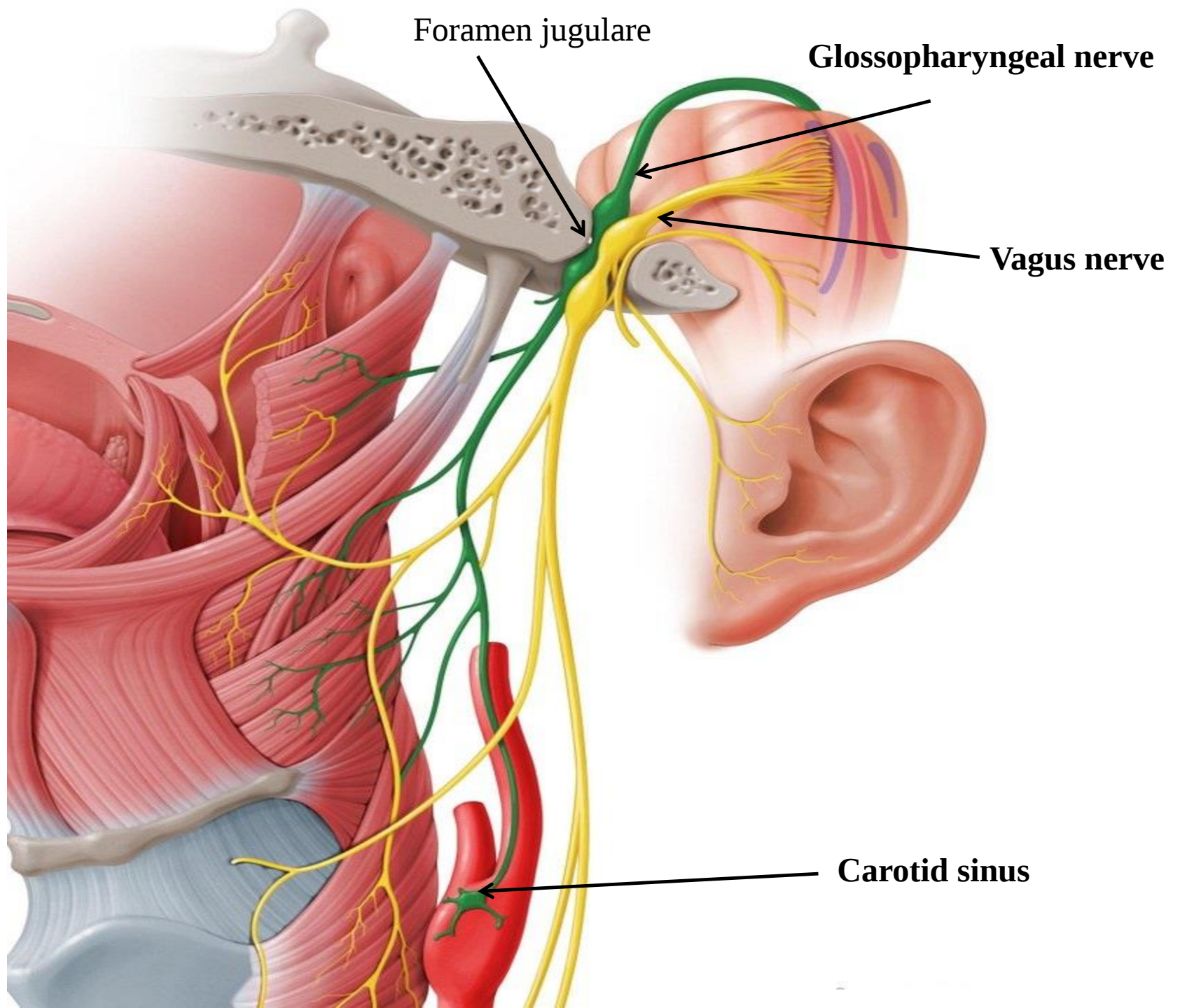


# Glossopharyngeal

N (GSA GVA SVA SVE GVE)







Solitary tract and  
nucleus

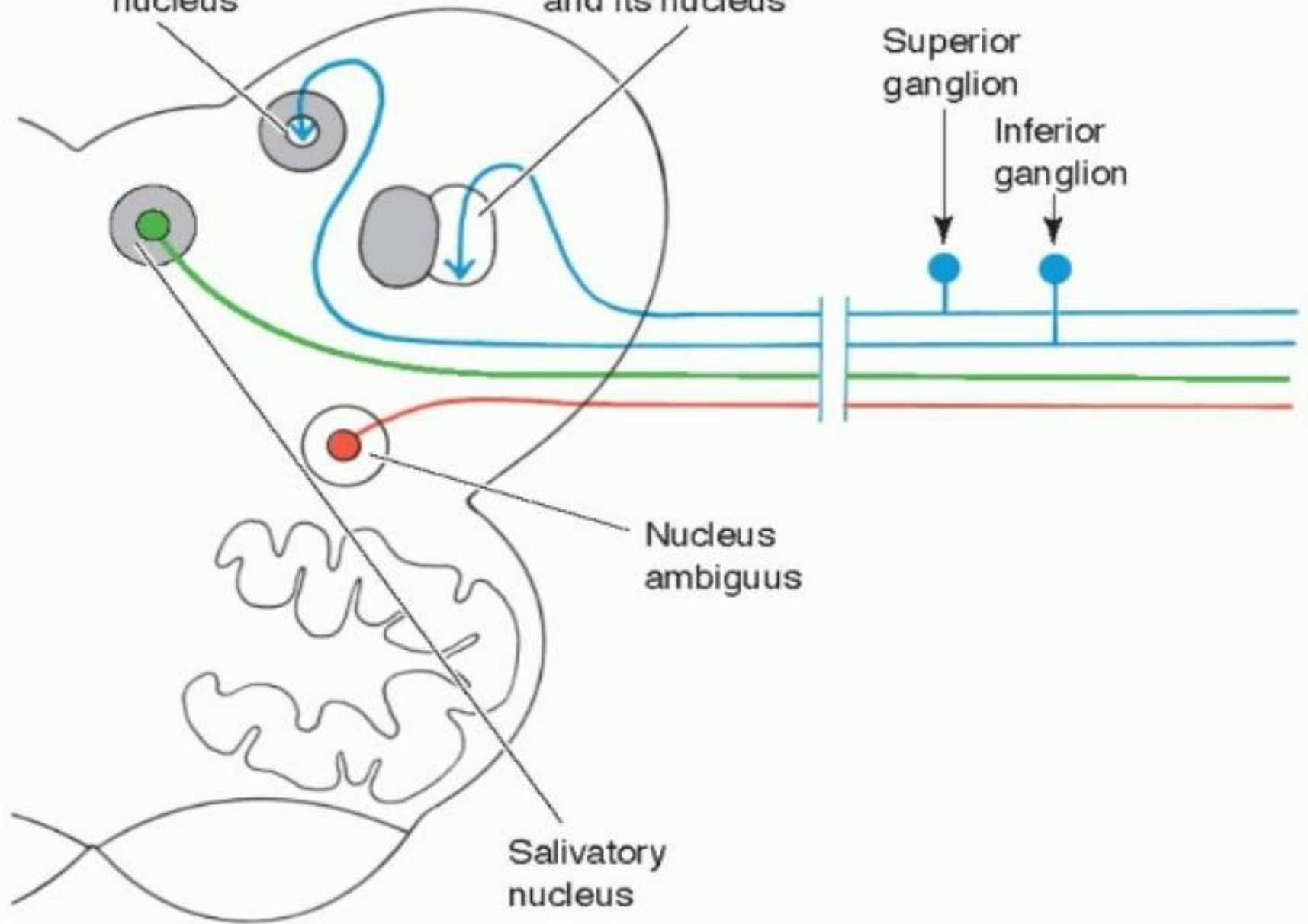
Spinal trigeminal tract  
and its nucleus

Superior  
ganglion

Inferior  
ganglion

Nucleus  
ambiguus

Salivatory  
nucleus



هسته بزاقي تحتانی  
(پاراسمپاتیکی)

عصب زوج ۹

شاخه صماخی زوج ۹

عصب پتروزال کوچک

گانگلیون اوتیک  
(پاراسمپاتیکی + سمپاتیکی)

عصب اوریکولو تمپورال

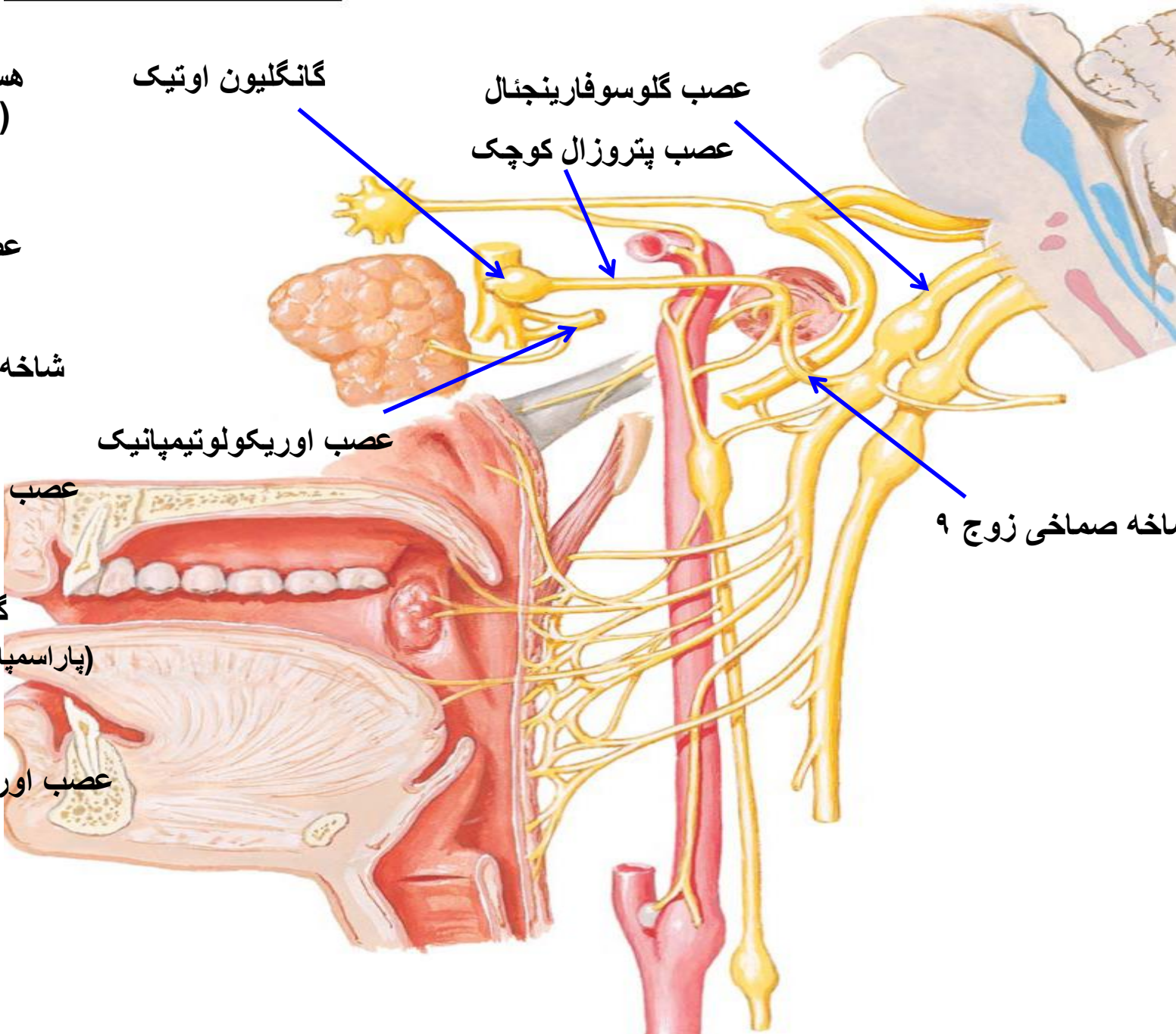
غده پاروتید

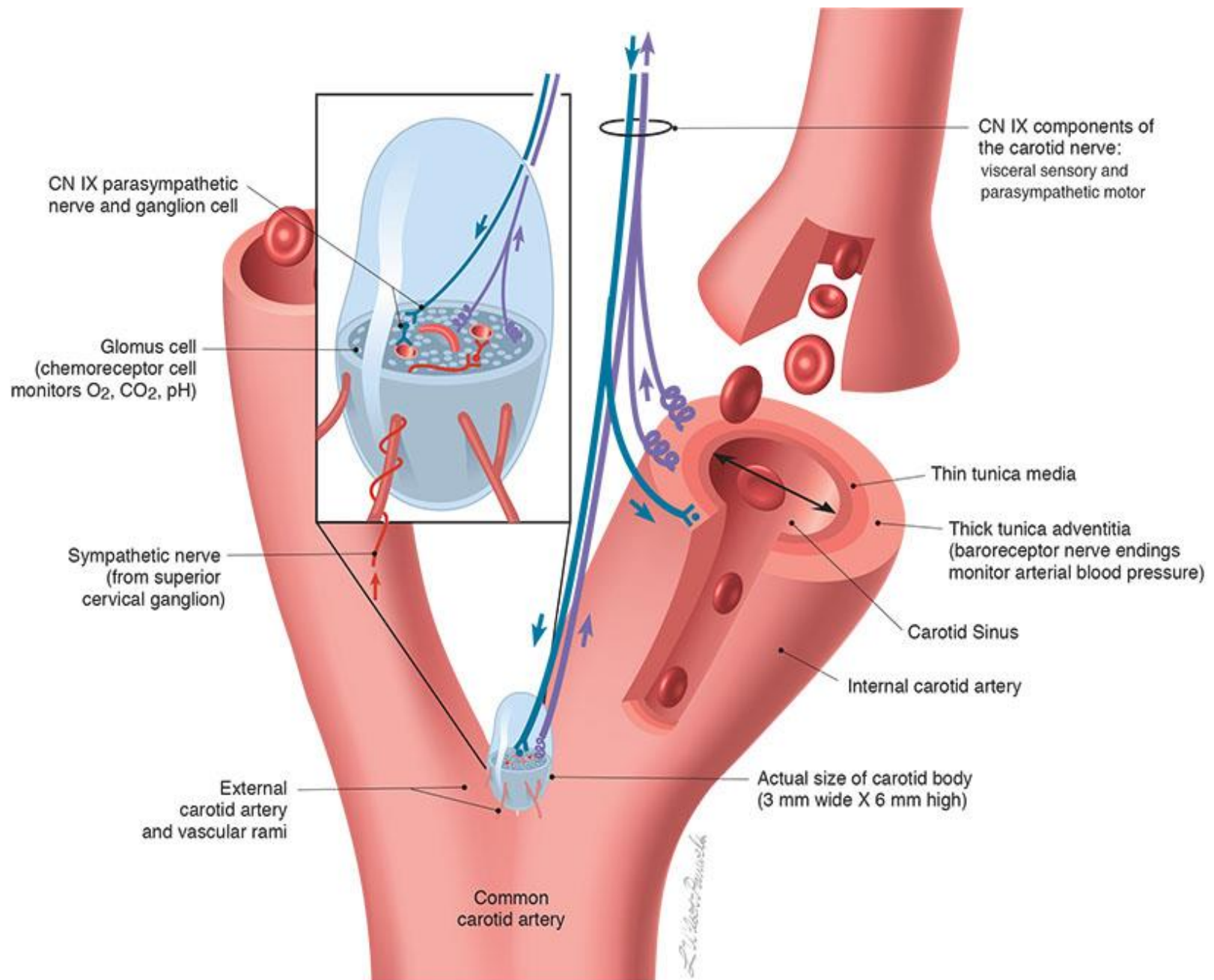
گانگلیون اوتیک

عصب گلوسوفارینجیال  
عصب پتروزال کوچک

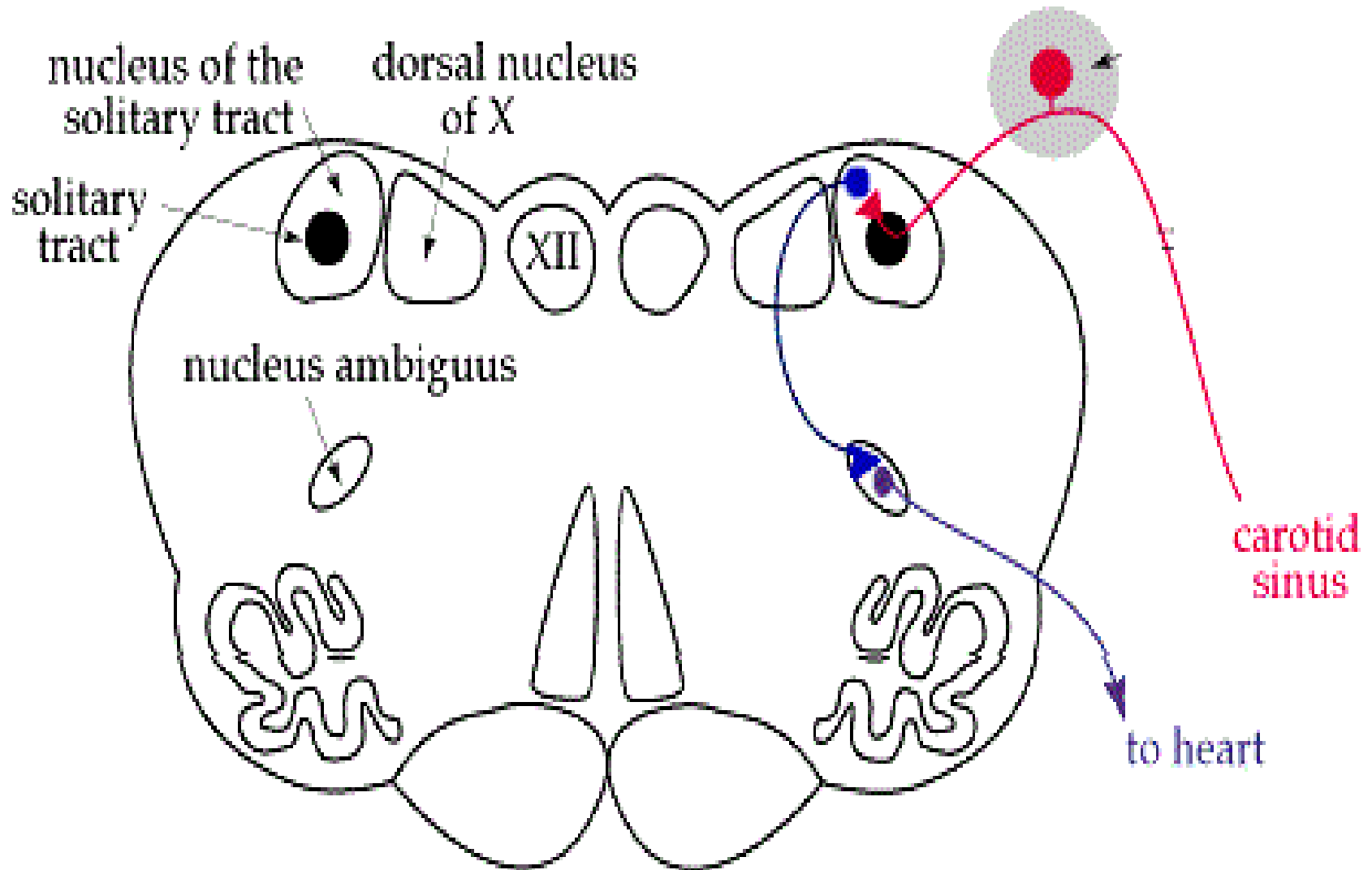
عصب اوریکولو تیمپانیکی

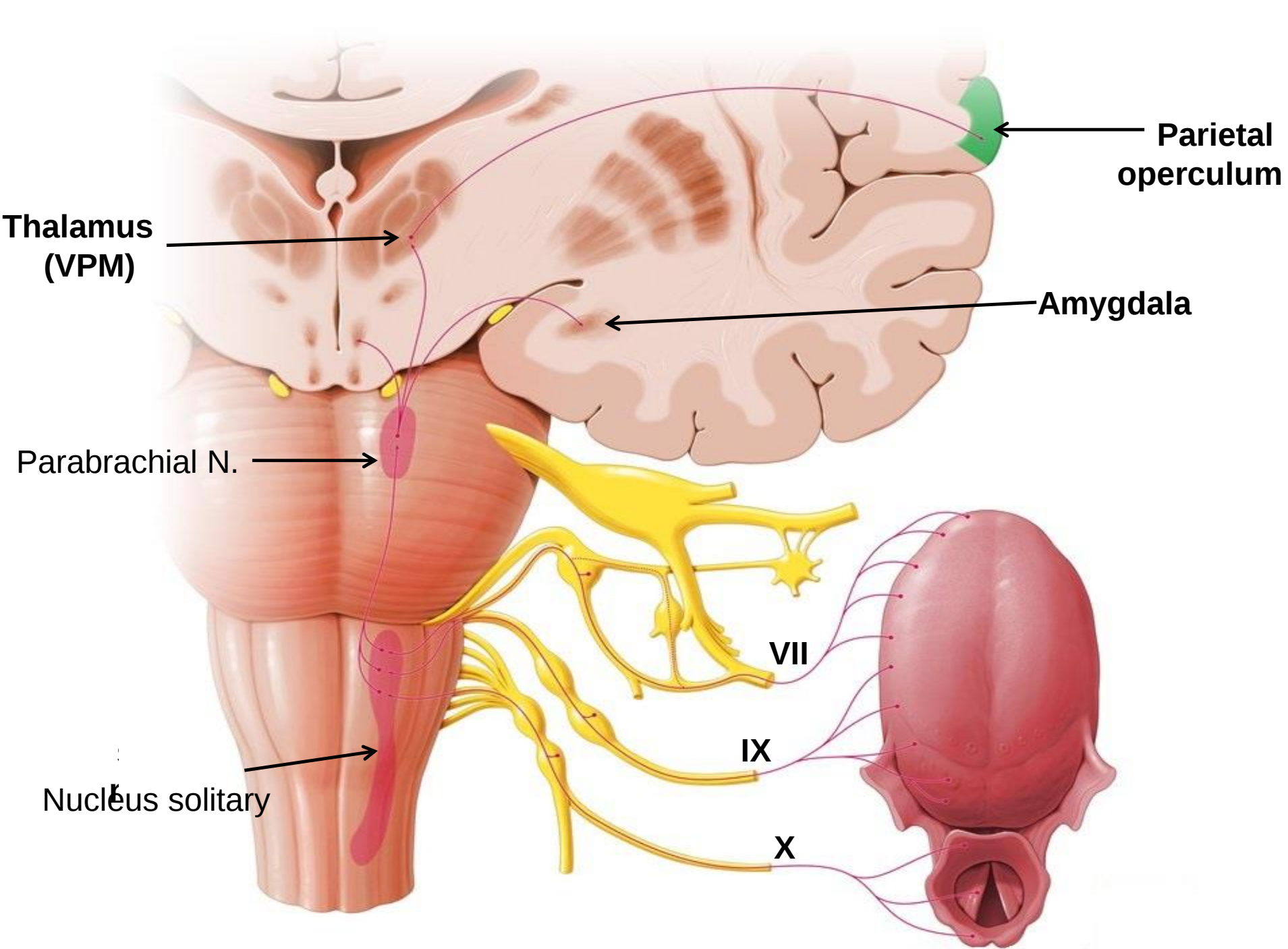
شاخه صماخی زوج ۹



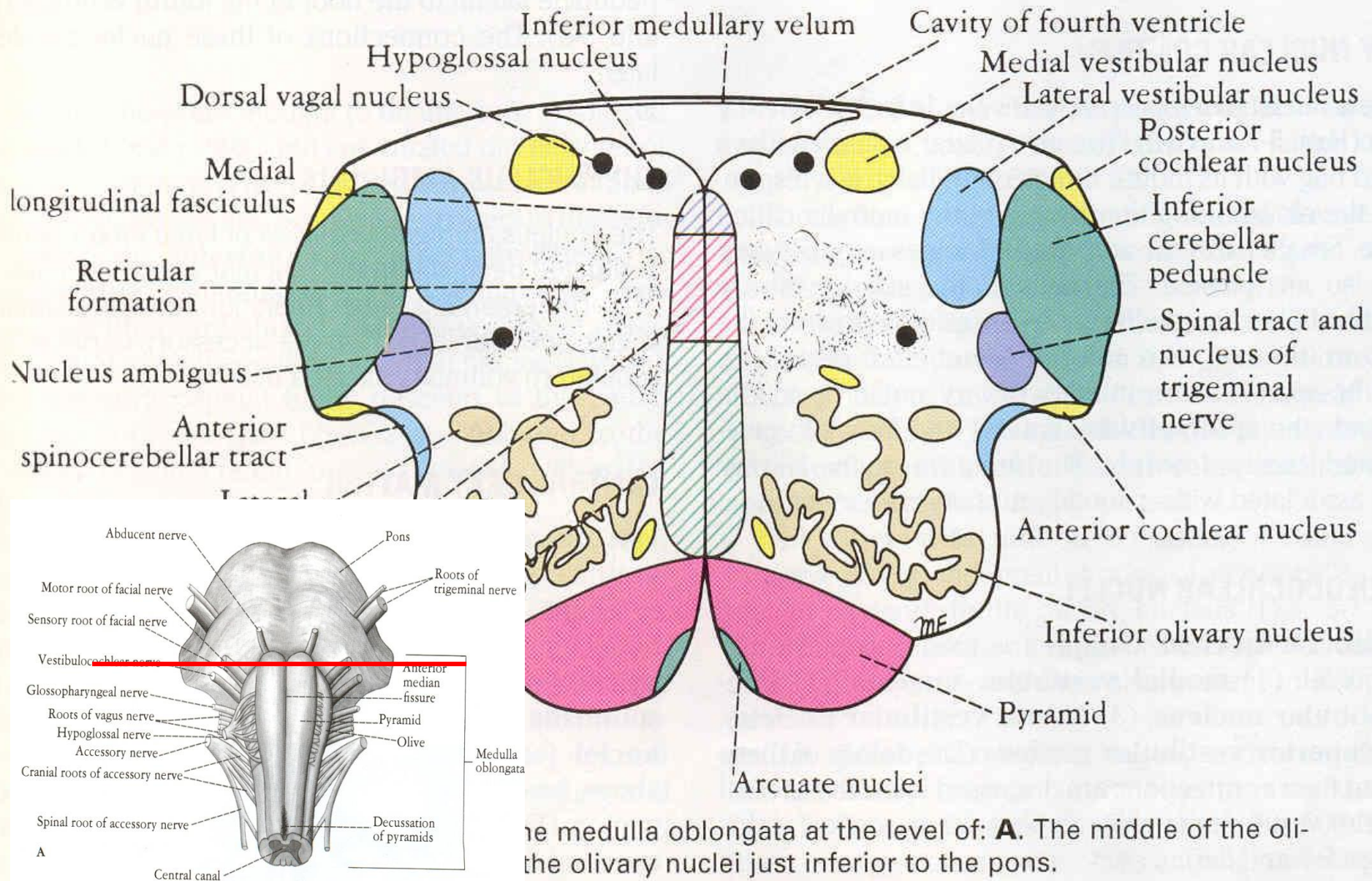


# Carotid sinus, GVA(Blood pressure and heart rate control)

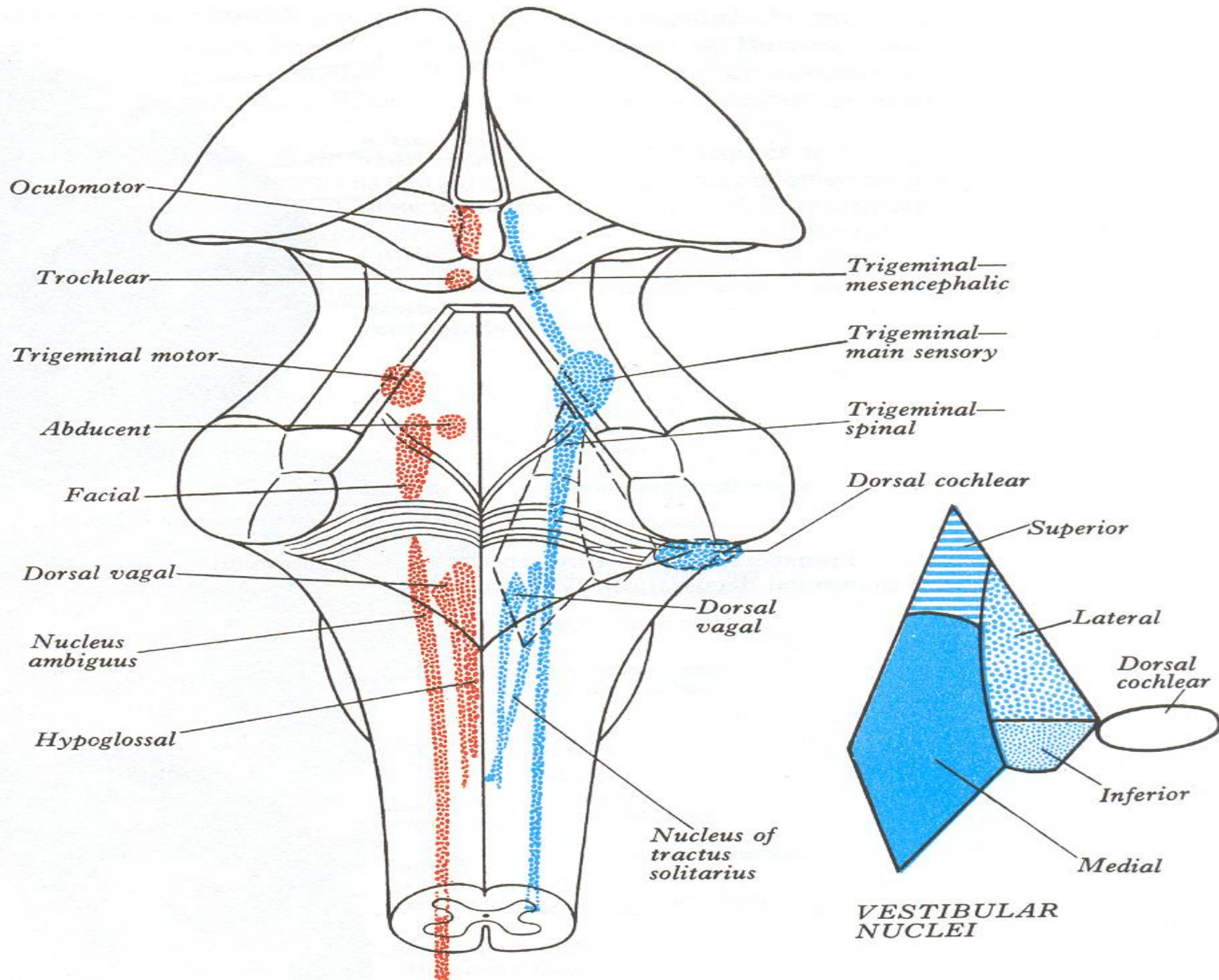




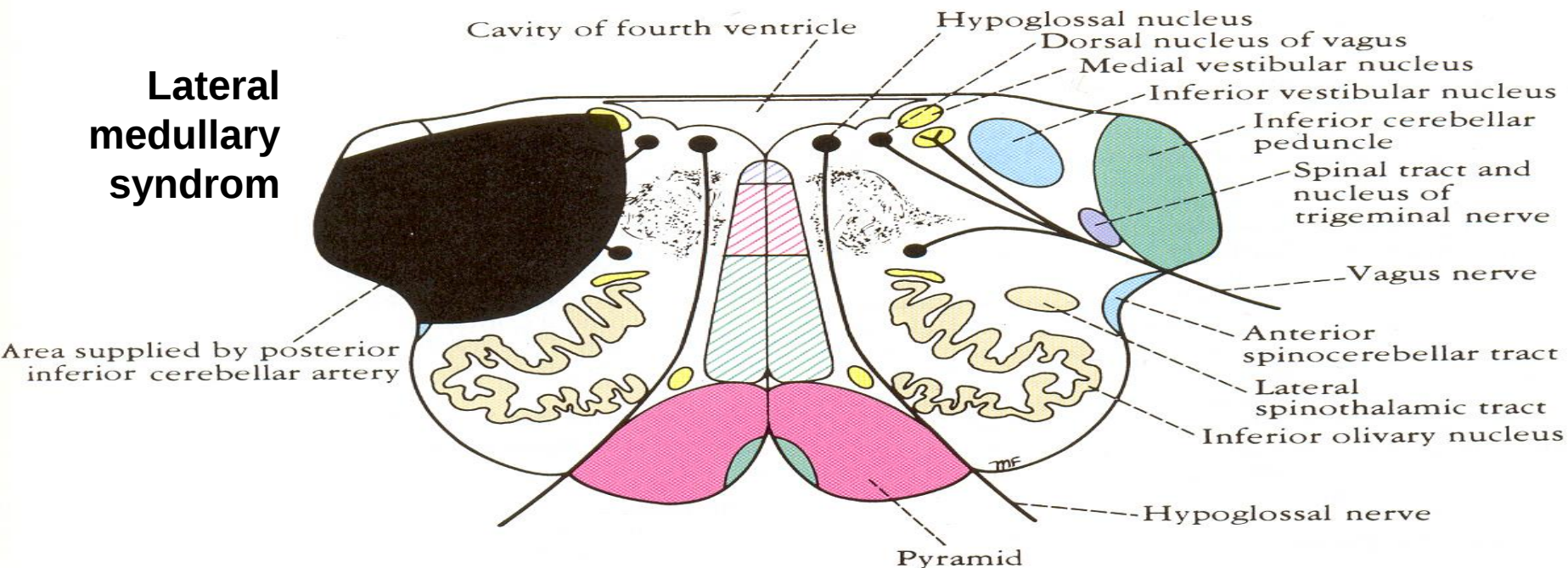
## سطح فوقانی بصل النخاع زیر پل



ne medulla oblongata at the level of: **A**. The middle of the oli-  
the olivary nuclei just inferior to the pons.

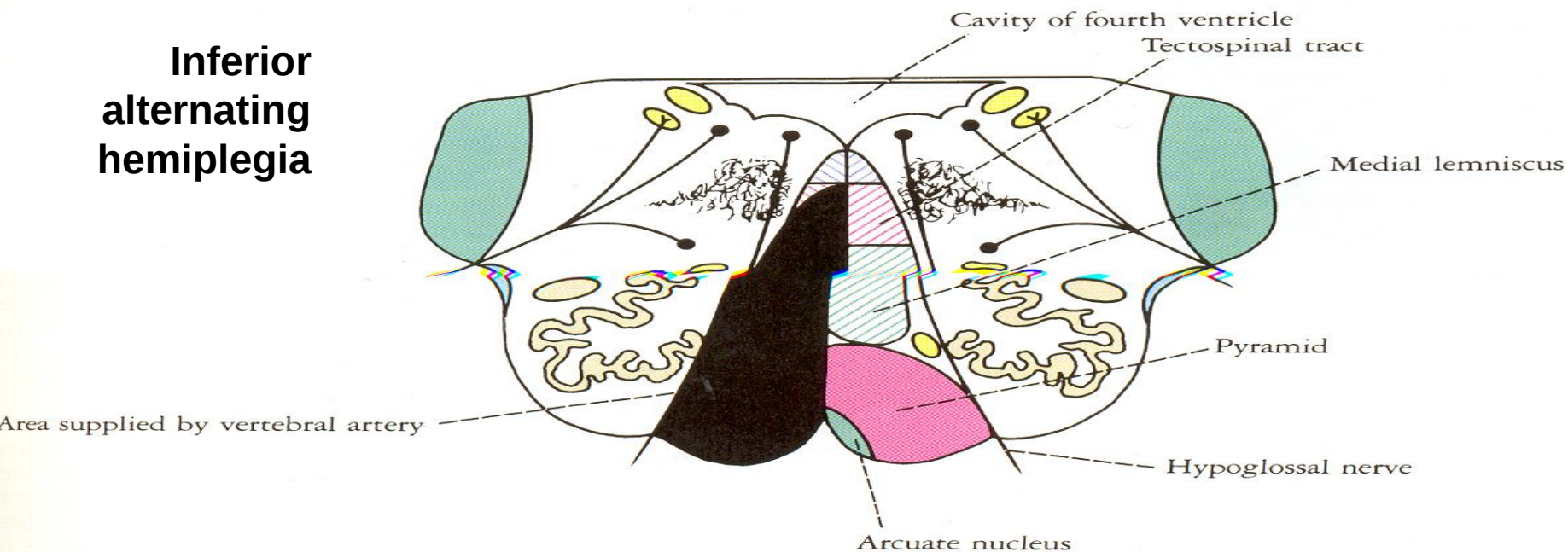


## Lateral medullary syndrom

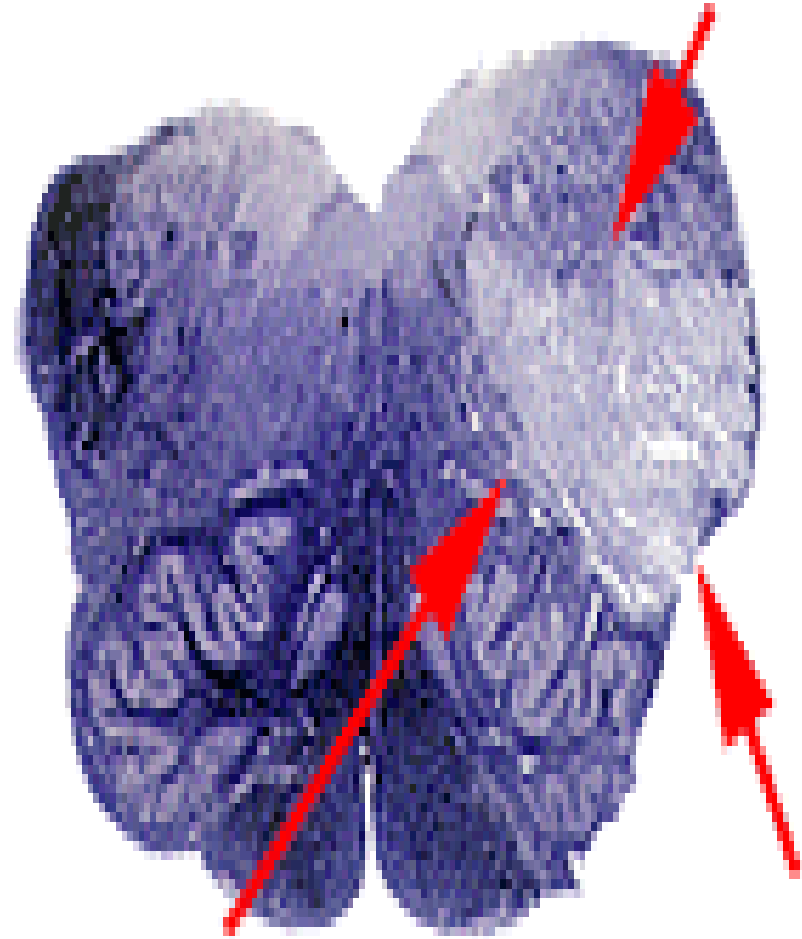


**Figure 5-24** Transverse section of the medulla oblongata at the level of the inferior olivary nuclei, showing the extent of the lesion producing the lateral medullary syndrome.

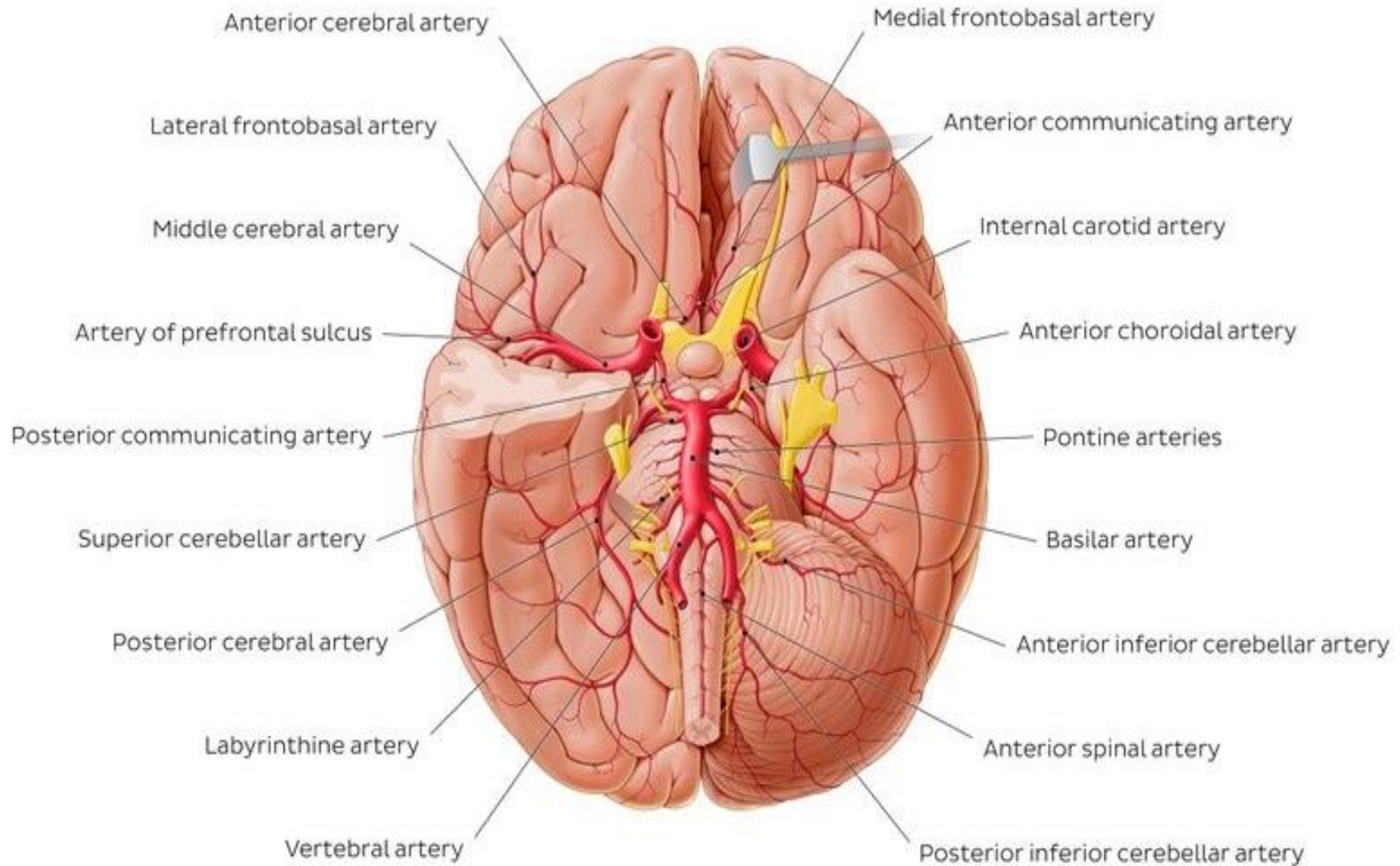
## Inferior alternating hemiplegia

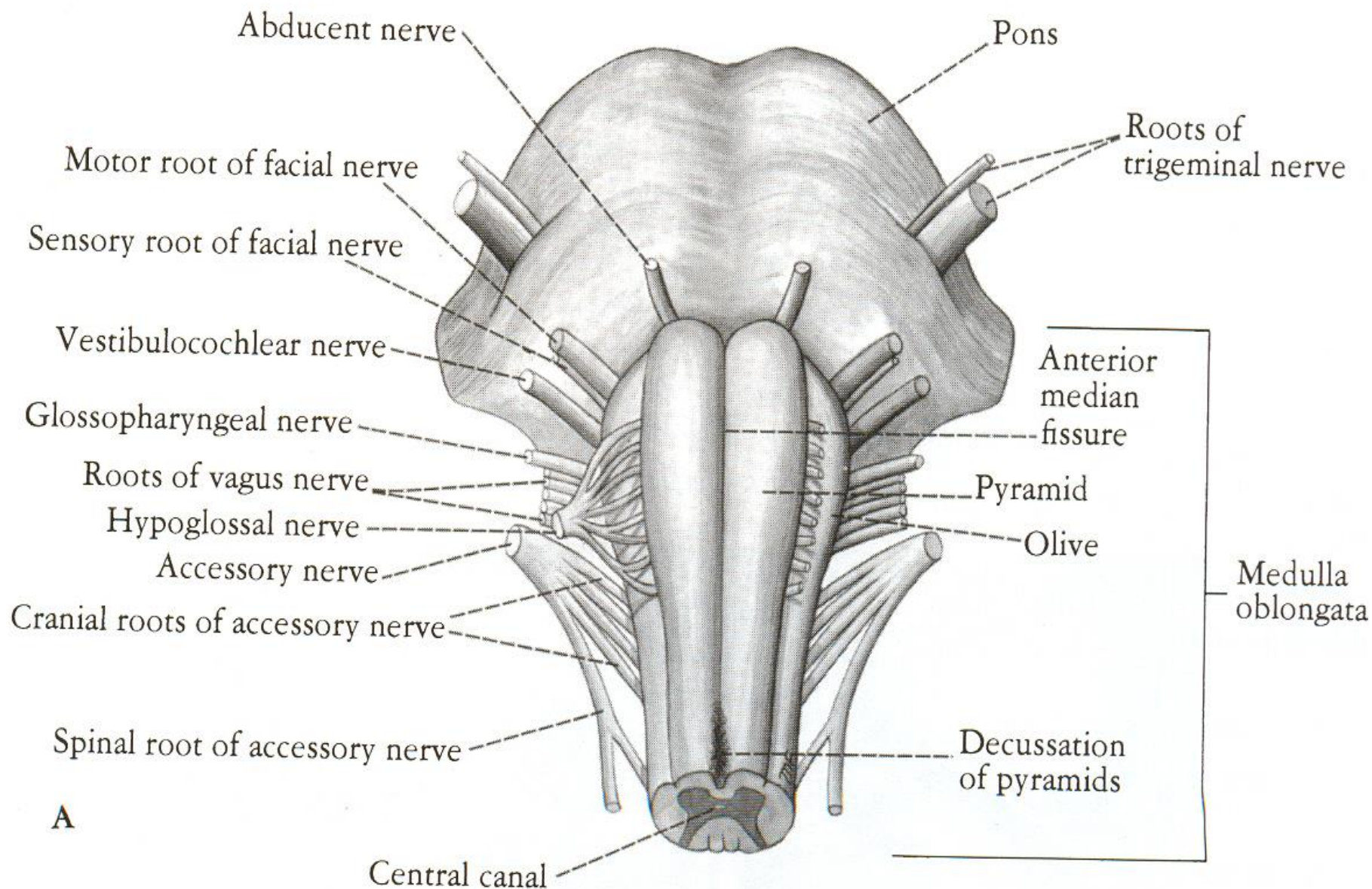


# سندرم لقرال مدولاری (والنبرگ)



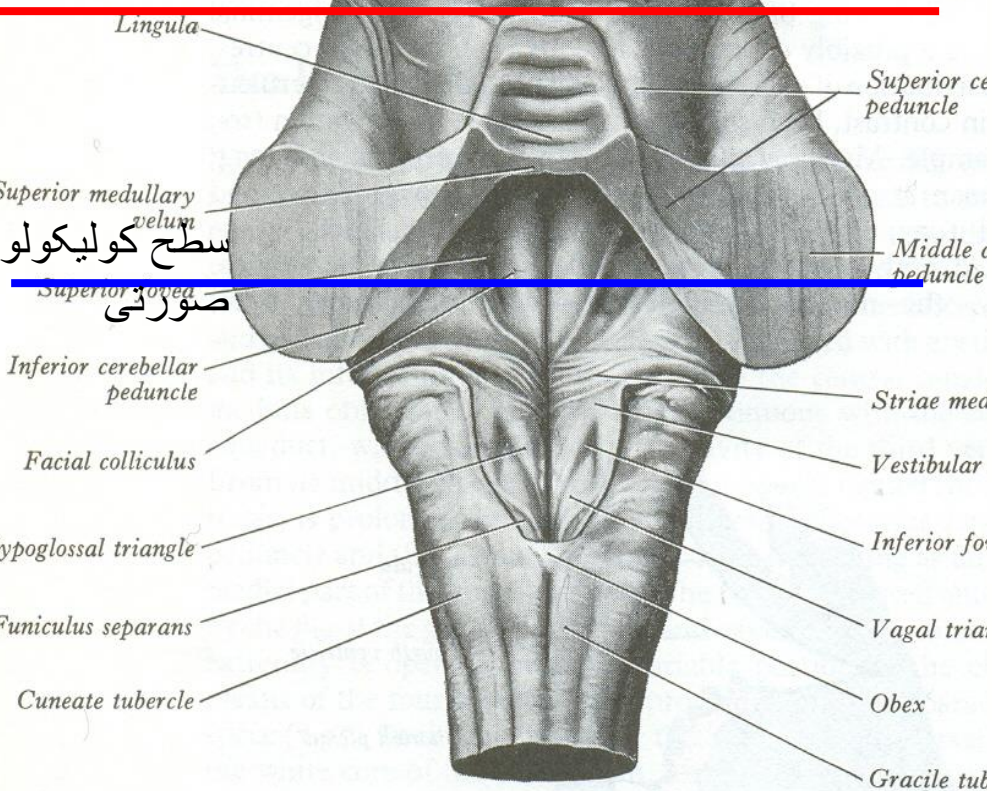
# Pons



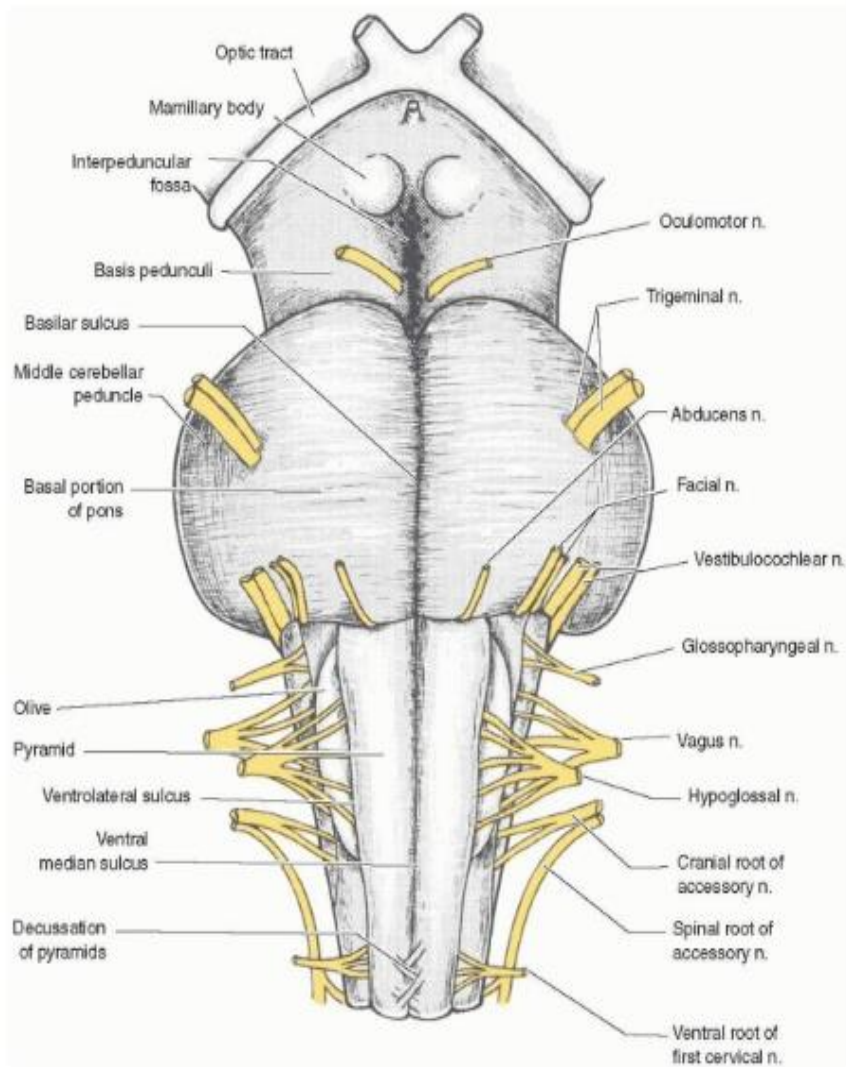


A

سطح فوقانی پل



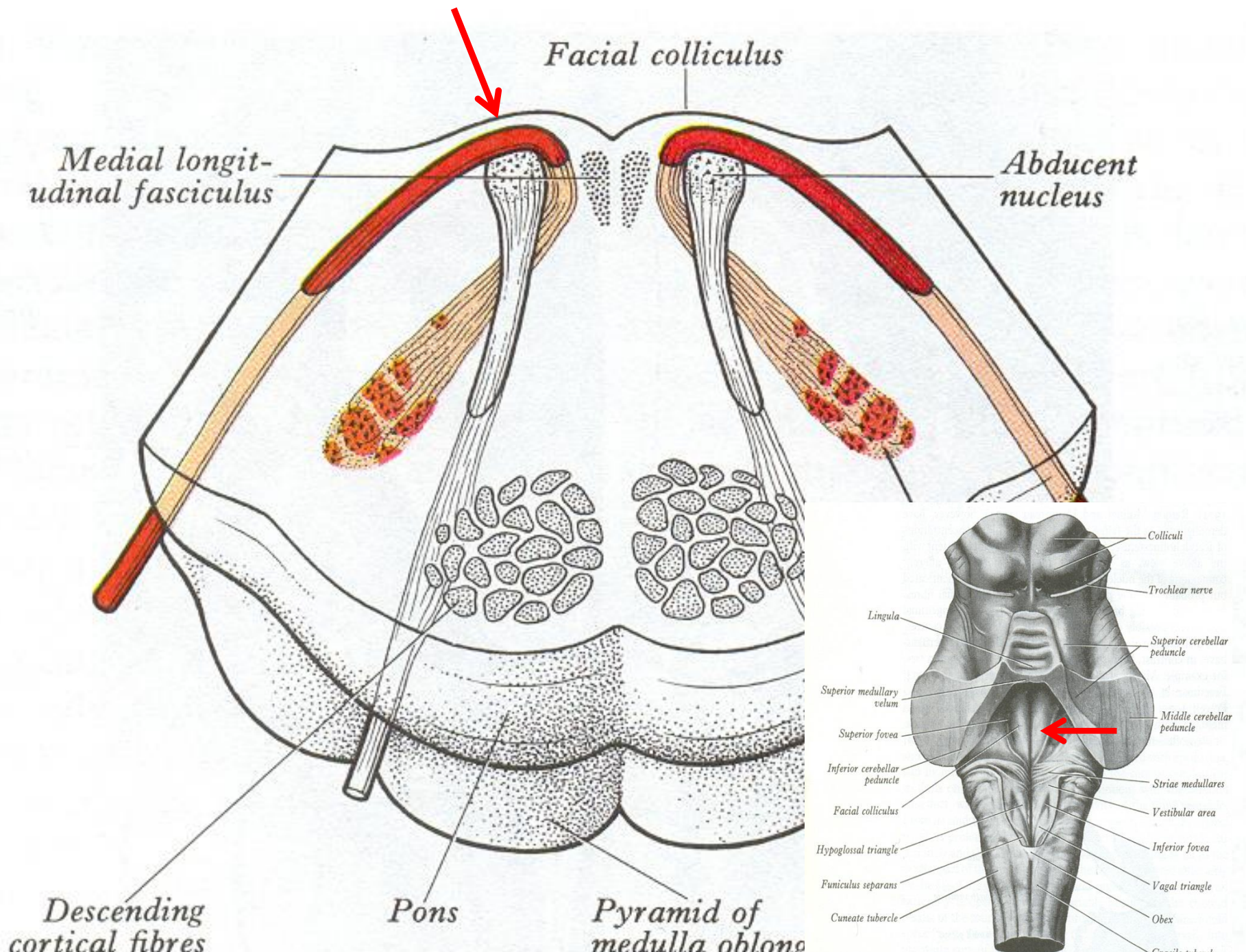
7.89 The rhomboid fossa, or 'floor' of the fourth ventricle.



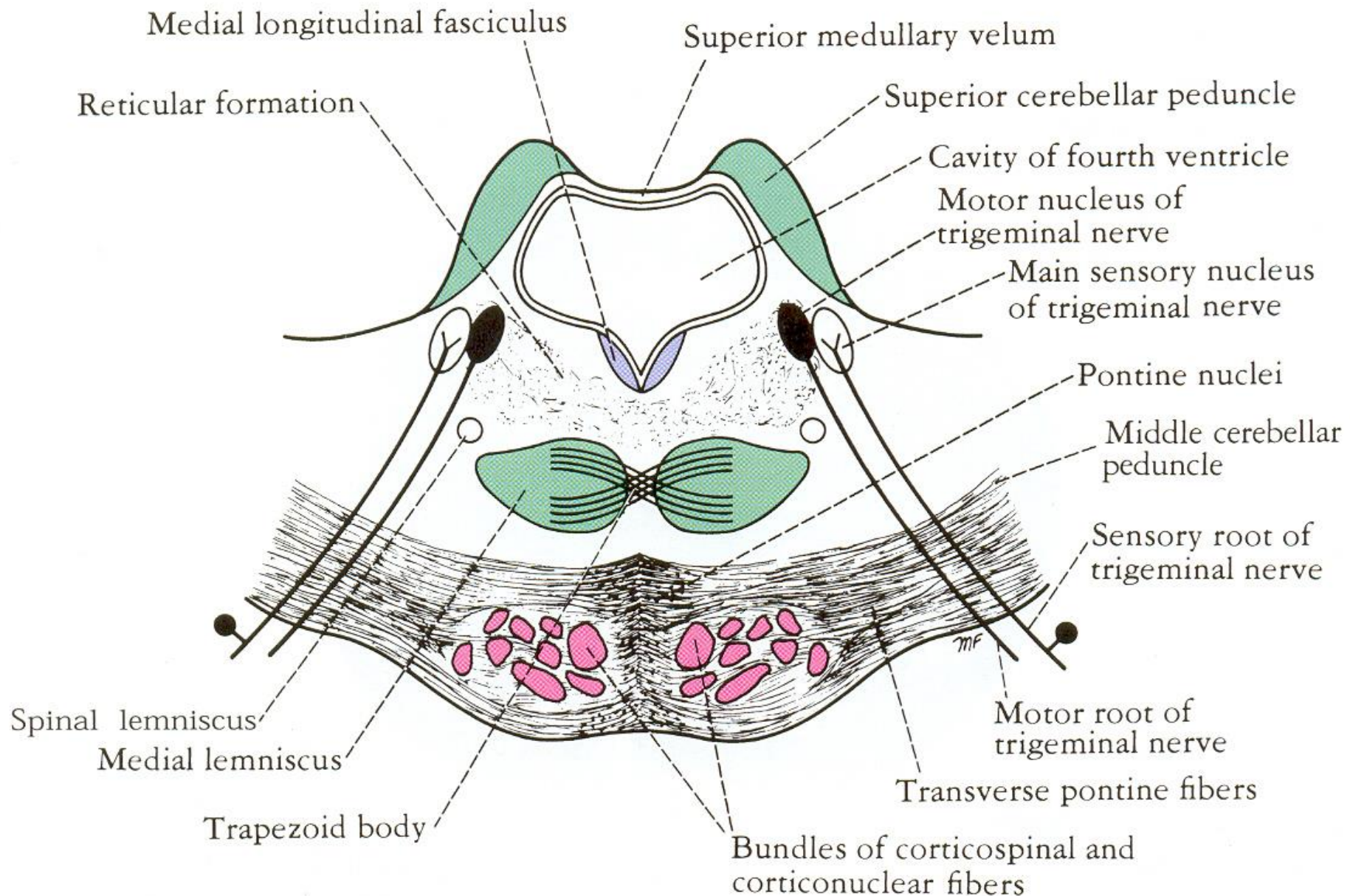
# مقطع پل در قسمت کولیکولوس صورتی

Cavity of fourth ventricle  
Medial longitudinal fasciculus  
Superior medullary velum



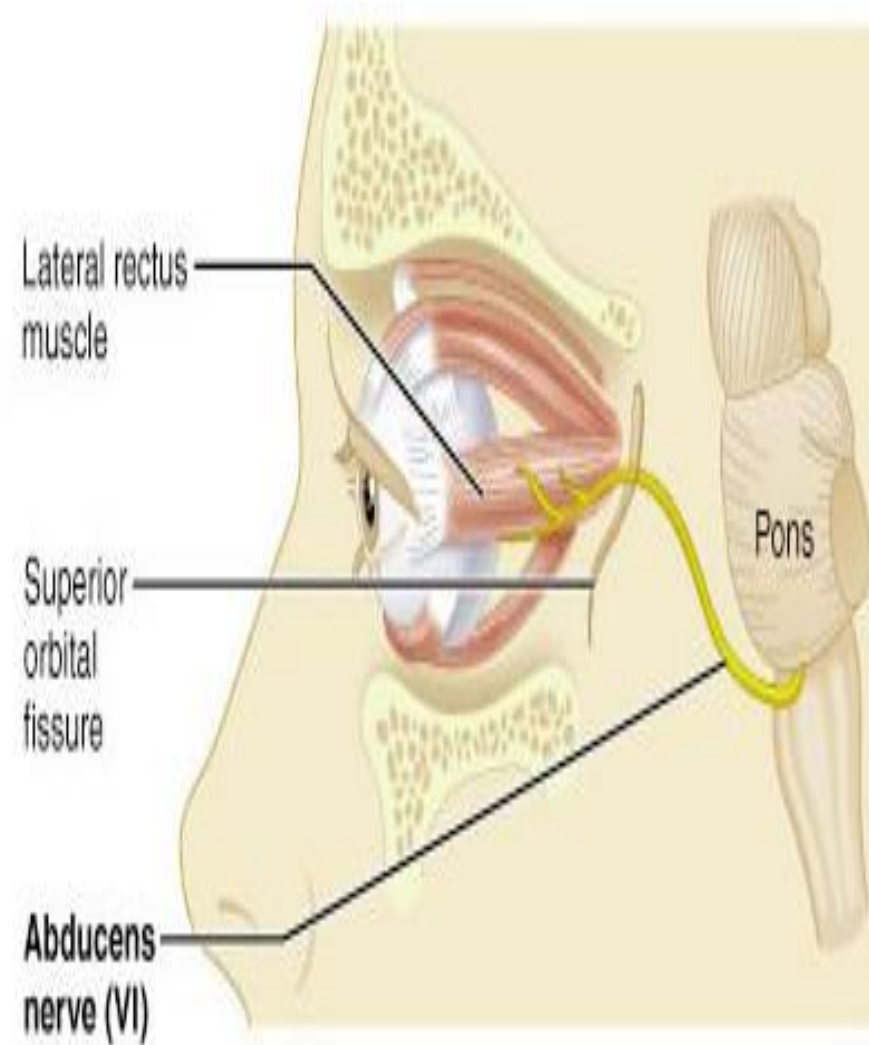
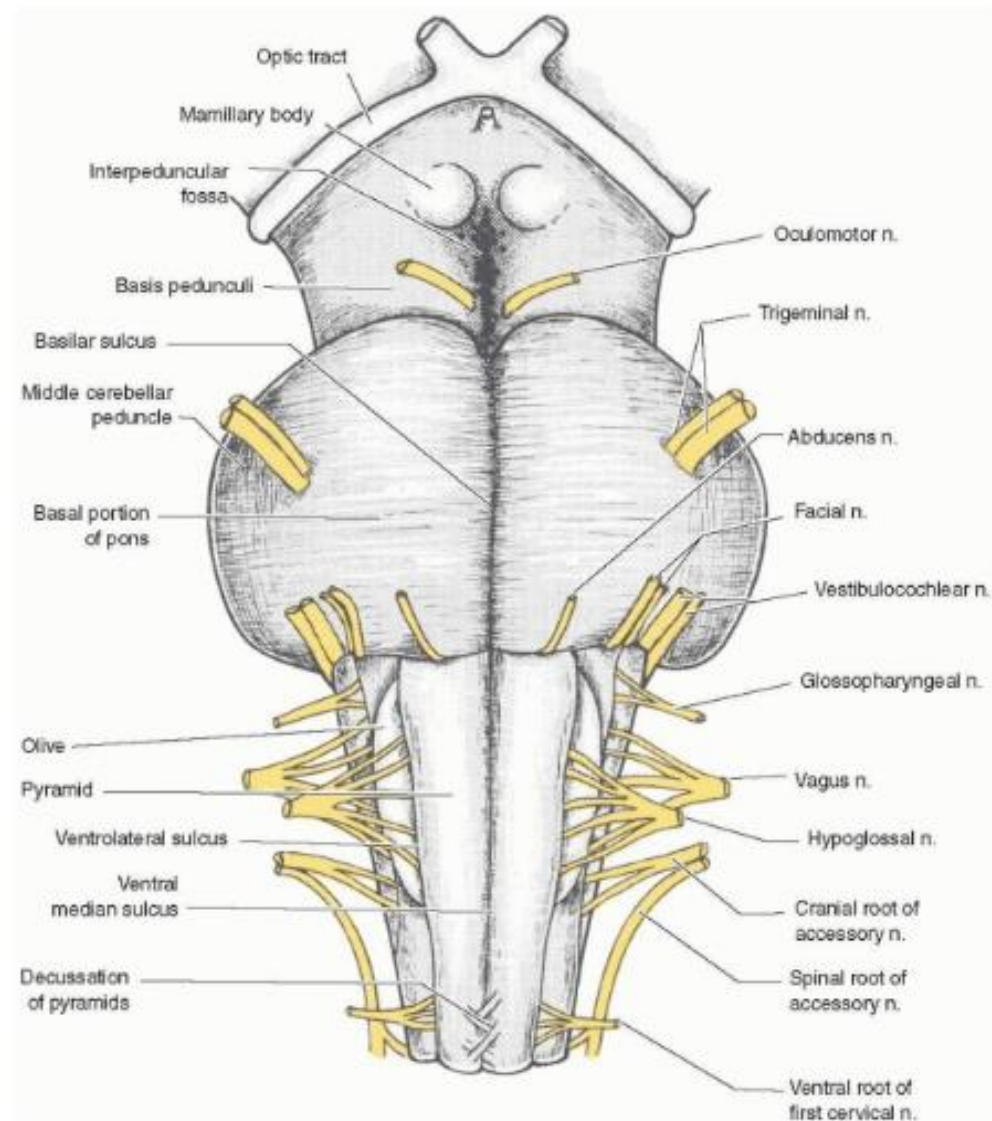


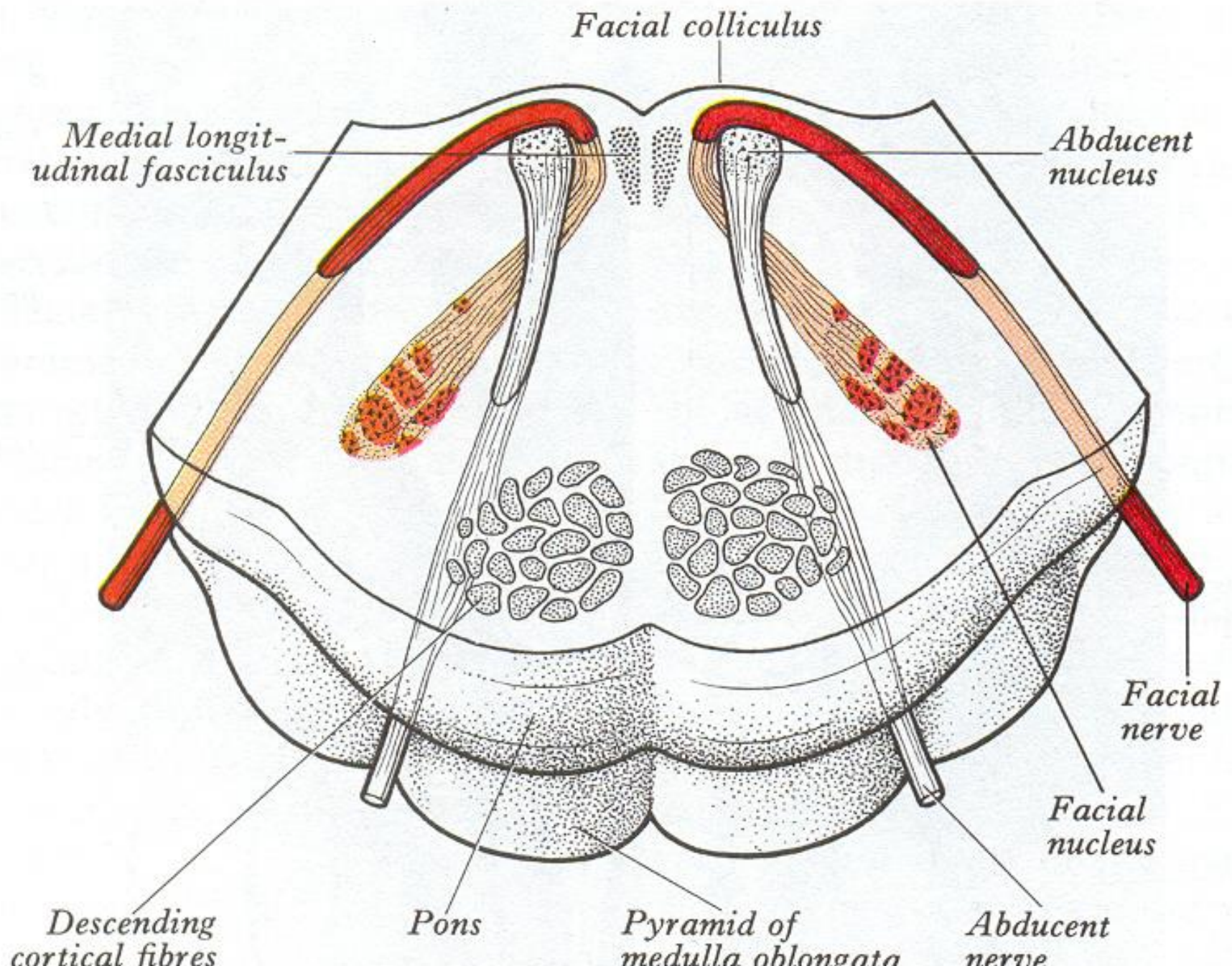
## مقطع پل در قسمت فوقانی



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

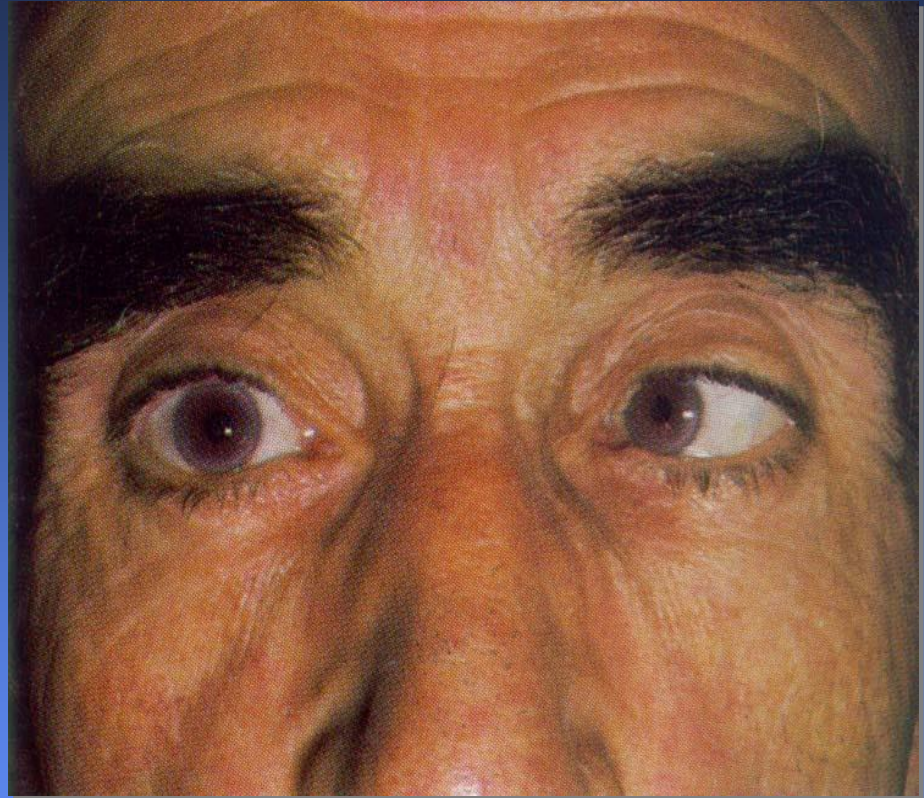
# Abducens N.(GSE)





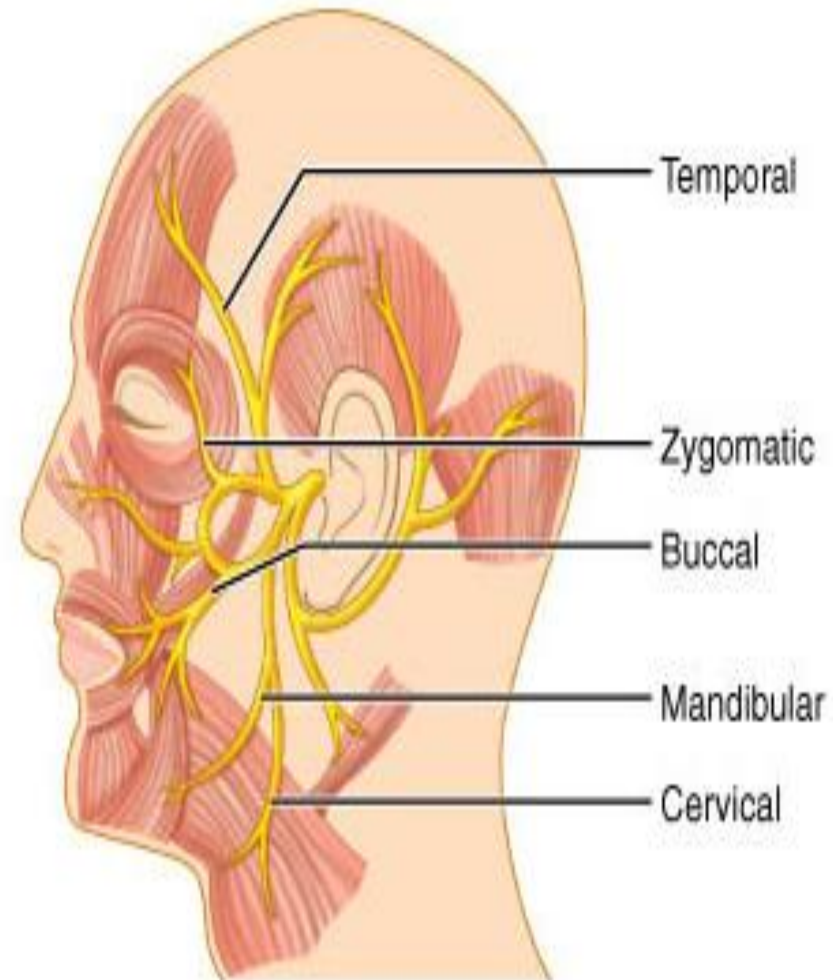
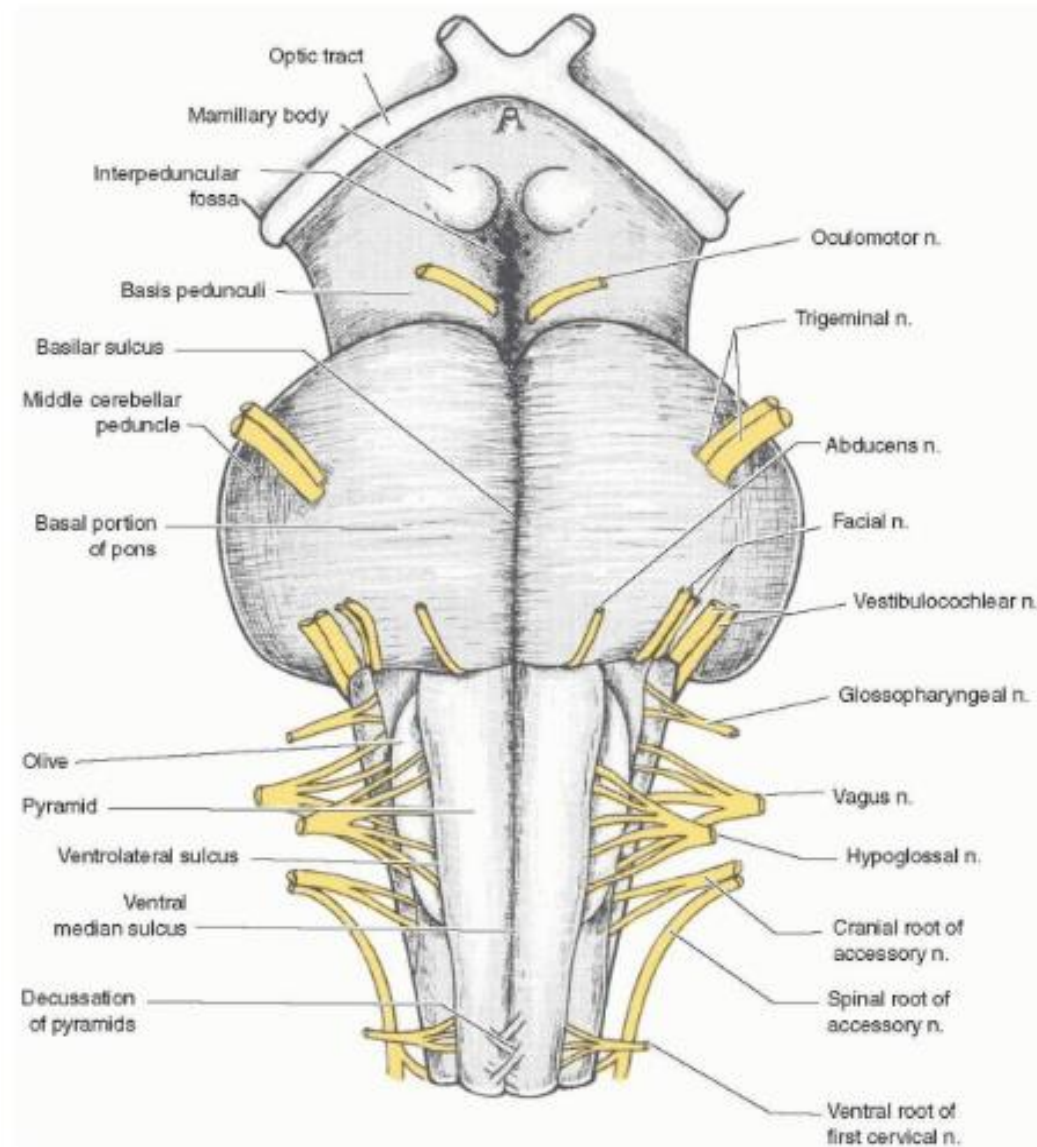
# *Abducens Palsy*

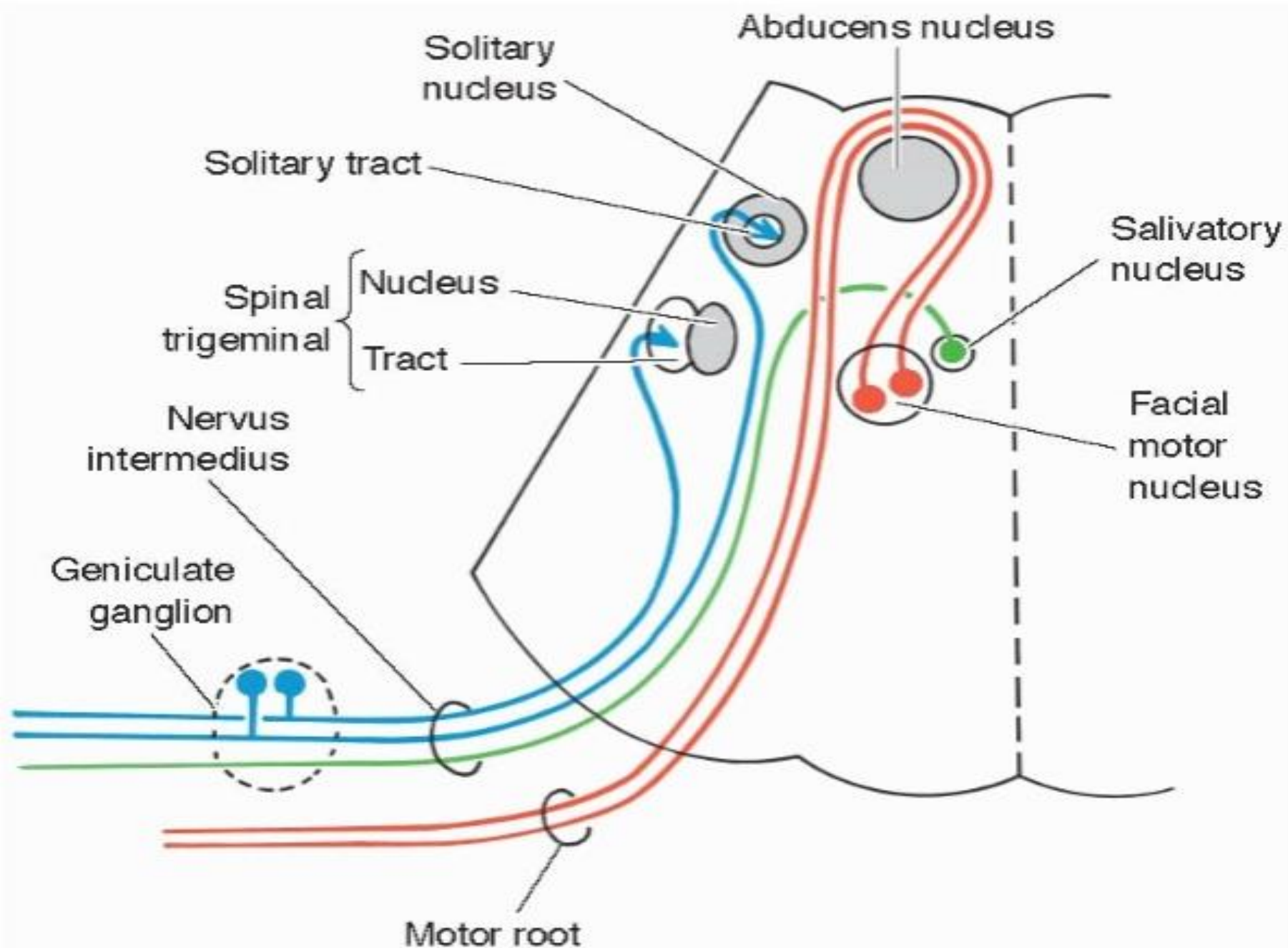
*Lower Motor  
Neuron  
Syndrome*



**Lateral Gaze Paralysis**

# Facial N.(GSA,SVA,GVE, SVE)

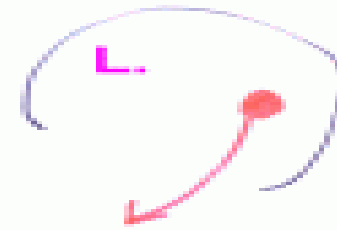






Right cortex

Left cortex



CEREBRAL  
HEMISPHERE

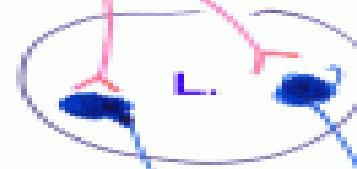
Cortico nuclear tract

DIAGRAM TO SHOW  
WHY AN UPPER  
MOTOR NEURON  
LESION AFFECTS  
THE MUSCLES  
OF ONLY THE LOWER  
HALF OF THE FACE

Motor nucleus of facial



FACIAL  
NUCLEI

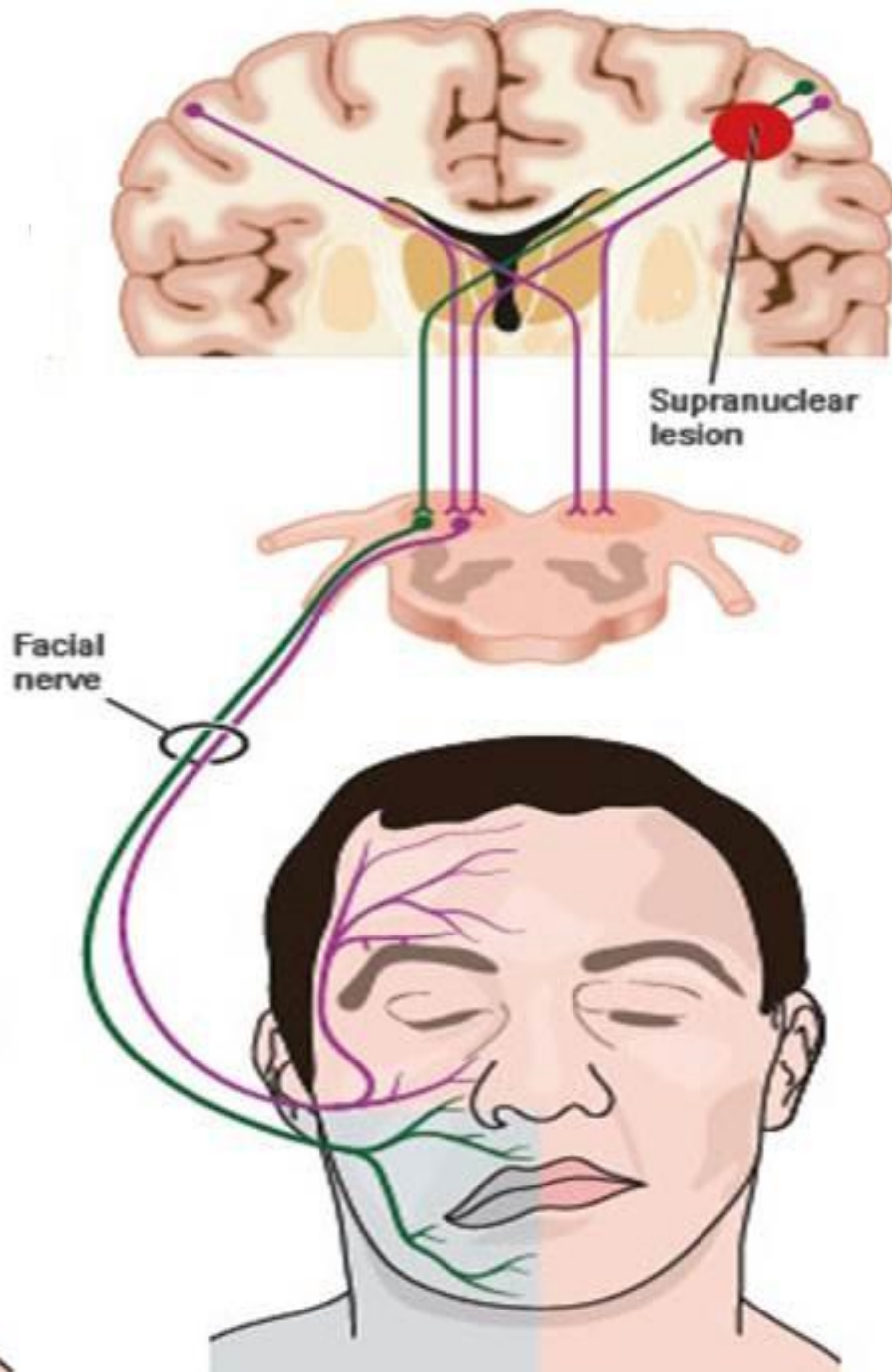


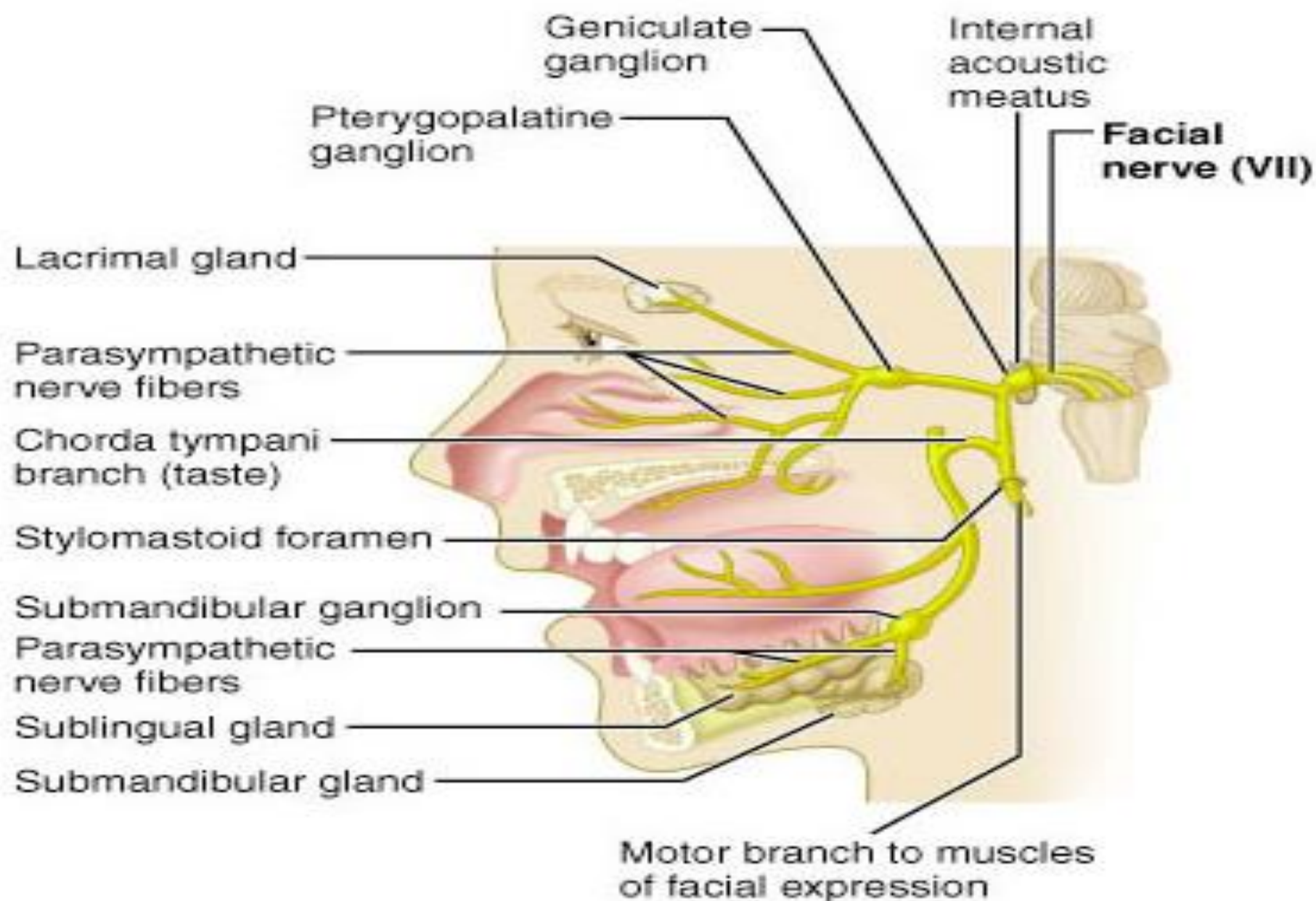
RIGHT

LEFT



## B. Supranuclear lesion





**(a) Parasympathetic efferents and sensory afferents**

هسته بزاقی فوقانی



عصب اینترمدیت



گانگلیون زانوئی



پاراسمپاتیک

عصب کوردا تیمپانی  
آورانهای چشمائی



عصب لینگوال



گانگلیون ساب مندیبولار (سمپاتیک + پاراسمپاتیک)



غده ساب مندیبولار و ساب لینگوال

کوردا تیمپانی  
(آورانهای چشمائی)



عصب لینگوال



عصب کوردا تیمپانی



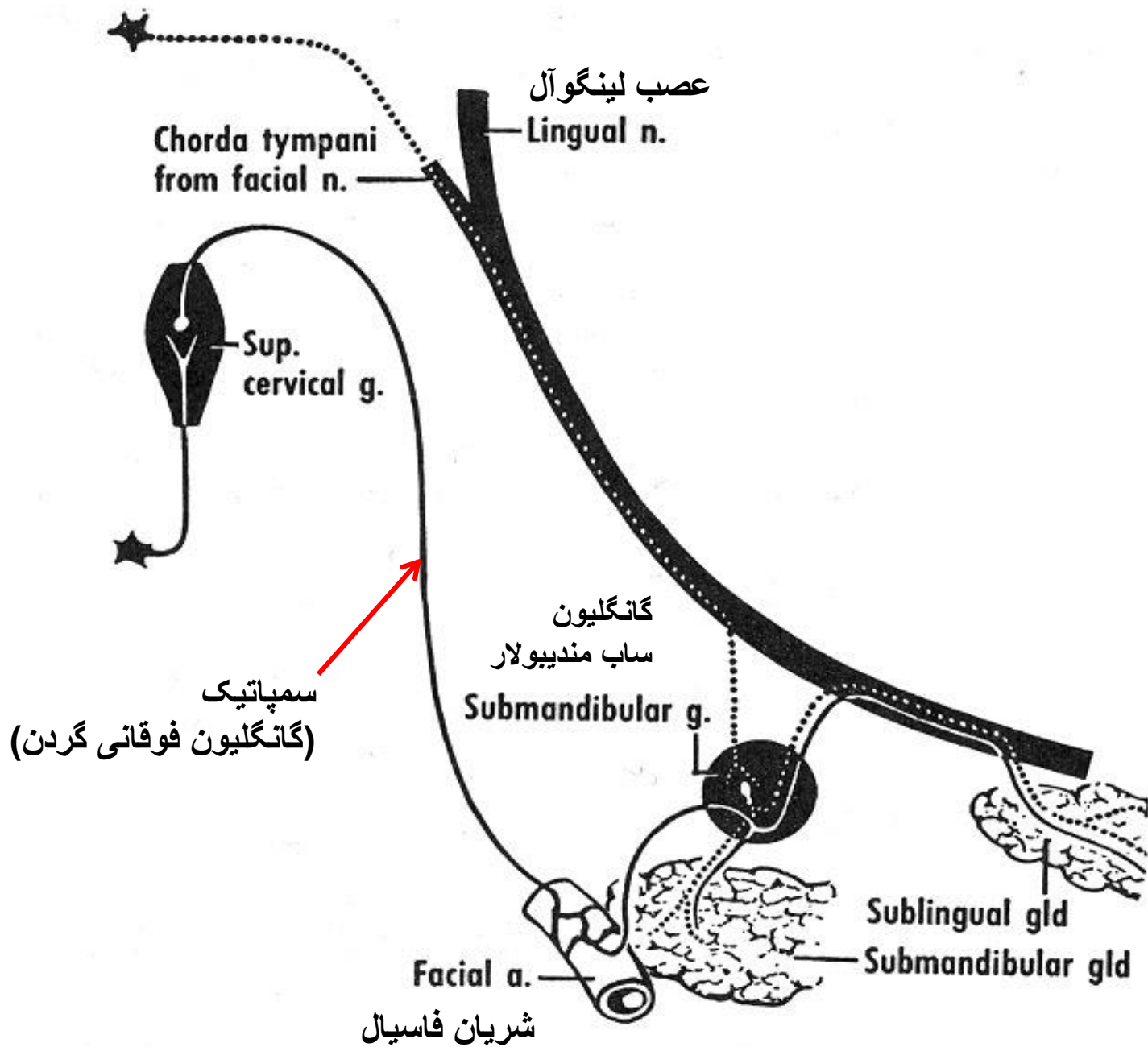
گانگلیون

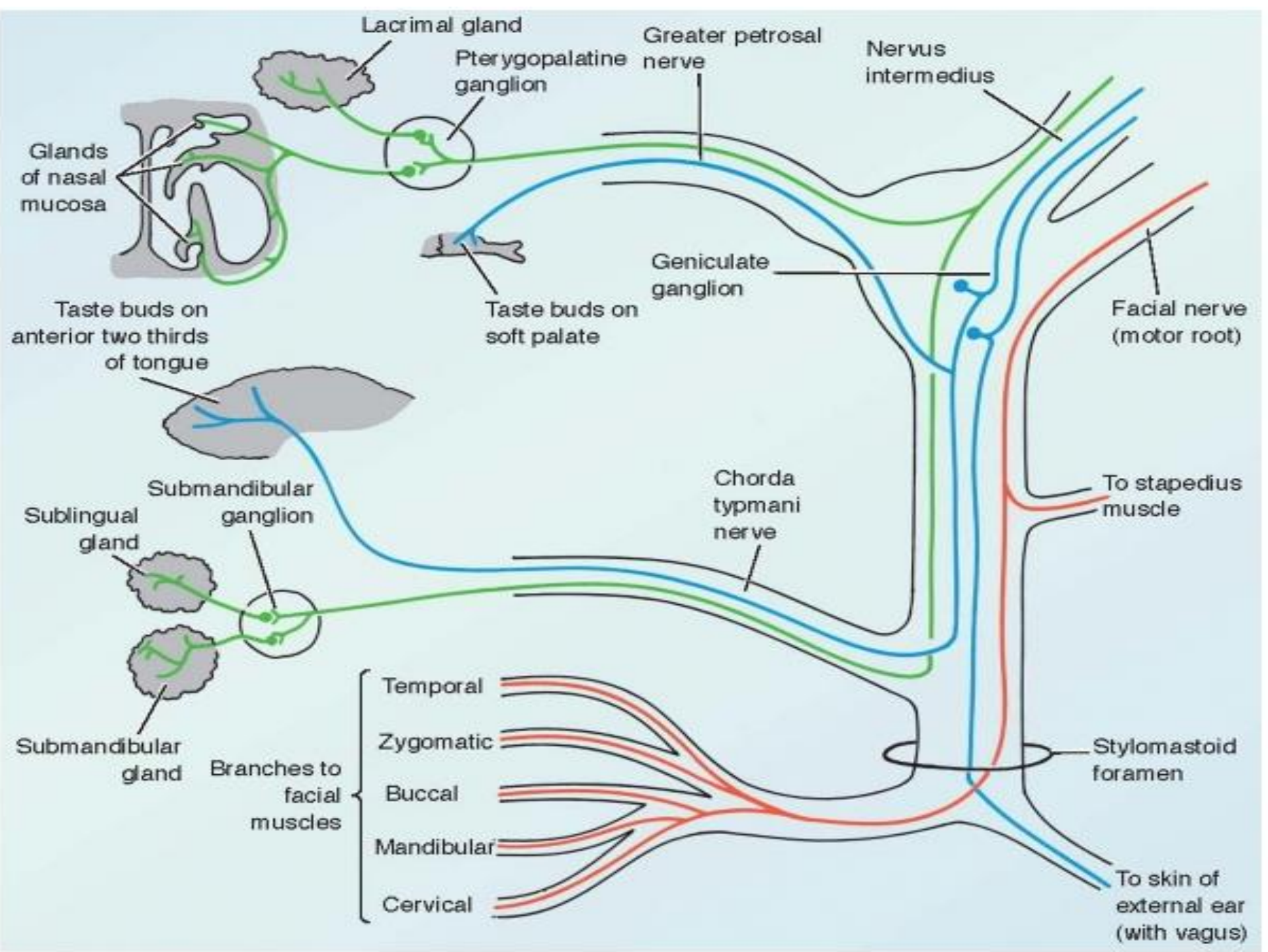
ساب مندیبولار



غده ساب مندیبولار







گانگلیون پتریگوپالاتین

عصب مجرای پتریگوئید  
(عصب ویدین)

عصب پتروزال بزرگ  
(پاراسمپاتیک)

سمپاتیک  
شریان کاروتید داخلی

هسته بزاقی فوقانی

عصب اینترمدیت

گانگلیون زانویی

عصب پتروزال بزرگ

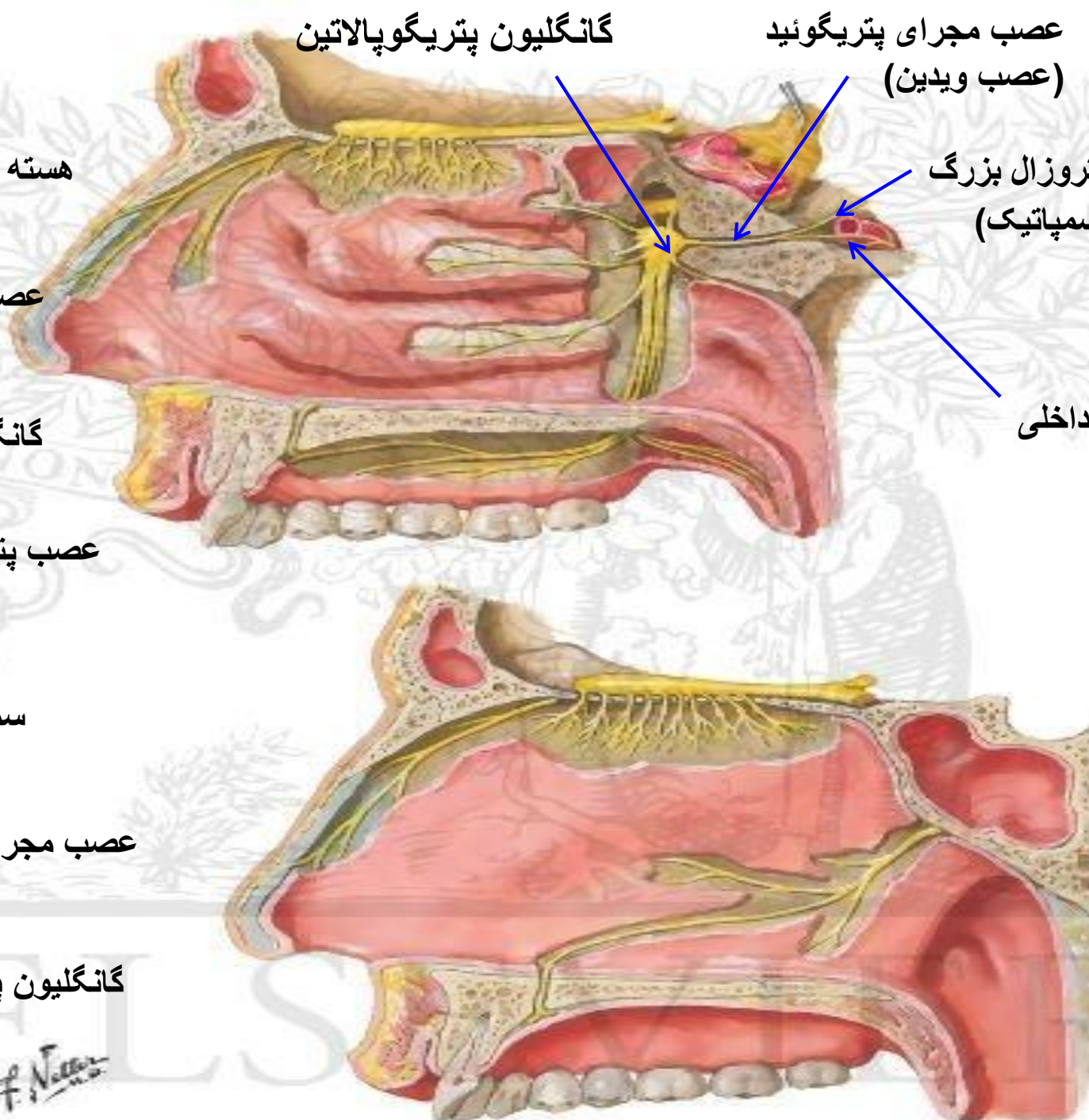
+

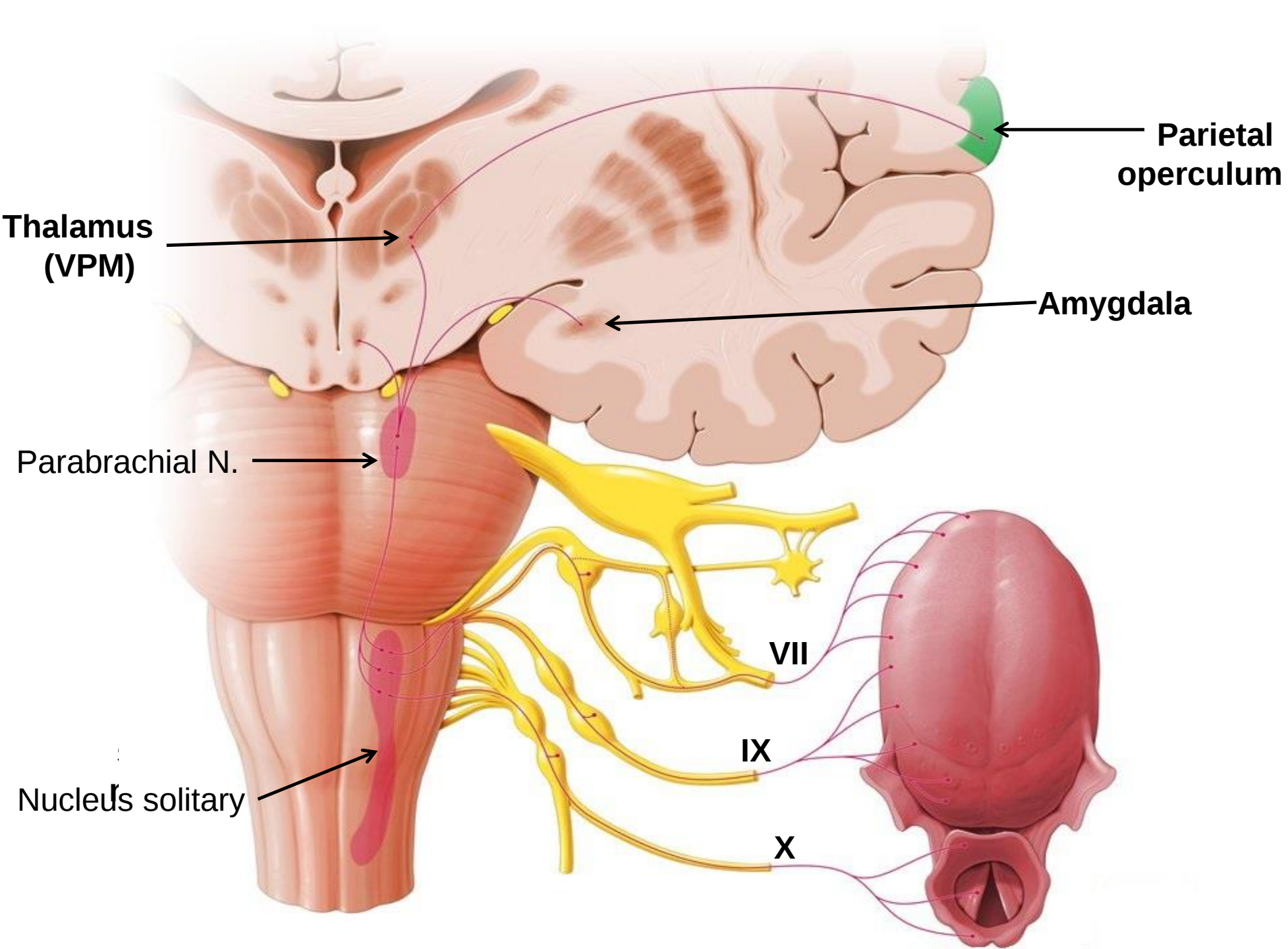
سمپاتیک

عصب مجرای پتریگوئید

گانگلیون پتریگوپالاتین

غدد اشکی



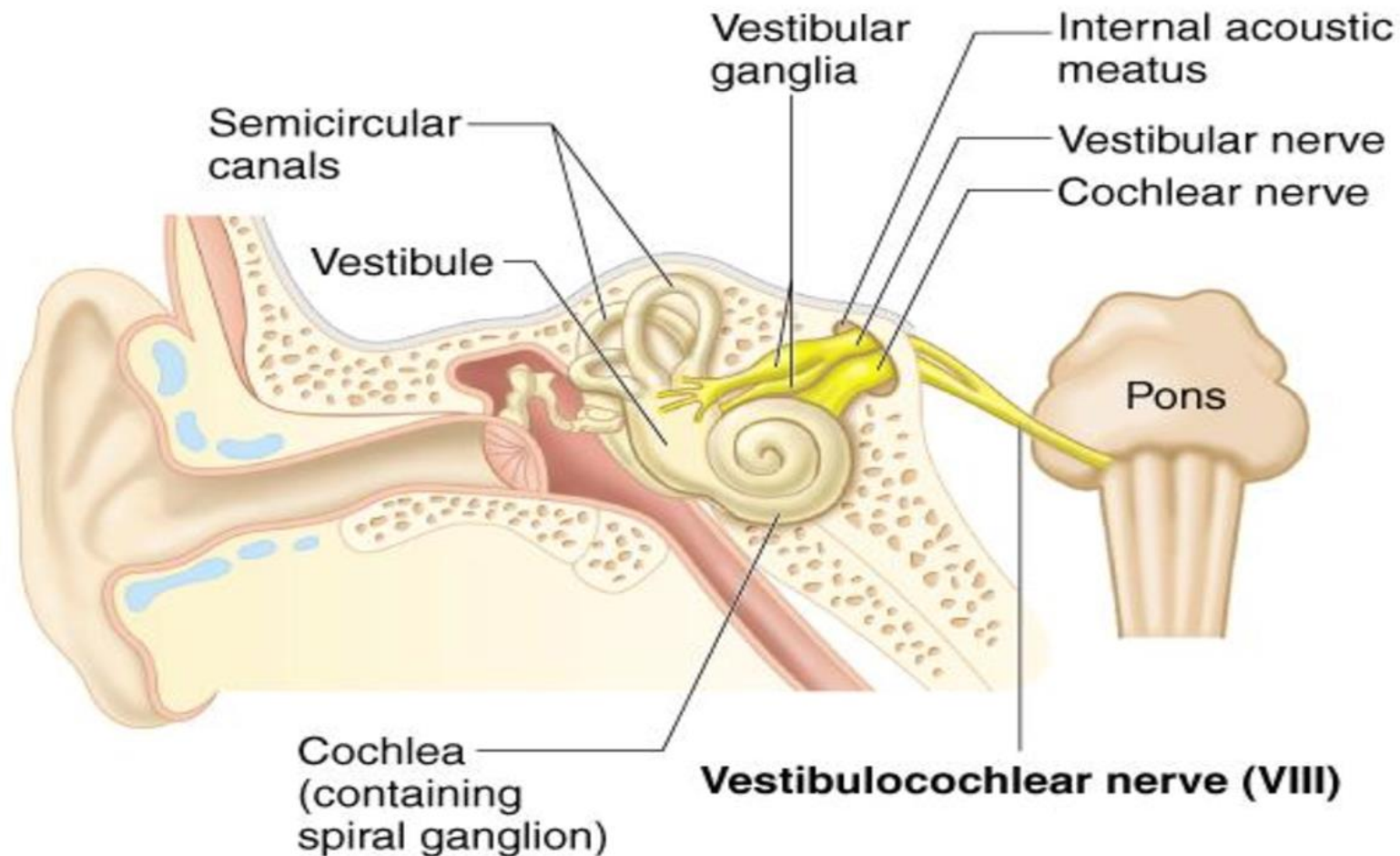


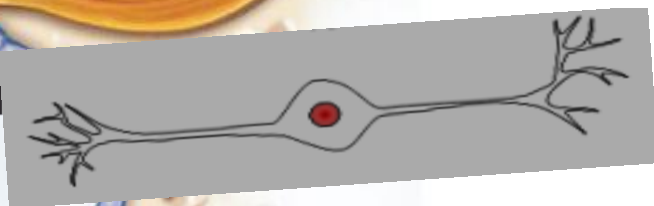
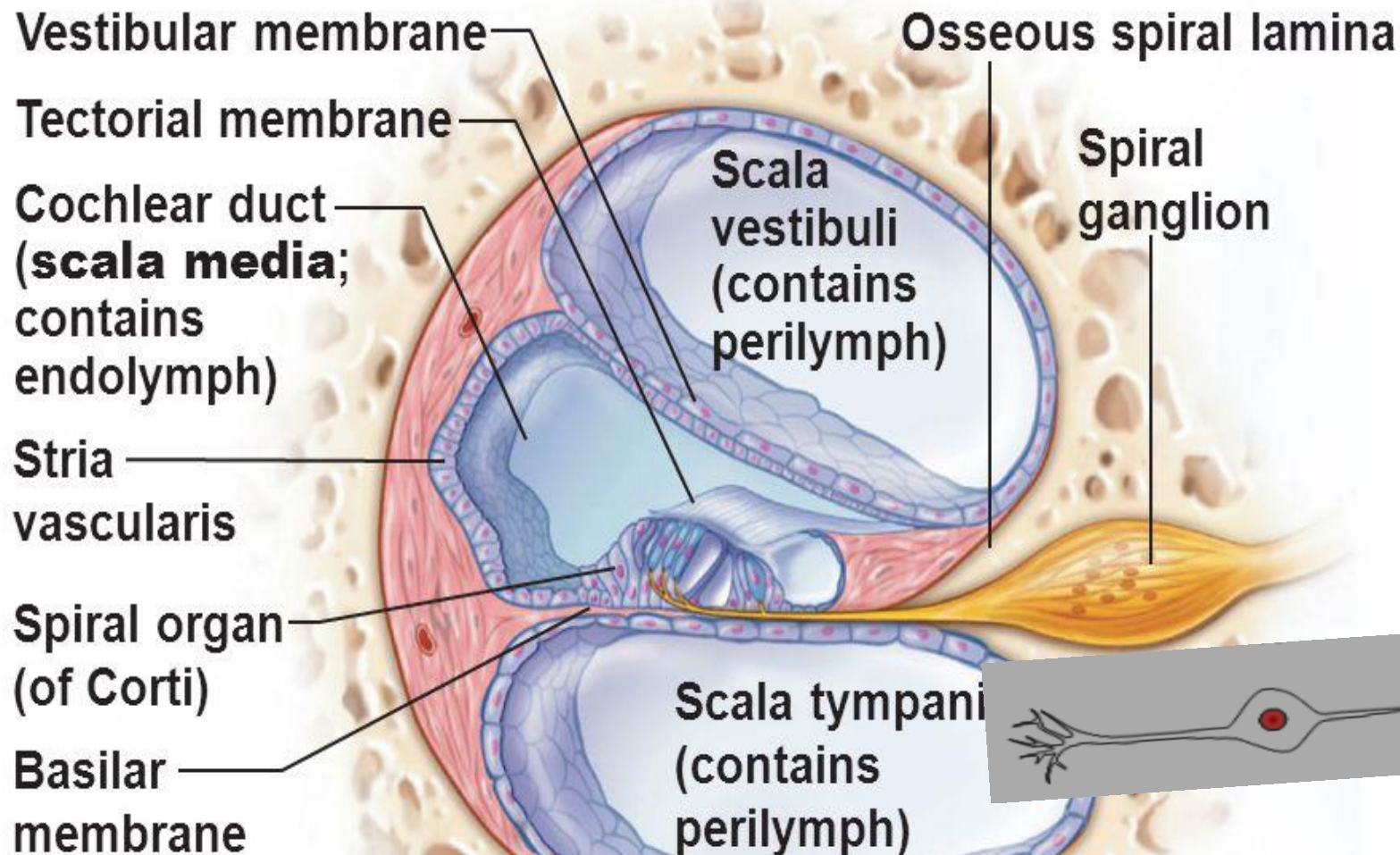
## *Facial Palsy (Bell's Palsy)*

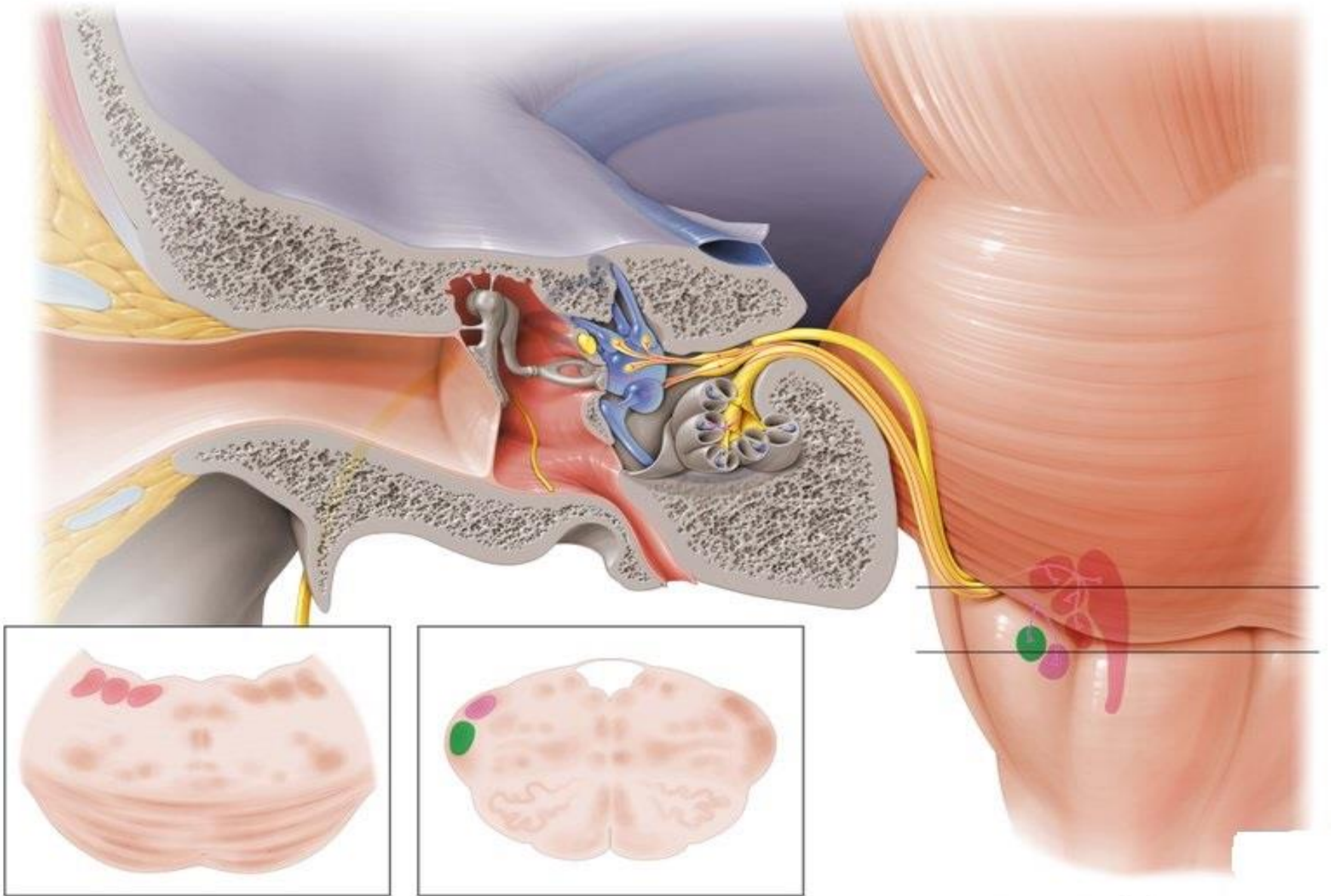


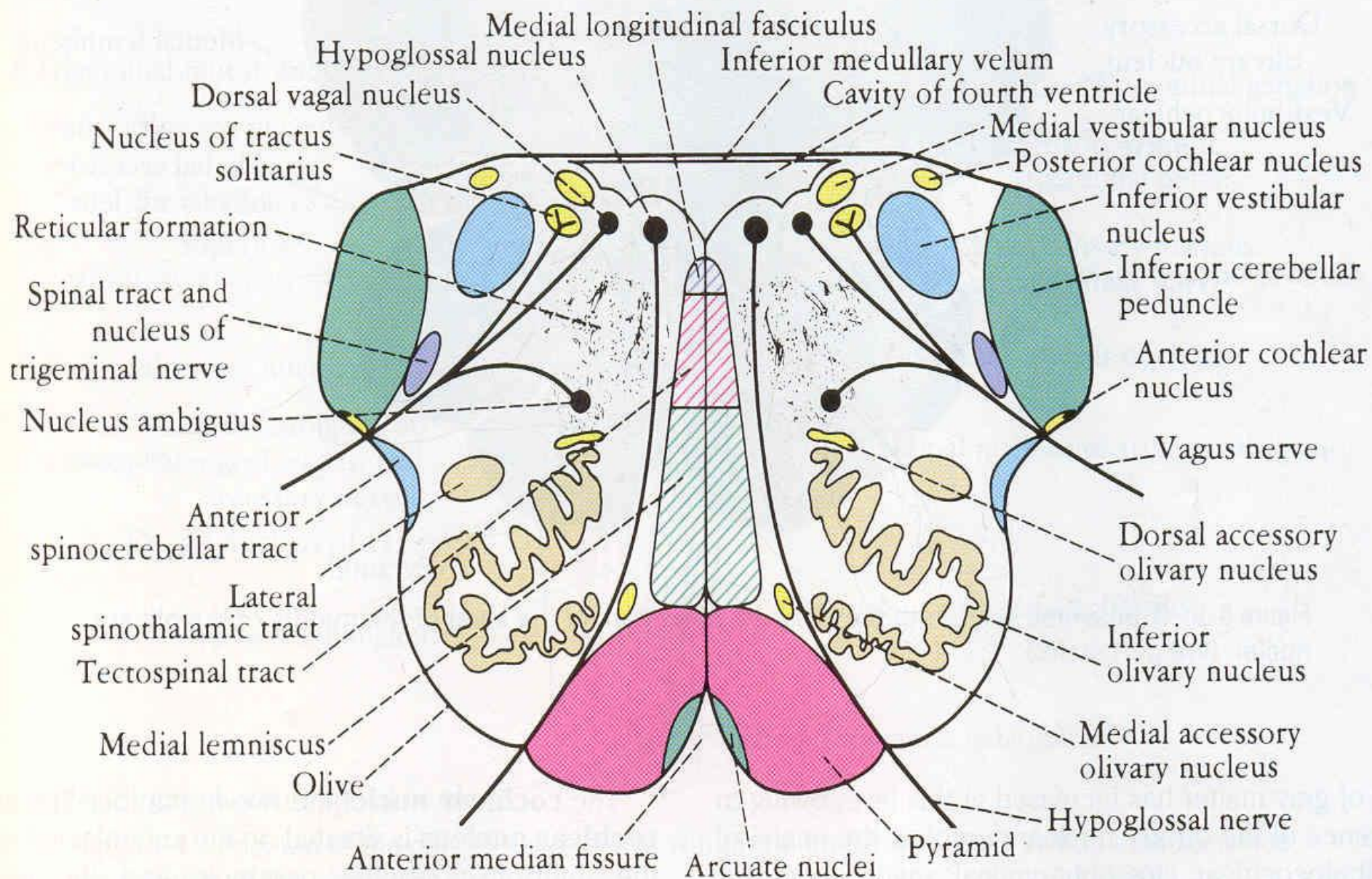
*Right facial paralysis*

# VESTIBULOCOCHLEAR NERVE









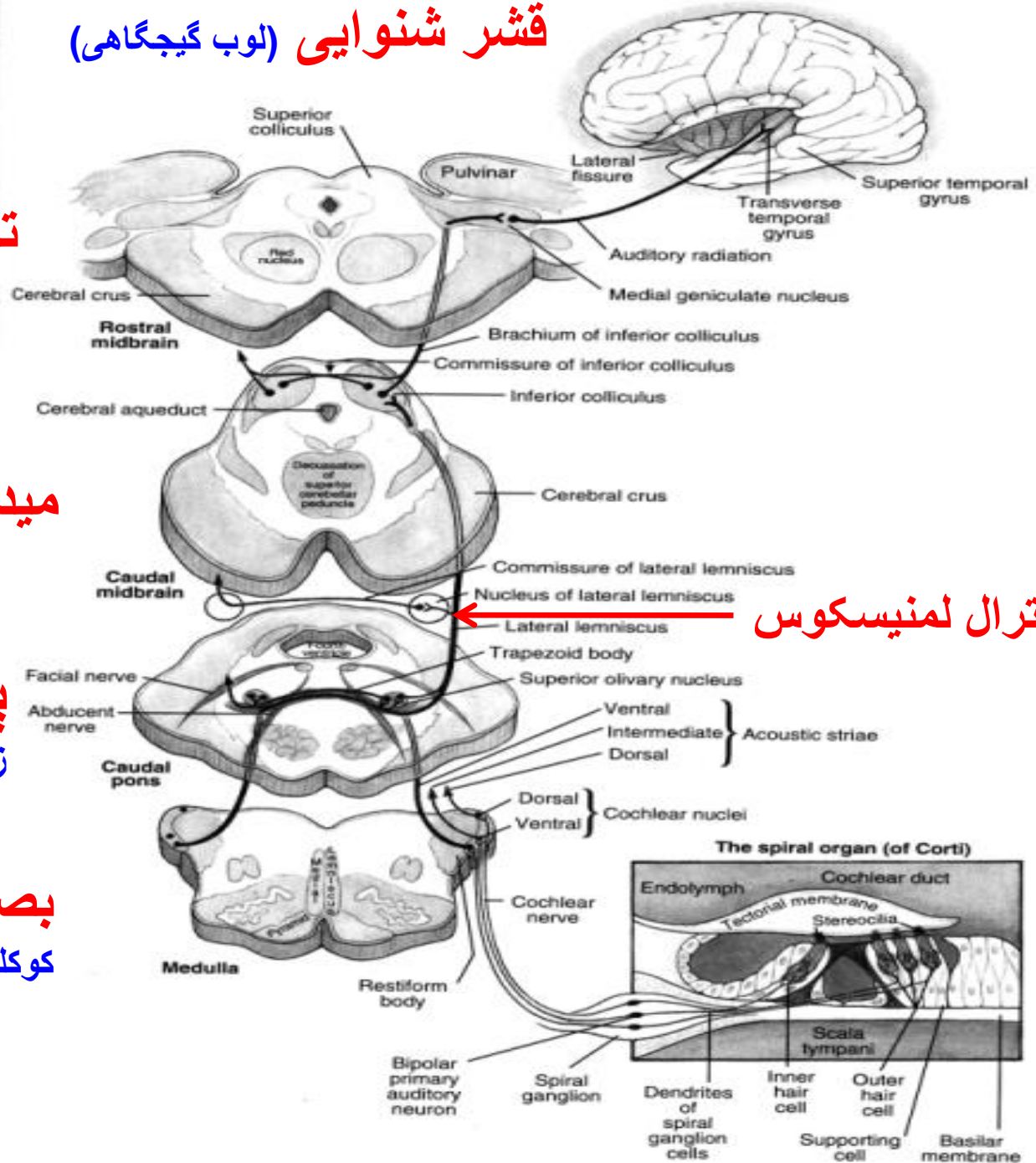
## قشر شنوایی (لوب گیجگاهی)

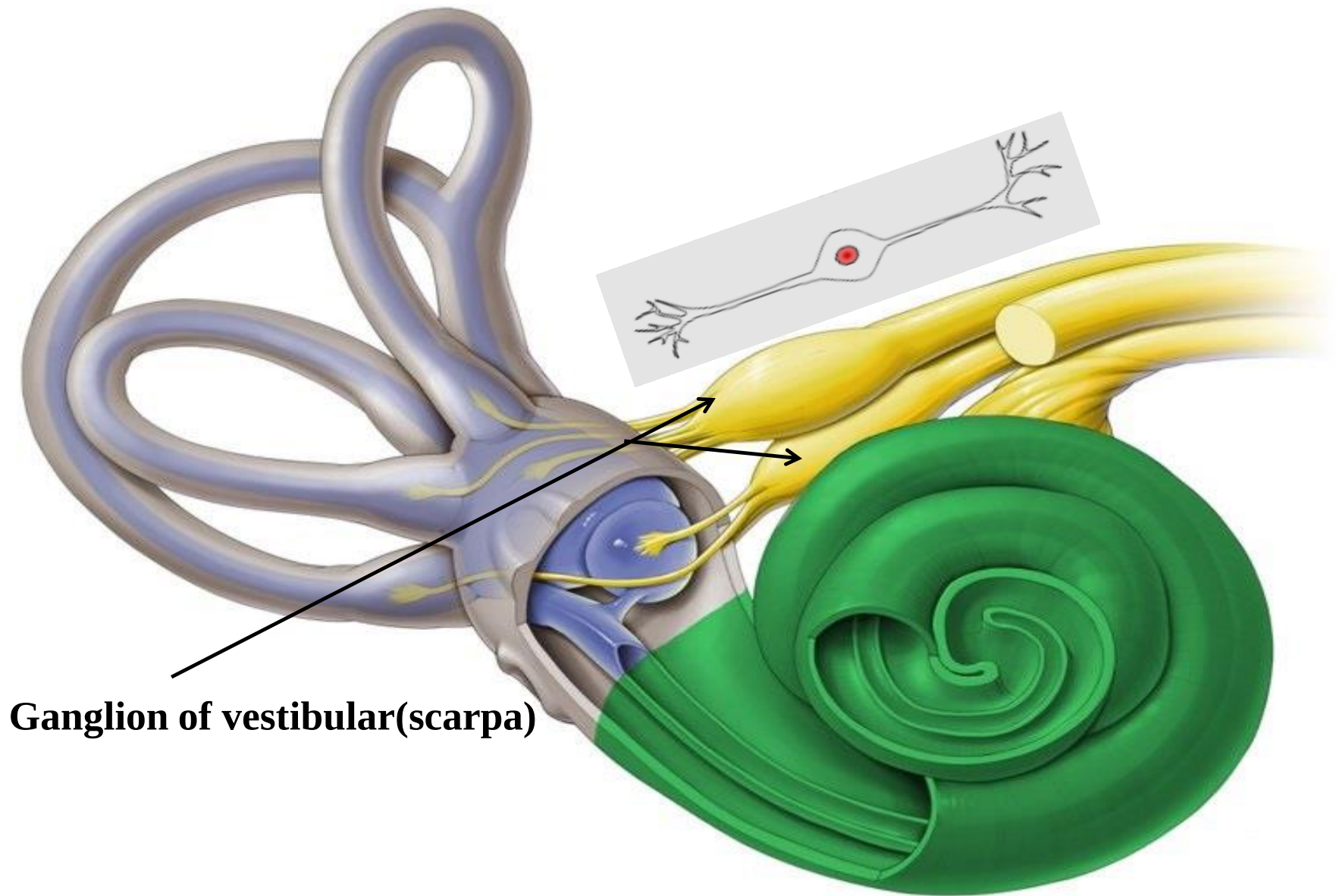
تالاموس (هسته زانویی داخلی)

مید برین (کولیکولوس تحتانی)

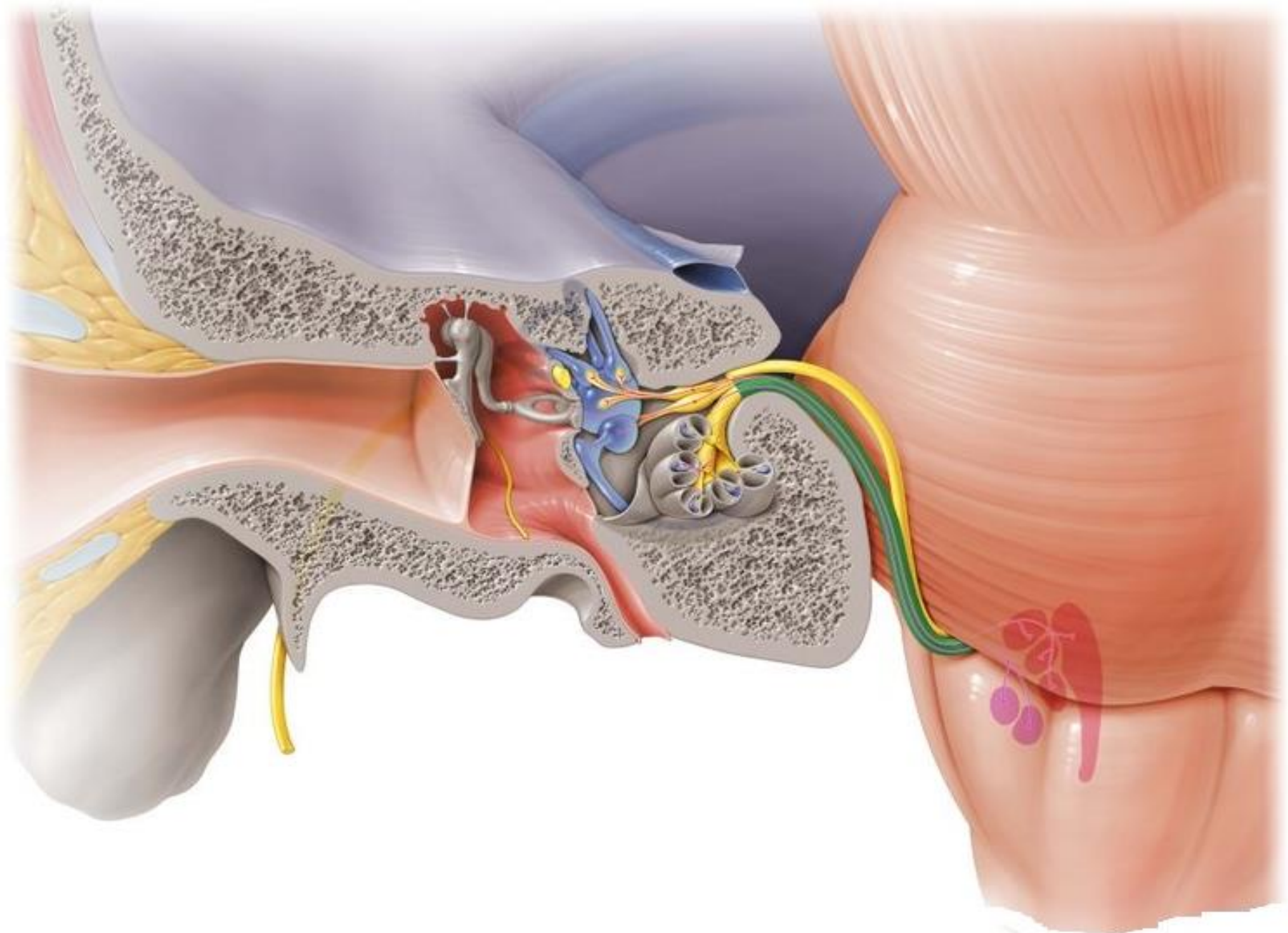
پل مغزی (هسته های  
زیتون فوقانی)

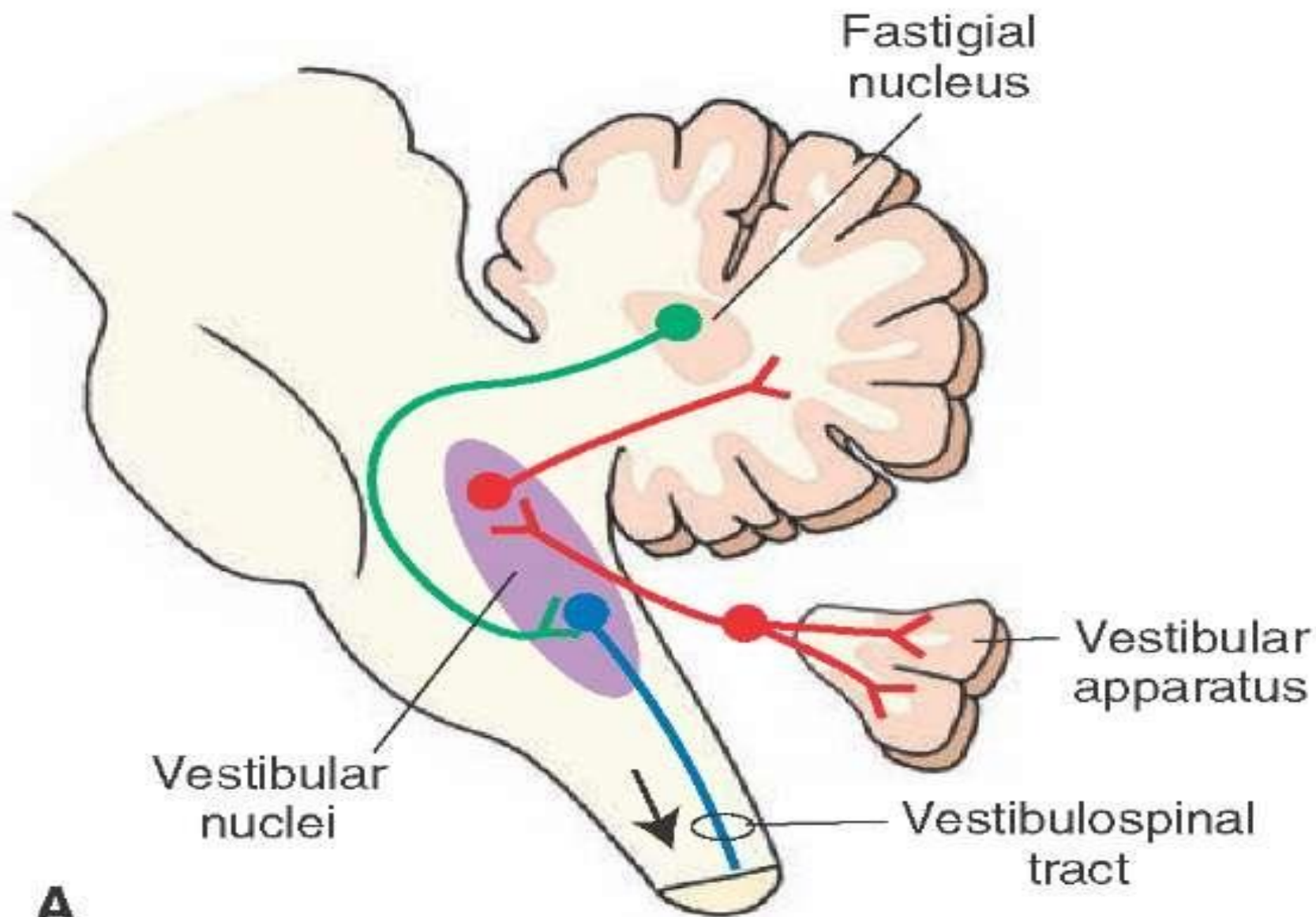
بصل النخاع (هسته های  
کوکلنار قدامی و خلفی)



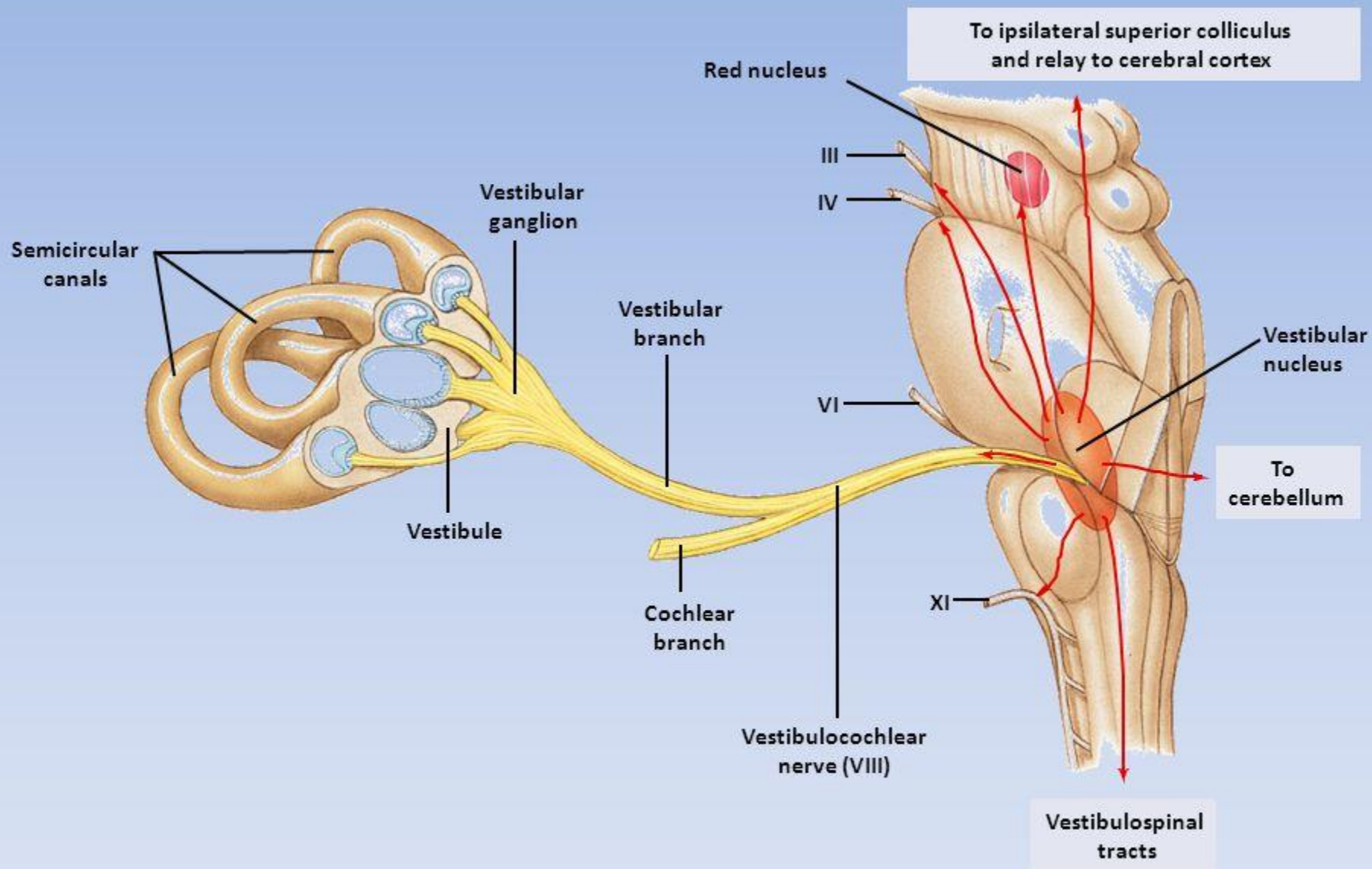


**Ganglion of vestibular(scarpa)**





**A**



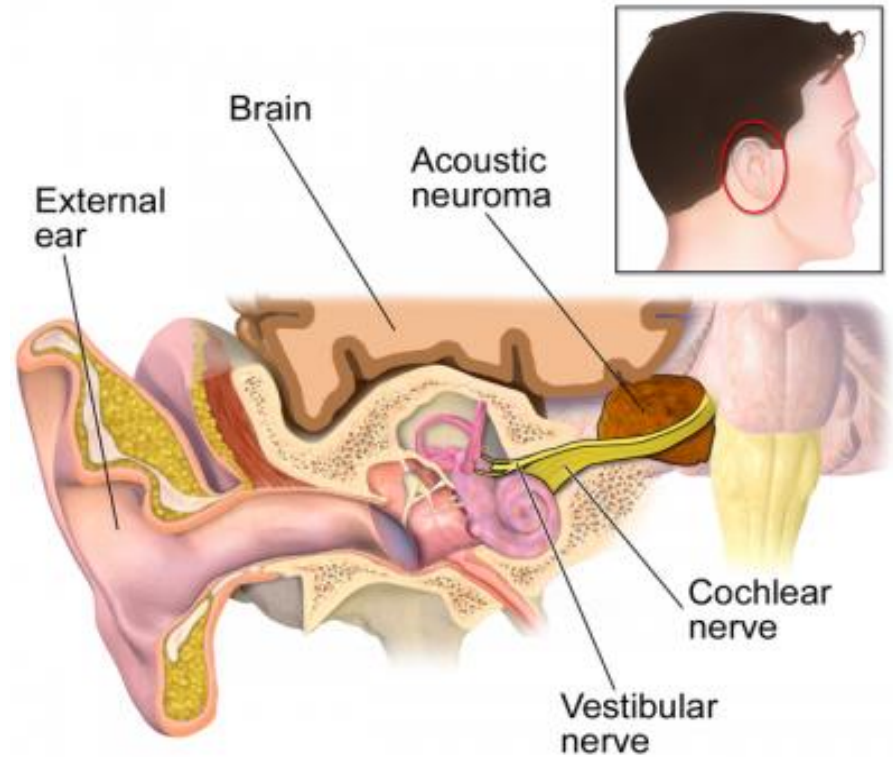
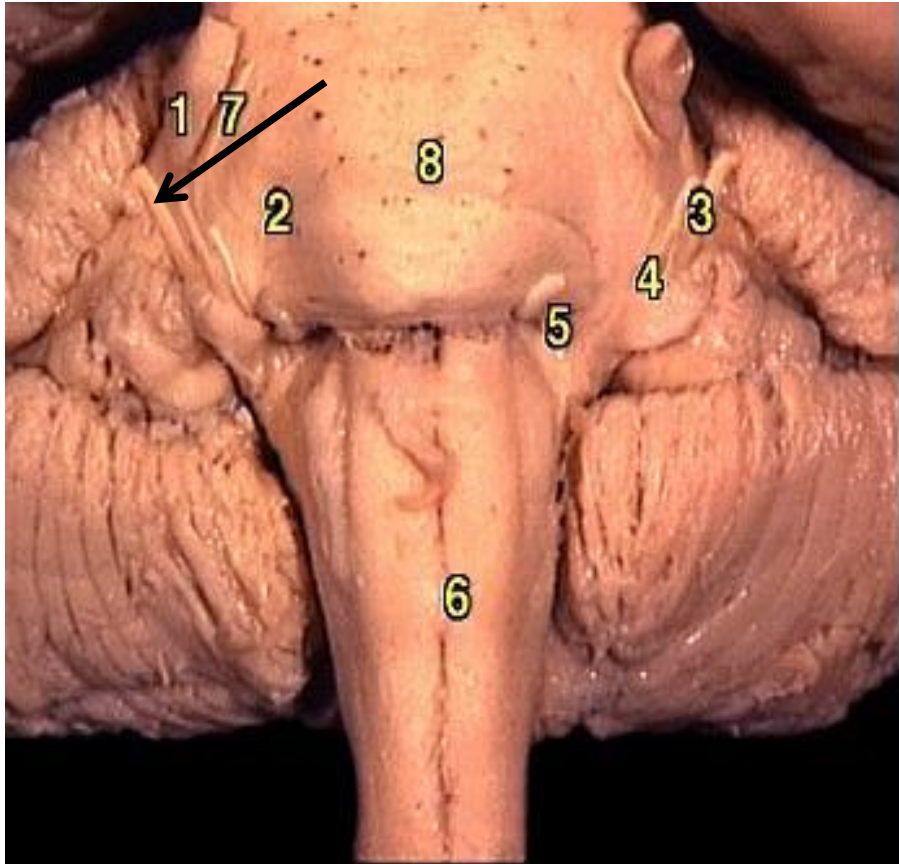
# Vestibulo-Ocular Reflex



# Nystagmus

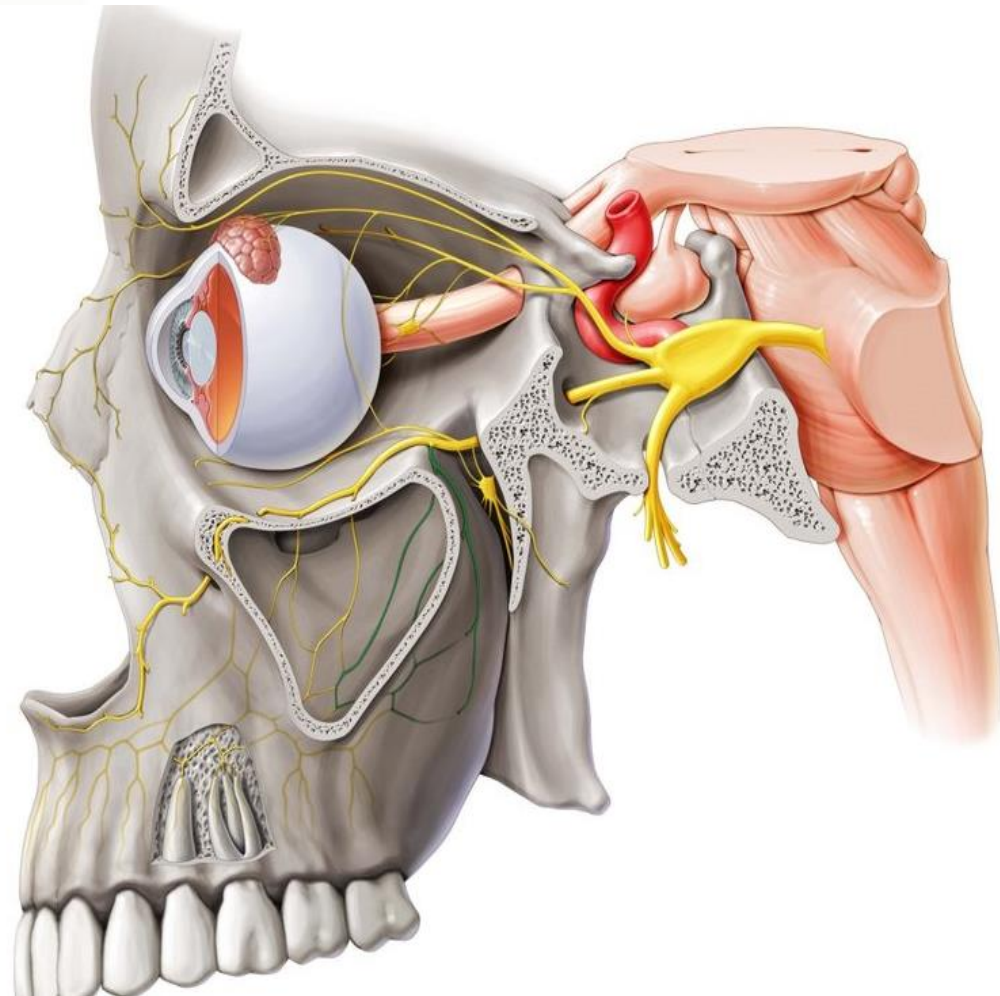
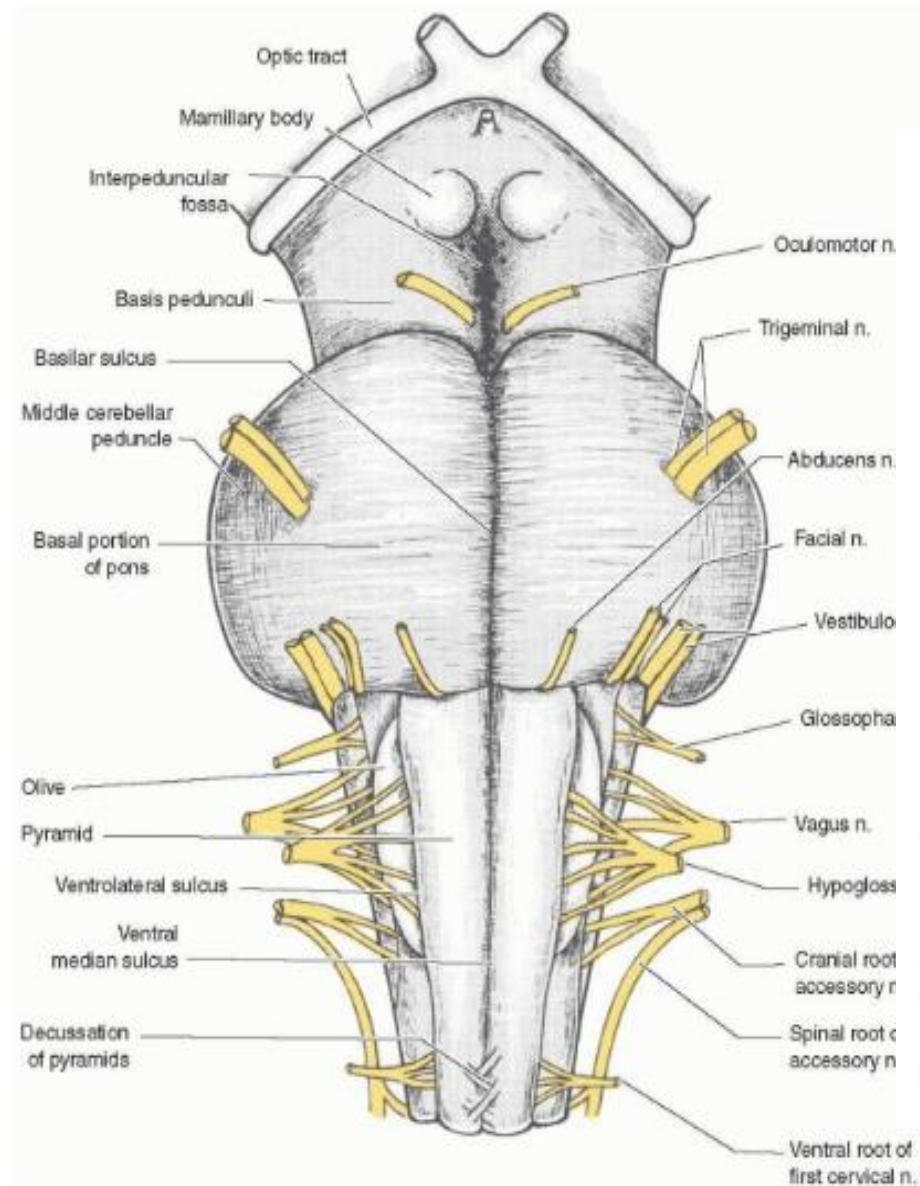


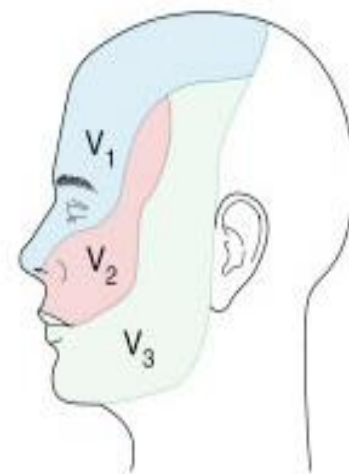
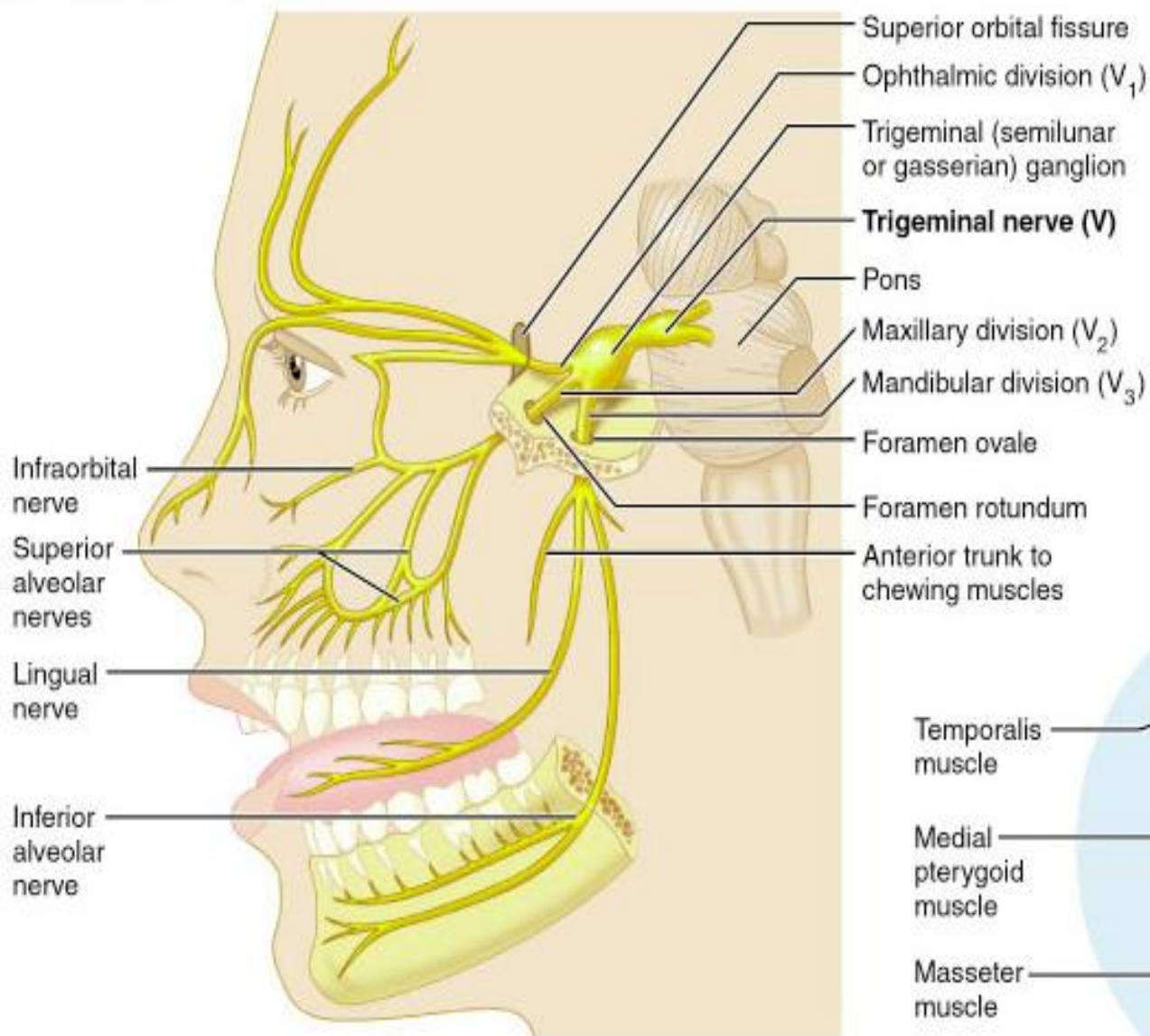
# Cerebellopontine angle tumor



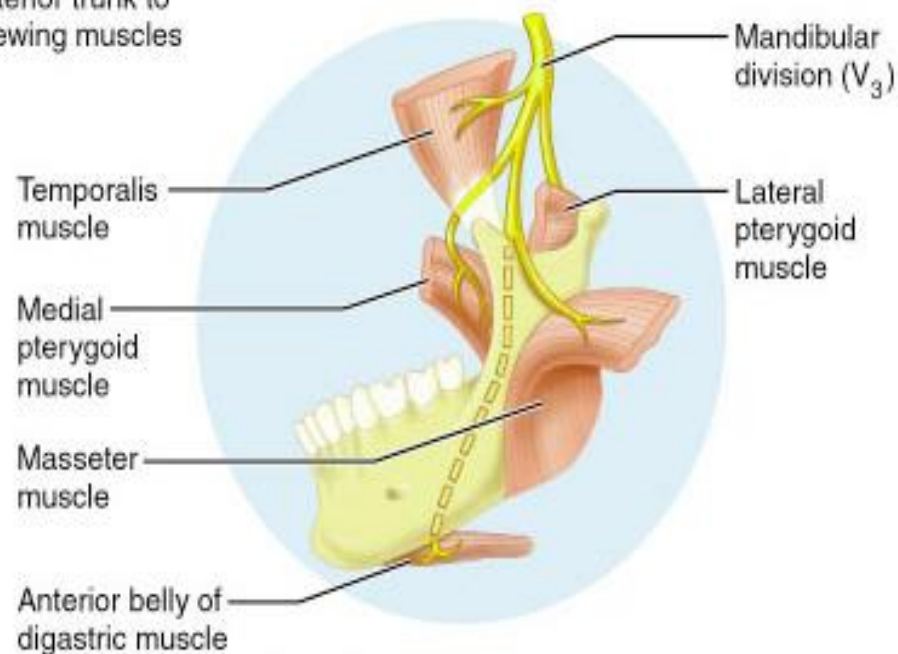
Acoustic Neuroma

# Trigeminal N.(GSA,SVE)

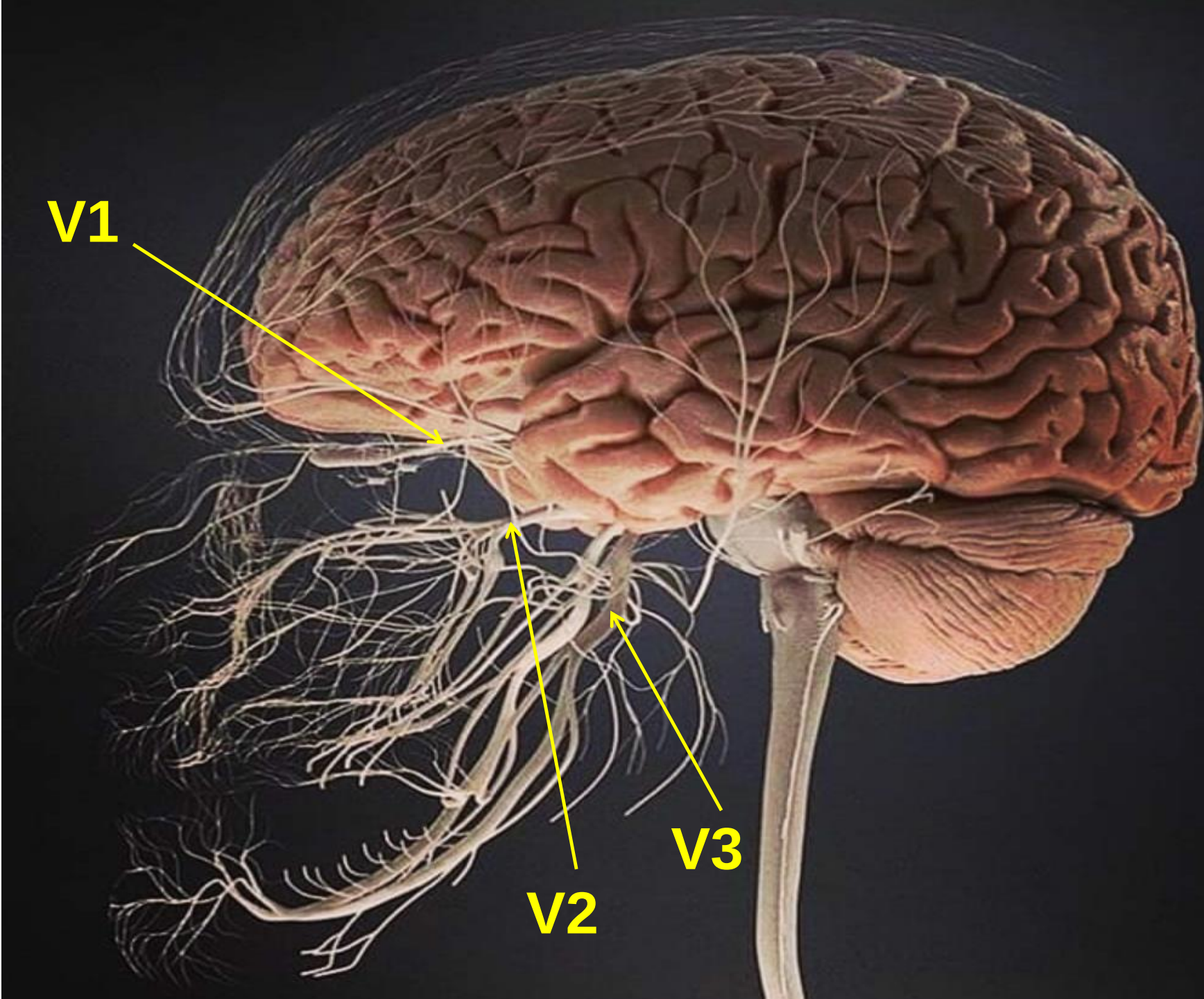


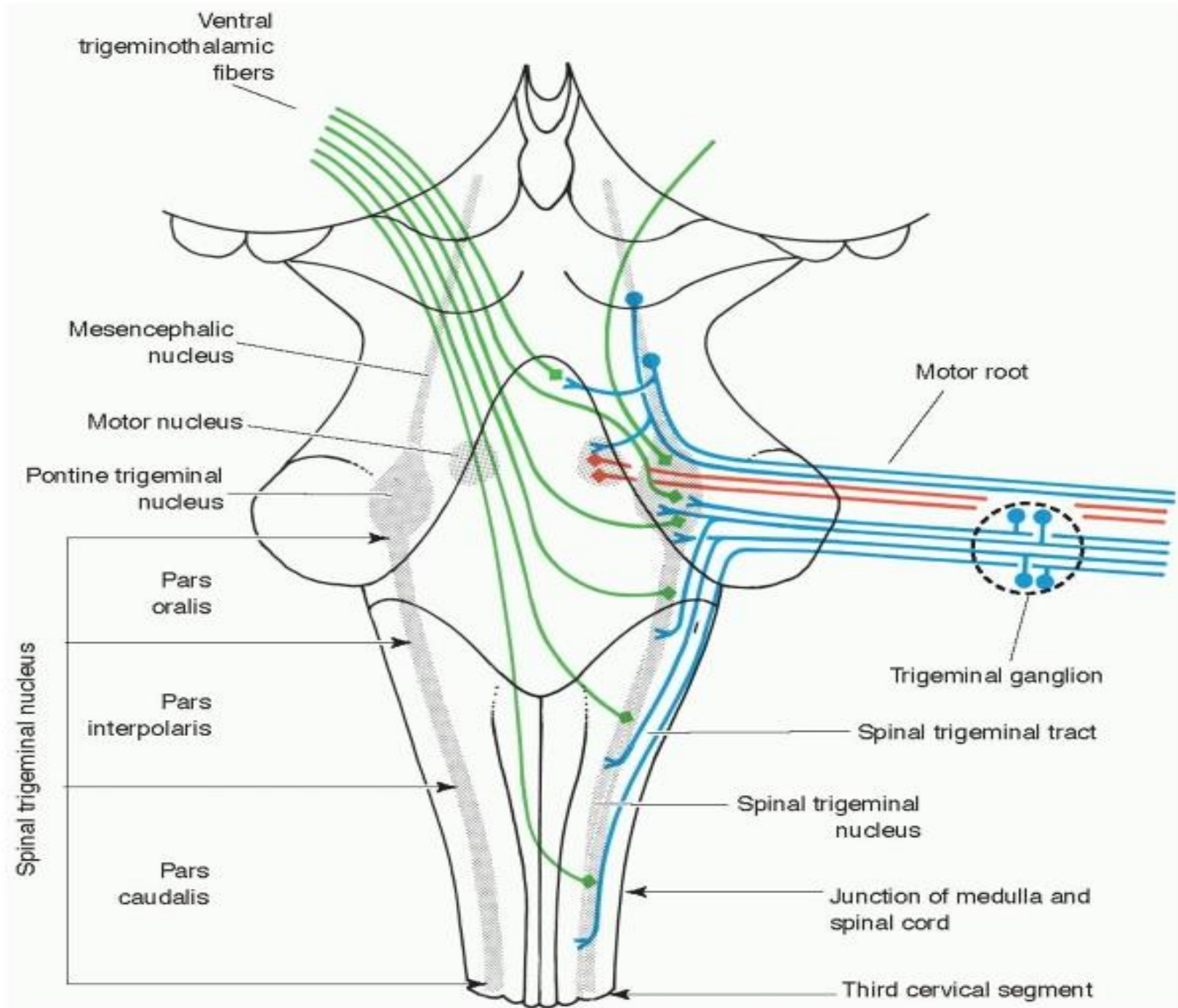


Distribution of sensory fibers of each division



Inset shows motor branches of the mandibular division (V<sub>3</sub>)





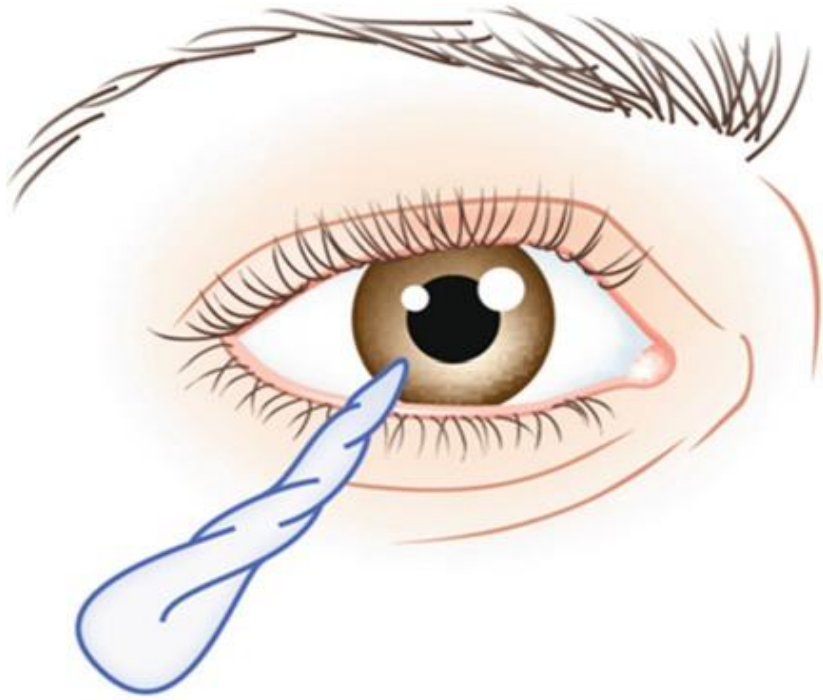
# jaw jerk reflex



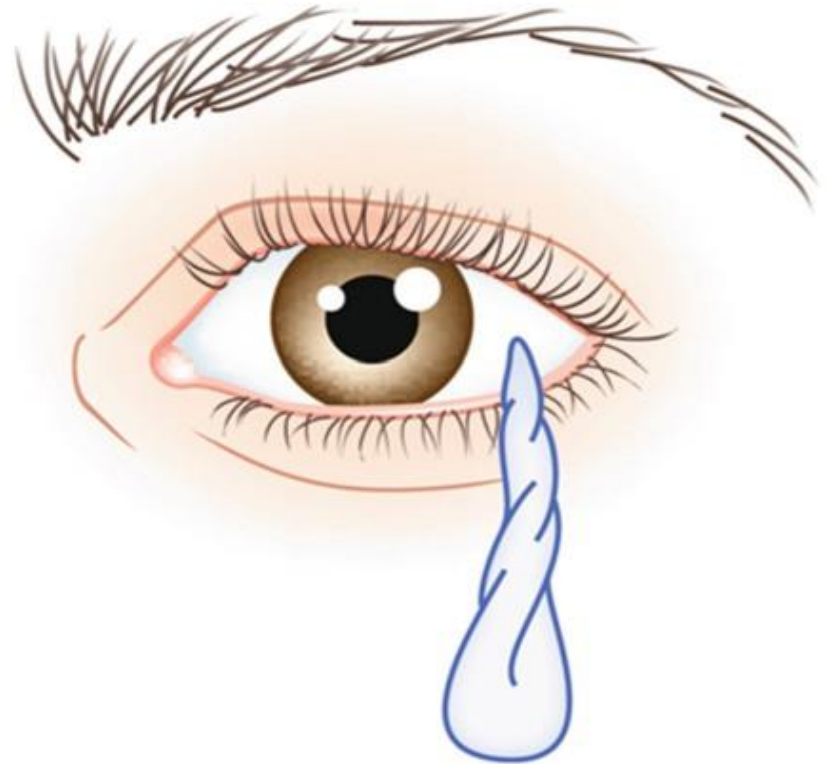
نورالژیای تریجمینال  
(*tic douloureux*)



## Testing Corneal Reflex

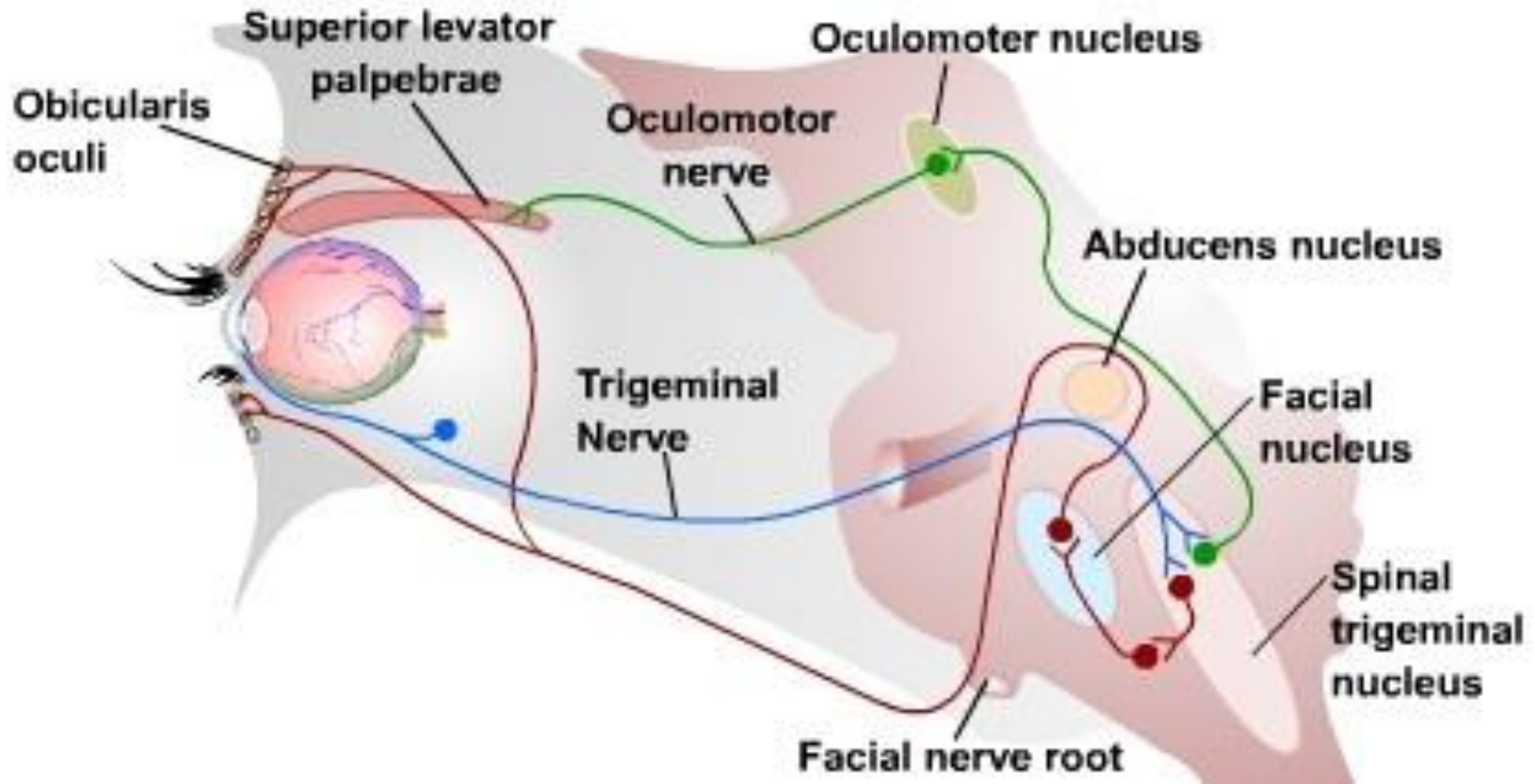


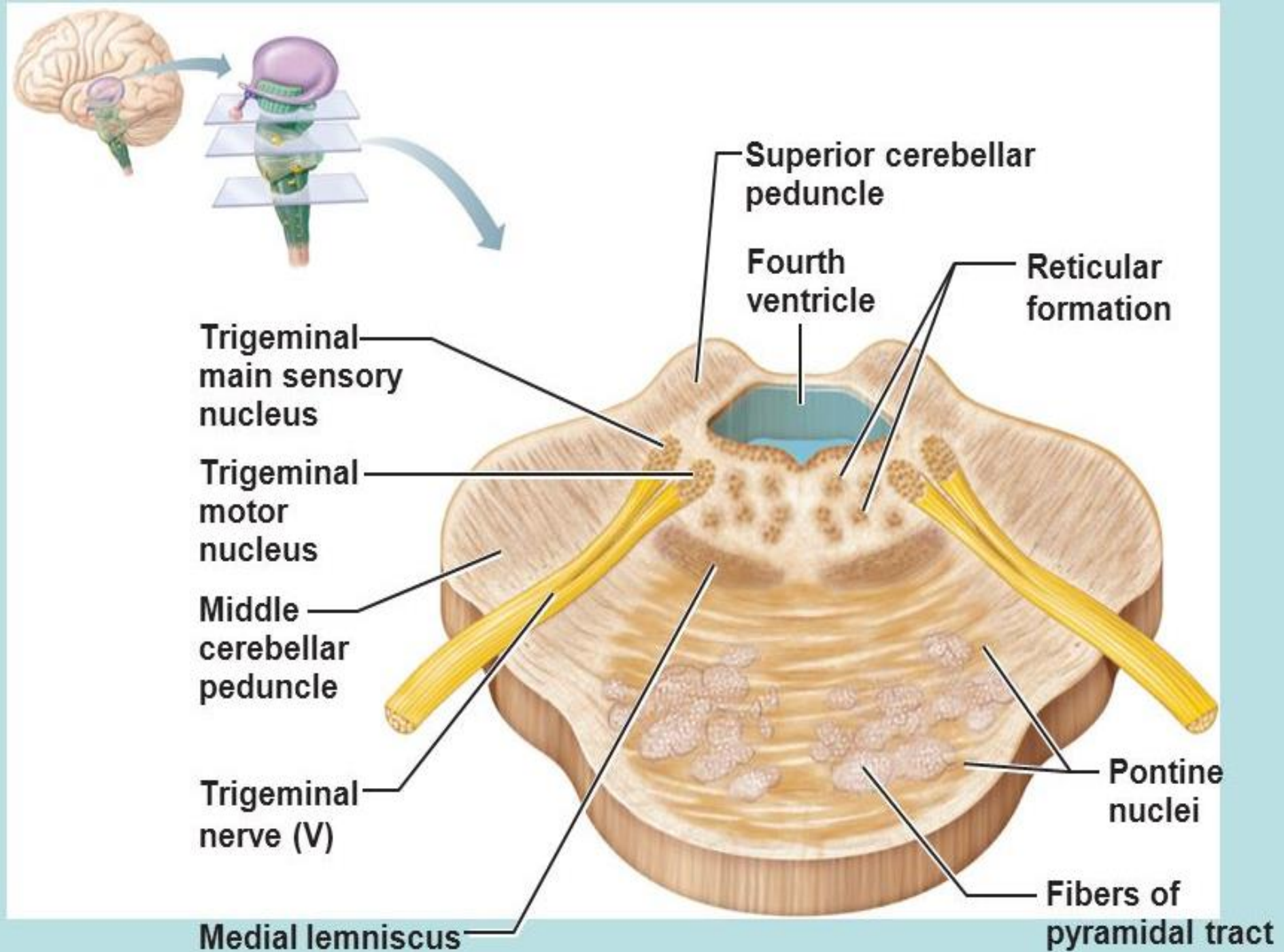
Correct

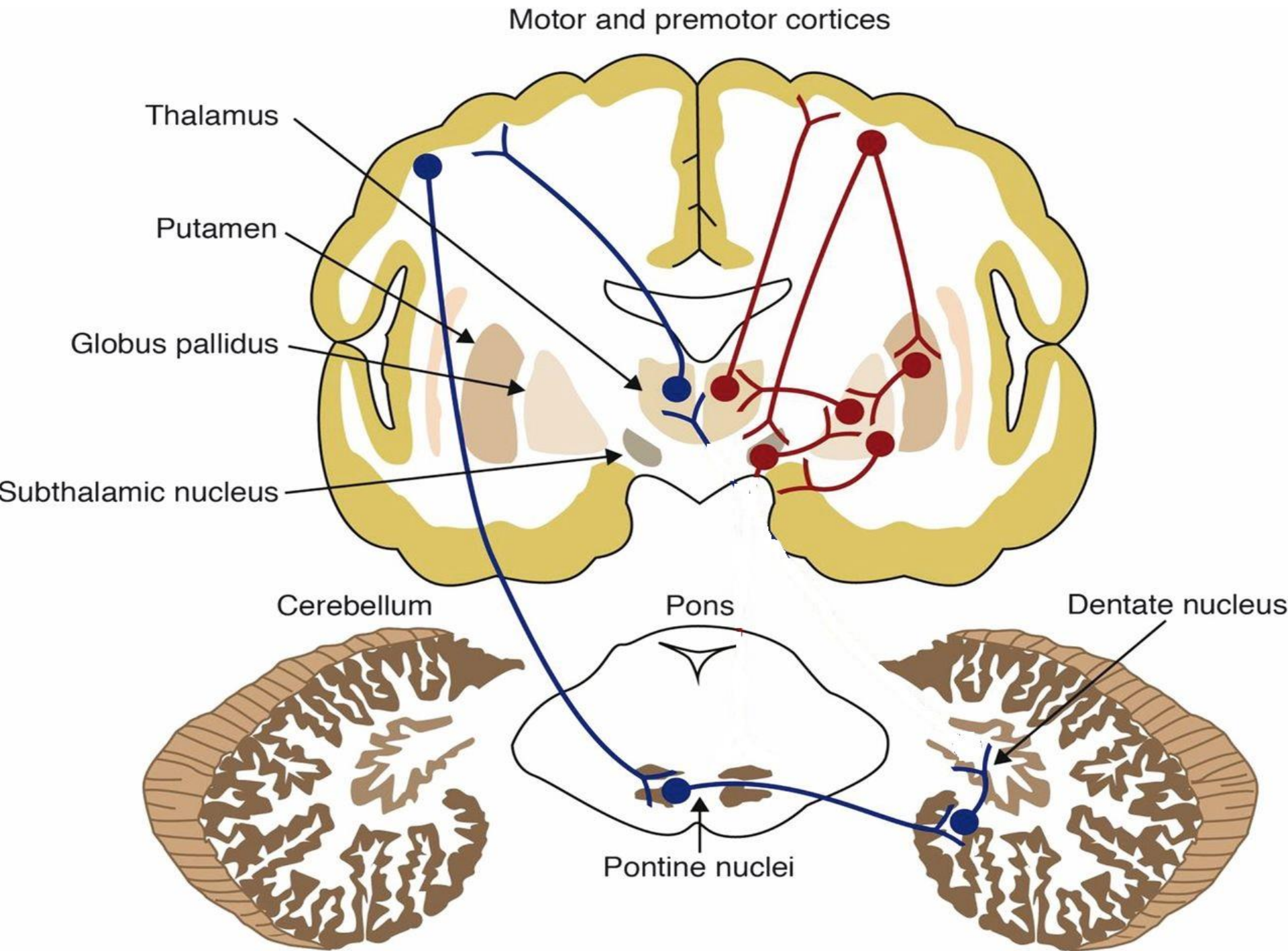


Incorrect

# Corneal reflex



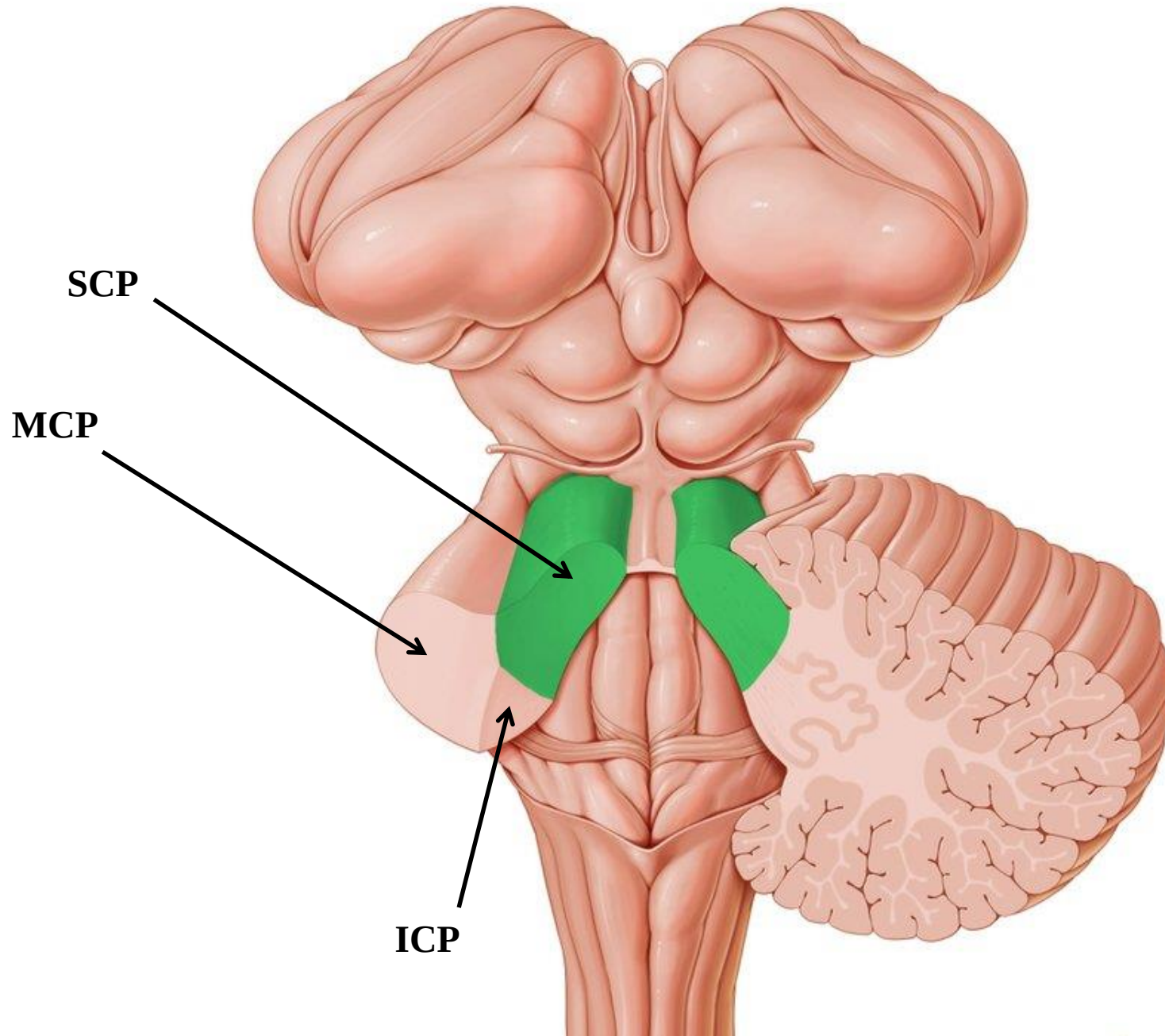




# Locked in syndrome

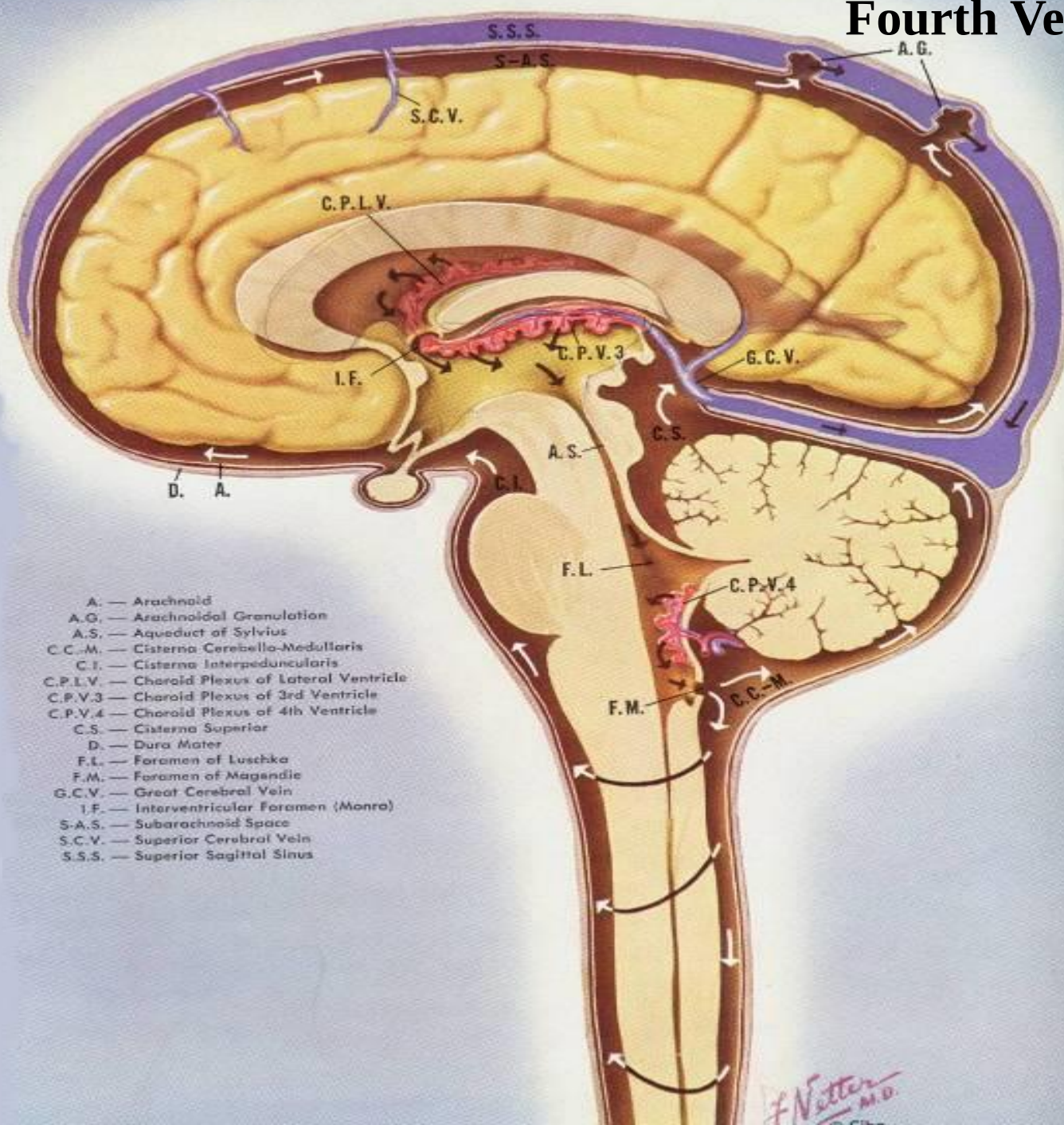


# Cerebellar peduncles



# Fourth Ventricle

# بطن چهارم



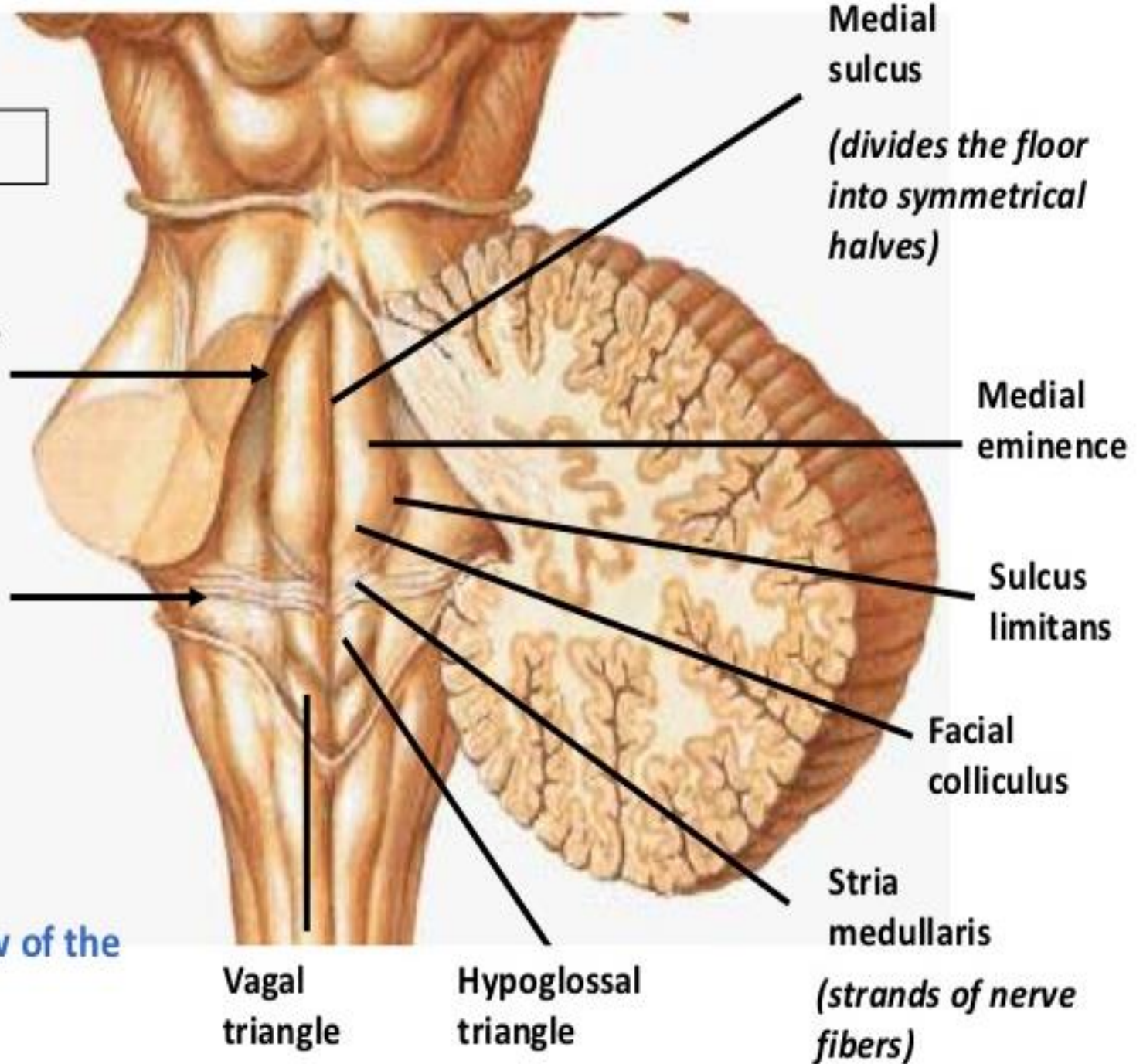
F. Netter M.D.

**Formed by :**

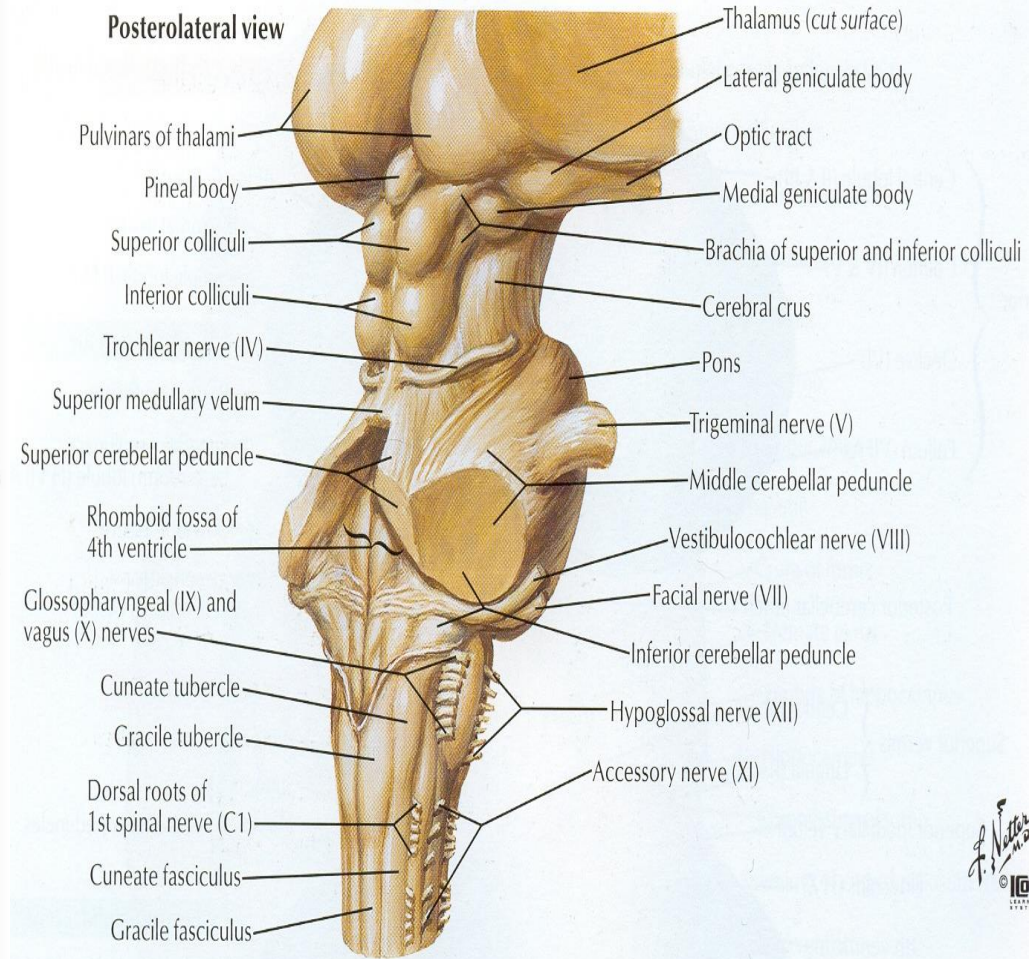
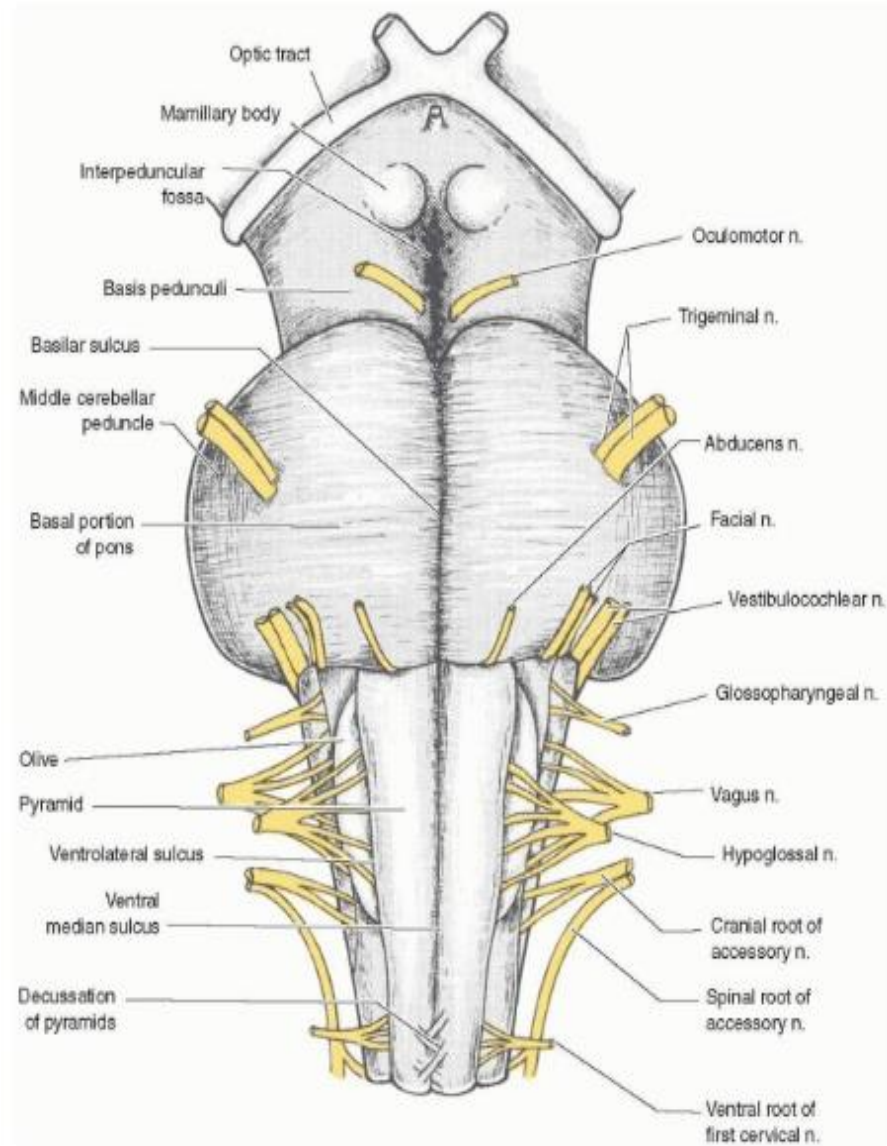
**1. Posterior surface of the pons**

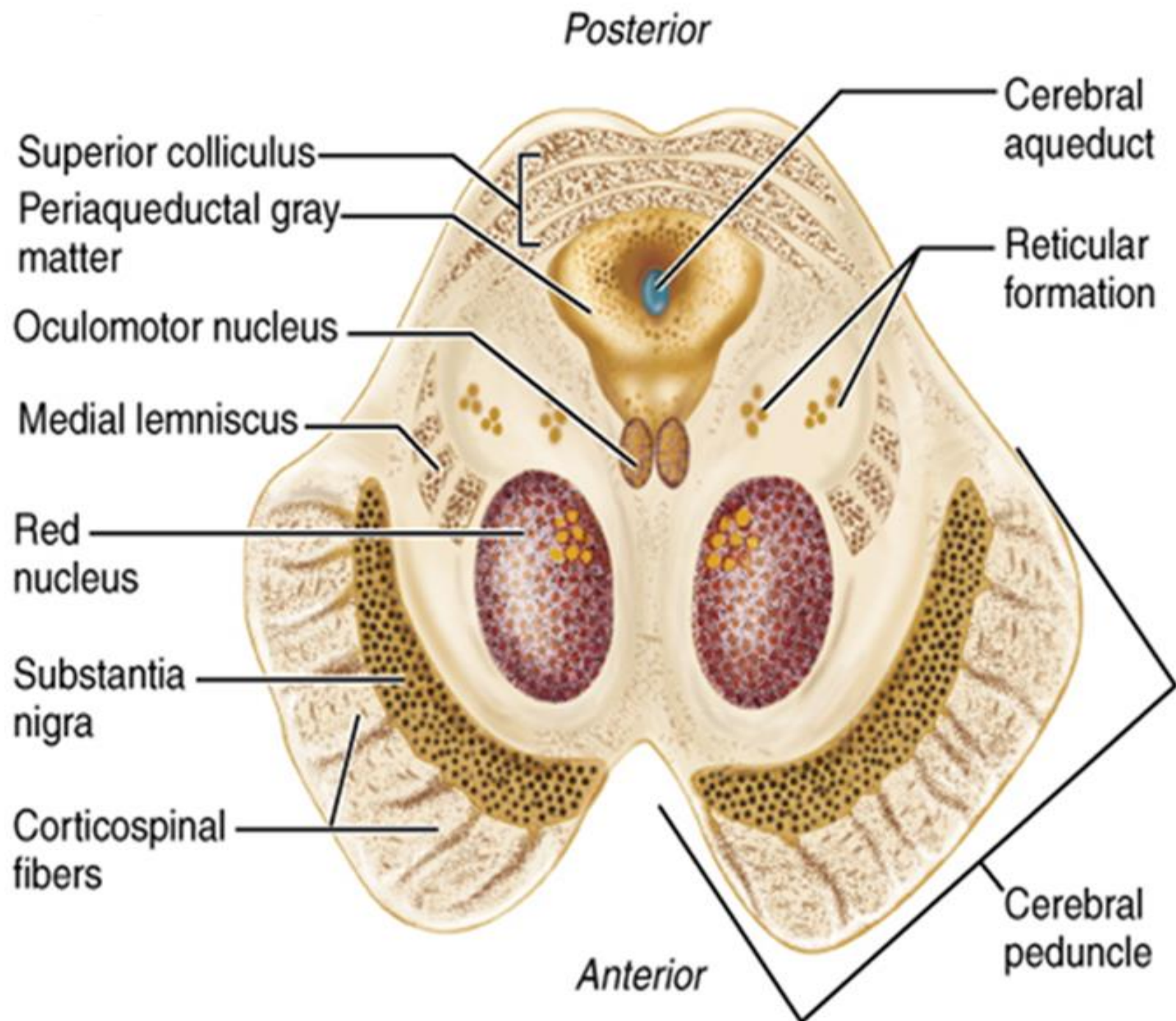
**2. Cranial ½ of the medulla oblongata**

**Posterior view of the 4<sup>th</sup> ventricle**

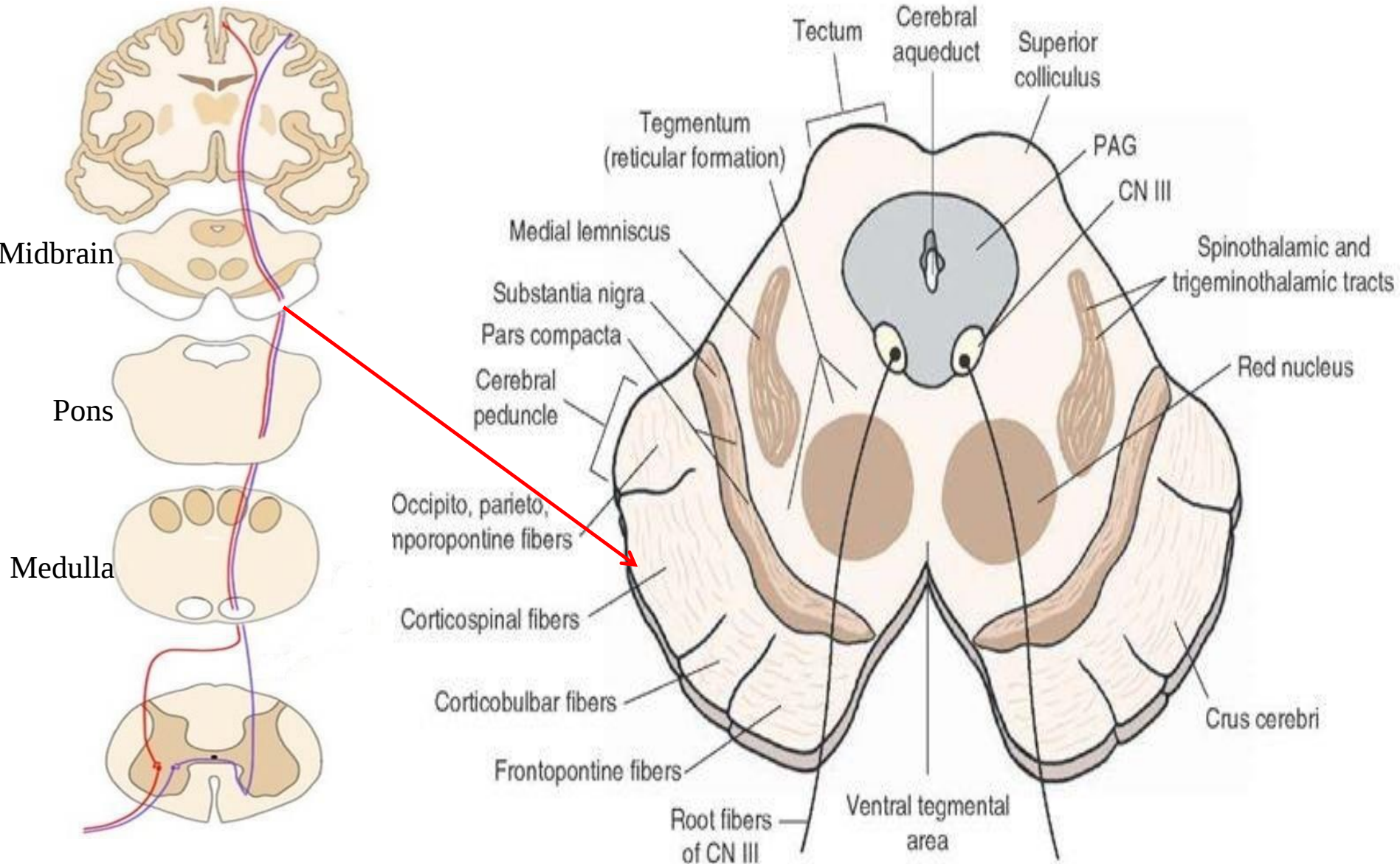


# Midbrain

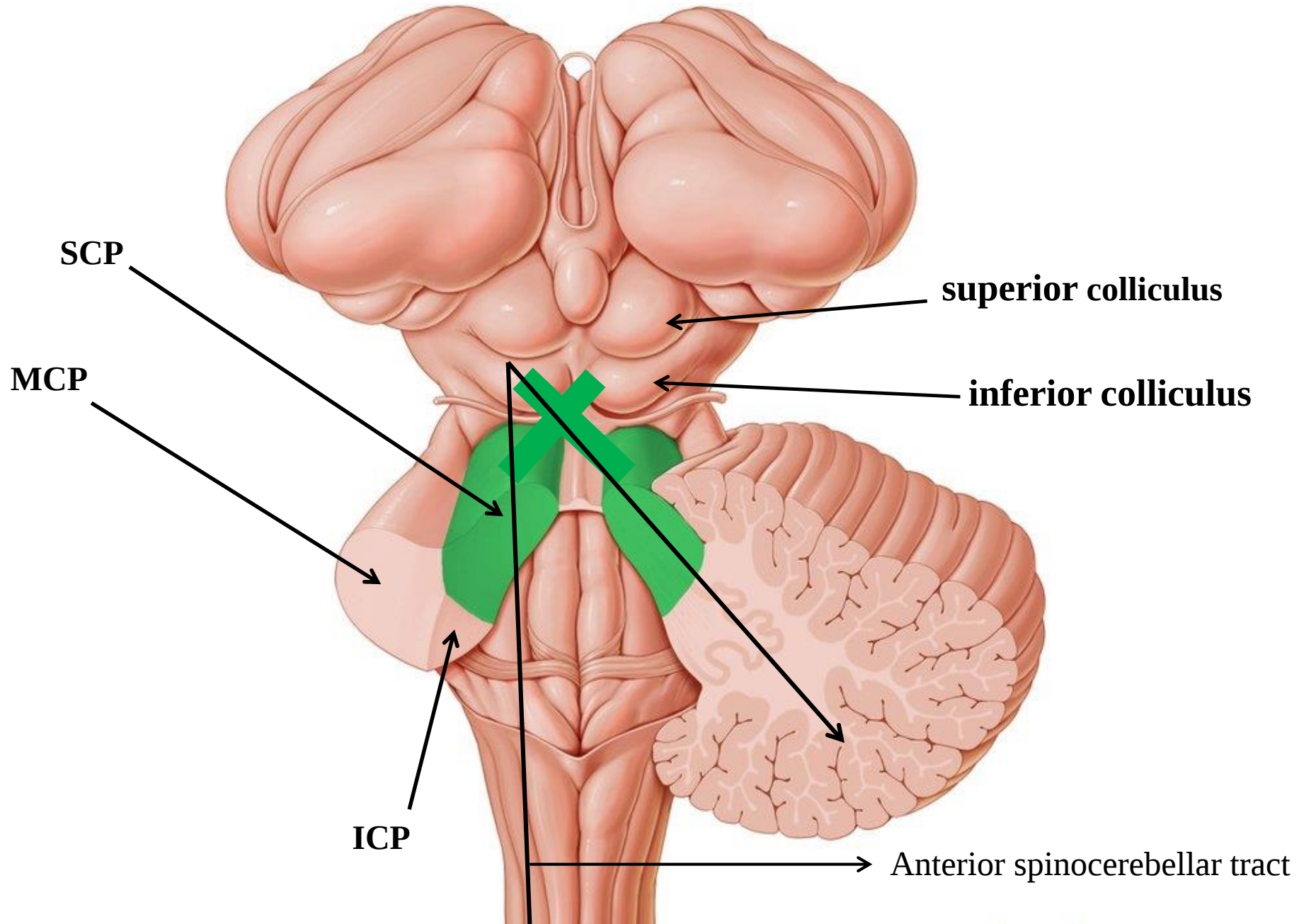


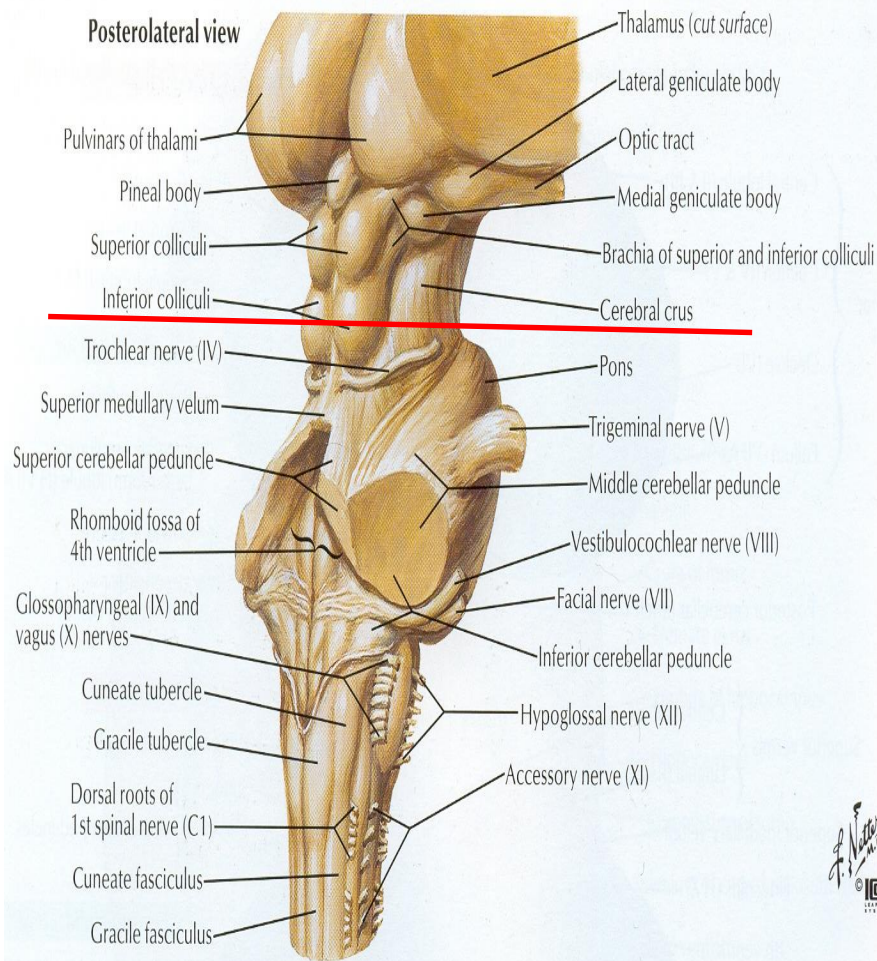


# Crus cerebri, Descending tracts

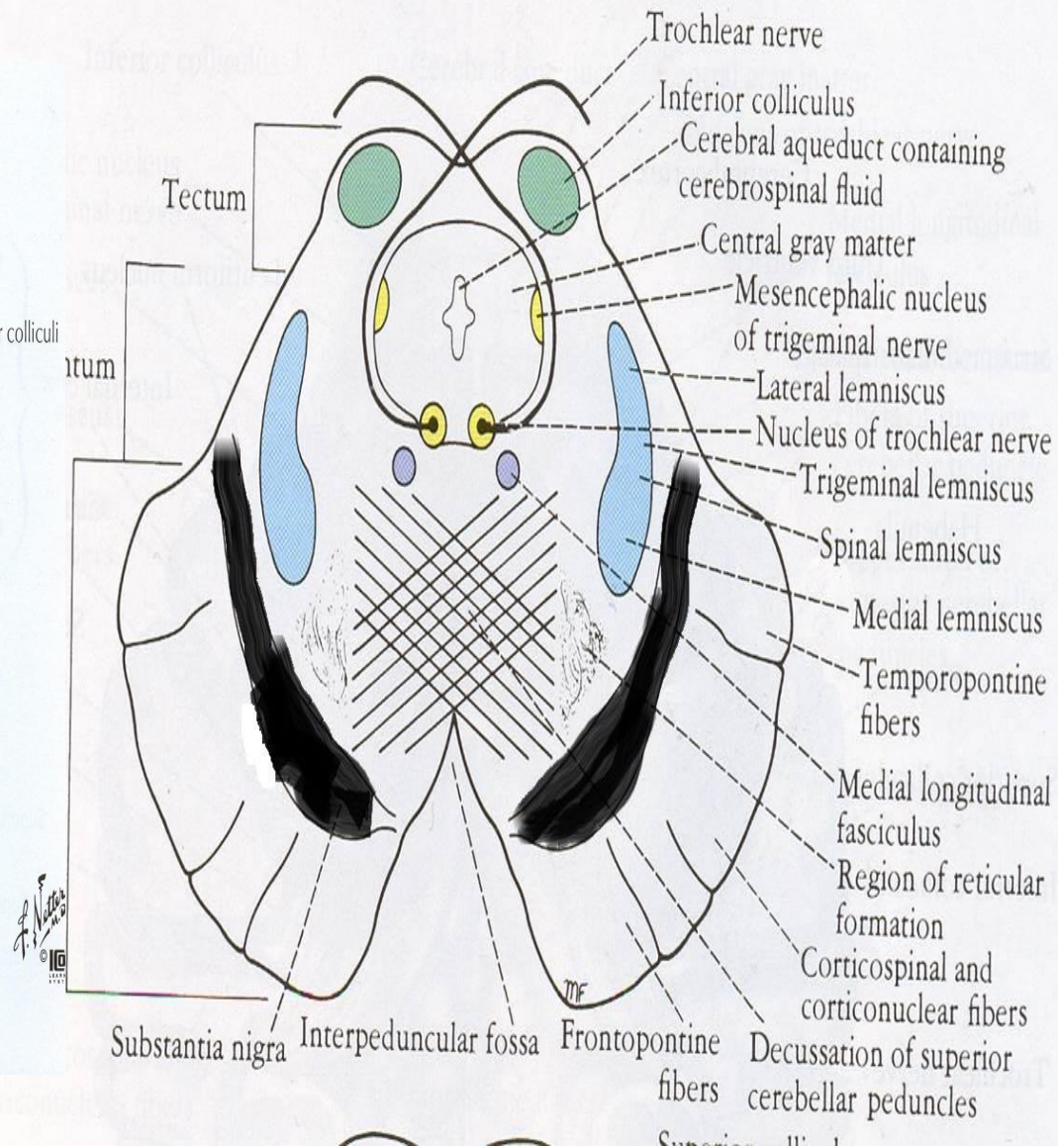


# Superior cerebellar peduncle

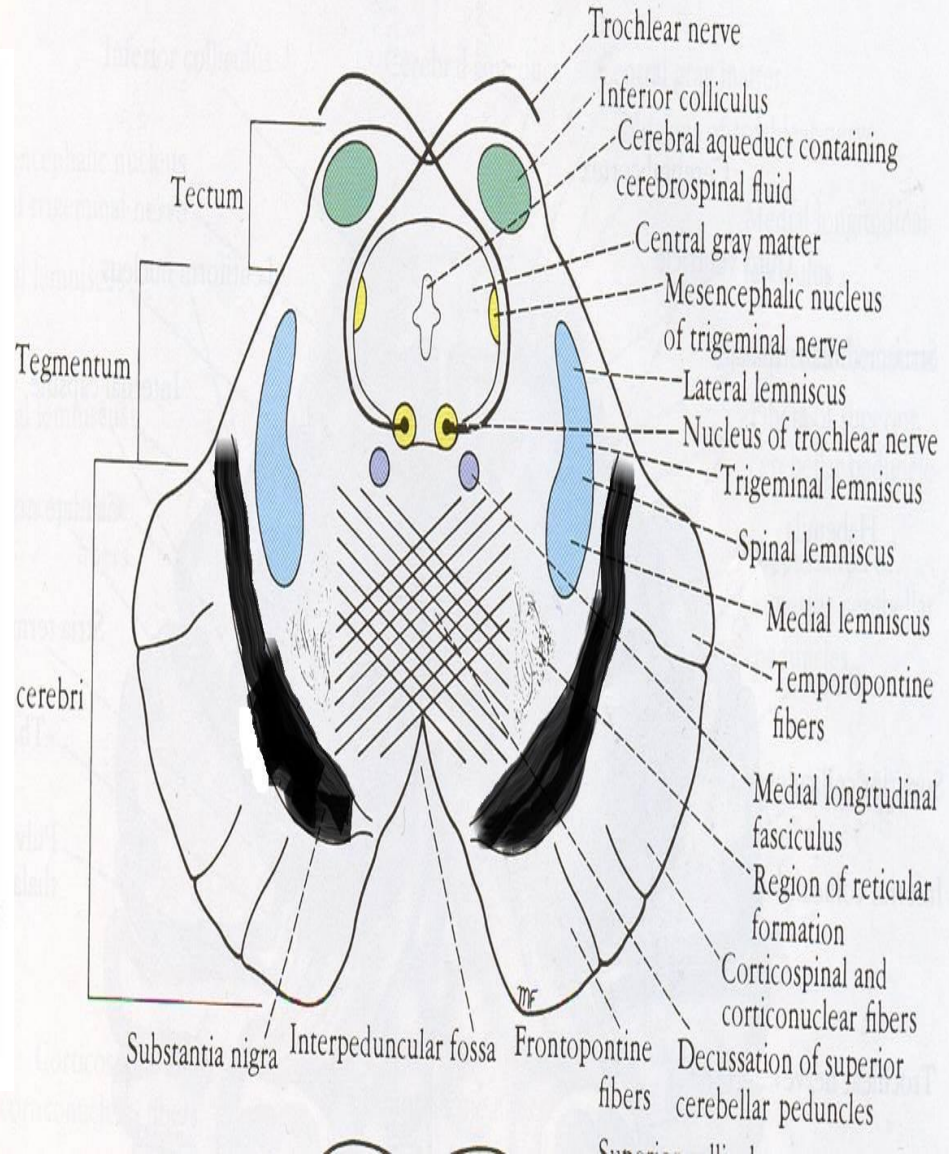
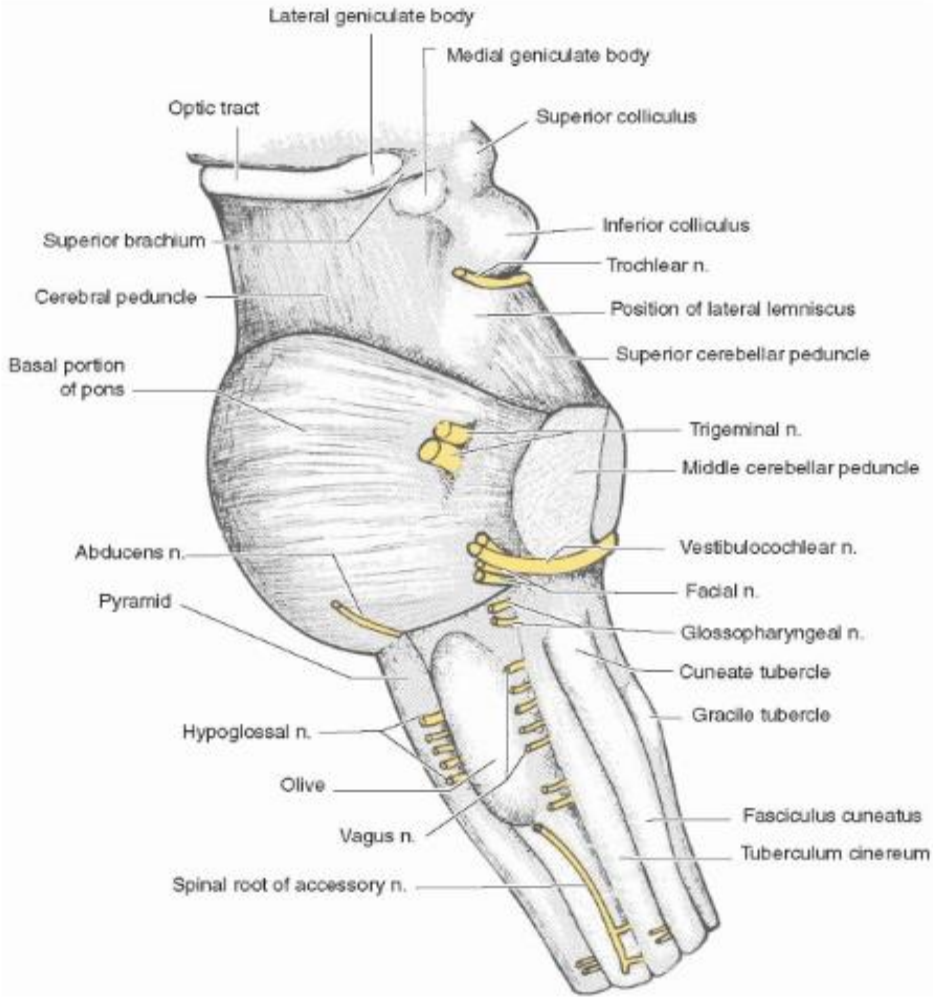


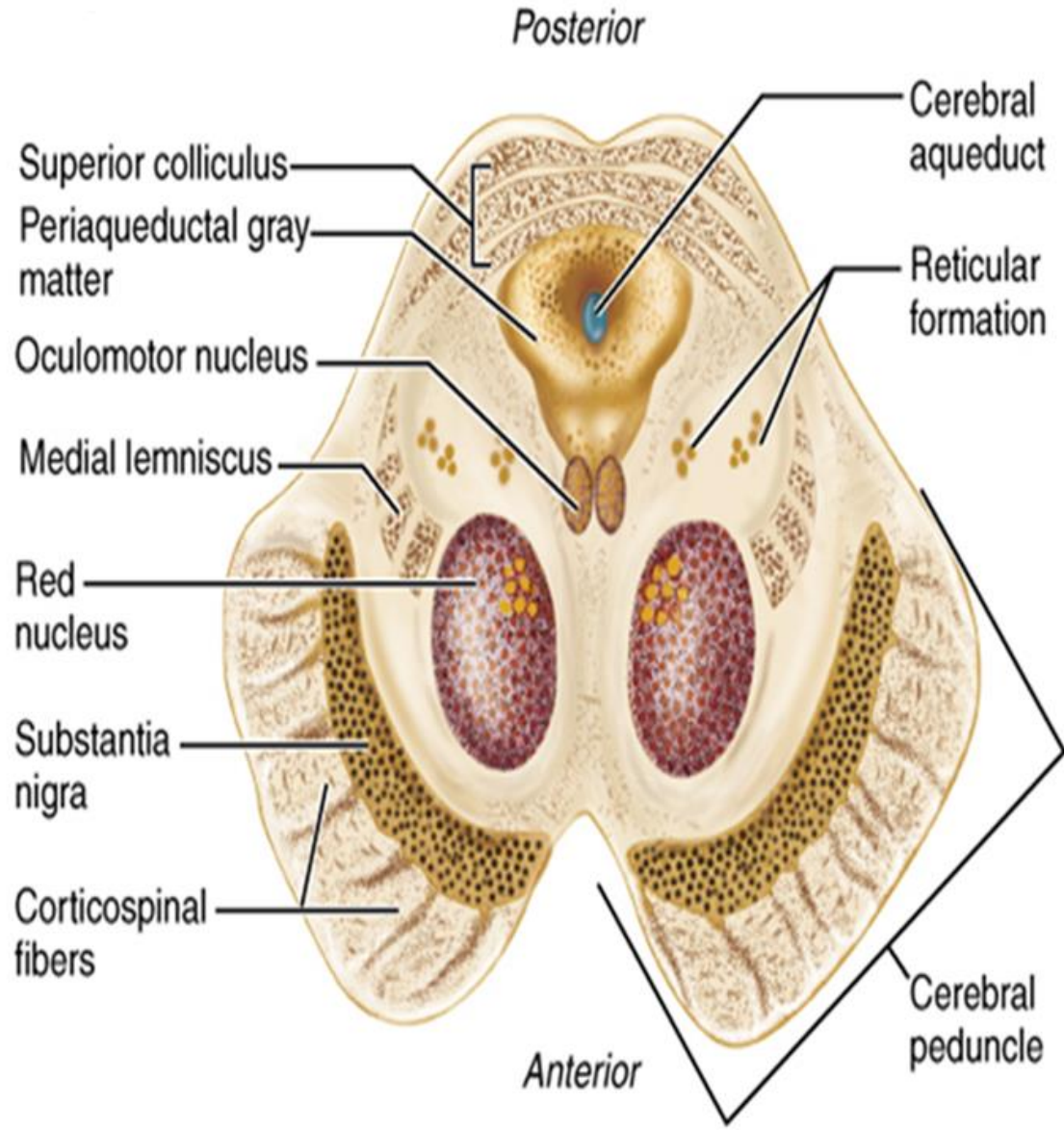
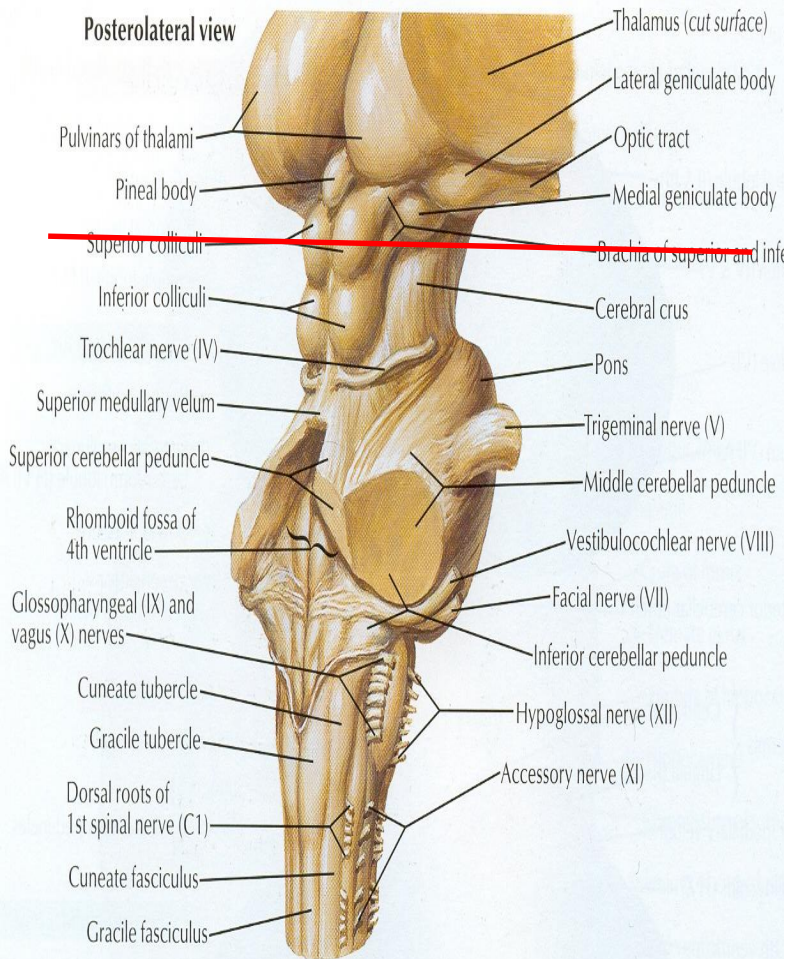


A

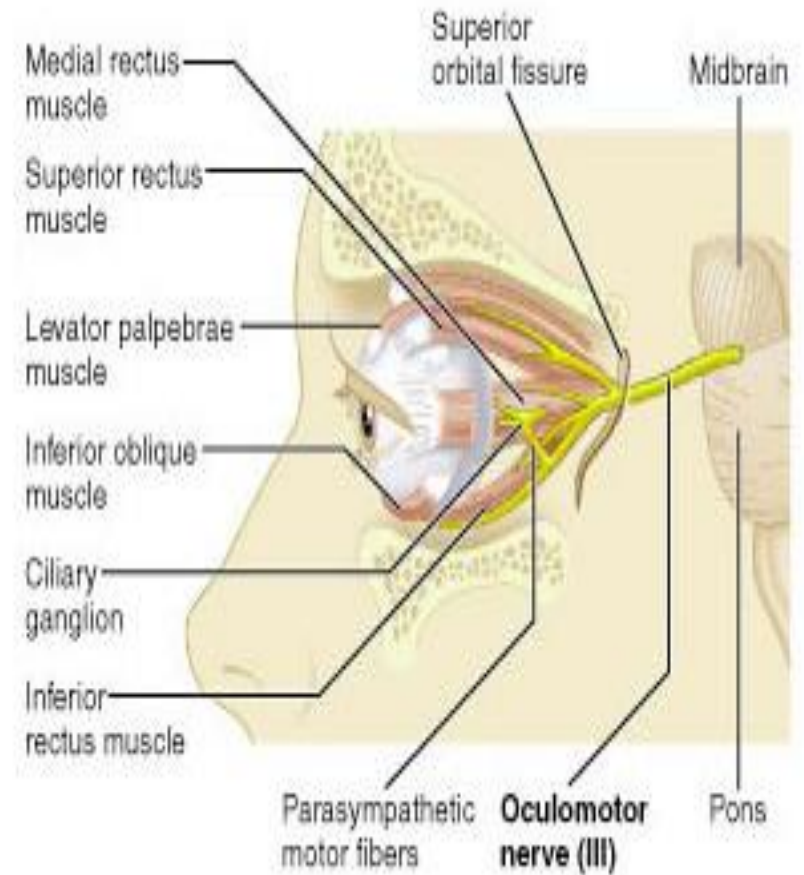
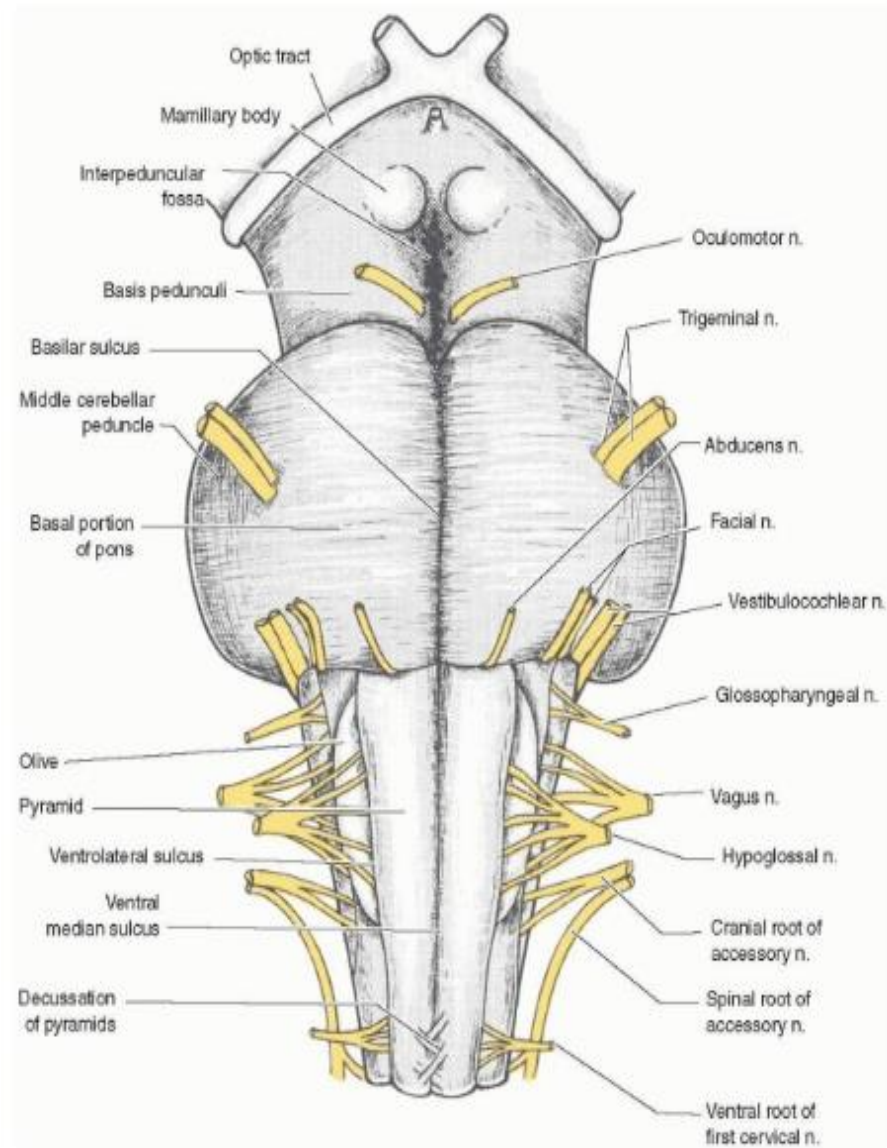


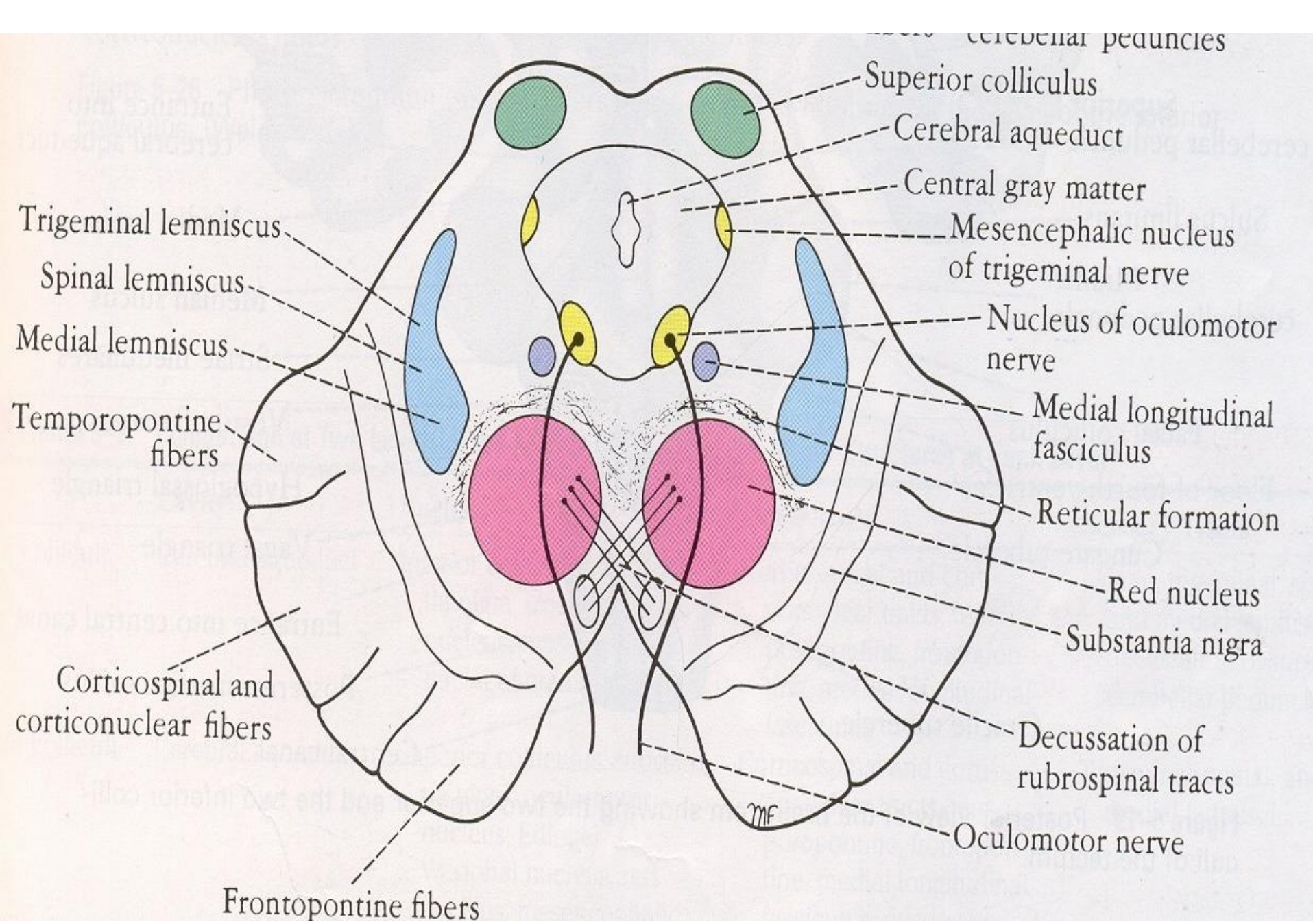
# Trochlear N.(GSE)





# Oculomotor N.(GSE,GVE)





Edinger-Westphal  
nucleus  
(Preganglionic  
parasympathetic  
neurons)

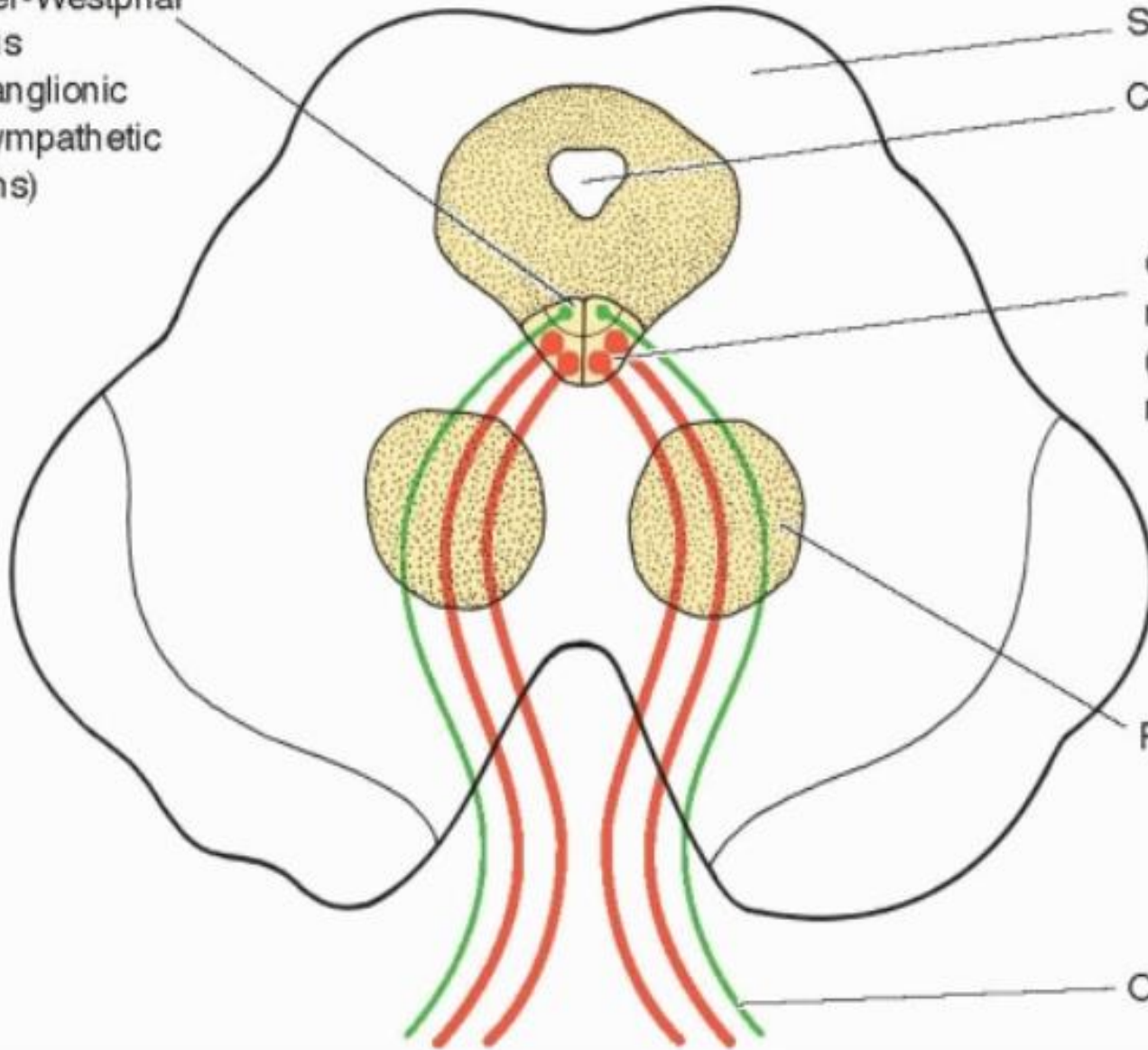
Superior colliculus

Cerebral aqueduct

Oculomotor  
nucleus  
(Somatic motor  
neurons)

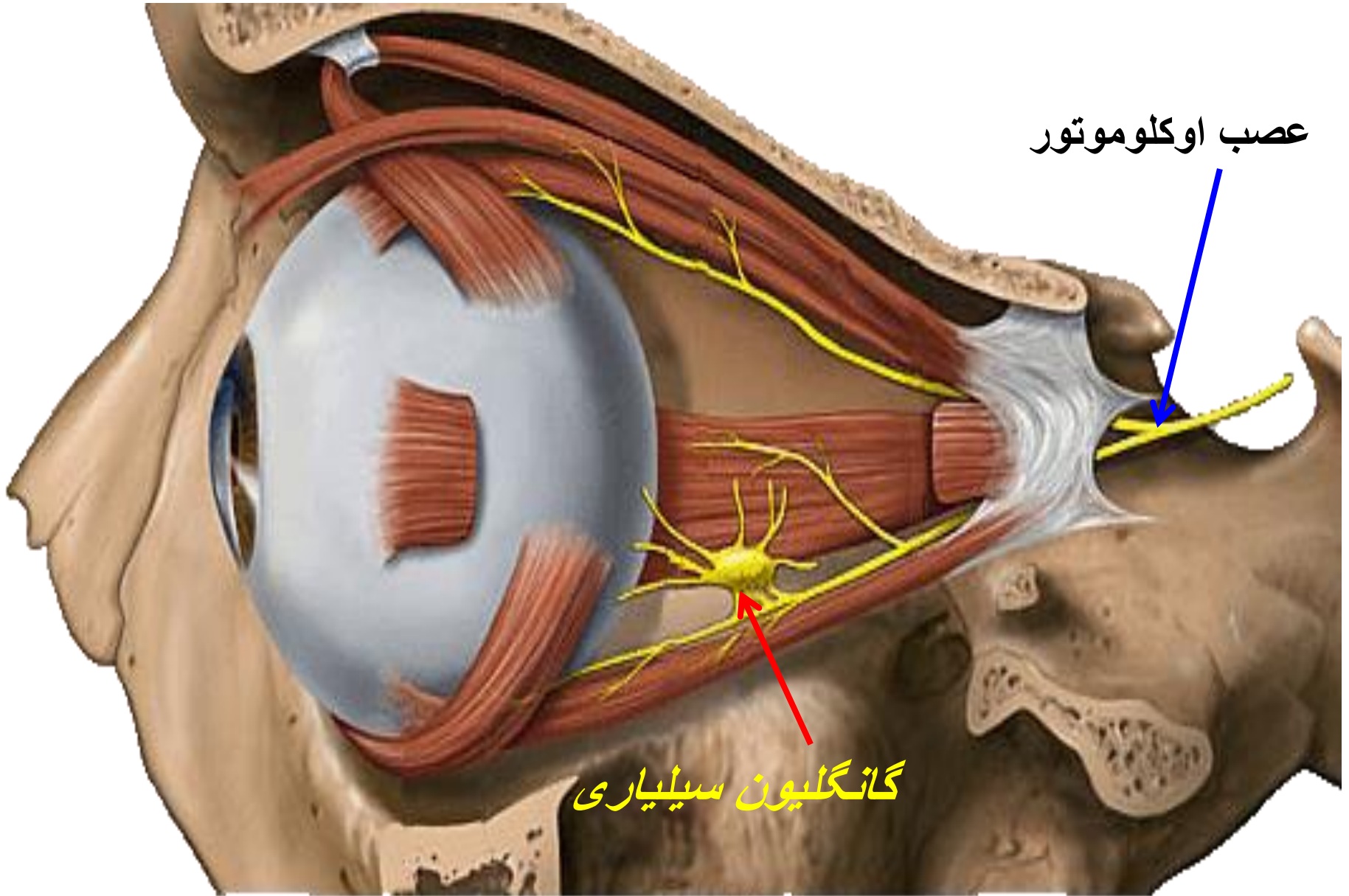
Red nucleus

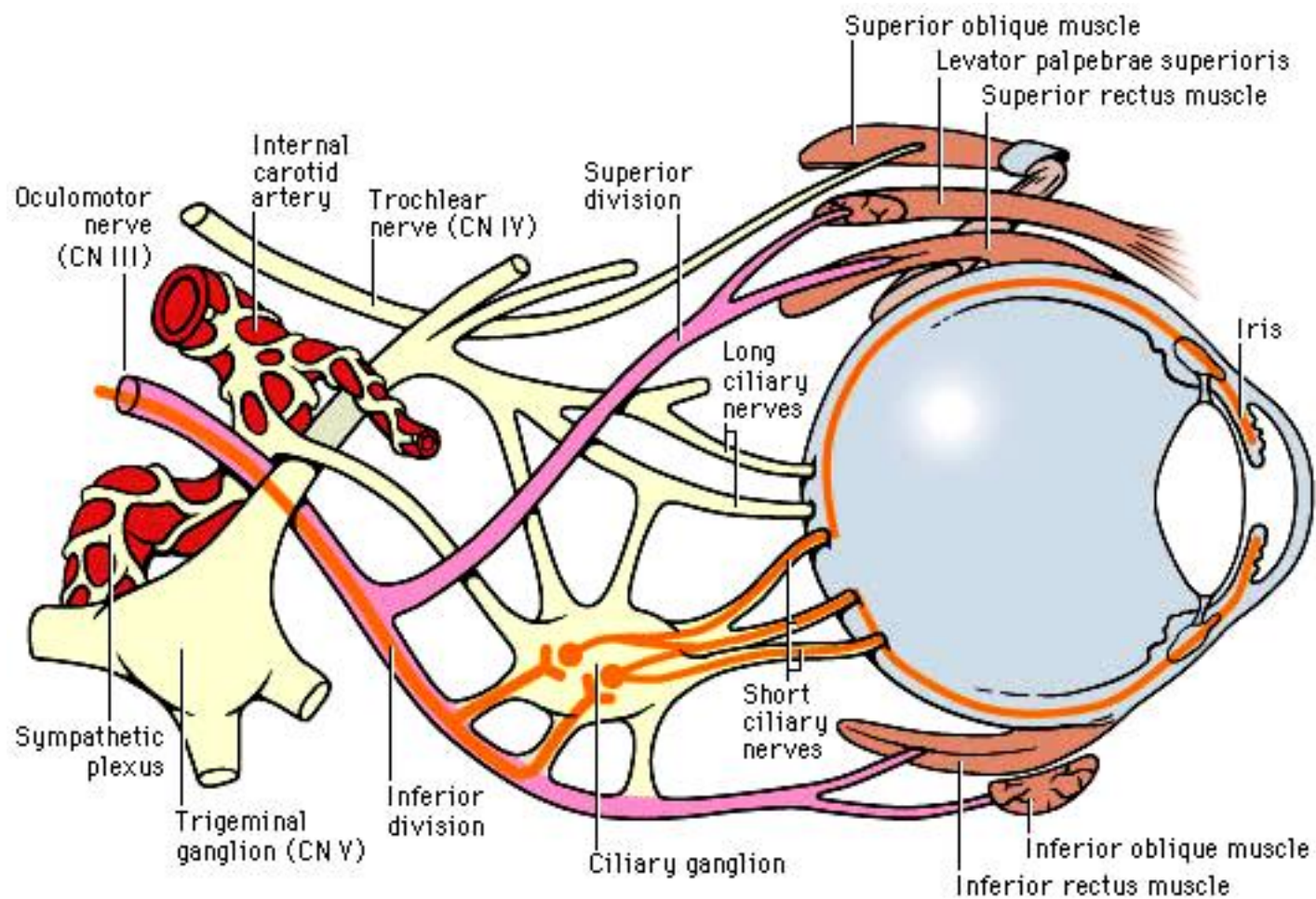
Oculomotor nerve

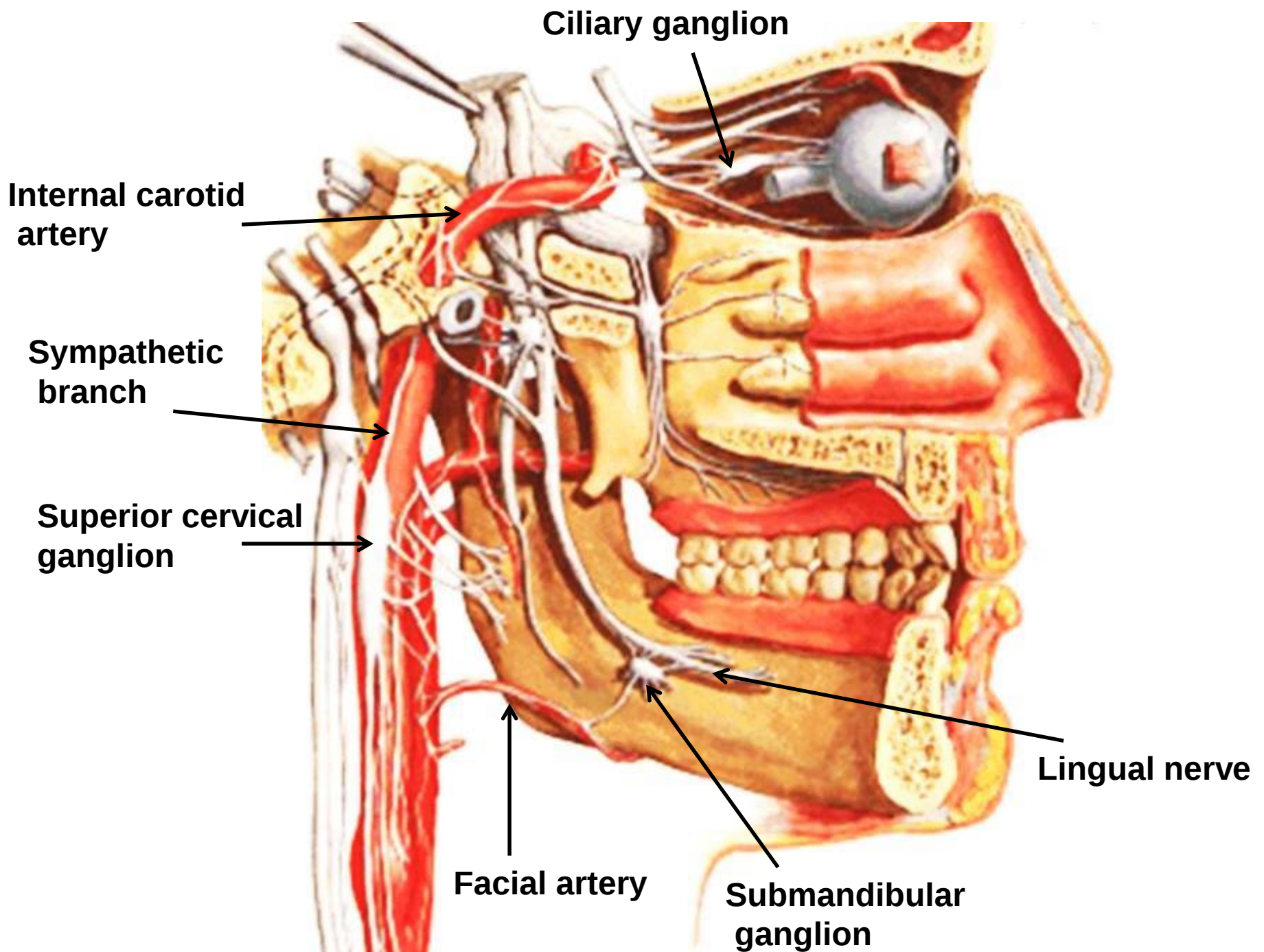


عصب اوکلو موتور

گانگلیون سیلیاری





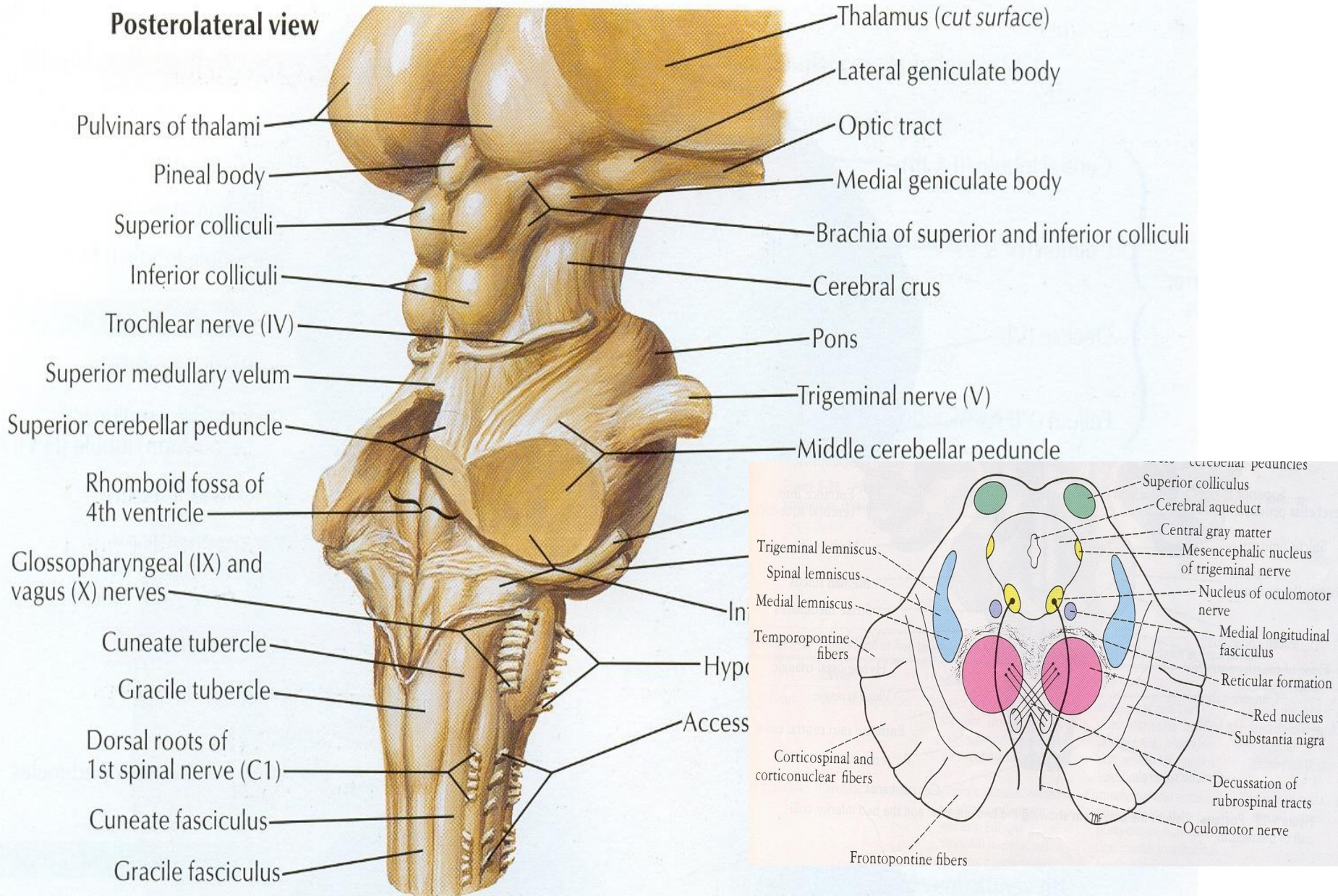


## فلج عصب زوج ۳ (اوکلوموتور)





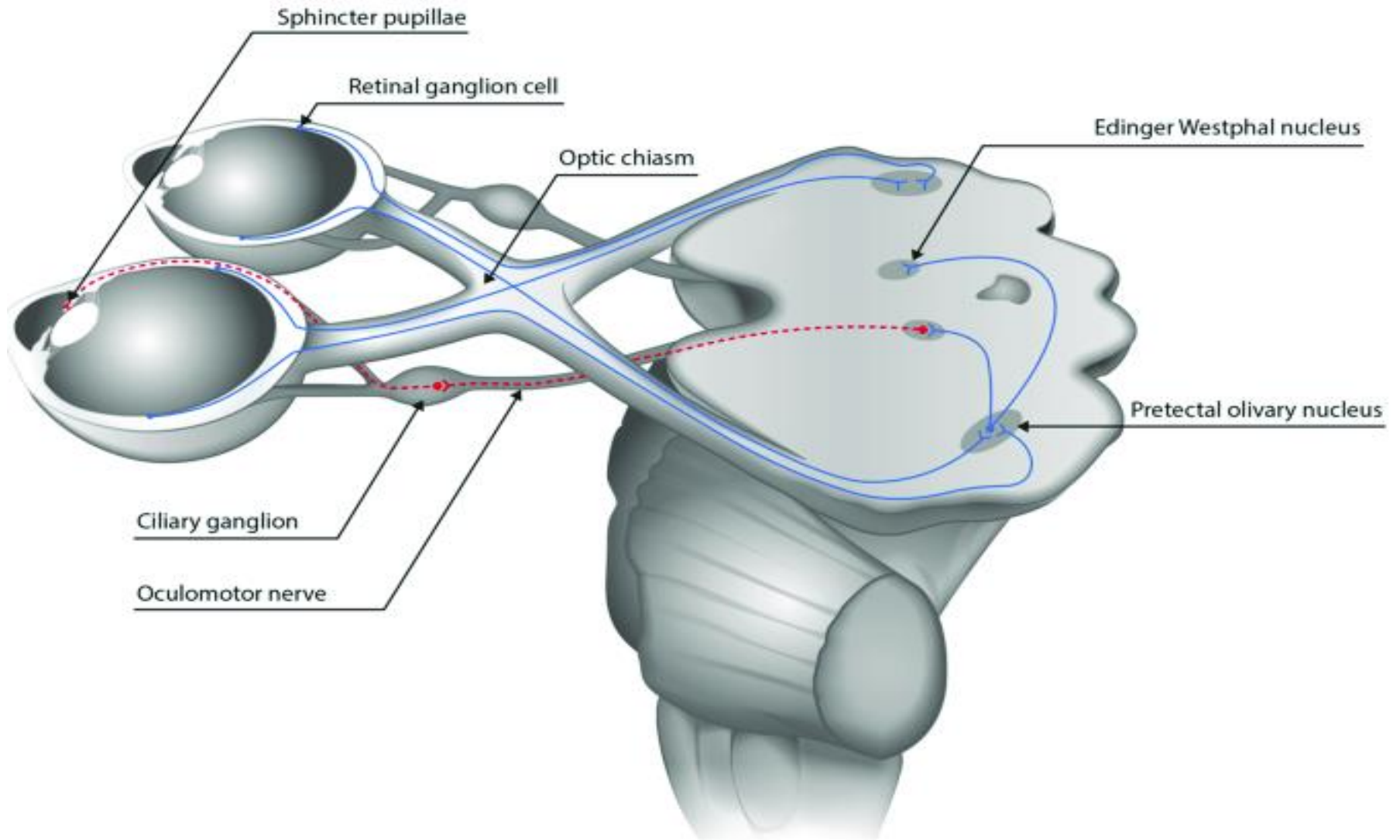
# superior colliculus

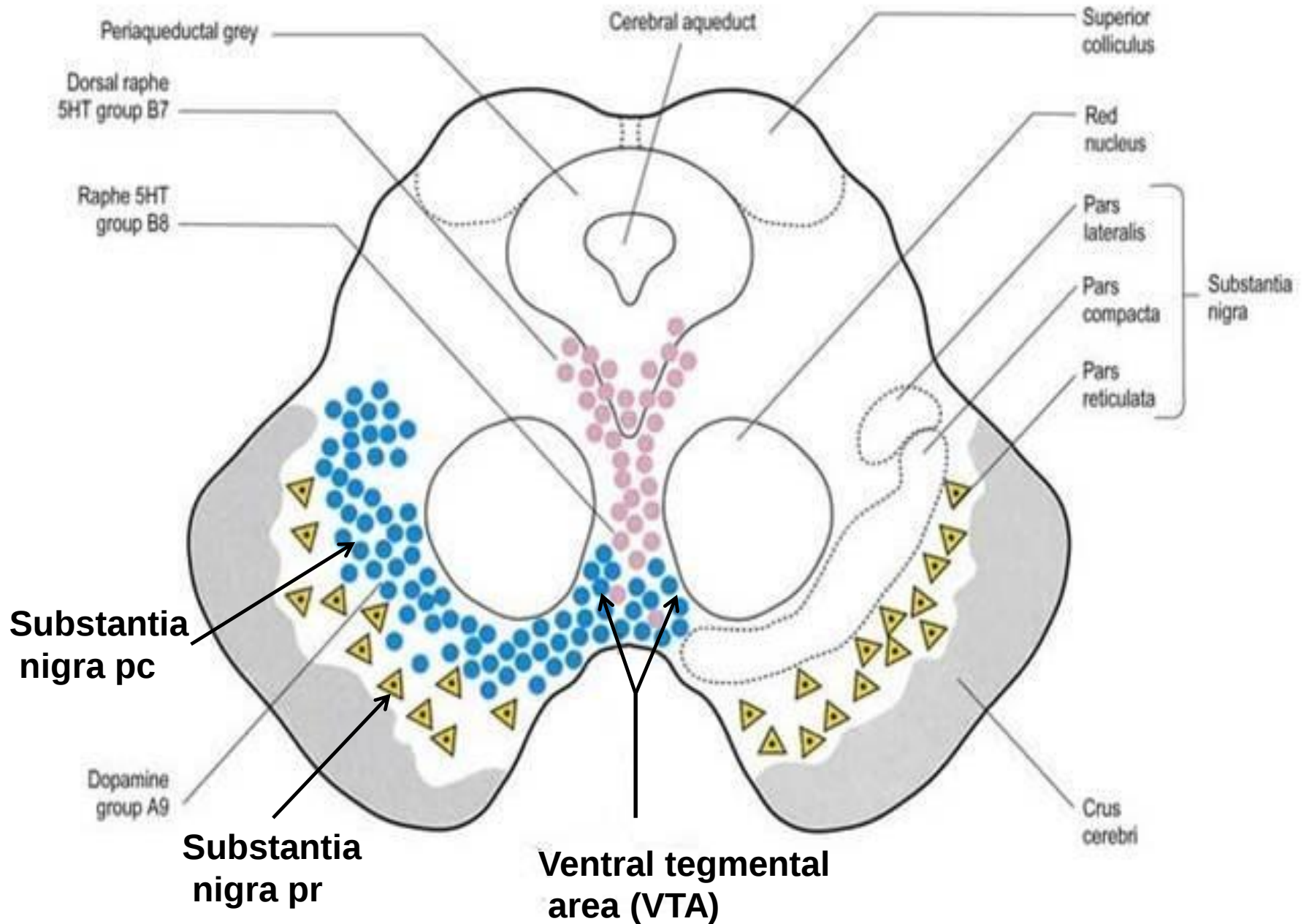


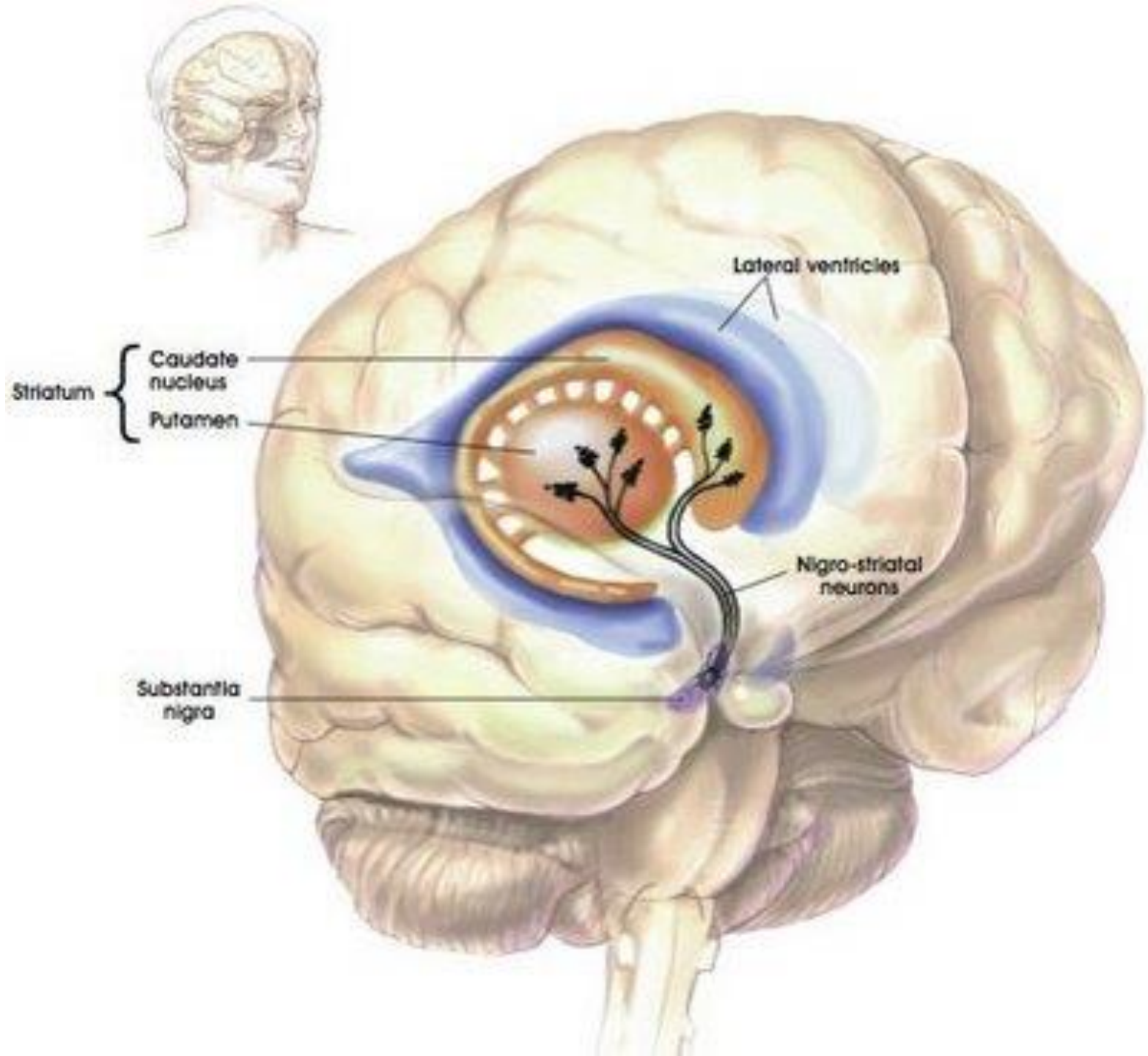
## saccades and pursuit eye movements

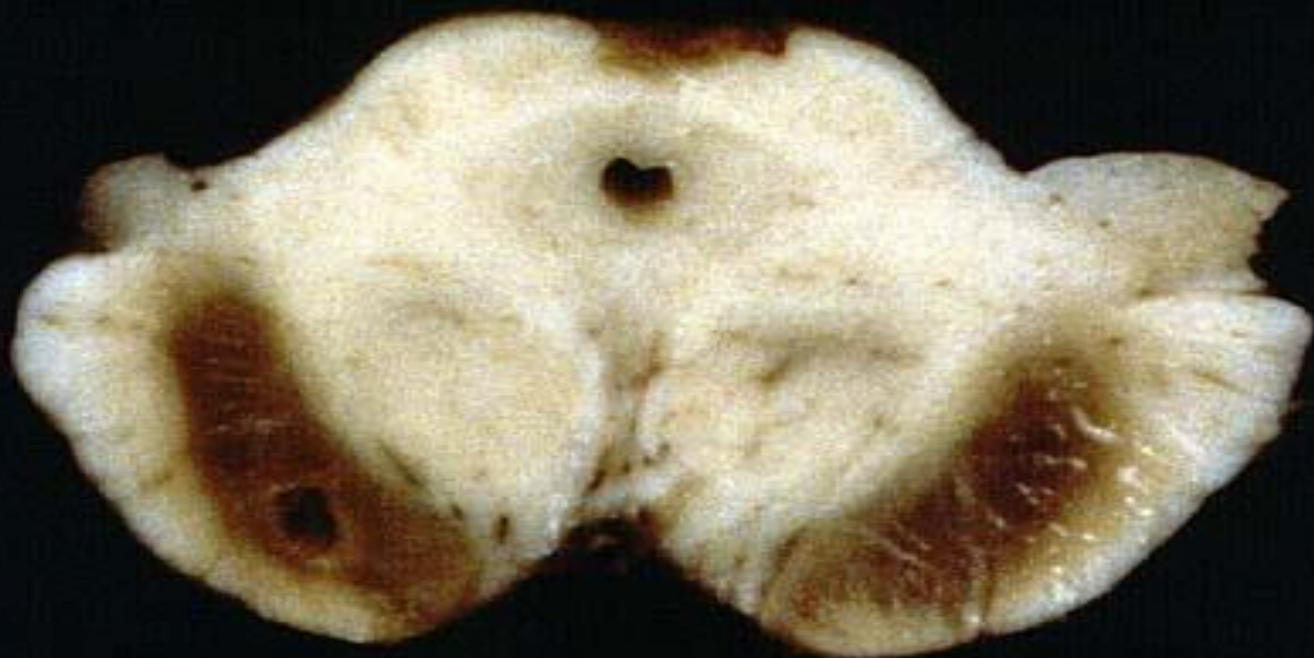


# Pretectal area



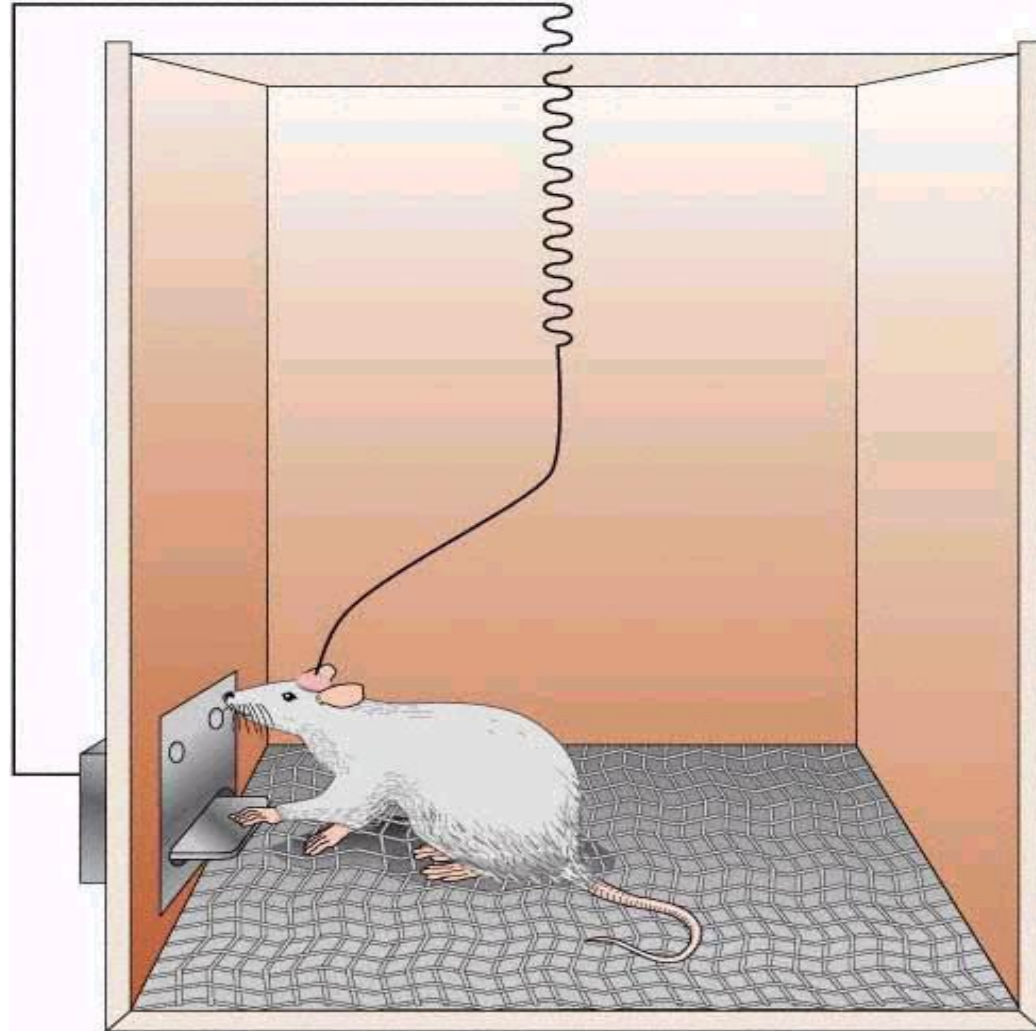




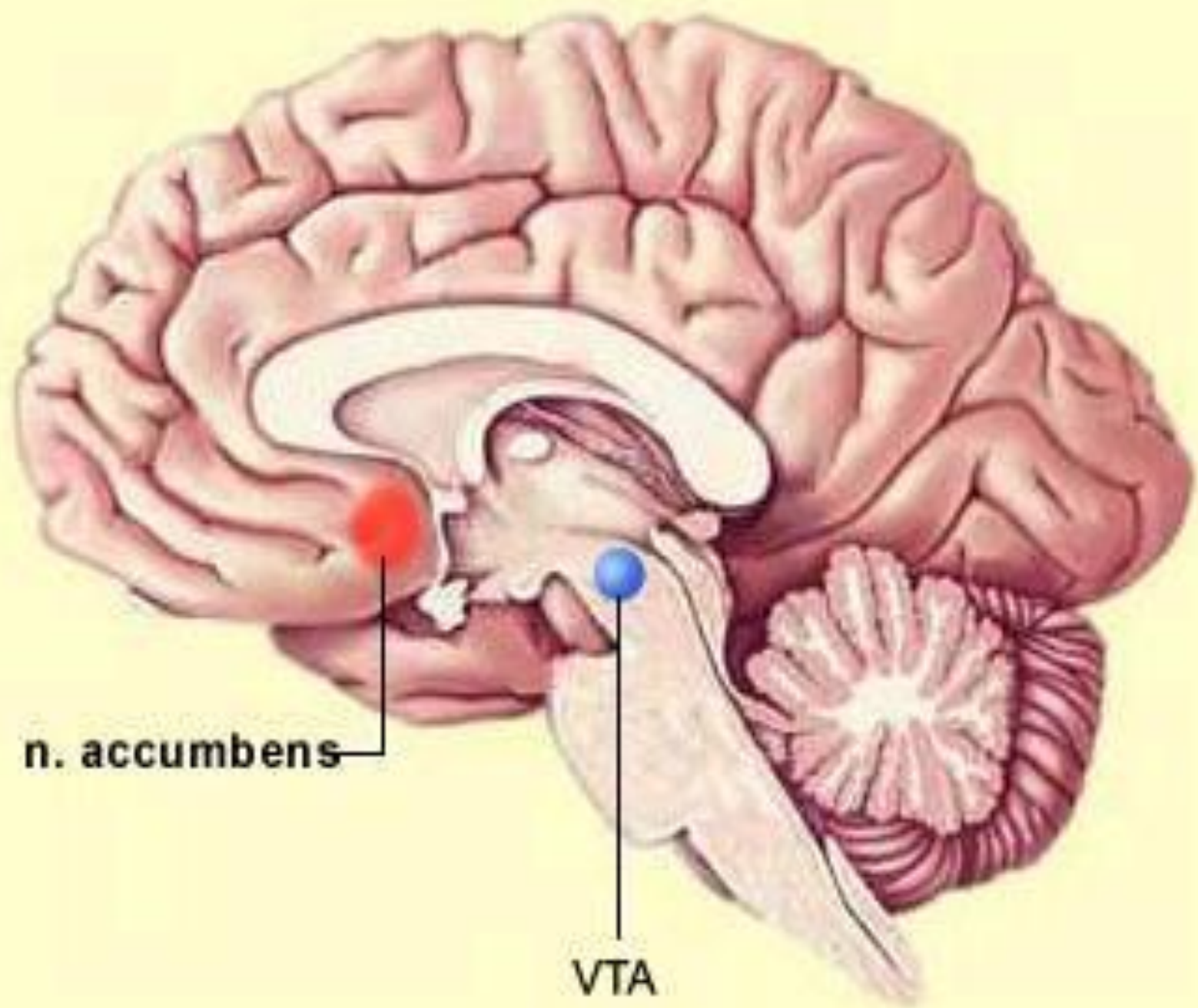




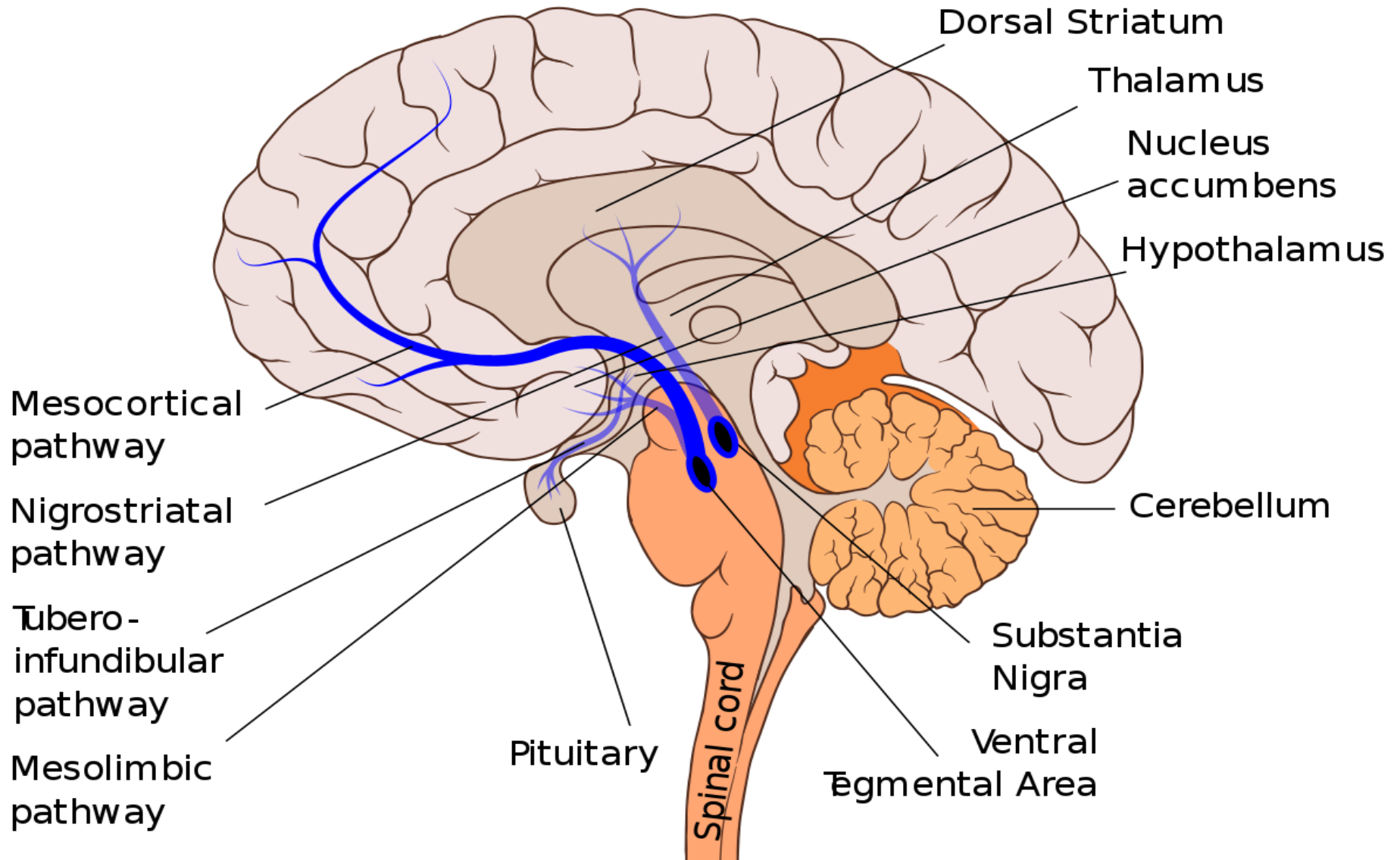
# Electrical self-stimulation and reward



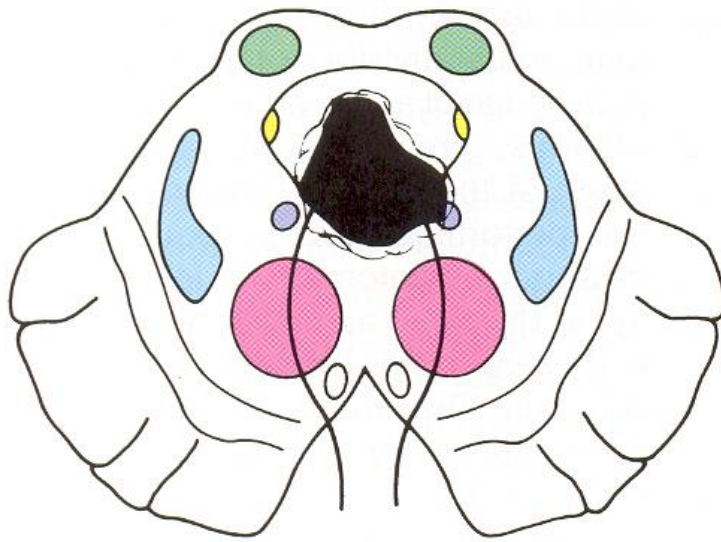




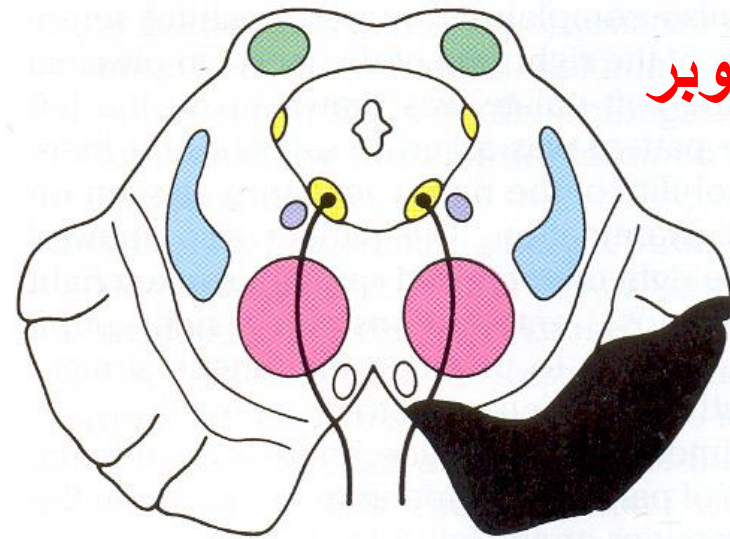
# Dopaminergic pathways



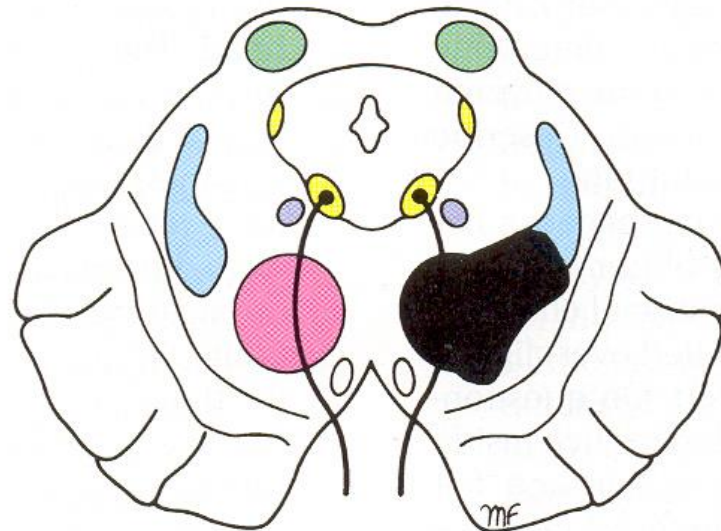
سندرم وبر



A



B

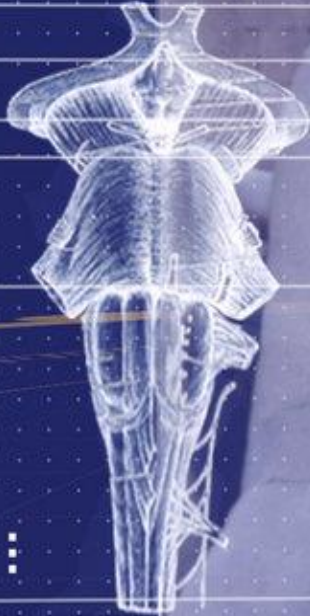


C

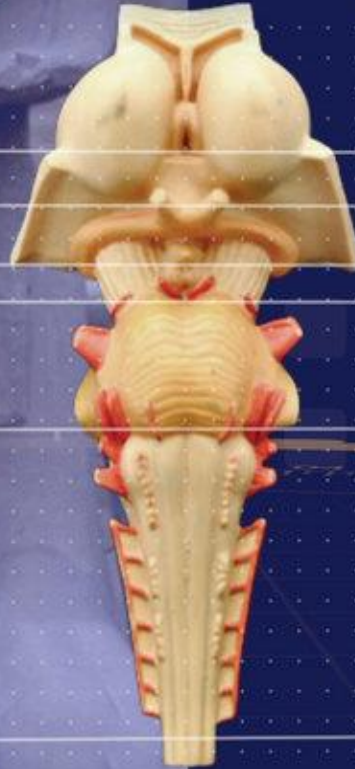
سندرم بندیکت

**Figure 5-26** Pathology of the midbrain. **A.** Tumor of the midbrain blocking the cerebral aqueduct. **B.** Weber's syndrome, involving the oculomotor nerve and the crus cerebri following occlusion of the blood supply to the midbrain. **C.** Benedikt's syndrome, involving the red nucleus and the medial lemniscus following occlusion of the blood supply to the midbrain.

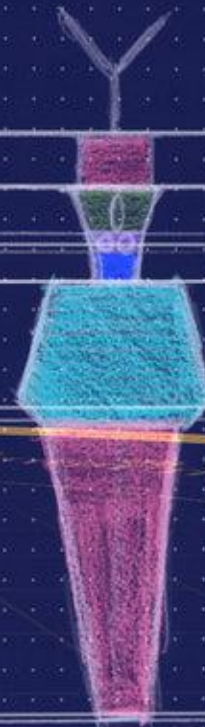
### MEDICAL ILLUSTRATION



### HUMAN BRAIN STEM



### BIOMETRIC TEMPLATE



Ram Sphinx statuary at Luxor and Karnak temples and the “coronal” or “front-facing” view of the human brain stem (Ancient Egyptian Art).

## پروردگارا:

هرگاه که تو را خواندم، پاسخم گفתי؛  
هرچه از تو خواستم، عنایتم فرمودی؛  
هرگاه اطاعت کردم، قدردانی و تشکر کردی؛  
و هر زمان که شکر را بجا آوردم، بر نعمتهایم افزودی.  
من کدام یک از نعمت‌های تو را می‌توانم بشمارم یا حتی به یاد آورم و به خاطر  
بسپارم؟  
خدایا! الطاف خفیهات و مهربانی‌های پنهانی‌ات بیشتر و بیشتر از نعمتهای  
آشکار توست

## بارالها:

در قضایت خیرم را بخواه  
و قدرت برکاتت را بر من فرو ریز تا آنجا که تأخیر را در تعجیل‌های تو و تعجیل  
را در تأخیرهای تو نپسندم.  
آنچه را که پیش می‌اندازی، دلم هوای تاخیرش را نکند  
و آنچه را که بازپس می‌نهی، من را به شکوه و گلایه نکشاند  
ای مهربان ترین مهربانان

دعای عرفه