

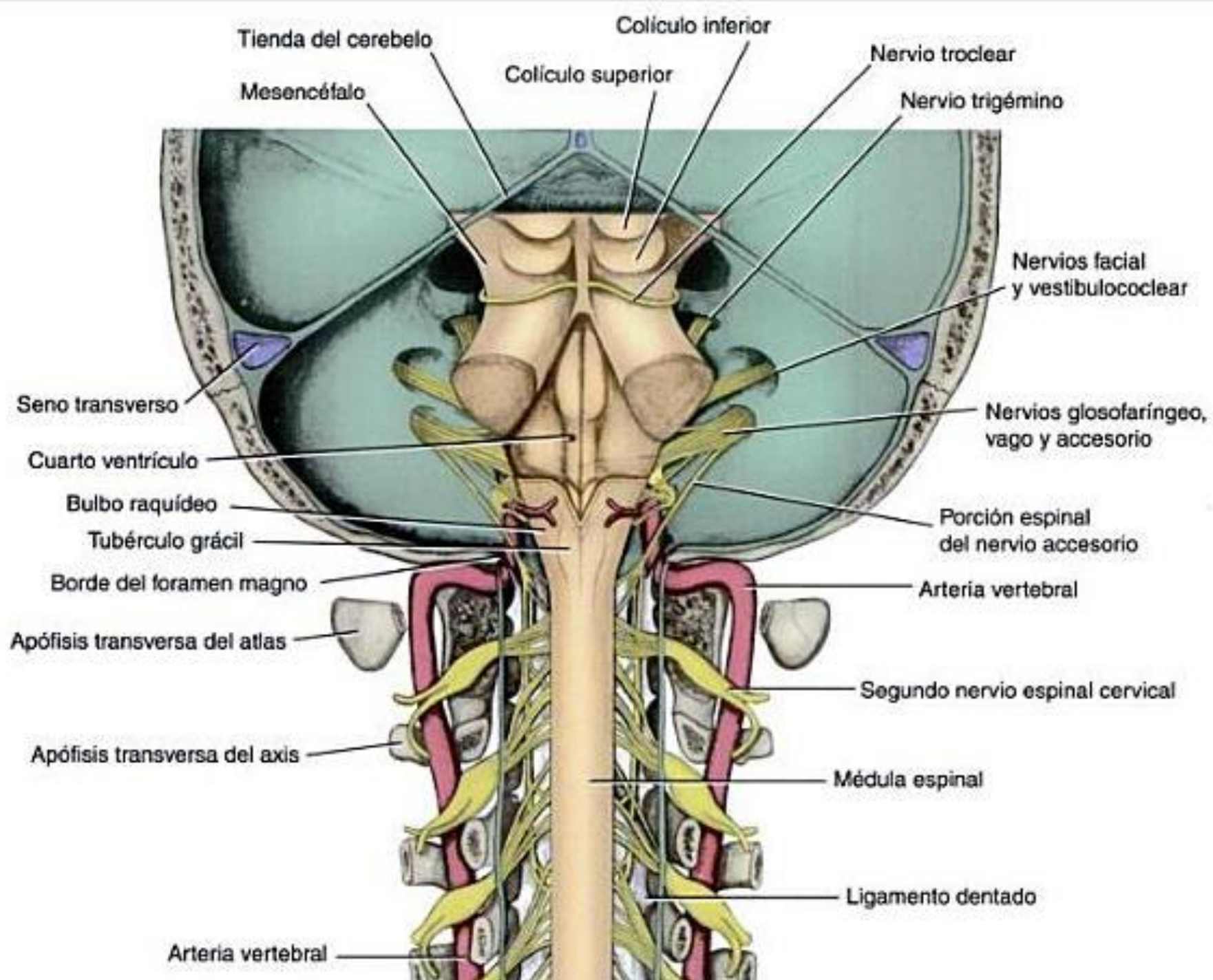
Estructura Interna del Tallo Cerebral

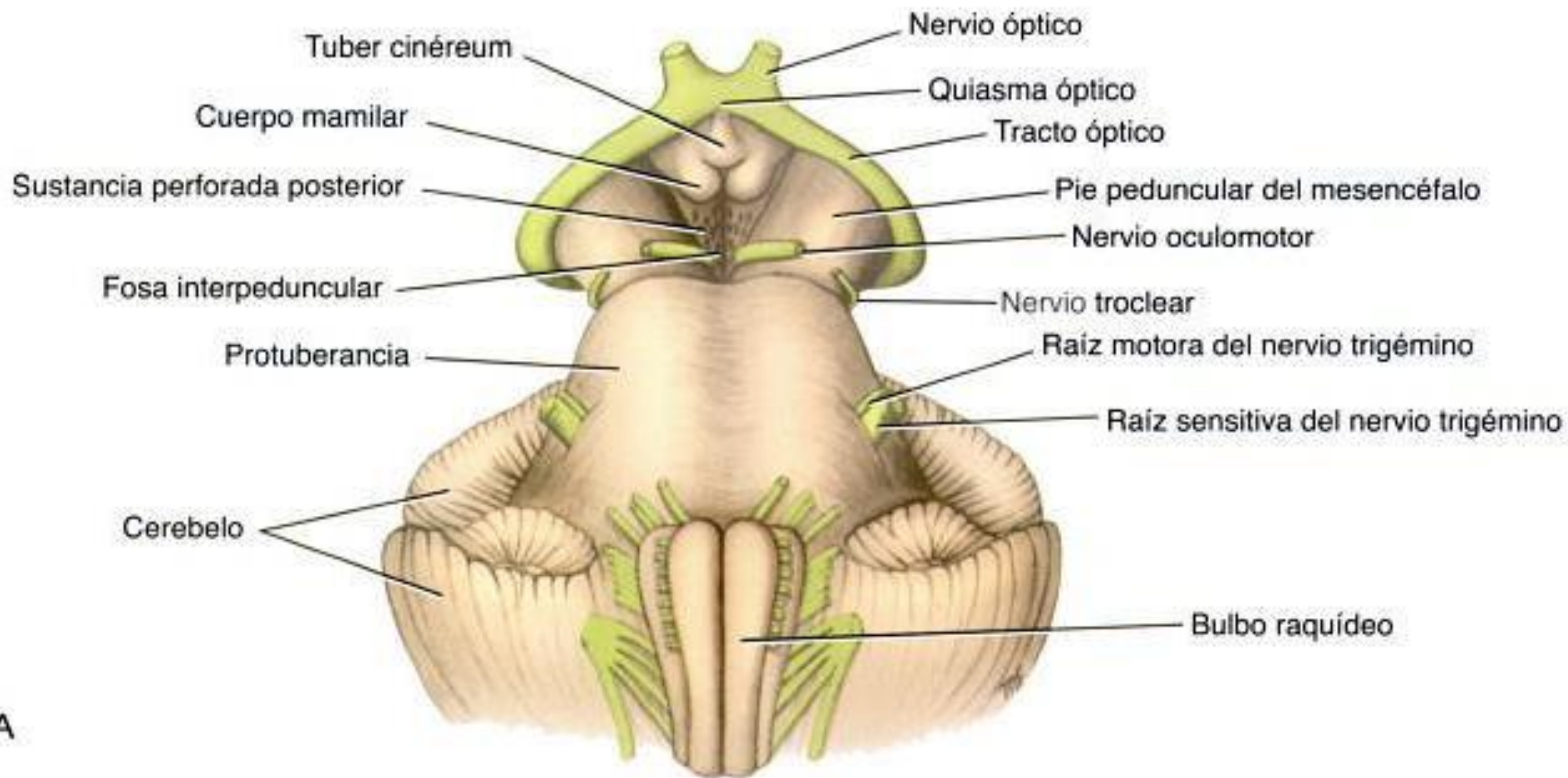
Nelson D. Villalba M.D. M.Sc.

HIPOTÁLAMO, SUBTÁLAMO, PORCIÓN VENTRAL DEL TÁLAMO

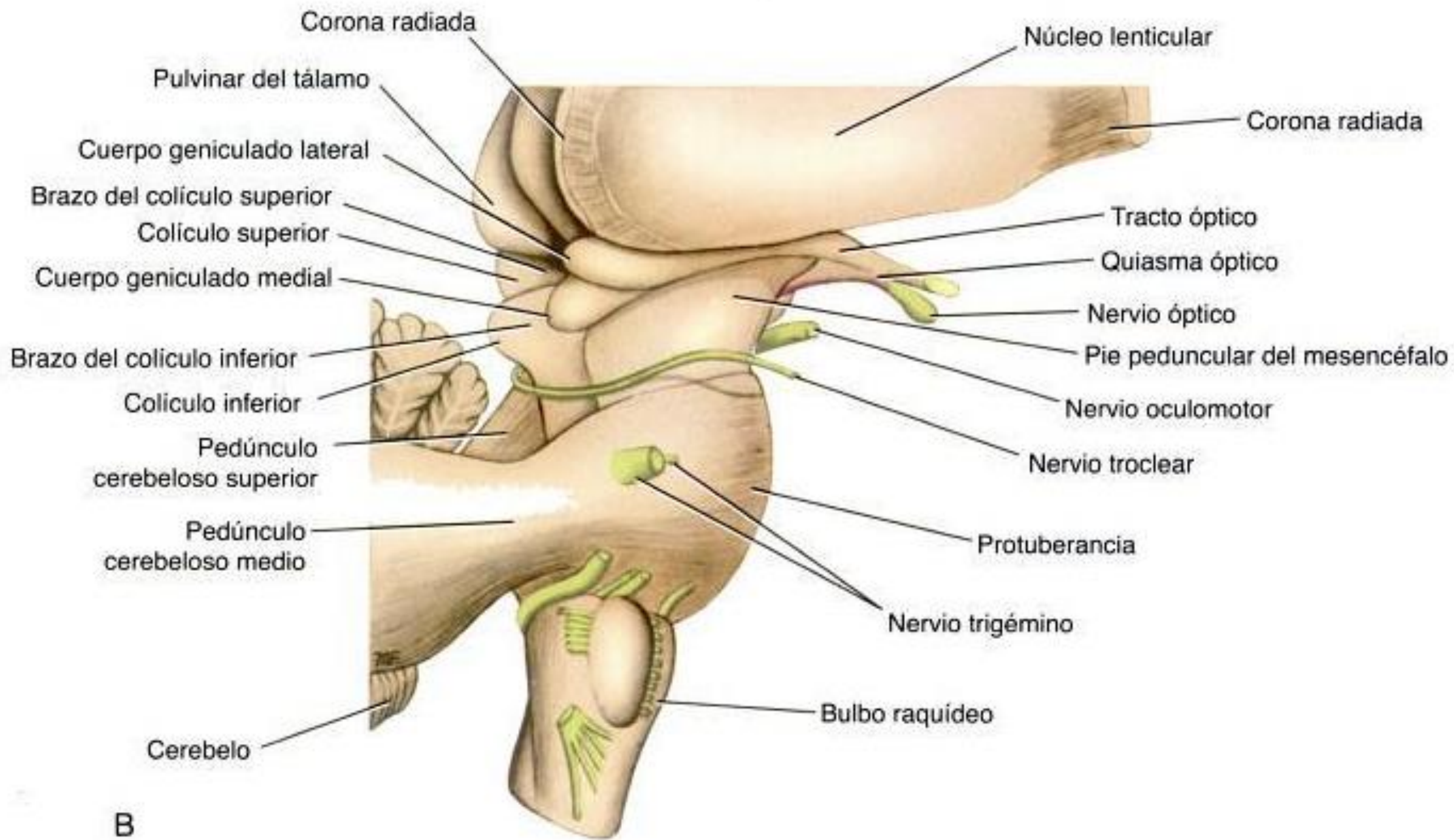
MESENCÉFALO

REGIÓN BASILAR, REGIÓN TEGMENTAL DE LA PROTUBERANCIA

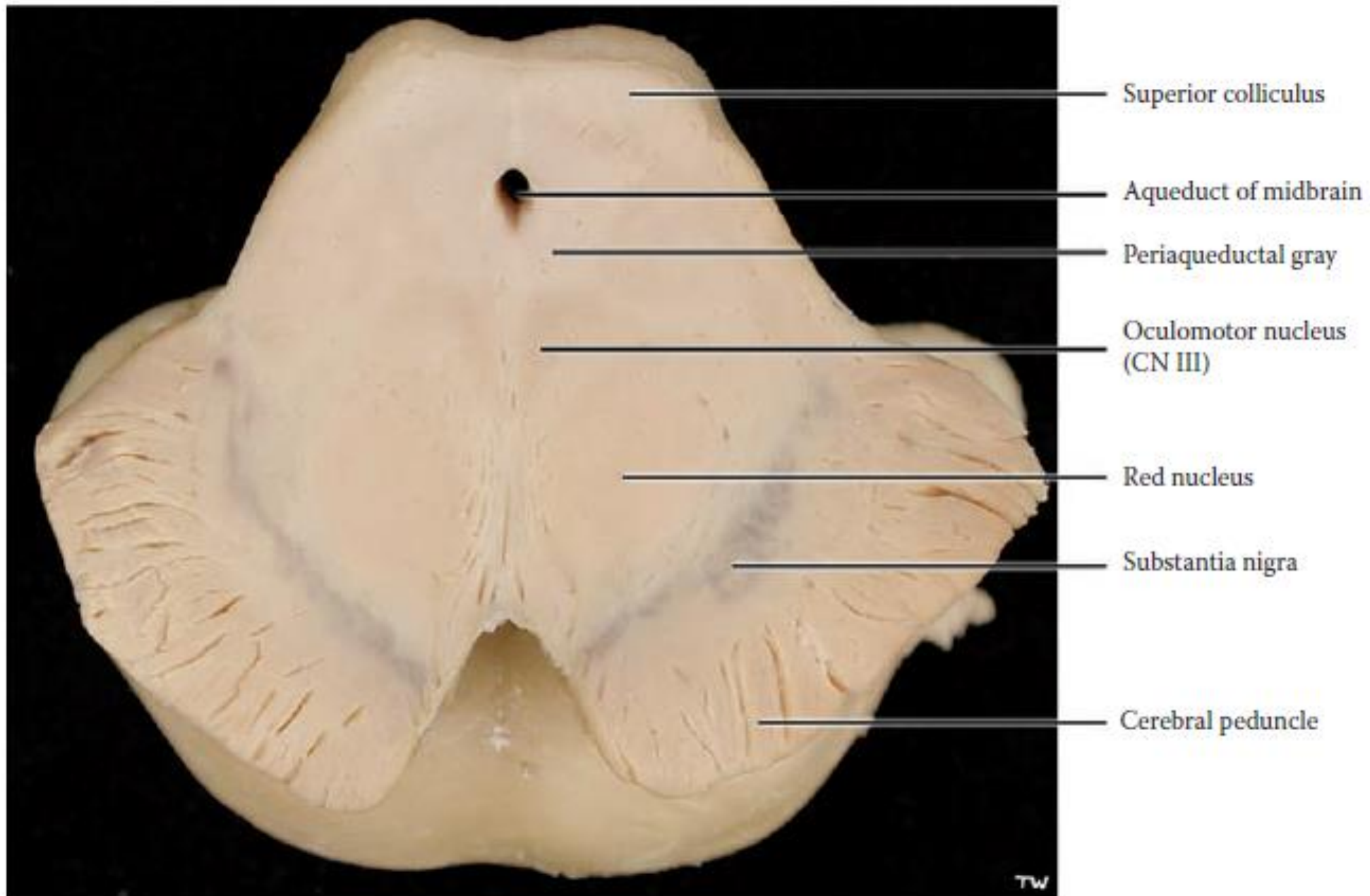




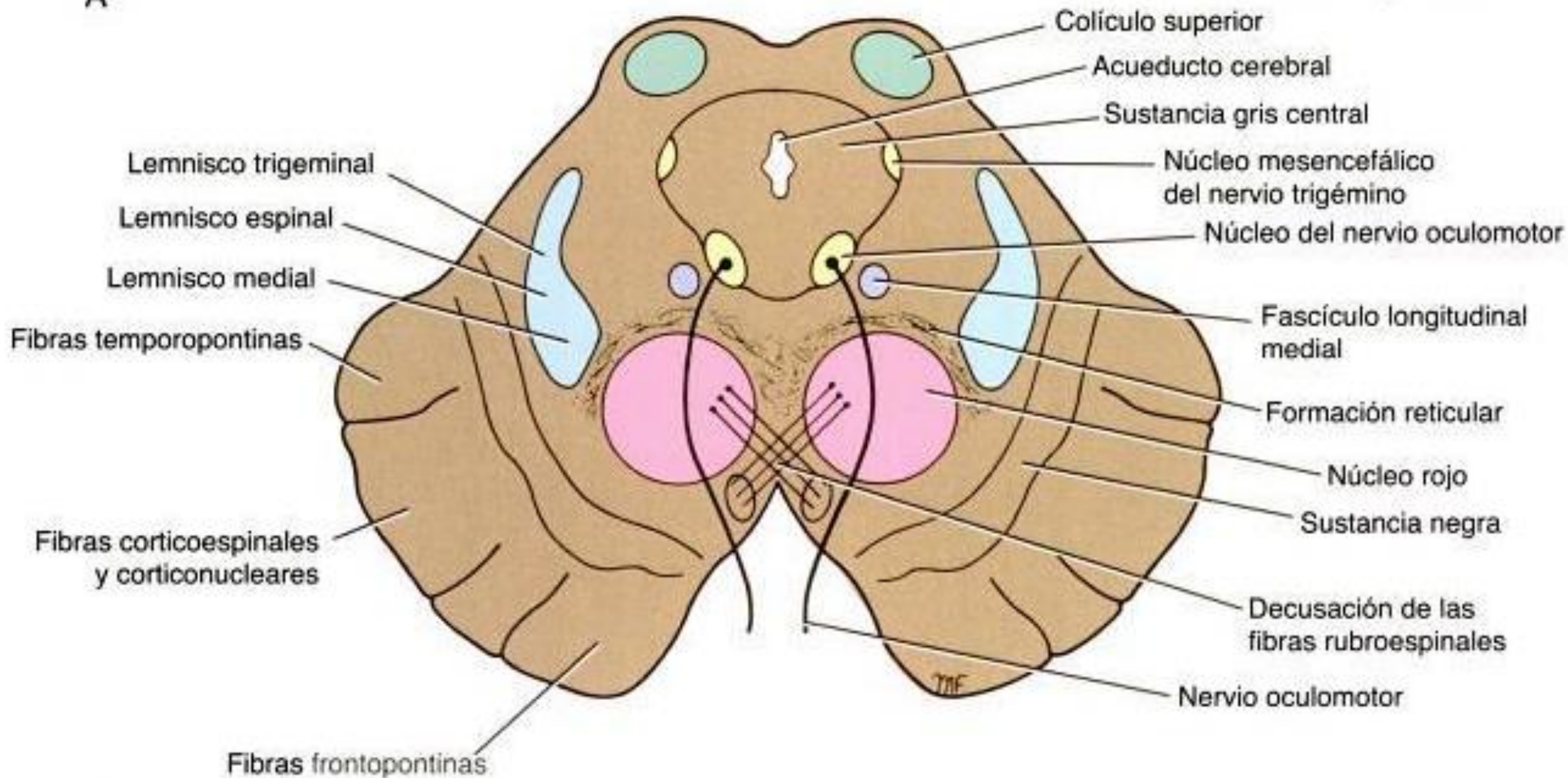
A



B



Midbrain (upper — photograph)

A**B**

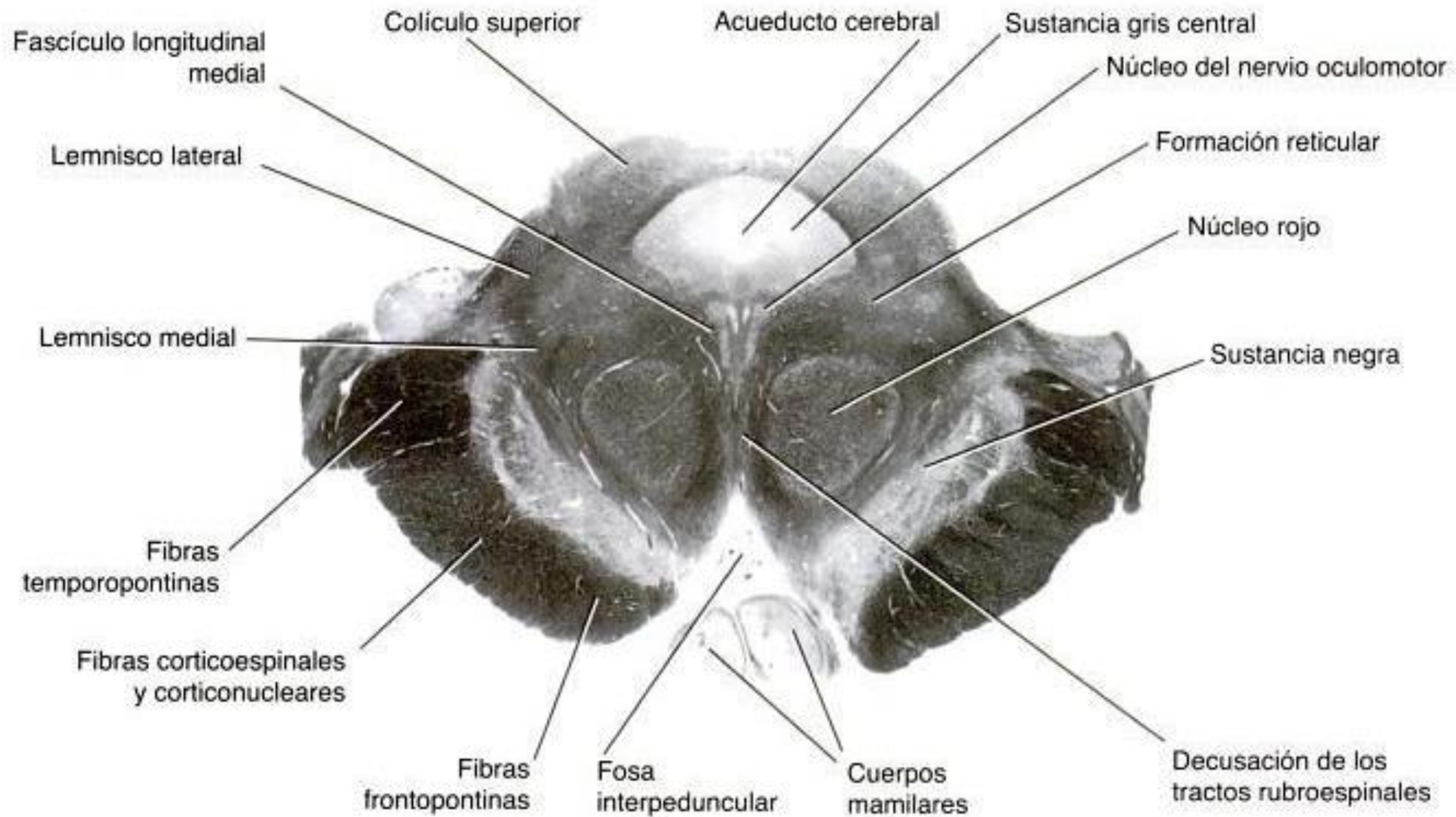
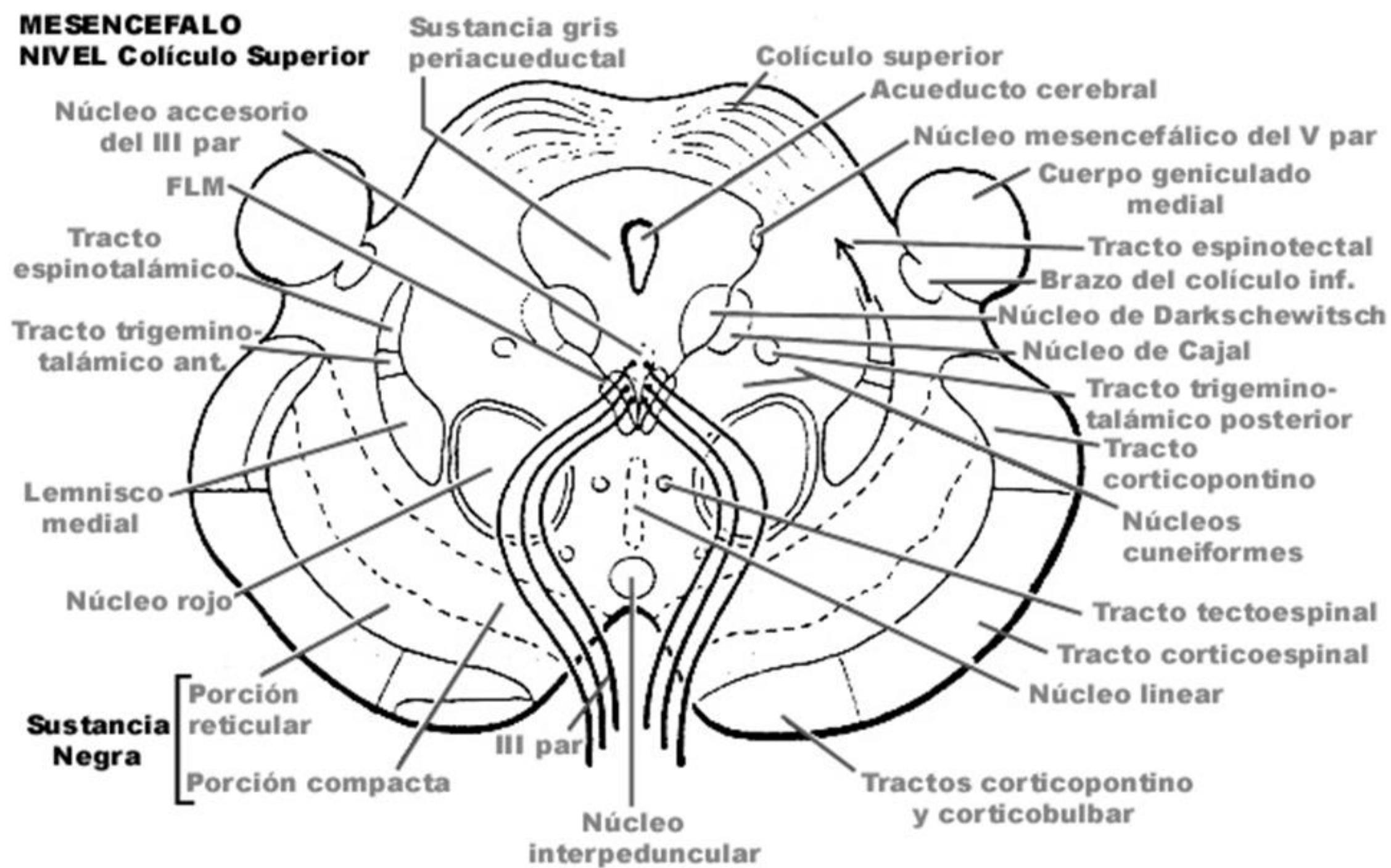
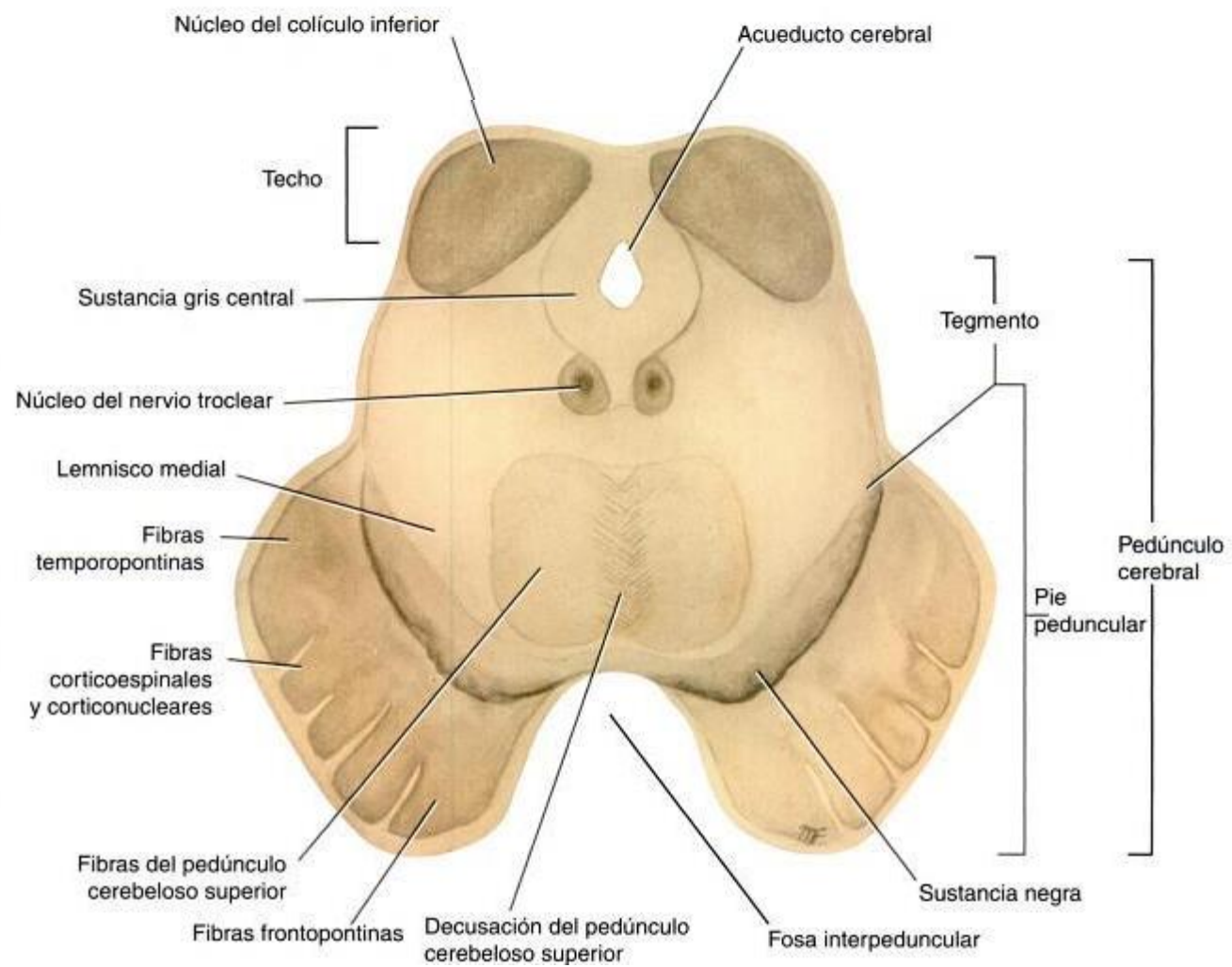
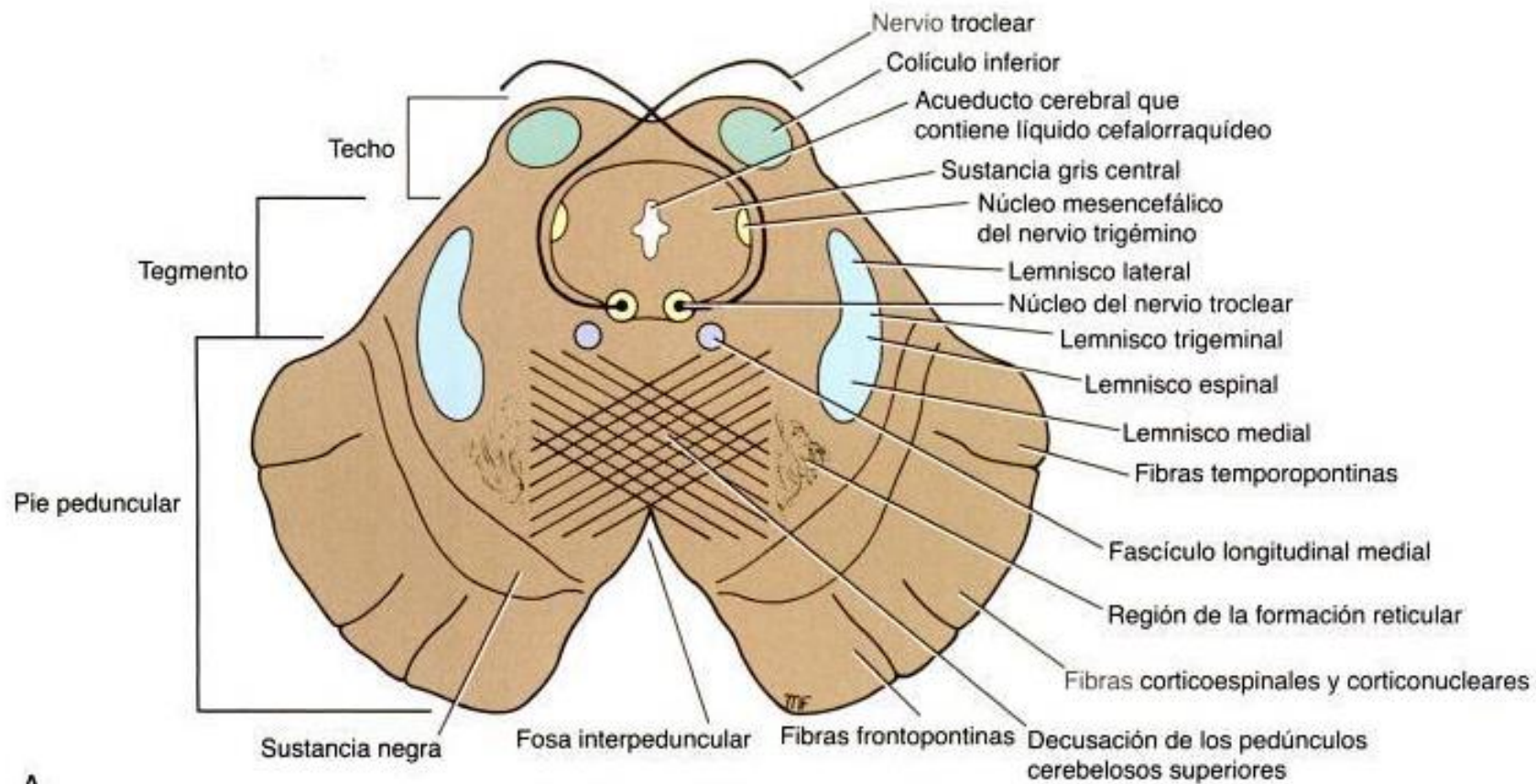


Fig. 5-21. Microfotografía de un corte transversal del mesencéfalo a nivel del colículo superior. (Tinción de Weigert.)

MESENCEFALO
NIVEL Colículo Superior







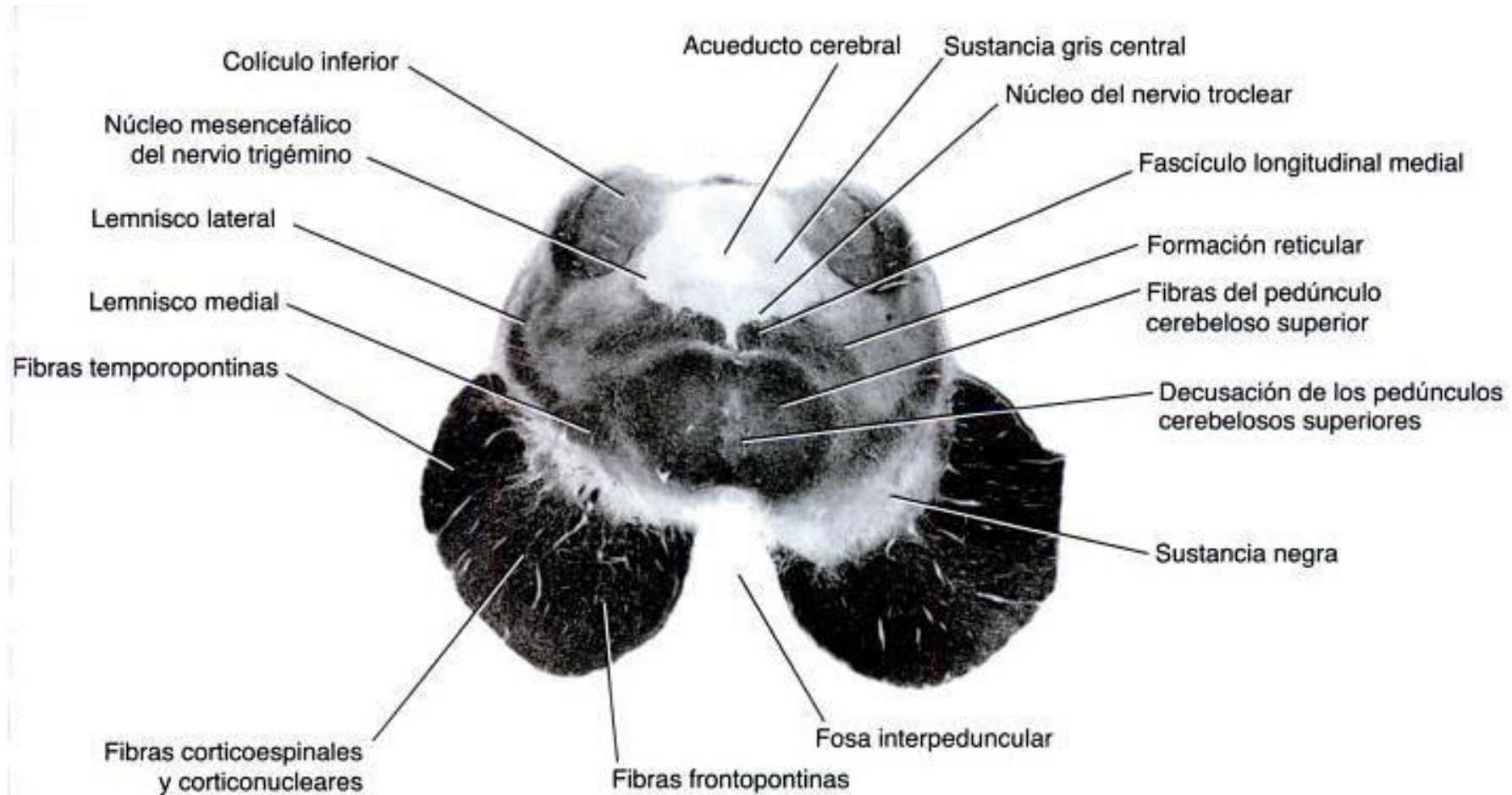
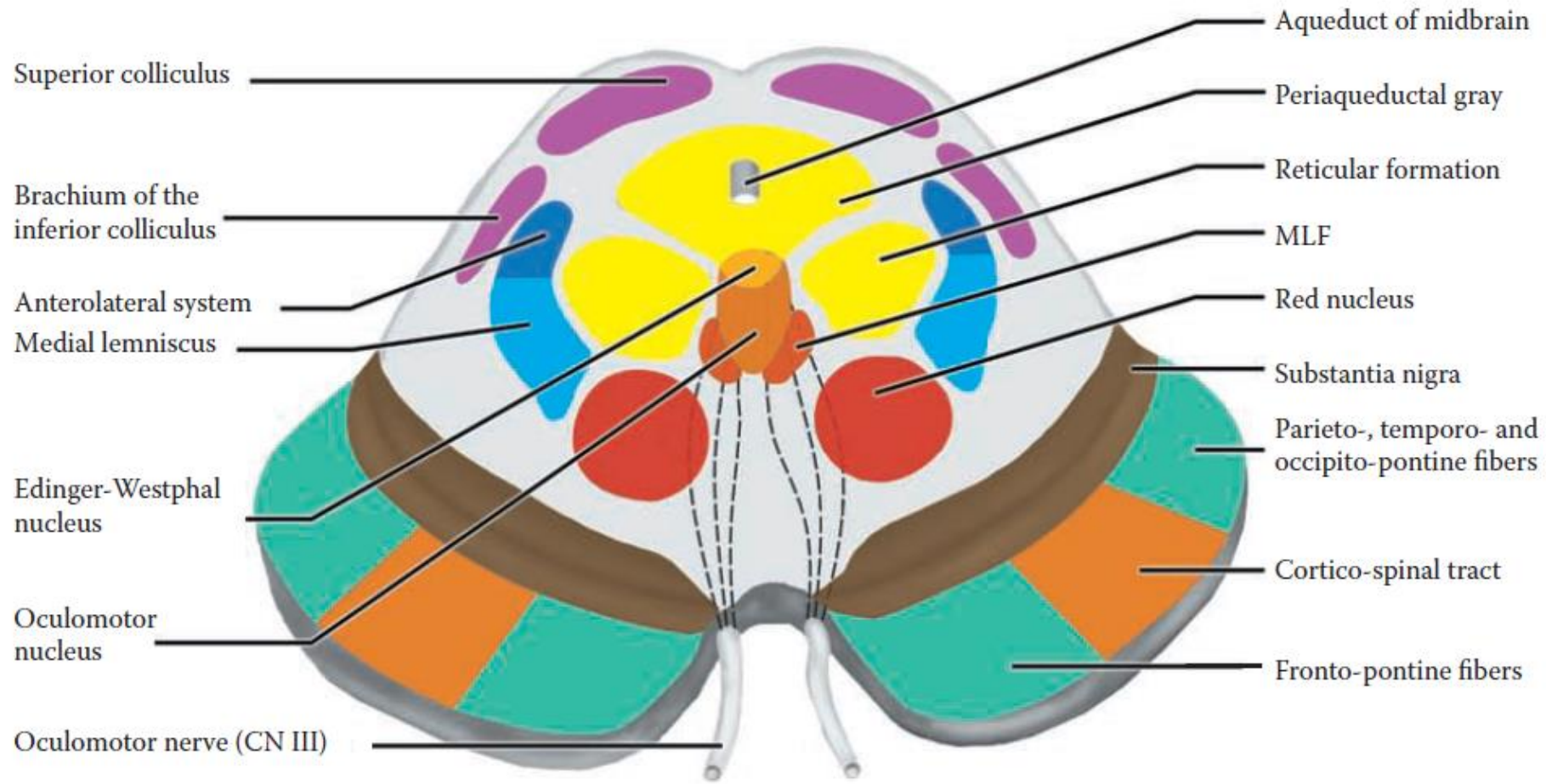
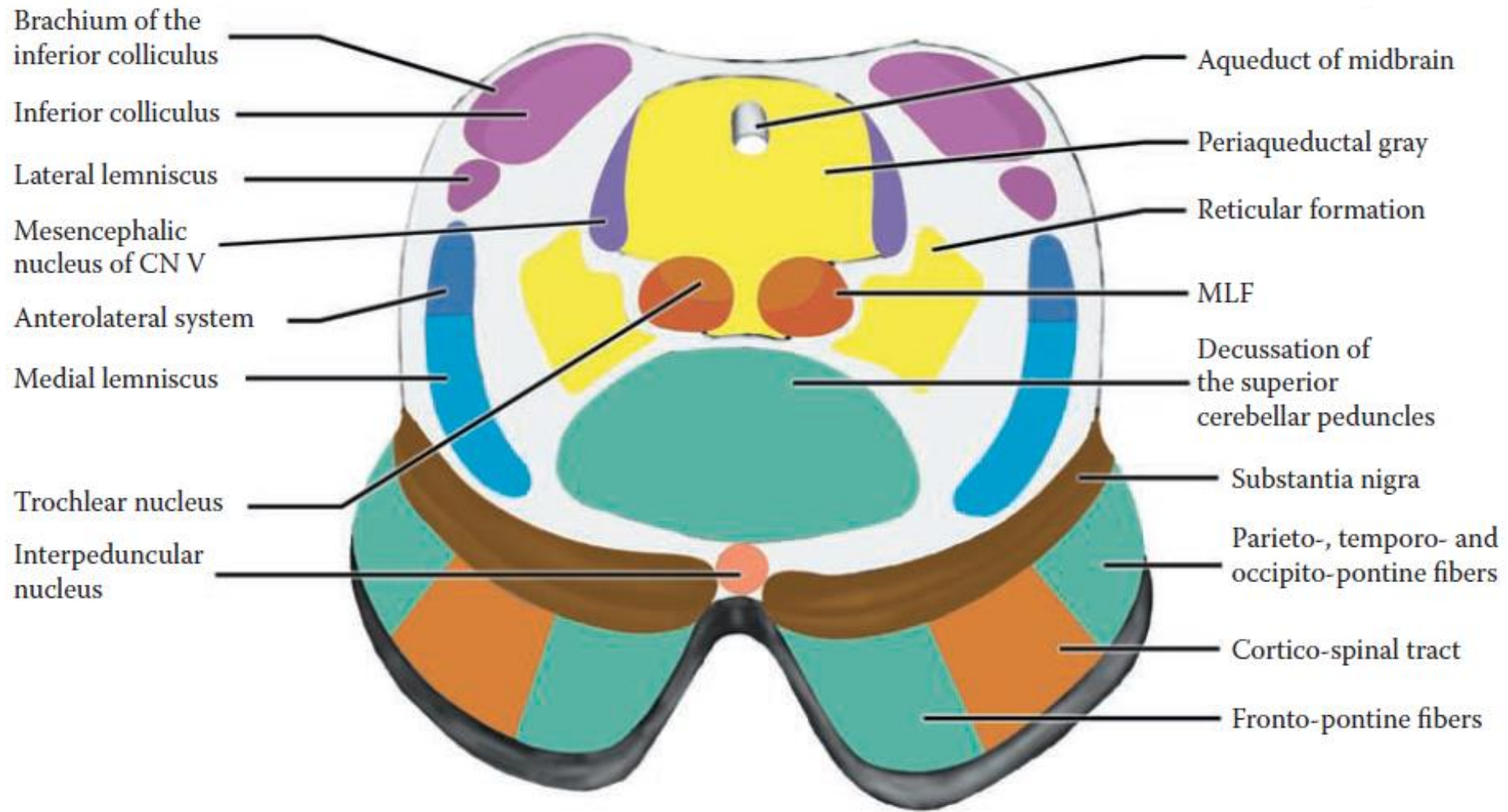
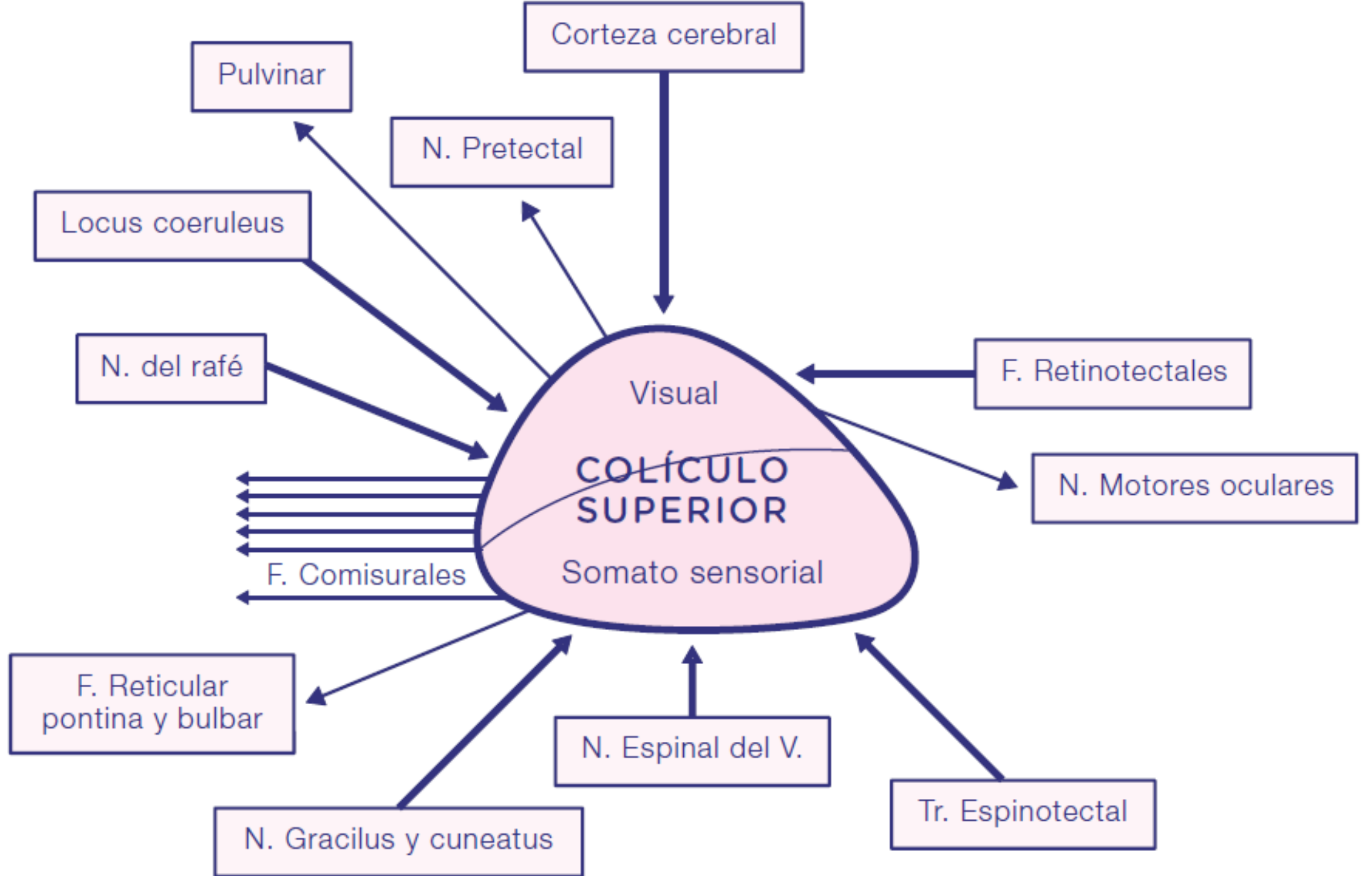


Fig. 5-20. Microfotografía de un corte transversal del mesencéfalo a nivel del colículo inferior. (Tinción de Weigert.)







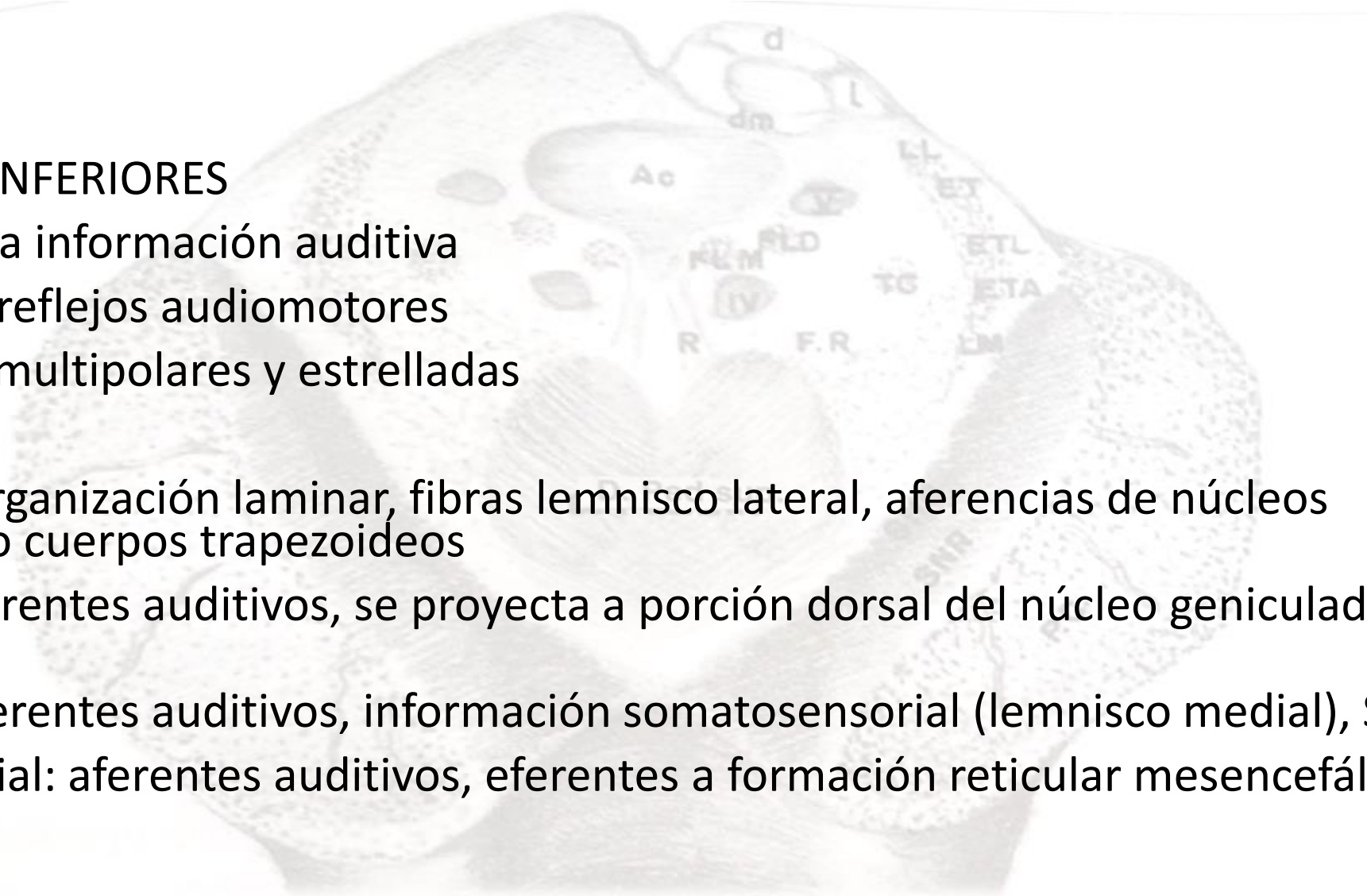
NÚCLEOS PRETECTALES

- Aferentes: Retina y corteza
- Eferentes: Núcleos accesorios del III par (conexión esencial del reflejo pupilar), pulvinar (retinopretecto-tálamocortical)



COLÍCULOS INFERIORES

- Relevo para información auditiva
- Centro de reflejos audiomotores
- Neuronas multipolares y estrelladas
- Central: Organización laminar, fibras lemnisco lateral, aferencias de núcleos cocleares o cuerpos trapezoides
- Dorsal: aferentes auditivos, se proyecta a porción dorsal del núcleo geniculado medial
- Lateral: aferentes auditivos, información somatosensorial (lemnisco medial), SN r
- Dorsomedial: aferentes auditivos, eferentes a formación reticular mesencefálica y pontina



SUSTANCIA GRIS PERIACUEDUCTAL

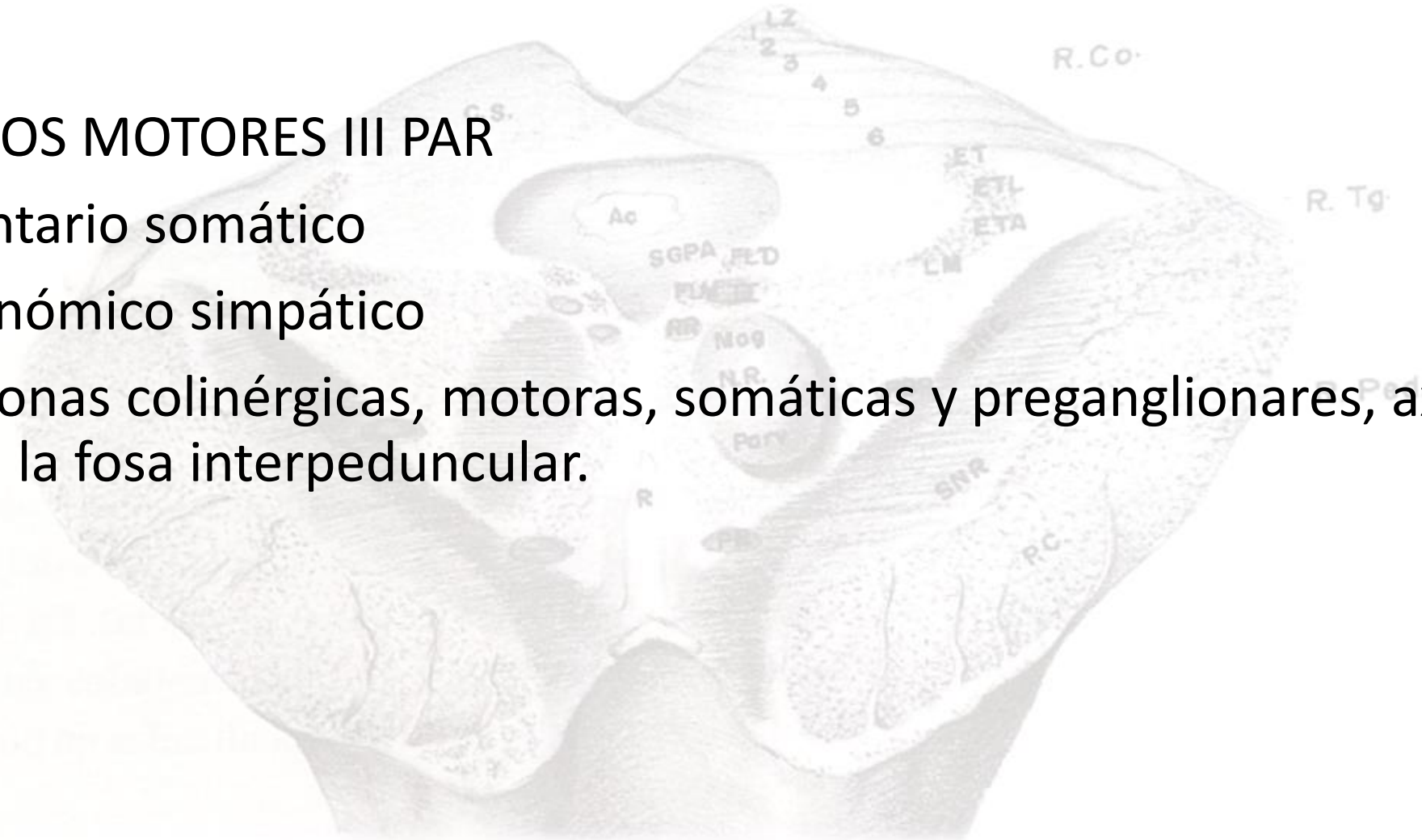
- Rodea al acueducto de Silvio
- Núcleo mediano
- Núcleo dorsal
- Núcleo lateral
- Neuronas pequeñas, fusiformes, también multipolares y piramidales

Fibras colinérgicas, neuronas glutamatérgicas, gabaérgicas, sustancia P, péptidos opioides

Corteza cerebral (24, 9 y 10, 8 y 6)
Amígdala, núcleos central y basolateral
Tálamo
Hipotálamo
Zona incerta
Colículos superior e inferior
Núcleo cuneatus
Locus ceruleus
Cerebelo
Núcleos de la formación reticular
Tracto solitario
Núcleo espinal del V
Láminas I de la médula espinal

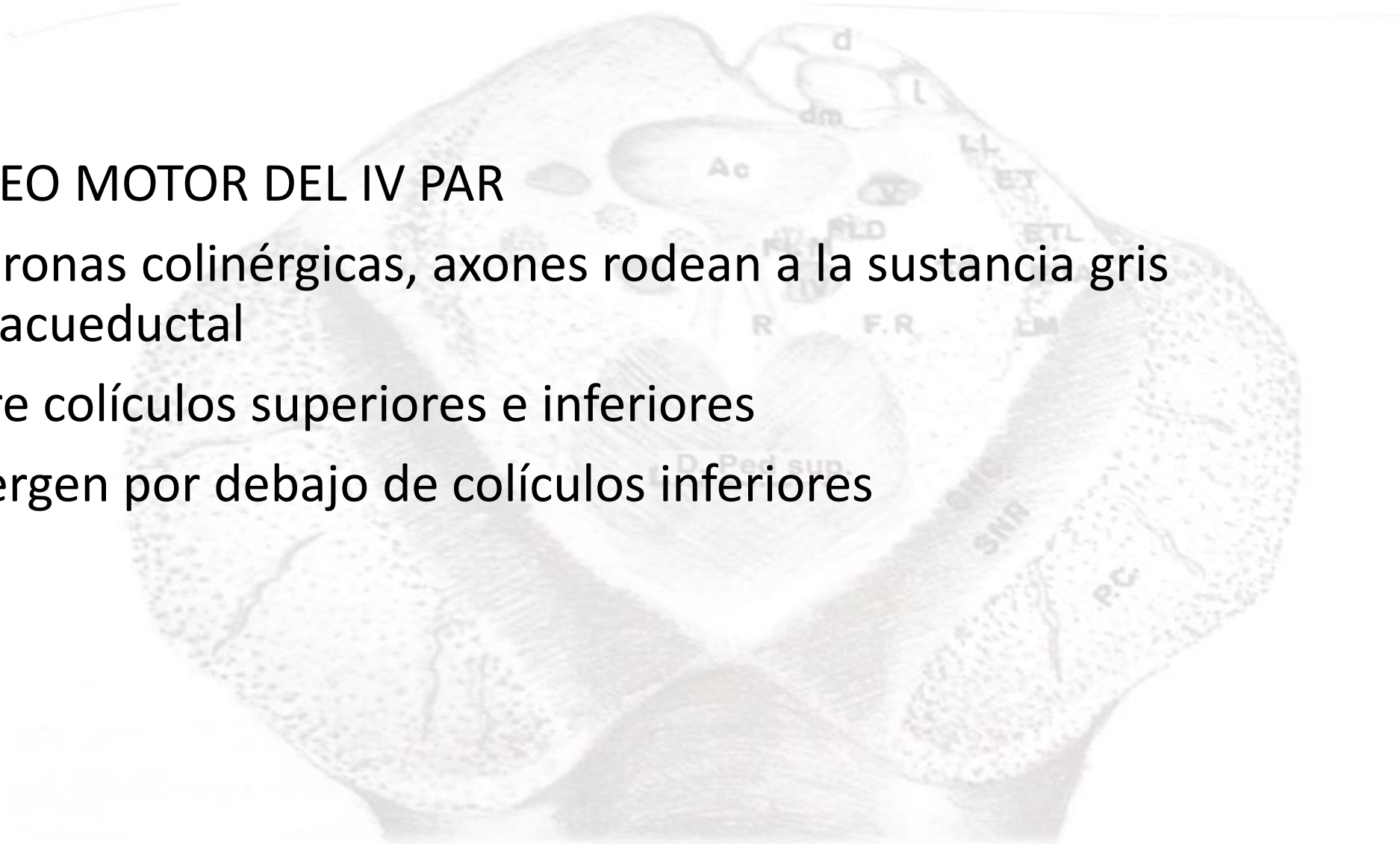
NÚCLEOS MOTORES III PAR

- Voluntario somático
- Autonómico simpático
- Neuronas colinérgicas, motoras, somáticas y preganglionares, axones hacia la fosa interpeduncular.



NÚCLEO MOTOR DEL IV PAR

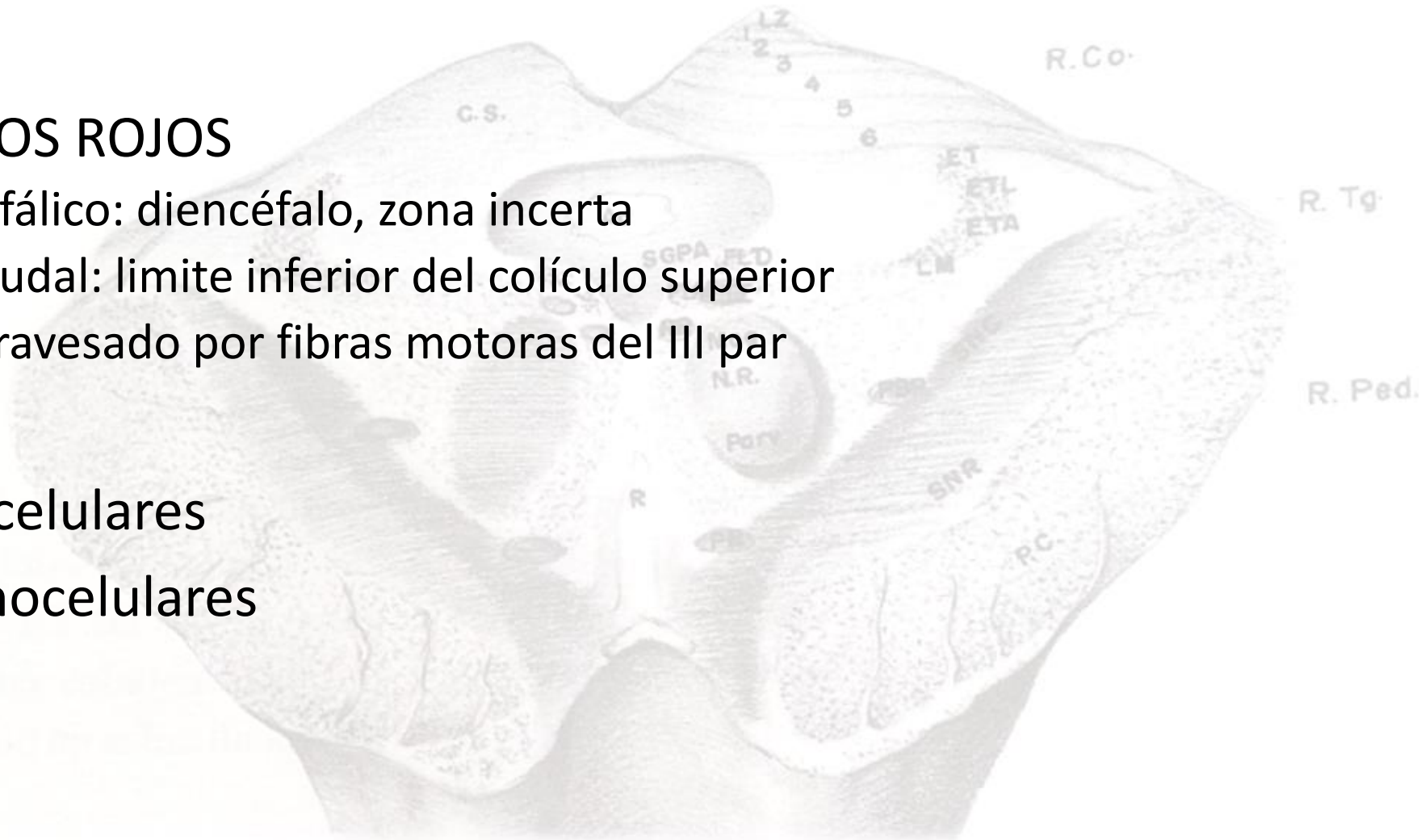
- Neuronas colinérgicas, axones rodean a la sustancia gris periacueductal
- Entre colículos superiores e inferiores
- Emergen por debajo de colículos inferiores

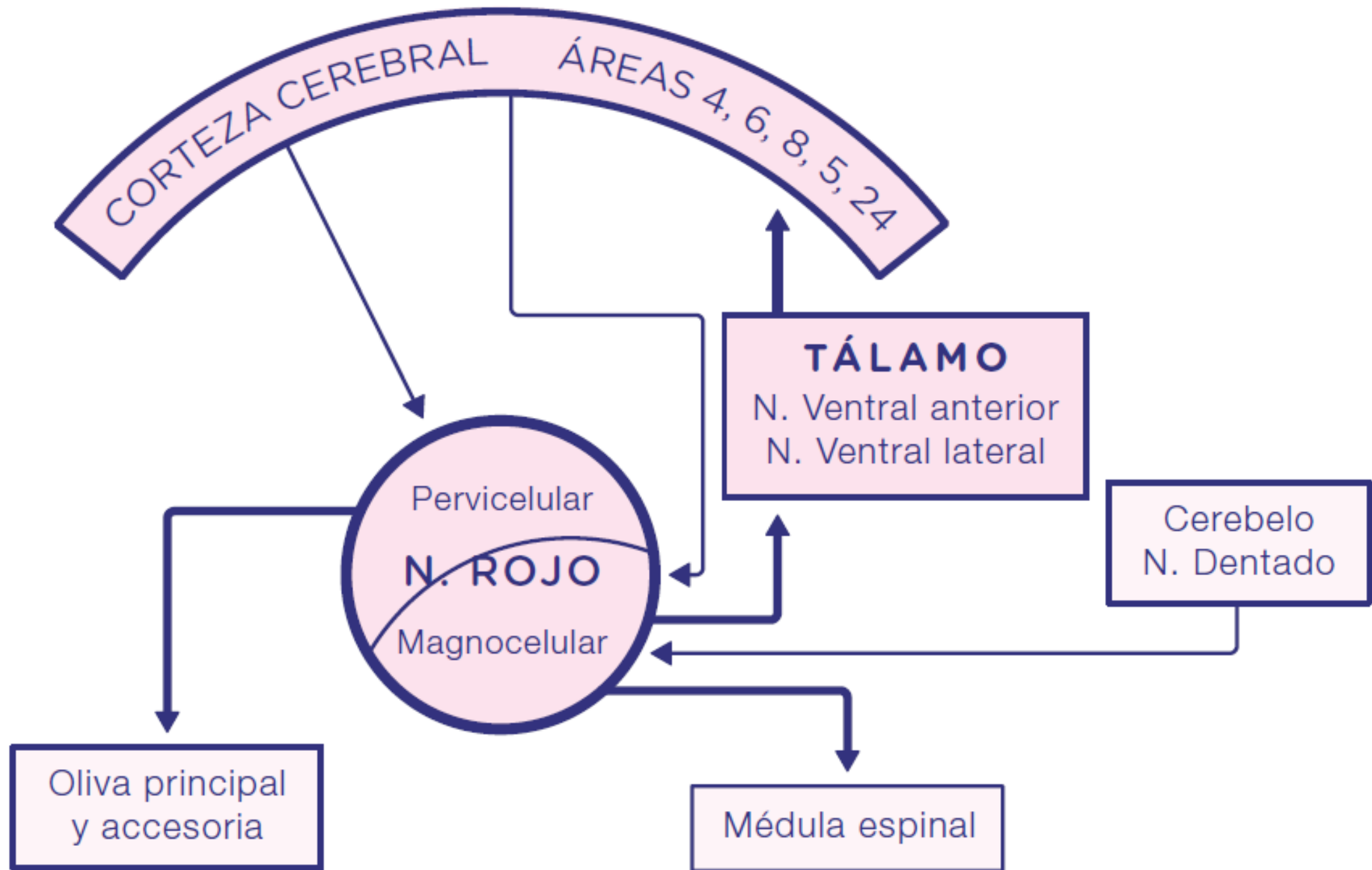


NÚCLEOS ROJOS

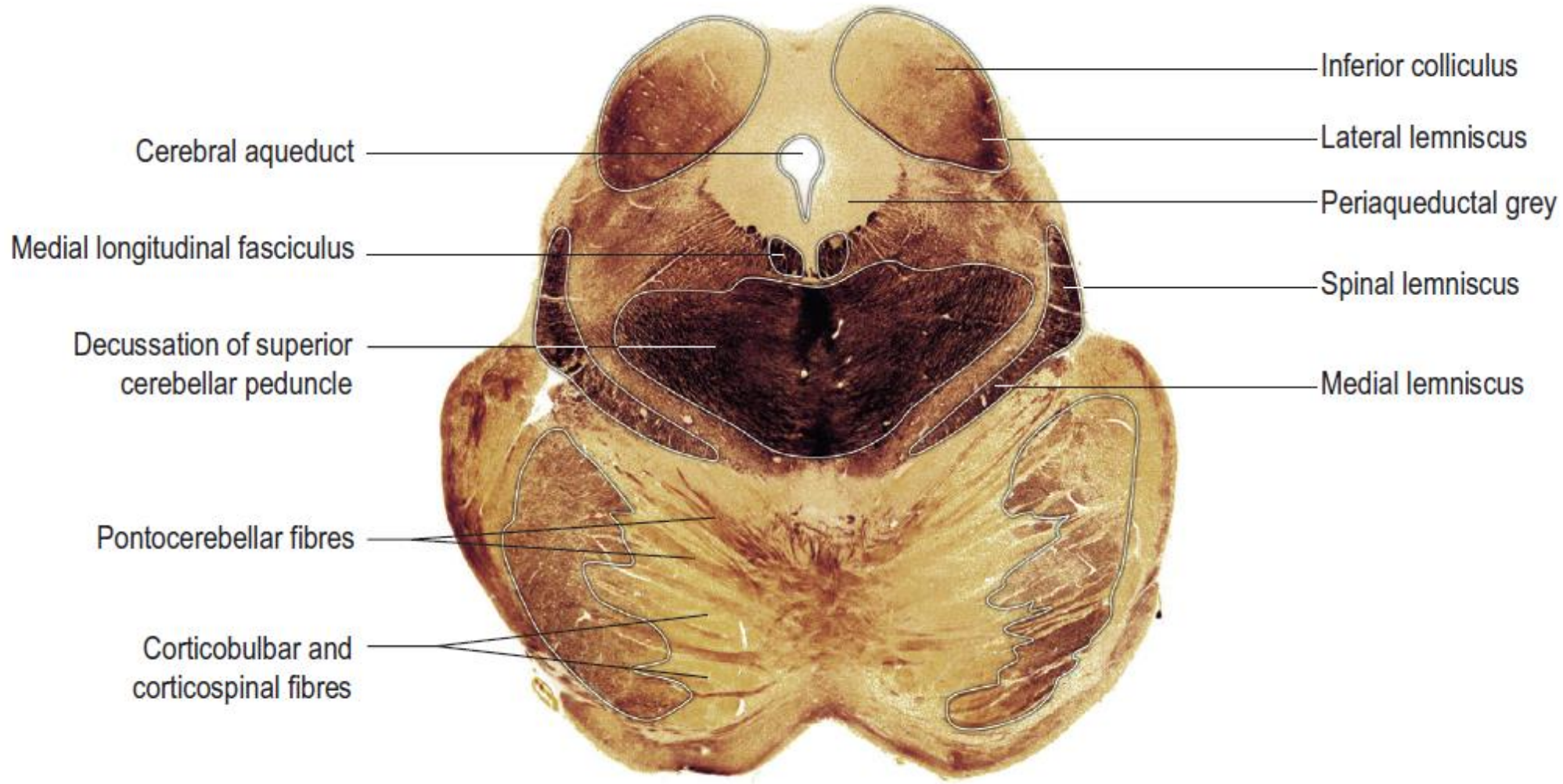
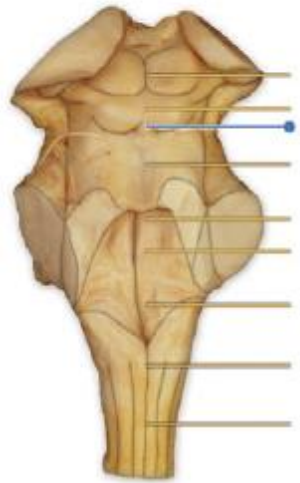
- Cefálico: diencéfalo, zona incerta
- Caudal: límite inferior del colículo superior
- Atravesado por fibras motoras del III par

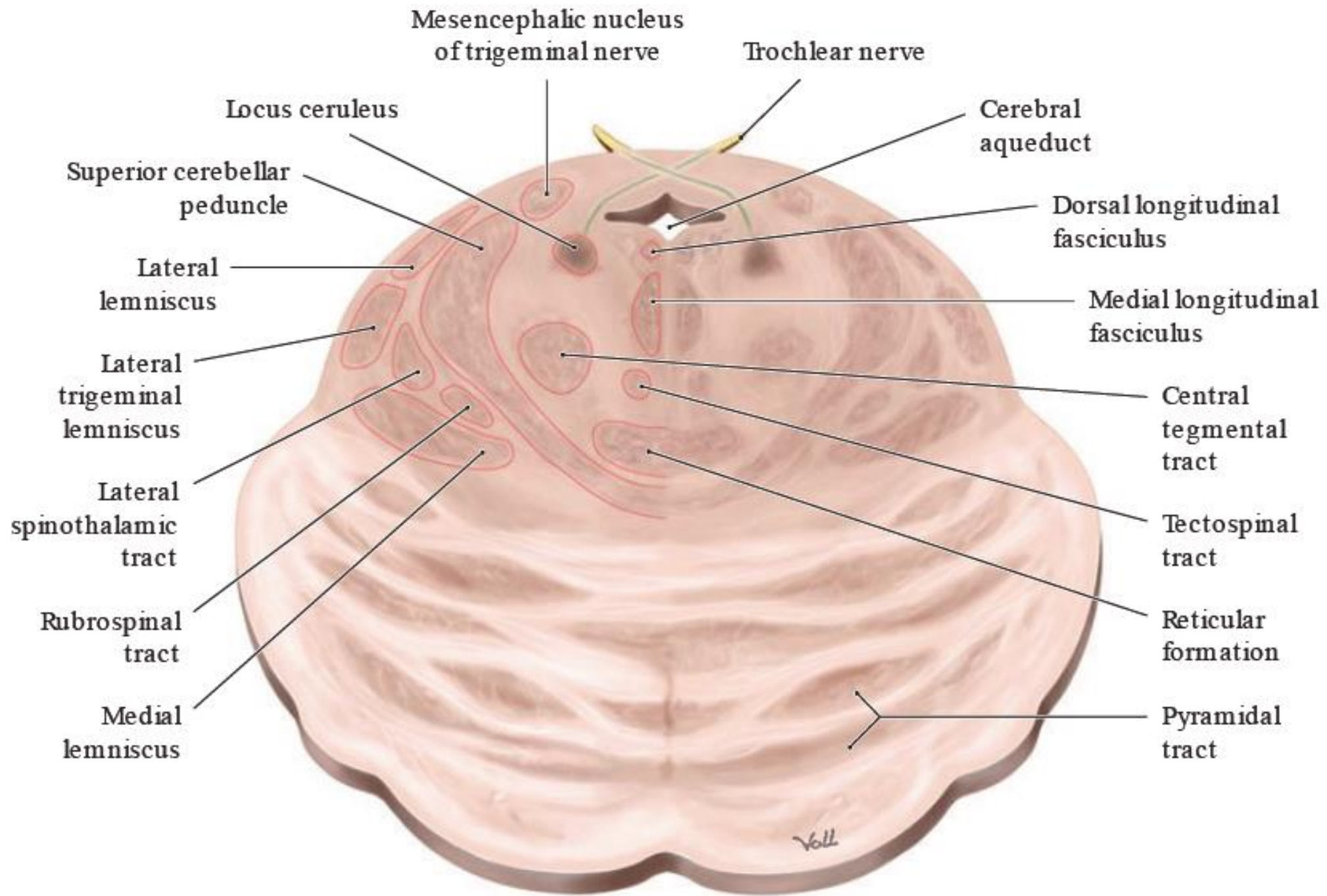
- Parvicelulares
- Magnocelulares

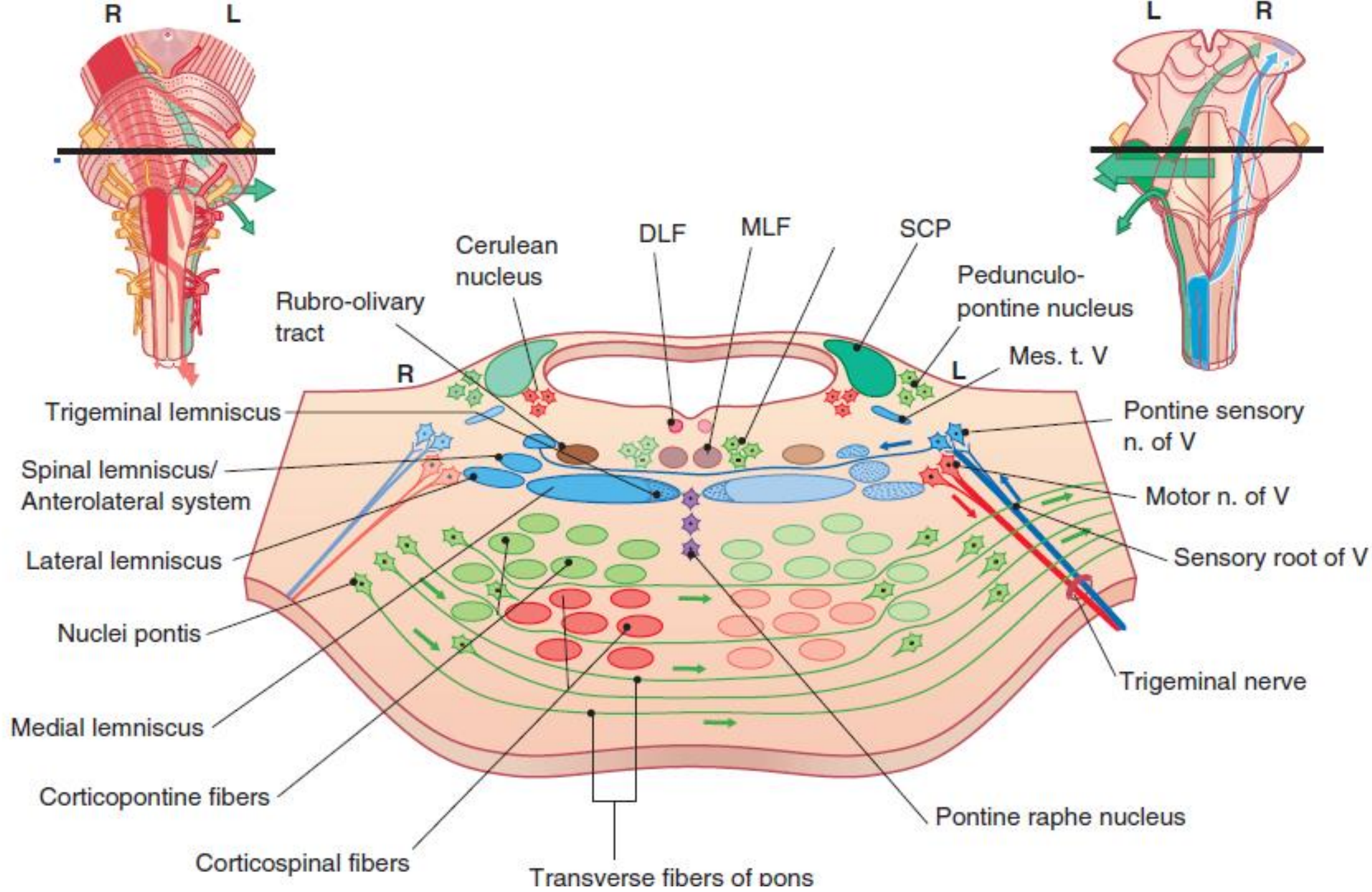


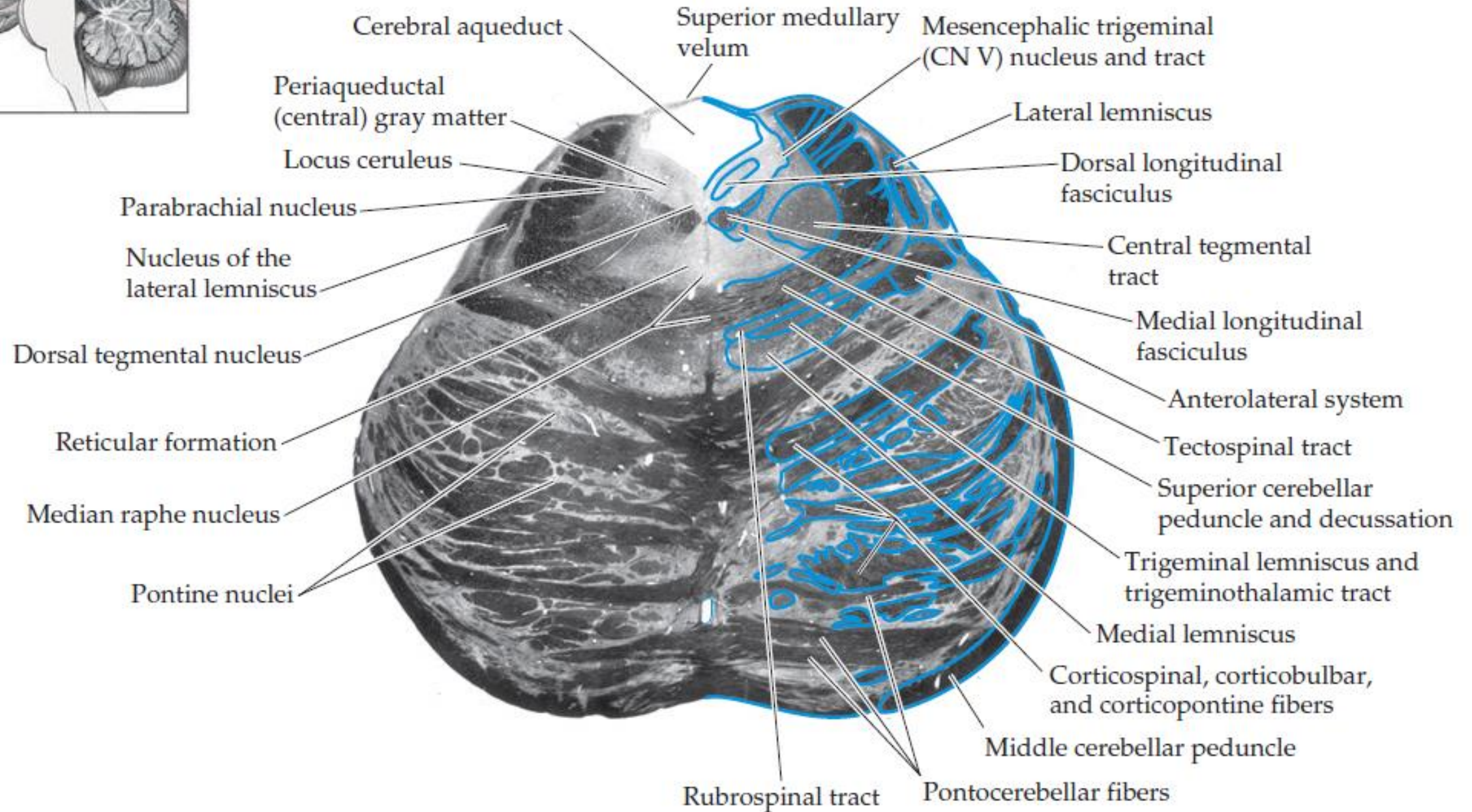
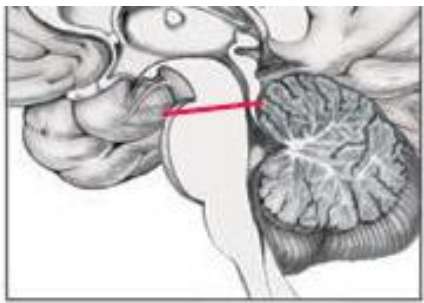


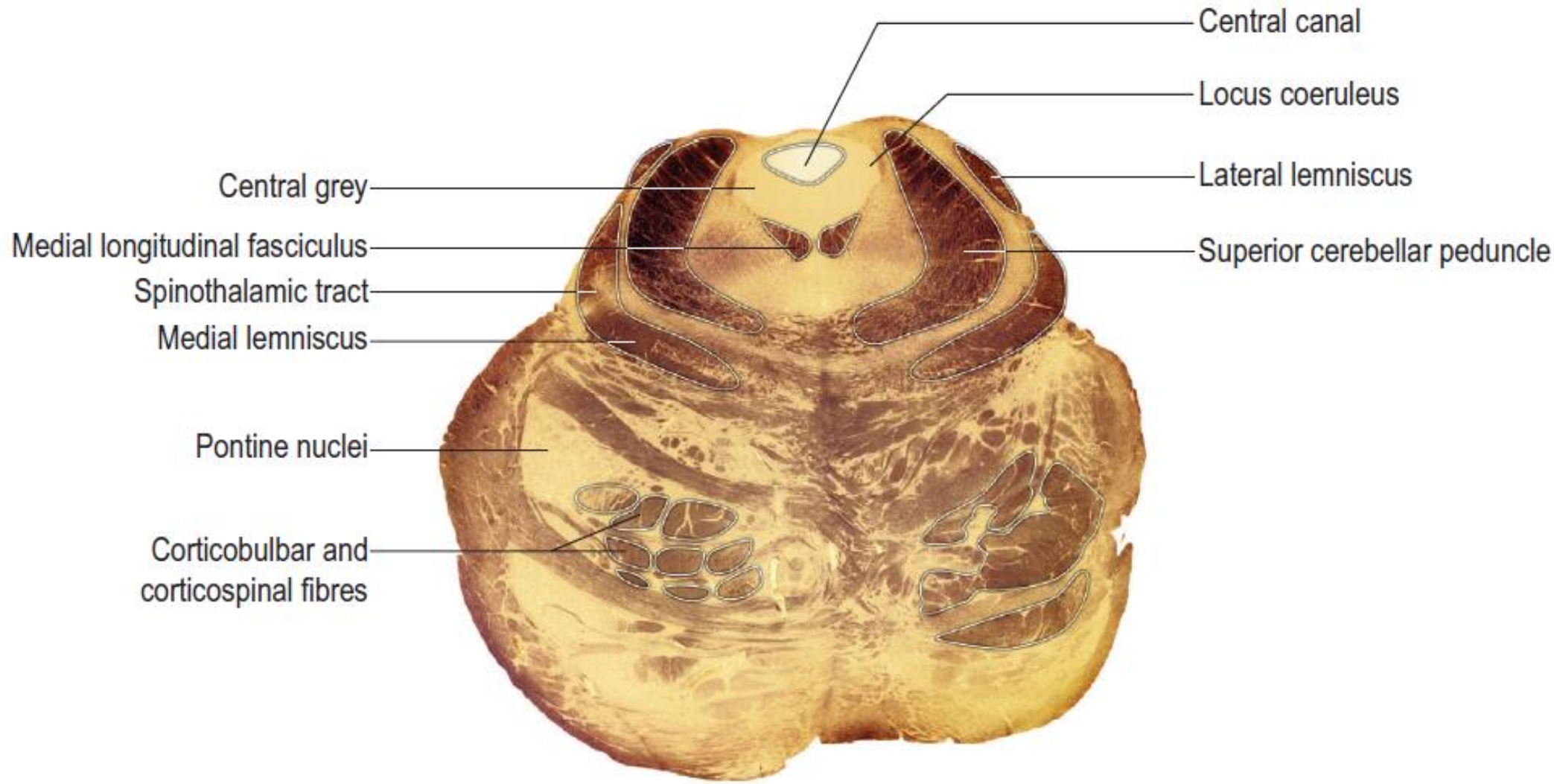
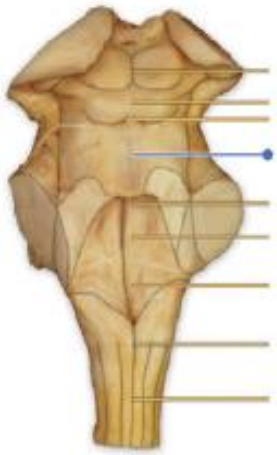


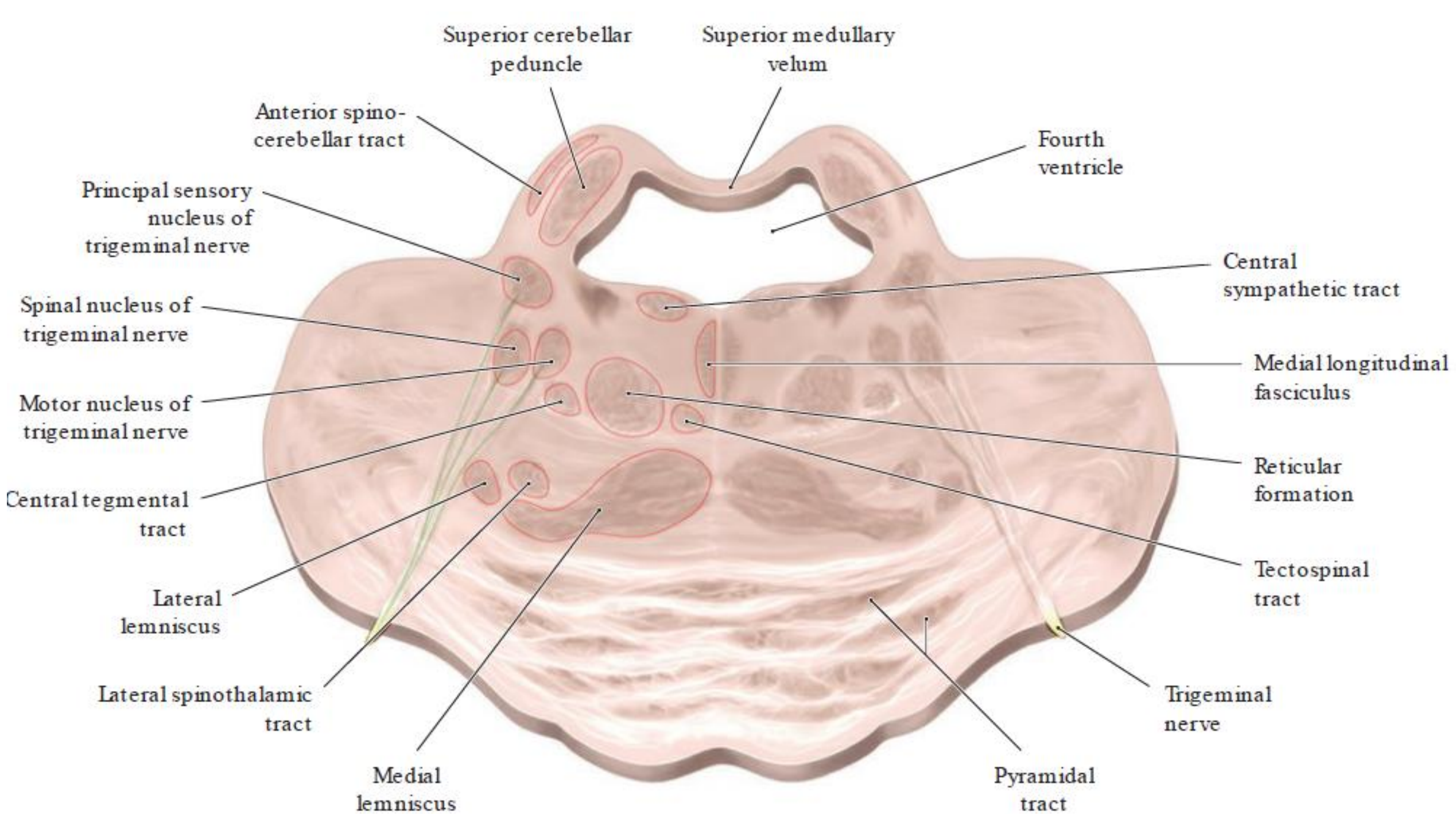


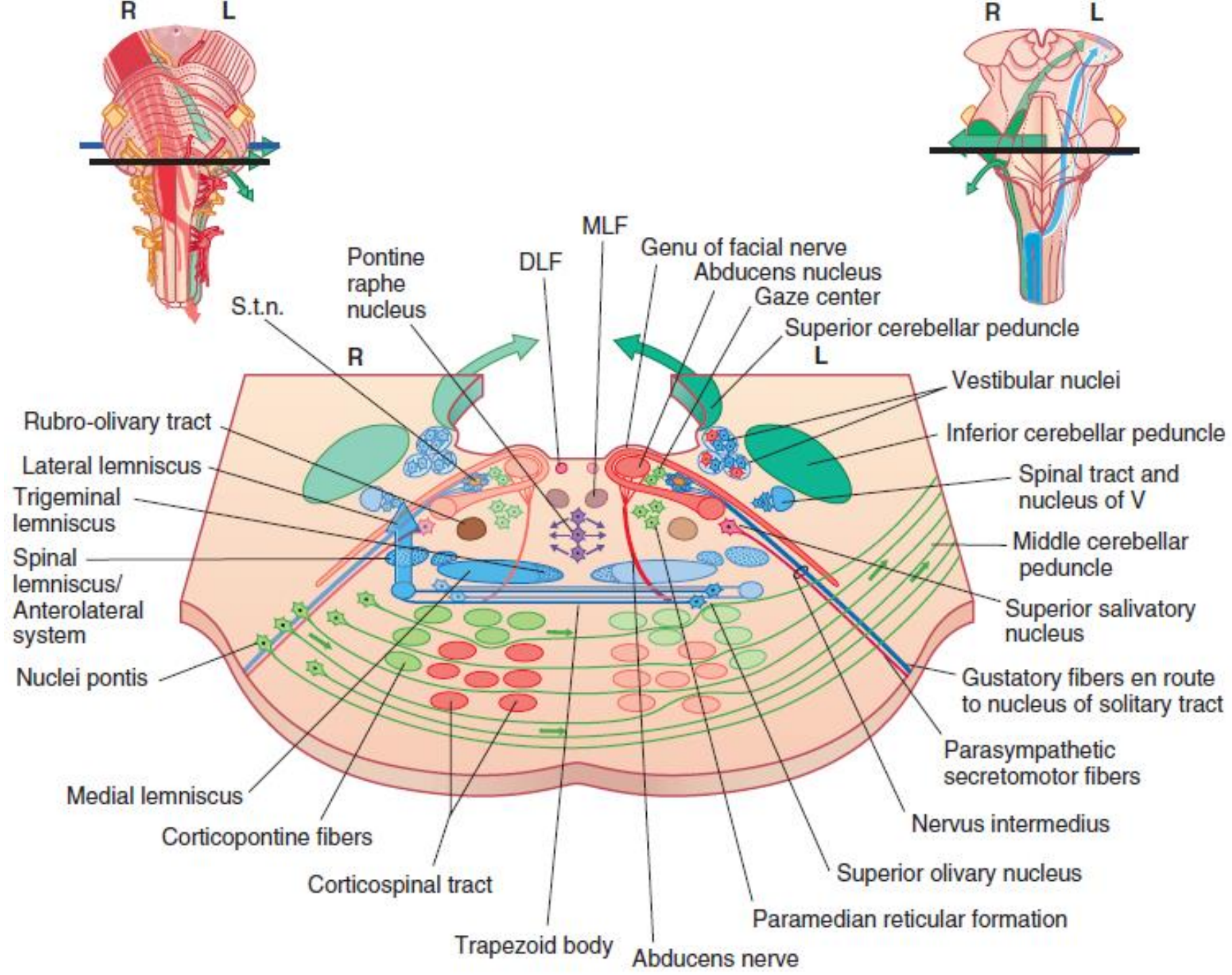




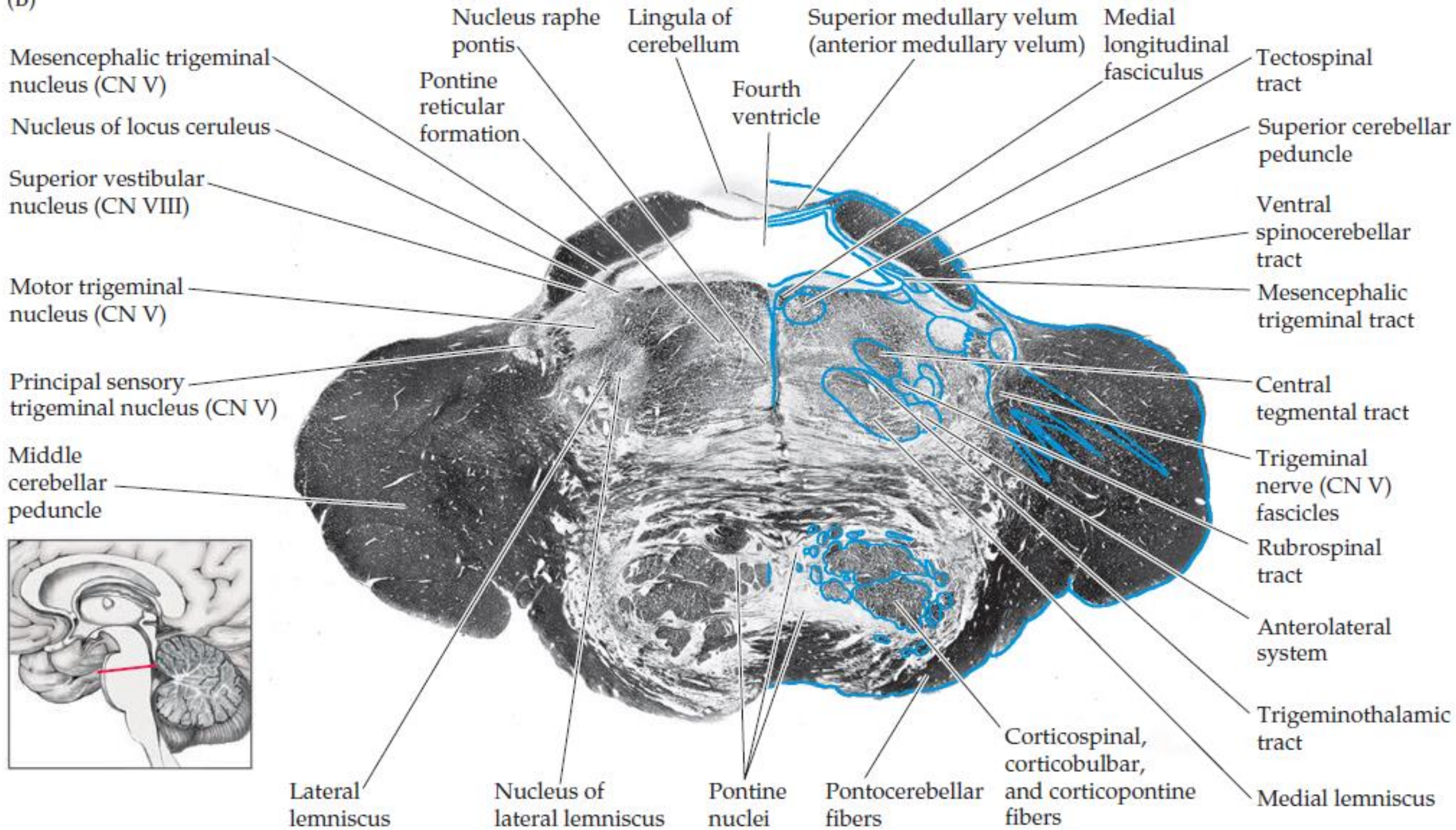


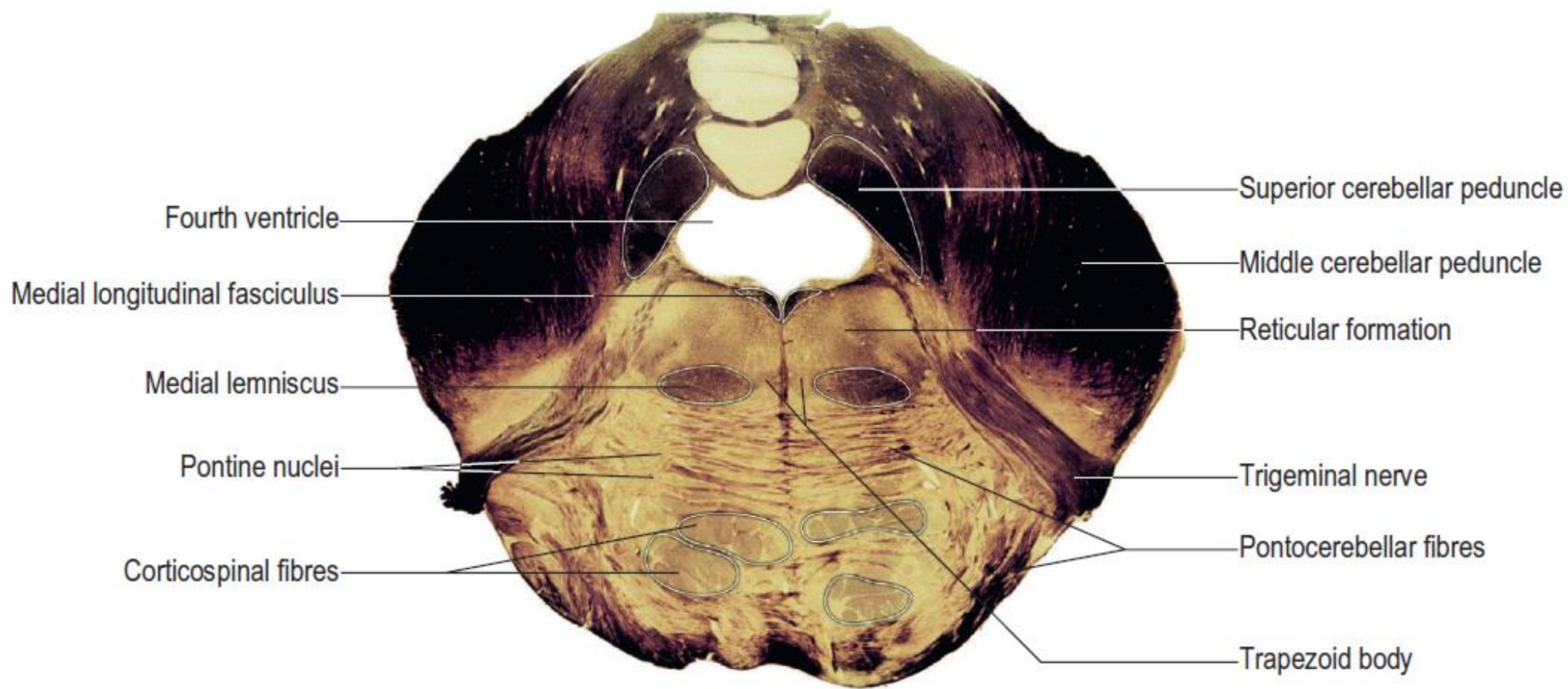






(U)





Fourth ventricle

Medial longitudinal fasciculus

Medial lemniscus

Pontine nuclei

Corticospinal fibres

Superior cerebellar peduncle

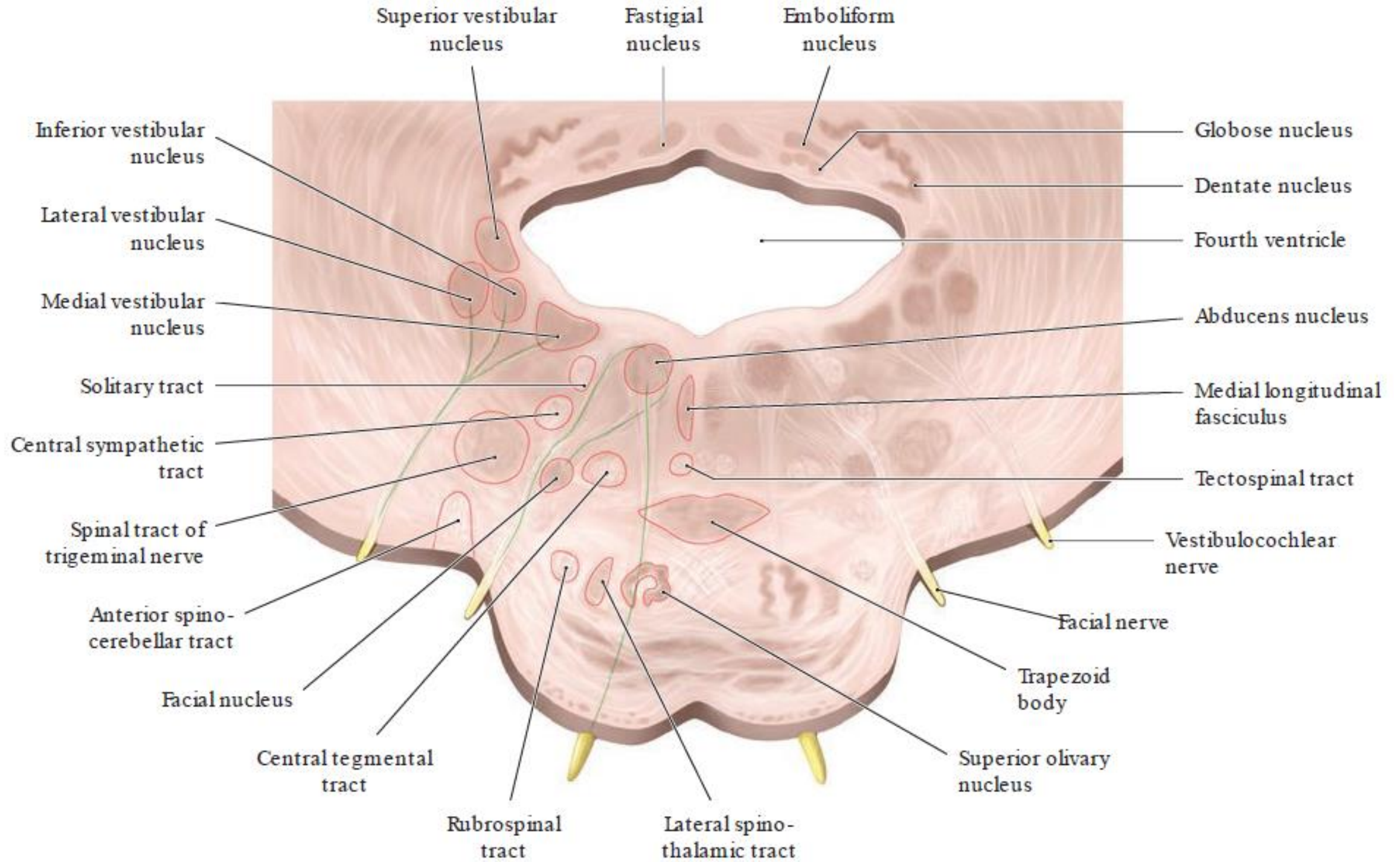
Middle cerebellar peduncle

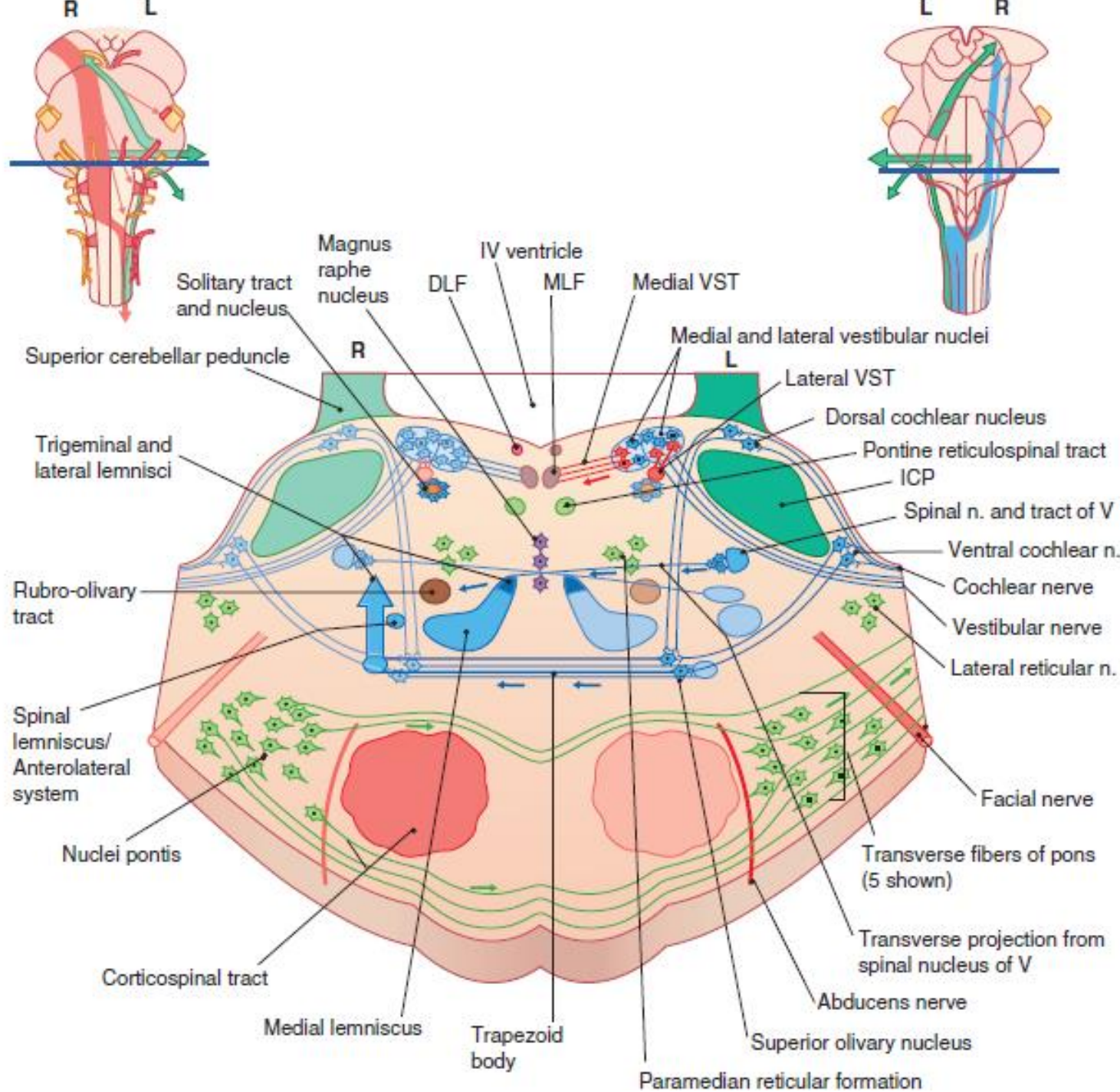
Reticular formation

Trigeminal nerve

Pontocerebellar fibres

Trapezoid body





(C)

Deep cerebellar nuclei:

- Dentate
- Interposed nuclei
 - Emboliform
 - Globose
 - Fastigial

Nodulus of cerebellum

Vestibular nuclei (CN VIII):

- Superior
- Medial
- Lateral

Abducens nucleus (CN VI)

Spinal trigeminal nucleus (CN V, VII, IX, X)
— oral nucleus

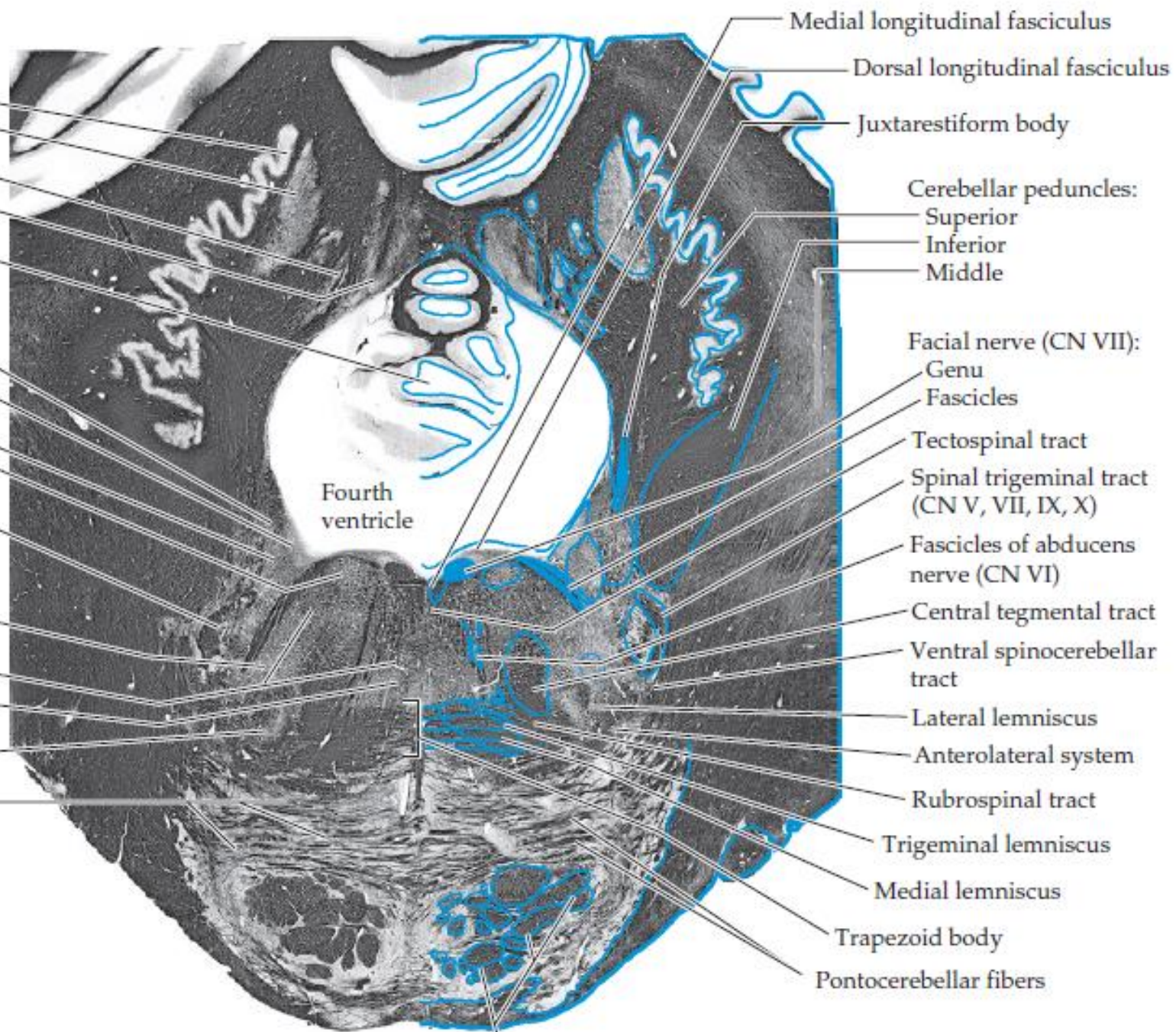
Facial nucleus (CN VII)

Reticular formation

Paramedian pontine reticular formation (PPRF)

Superior olivary complex

Pontine nuclei



Medial longitudinal fasciculus

Dorsal longitudinal fasciculus

Juxtarestiform body

Cerebellar peduncles:

- Superior
- Inferior
- Middle

Facial nerve (CN VII):

- Genu
- Fascicles

Tectospinal tract

Spinal trigeminal tract (CN V, VII, IX, X)

Fascicles of abducens nerve (CN VI)

Central tegmental tract

Ventral spinocerebellar tract

Lateral lemniscus

Anterolateral system

Rubrospinal tract

Trigeminal lemniscus

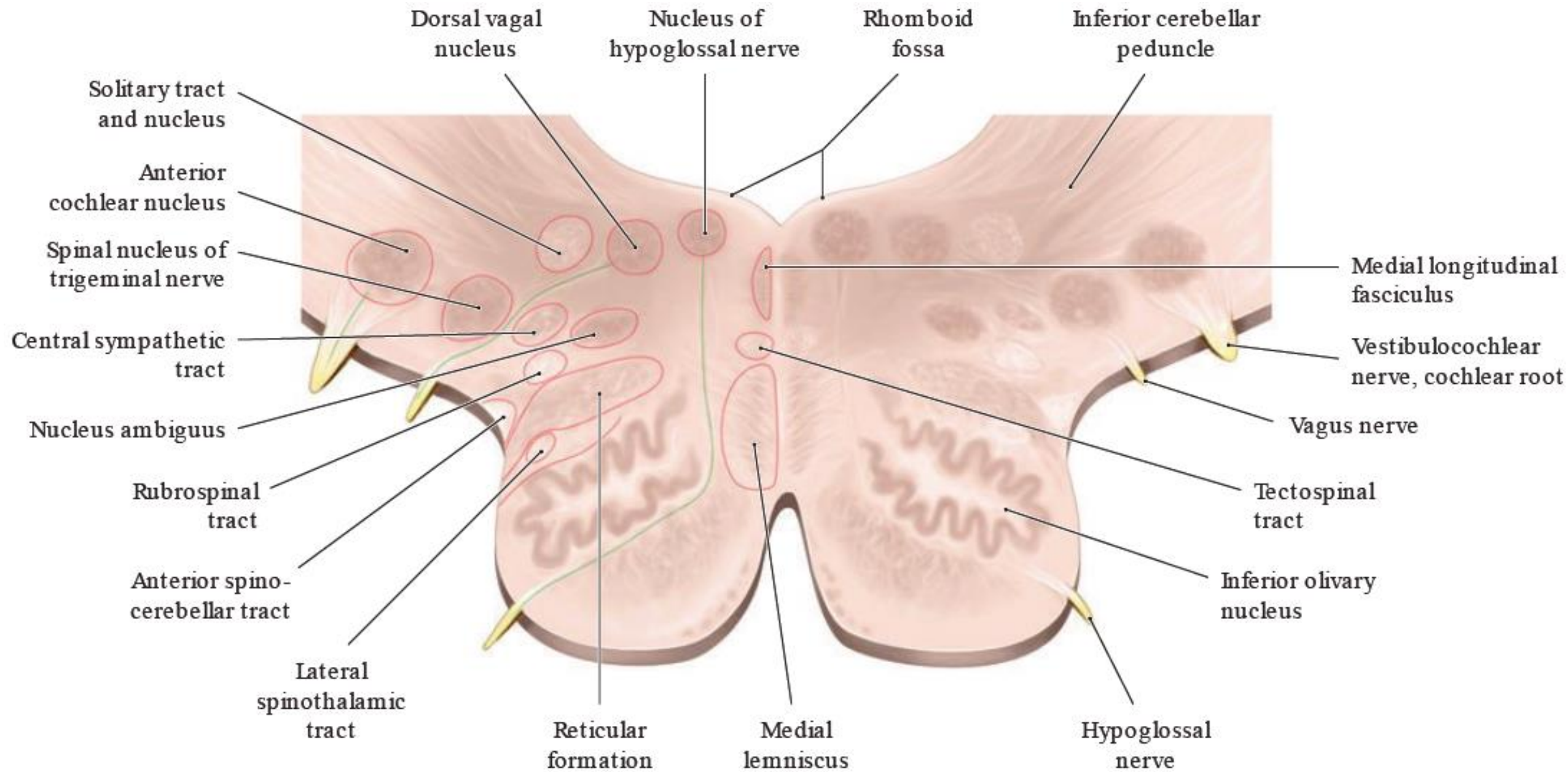
Medial lemniscus

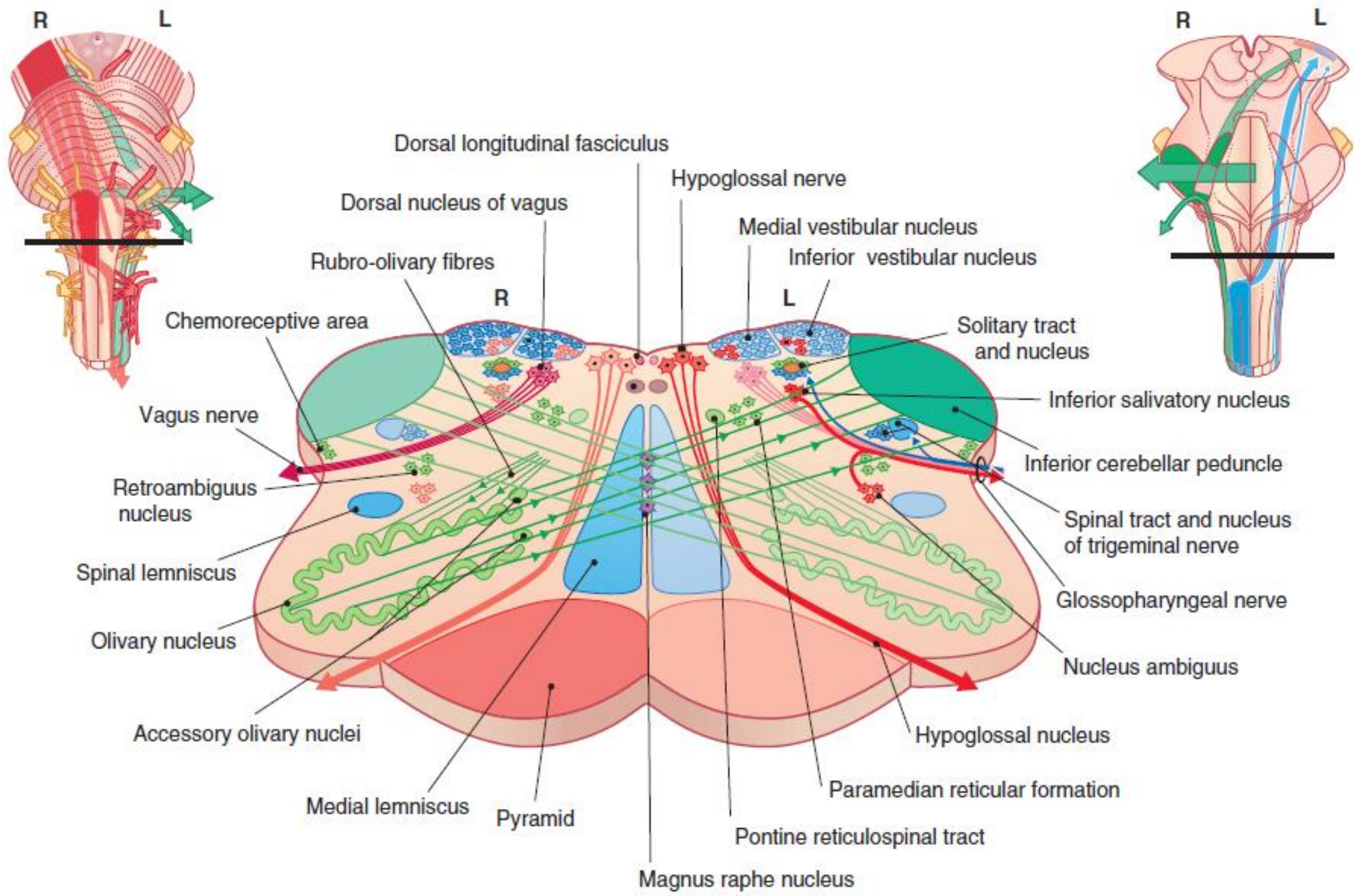
Trapezoid body

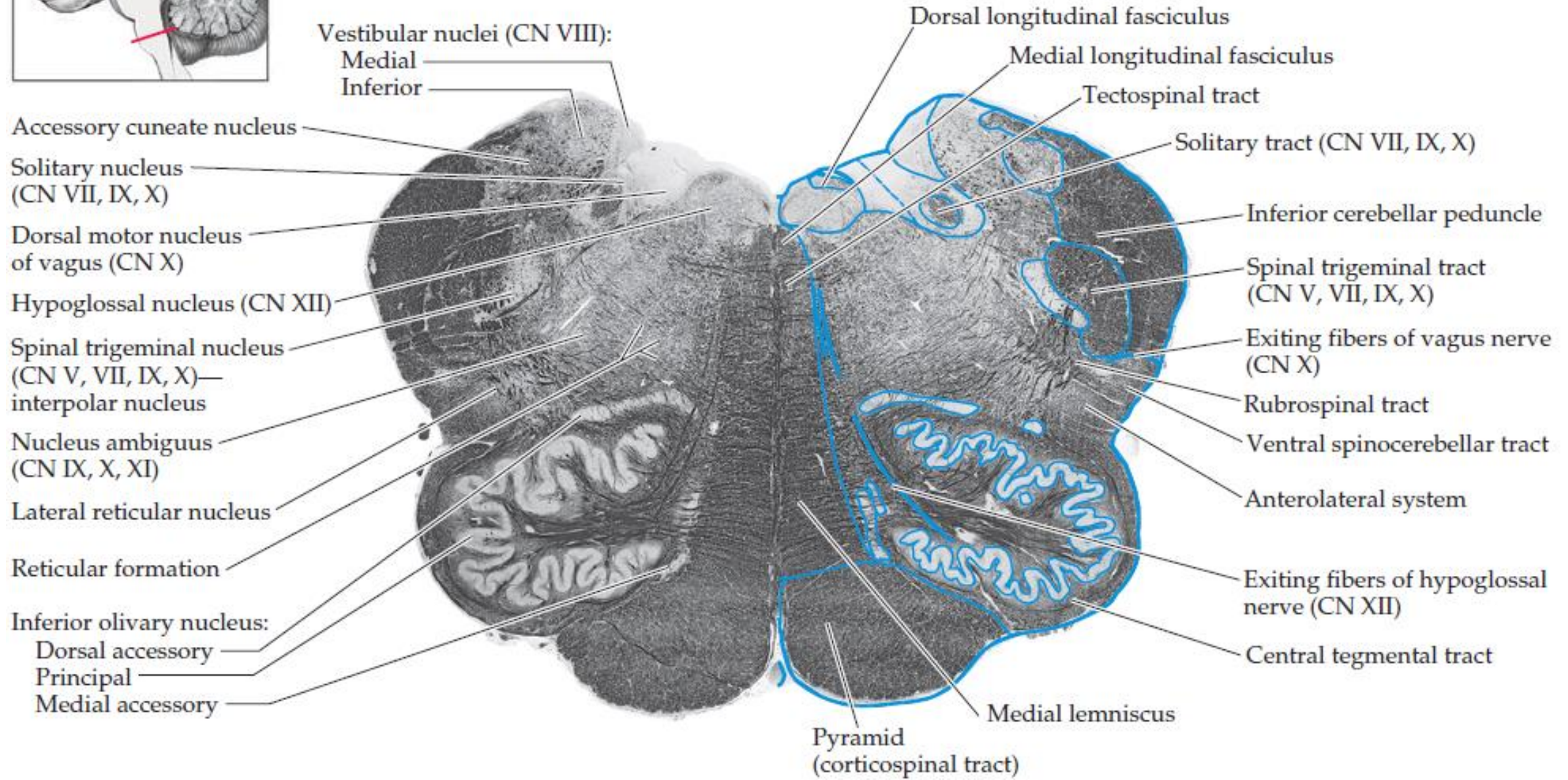
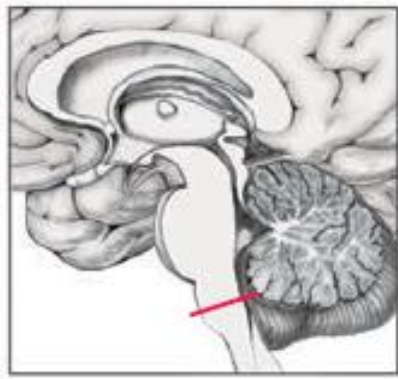
Pontocerebellar fibers

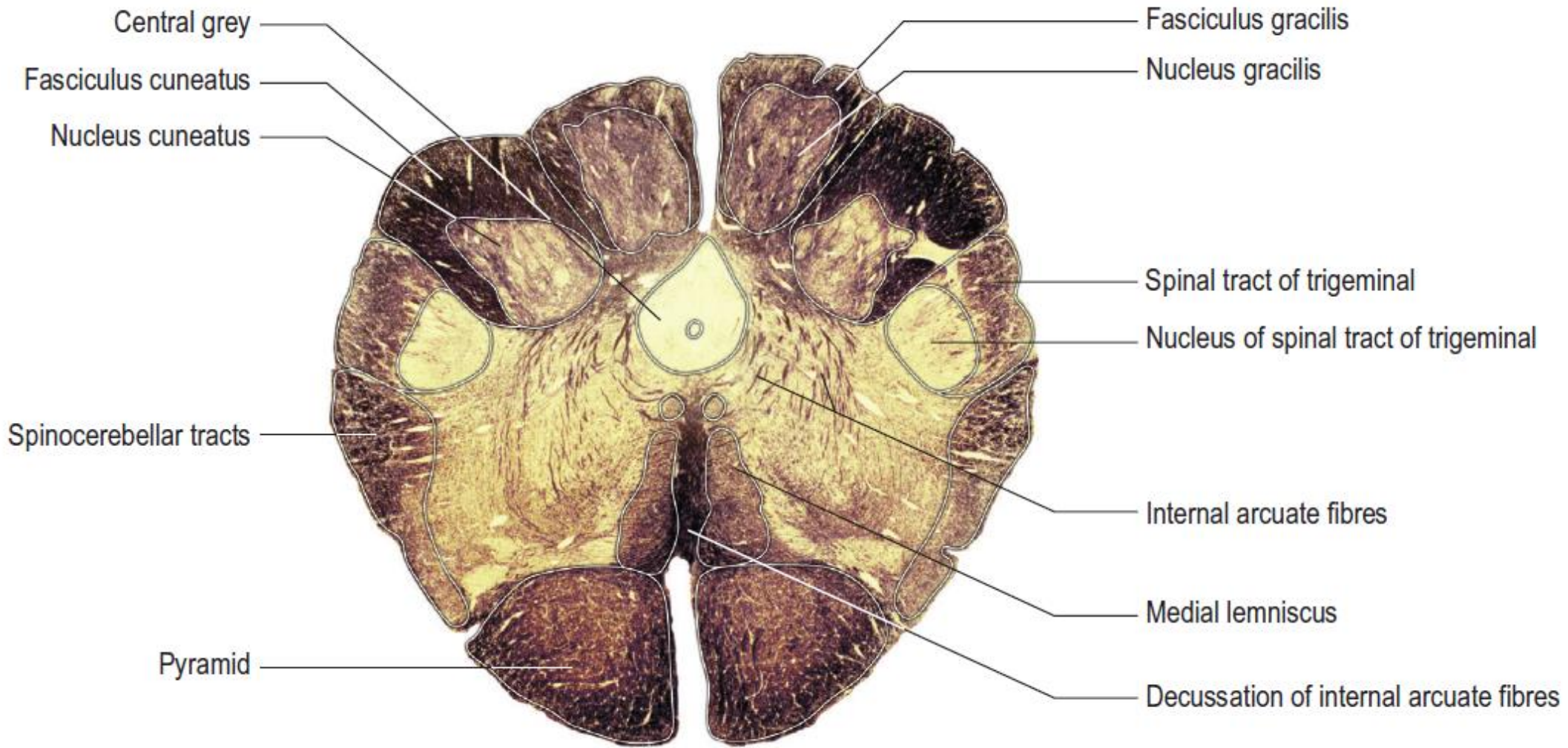
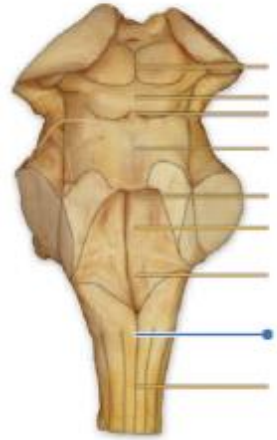
Corticospinal and corticobulbar tracts

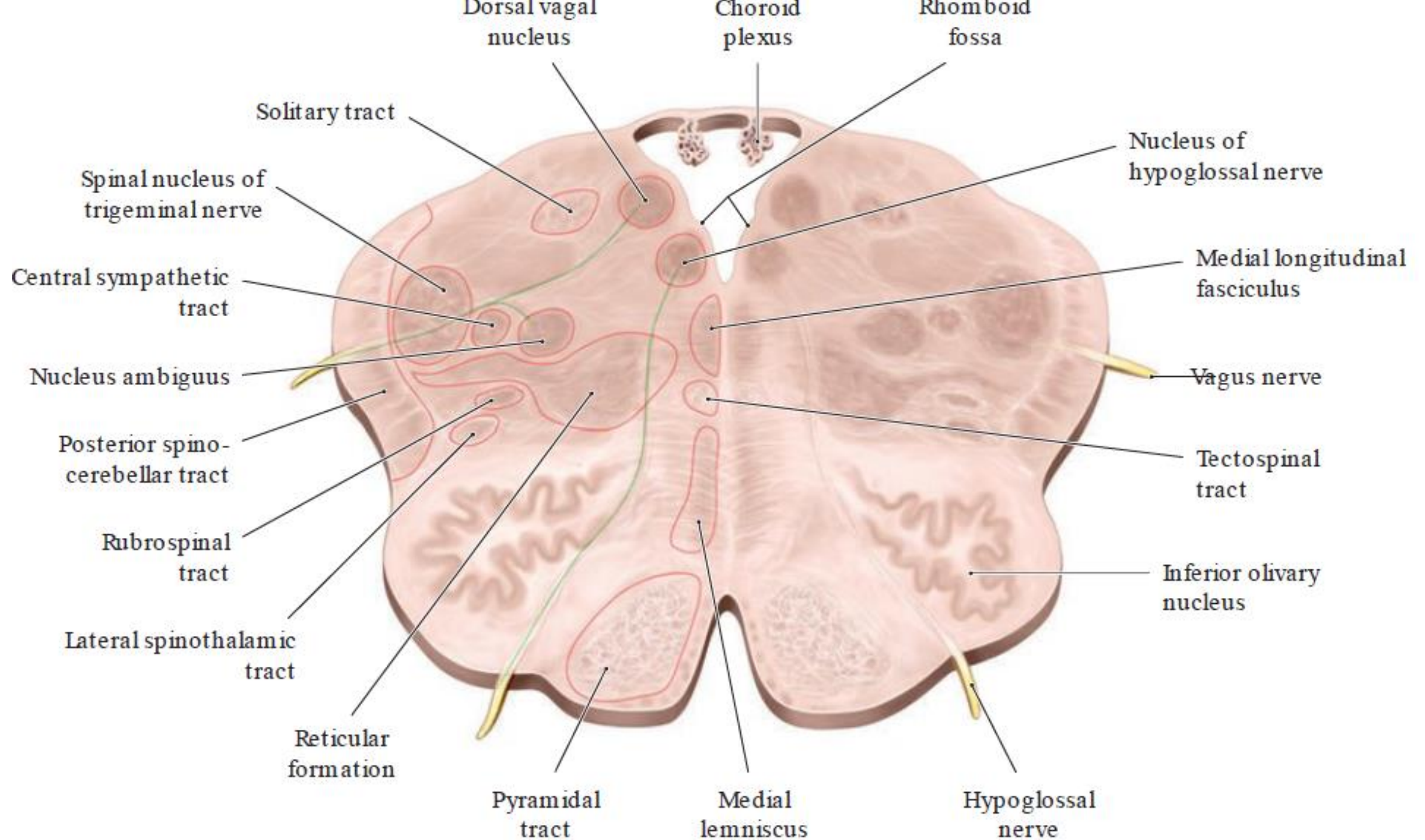


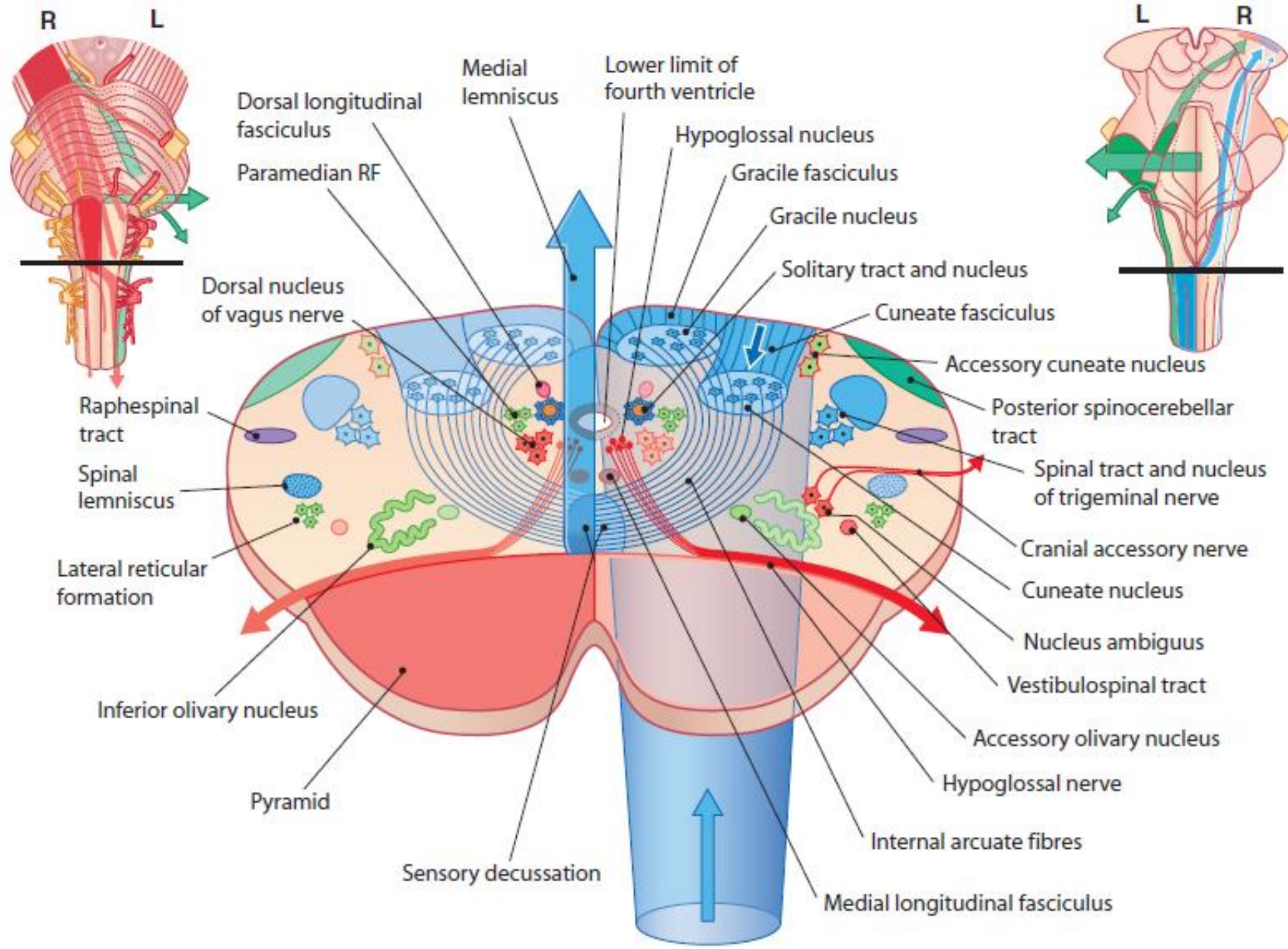


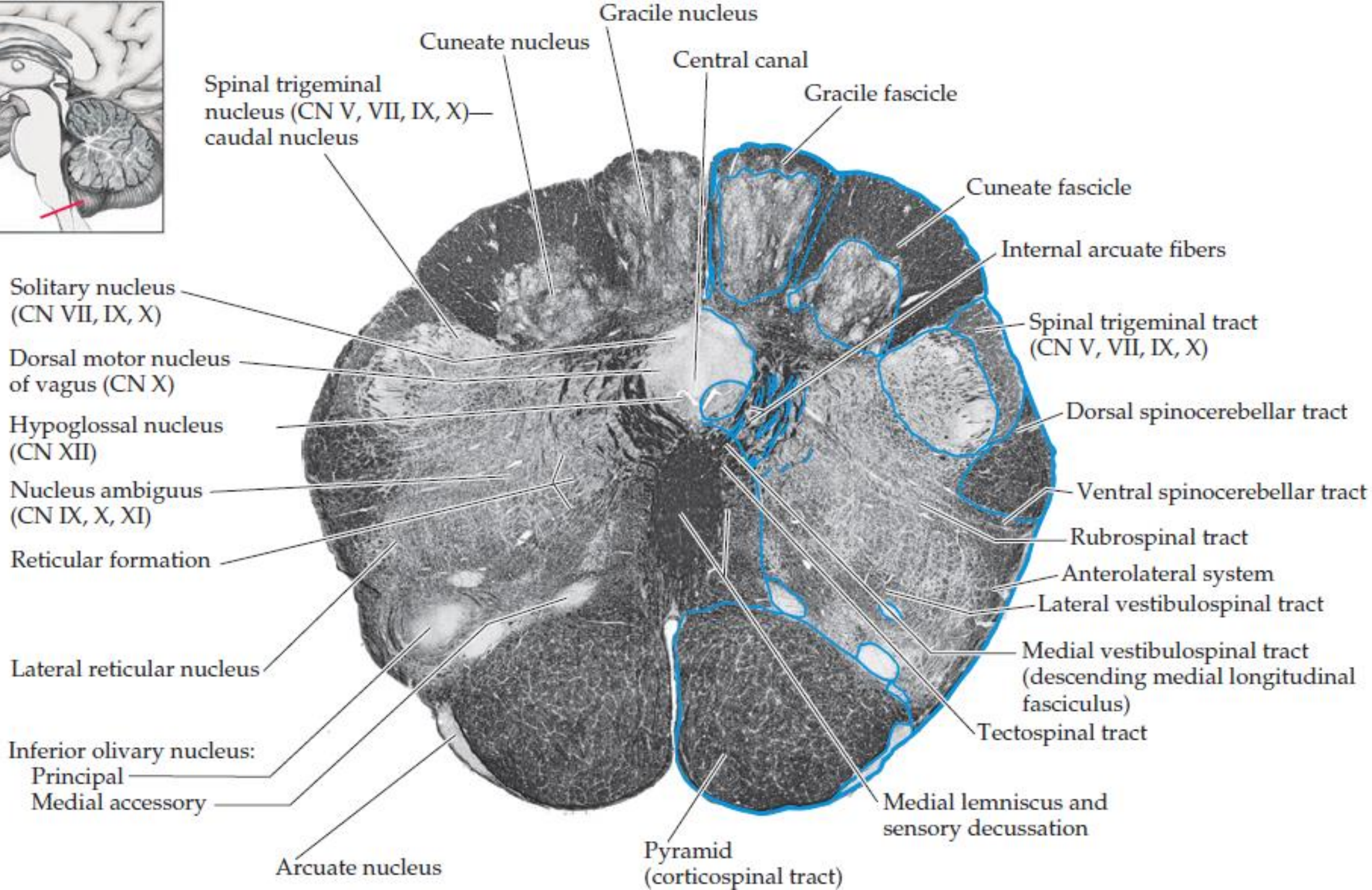


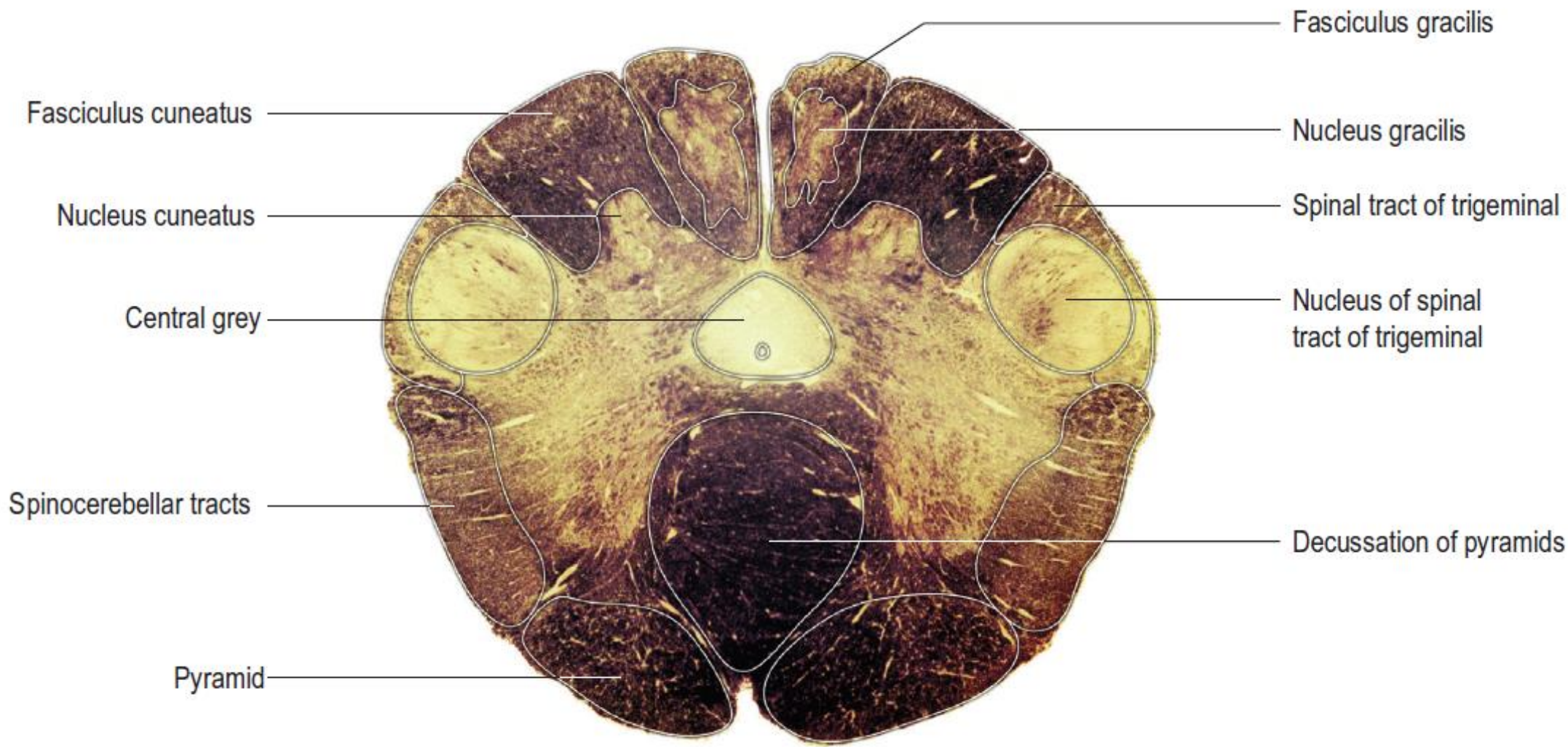
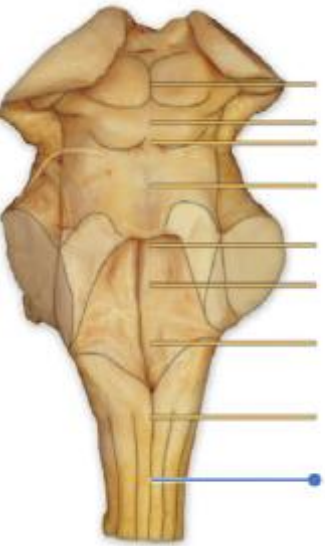


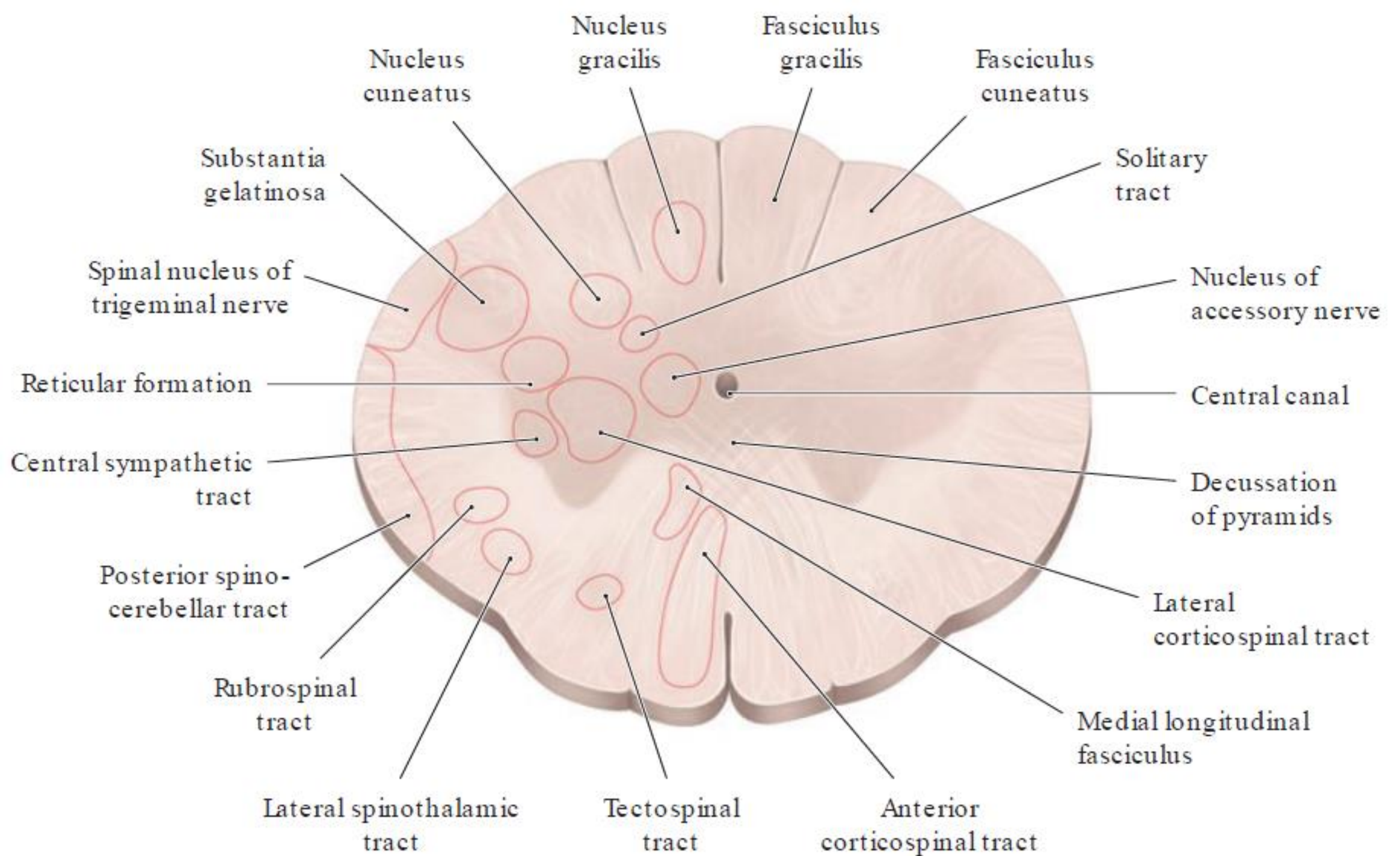


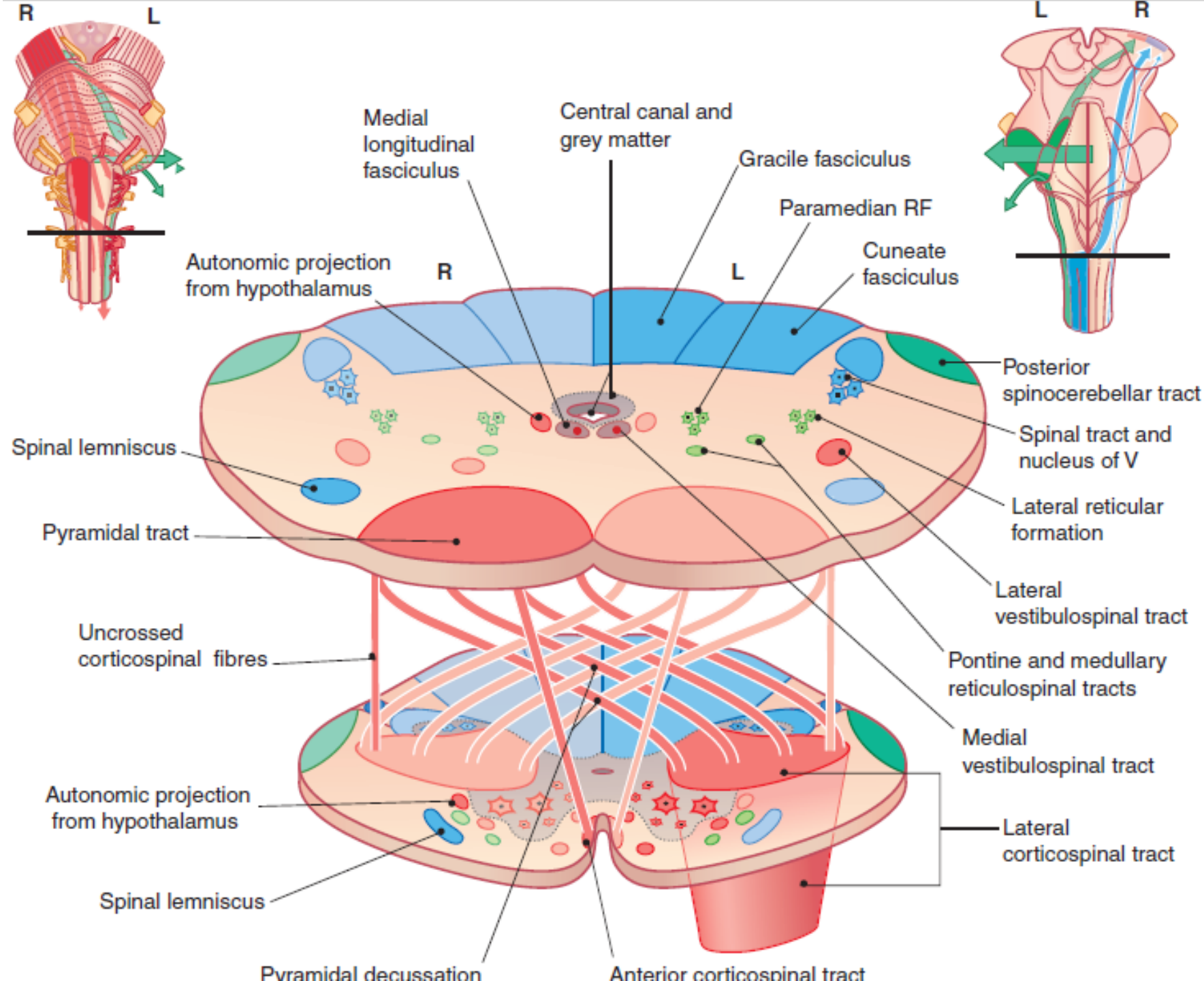


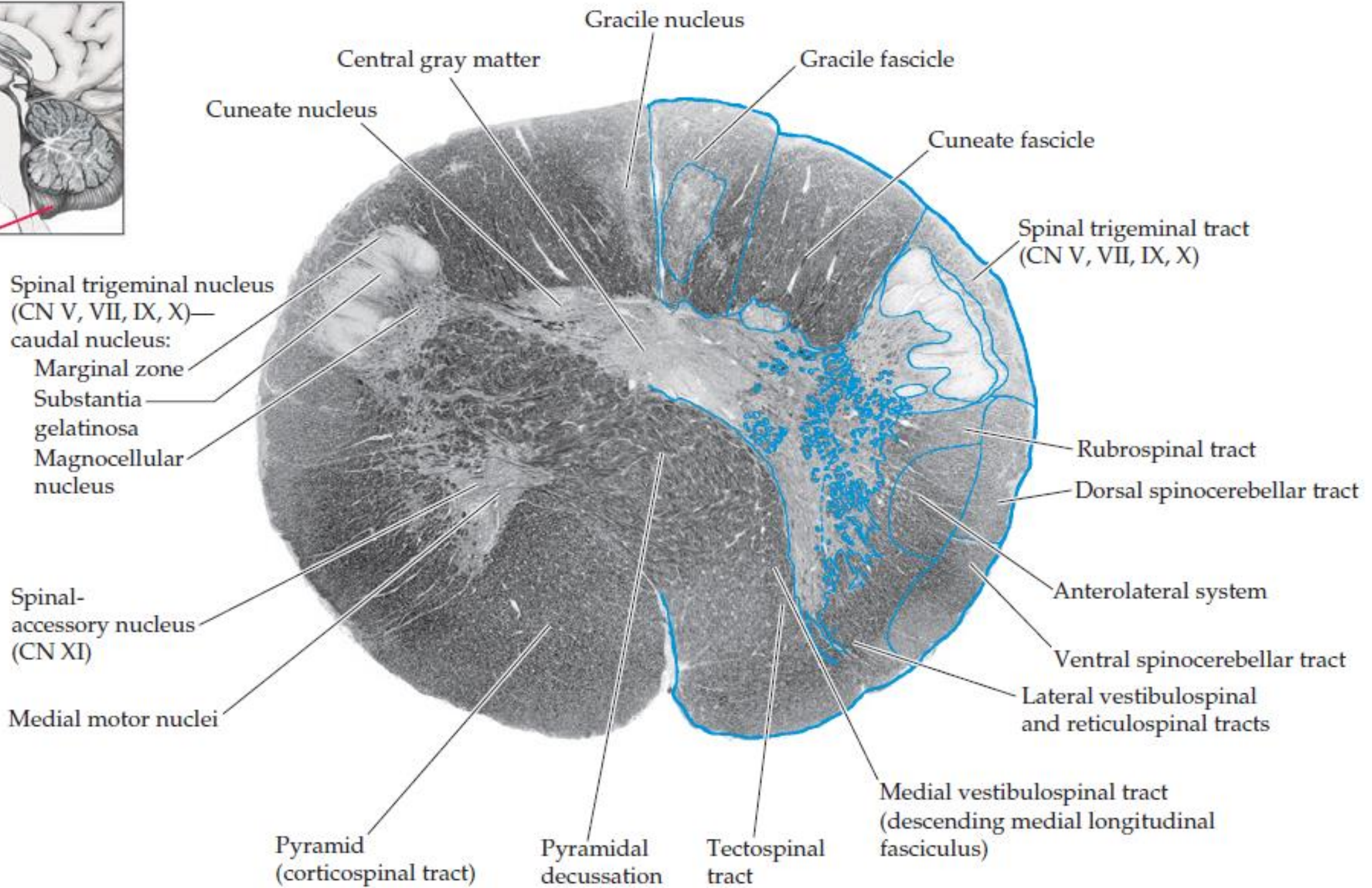
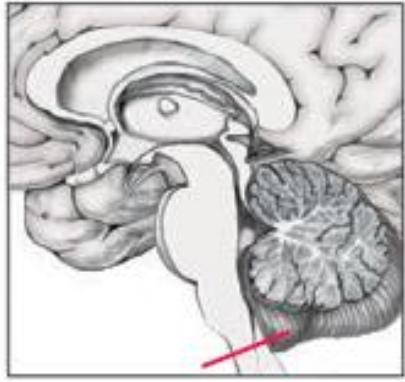












Gracile nucleus

Central gray matter

Gracile fascicle

Cuneate nucleus

Cuneate fascicle

Spinal trigeminal tract
(CN V, VII, IX, X)

Spinal trigeminal nucleus
(CN V, VII, IX, X)—
caudal nucleus:
Marginal zone
Substantia
gelatinosa
Magnocellular
nucleus

Rubrospinal tract

Dorsal spinocerebellar tract

Spinal-
accessory nucleus
(CN XI)

Anterolateral system

Ventral spinocerebellar tract

Medial motor nuclei

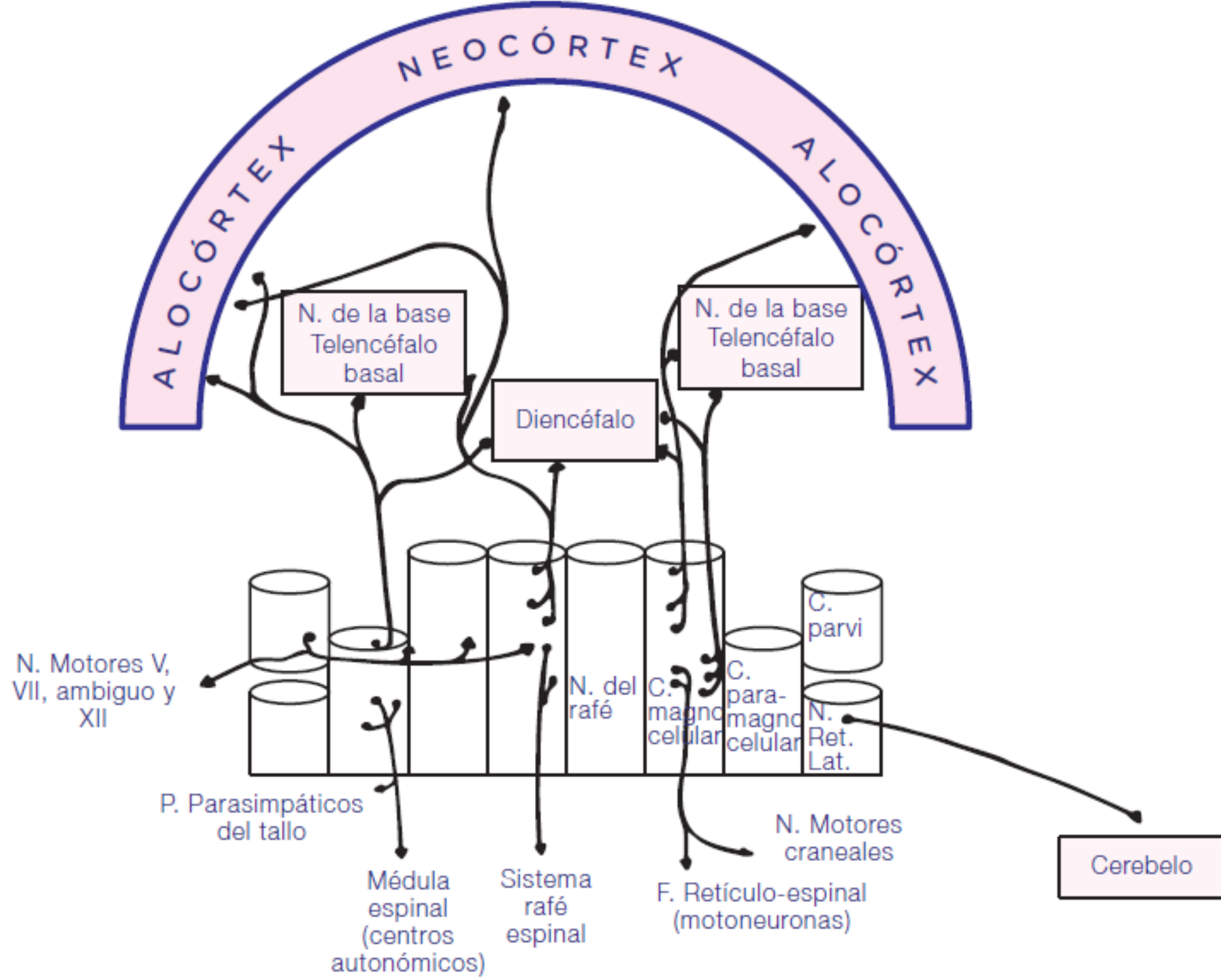
Lateral vestibulospinal
and reticulospinal tracts

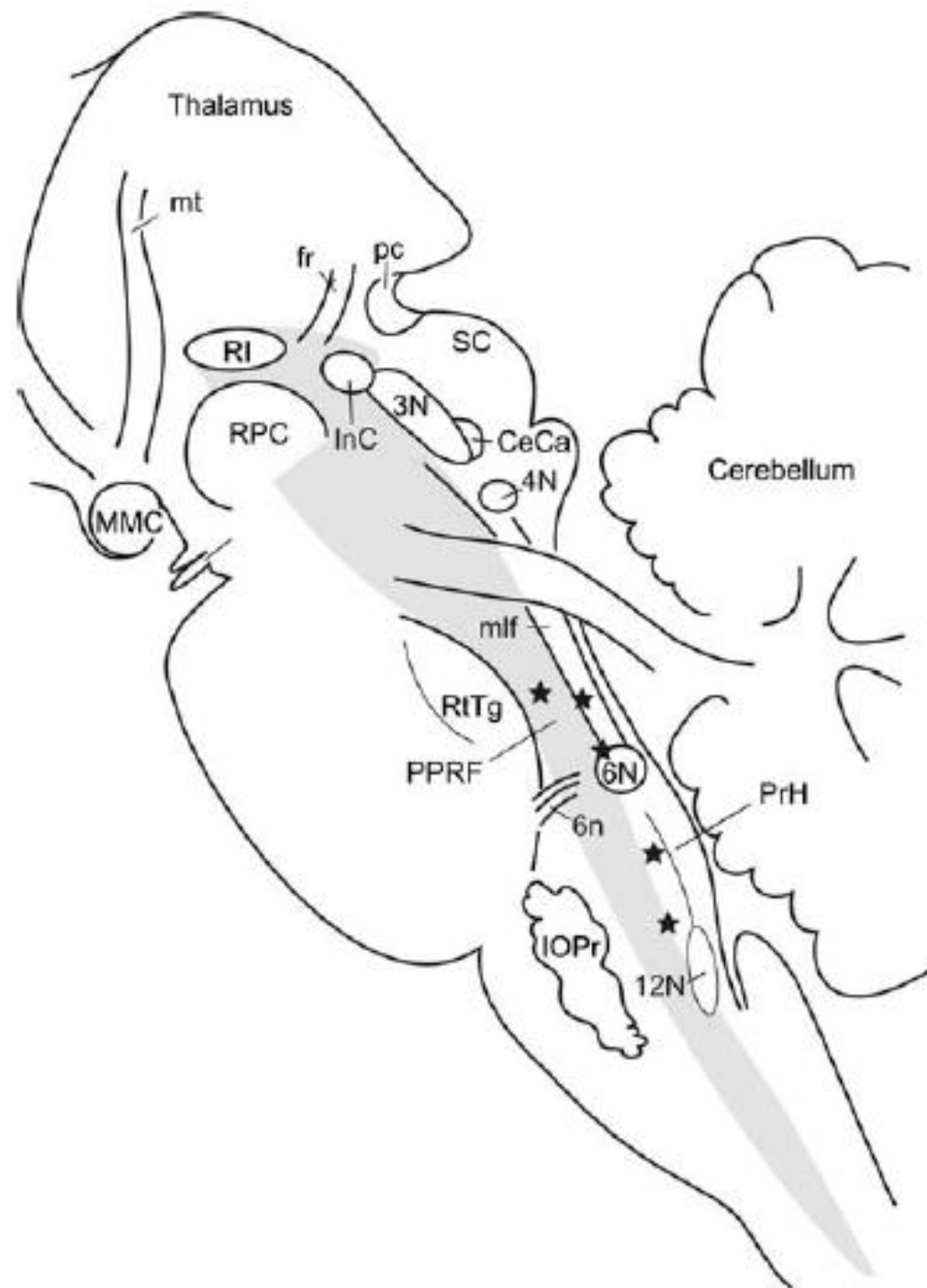
Pyramid
(corticospinal tract)

Pyramidal
decussation

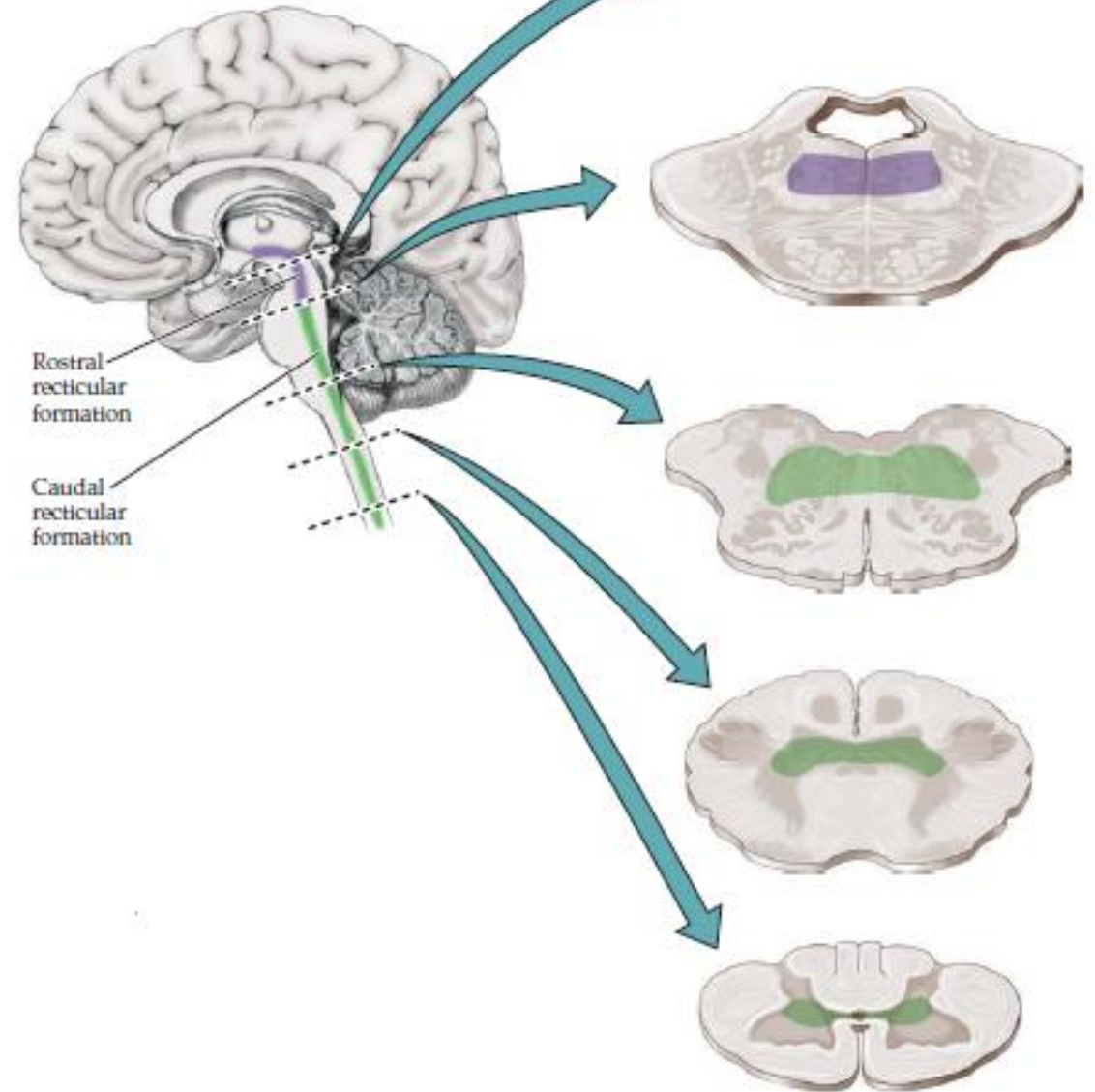
Tectospinal
tract

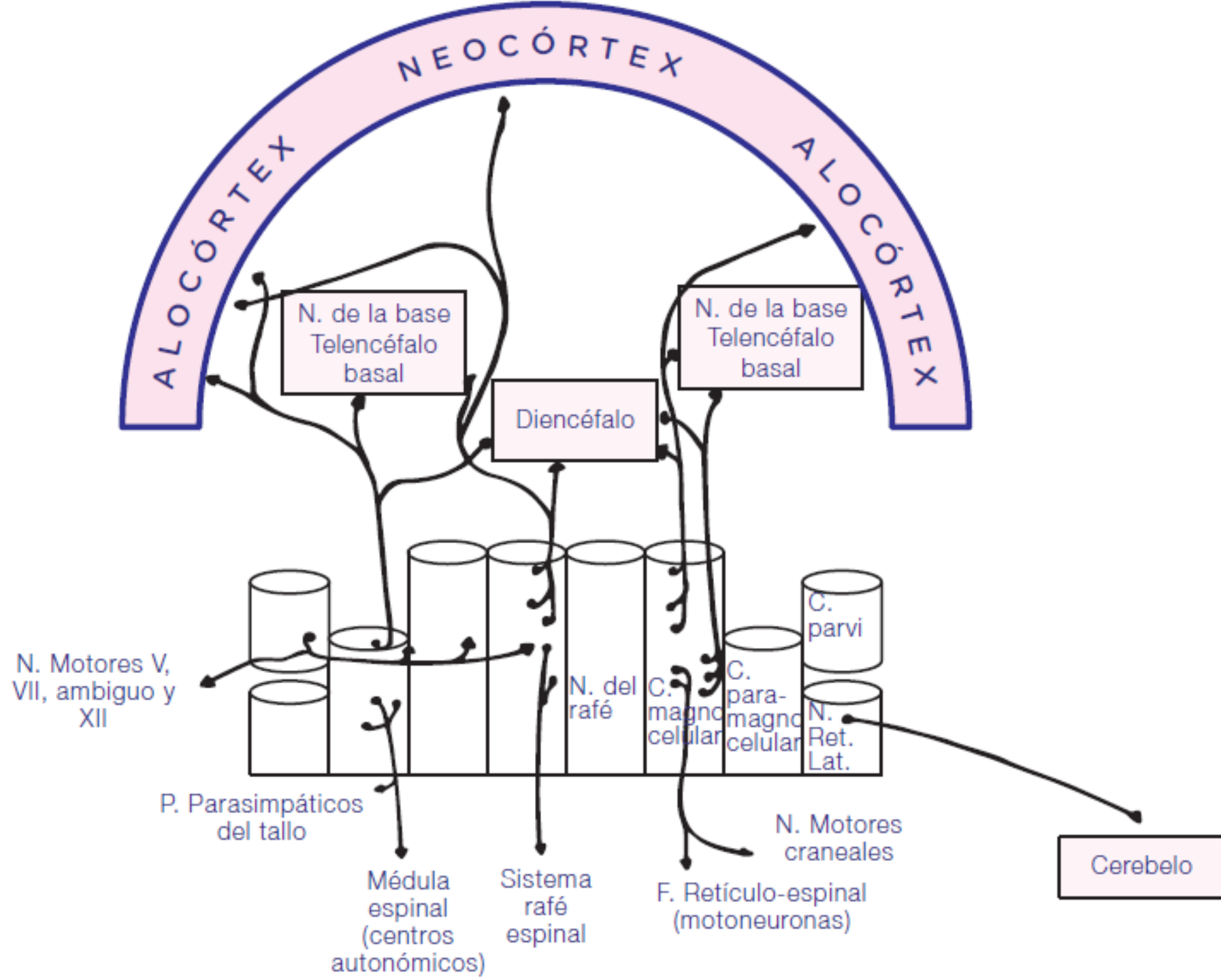
Medial vestibulospinal tract
(descending medial longitudinal
fasciculus)

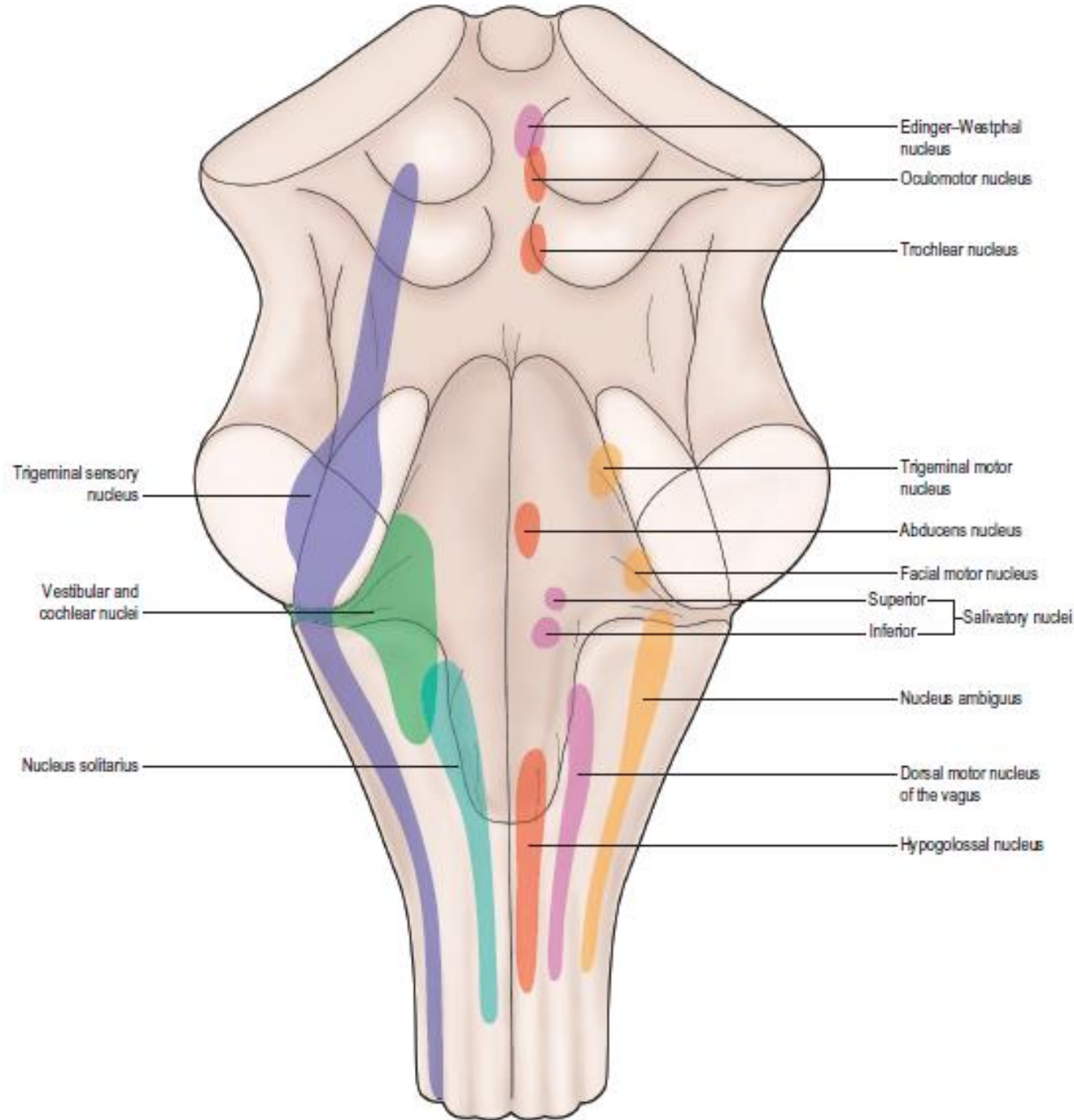


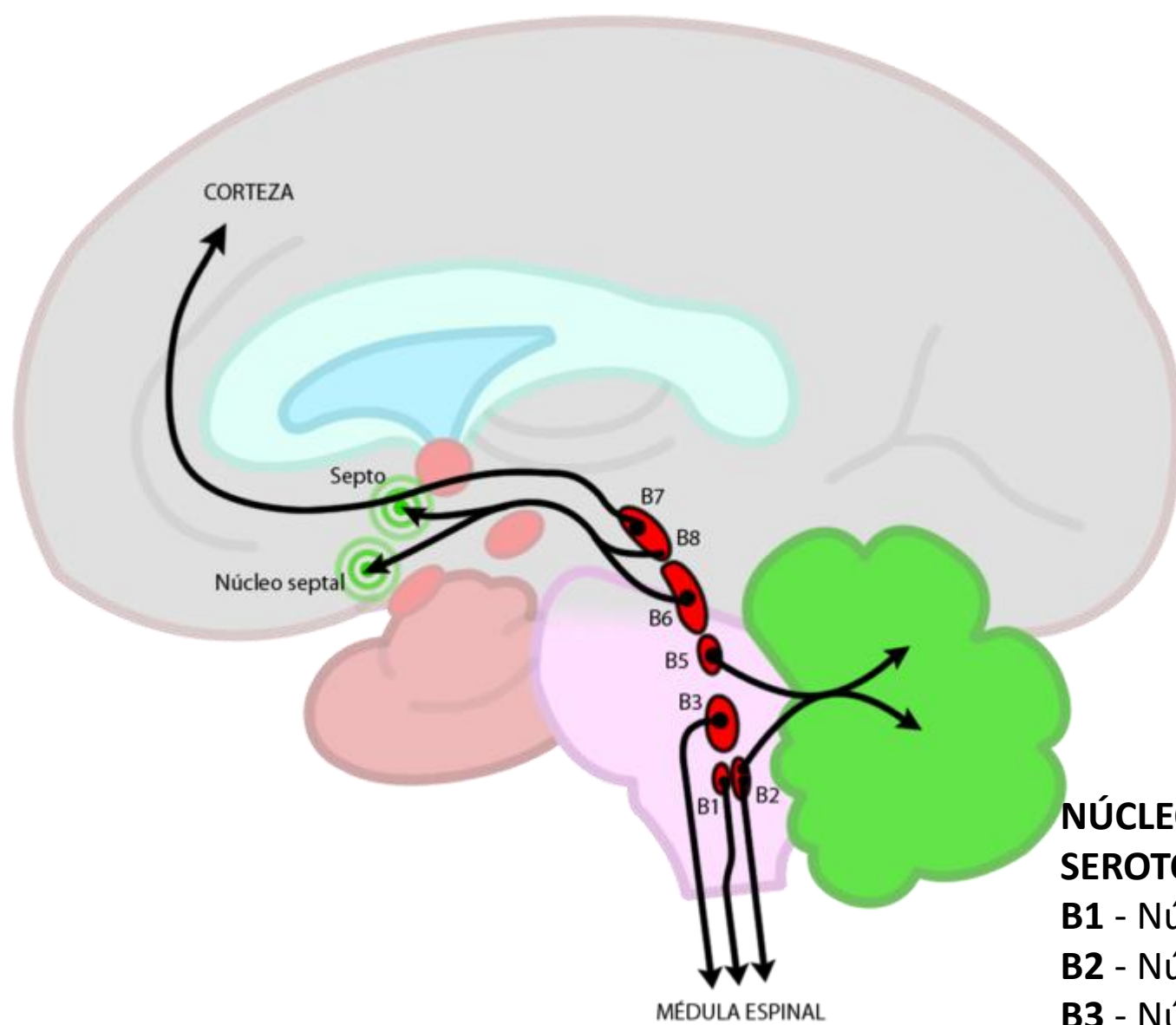


ular Formation Location at
eticular formation merges cau-
mediate zone and rostrally with
eral hypothalamus.









NÚCLEOS

SEROTONINÉRGICOS

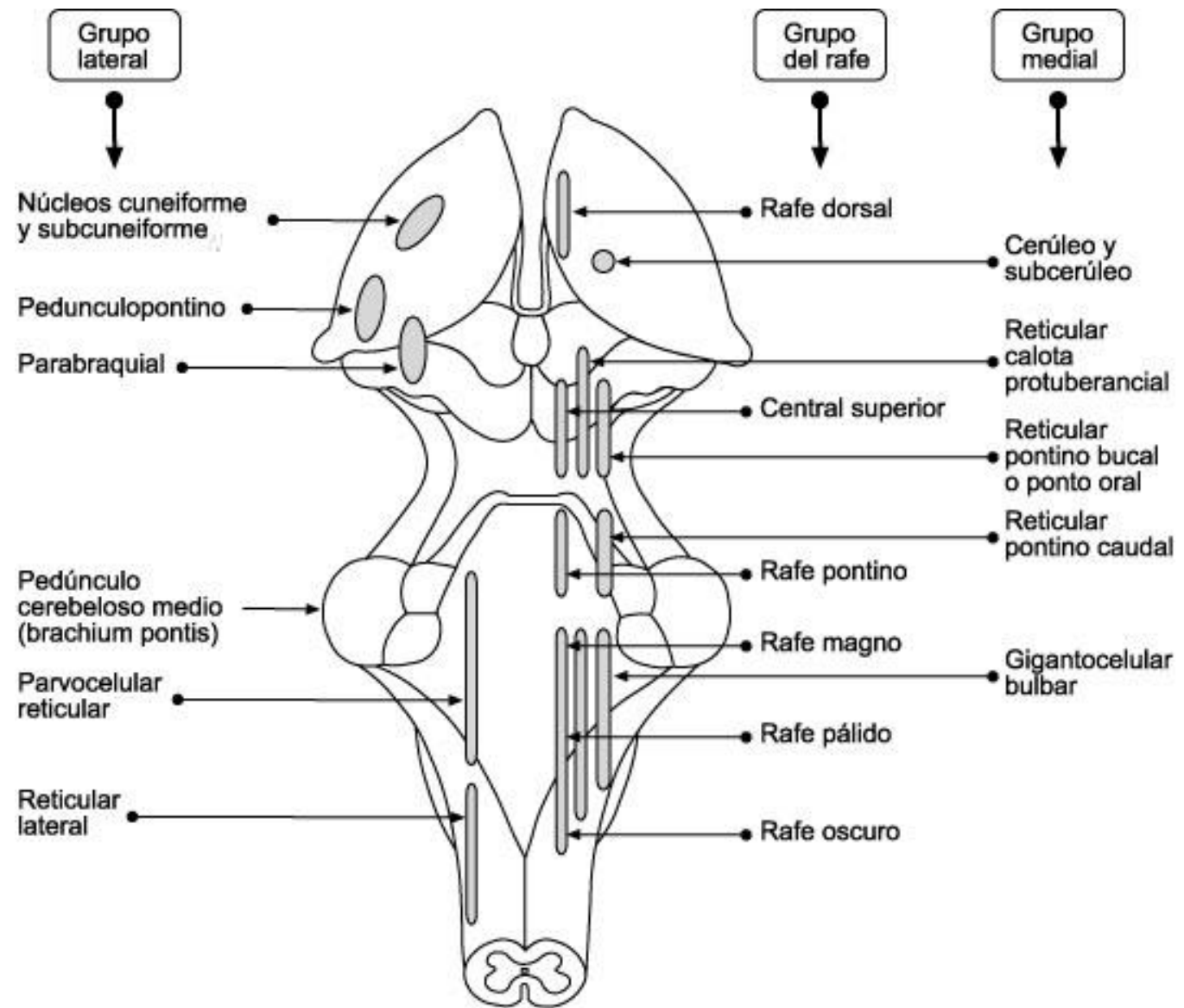
B1 - Núcleo del rafé *pallidus*

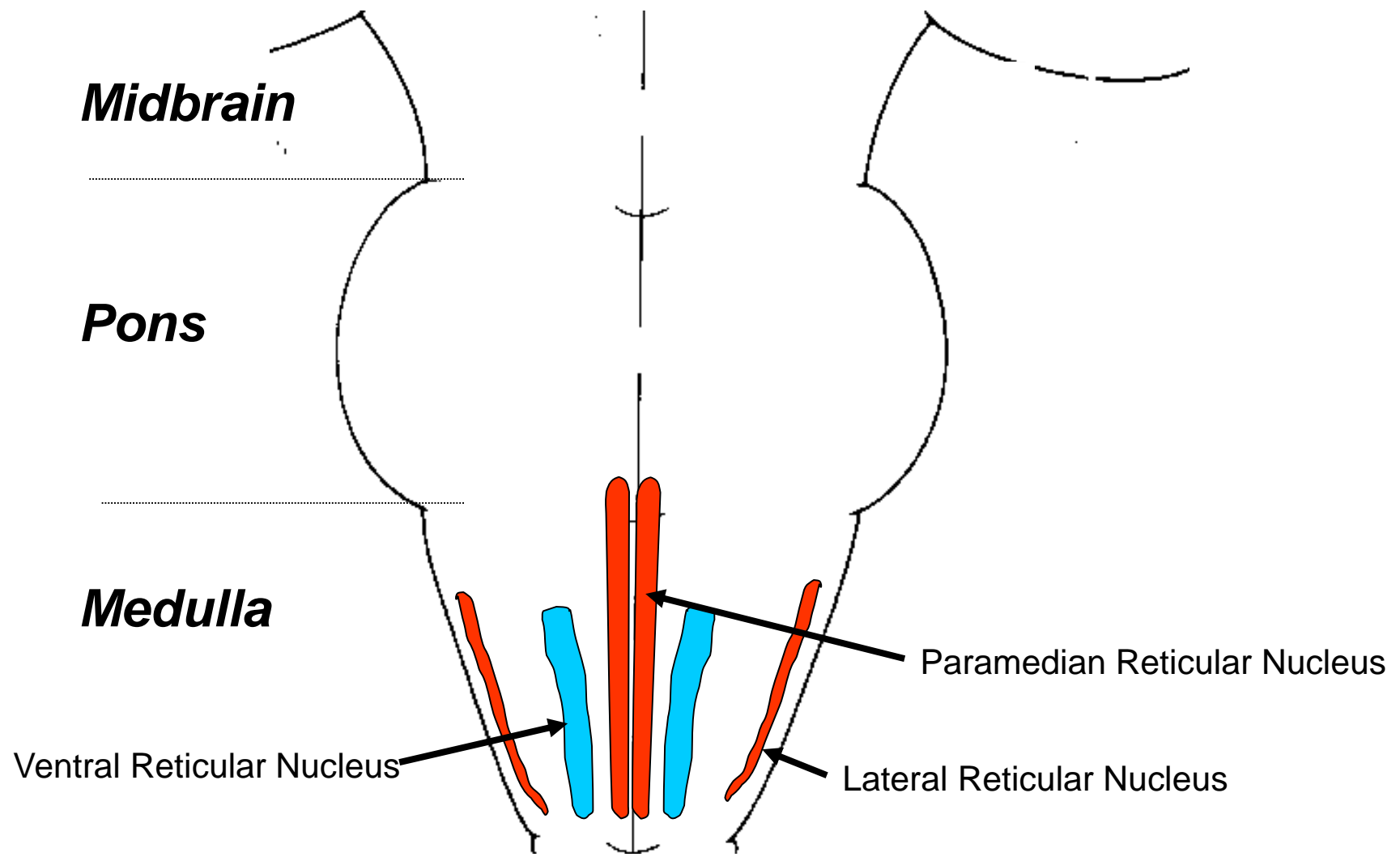
B2 - Núcleo del rafé *obscurus*

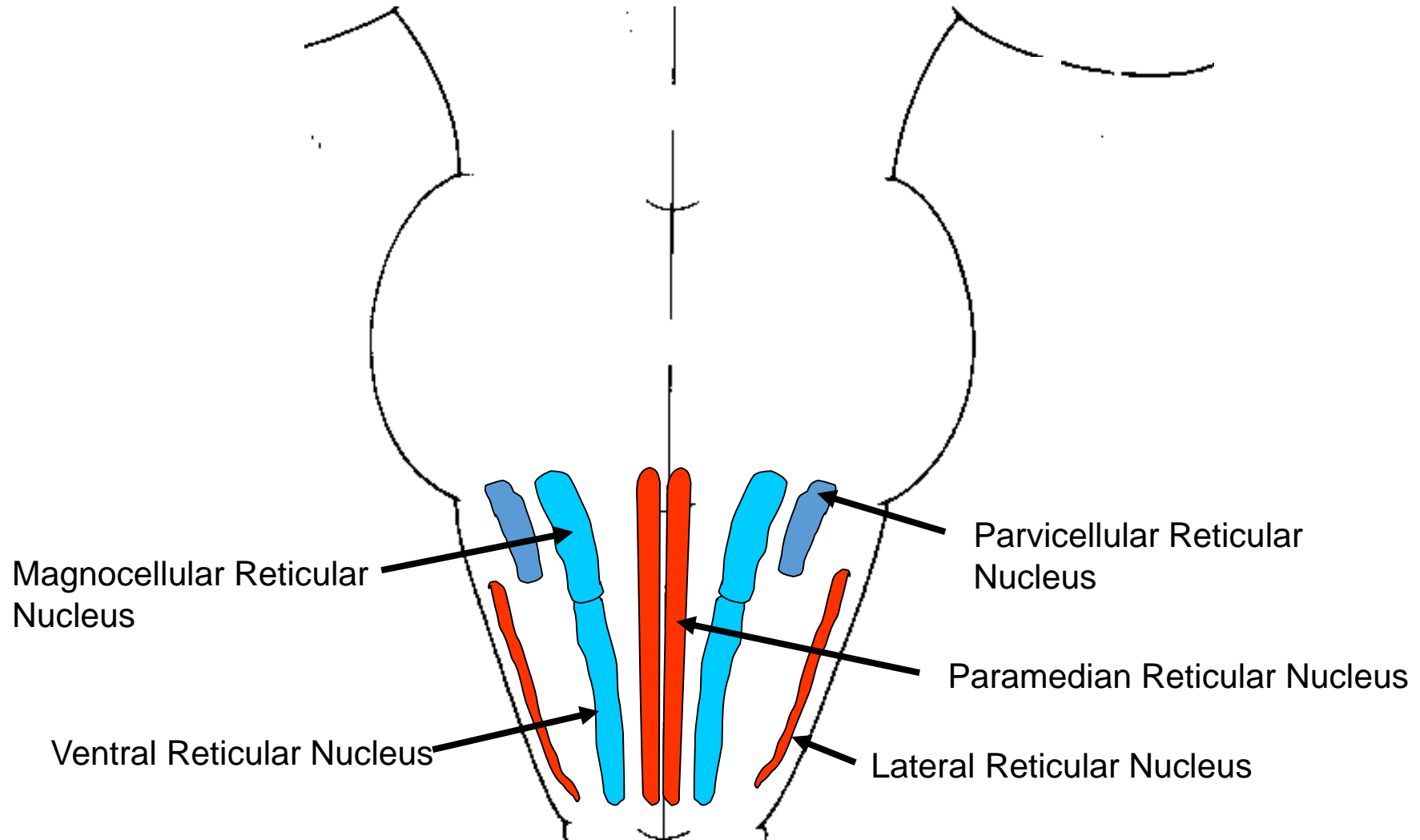
B3 - Núcleo del rafé *magnus*

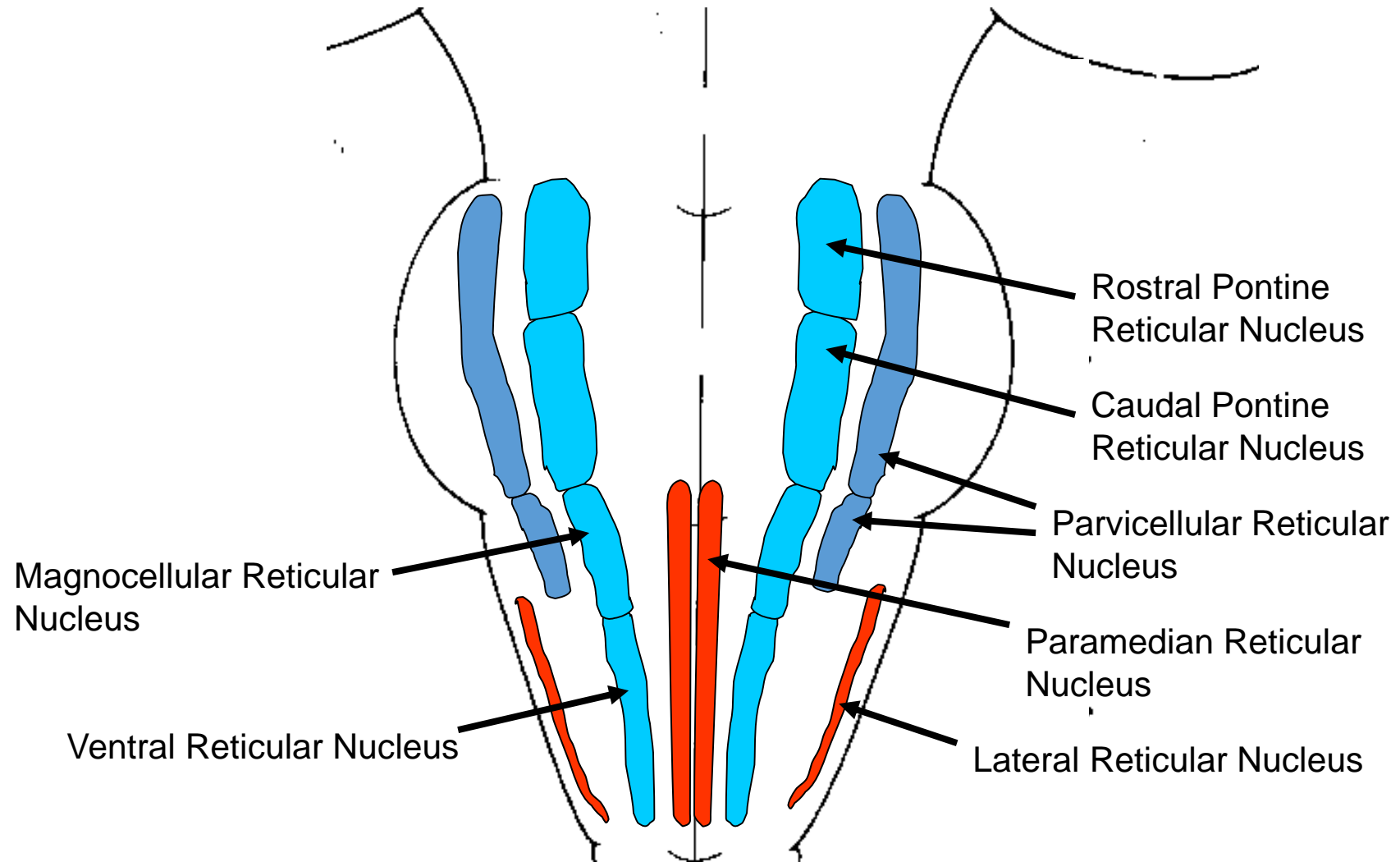
B5 - Núcleo del rafé *pontis*

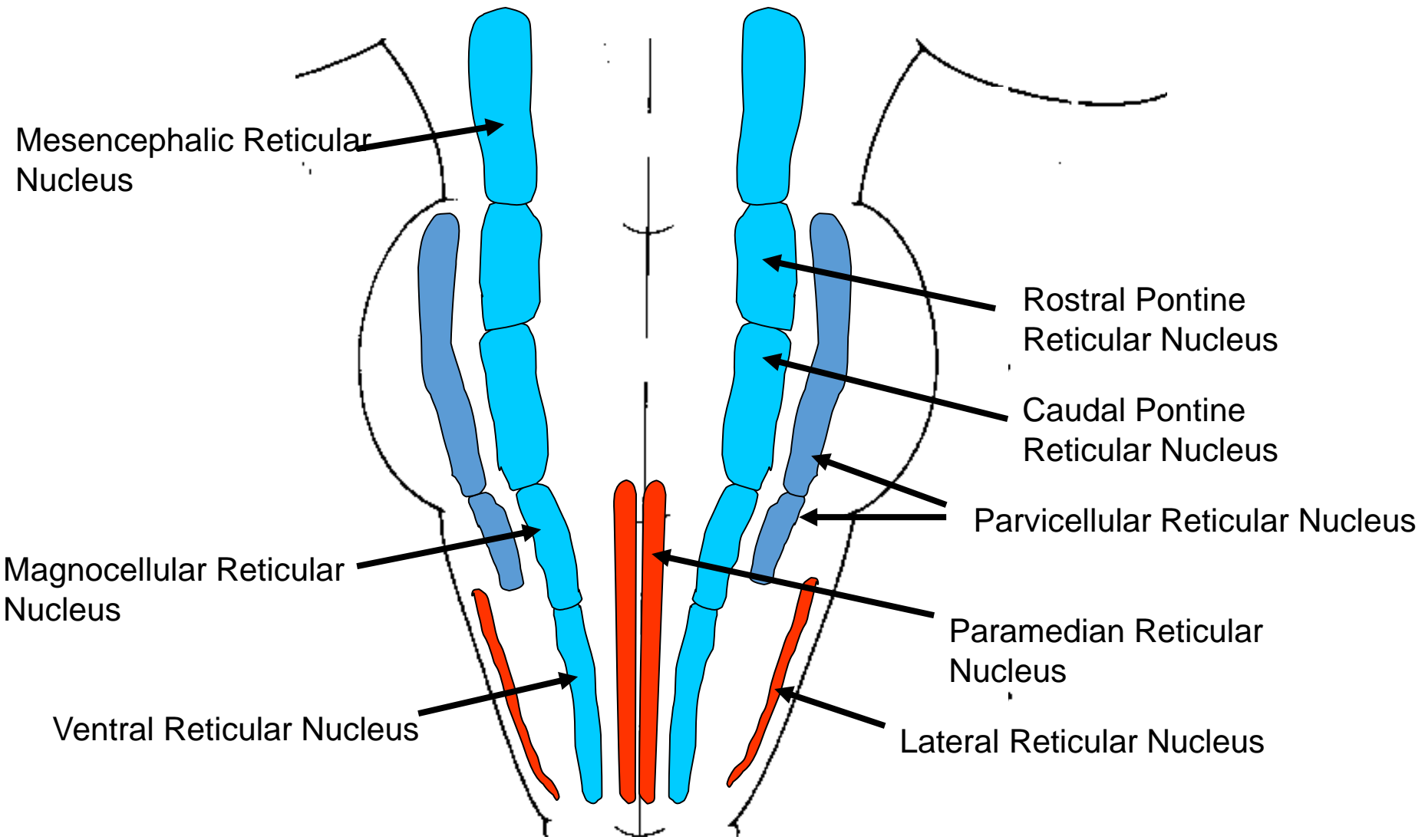
B7 - Núcleo del rafé *dorsalis*











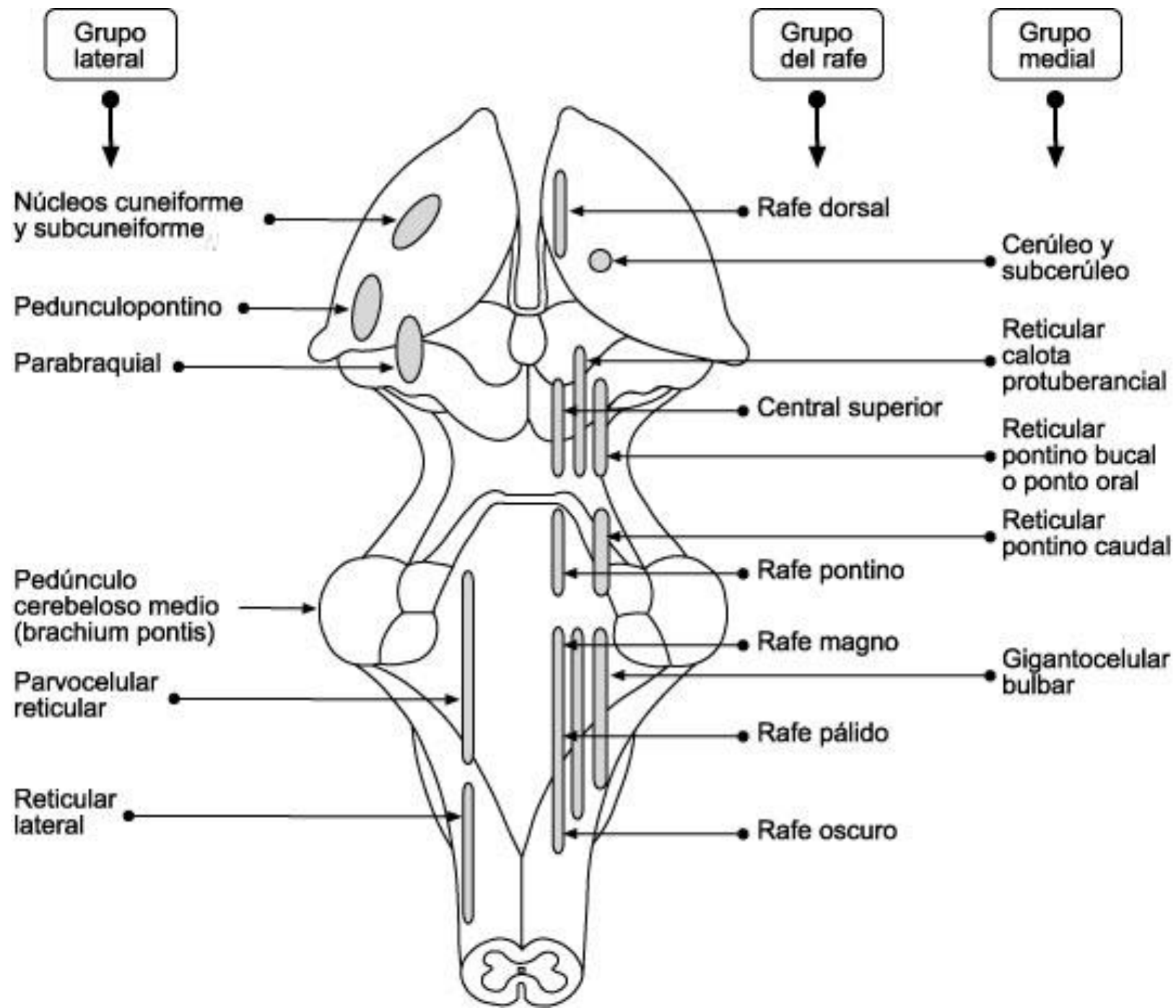


TABLE 9.1. Nuclear groups of the reticular formation in humans

Brain stem level	Named nuclear group	Abbreviation	Levels*
Medulla	Ventral reticular nucleus	VRt	4–21
	Dorsal reticular nucleus	DRt	5–21
	Medial reticular nucleus	MRt	6–21
	Intermediate reticular zone	IRt	5–33
	Lateral reticular nucleus, proper	LRt	12–27
	Lateral reticular nucleus, subtrigeminal part	LRtS5	15–28
	Lateral reticular nucleus, parvicellular part	LRtPC	
	Epiolivary lateral reticular nucleus	EO	16–23
	Interfascicular nucleus	IFH	17–23, 25, 26
	Lateral paragigantocellular nucleus	LPGi	21–32
	Dorsal paragigantocellular nucleus	DPGi	23–32
	Gigantocellular reticular nucleus	Gi	22–33
	Gigantocellular reticular nucleus, ventral part	GiV	22–27
	Gigantocellular reticular nucleus, alpha part	Gi α	30–33
	Parvicellular reticular nucleus	PCRt	22–32
	Pons	Parvicellular reticular nucleus, alpha part	PCRt α
Pontine reticular nucleus, caudal part		PnC	33–36
Reticulotegmental nucleus of the pons		RtTg	34–45
Pontine reticular nucleus, oral part		PnO	37–50
Pedunclopontine tegmental nucleus, diffuse part		PPTgD	48–52
Pedunclopontine tegmental nucleus, compact part		PPTgC	50–53
Midbrain	Cuneiform nucleus	CnF	50–56
	Mesencephalic reticular fields	MRF	56–62
	Parapenduncular nucleus	PaP	59–62

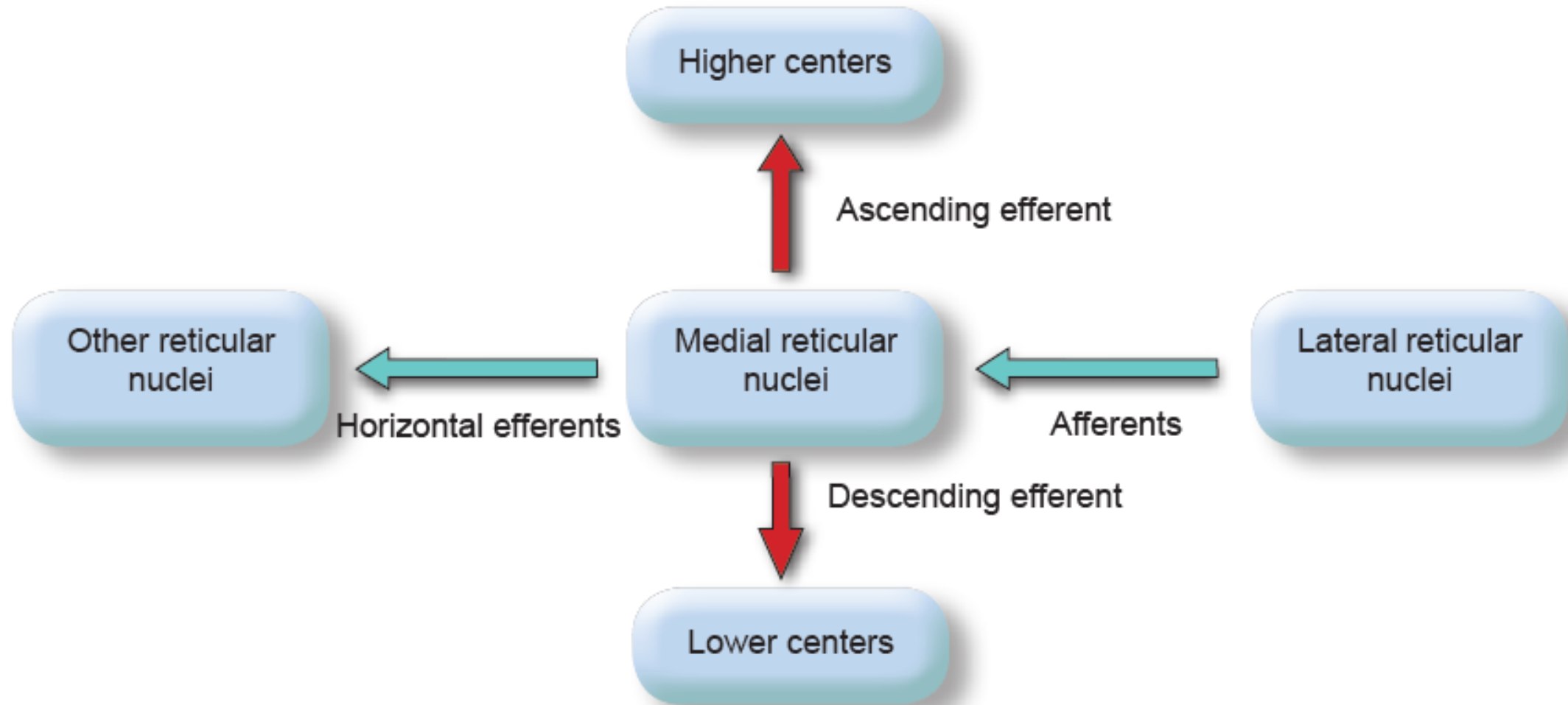
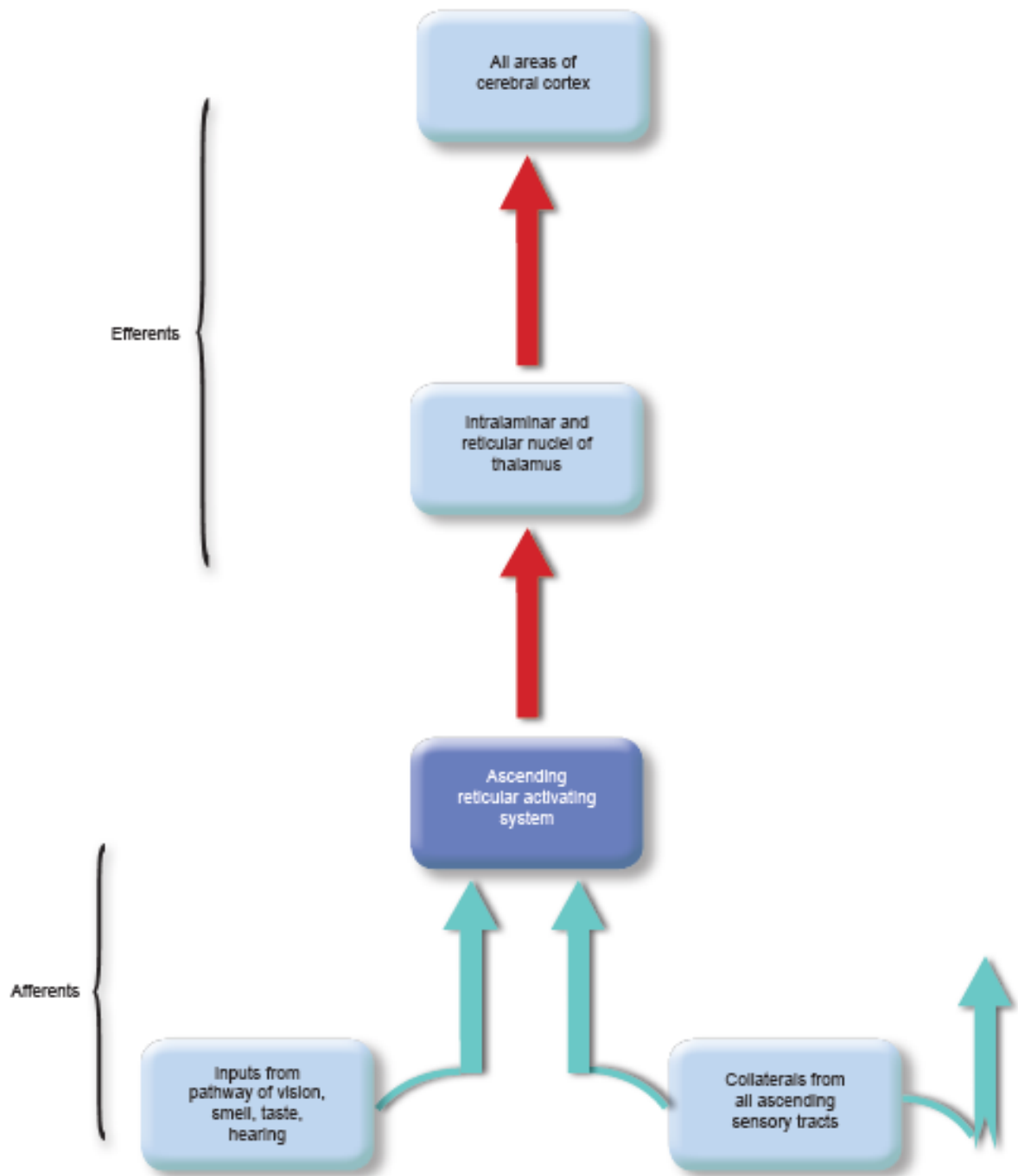
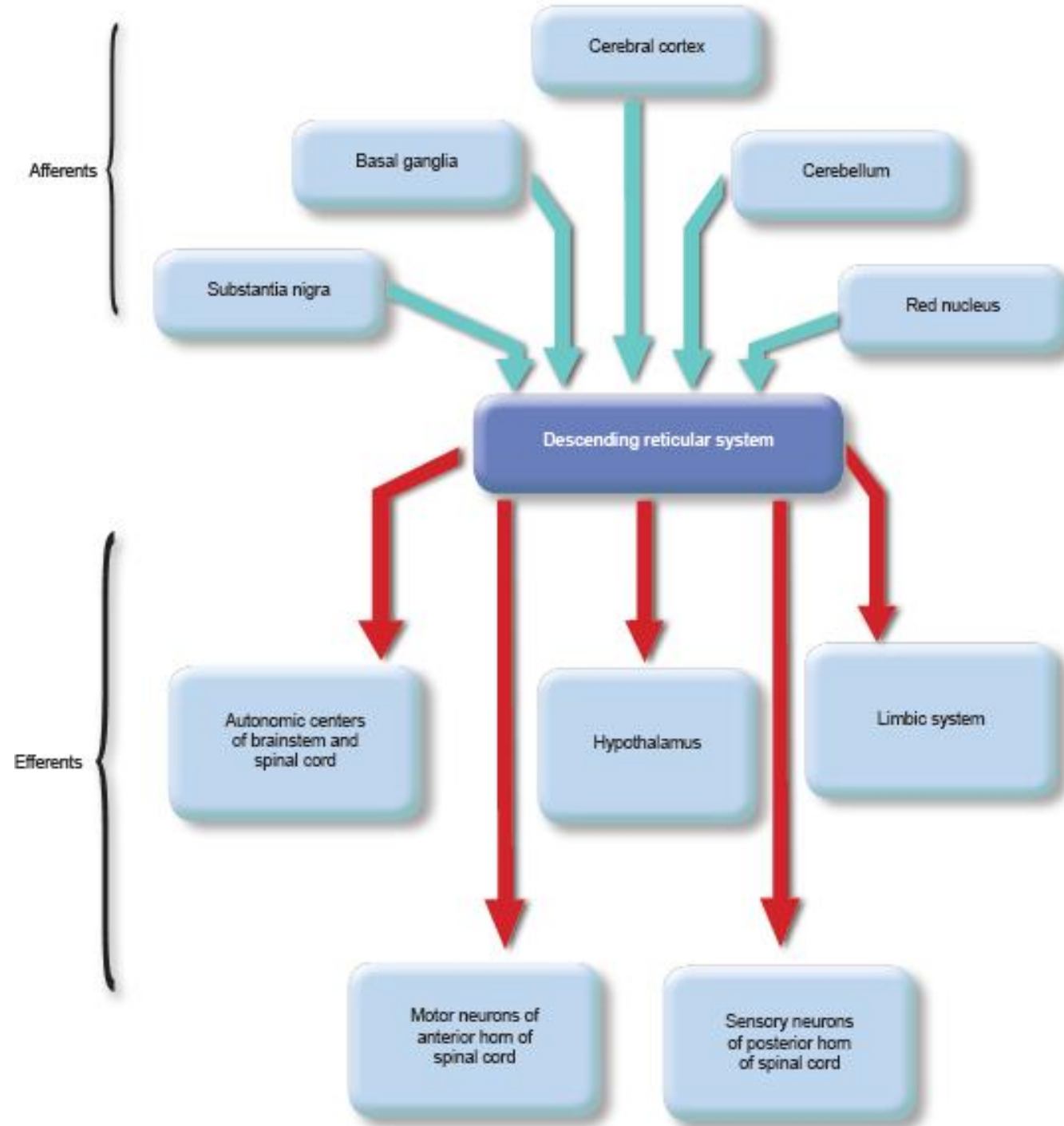
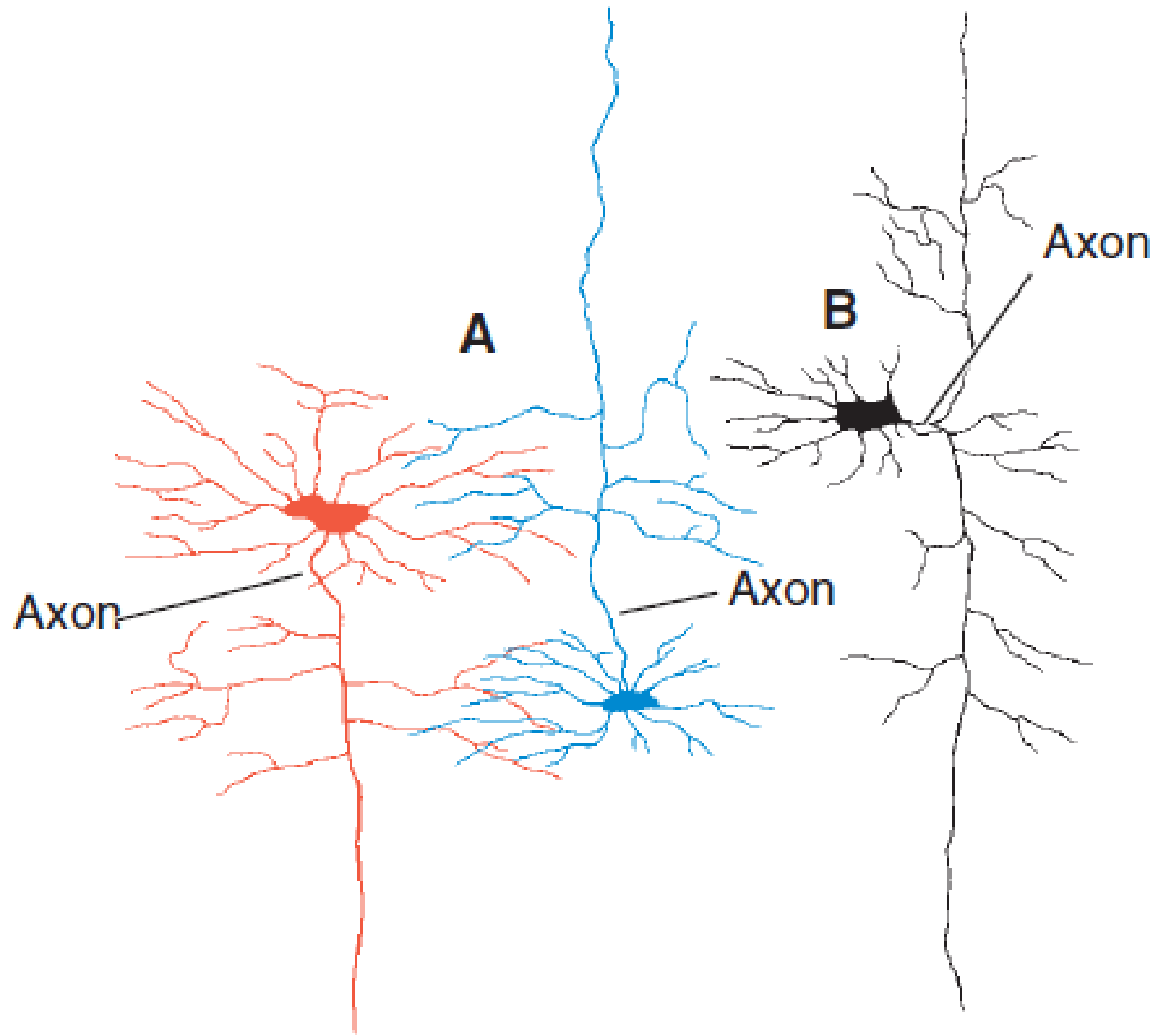


Fig. 16.6 Connections of medial column reticular nucleus

Connections of Ascending Reticular Activating System (ARS)







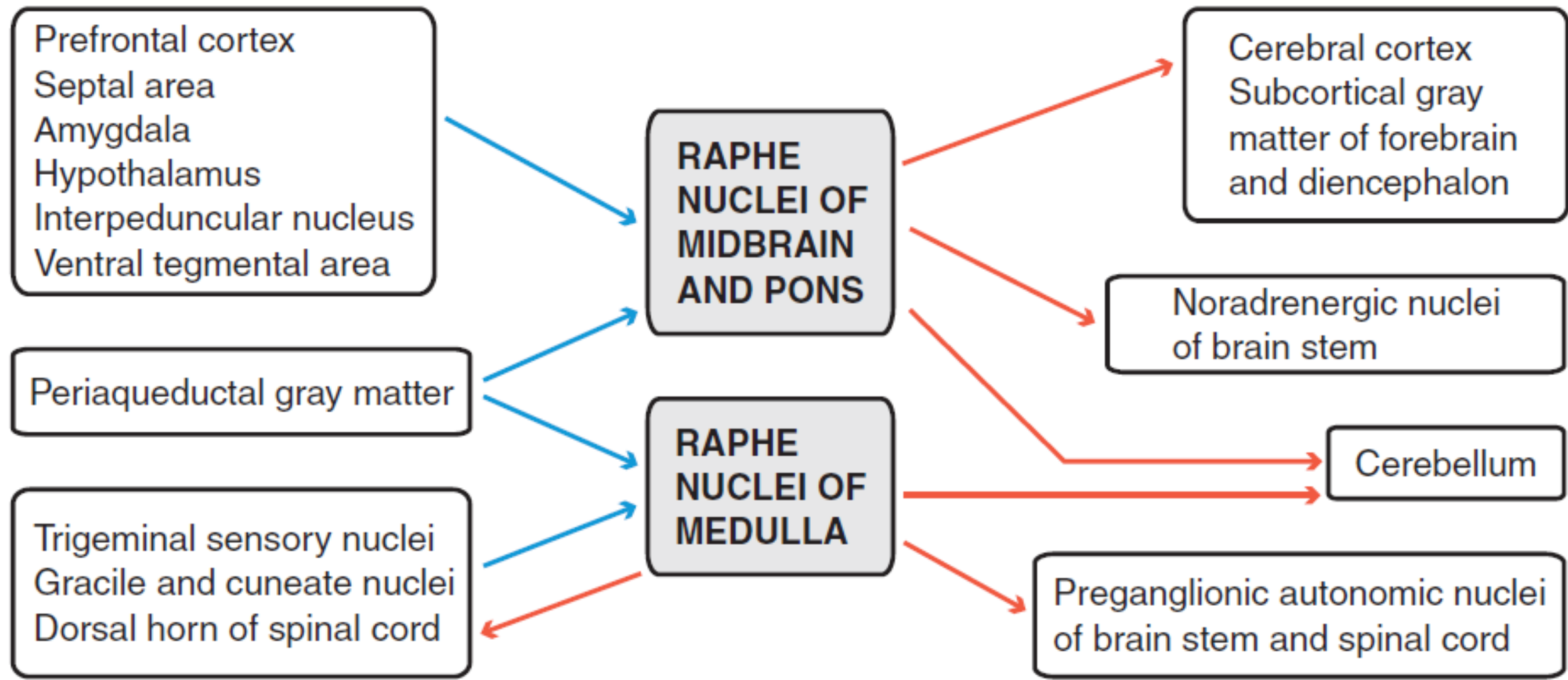
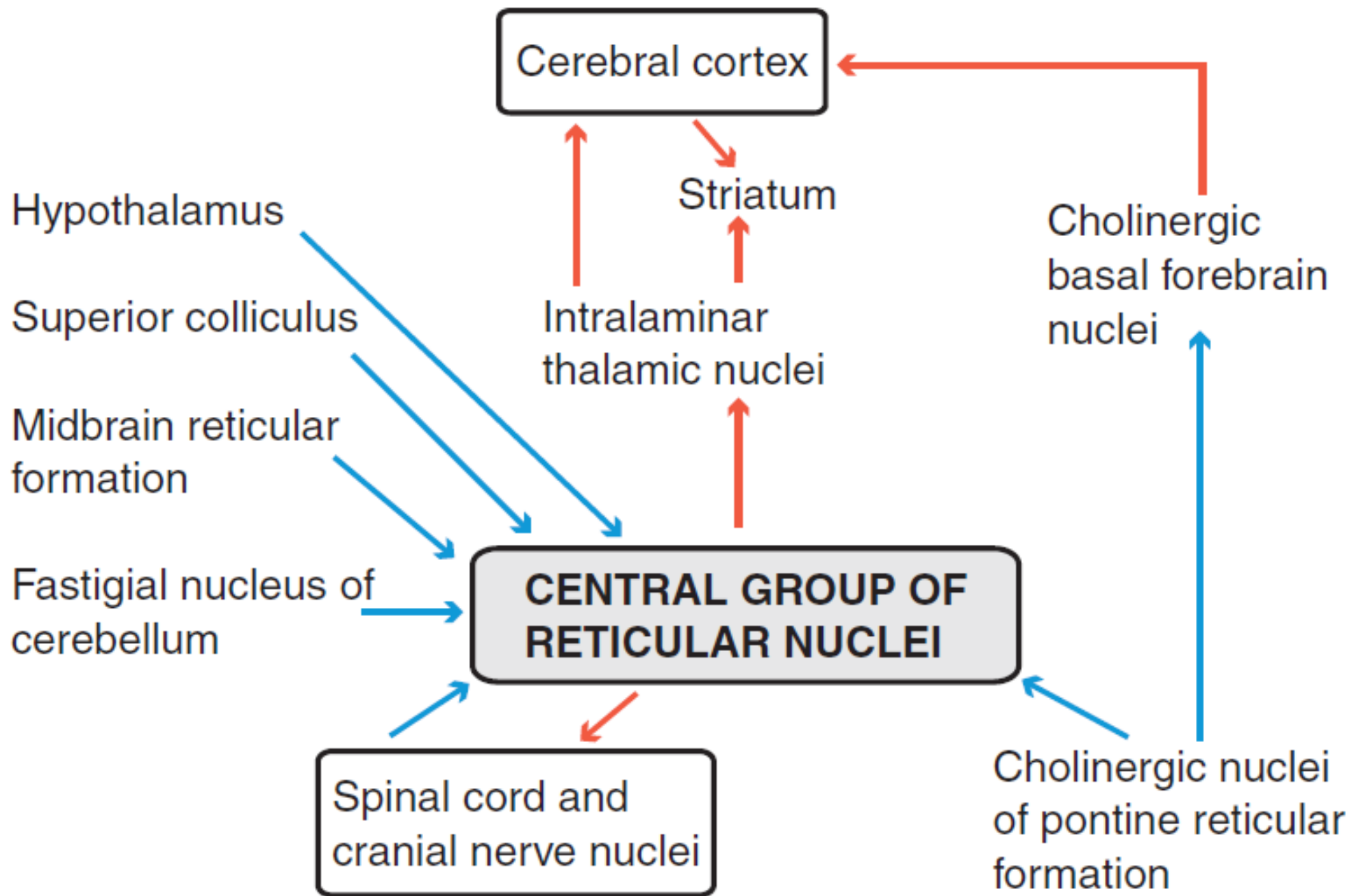


FIGURE 9-3 Major connections of the serotonergic raphe nuclei.



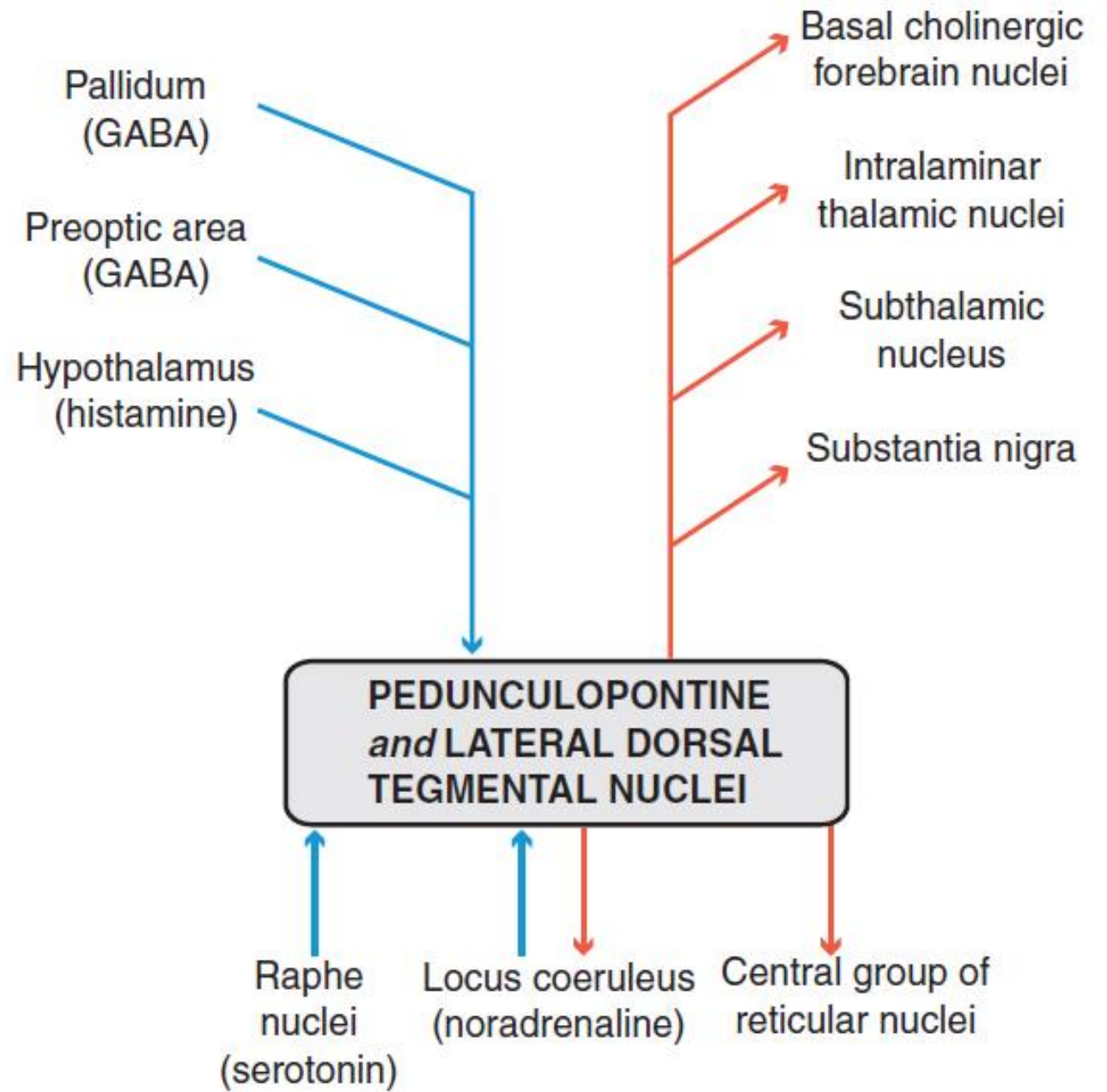


FIGURE 9-6 Major connections of the cholinergic nuclei of the brain stem.

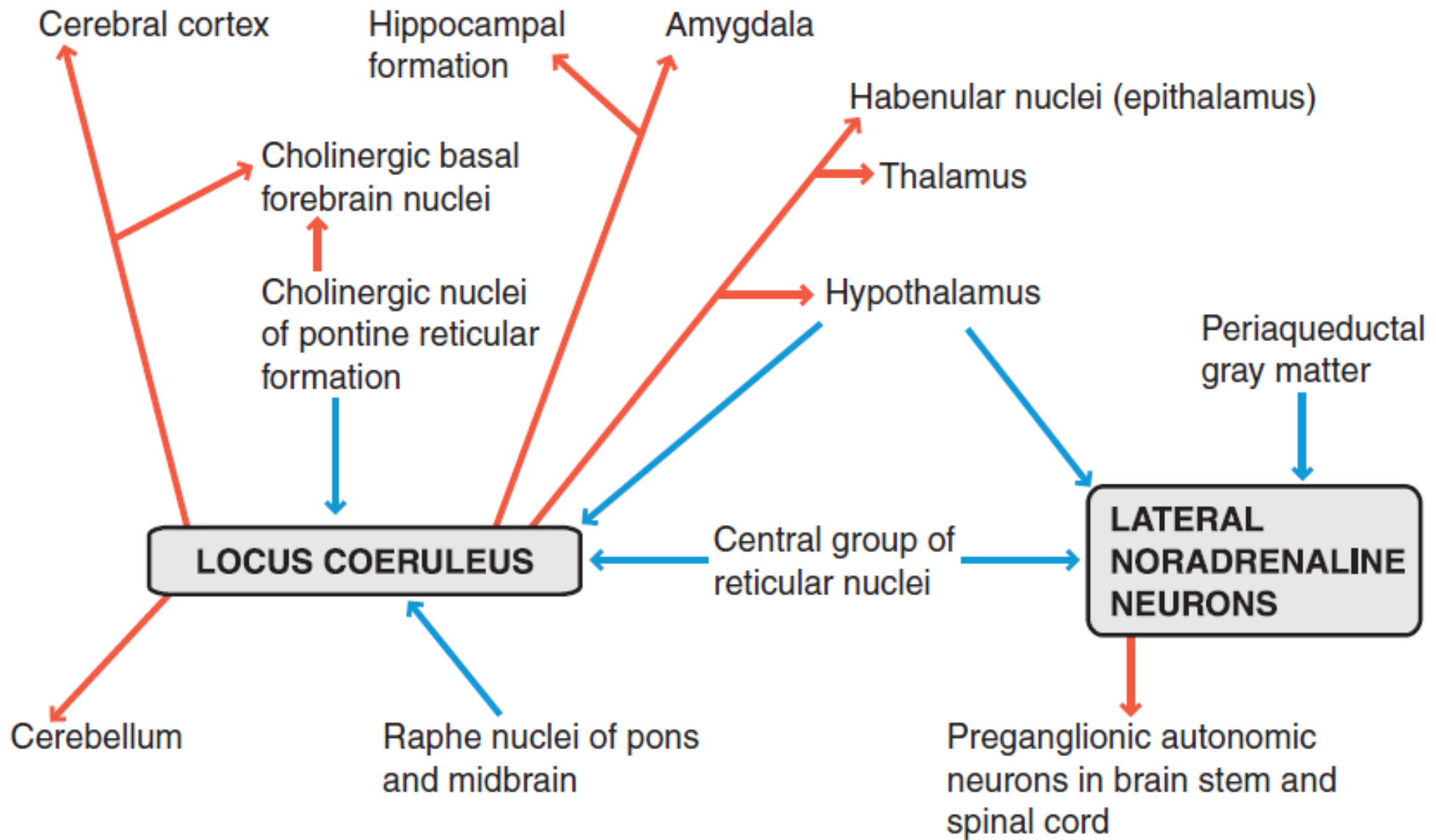
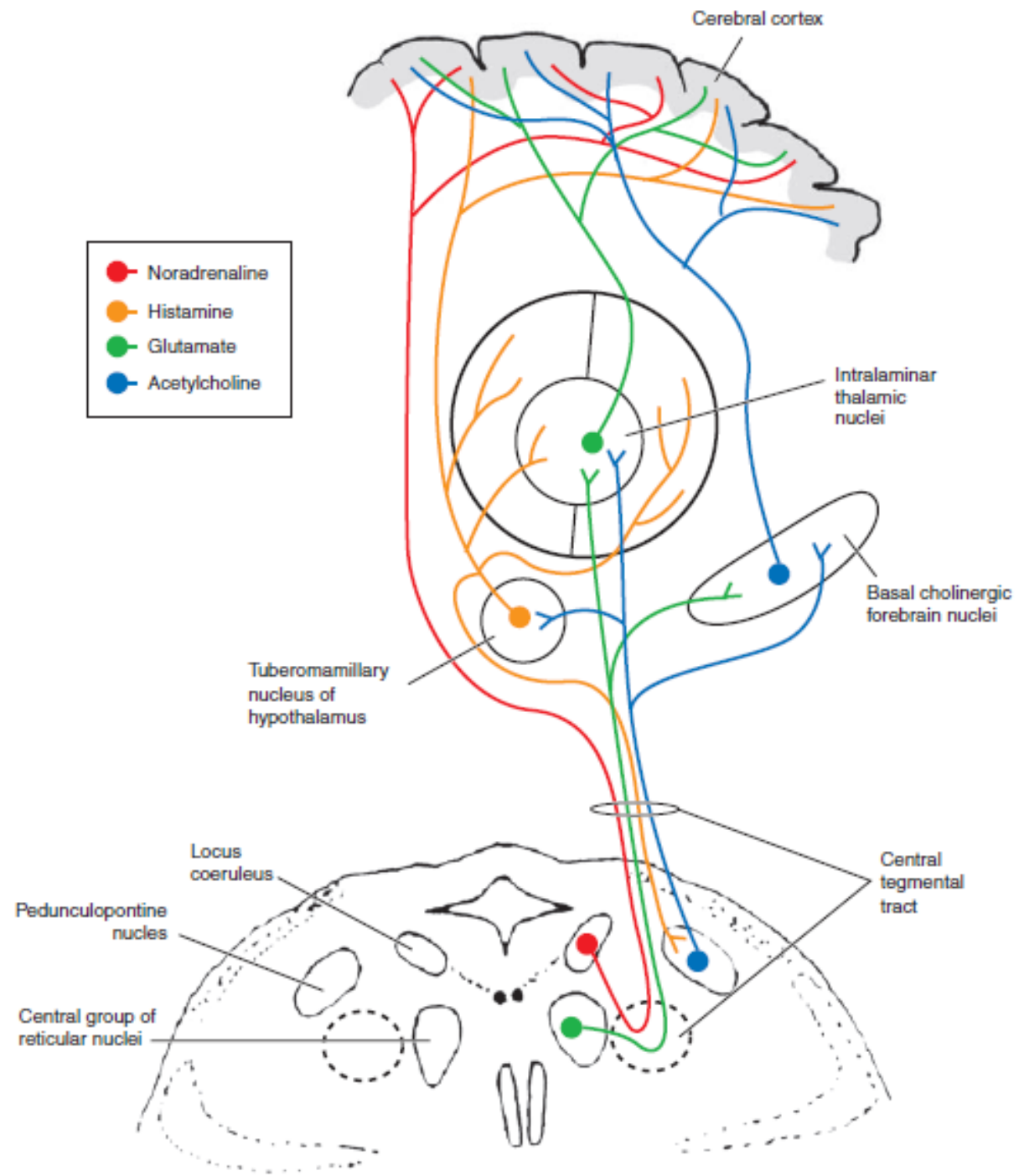


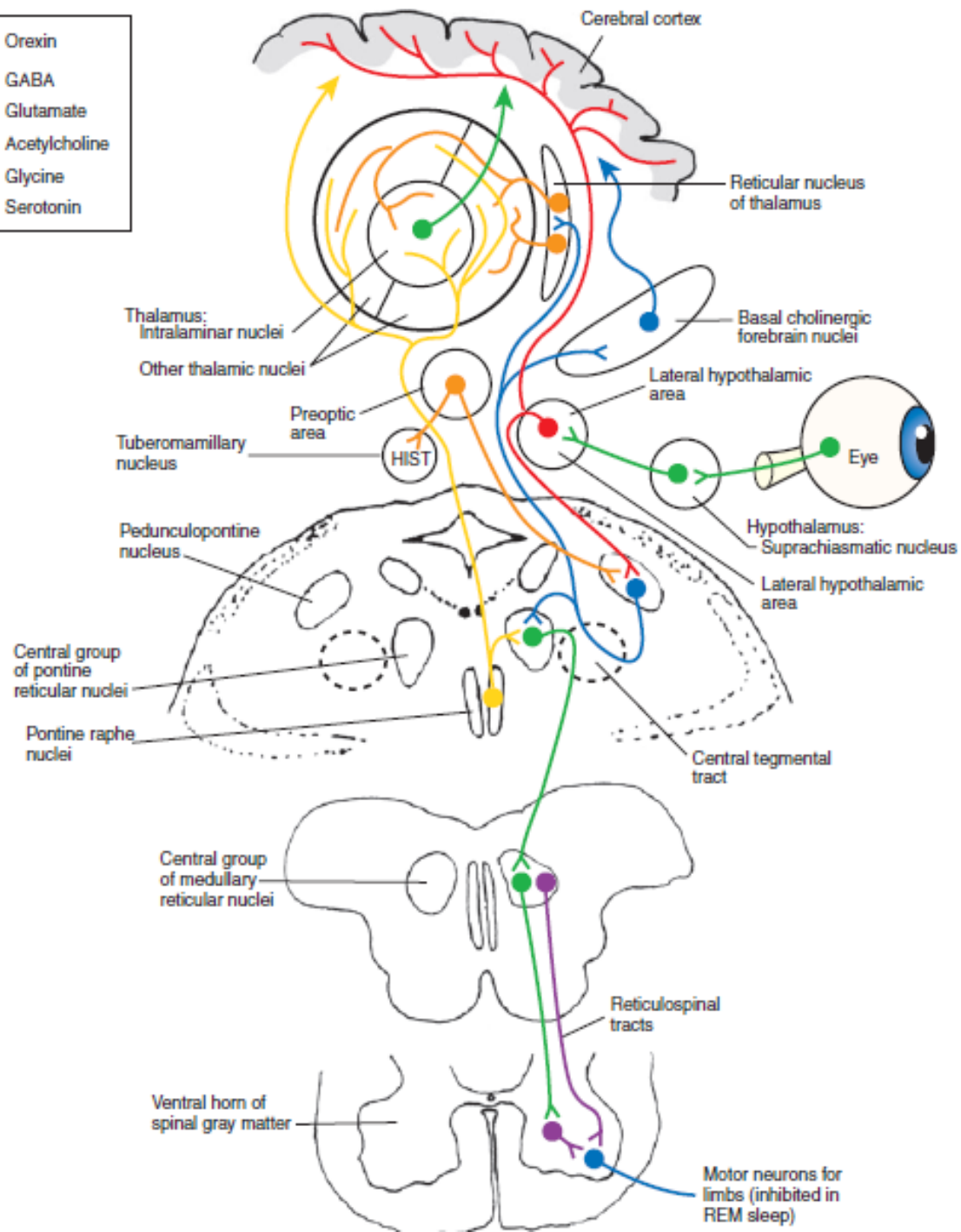
FIGURE 9-7 Major connections of the noradrenergic nuclei of the brain stem.



- Noradrenaline
- Histamine
- Glutamate
- Acetylcholine



- Orexin
- GABA
- Glutamate
- Acetylcholine
- Glycine
- Serotonin



Midbrain and upper pons

Lower pons and medulla

Midline (raphe)

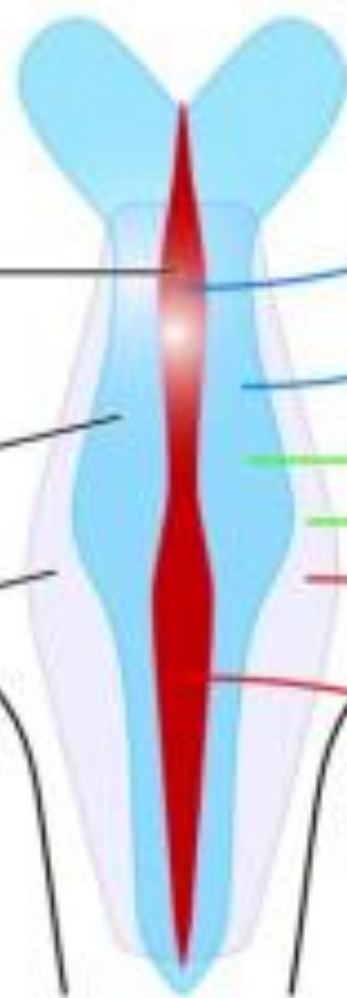
Medial

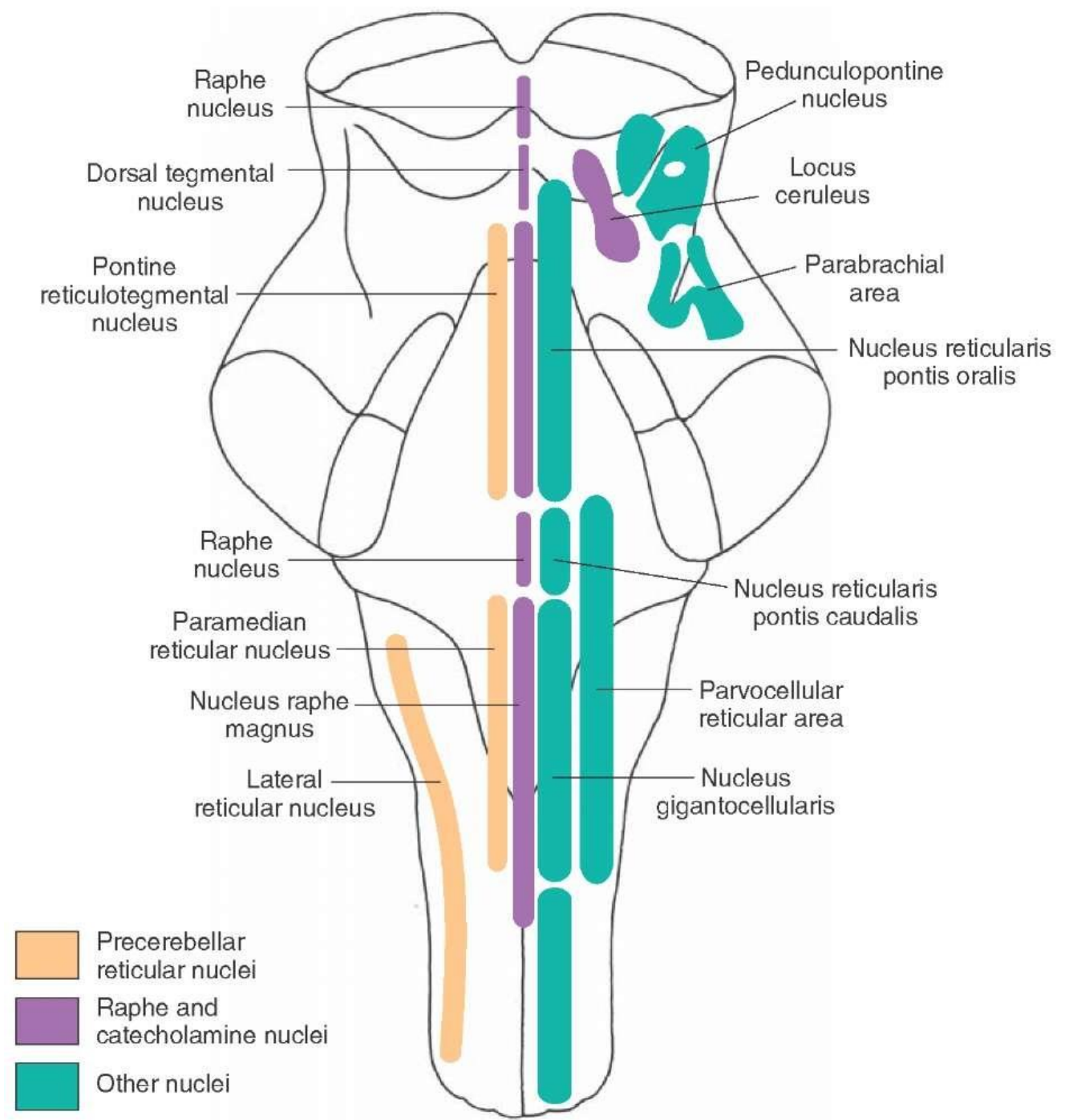
Lateral

Ascending projections for arousal and attention

Intrinsic connections for control of eye movements, swallowing, and brainstem reflexes

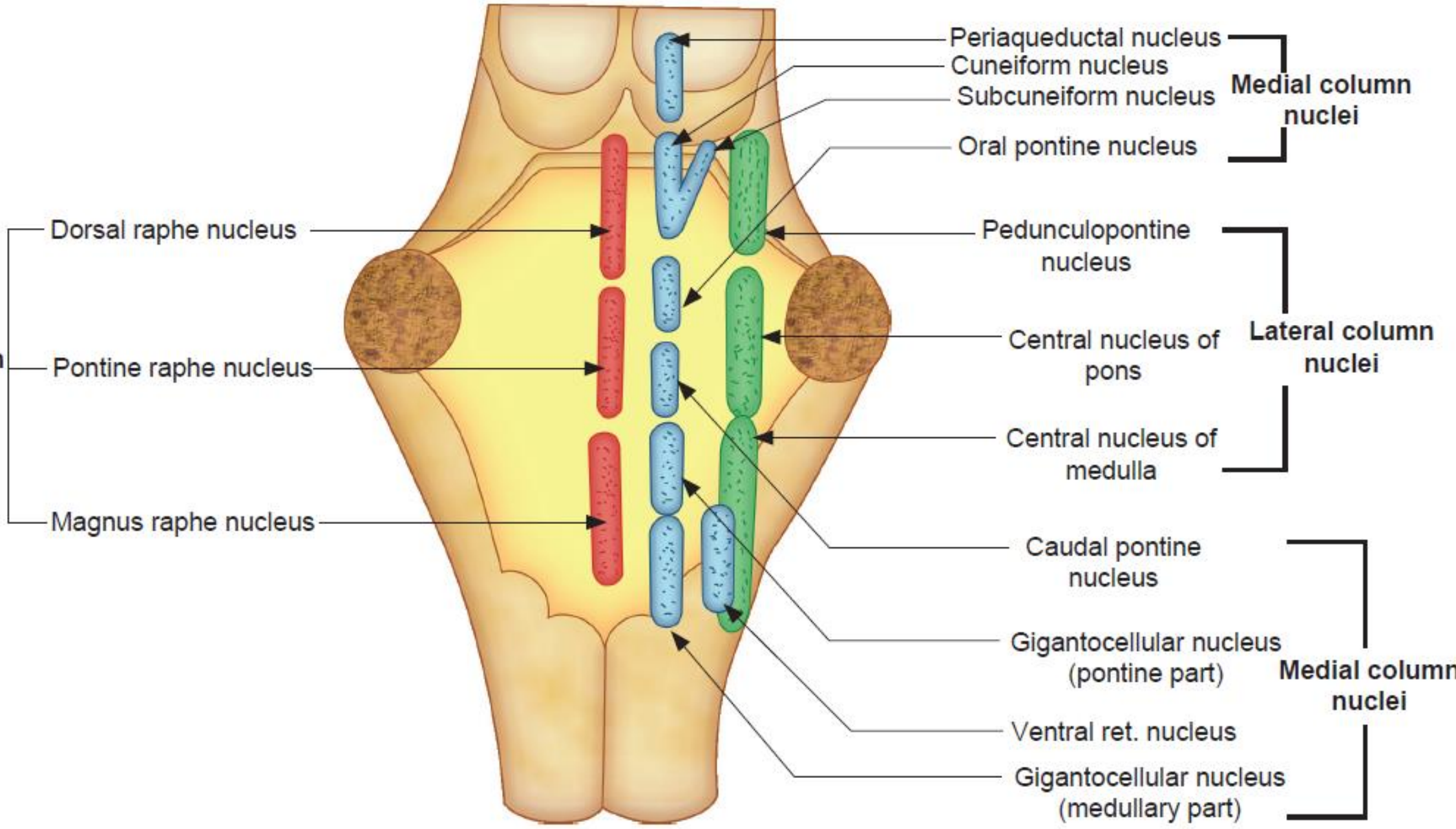
Descending projections for control of muscle tone, respiration, and arterial pressure

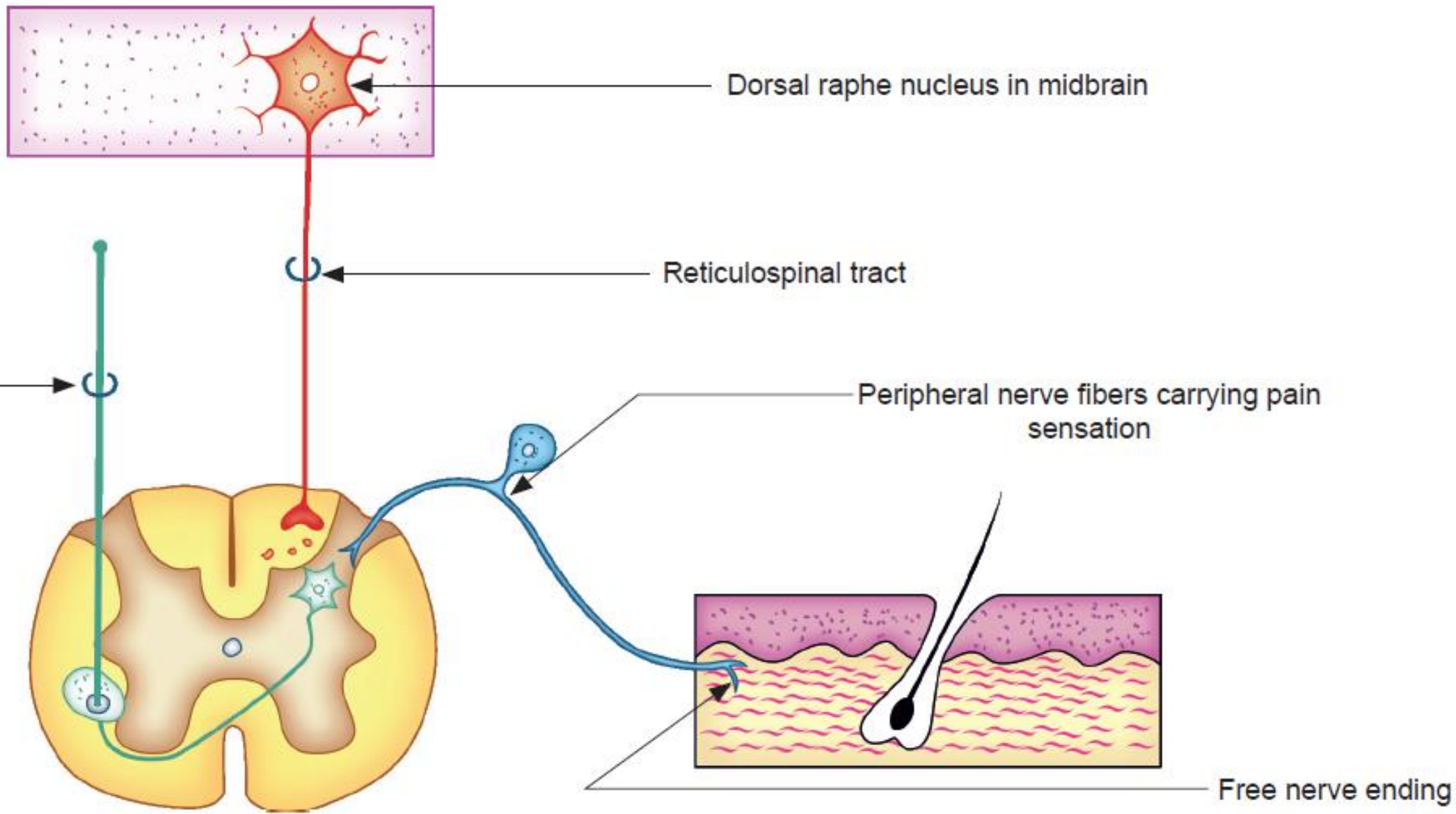


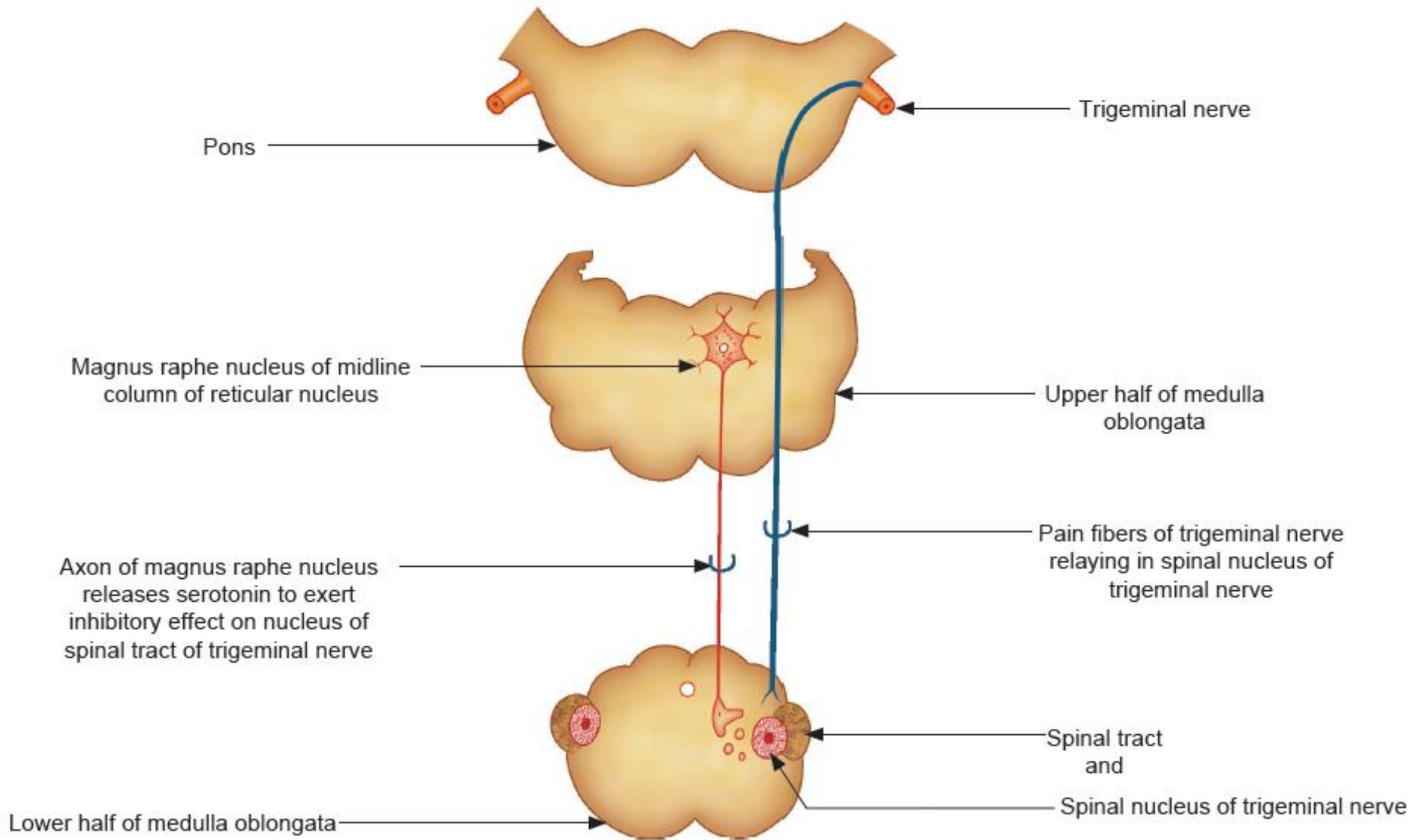


- Precerebellar reticular nuclei
- Raphe and catecholamine nuclei
- Other nuclei

Median column nuclei



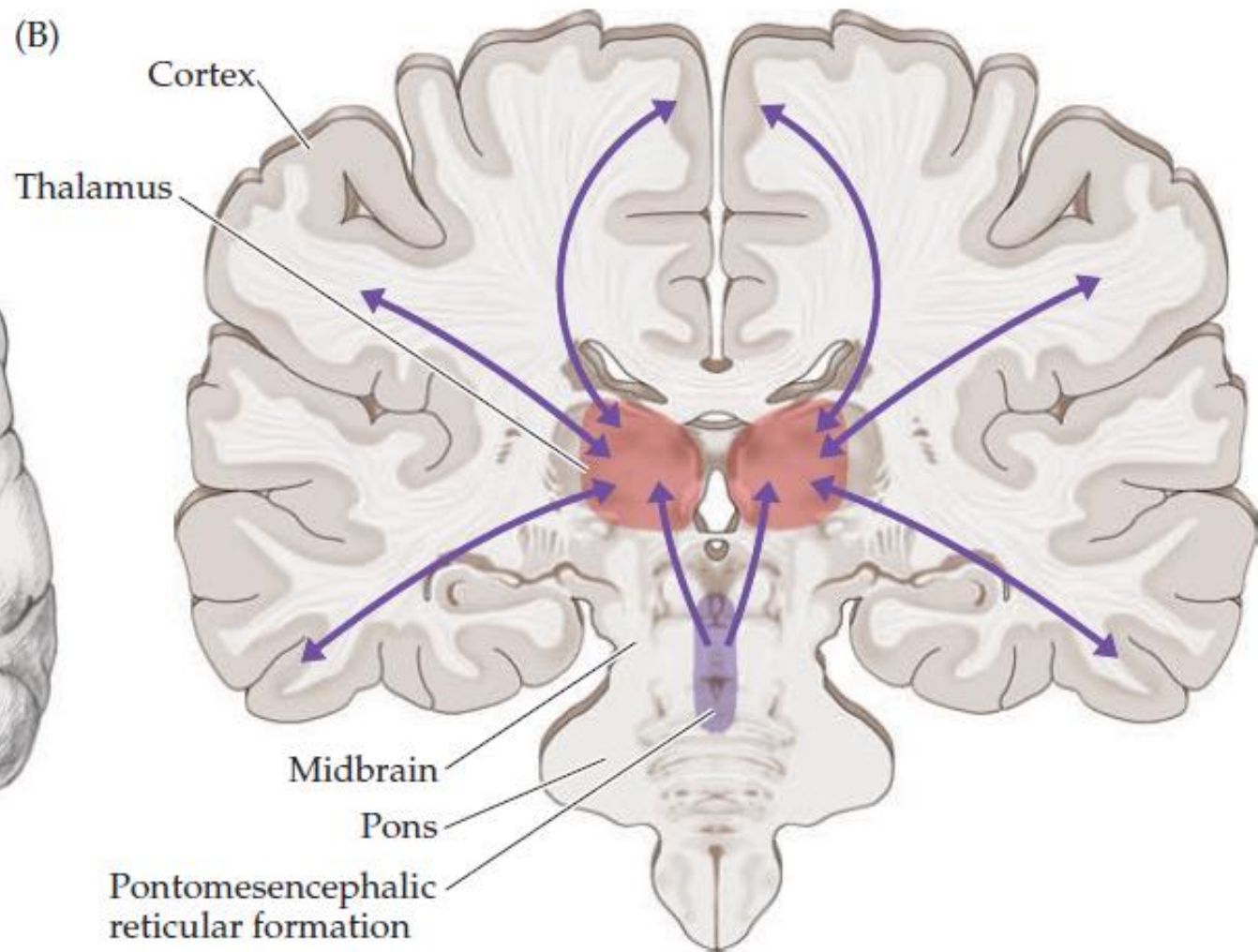
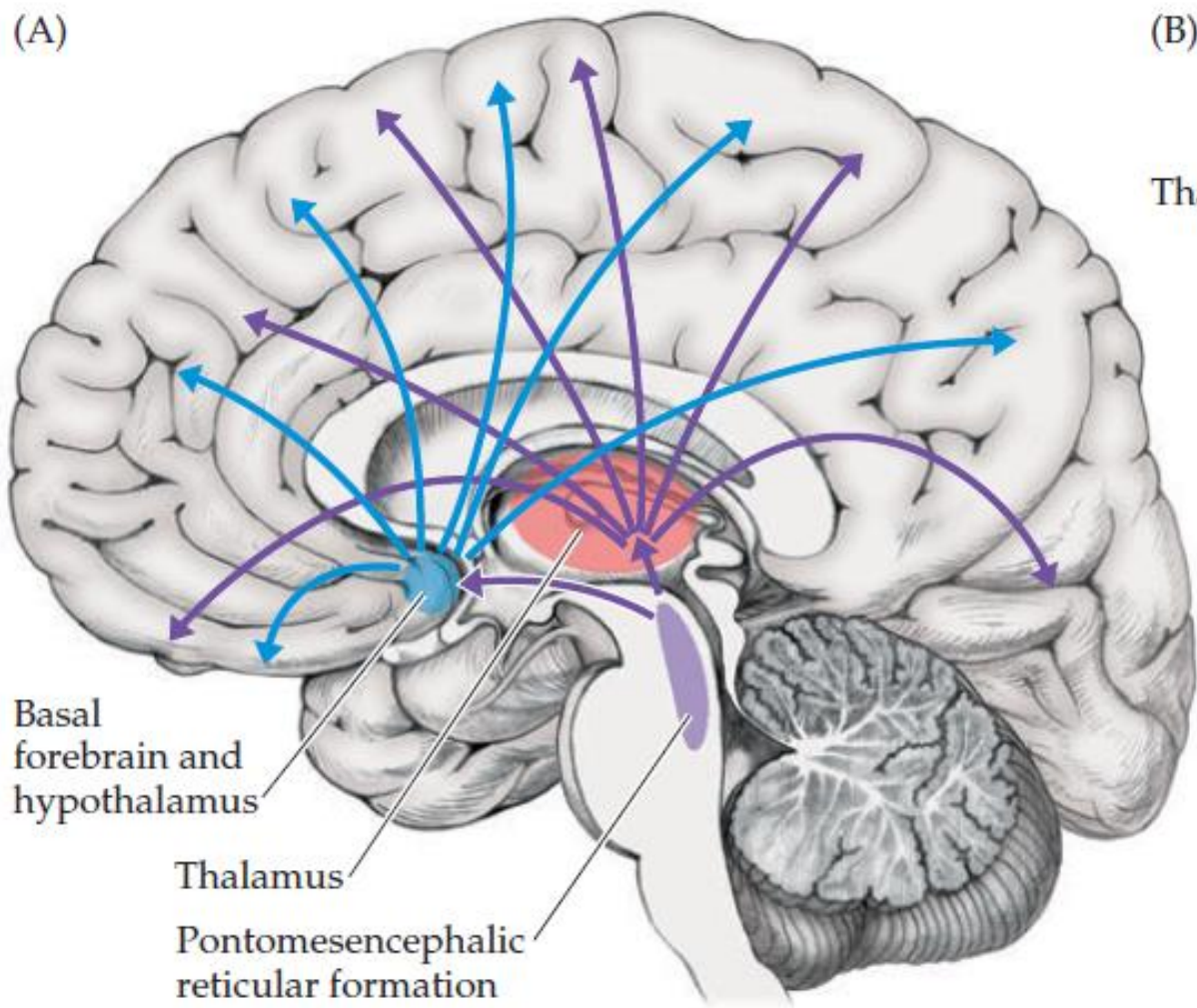






NÚCLEOS DEL RAFÉ

- NEURONAS: multipolares, bipolares y fusiformes a lo largo del tallo
- Neuronas **serotoninérgicas** y dopaminérgicas
 - Serotoninérgicos: rafé dorsal, caudal linear (algunas neuronas dopaminérgicas) y rafé mediano
- AFERENCIAS: Formación reticular, vías ascendentes sensitivas
- EFERENCIAS: tracto dorsal (axones varicosos y delgados), tracto ventral (axones mas gruesos), inervan estructuras diencefálicas, núcleos de la base, allocortex, neocortex (corteza sensitiva, visual primaria), hipotálamo, cíngulo, hipocampo y amígdala. PERCEPCIÓN



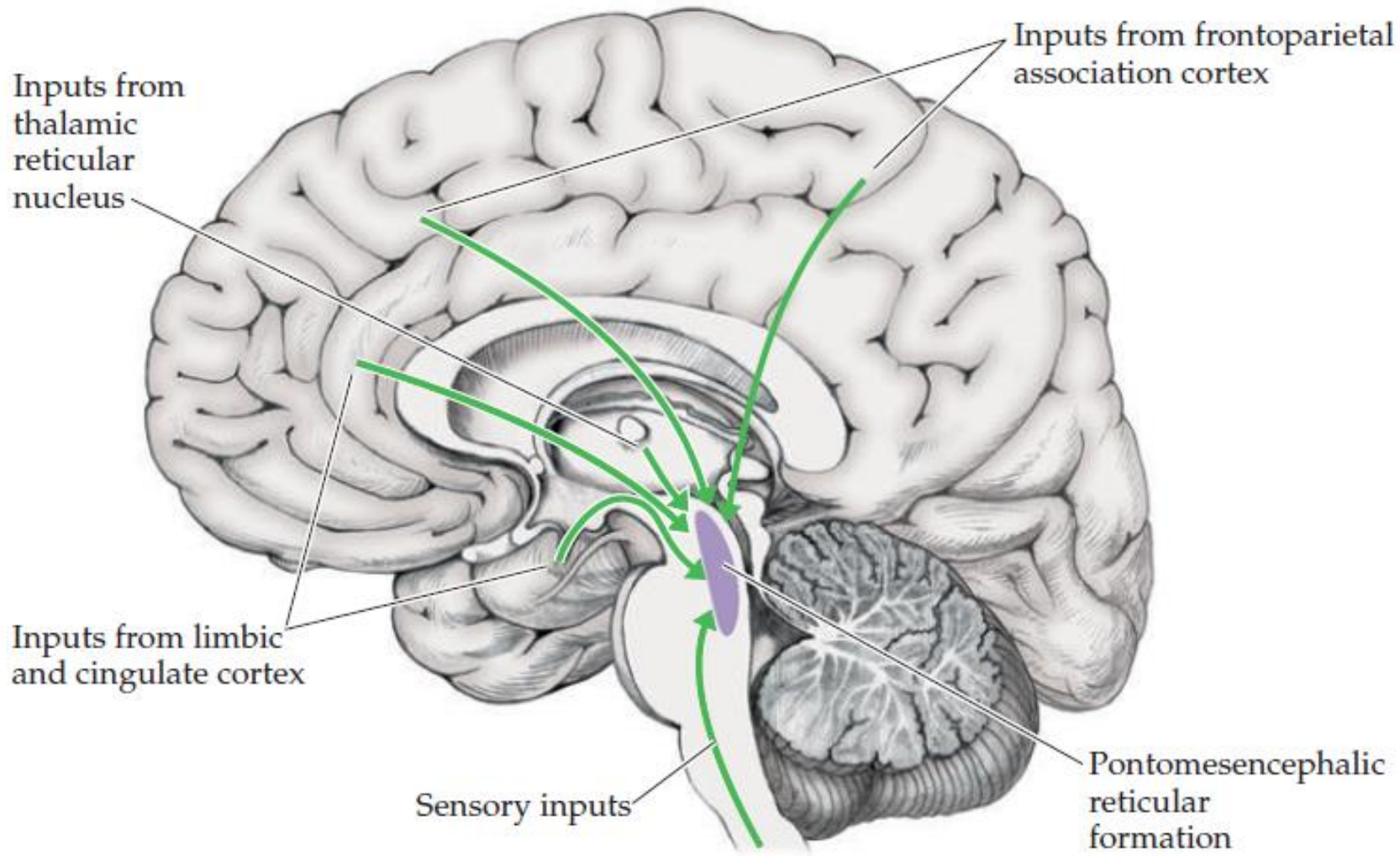
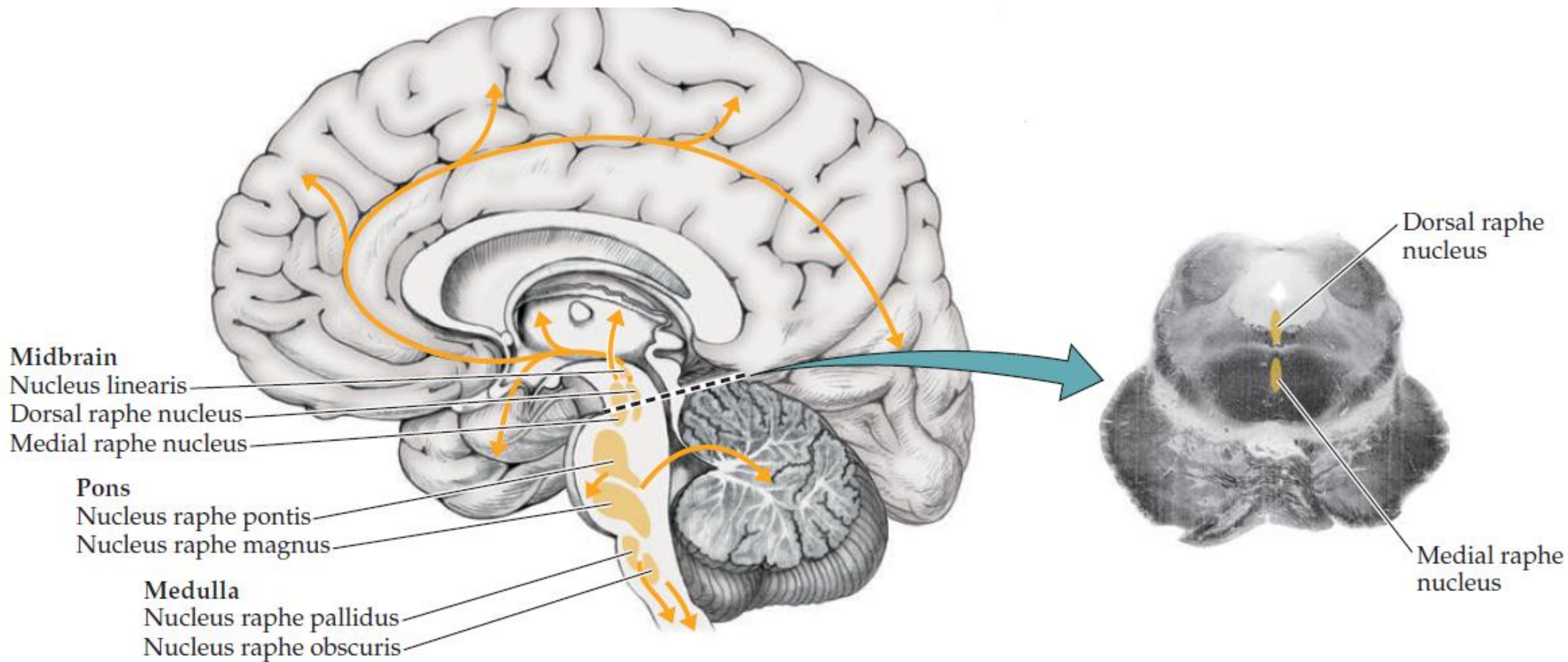
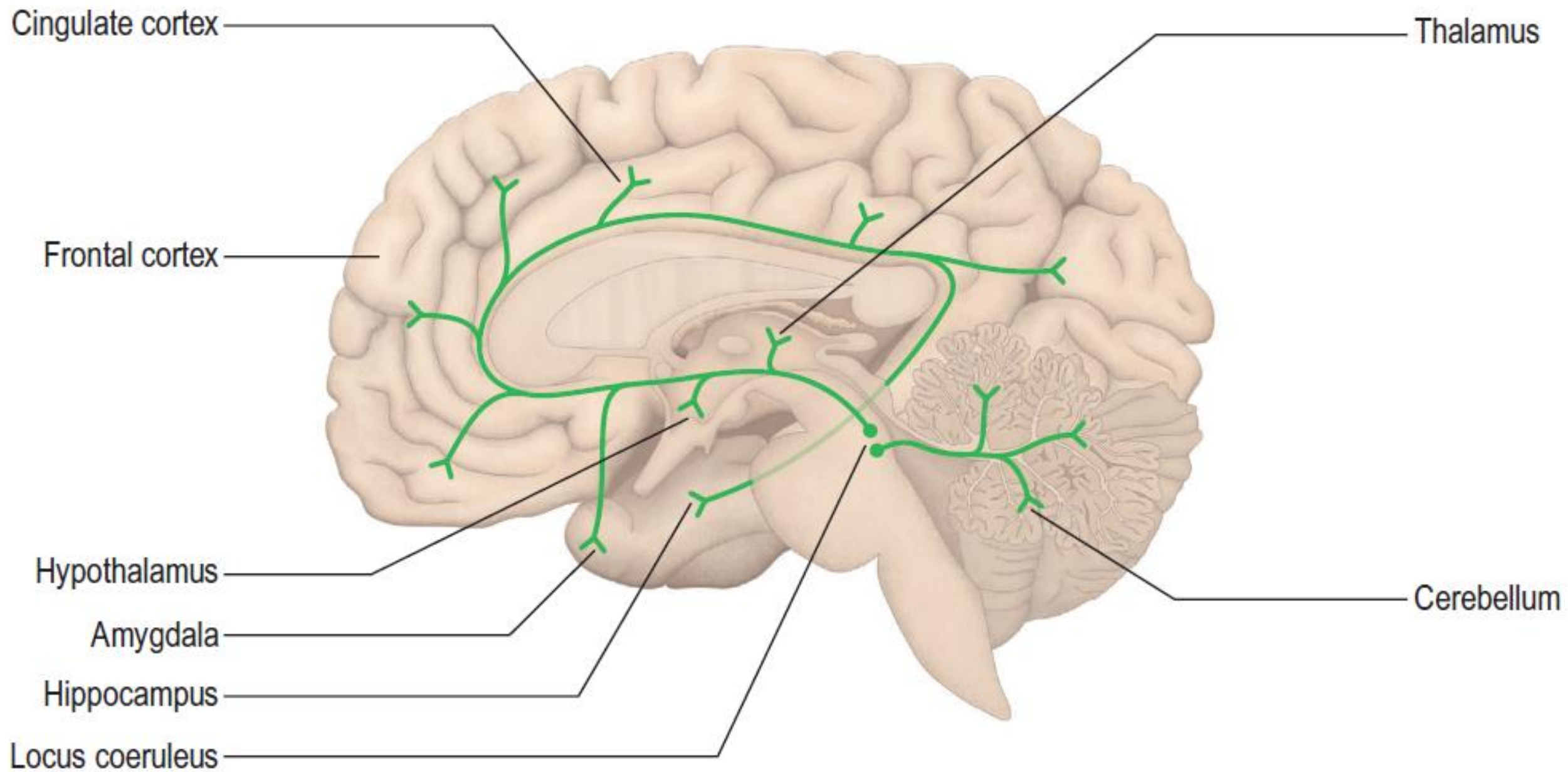
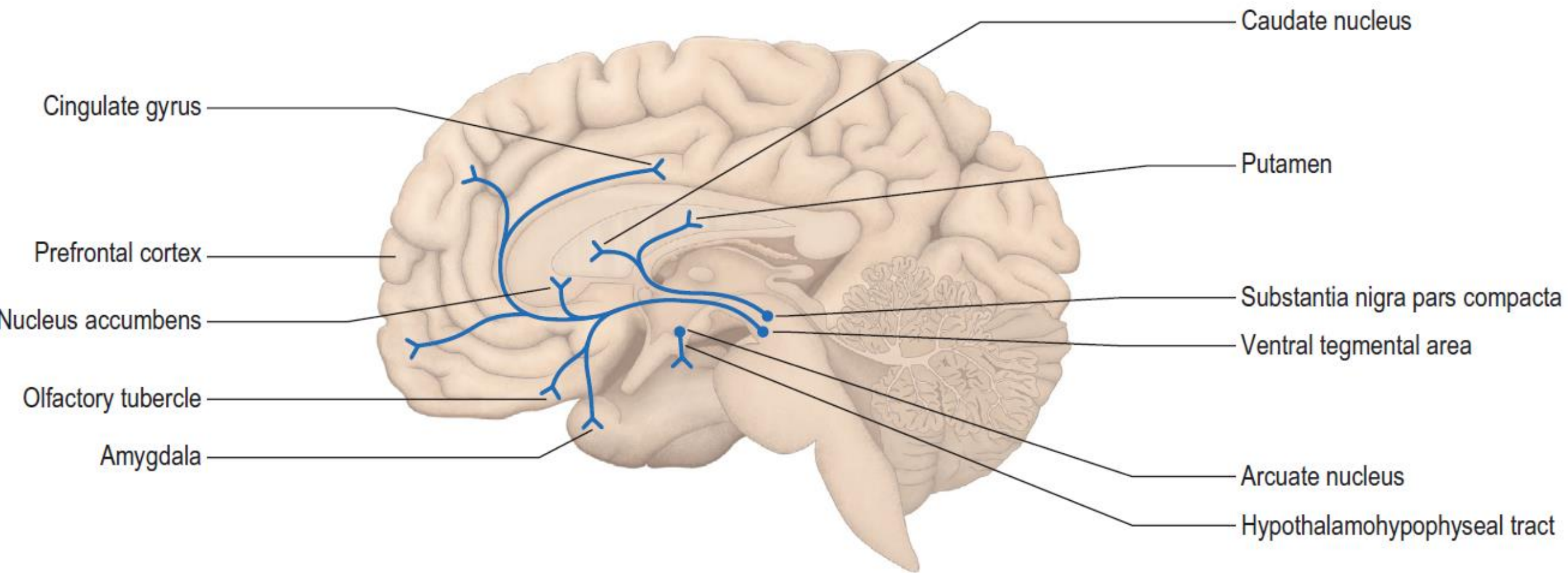
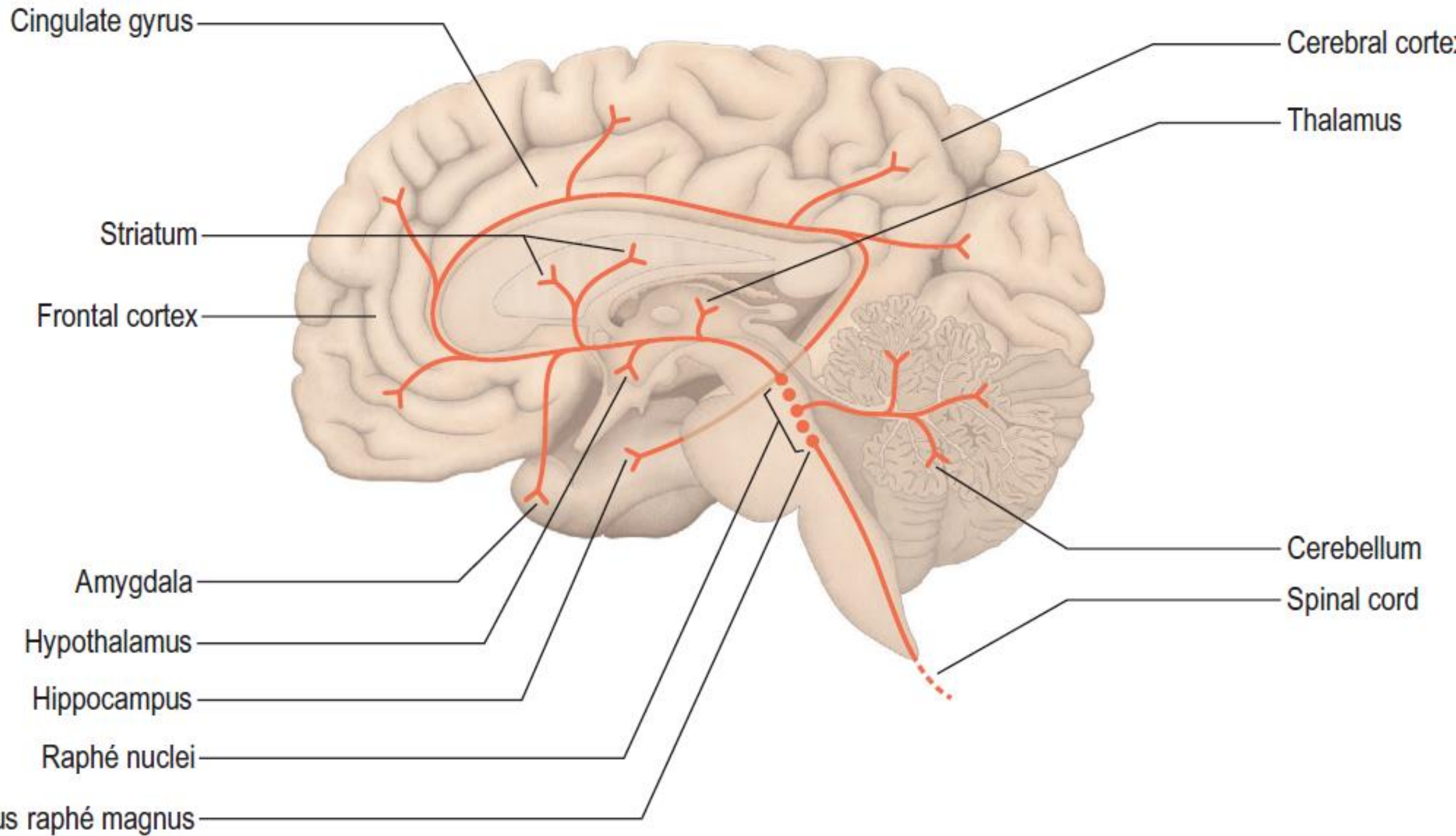


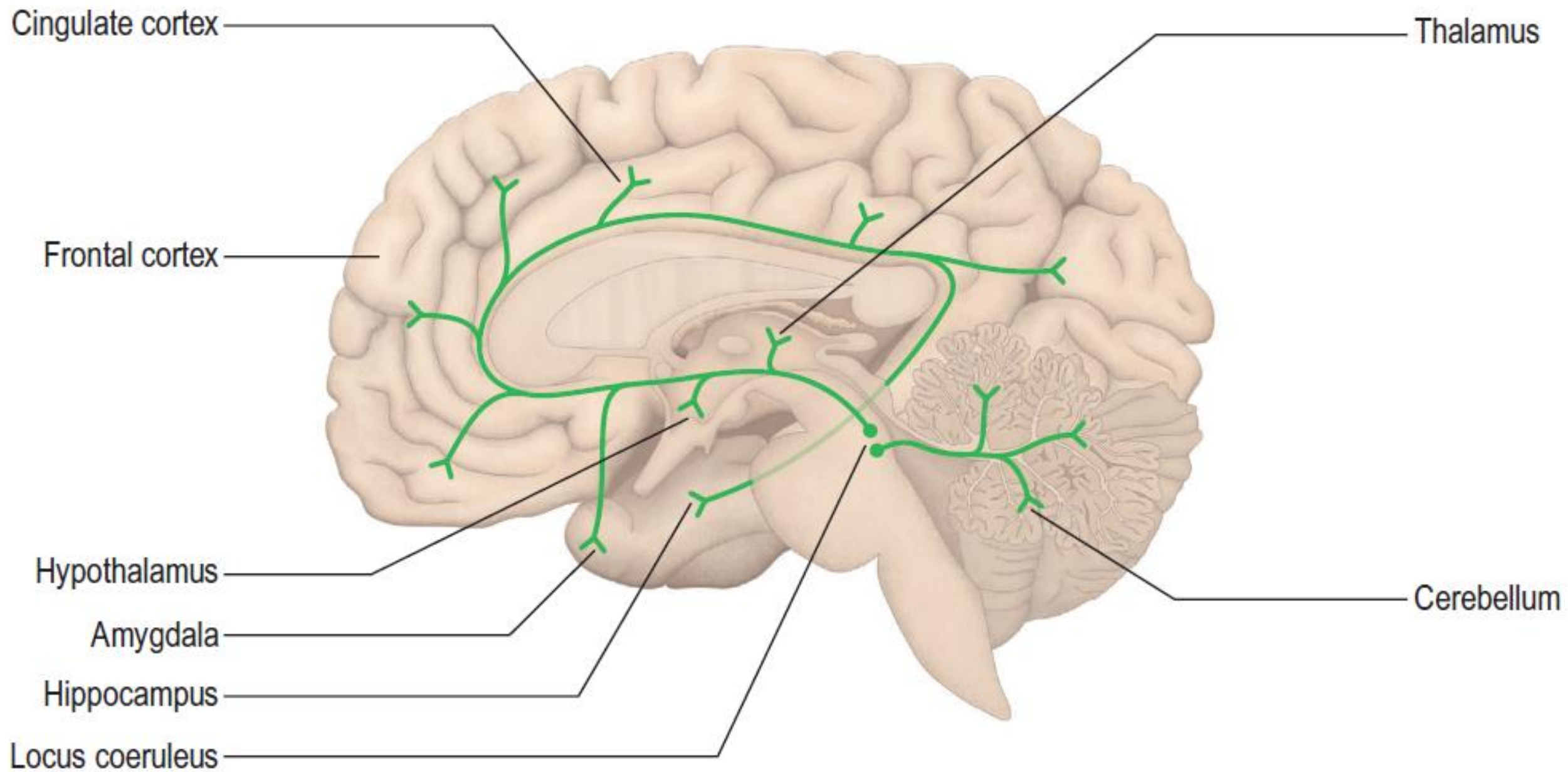
FIGURE 14.8 Major Inputs to the Pontomesencephalic Reticular Formation and Related Structures



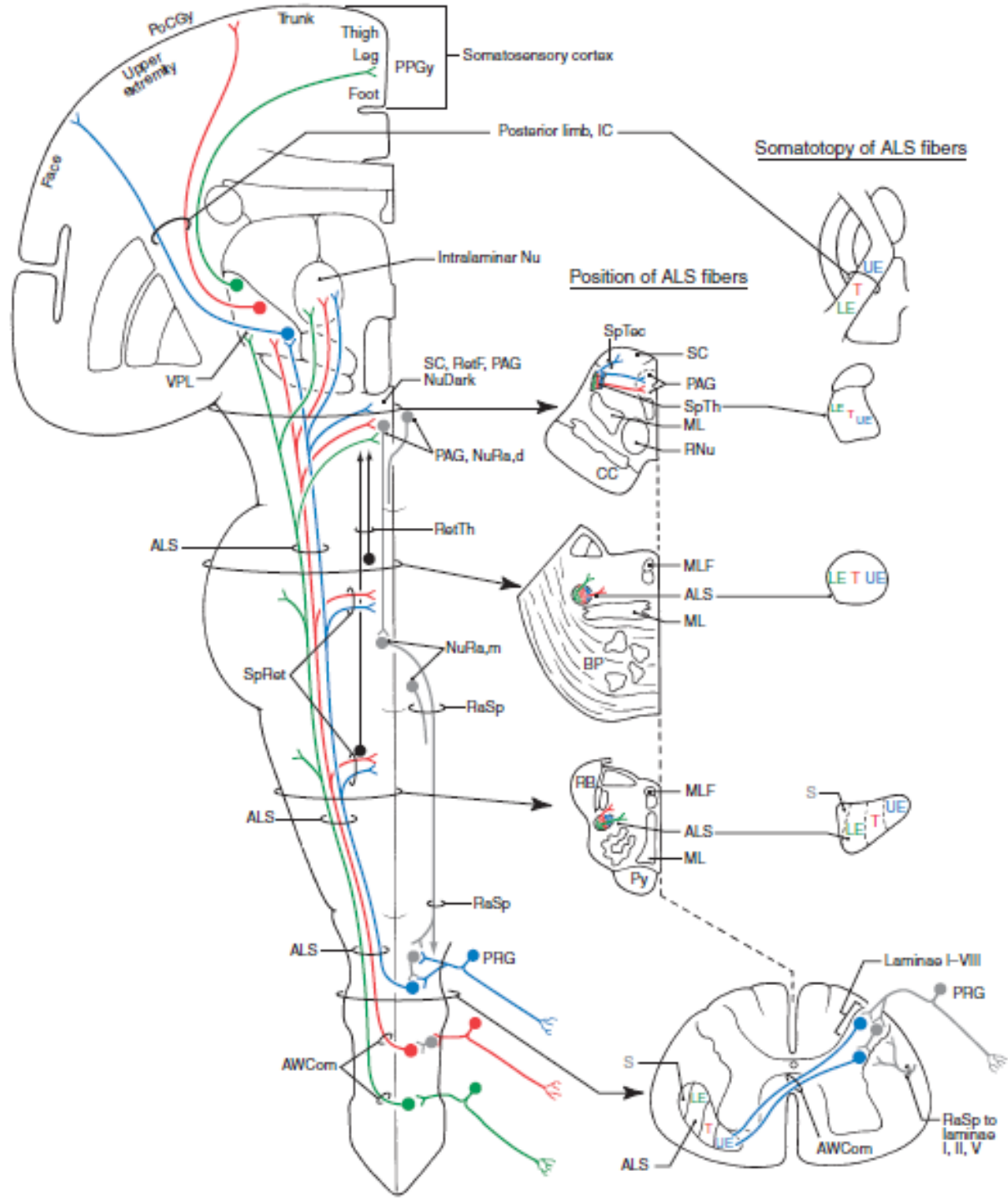




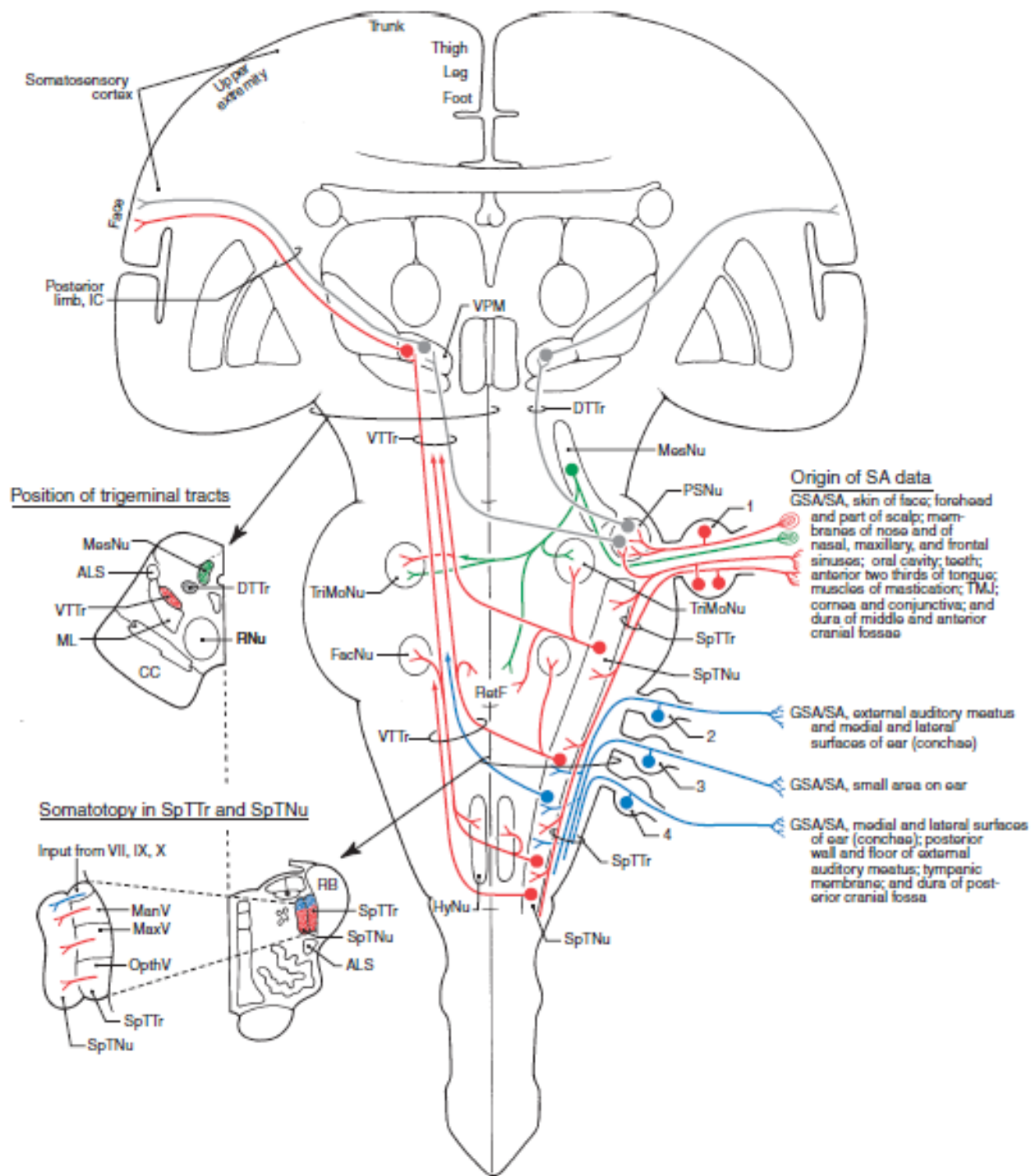




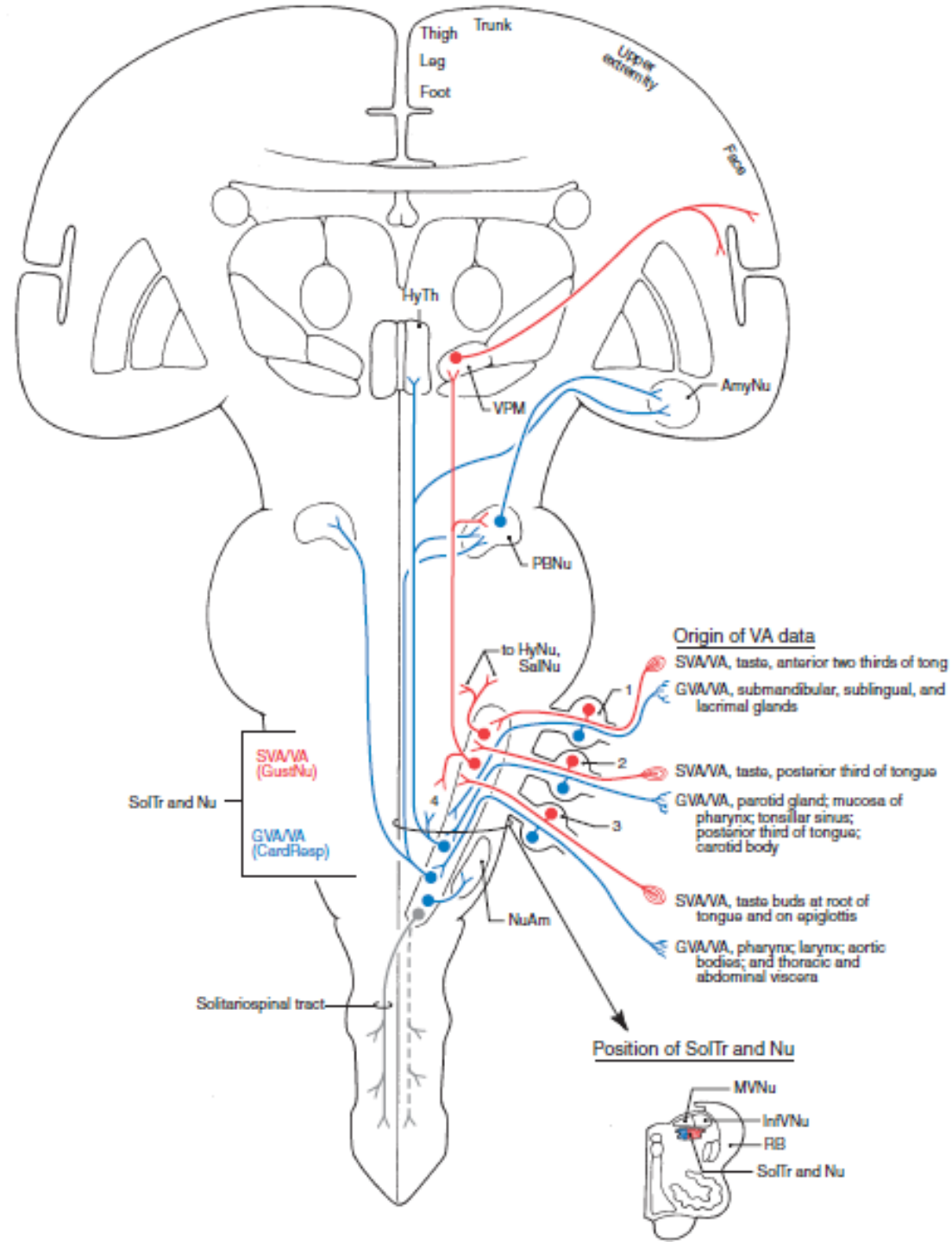
Espinothalámico



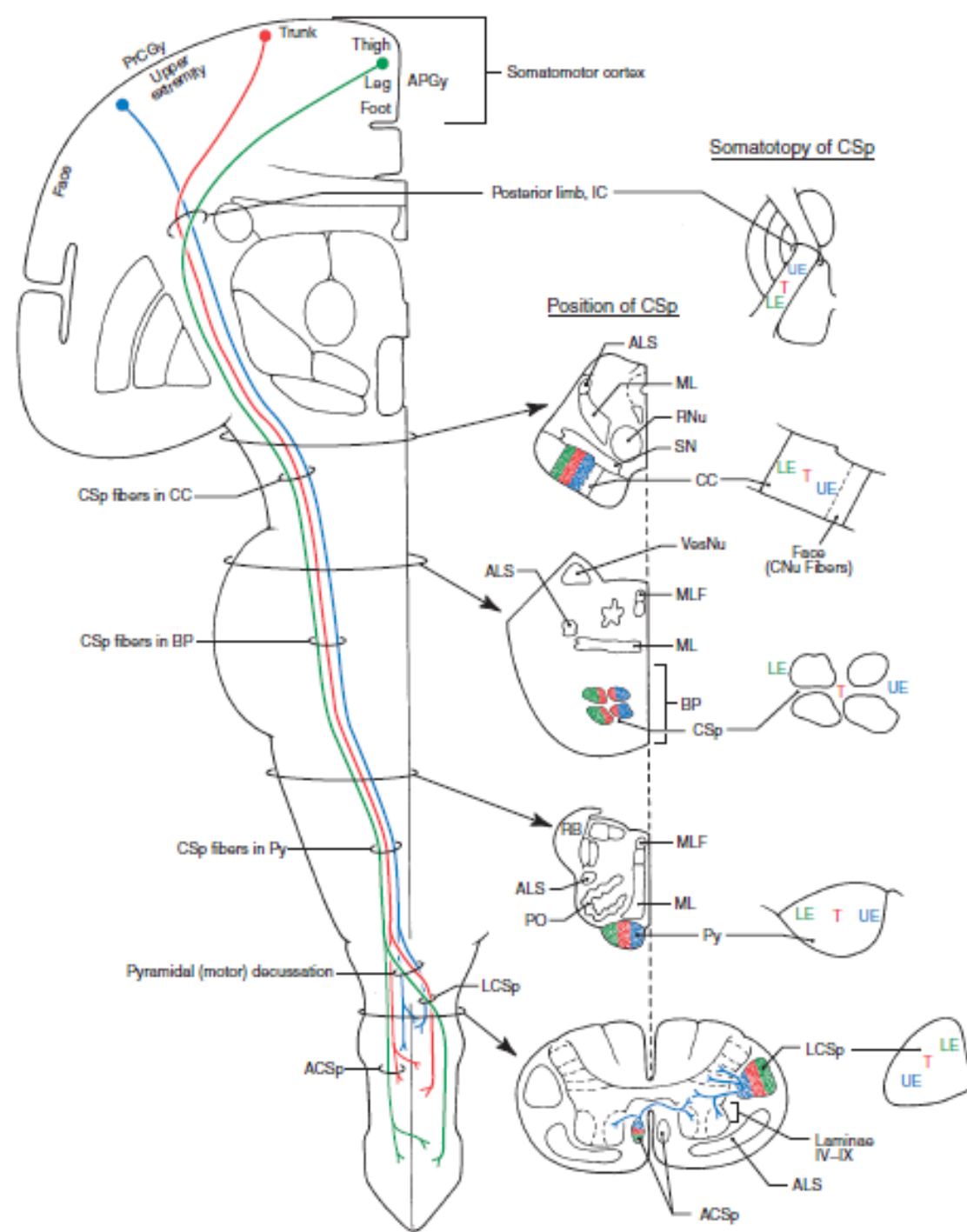
Vía Trigeminal



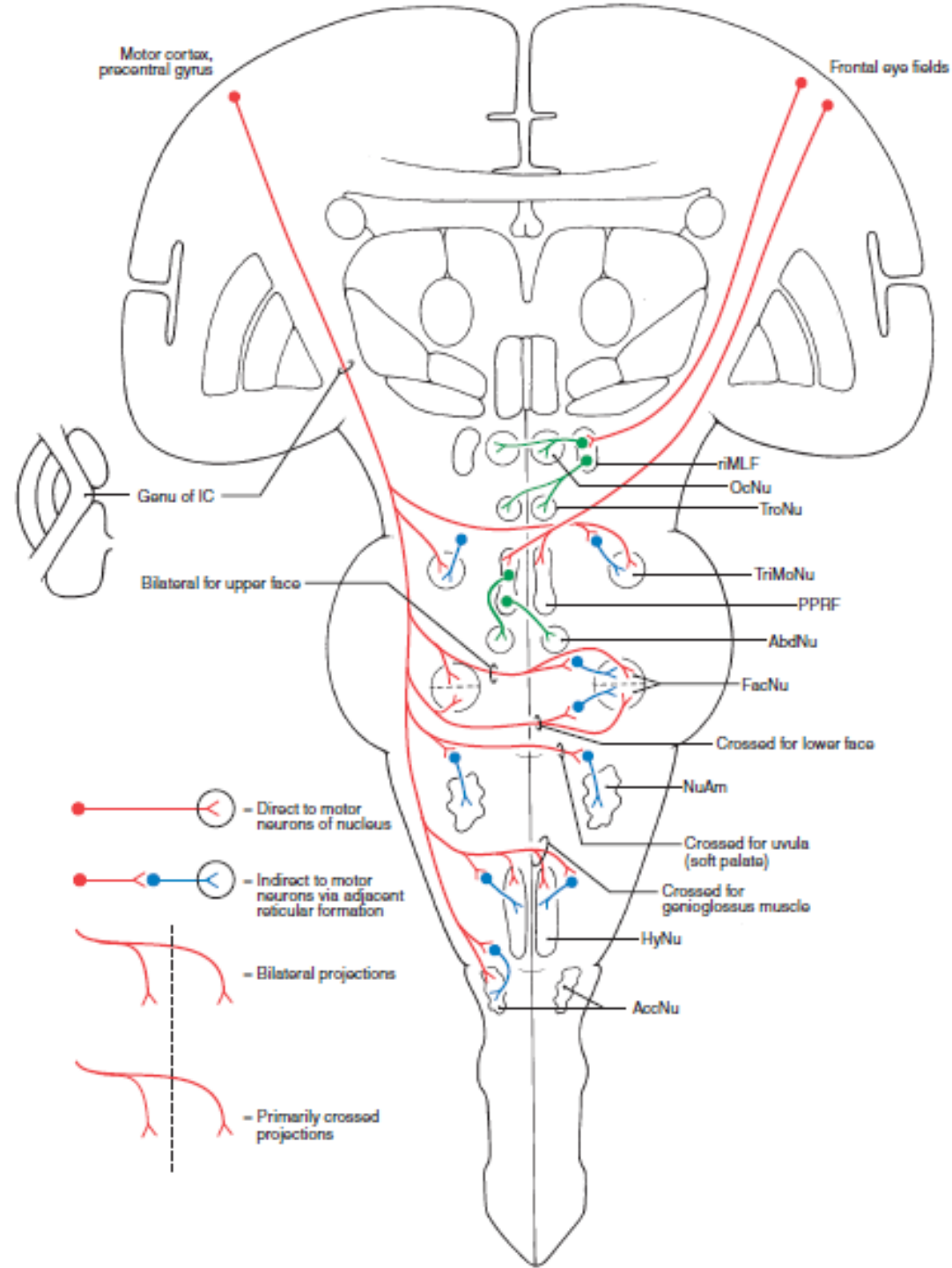
Tracto Solitario



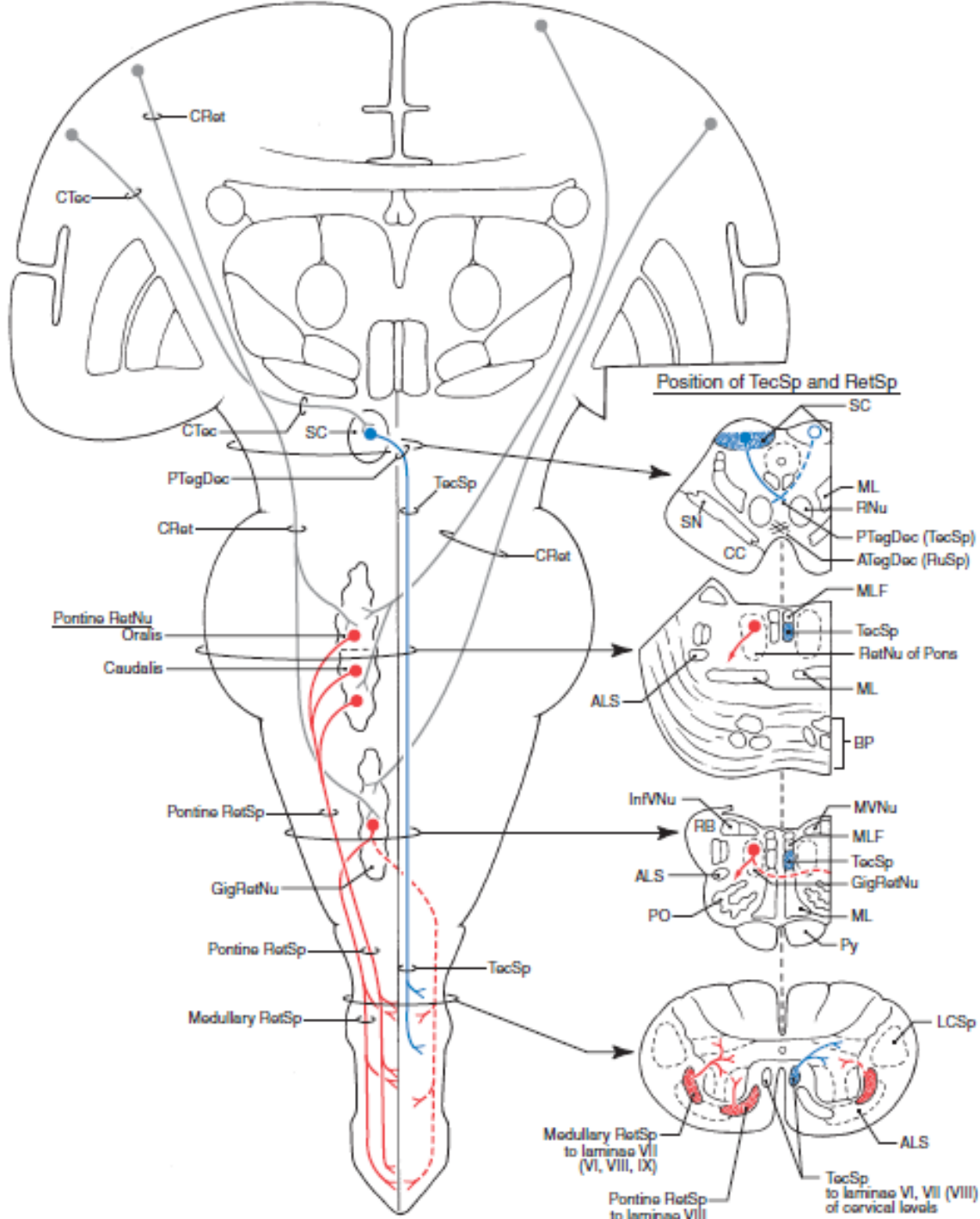
Corticospinal



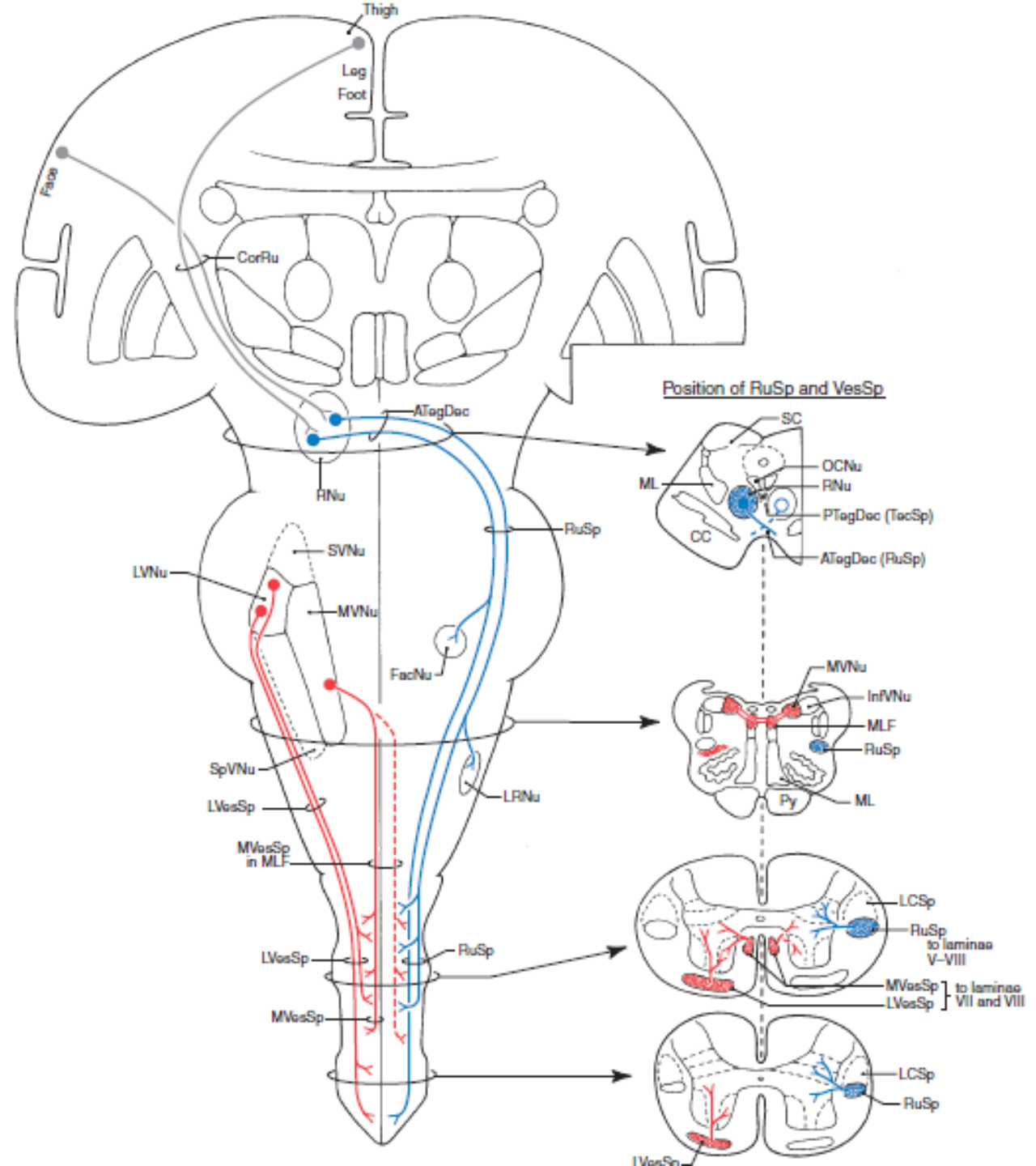
Corticonuclear



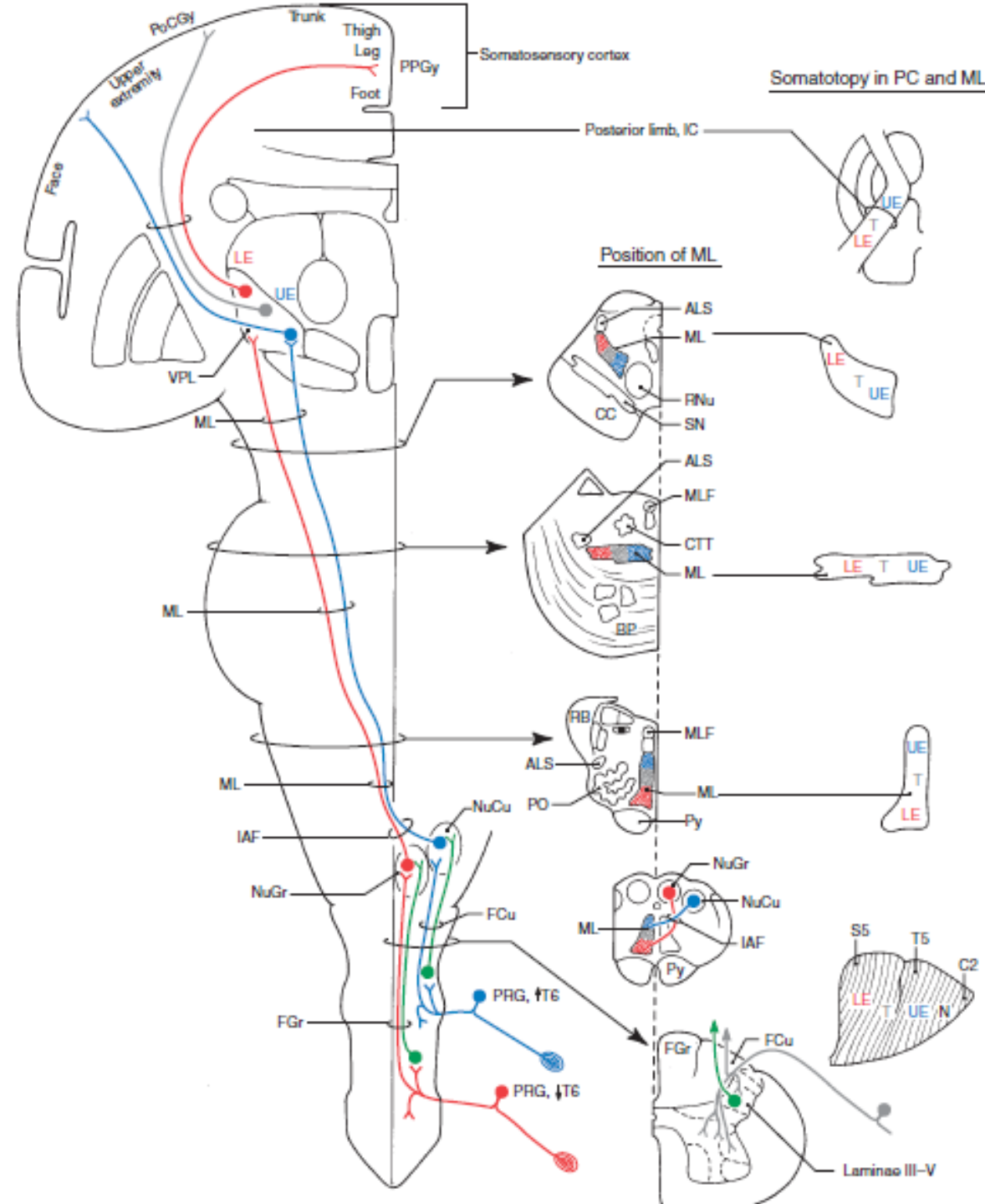
Tectoespinal/Reticuloespinal



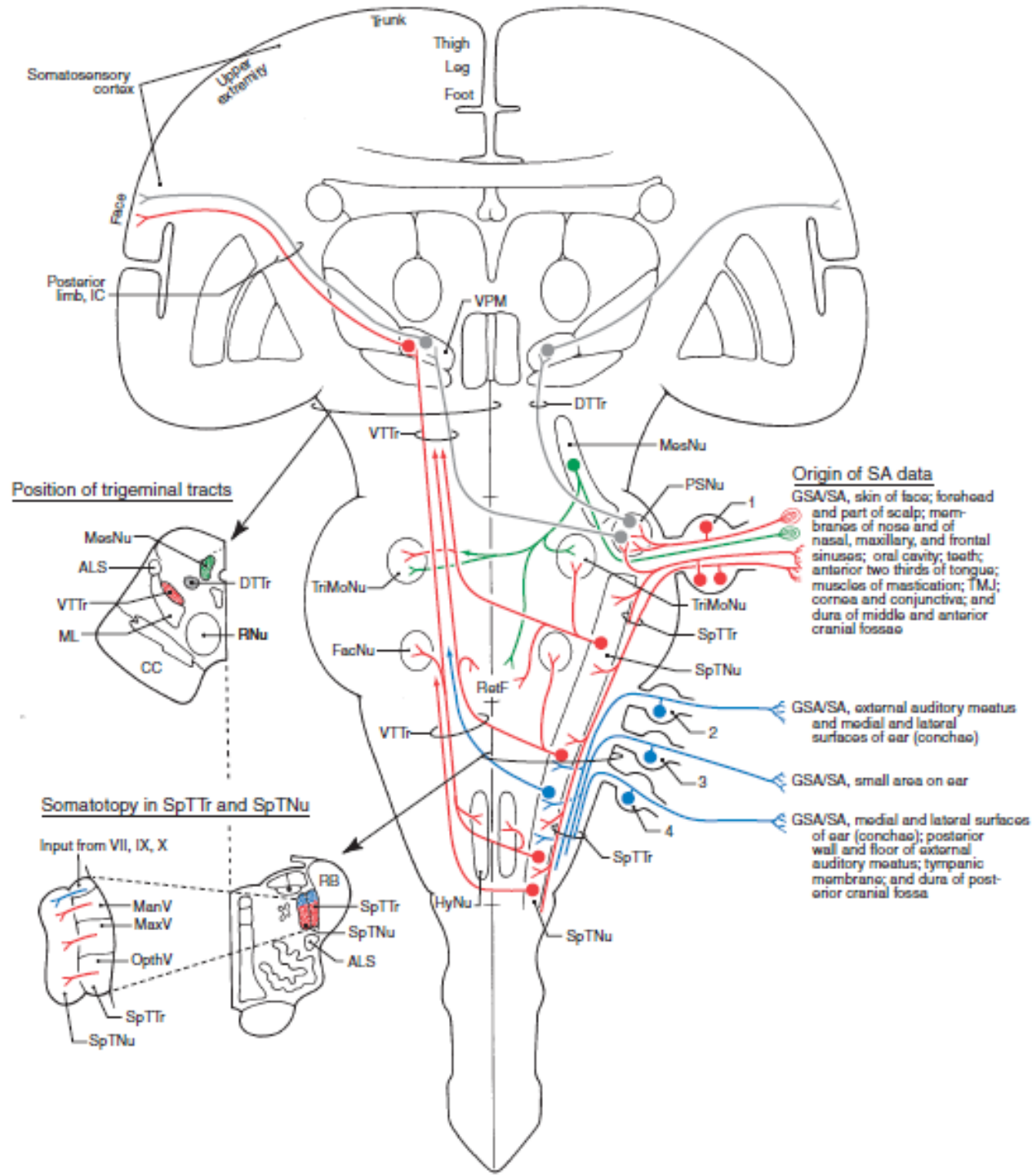
Rubrospinal/Vestibuloespinal



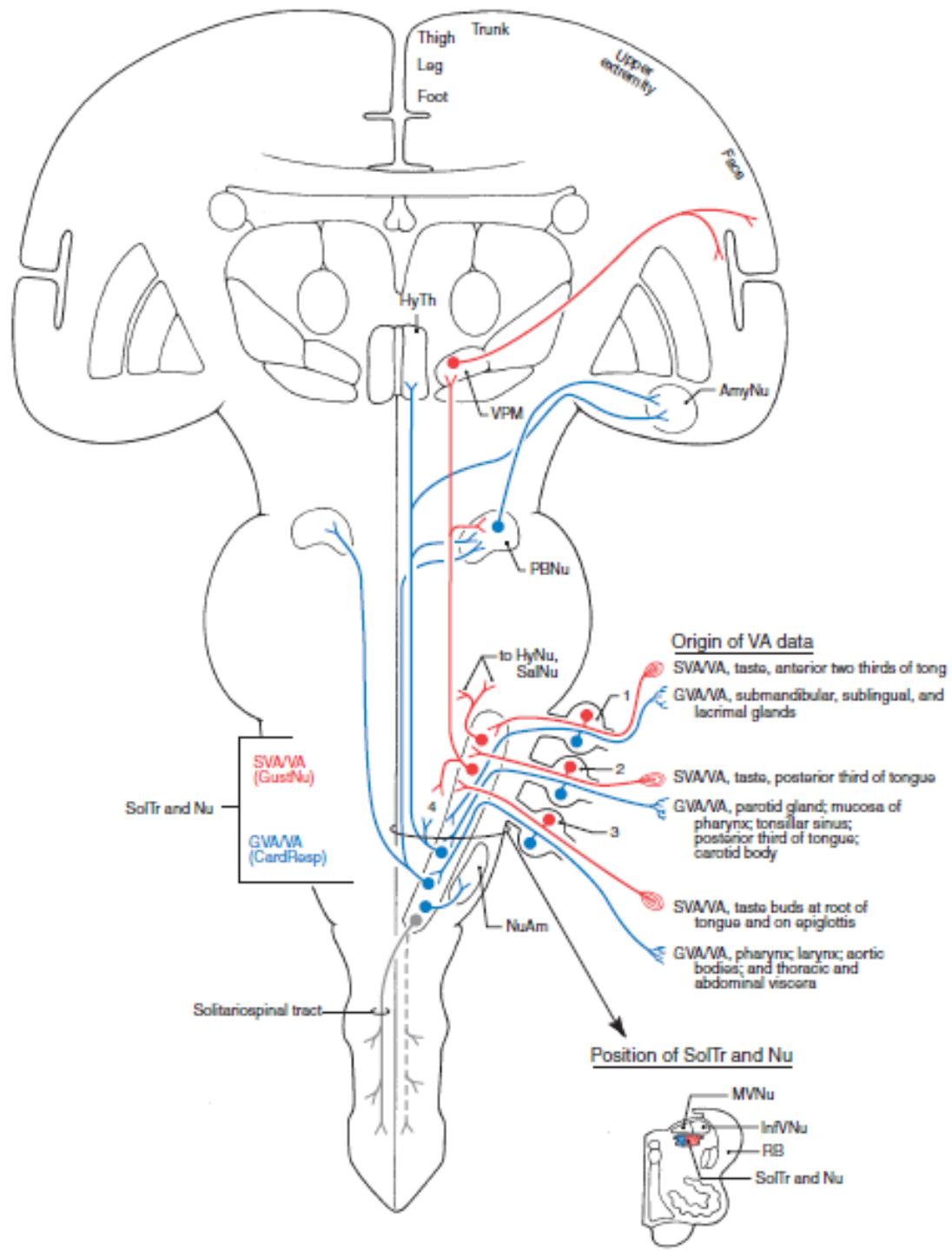
Lemnisco Medial



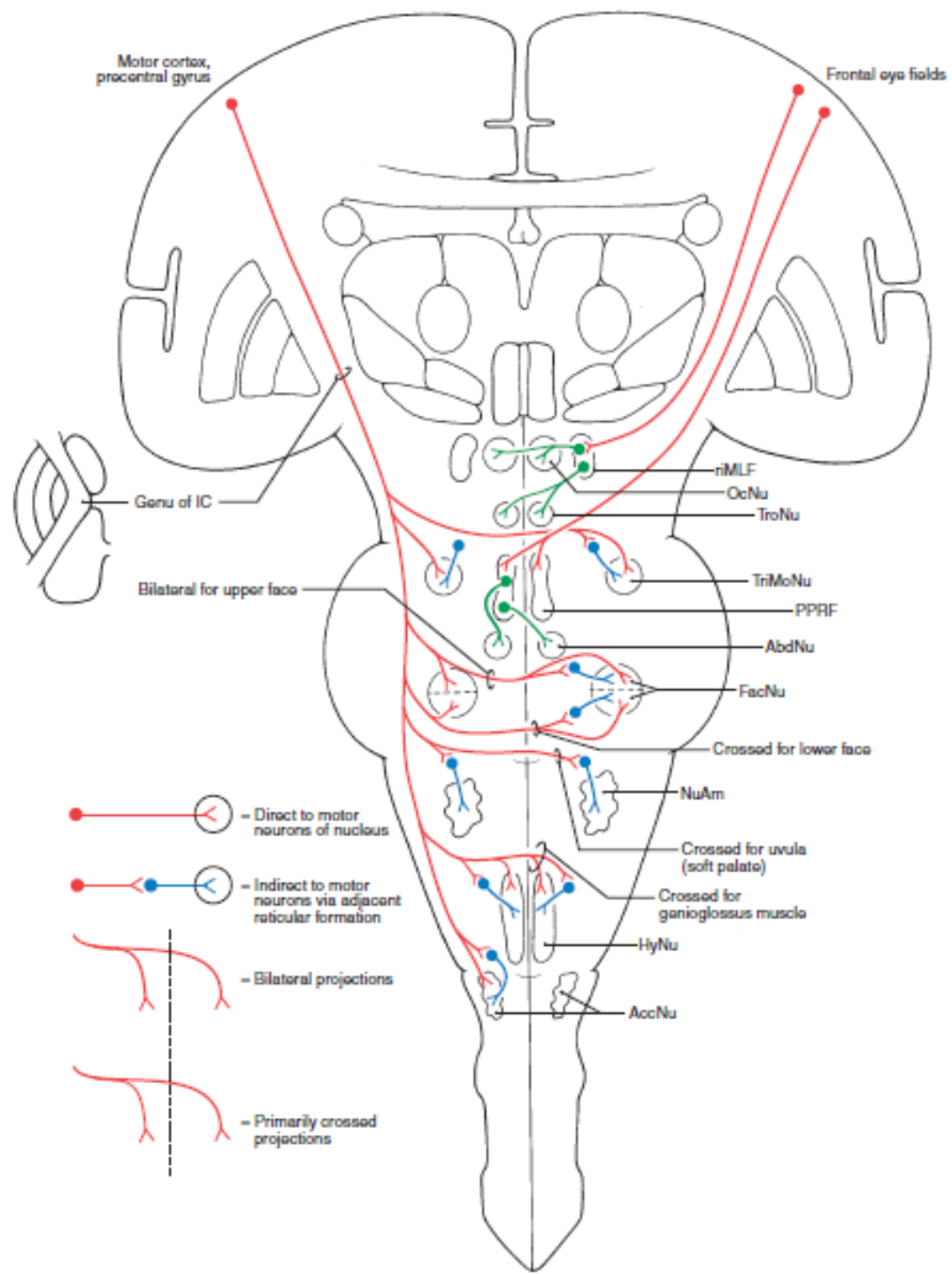
Vía Trigeminal



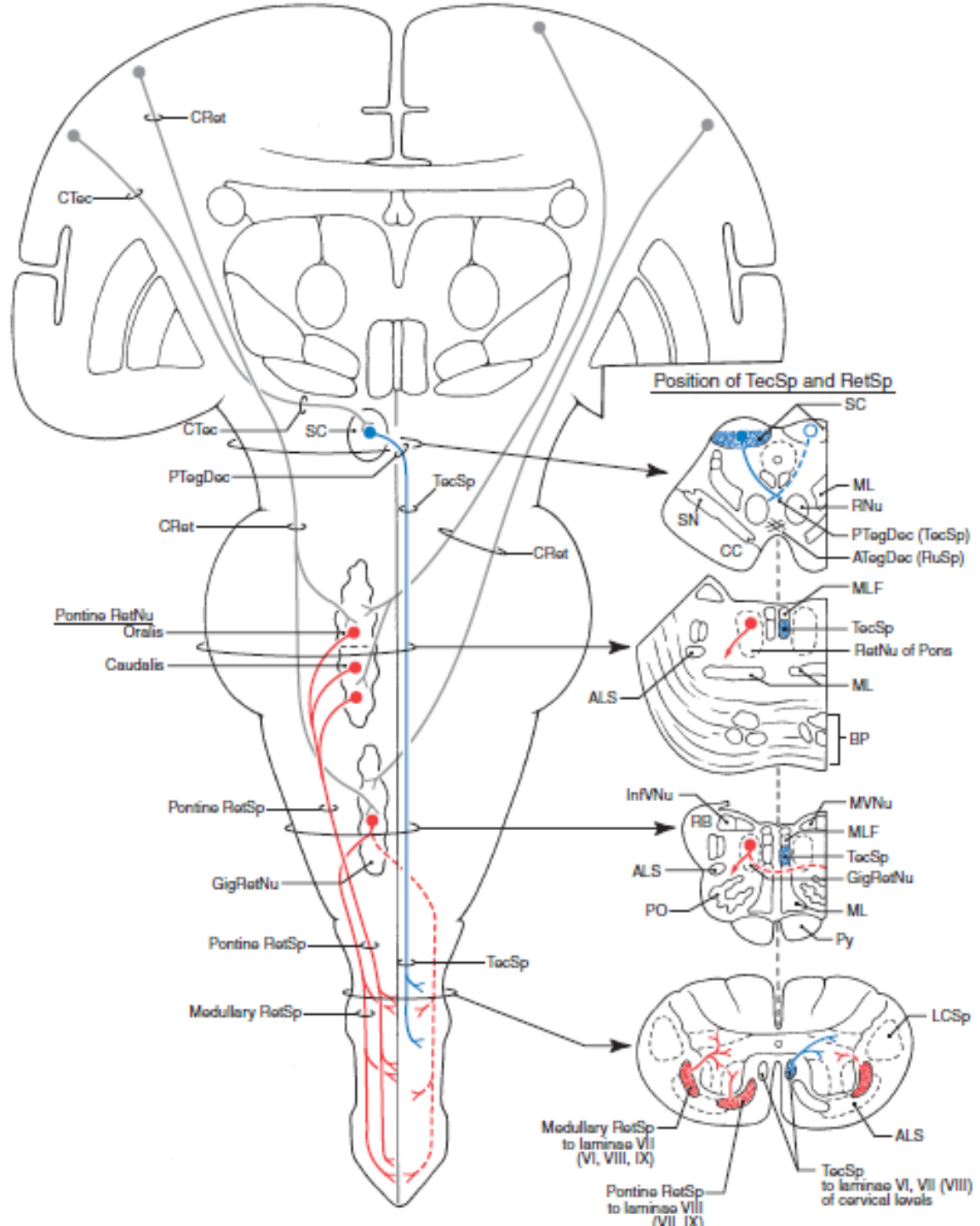
Tracto Solitario



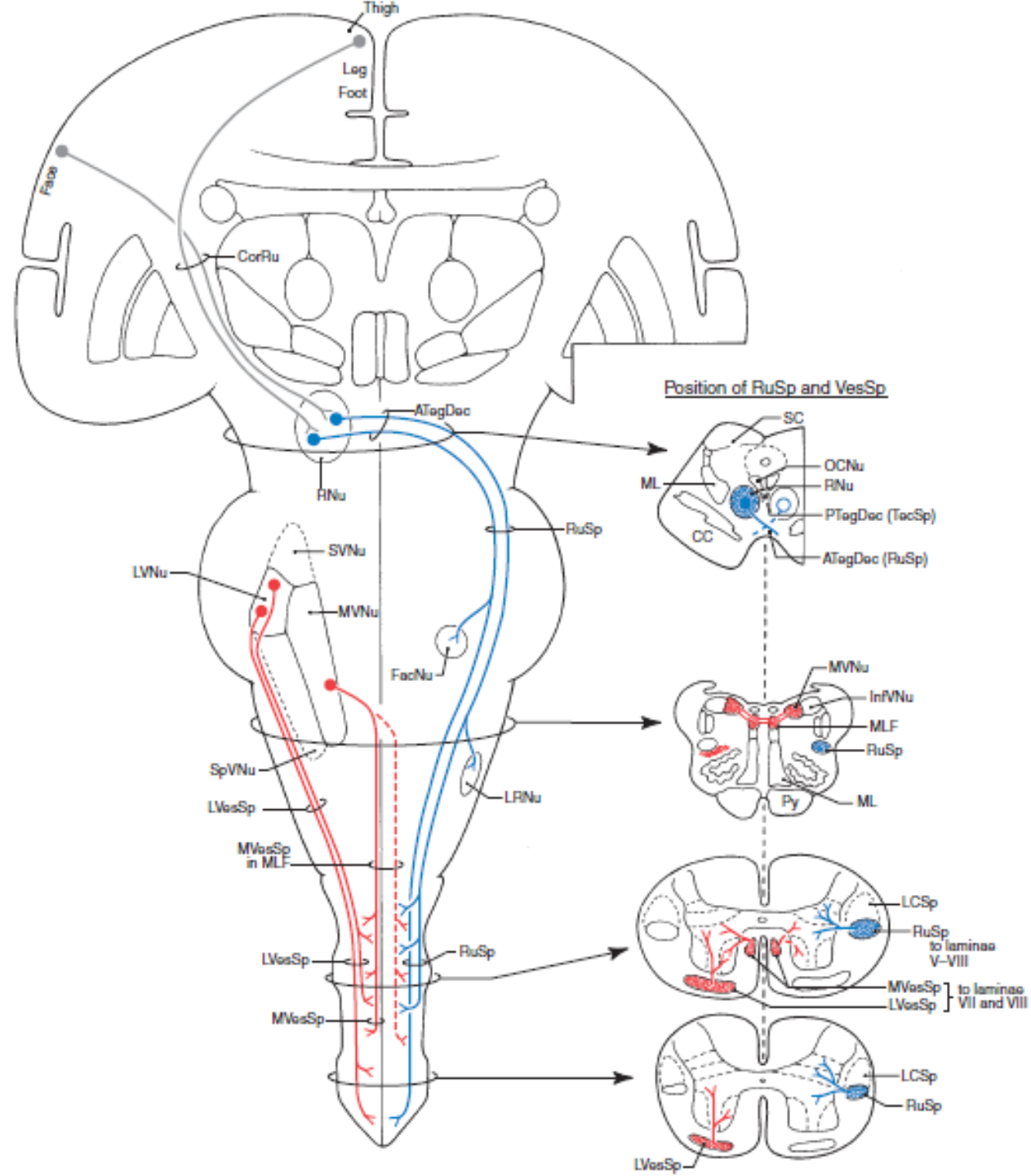
Fibras Cortico-Nucleares



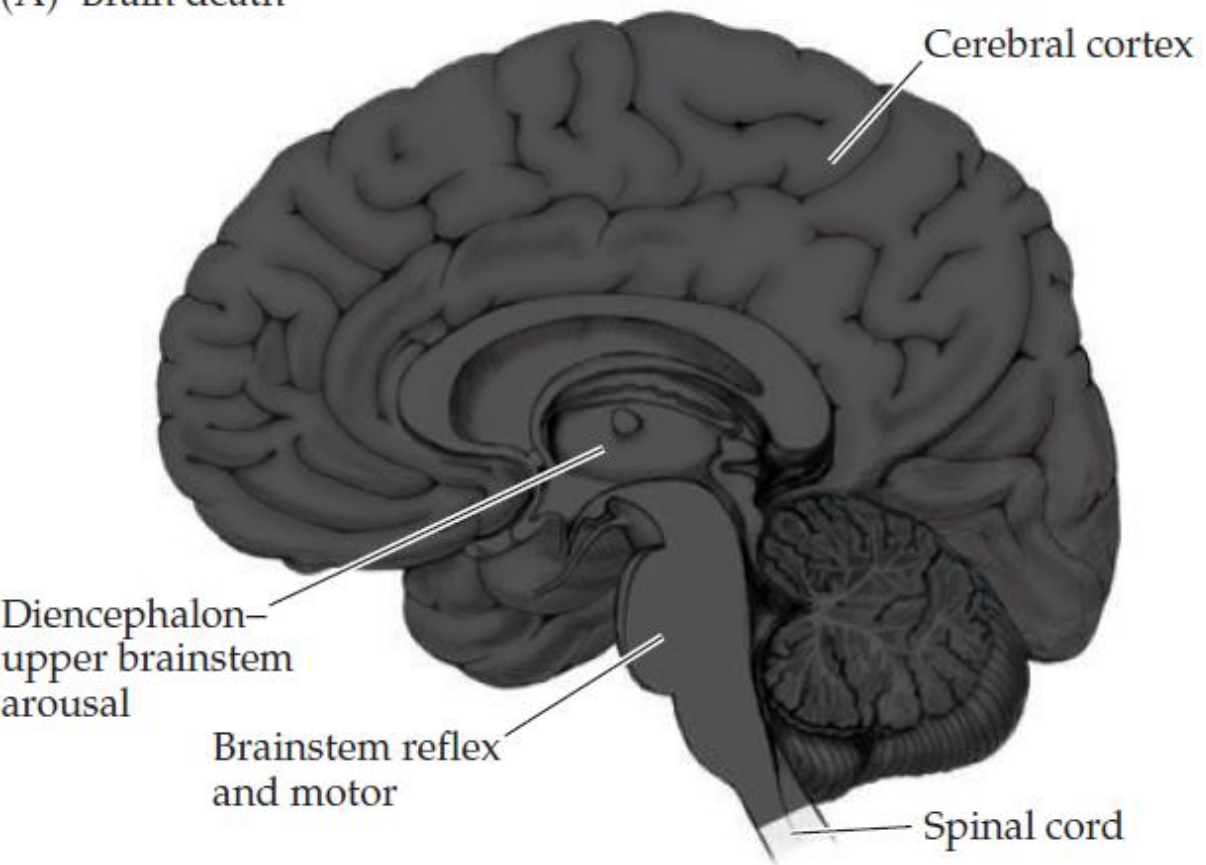
Tectoespinal/Reticuloespinal



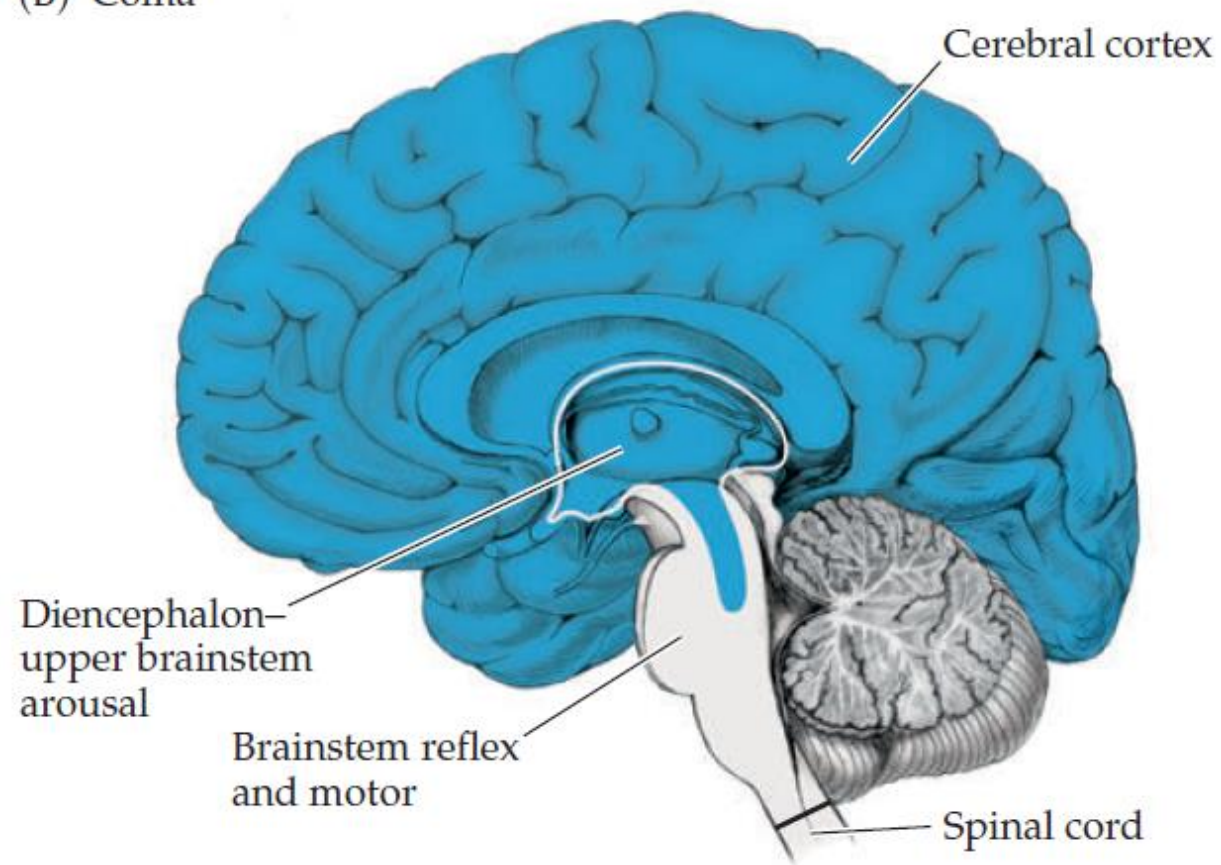
Rubroespinal/Vestibuloespinal



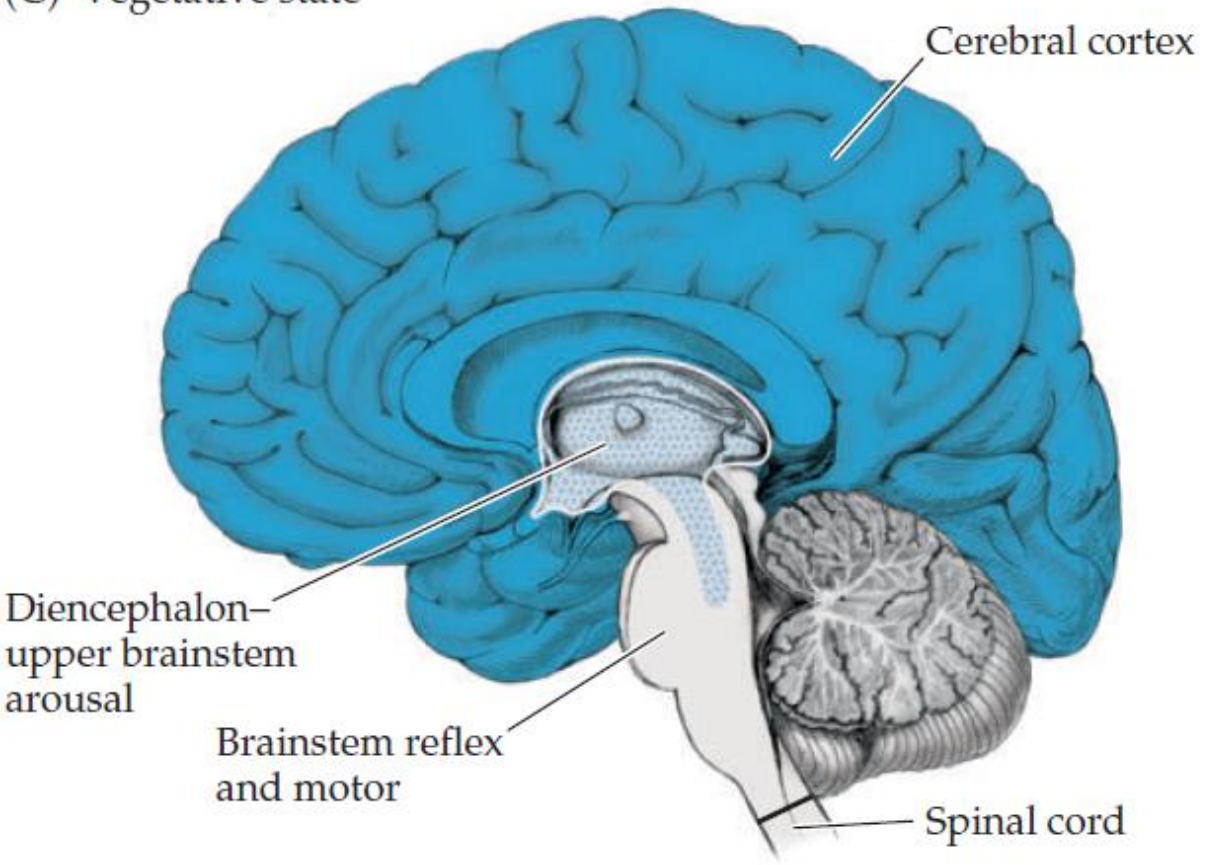
(A) Brain death



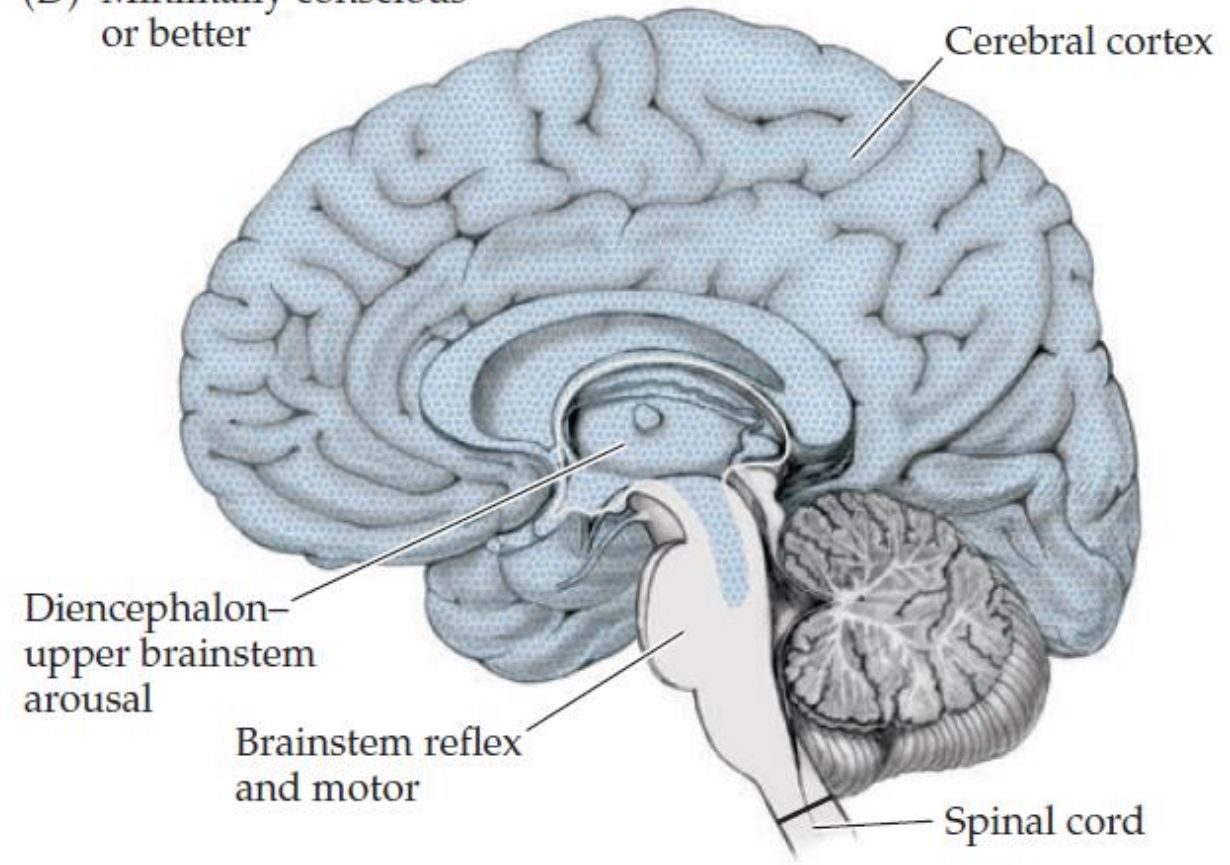
(B) Coma



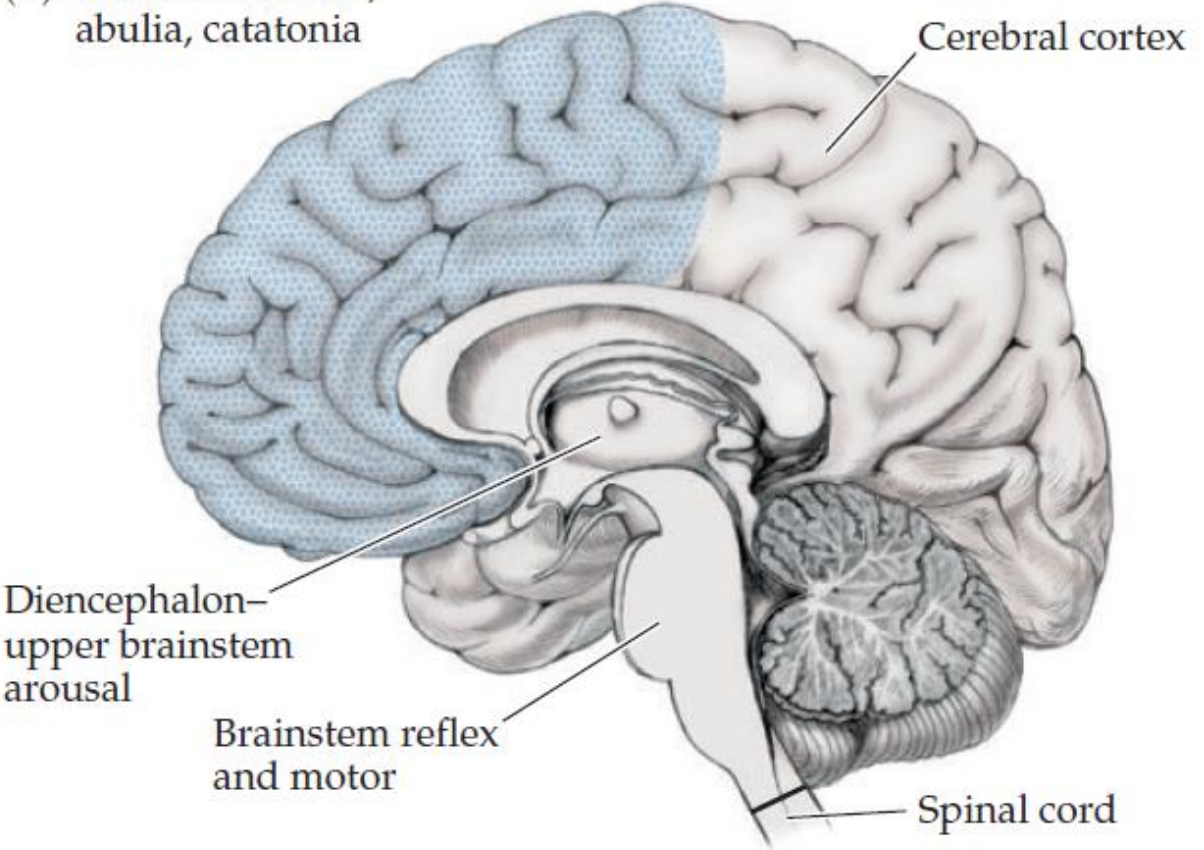
(C) Vegetative state



(D) Minimally conscious or better



(E) Akinetic mutism, abulia, catatonia



(F) Locked in

