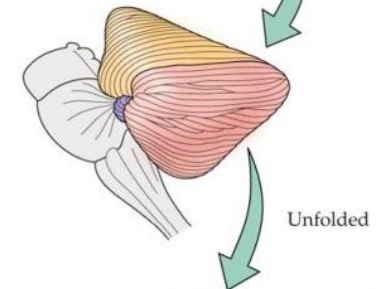


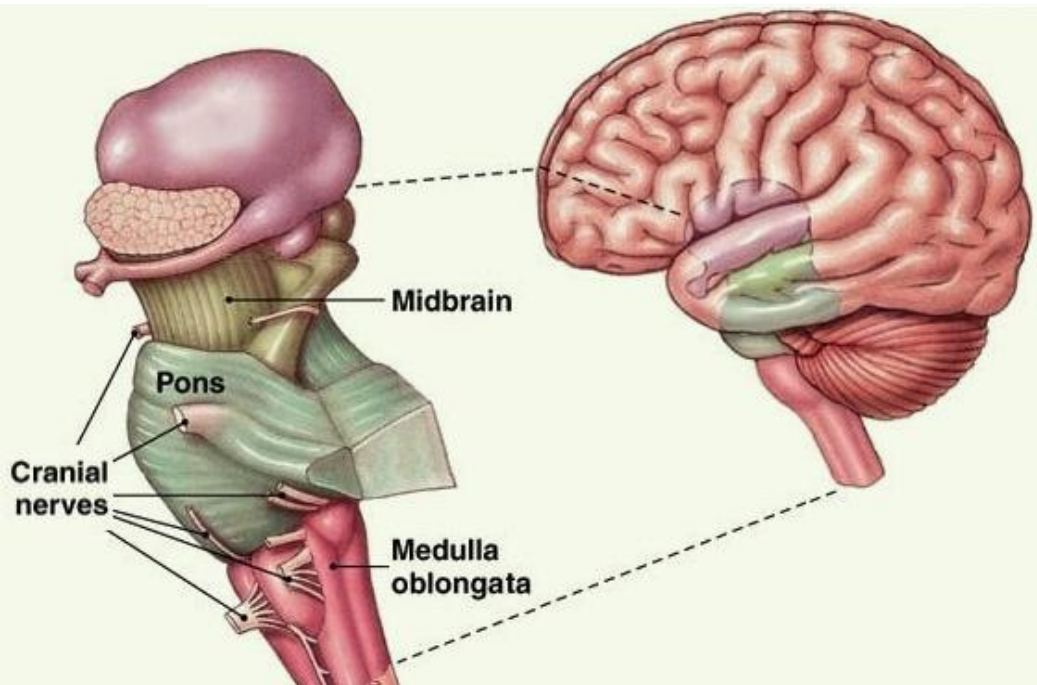
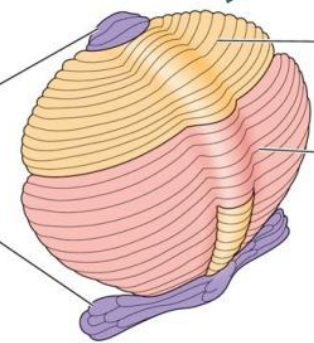
Brain Stem, Cerebellum, Spinal Cords & Tracts



Vestibulocerebellum:
Balance, postural adjustments, coordination of eye movements

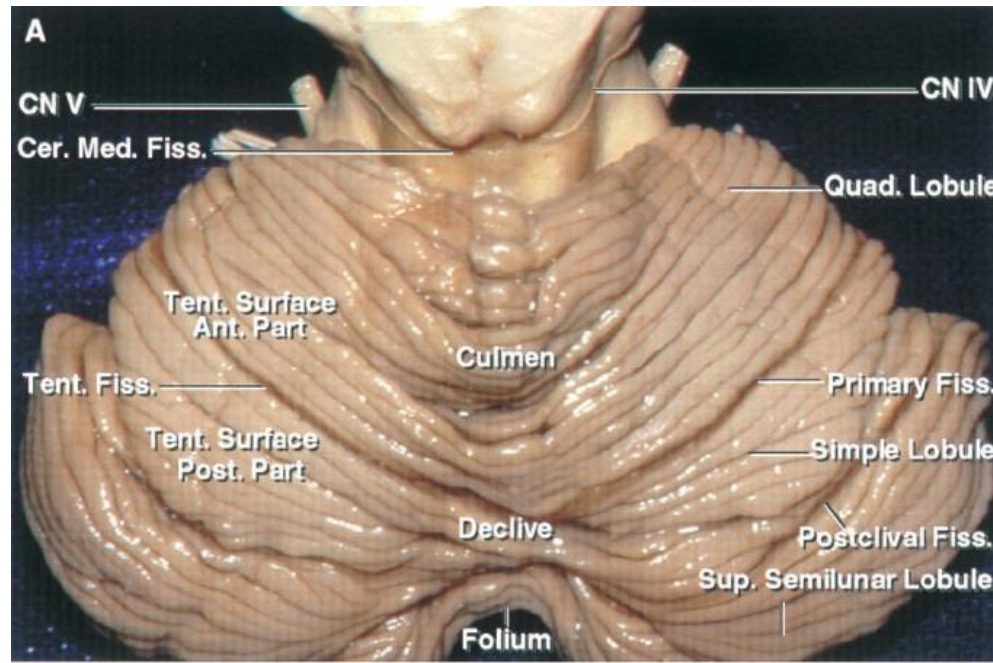
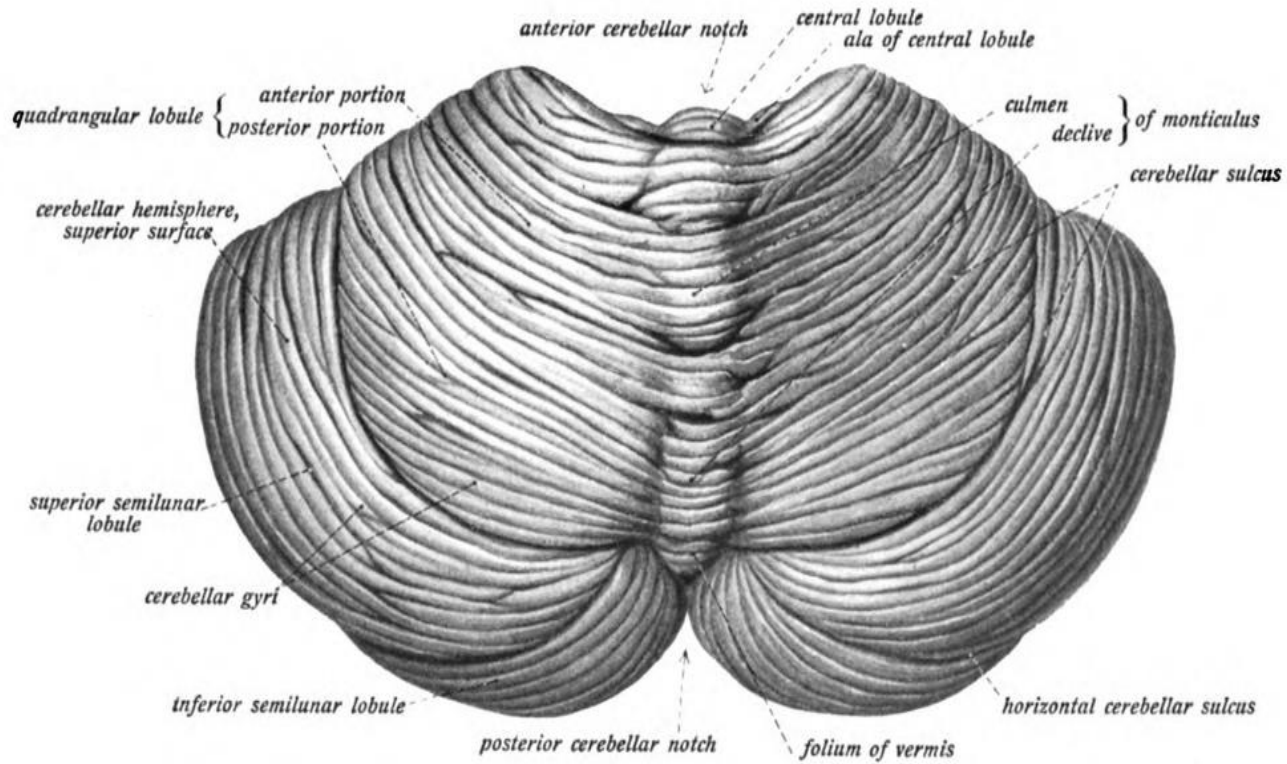
Spinocerebellum:
Control of muscle tone and coordination

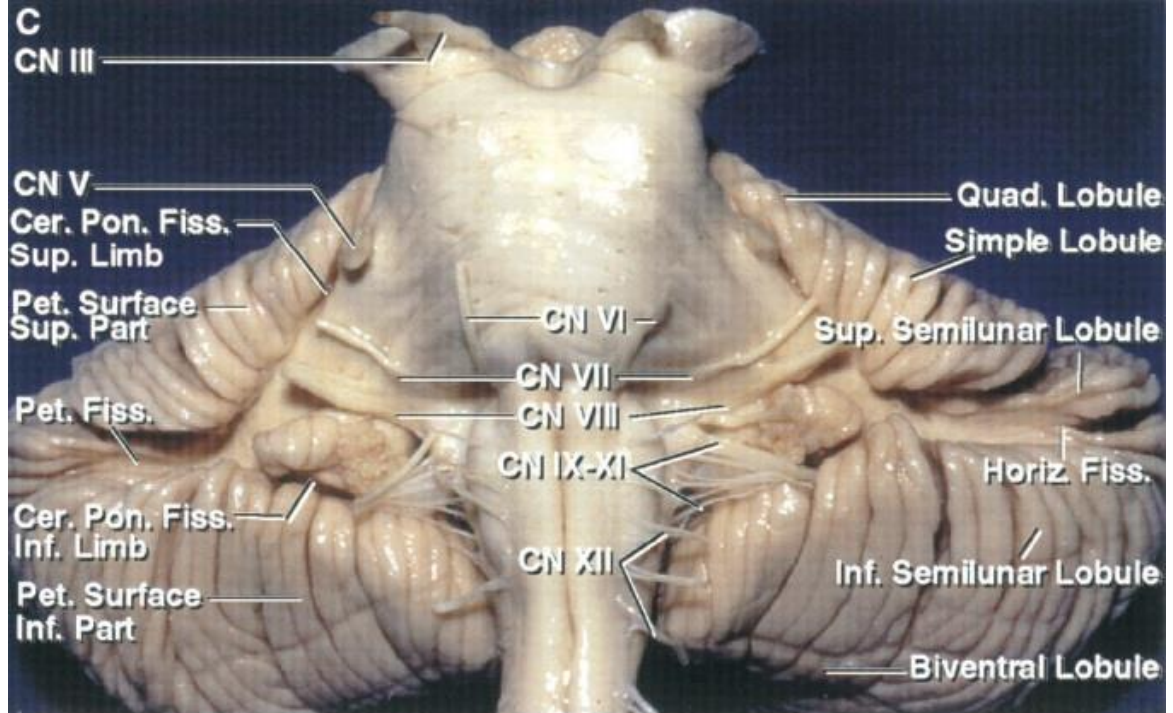
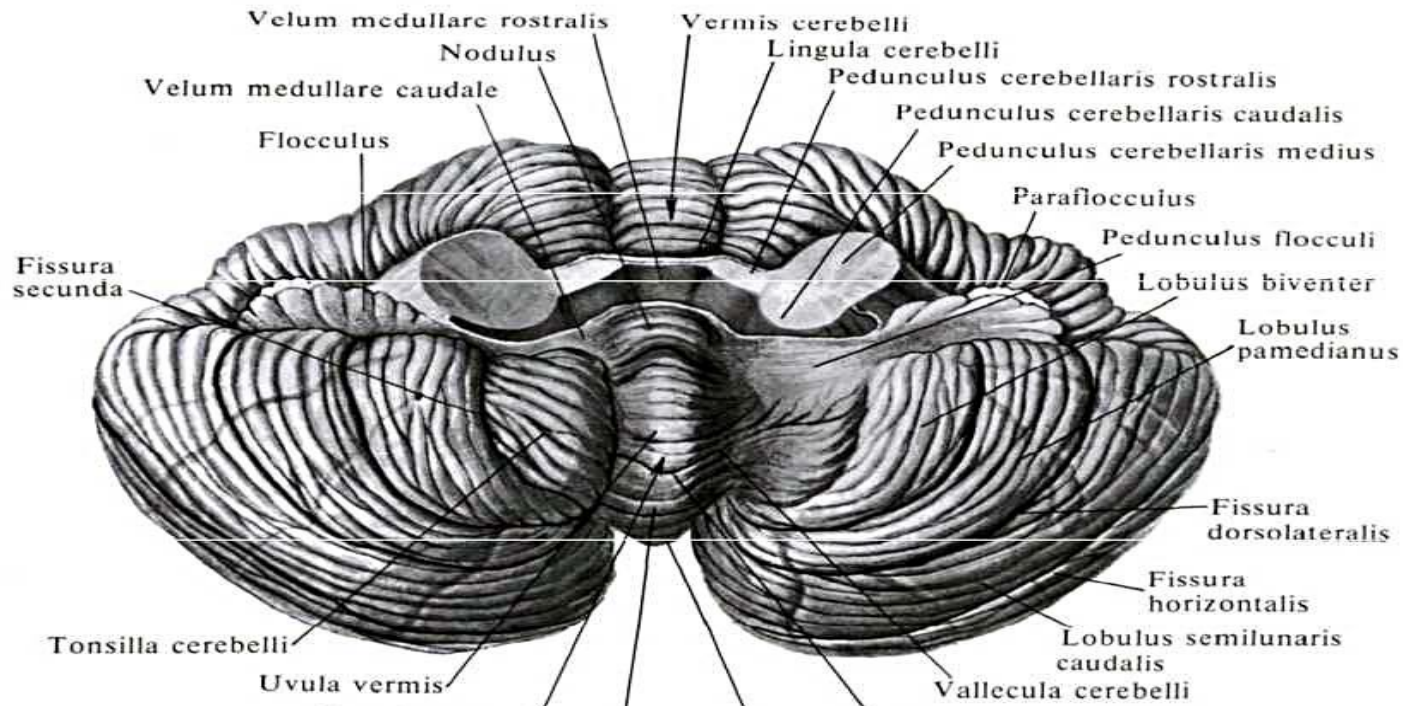
Cerebrocerebellum:
Motor planning, learning and memory

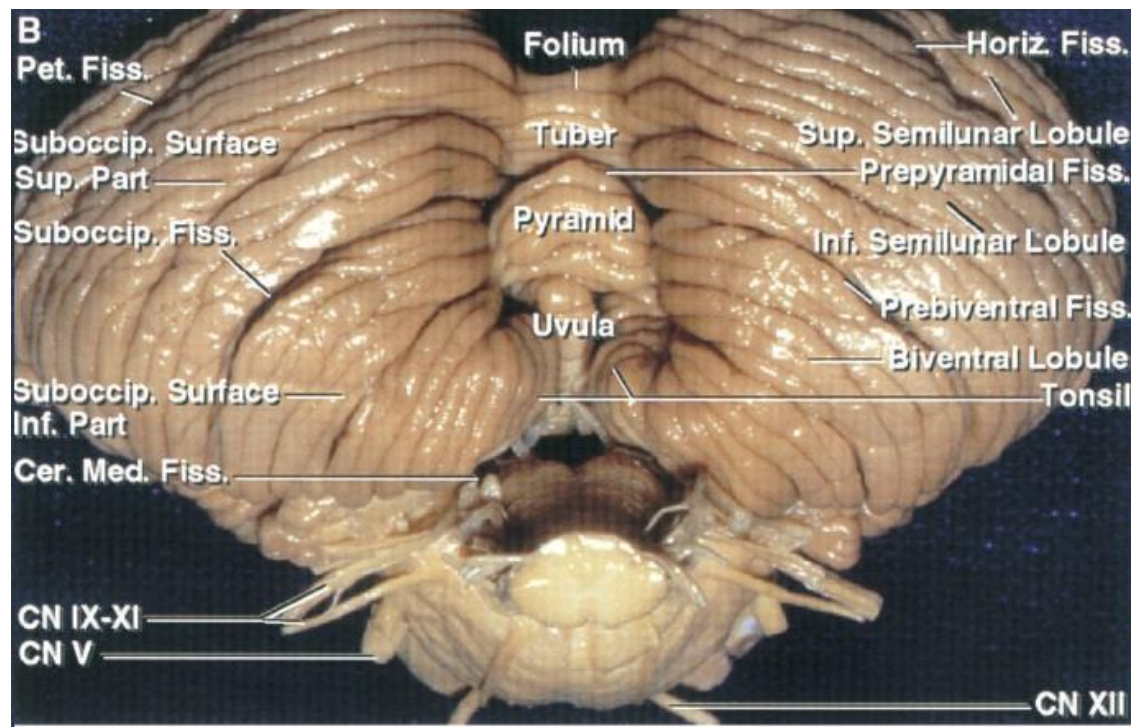
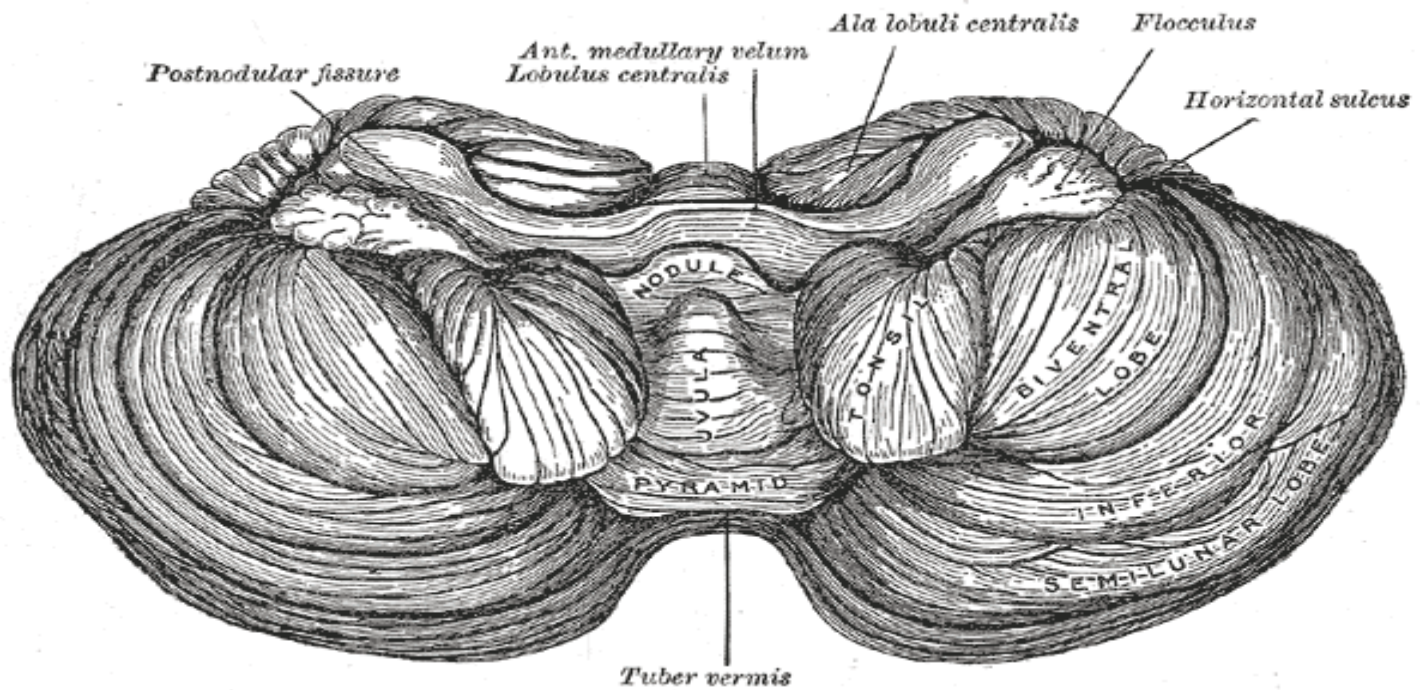


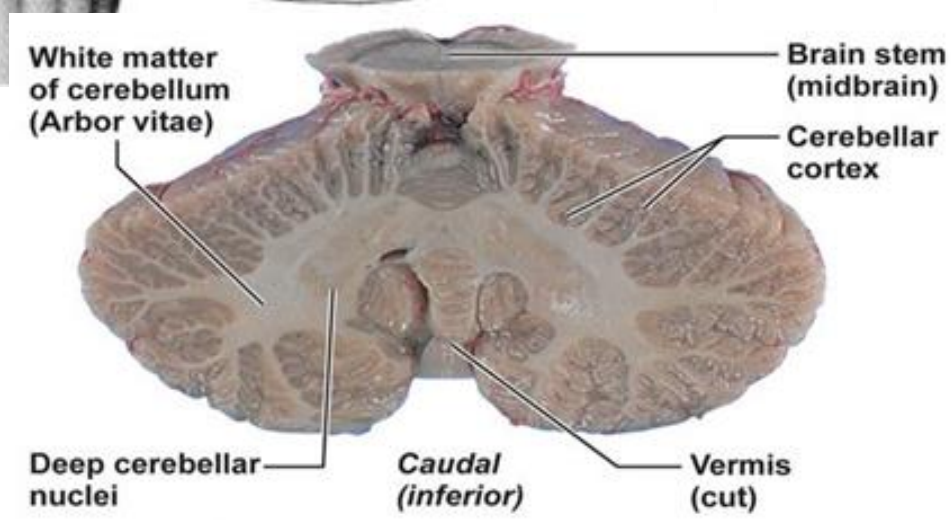
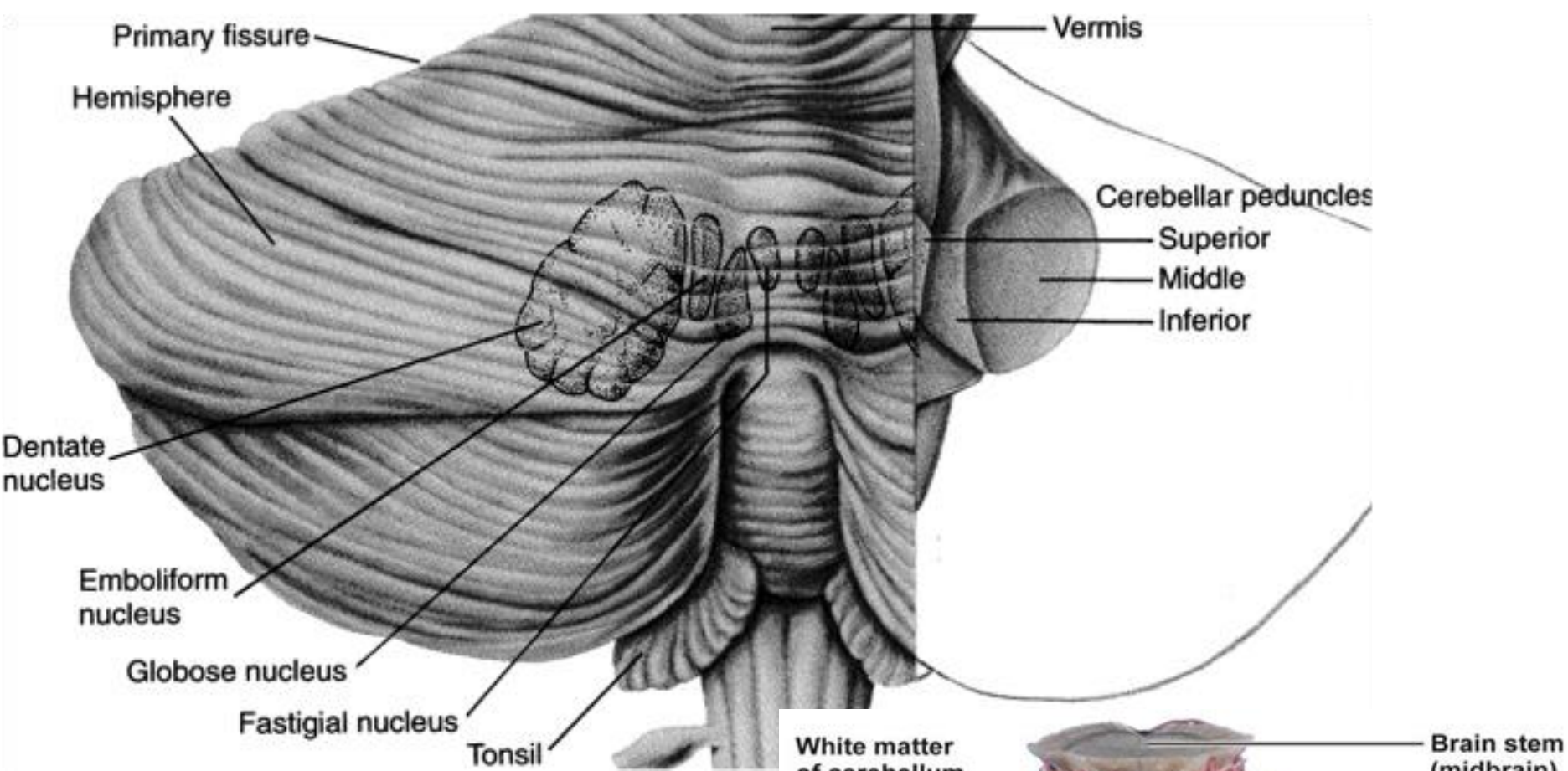
MUDr. Azzat Al-Redouan

Cerebellum

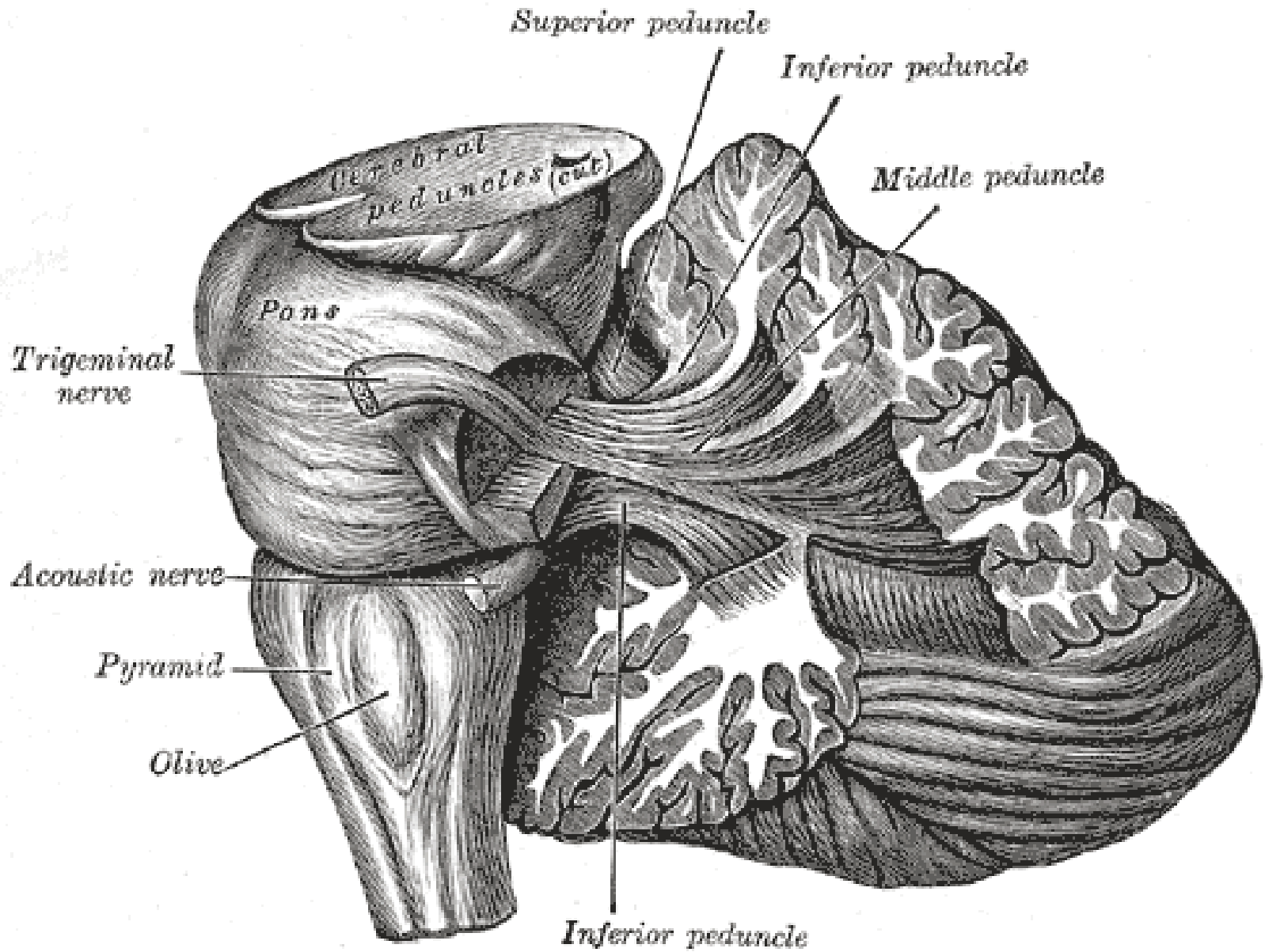








Coronal section, posterior view



Fibres entering and leaving through cerebellar peduncles

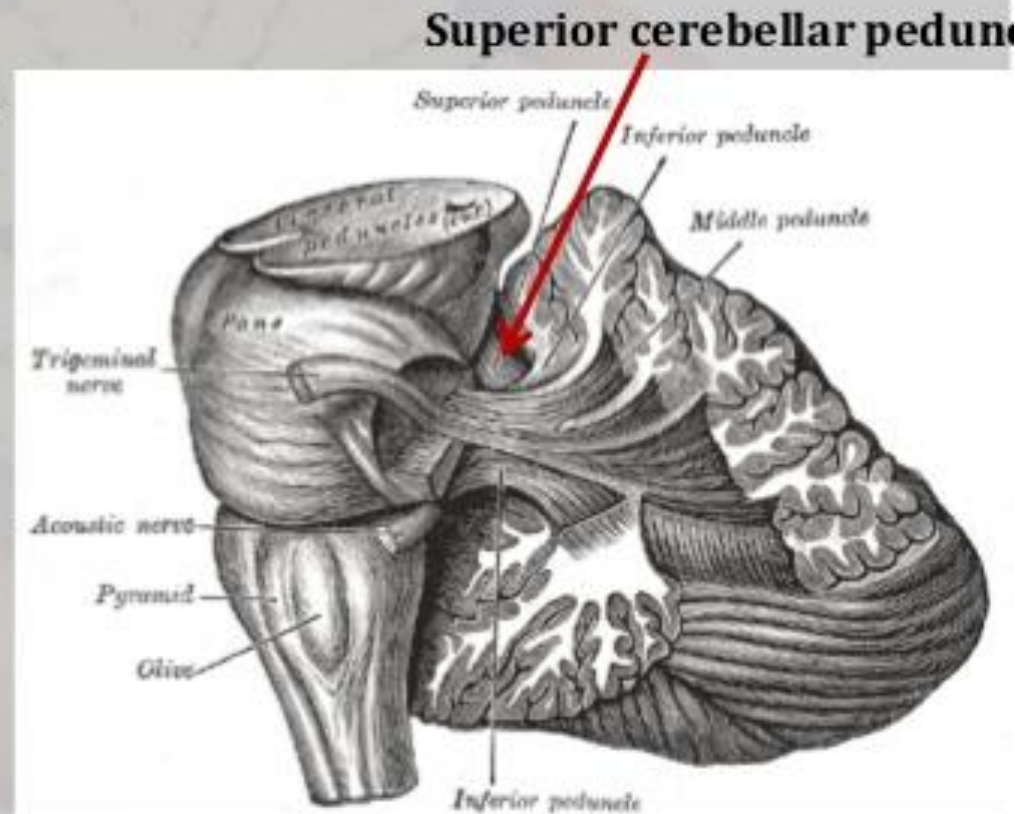
Superior cerebellar peduncle

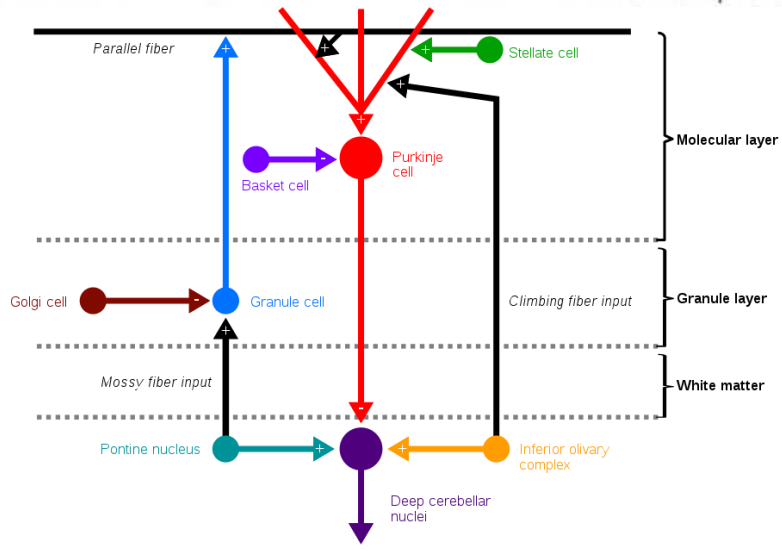
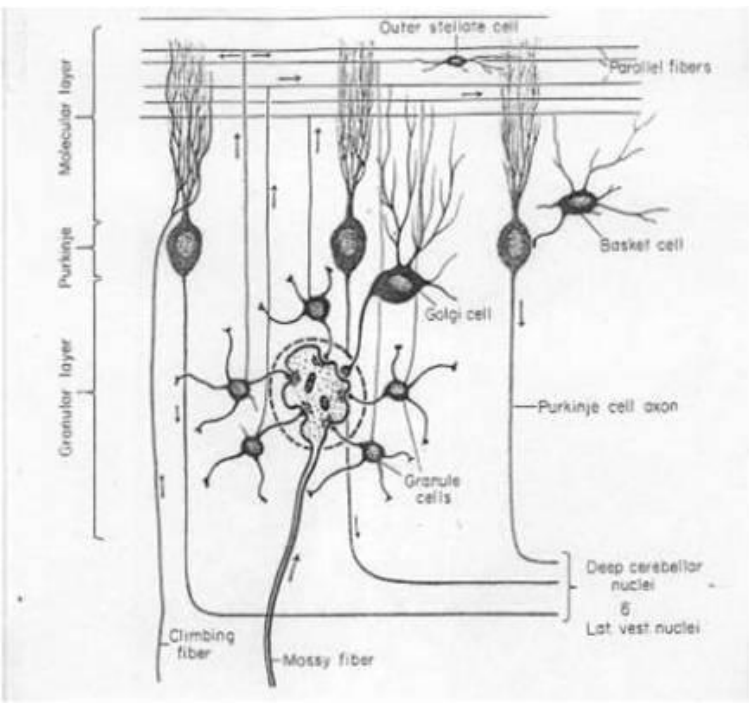
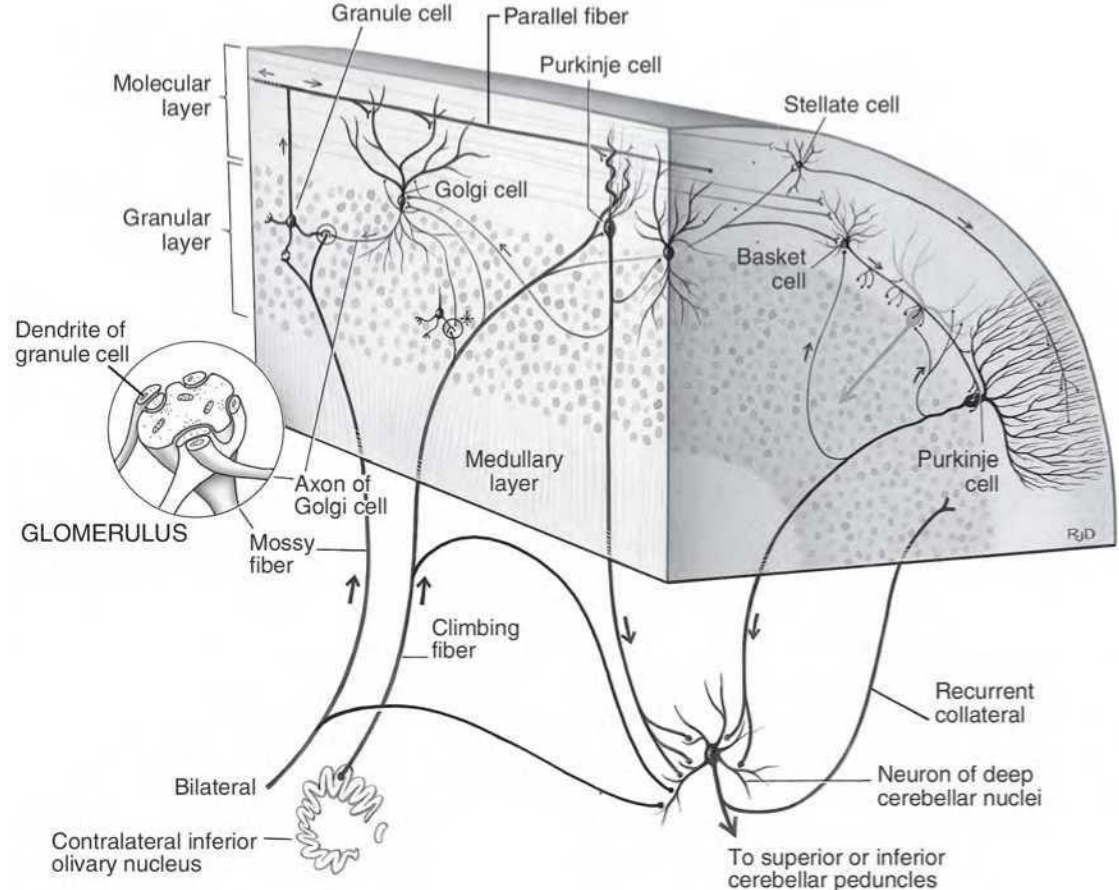
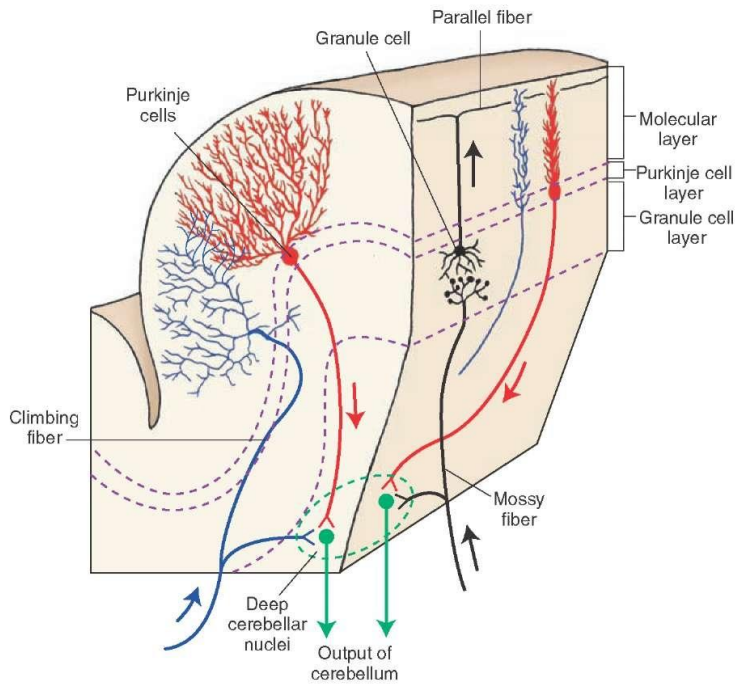
A. Fibres entering the cerebellum

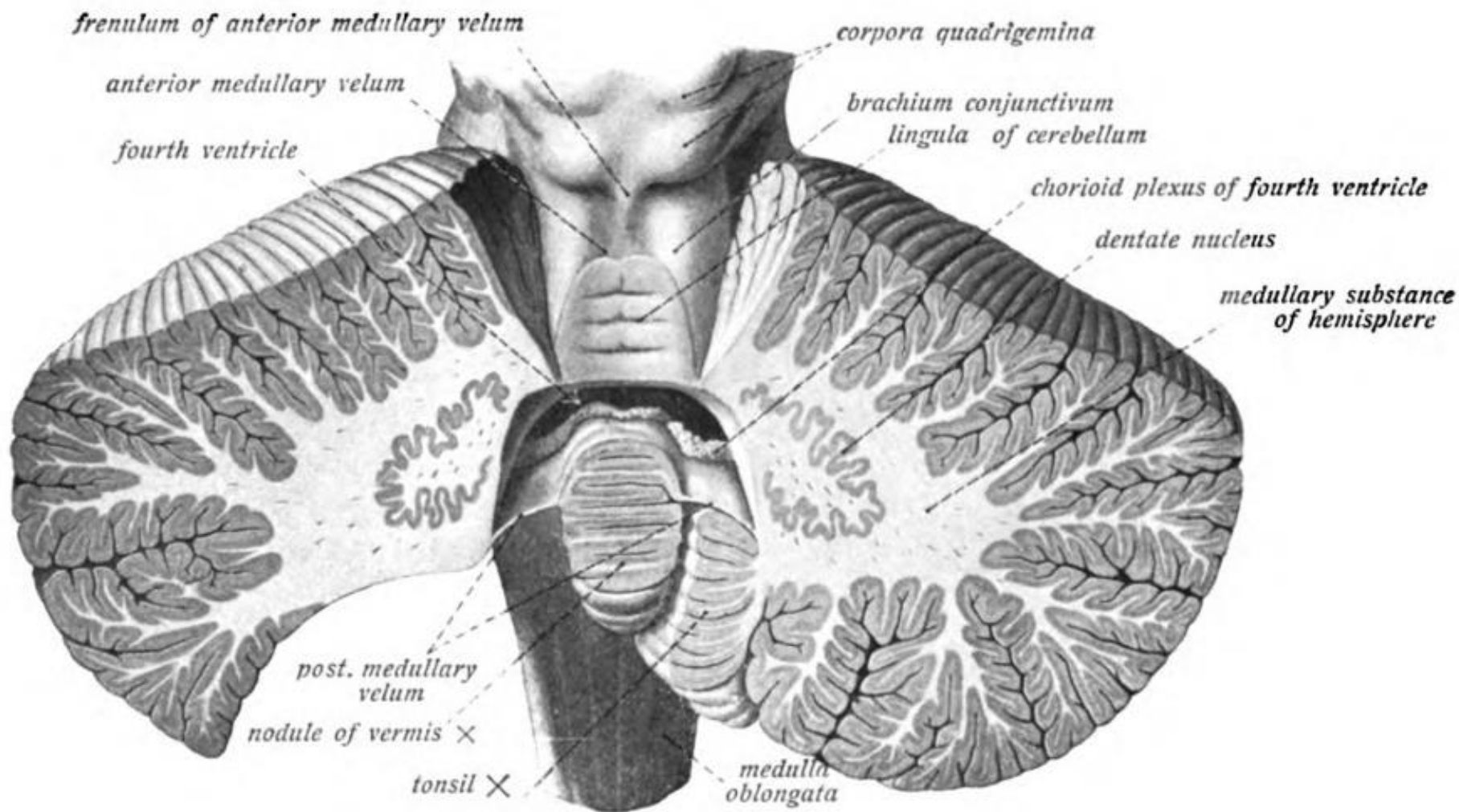
1. Ventral spino-cerebellar tract
2. Rostral spino-cerebellar tract
3. Tecto-cerebellar fibres
4. Rubro-cerebellar fibres
5. Trigemino-cerebellar fibres
6. Hypothalamo-cerebellar fibres
7. Coeruleo-cerebellar fibres

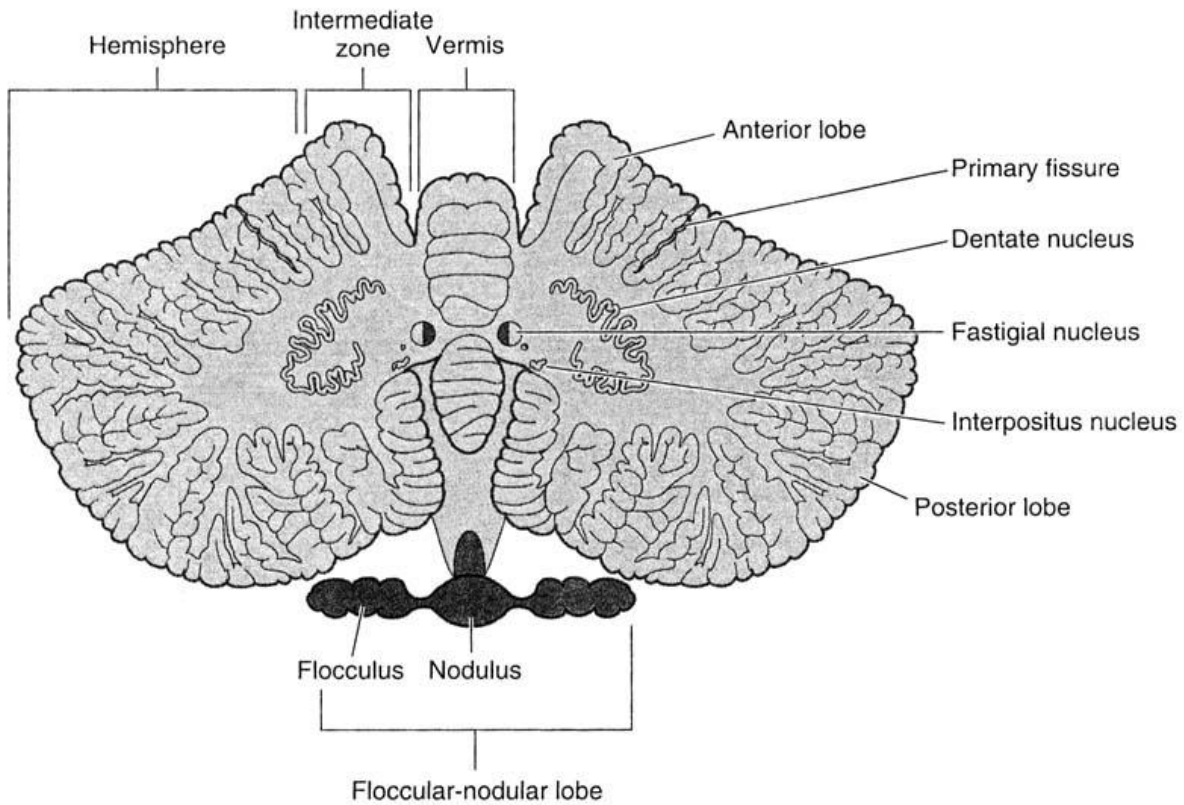
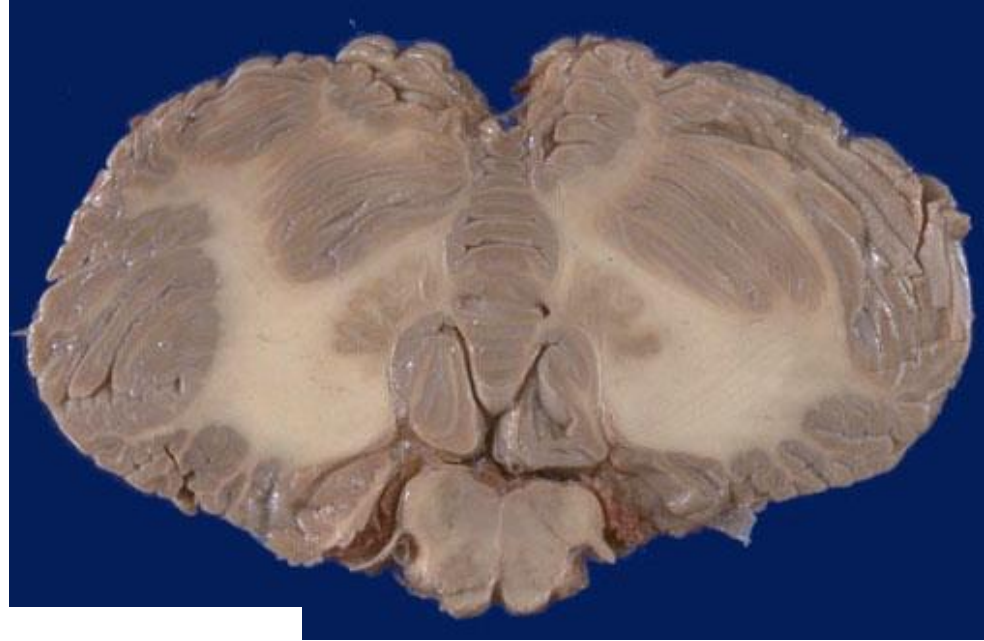
B. Fibres leaving the cerebellum

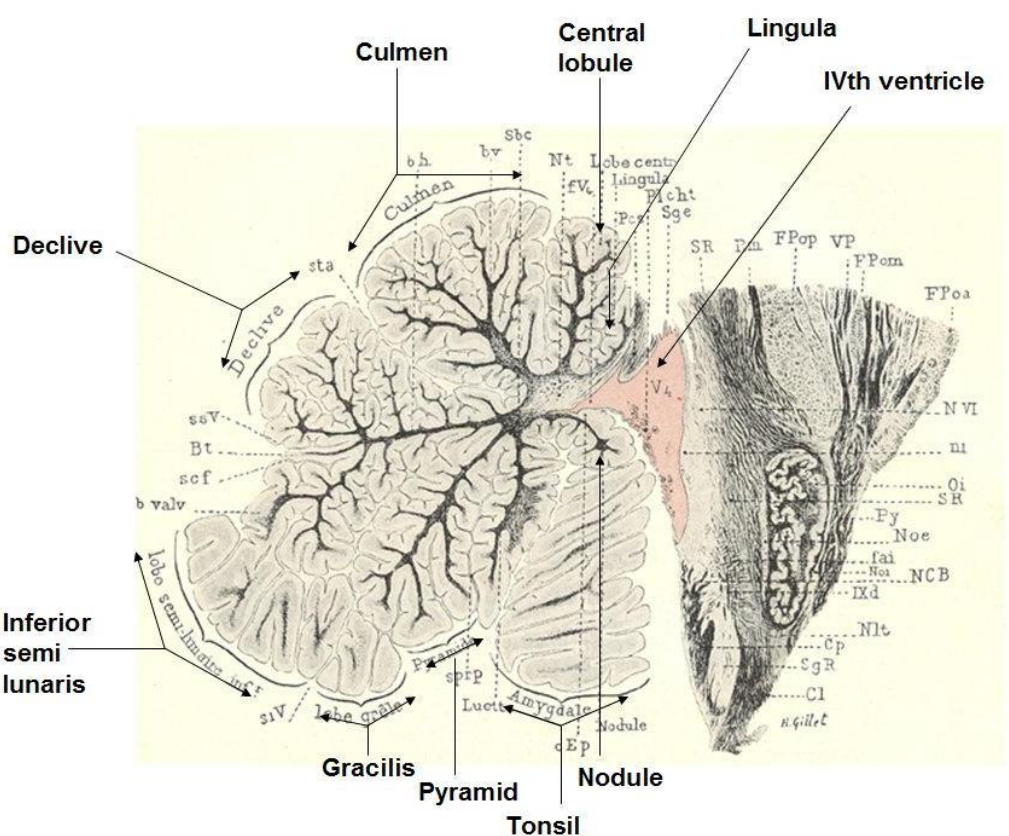
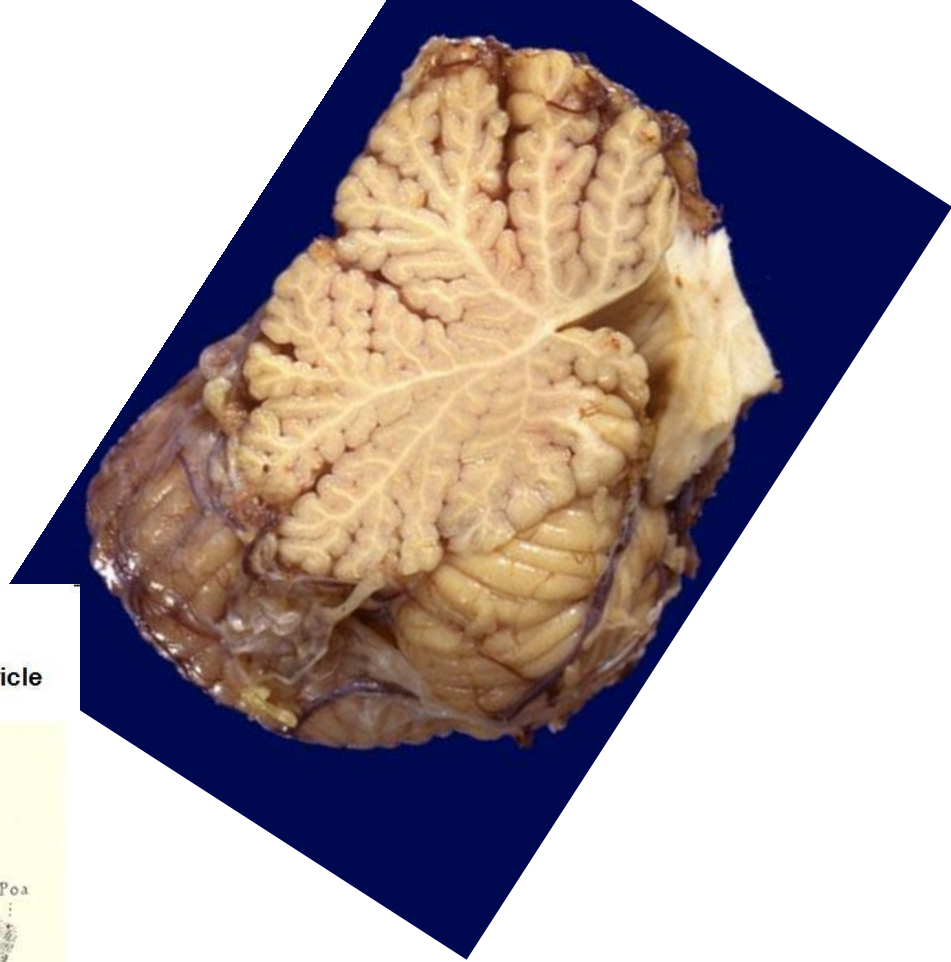
1. Cerebello-rubral fibres
2. Cerebello-thalamic fibres
3. Cerebello-reticular fibres
4. Cerebello-olivary fibres
5. Cerebello-nuclear fibres
6. Some fibres to hypothalamus and thalamus

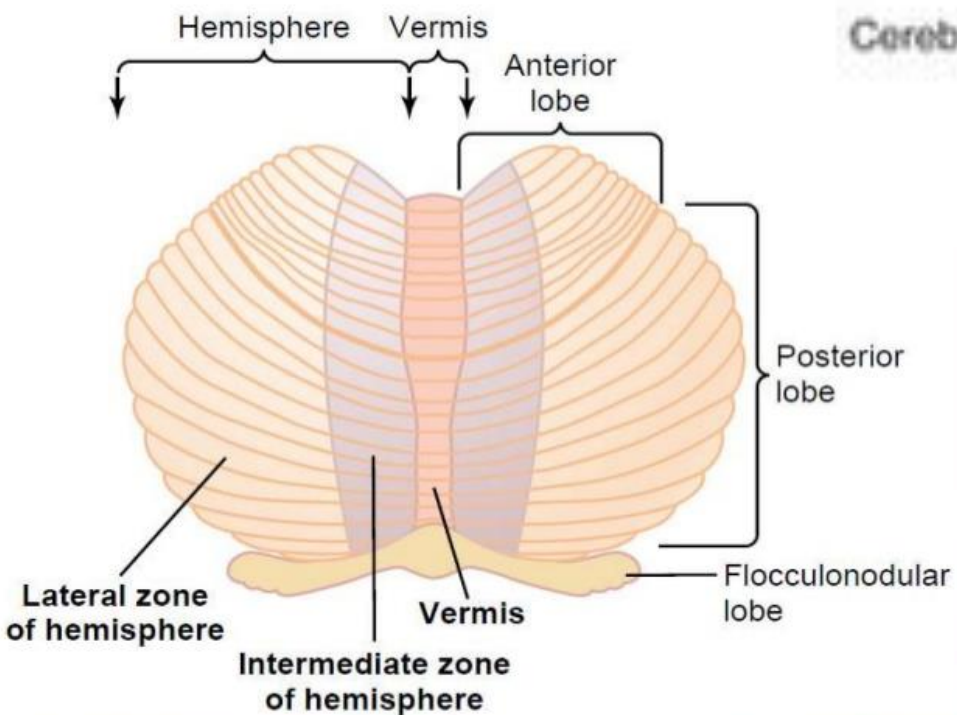
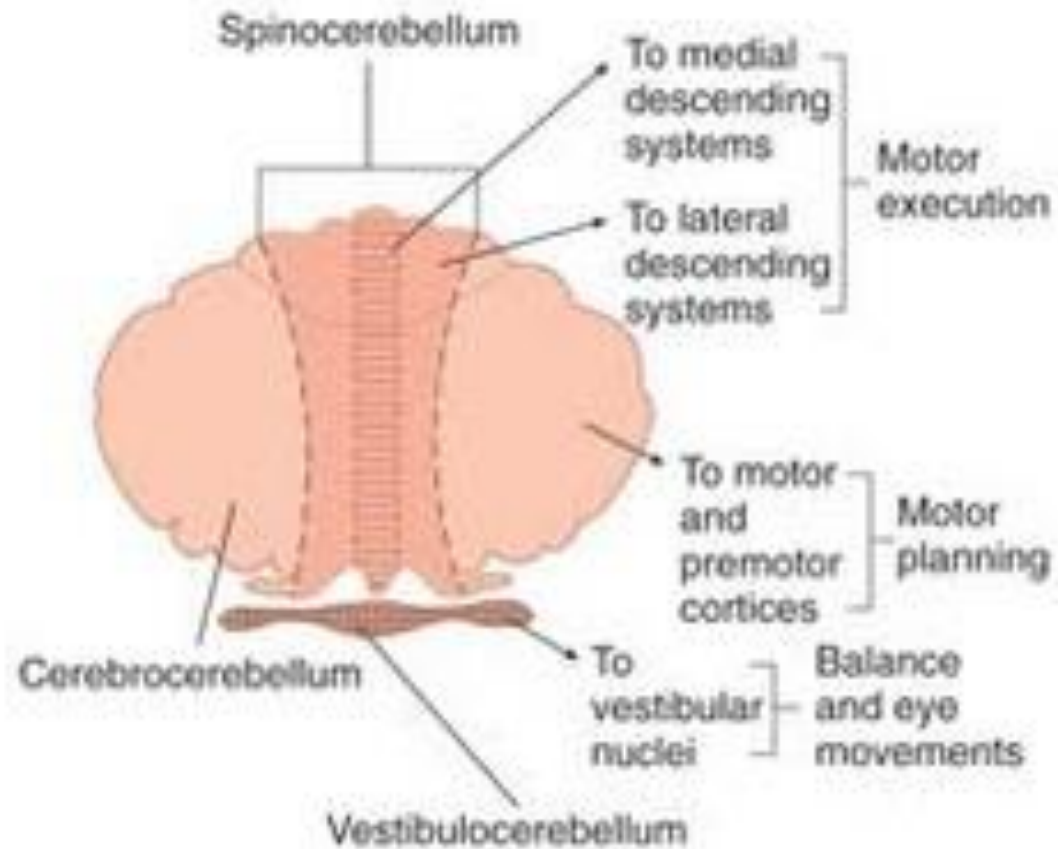








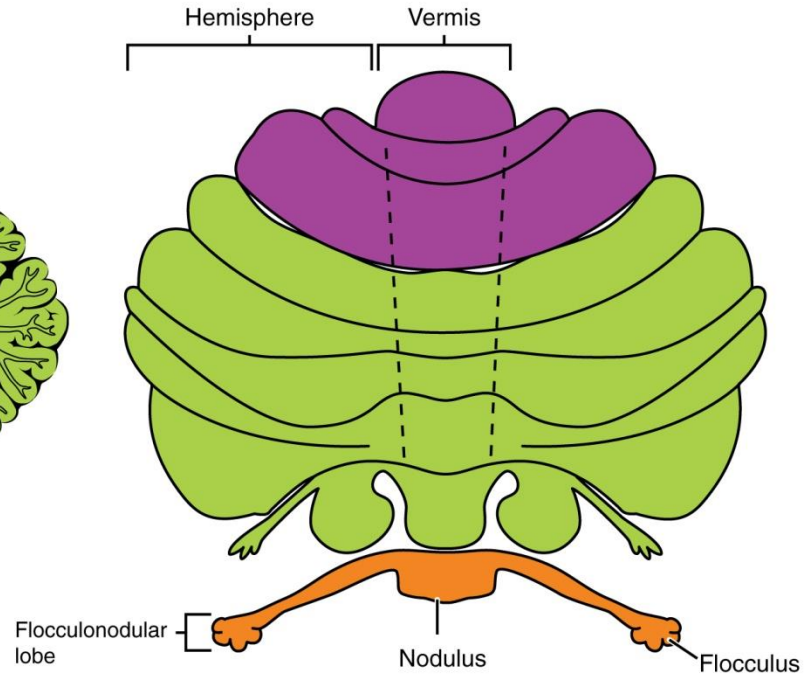




Midsagittal section of cerebellum



Superior view of an "unrolled" cerebellum



Anterior Lobe

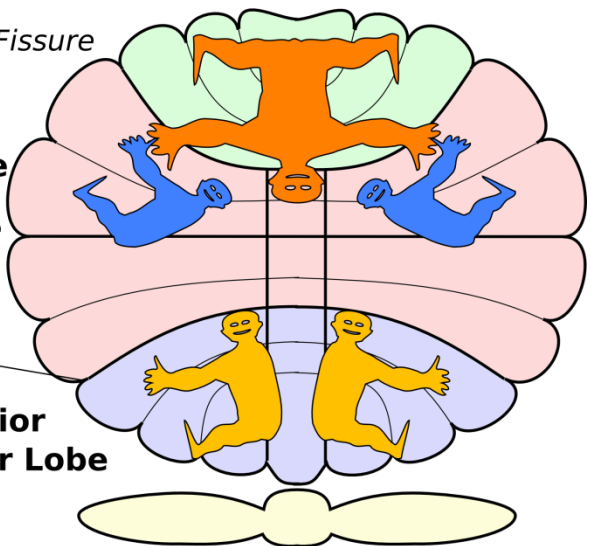
Primary Fissure

Superior Posterior Lobe

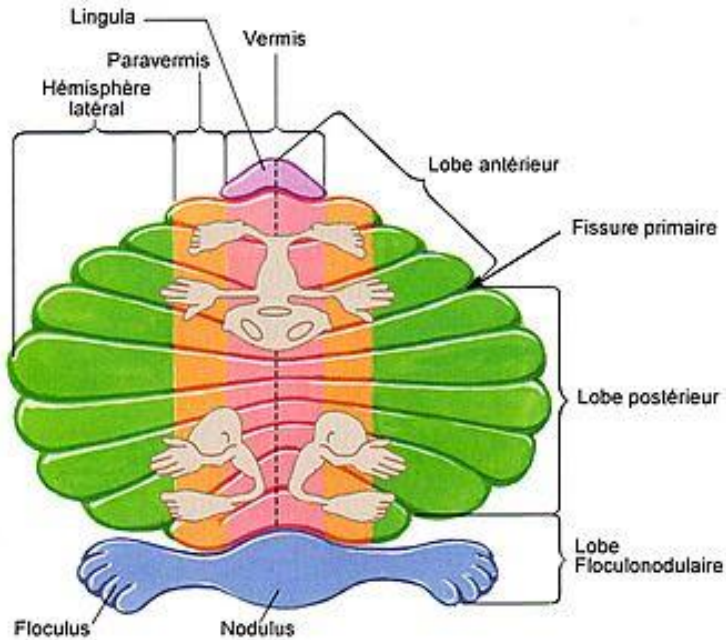
Horizontal Fissure

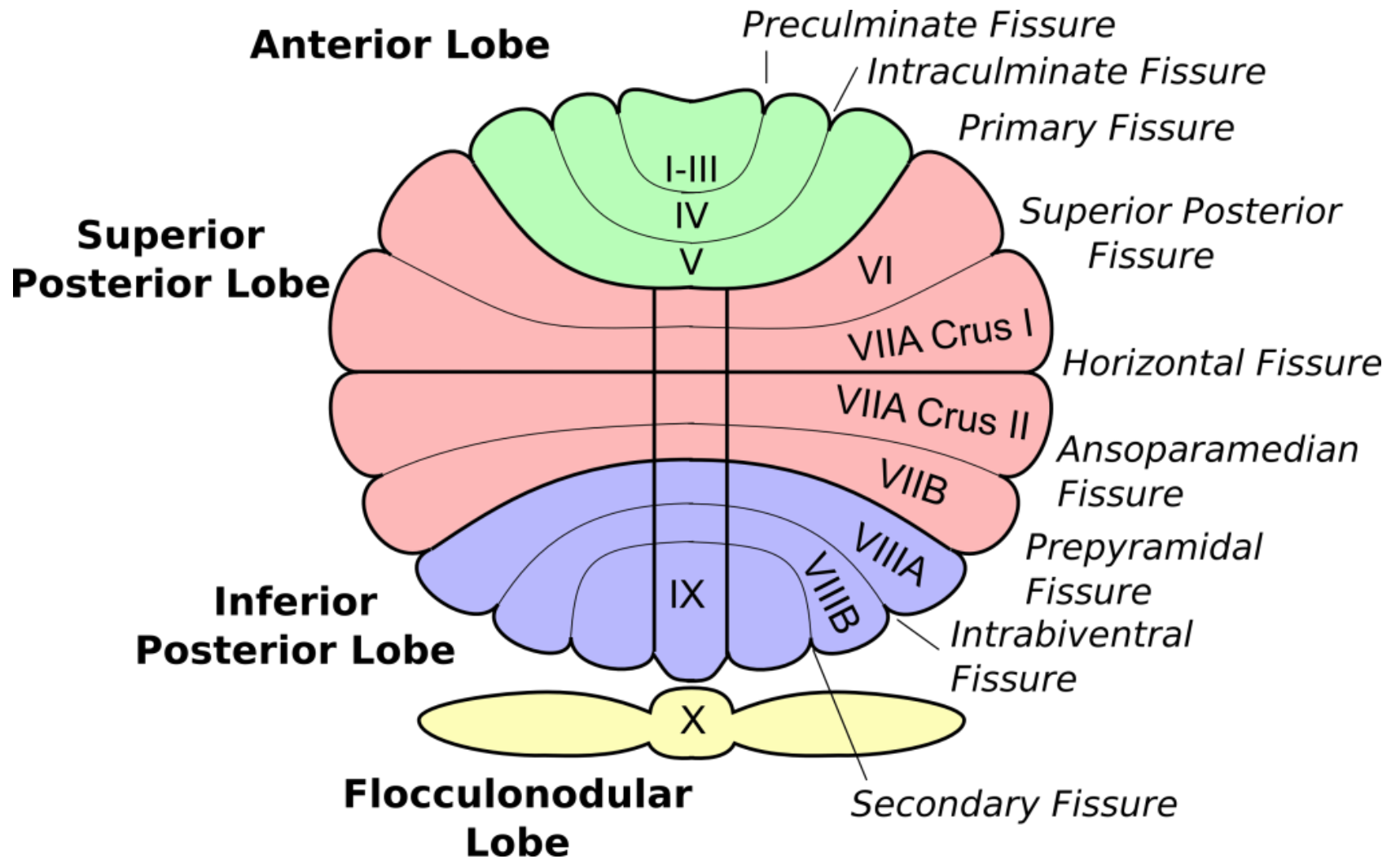
Prepyramidal Fissure

Inferior Posterior Lobe



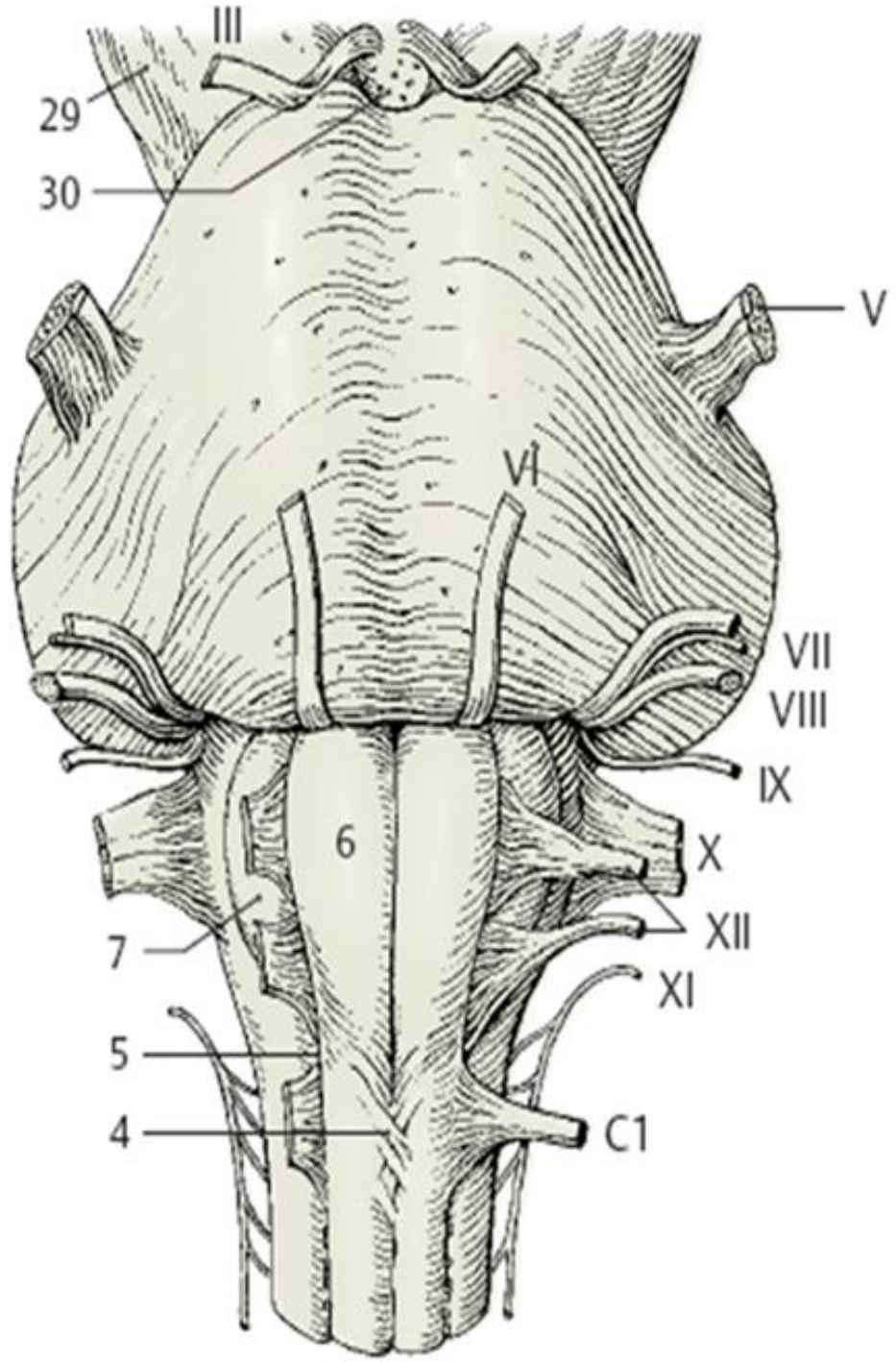
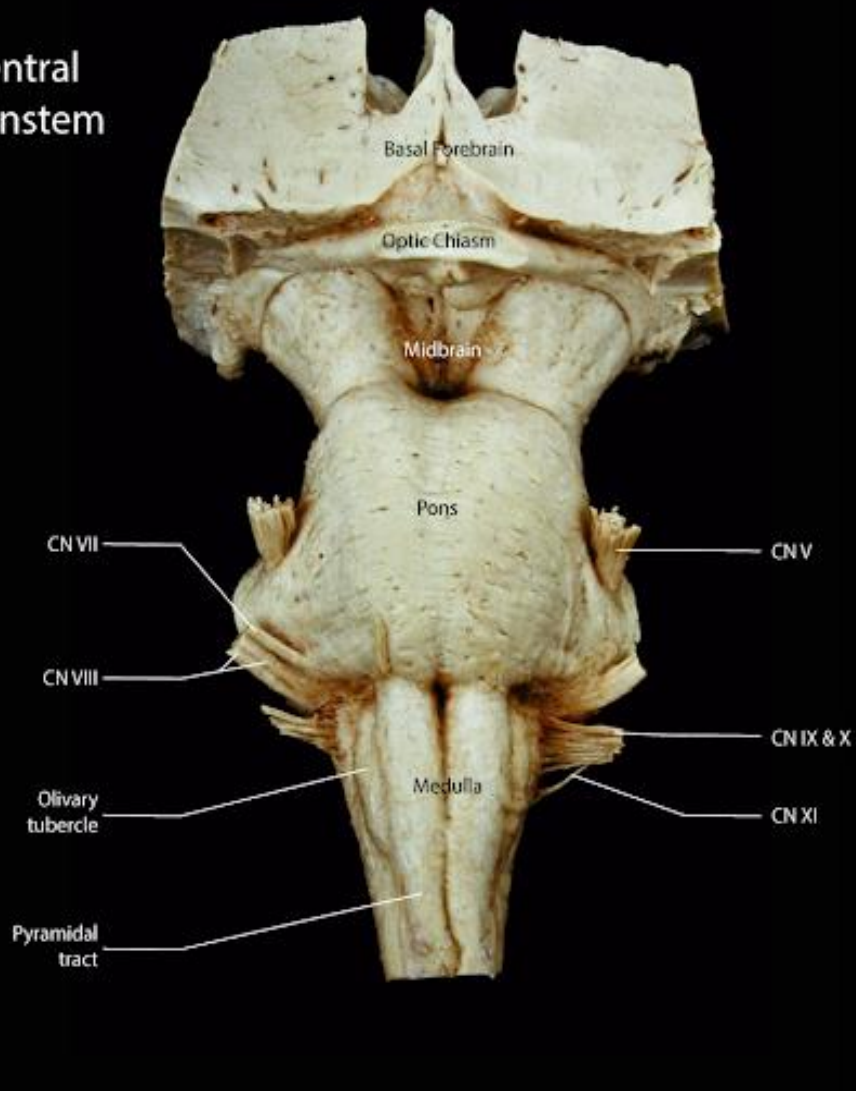
Flocculonodular Lobe

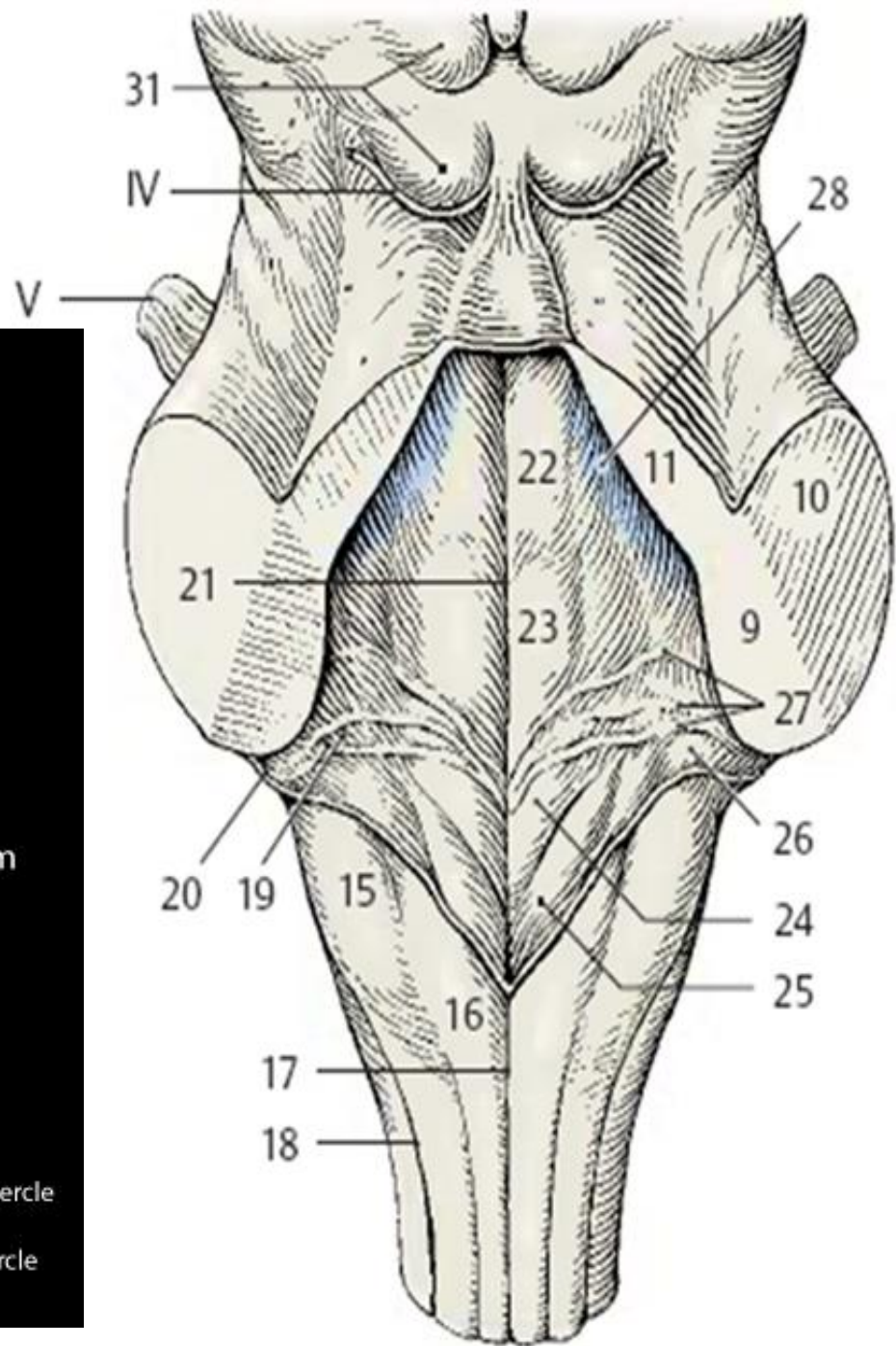
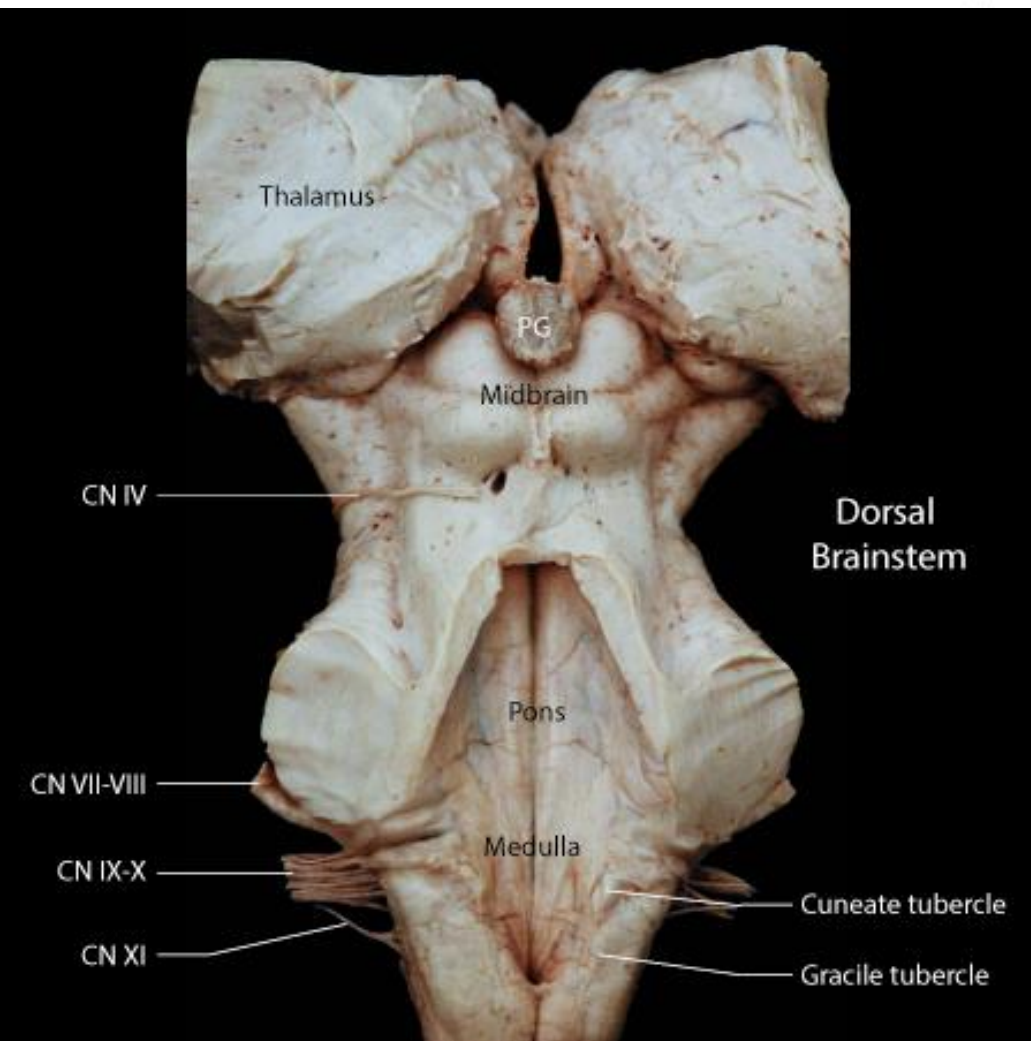


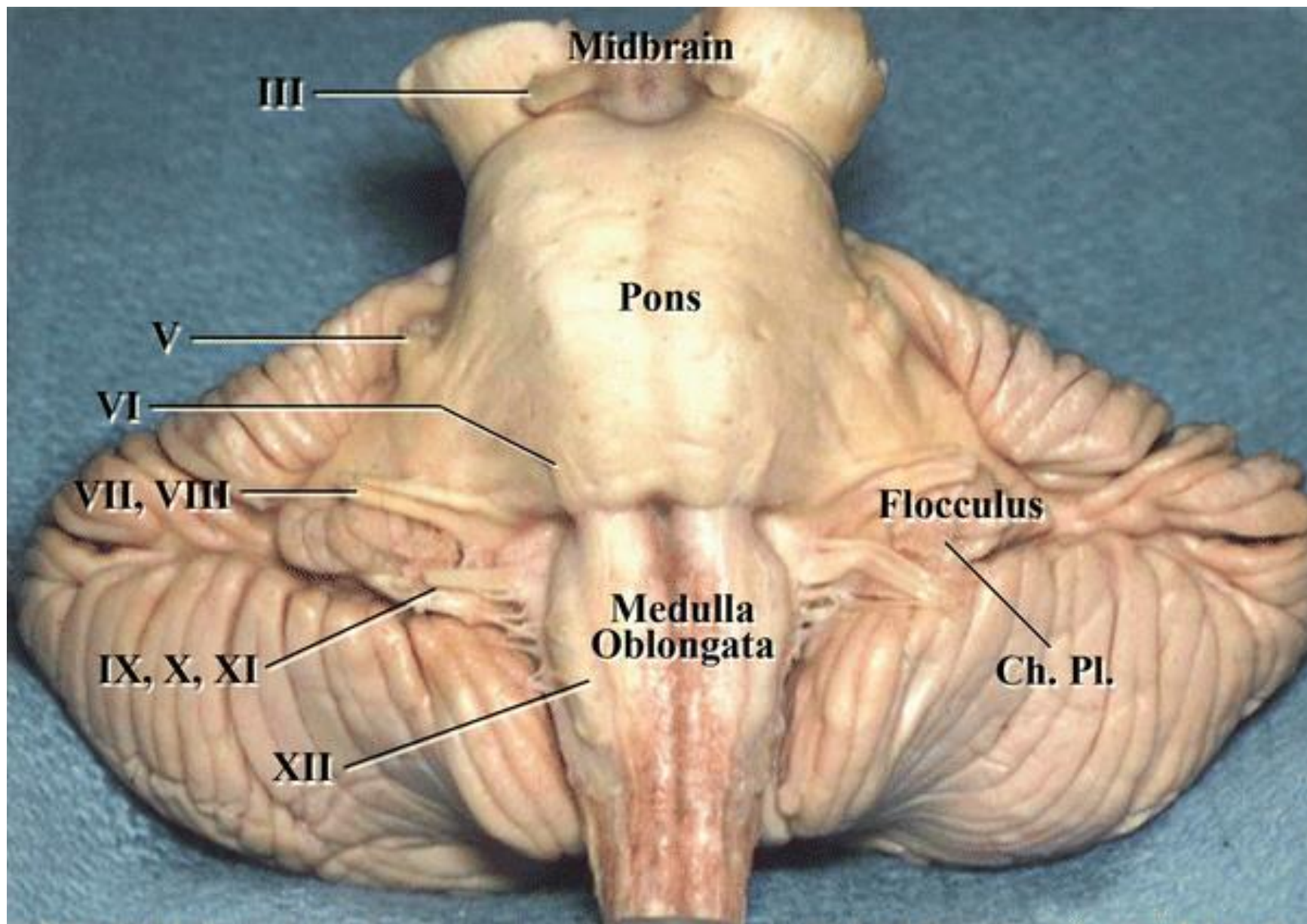


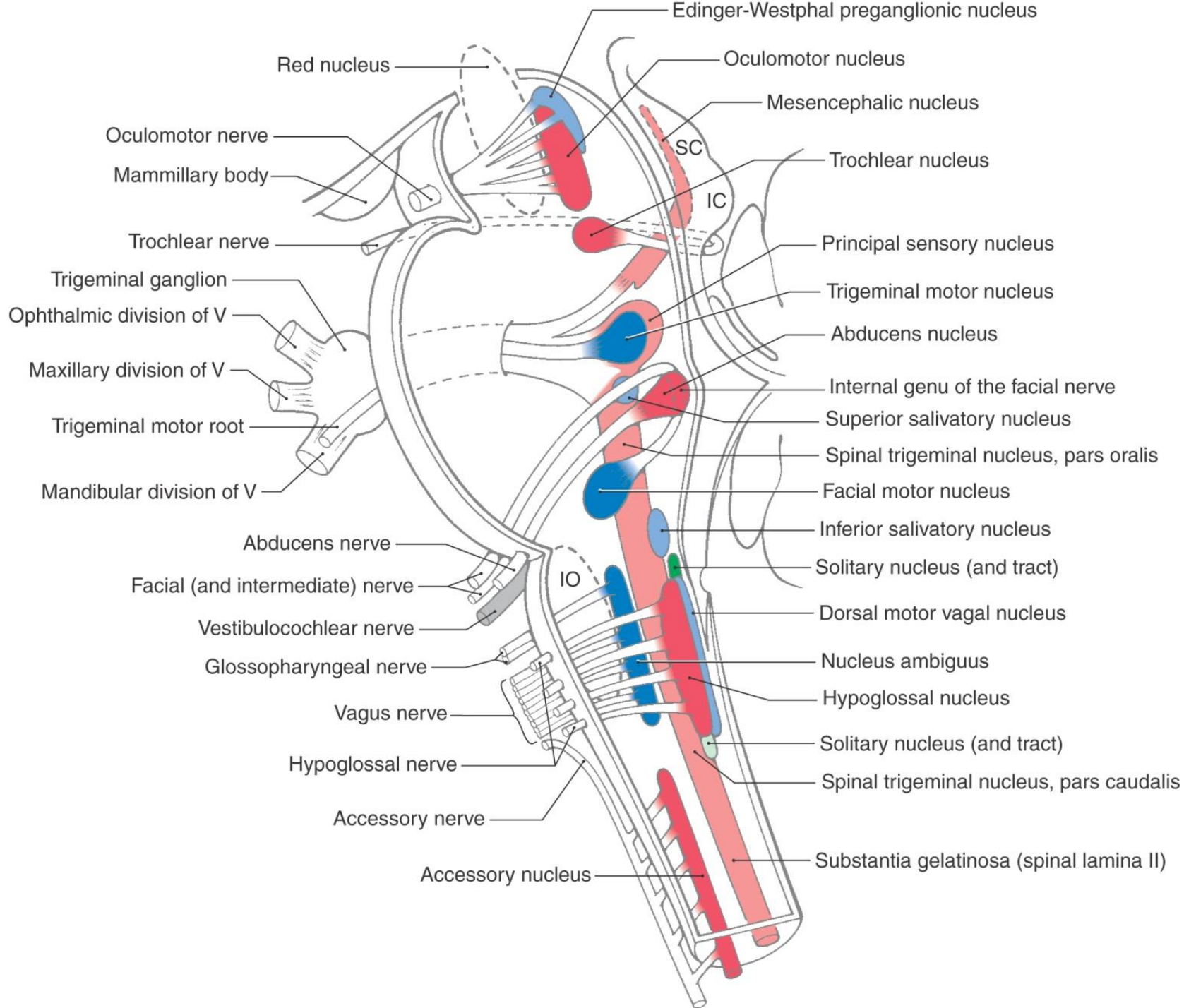
Brain Stem

Ventral Brainstem

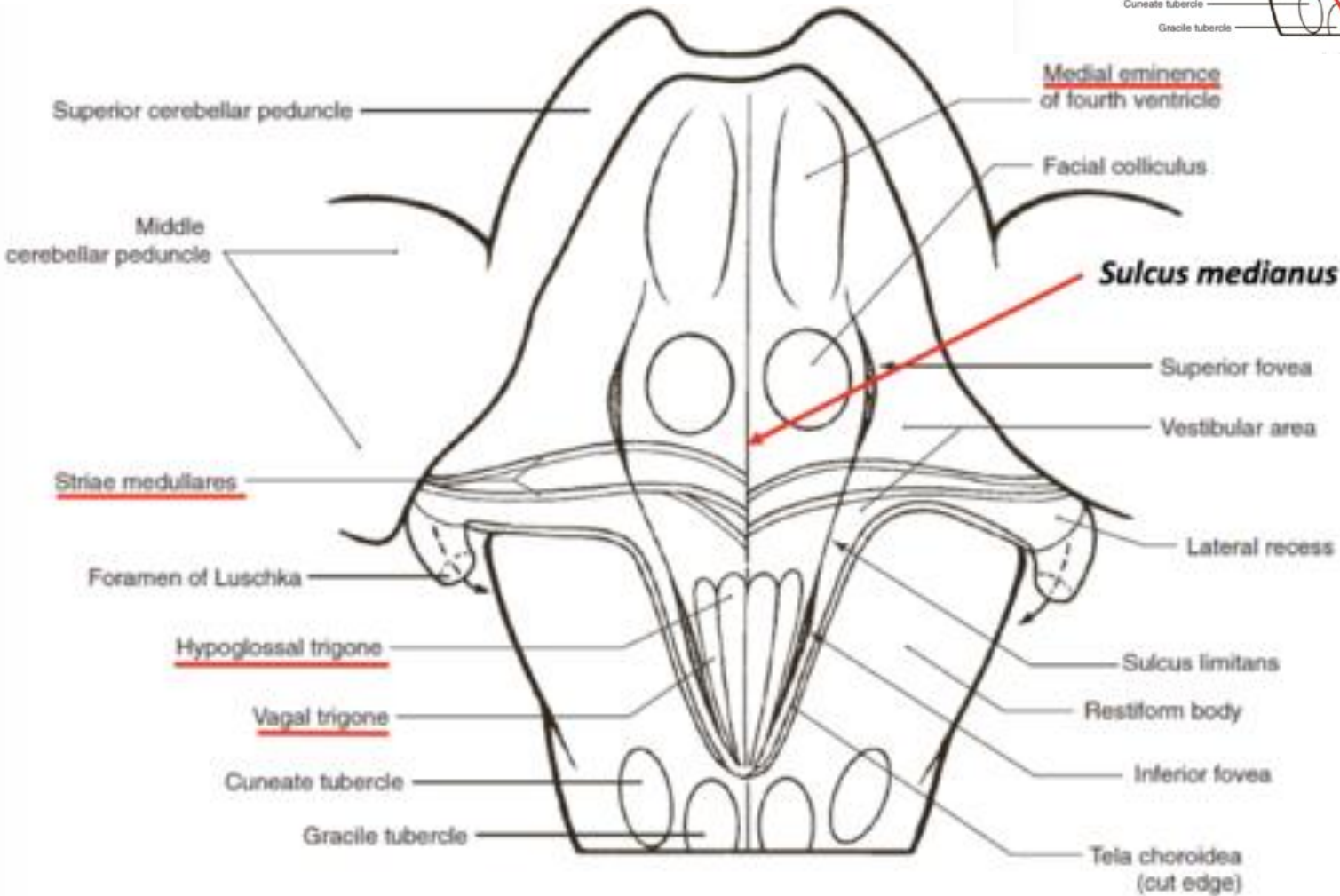
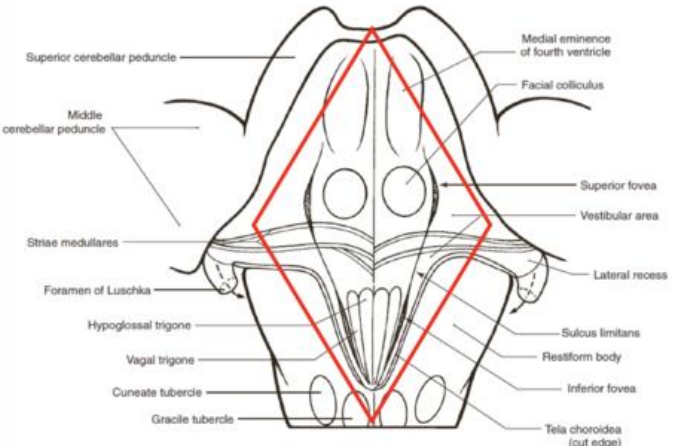




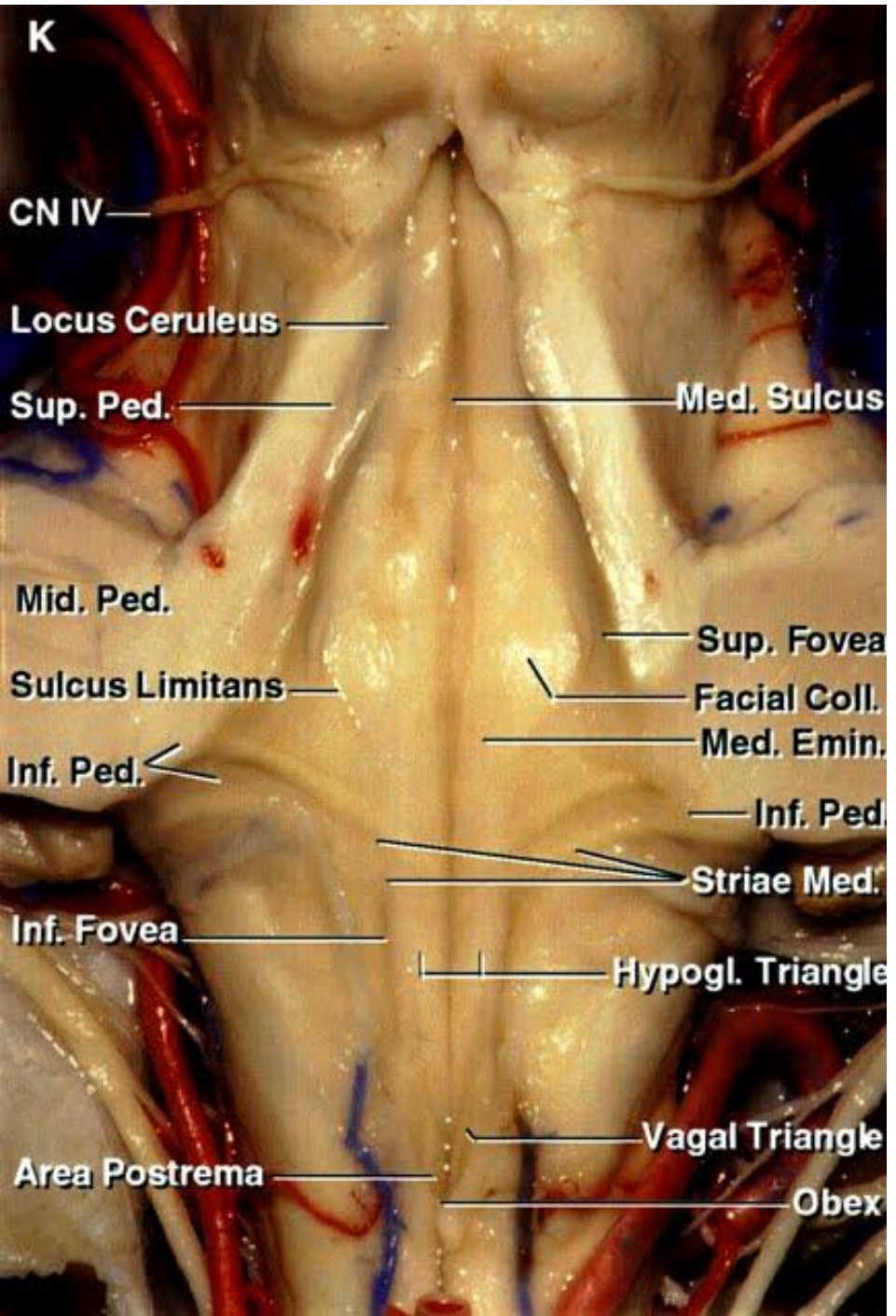
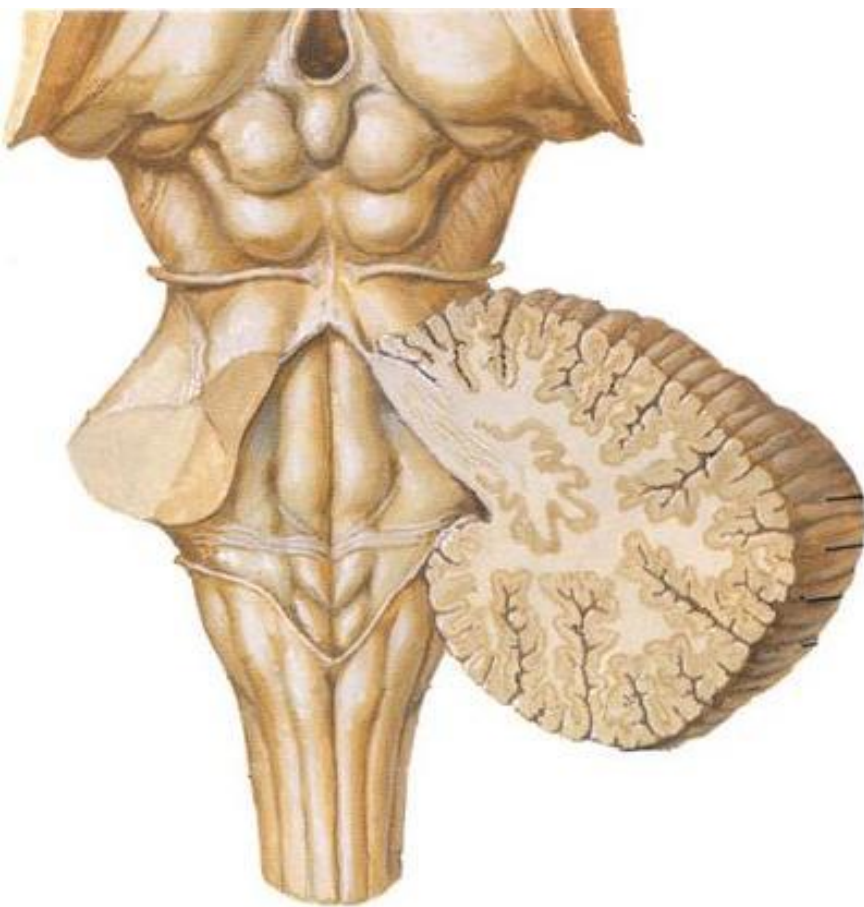




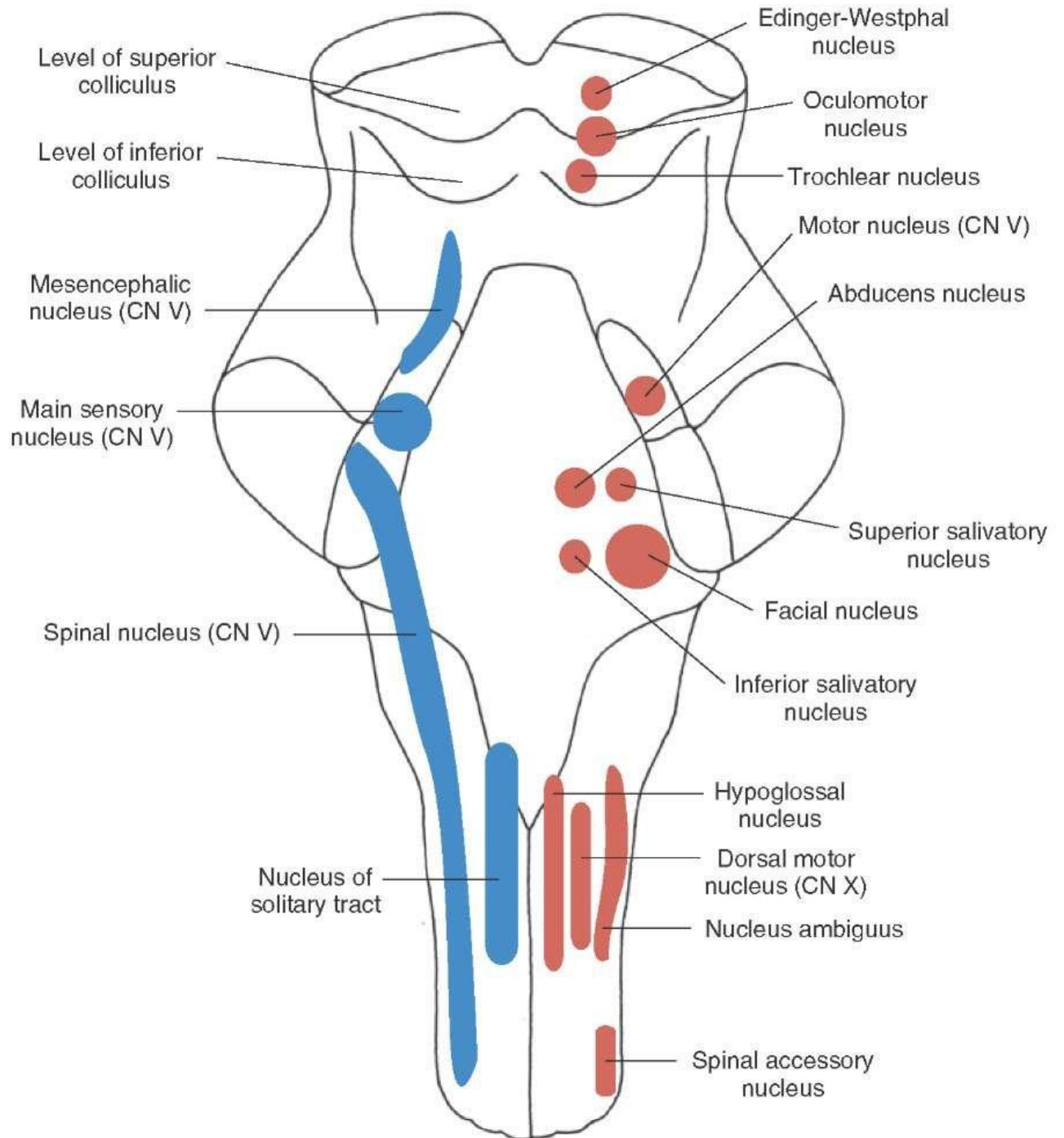
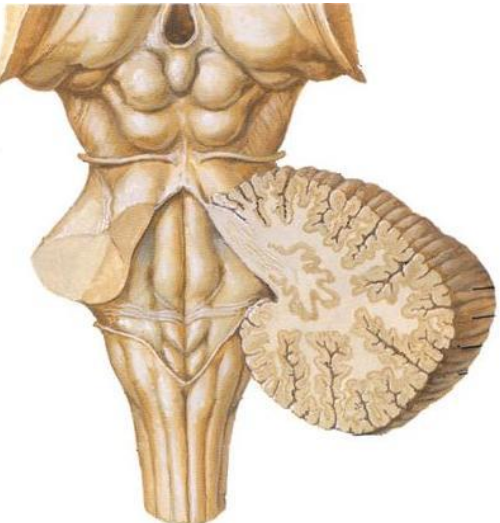
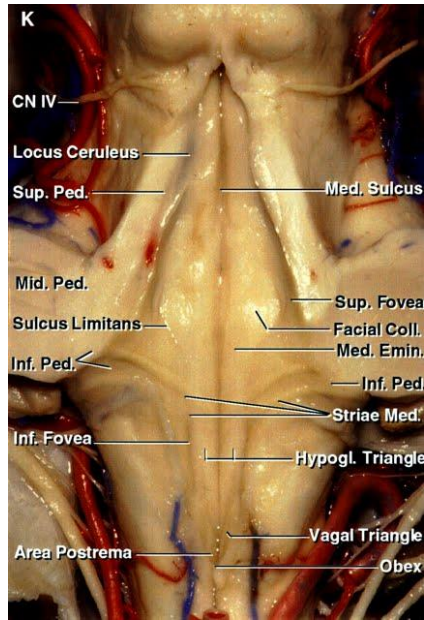
Rhomboid Fossa



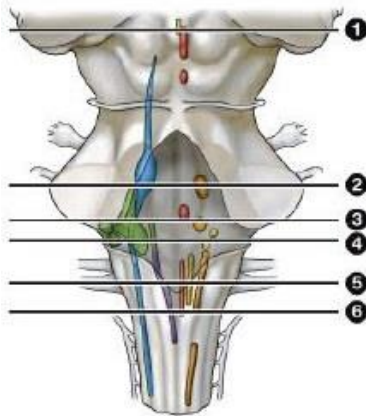
Rhomboid Fossa



Rhomboid Fossa



Rhomboid Fossa



Color key for cranial nerve nuclei:

■	Somatic motor
■	Branchial motor
■	Visceral motor
■	General sensory
■	Special sensory
■	Visceral sensory

1 Midbrain

- Superior colliculus
- Substantia nigra
- Edinger-Westphal nucleus
- Oculomotor nucleus

2 Middle pons

- Fourth ventricle
- Trigeminal motor nucleus
- Pyramidal tract
- Superior cerebellar peduncle
- Principal trigeminal nucleus
- Middle cerebellar peduncle

3 Lower pons

- Vestibular nuclei
- Facial nucleus
- Medial lemniscus
- Abducens nucleus
- Spinal trigeminal nucleus
- Middle cerebellar peduncle

4 Upper medulla

- Vestibular nuclei
- Nucleus of the solitary tract
- Inferior olivary nucleus
- Cochlear nuclei
- Spinal trigeminal nucleus
- Inferior cerebellar peduncle

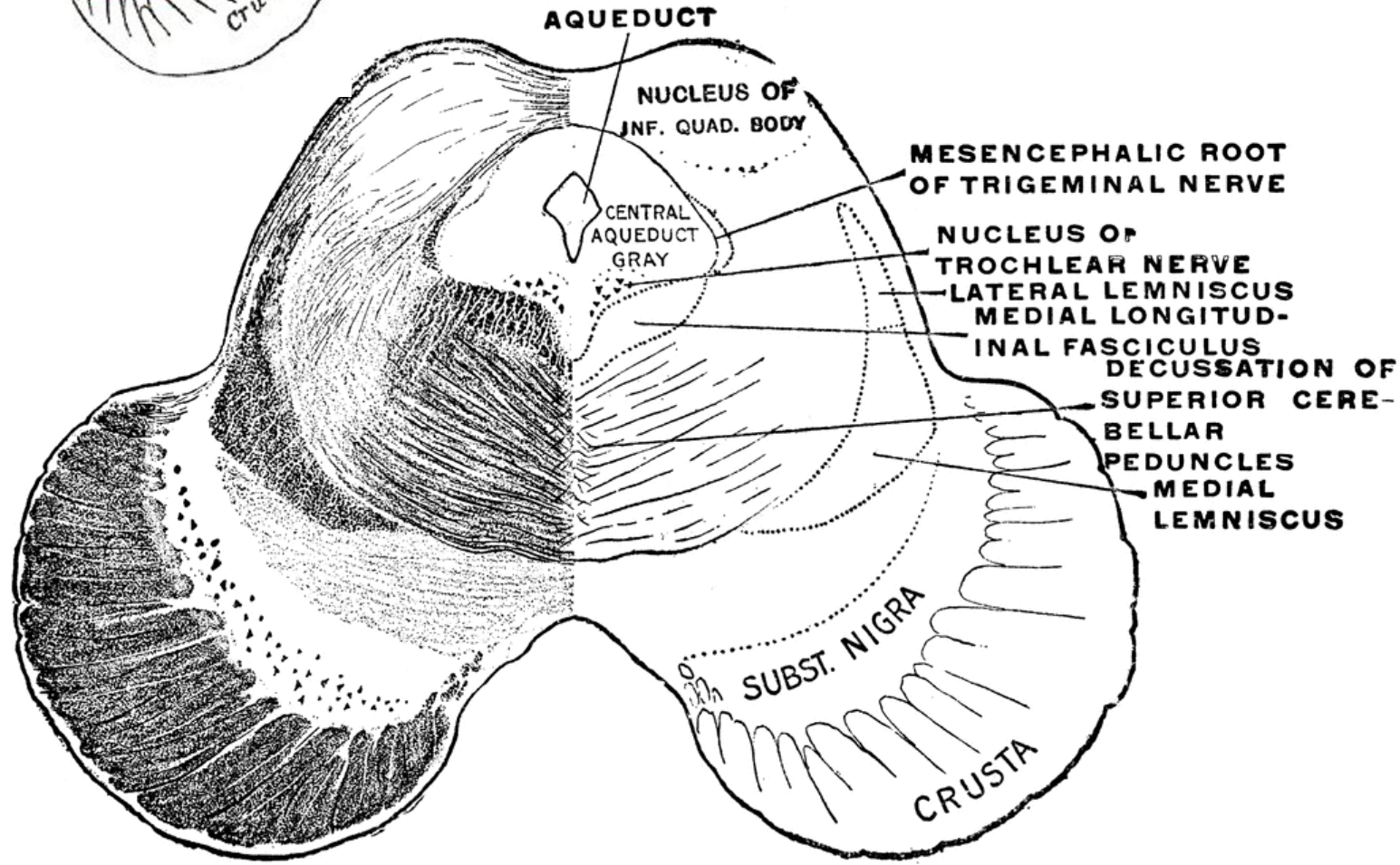
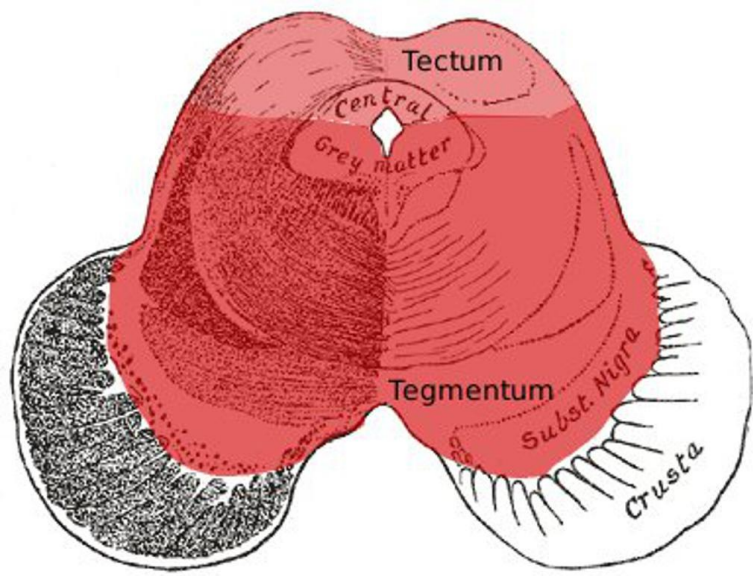
5 Middle medulla

- Vestibular nuclei
- Nucleus of the solitary tract
- Hypoglossal nucleus
- Dorsal motor nucleus of vagus
- Spinal trigeminal nucleus
- Nucleus ambiguus
- Medullary pyramid

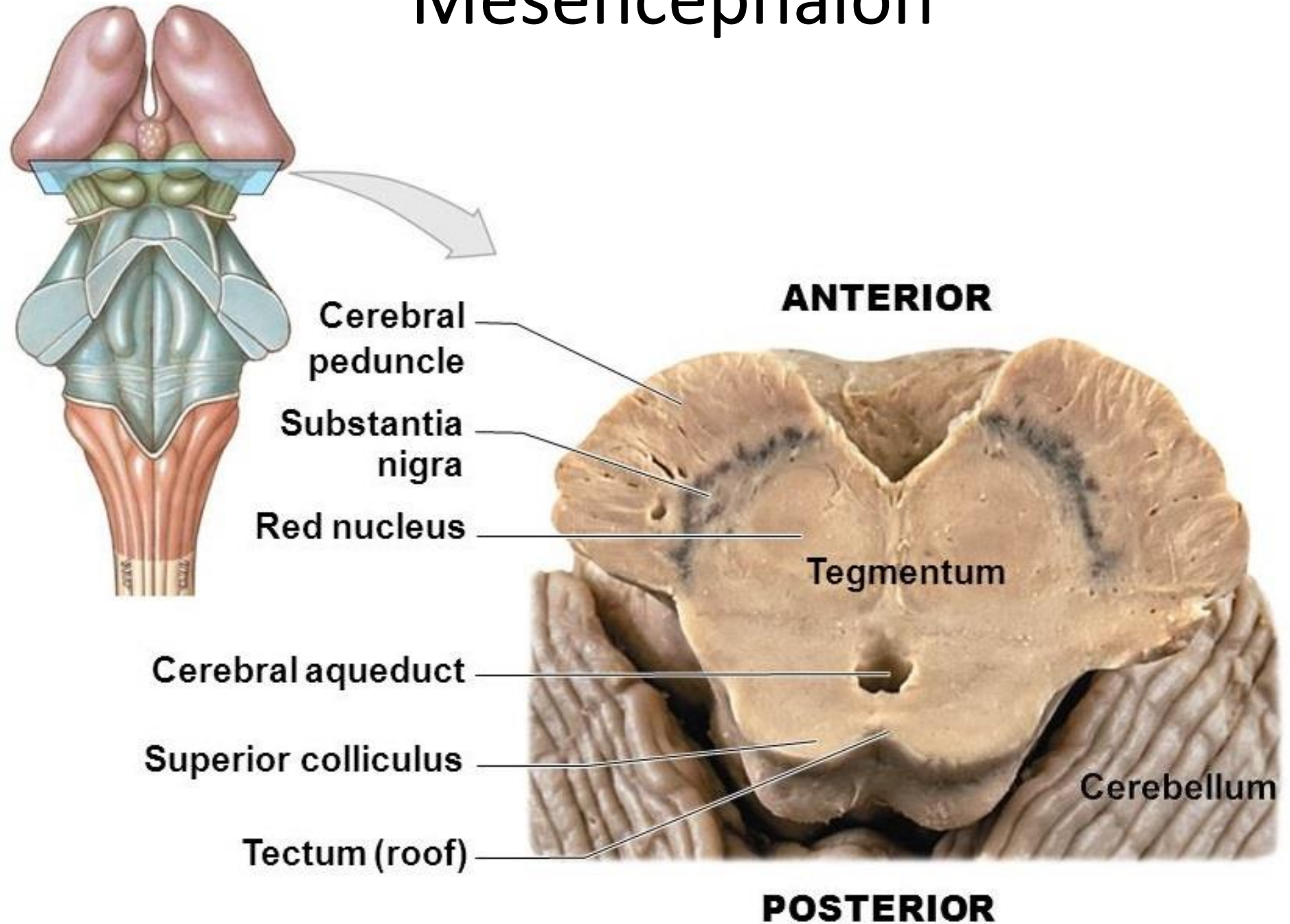
6 Caudal medulla

- Nucleus of the solitary tract
- Nucleus cuneatus
- Spinal trigeminal nucleus
- Hypoglossal nucleus
- Nucleus gracilis
- Dorsal motor nucleus of vagus
- Medial lemniscus

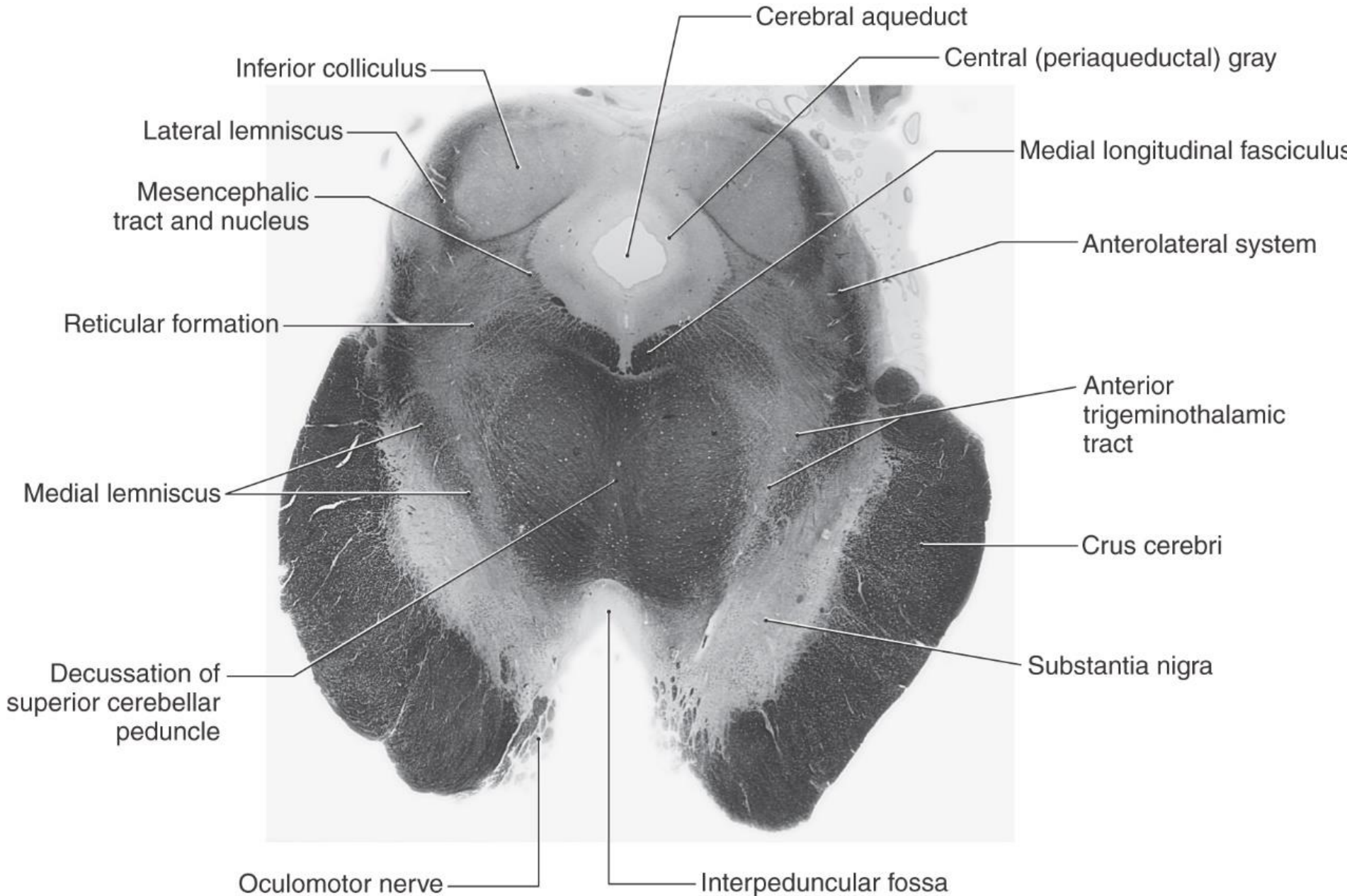
Mesencephalon



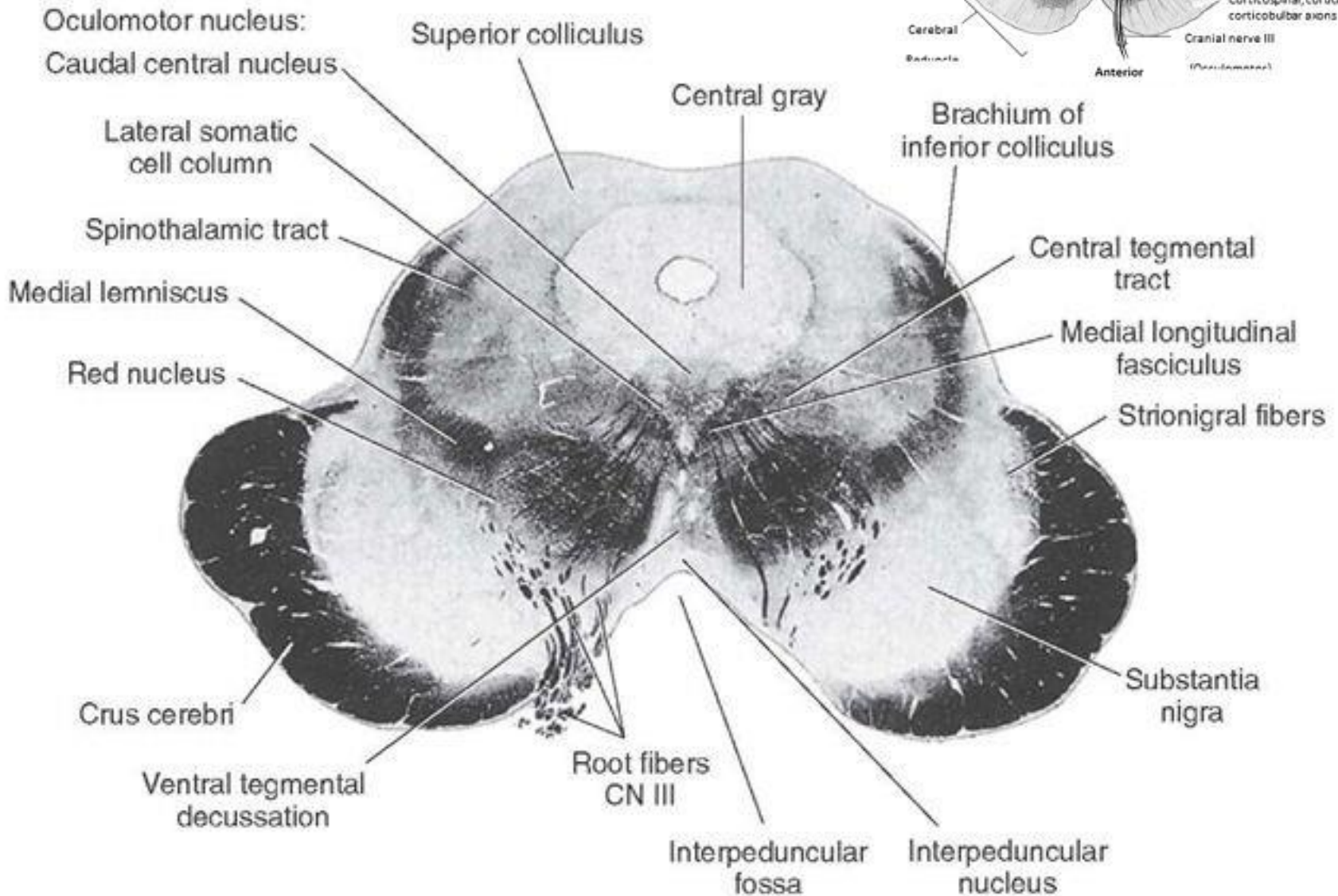
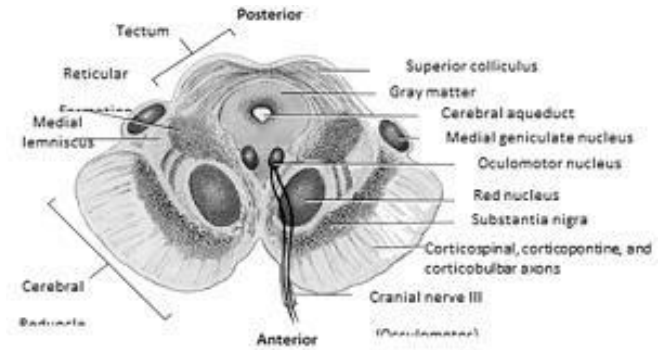
Mesencephalon



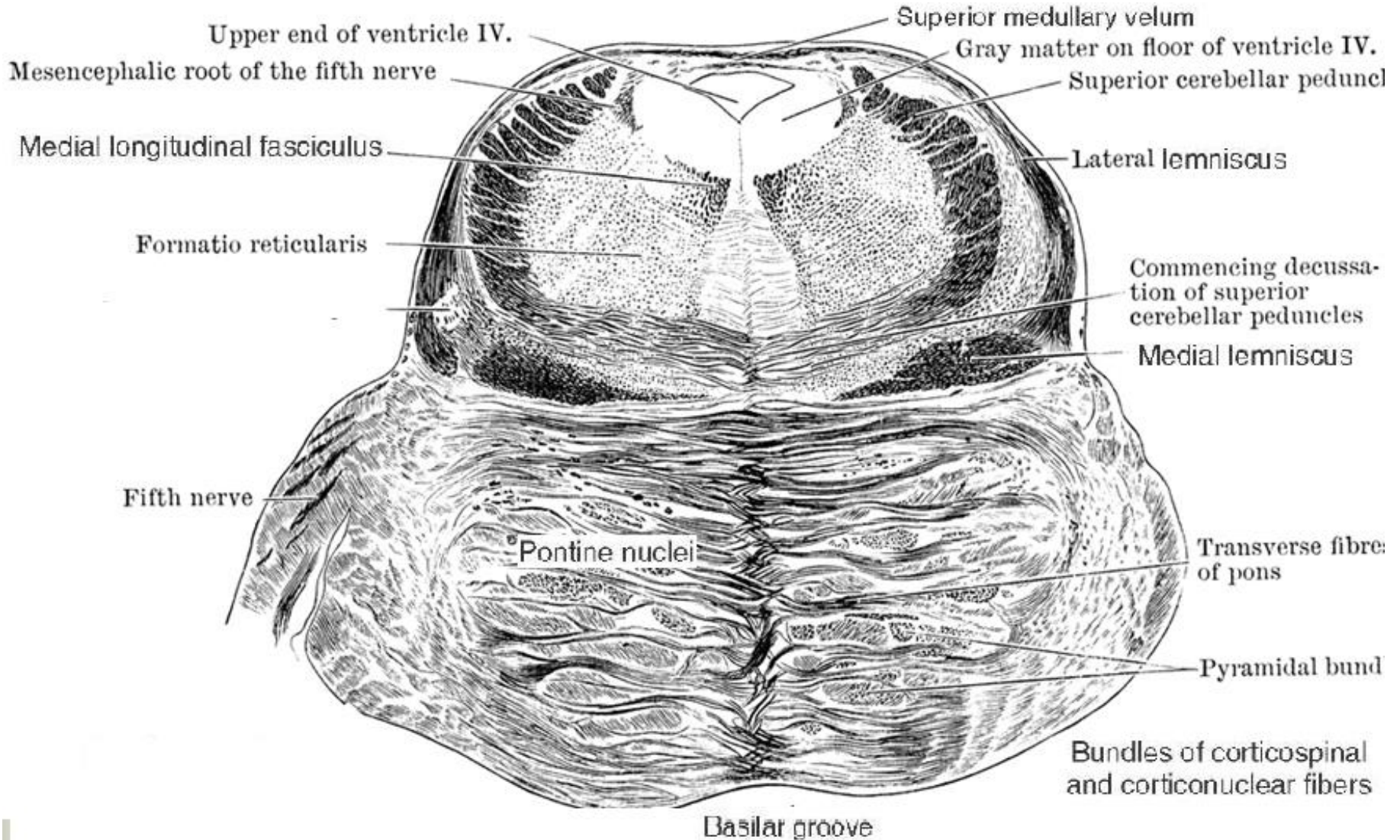
Mesencephalon



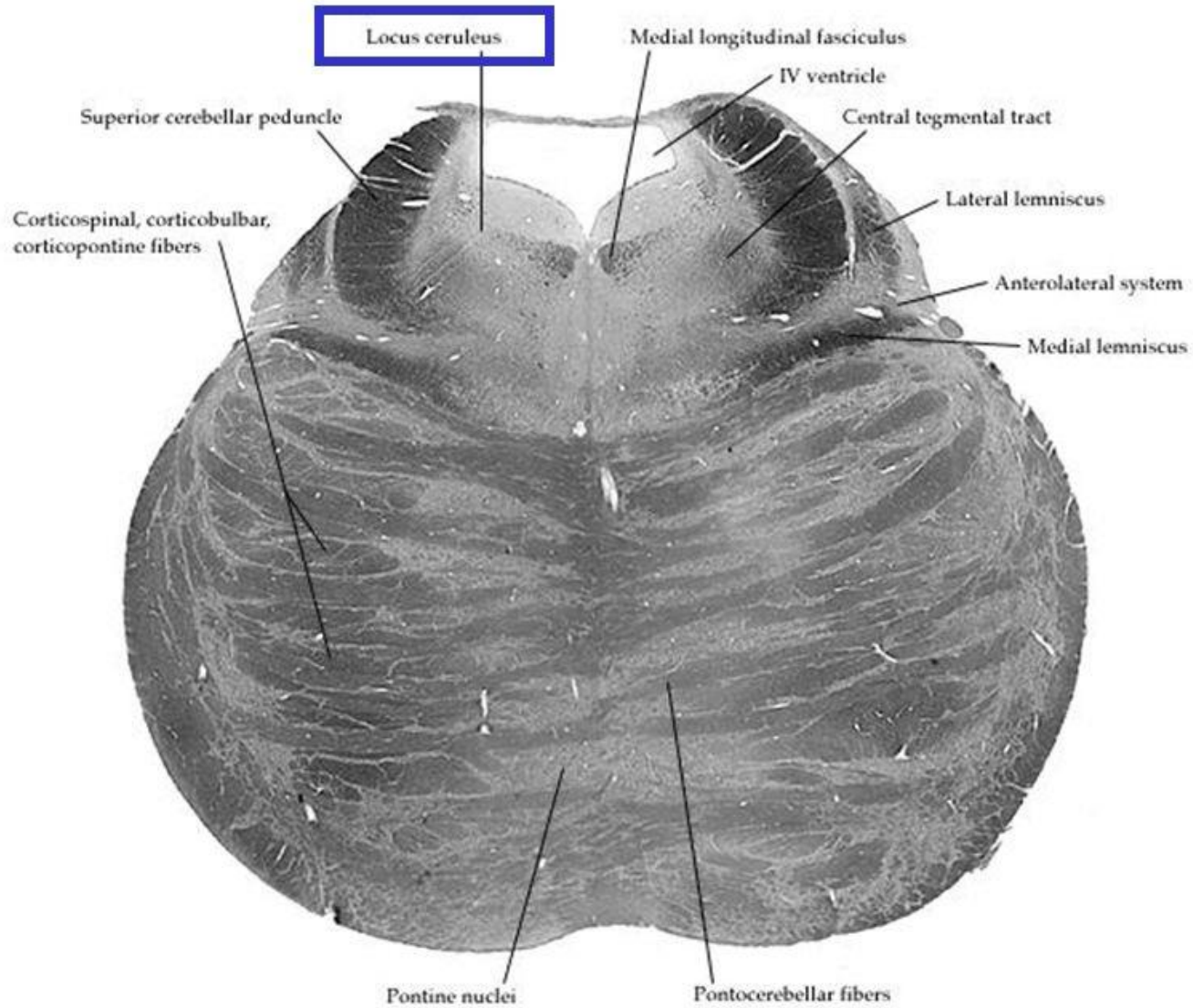
Mesencephalon



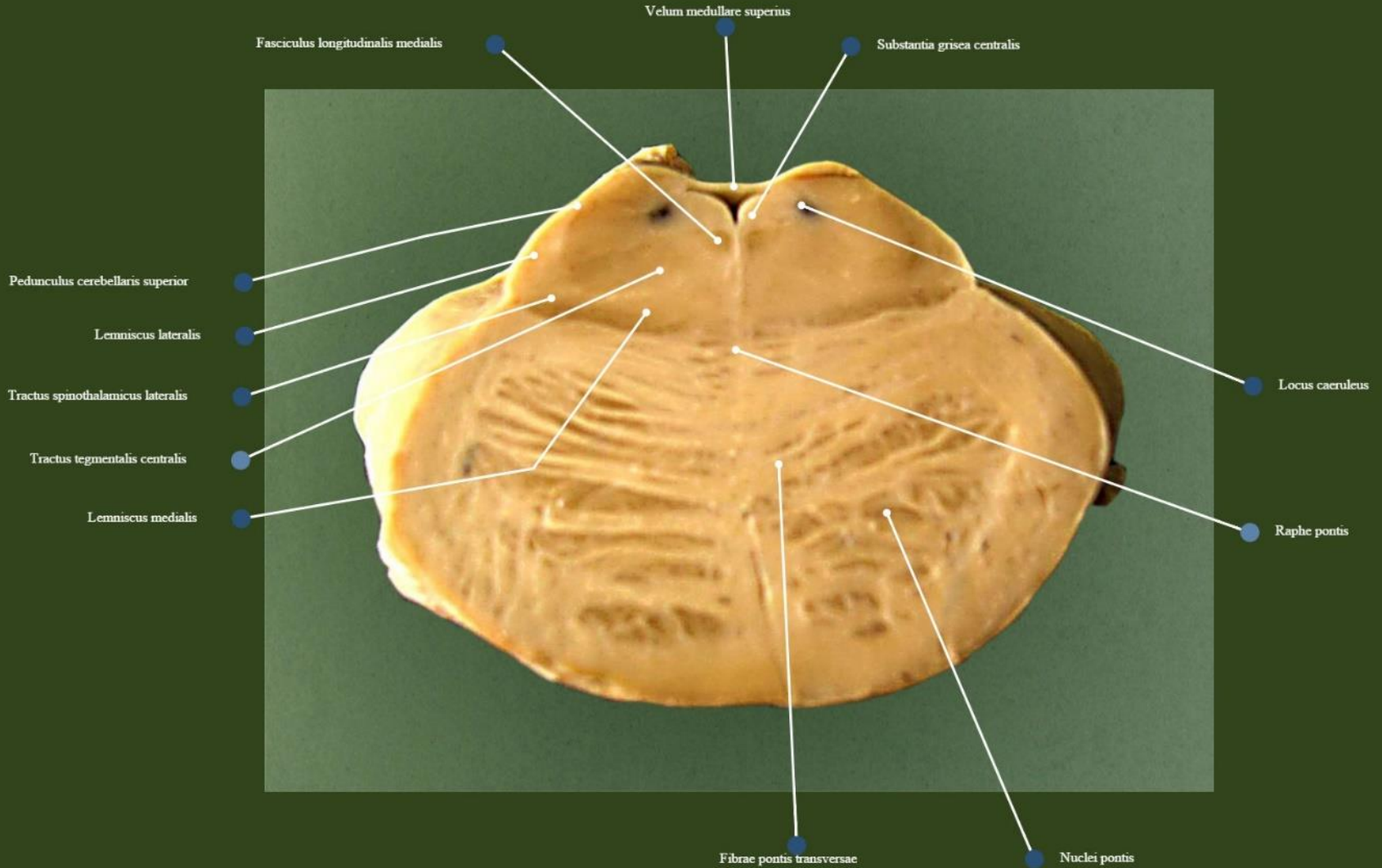
Pons



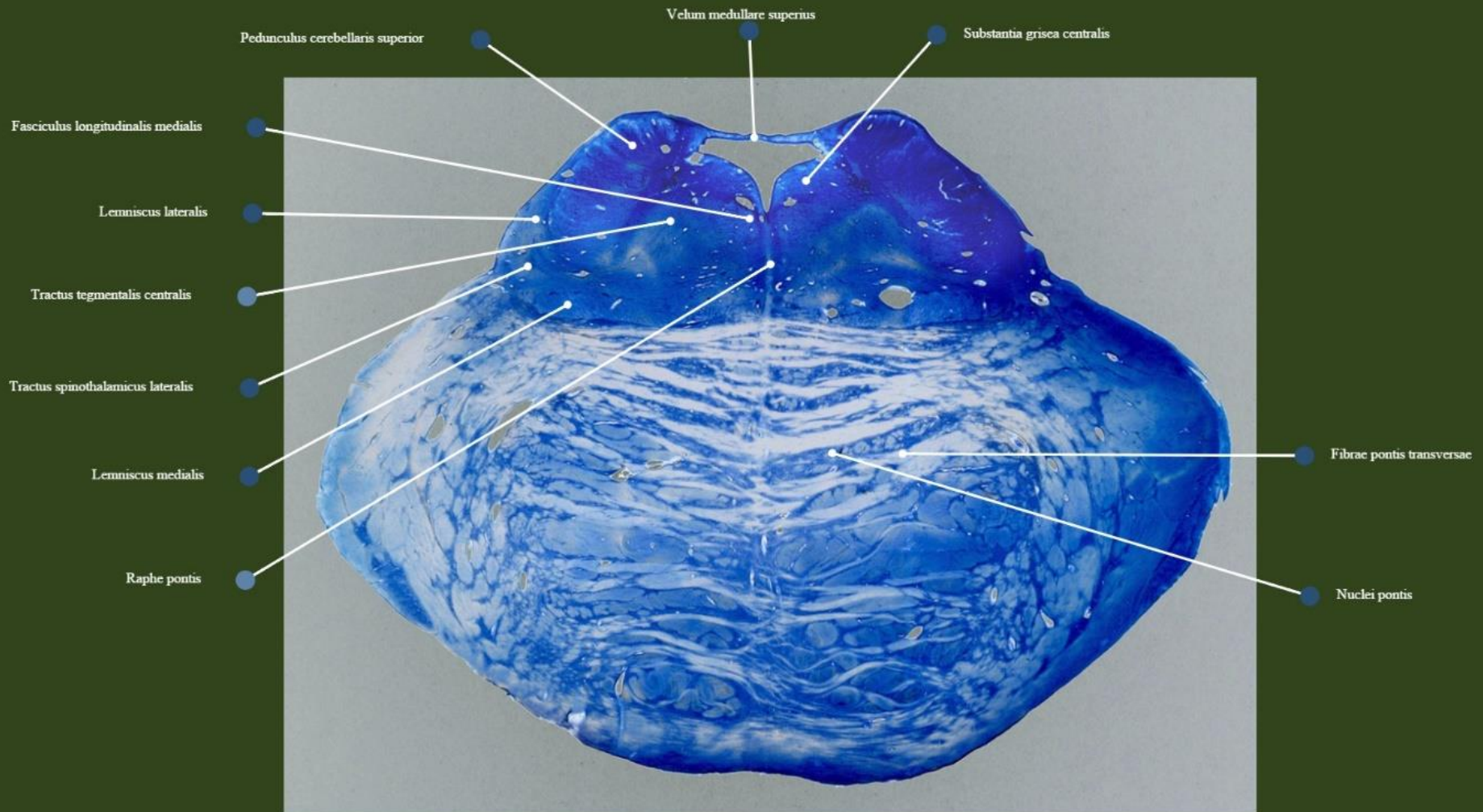
Pons



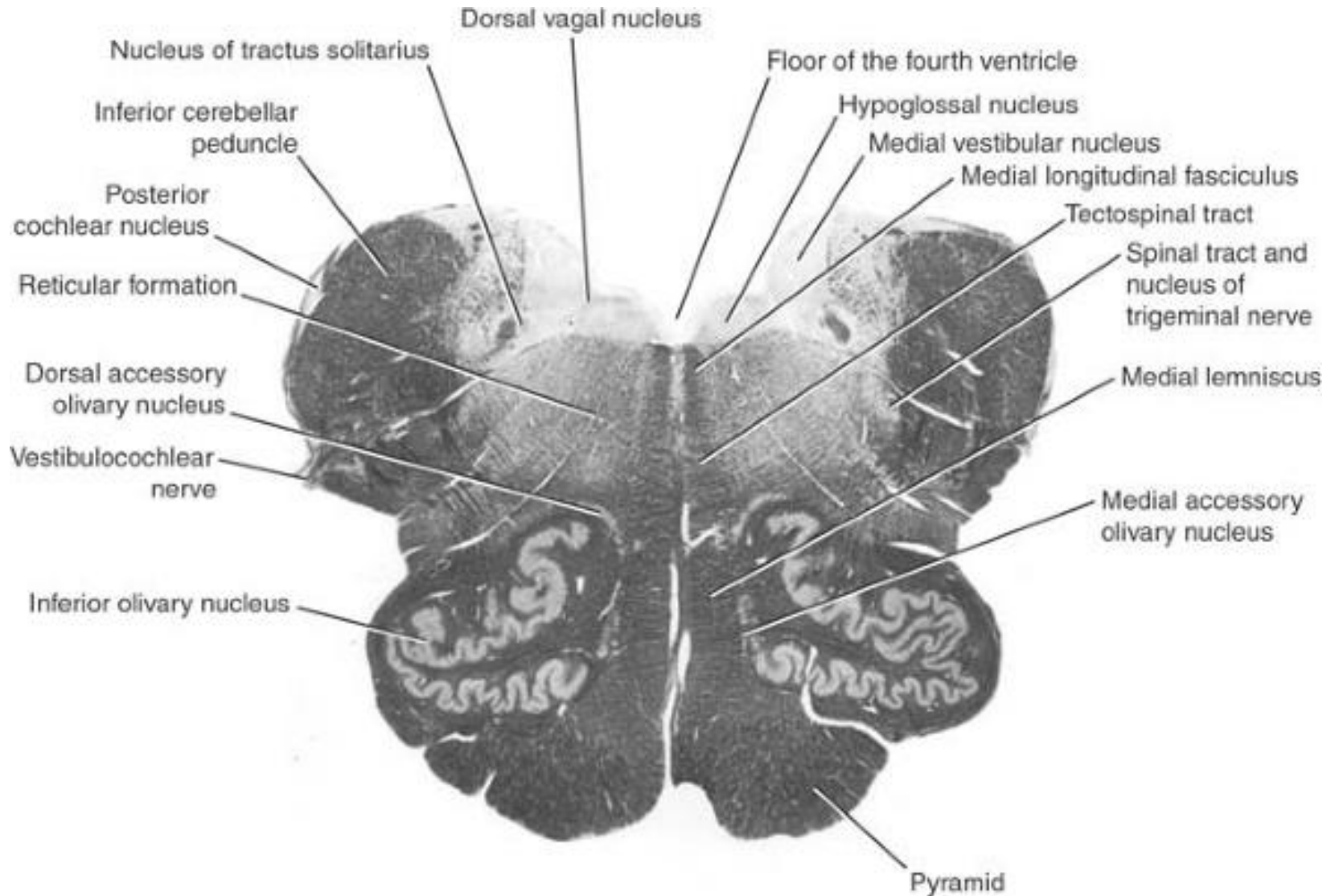
Pons



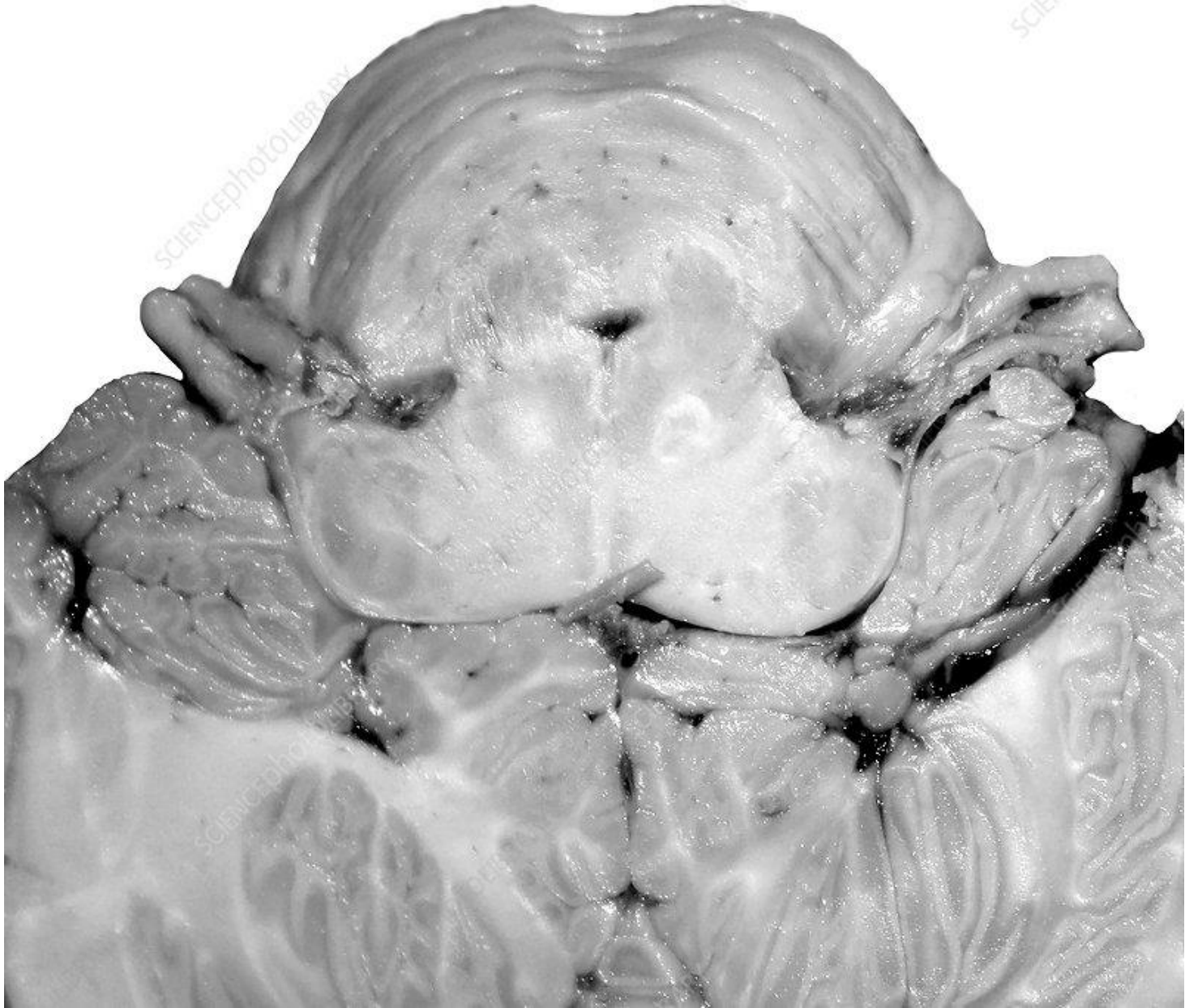
Pons



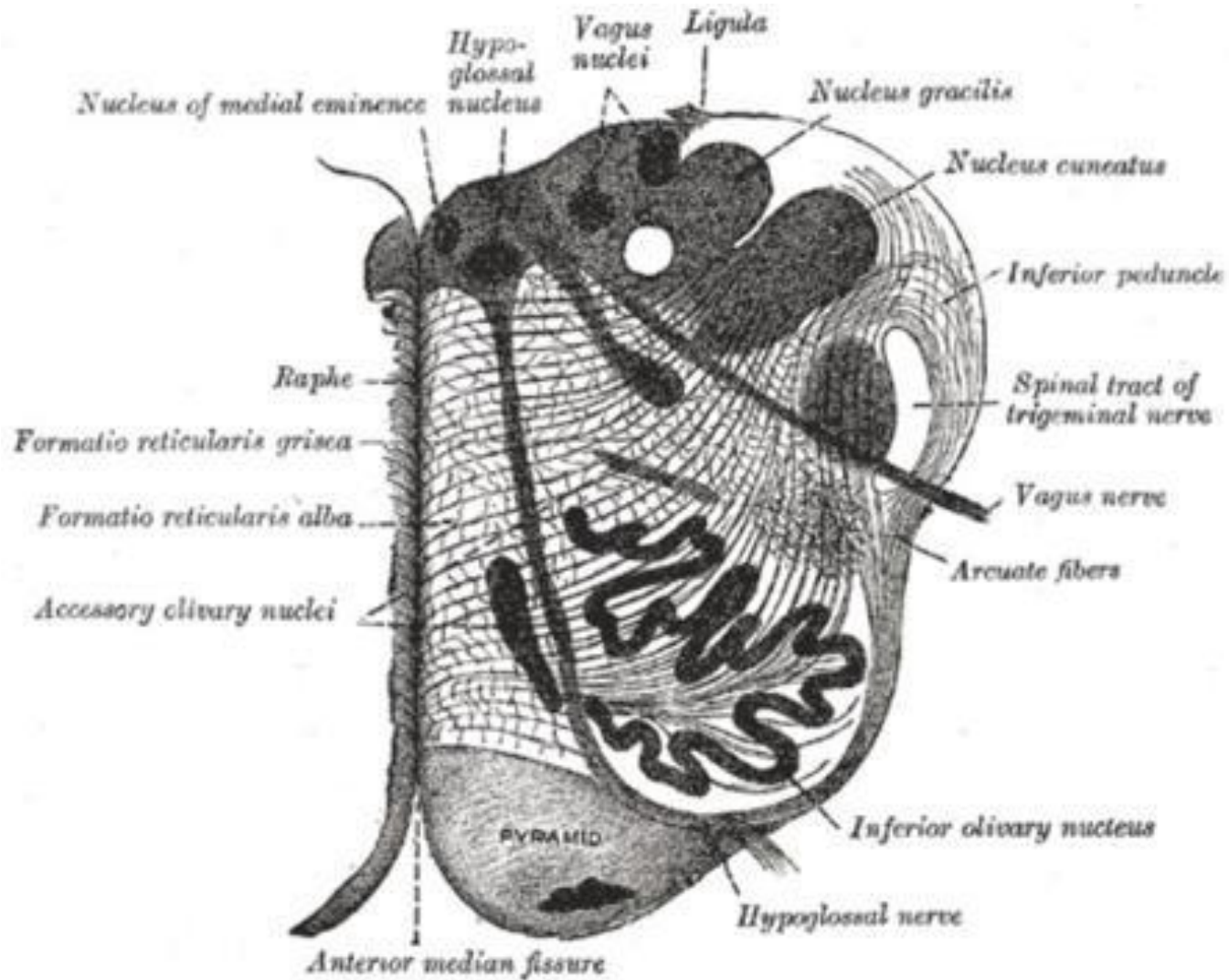
Medulla Oblongata



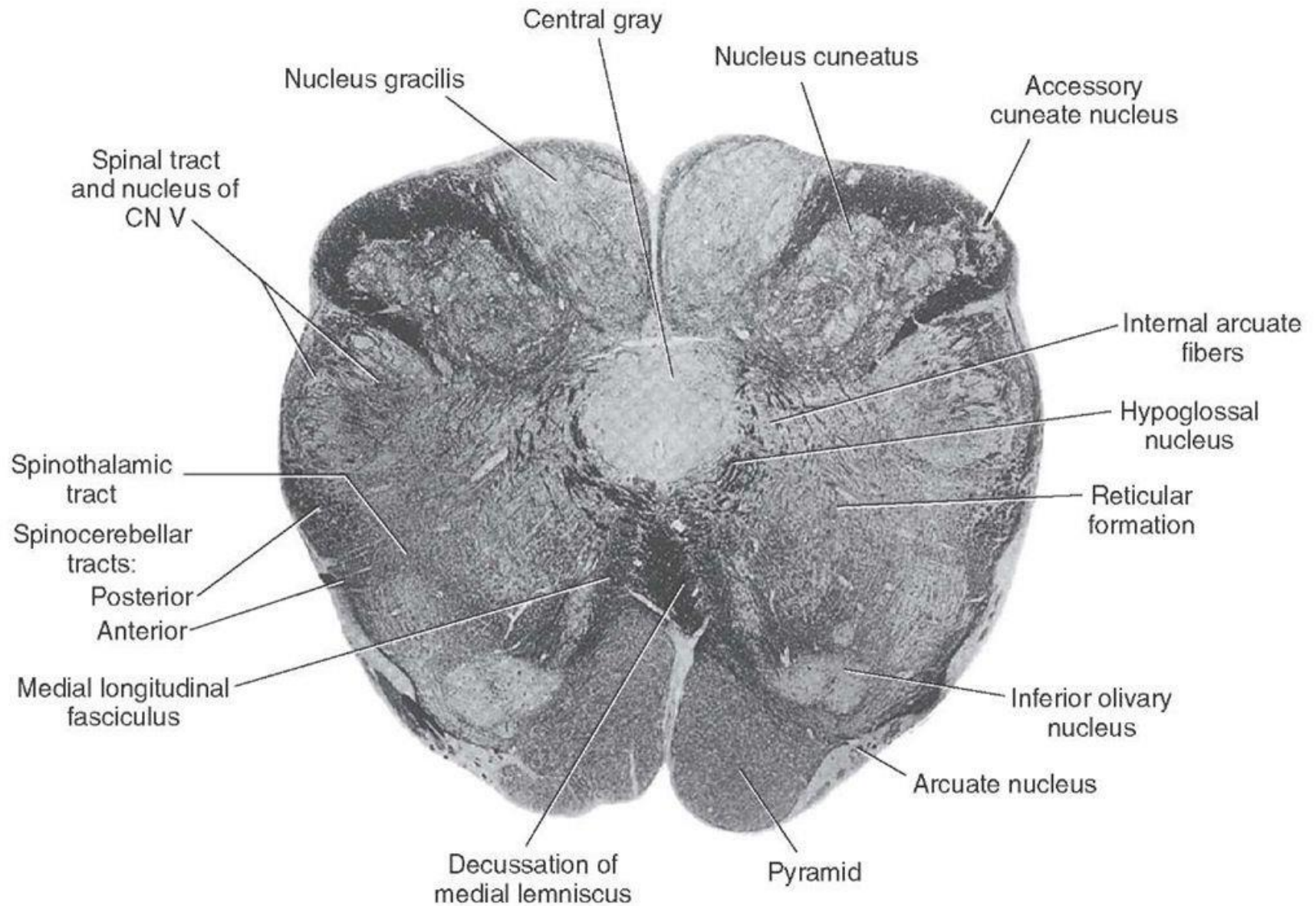
Medulla Oblongata



Medulla Oblongata

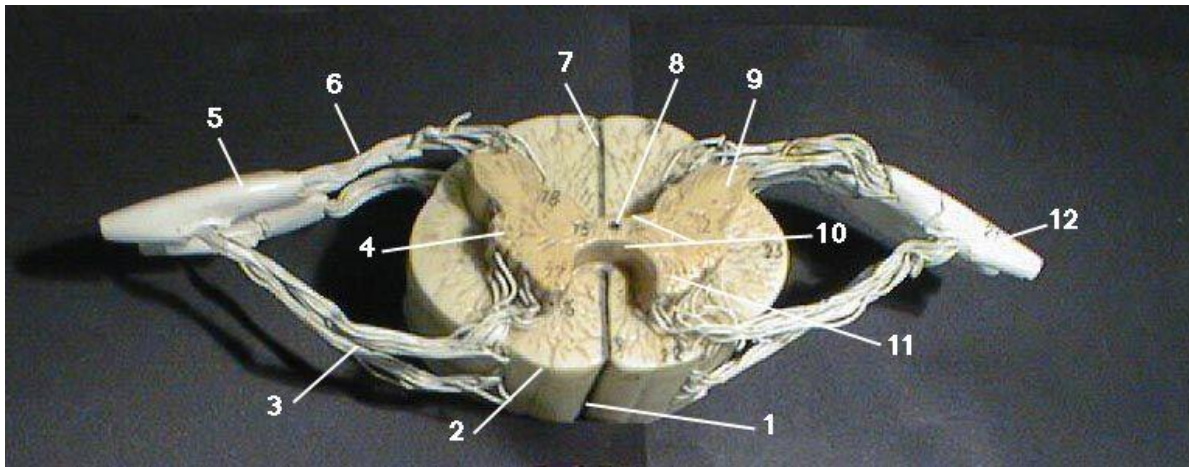


Medulla Oblongata

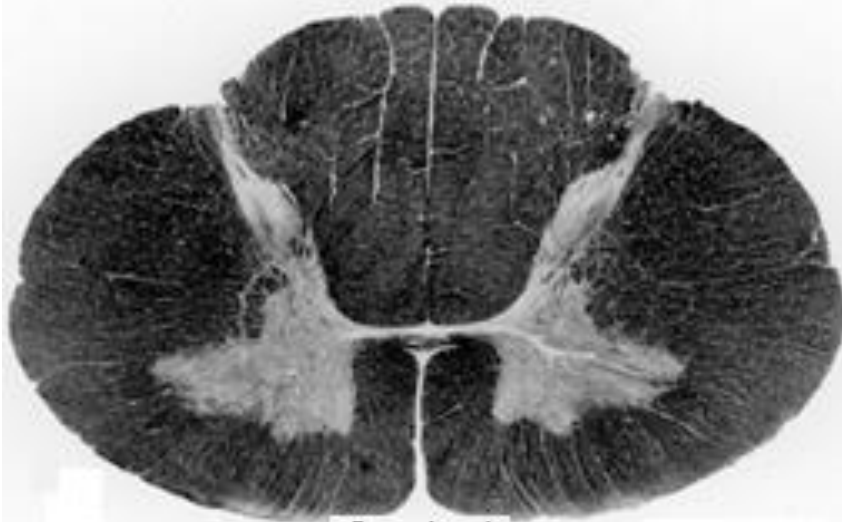


Spinal Cord

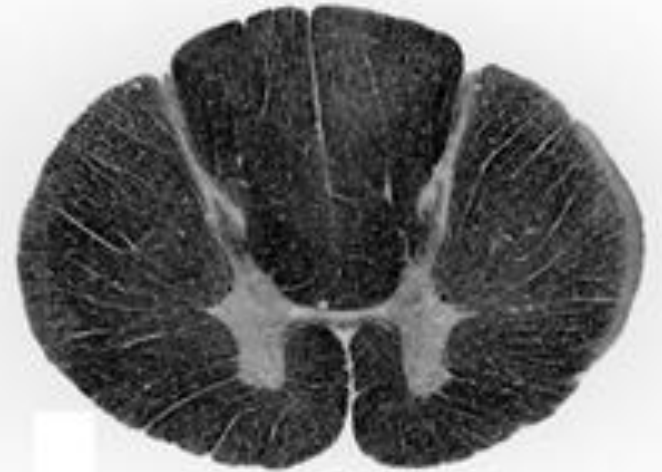
Spinal Cord



Spinal Cord



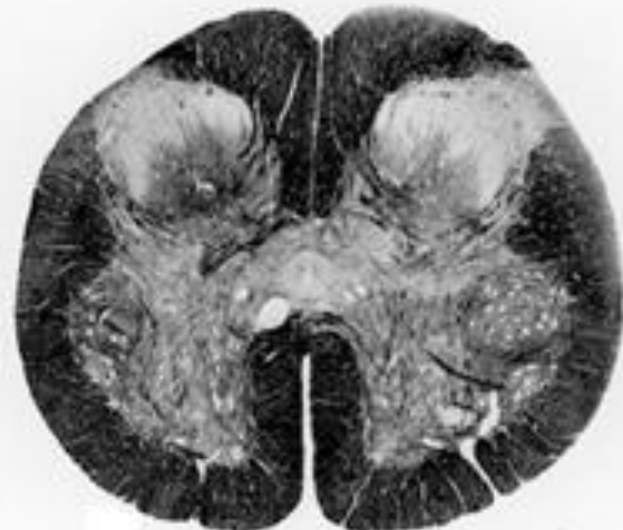
Cervical



Thoracic

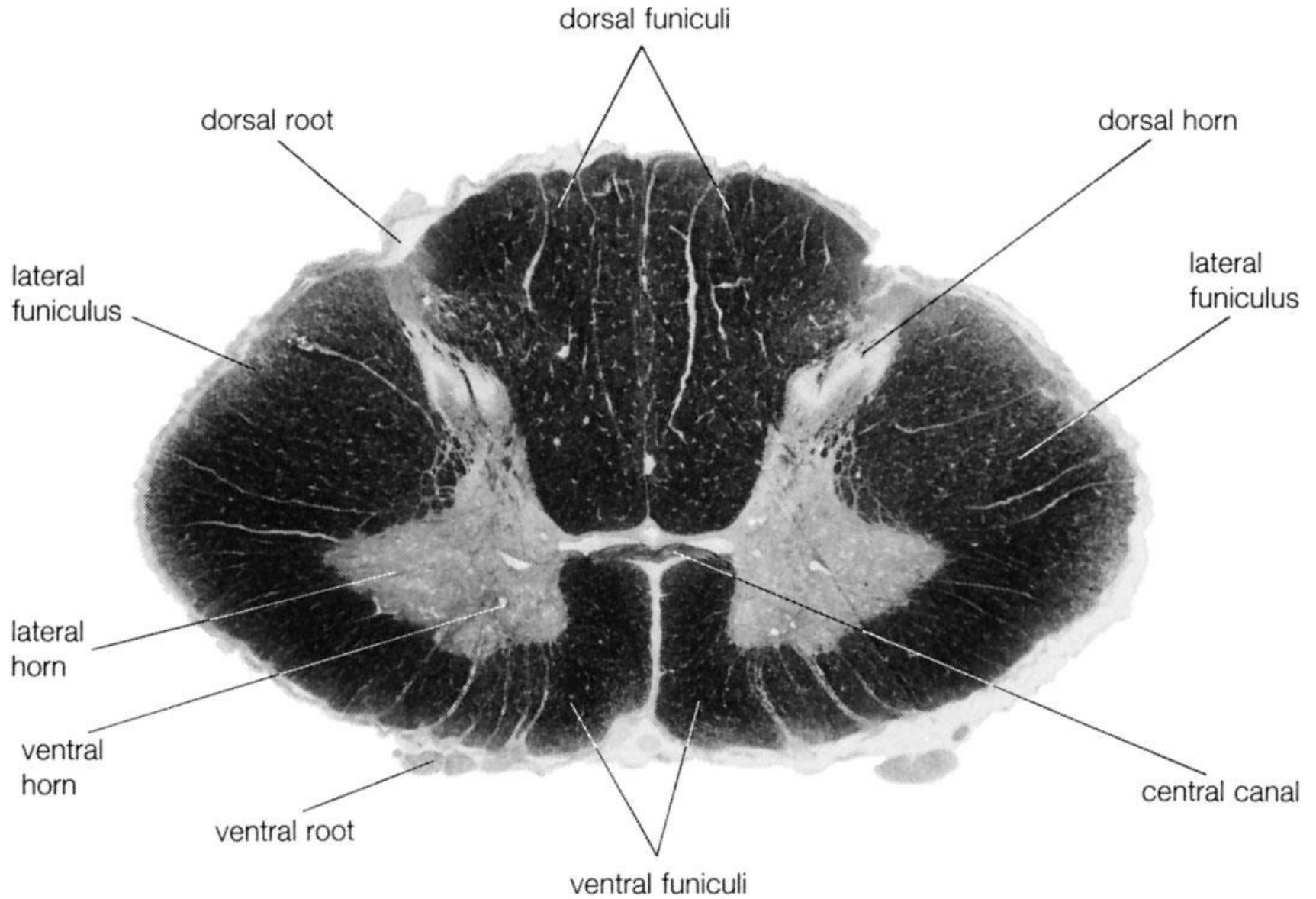


Lumbar

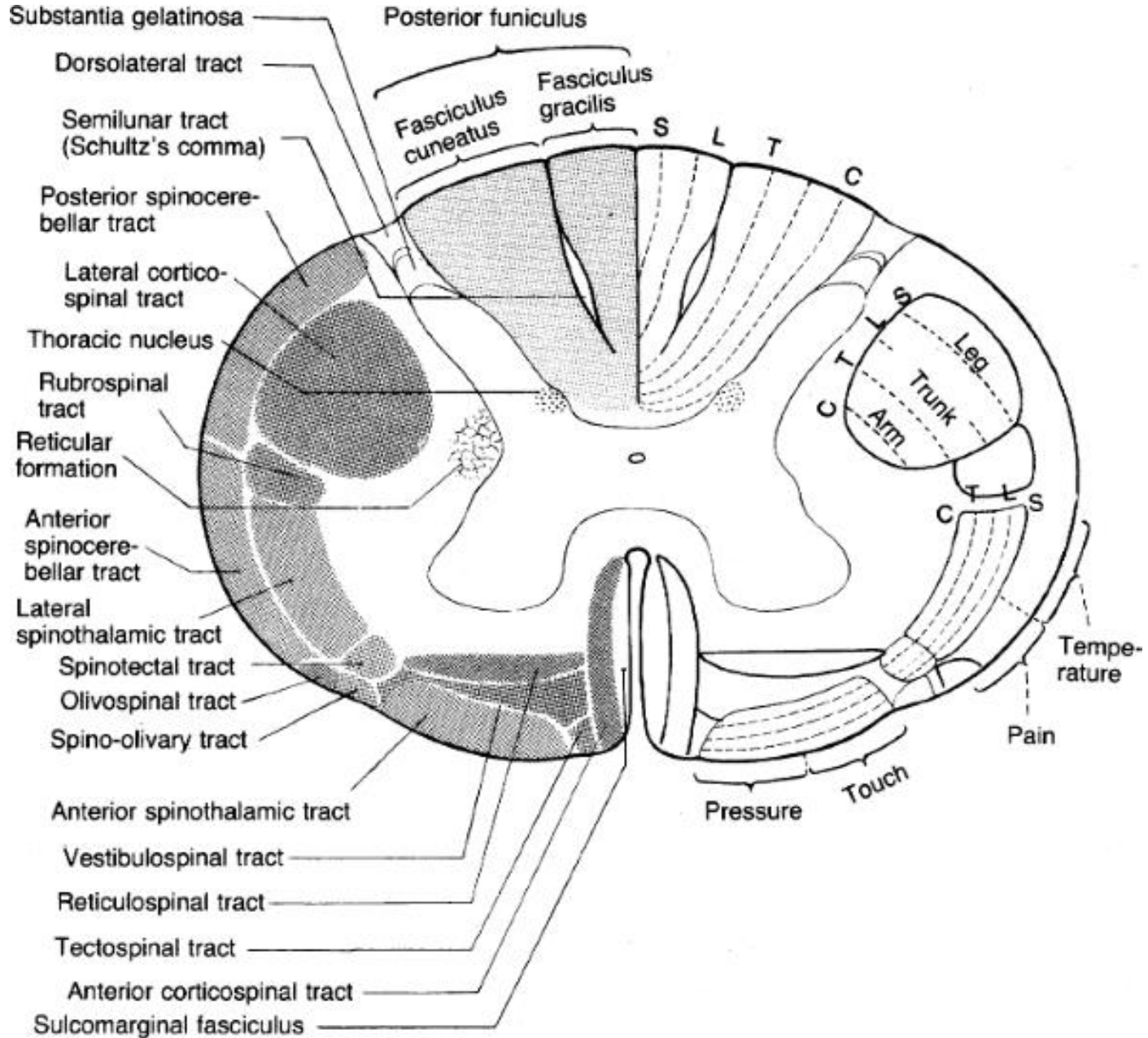


Sacral

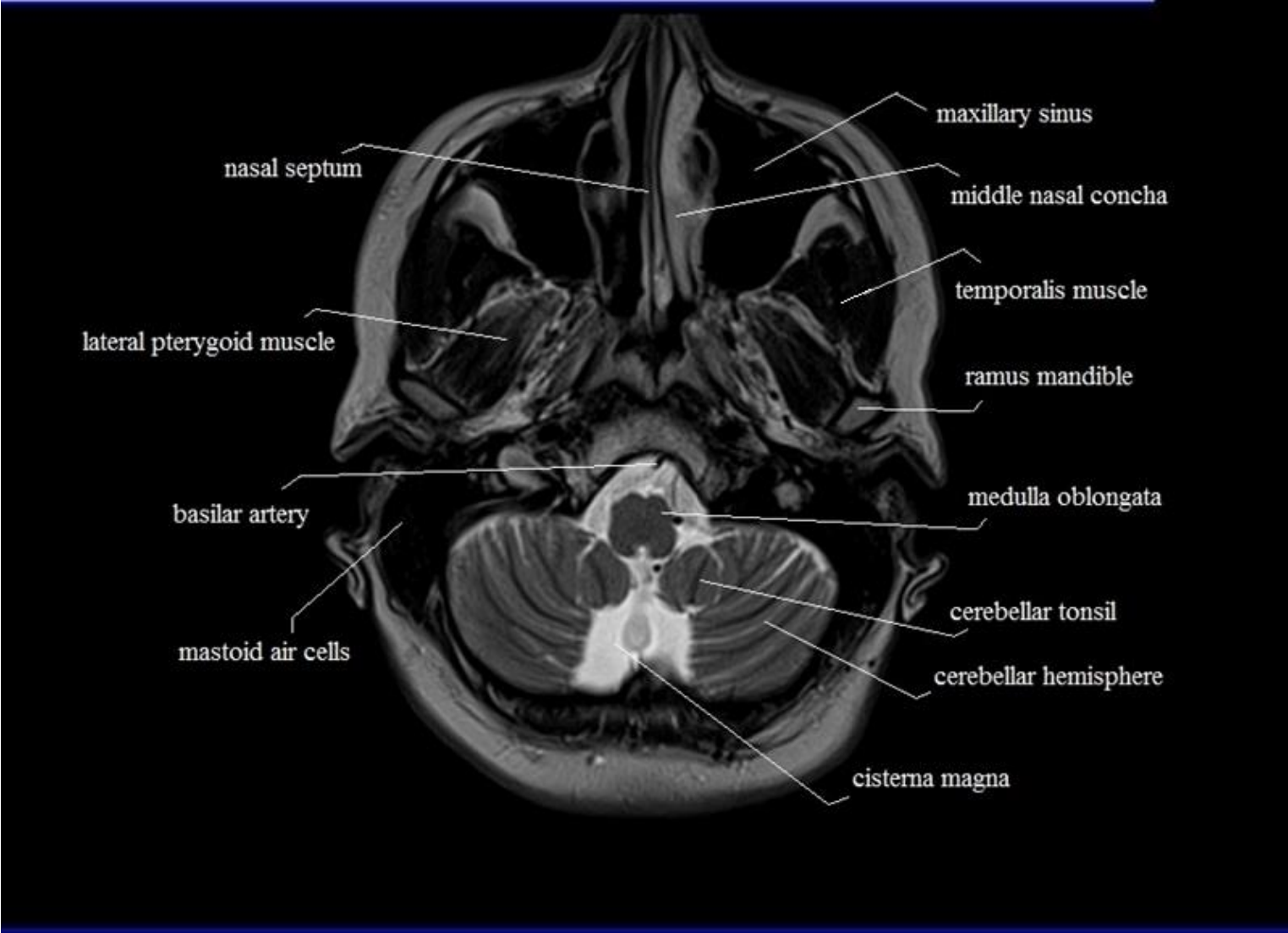
Spinal Cord

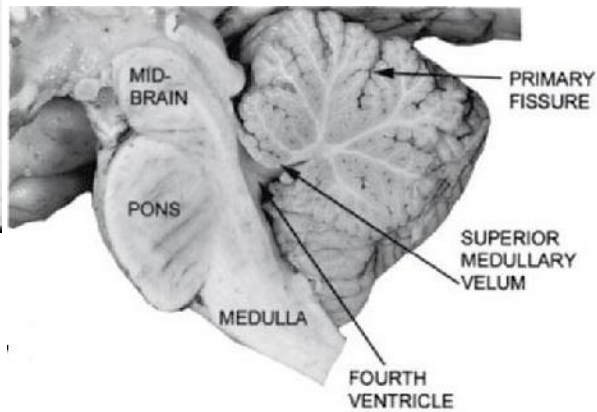
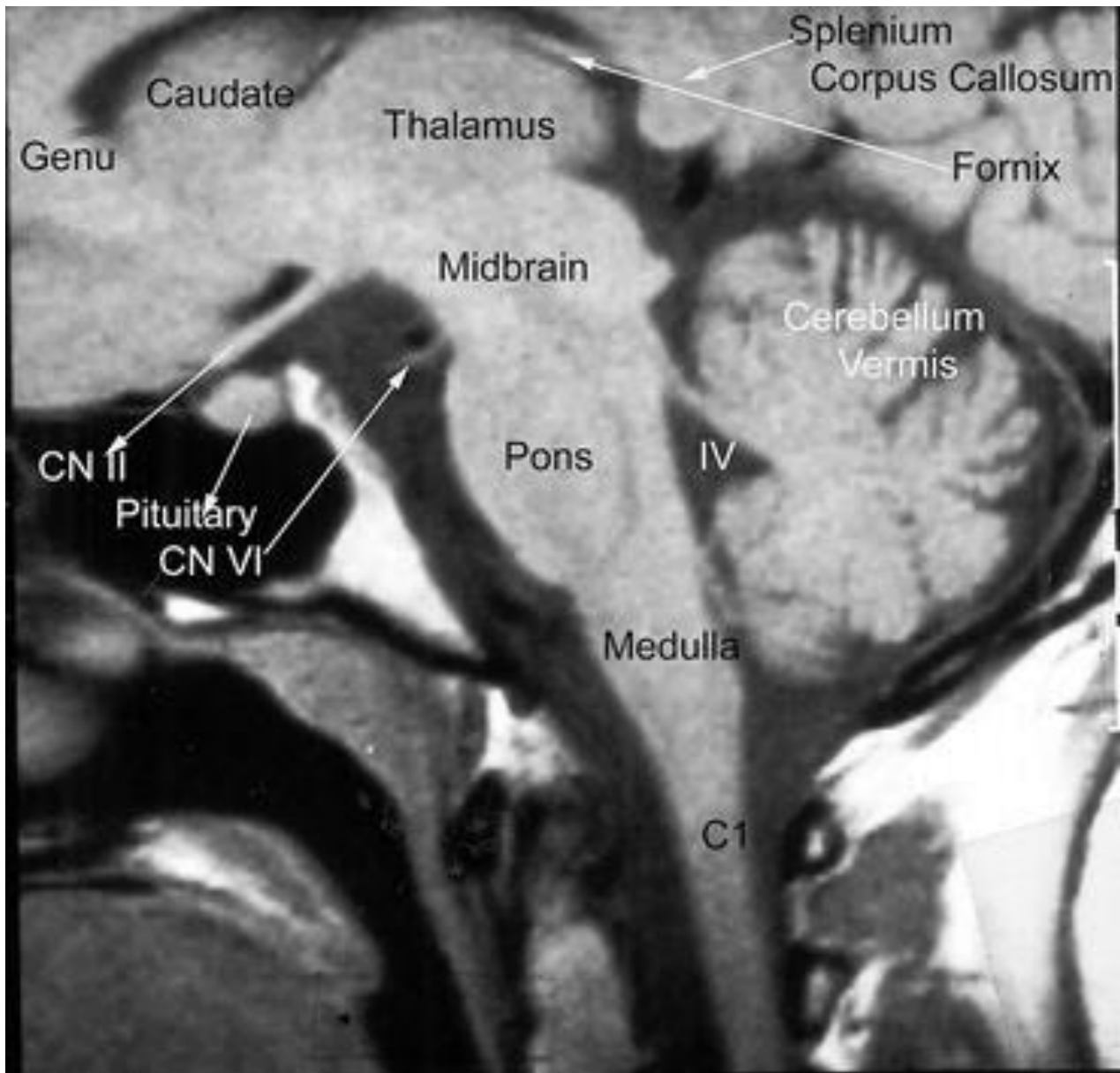


Spinal Cord

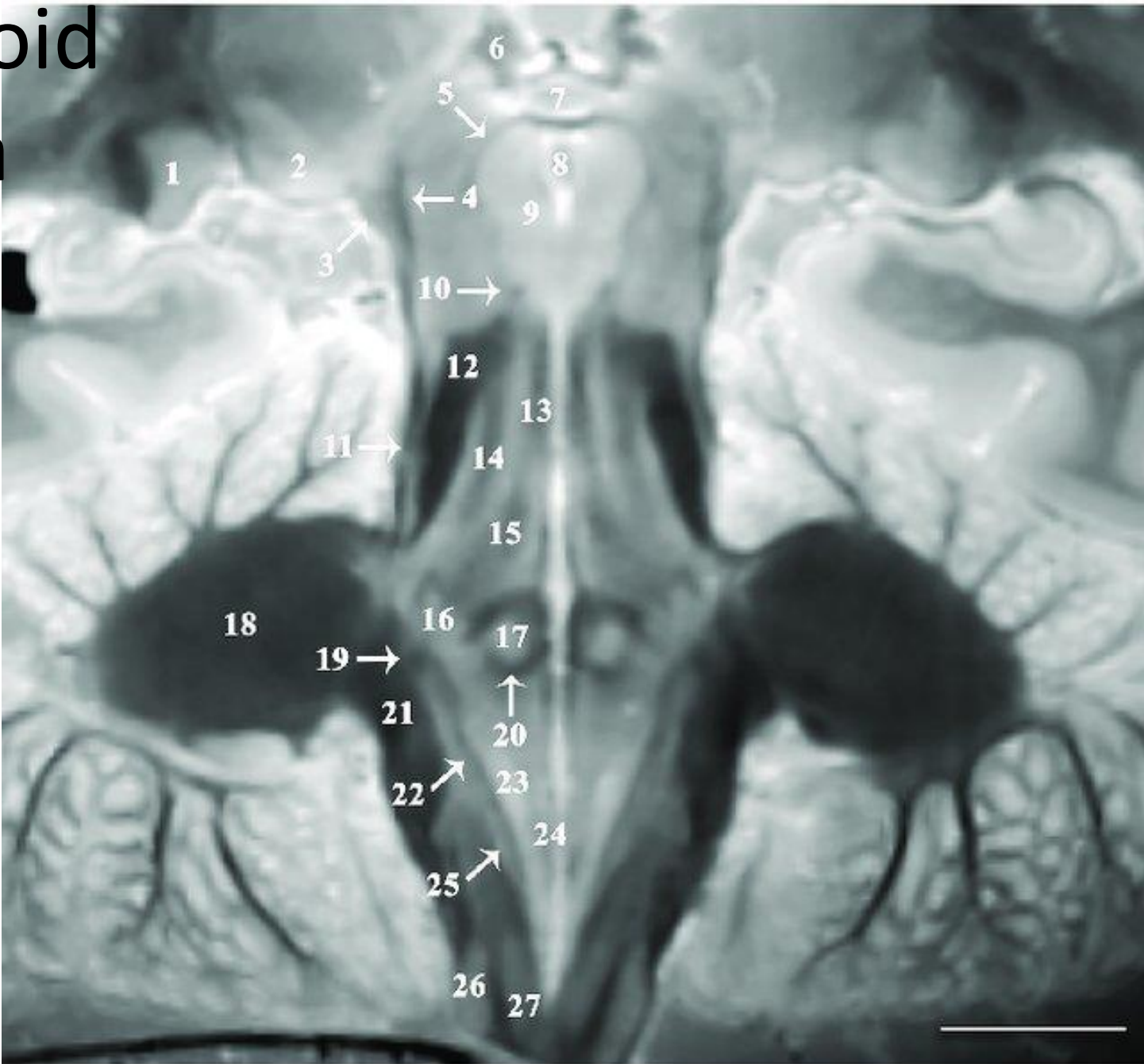


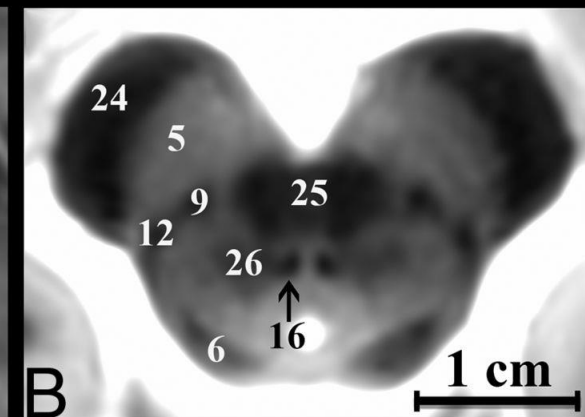
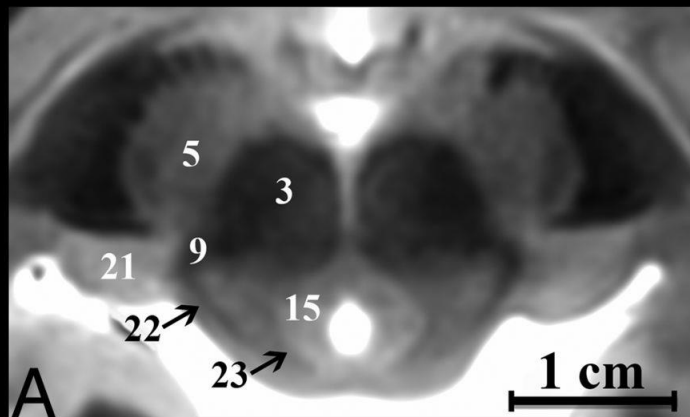
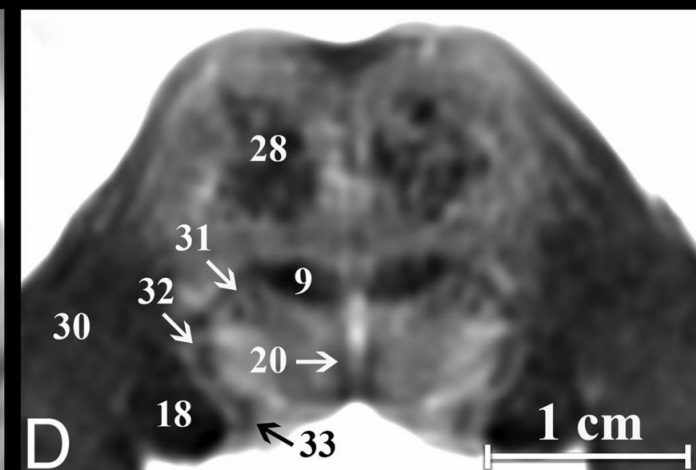
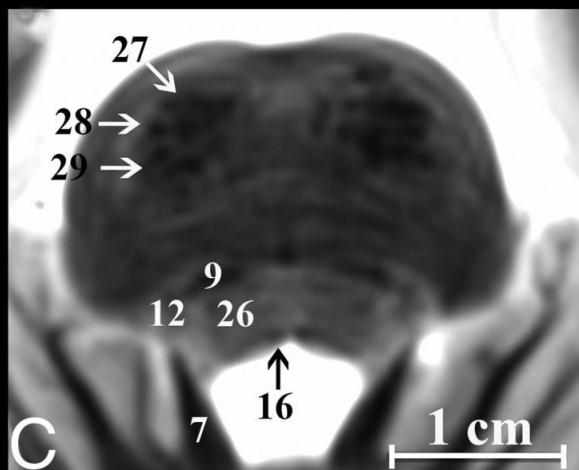
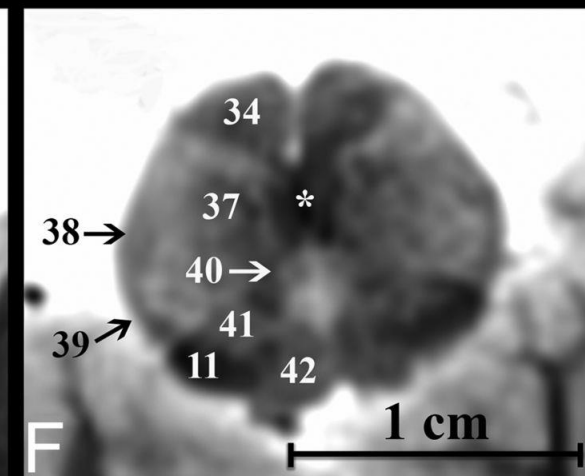
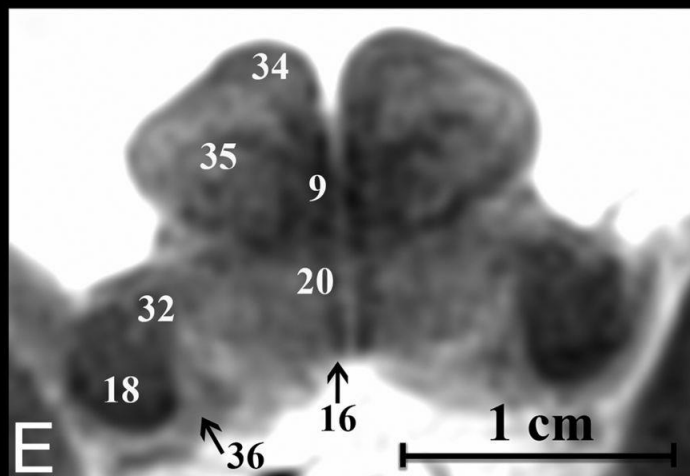
MRI

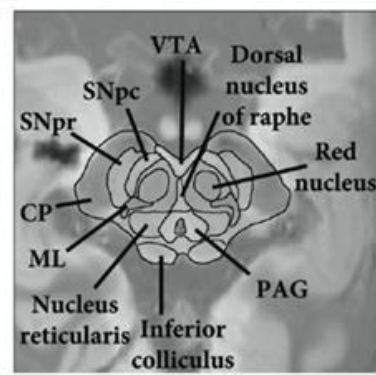
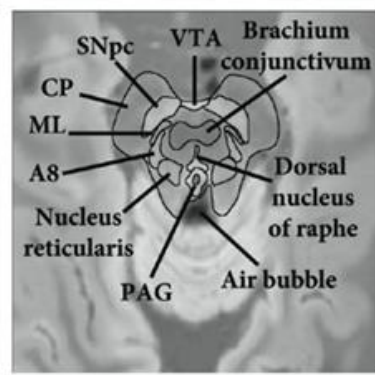
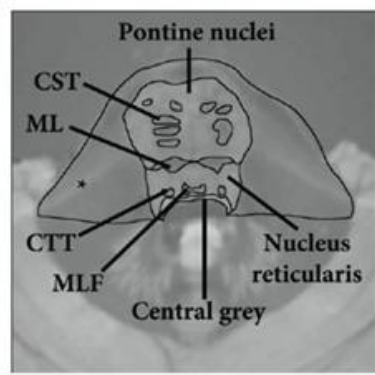
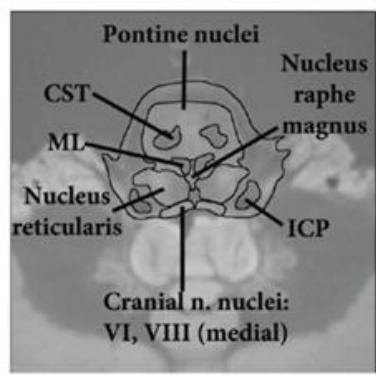
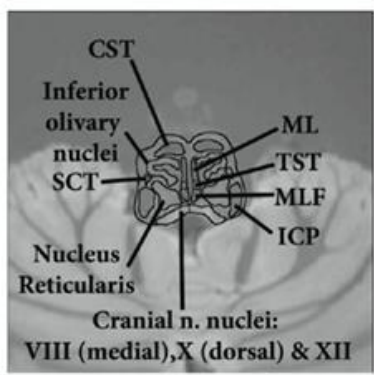
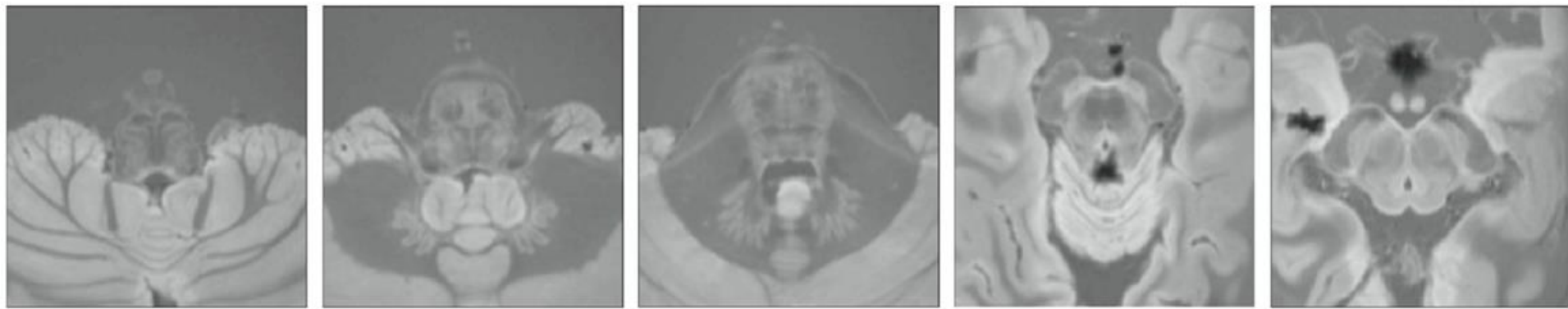
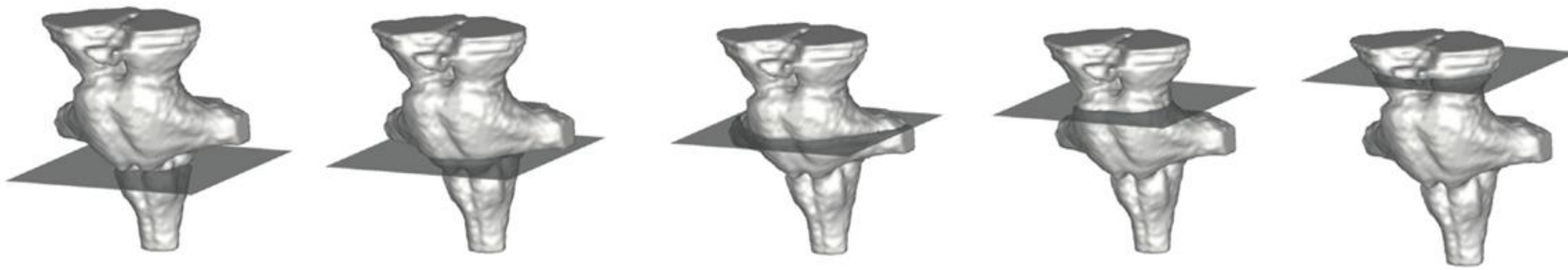




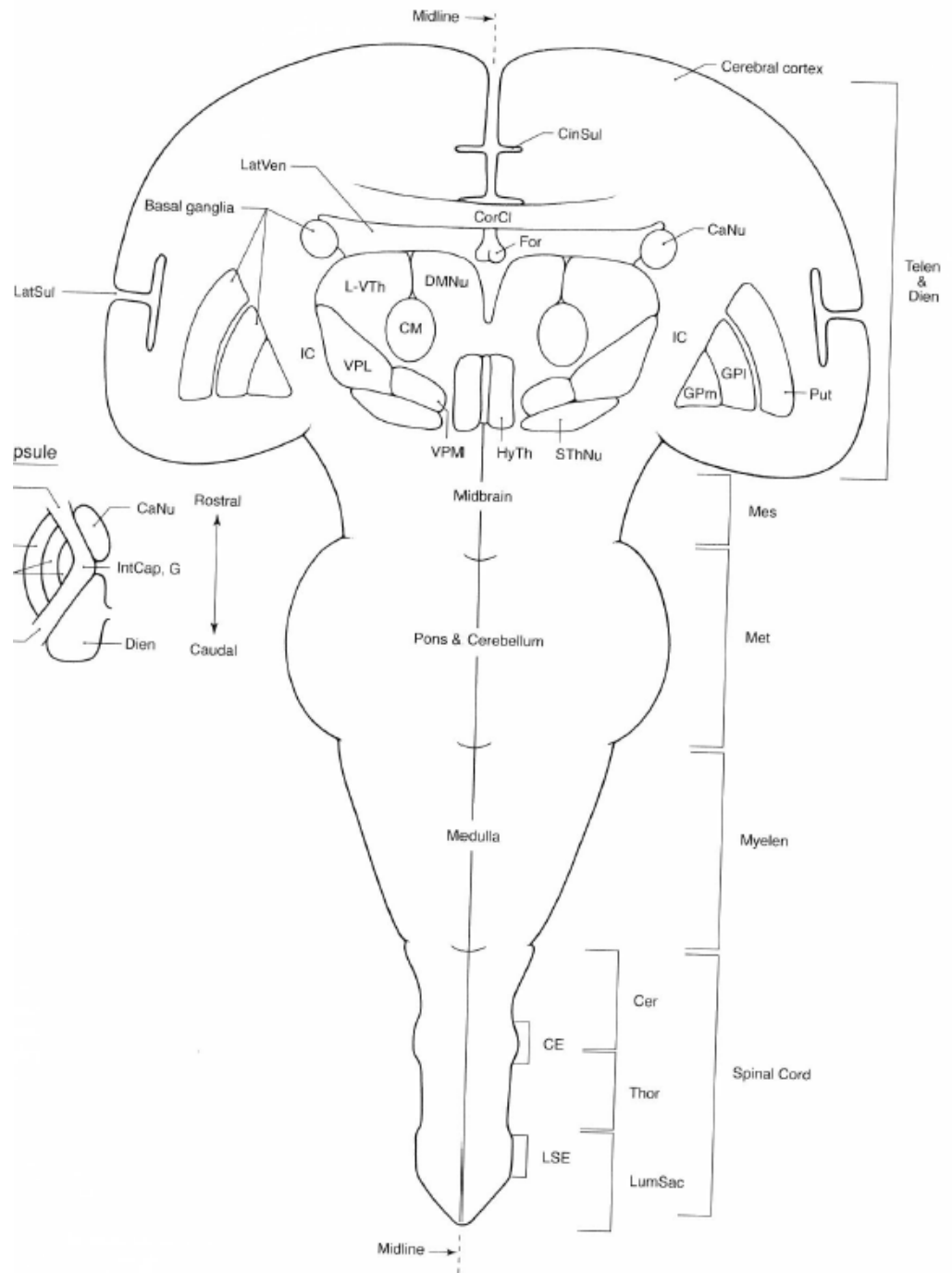
Rhomboid Fossa

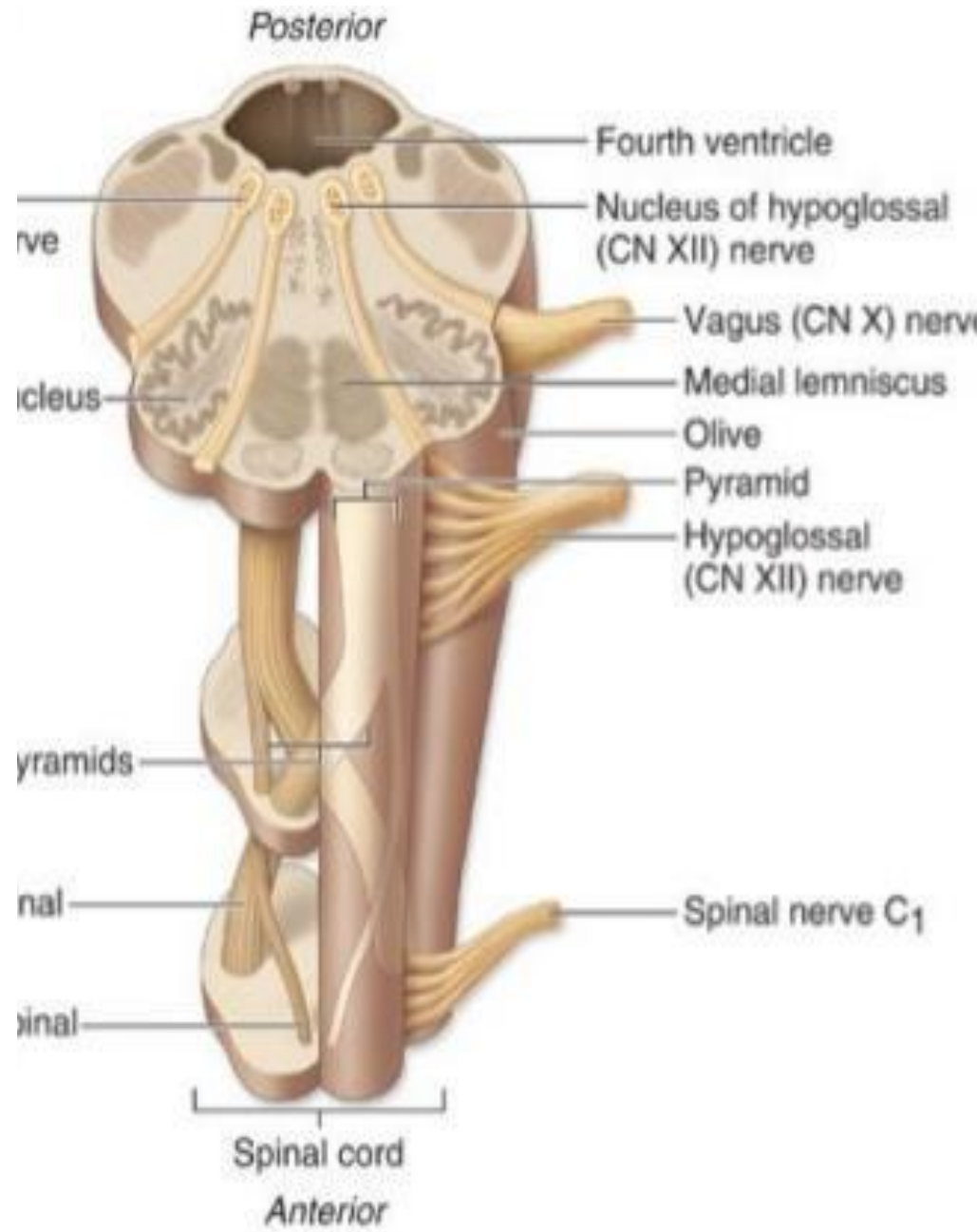
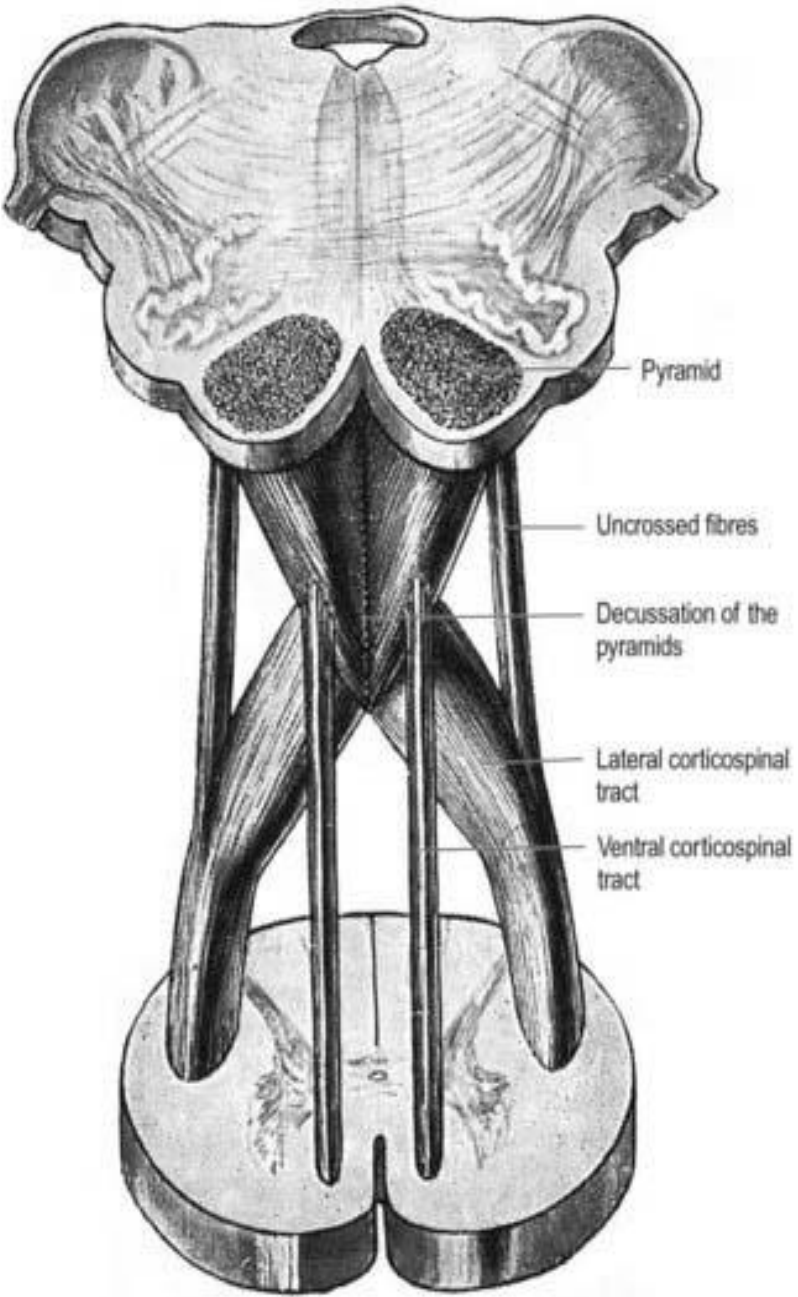


Cranial**Caudal****M
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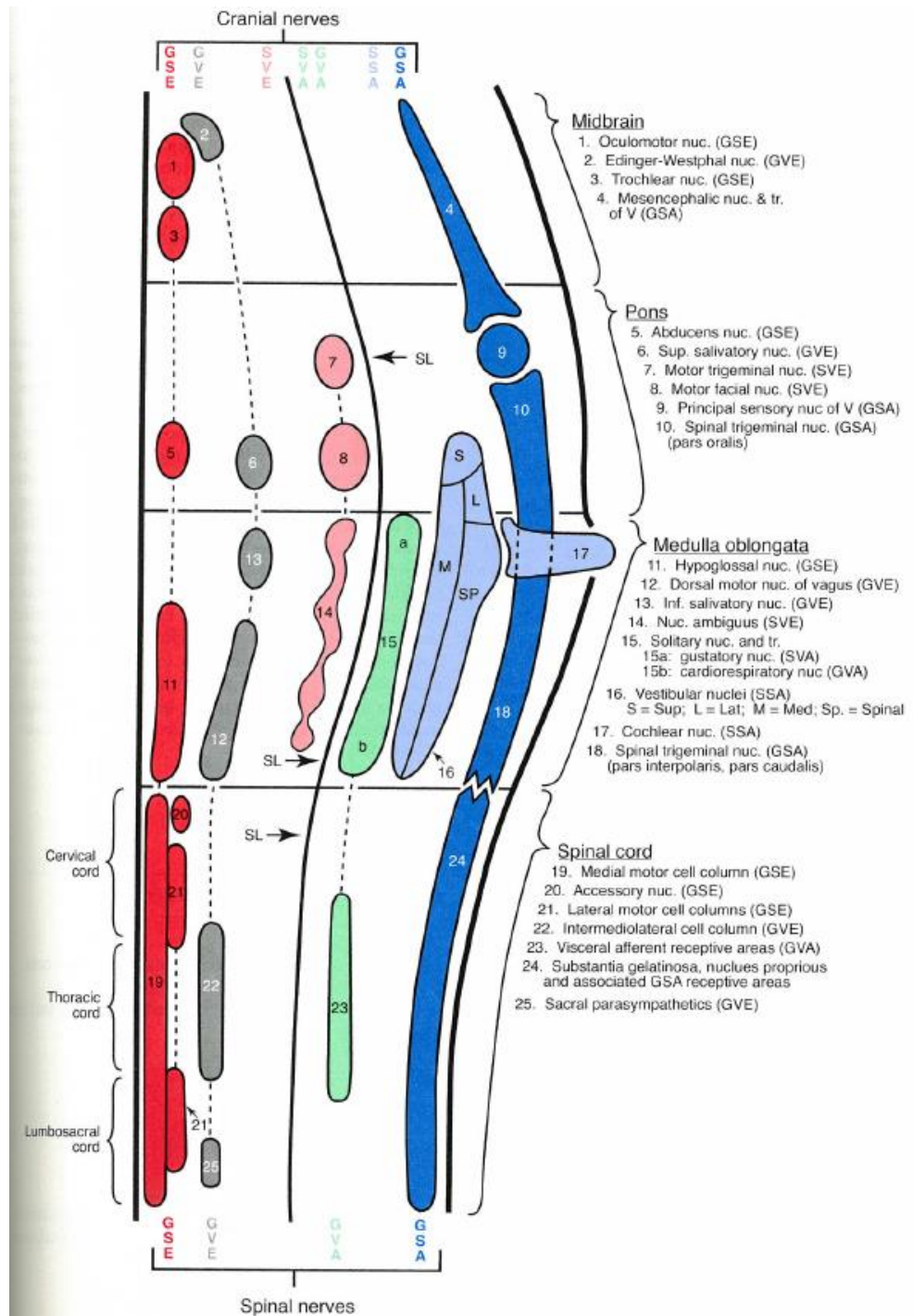


TRACTS

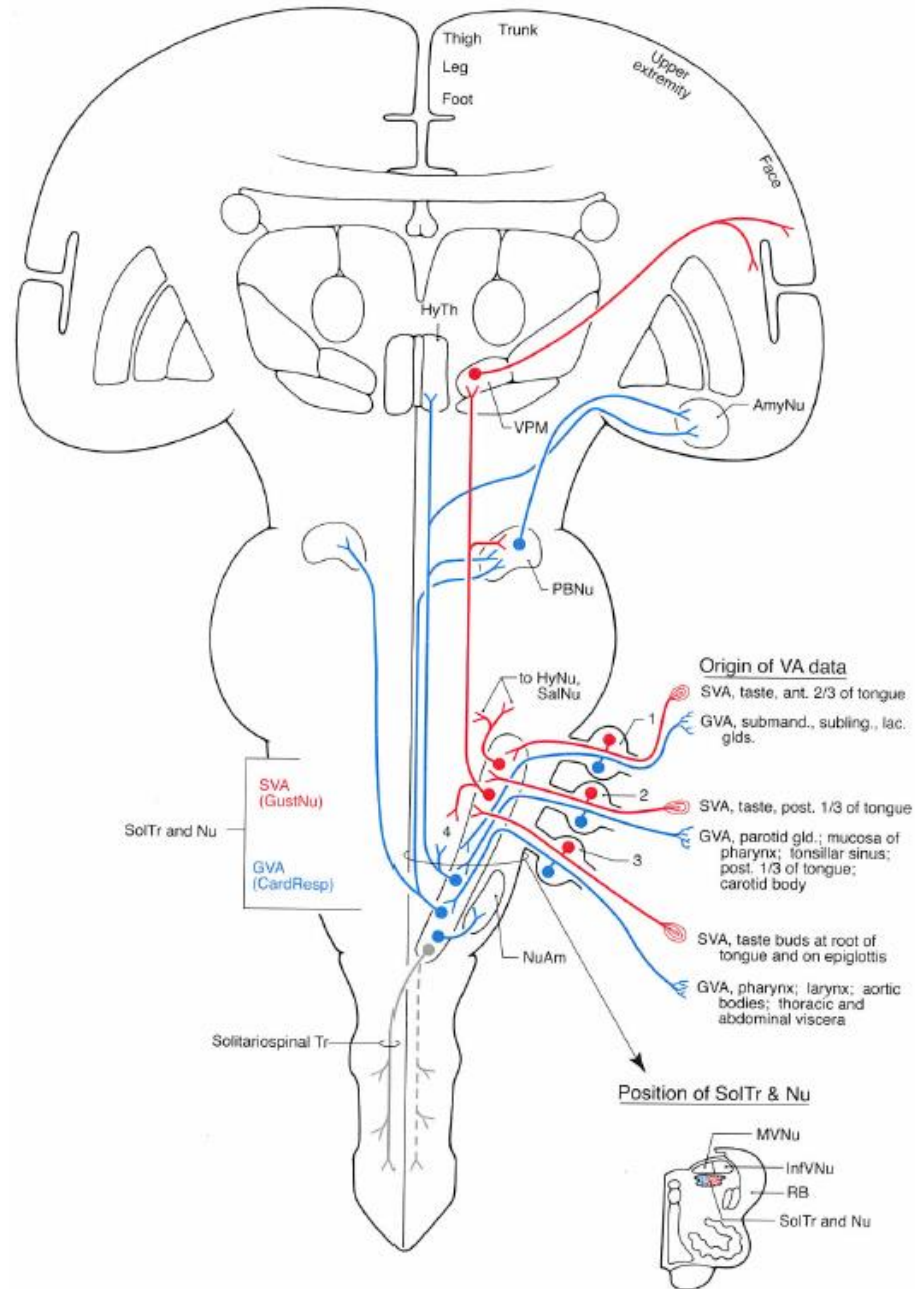




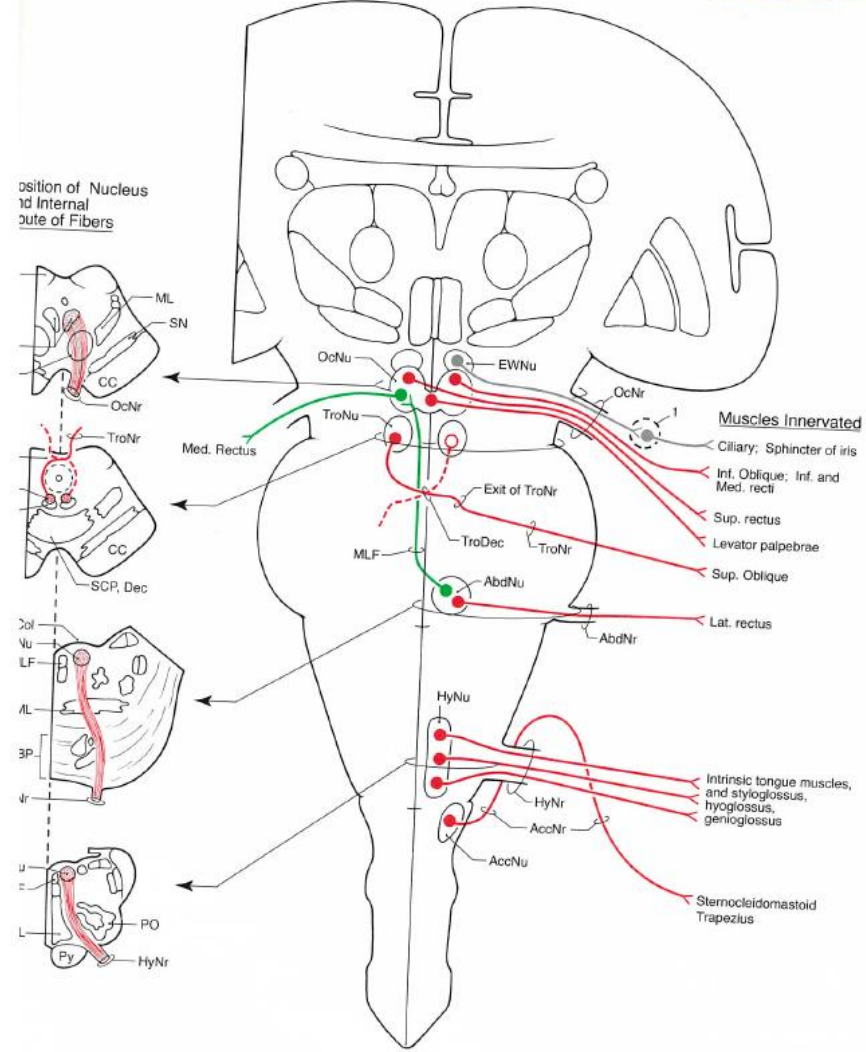
CNS Nuclei



8-11 Solitary Pathways in Anatomical Orientation



III, IV, VI, XI - AccNu, and XII) in Anatomical Orientation



Cranial Nerve Efferents (III, IV, VI, and XII) in Clinical Orientation: Representative Lesions and Deficits

Damage to oculomotor root

- Paralysis of most eye movement on left, eye oriented down and out; superior oblique and lateral rectus preserved
- Ptosis of left upper eyelid
- Left pupil dilated, diplopia

Oculomotor deficits from other causes

- Cerebral peduncle/Weber syndrome on left = left-sided oculomotor paralysis; right-sided hemiplegia of UE, LE; paralysis of lower face on right; deviation of tongue to right on protrusion
- Red nucleus/Claude syndrome on left = left-sided oculomotor paralysis; right-sided loss of proprioception, discriminative touch, vibratory sense on UE; right-sided akinesia (substantia nigra); right-sided akinesia (substantia nigra)
- Benedikt syndrome = Weber + Claude

Damage to trochlear root

- Paralysis of left superior oblique muscle
- Diplopia, head-tilt to healthy right side

Lesion in medial longitudinal fasciculus

- Lesion on left = left internuclear ophthalmoplegia (INO)

Damage to abducens root

- Paralysis of left lateral rectus muscle
- Diplopia on left lateral gaze

Abducens deficits from other causes

- Caudal pontine base/Foville syndrome on left = paralysis of left lateral rectus; right-sided hemiplegia UE, LE; diplopia
- Lesion of facial colliculus on left = paralysis of facial ms. on left and left gaze palsy consisting of paralysis of left lateral rectus muscles and right internuclear ophthalmoplegia
- Lesion of abducens nucleus + adjacent MLF = one-and-a-half syndrome

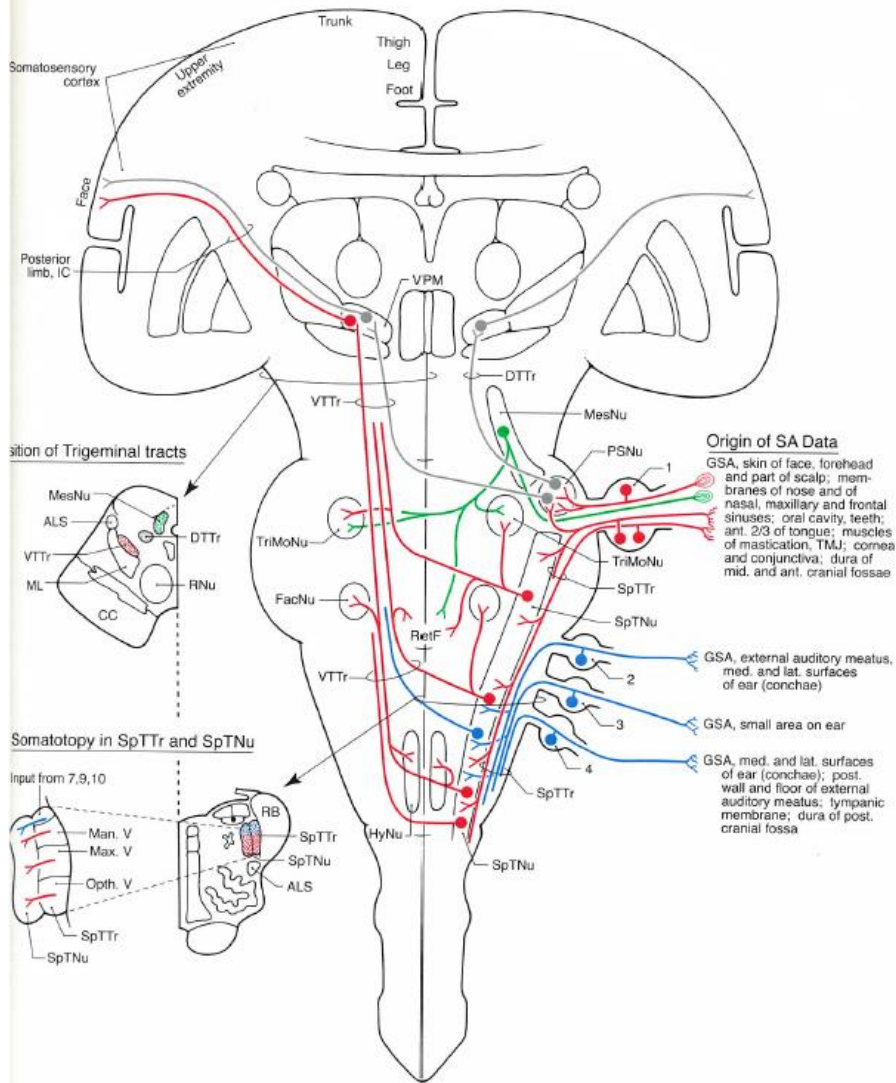
Damage to hypoglossal root

- Deviation of the tongue to the left on protrusion

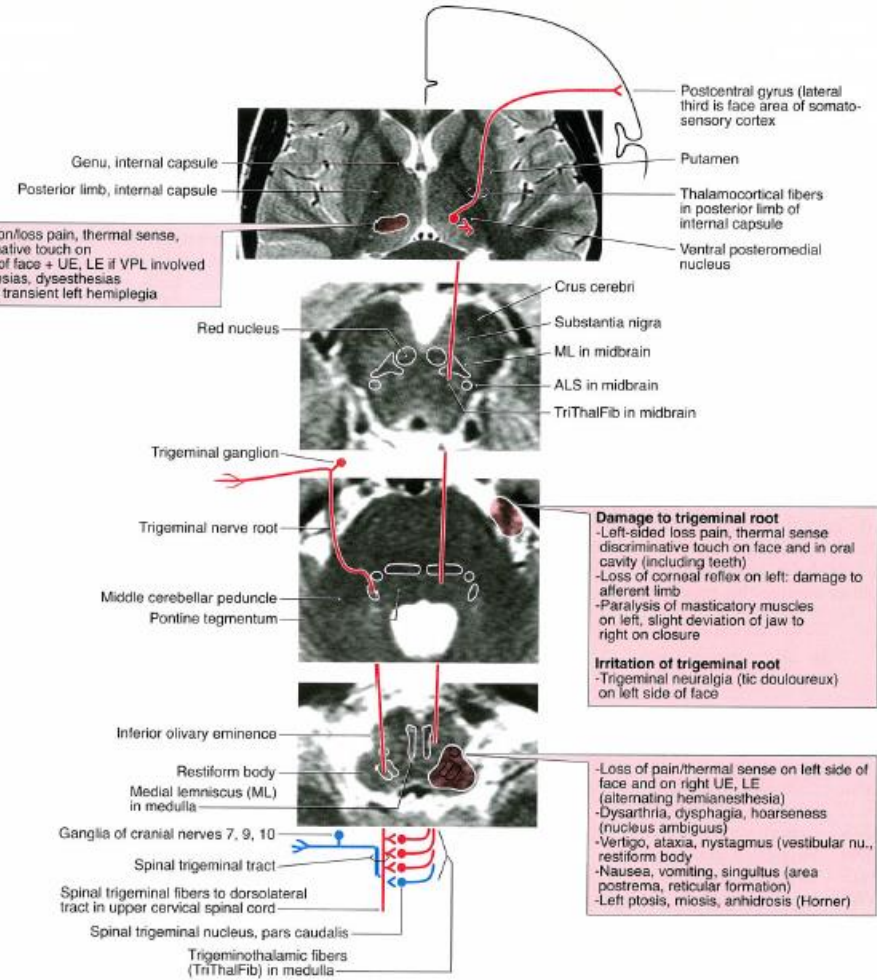
Hypoglossal deficits from other causes

- Medial medullary/Dejerine syndrome on left = deviation of the tongue to the left on protrusion; right-sided hemiplegia; right-sided loss of proprioception, discriminative touch, vibratory sense on UE, LE
- Lesion of genu of internal capsule on right = deviation of the tongue to left on protrusion

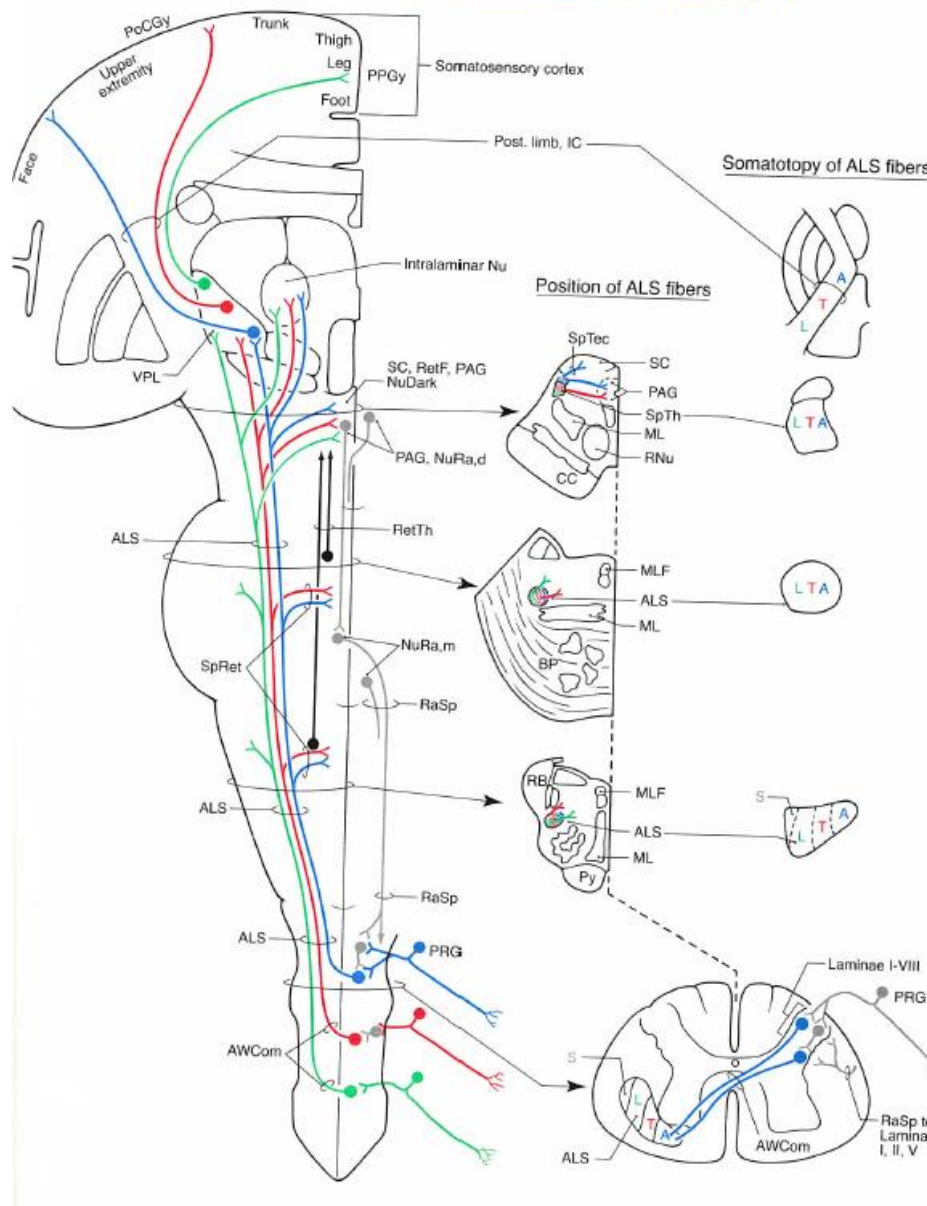
8-9 Trigeminal Pathways in Anatomical Orientations



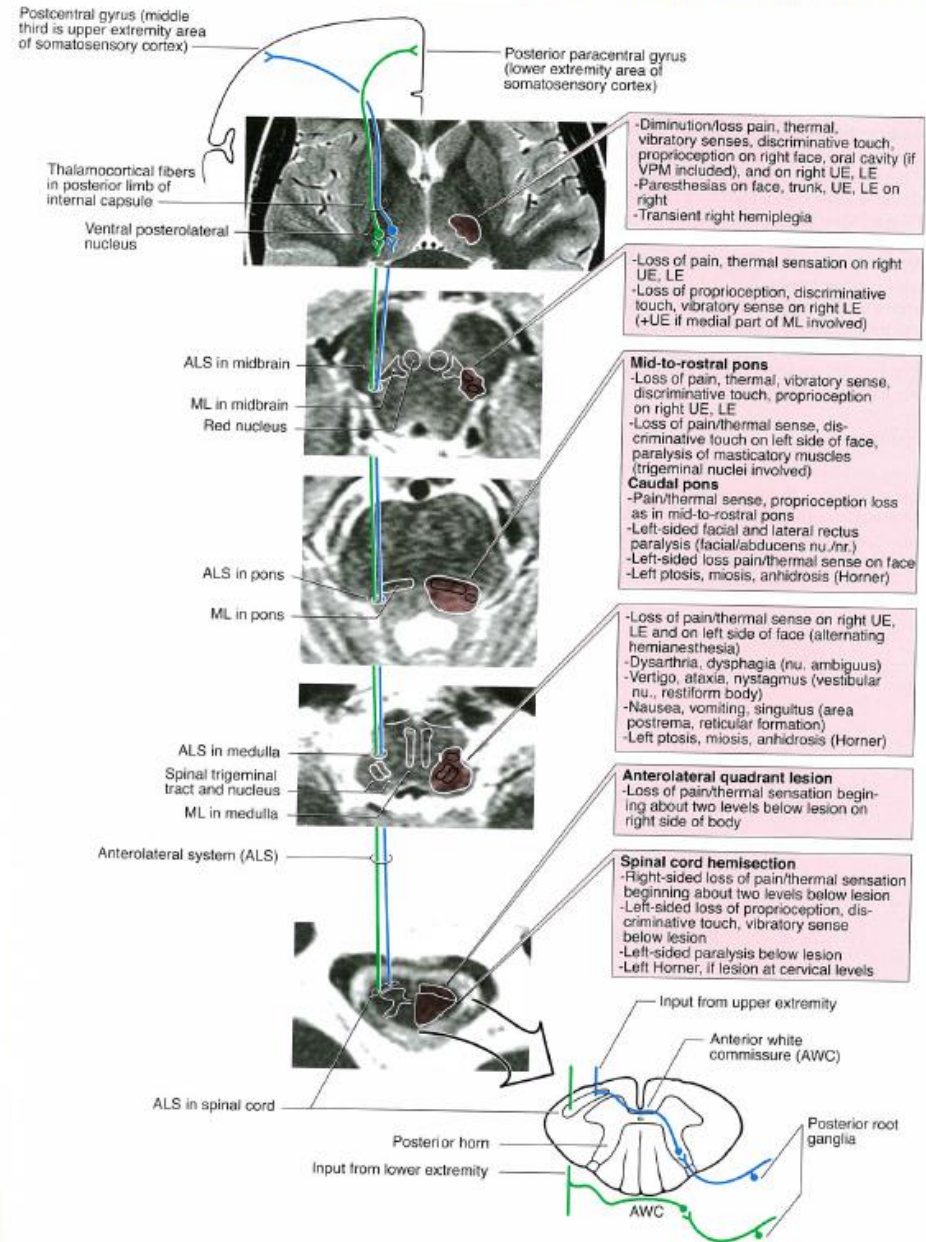
Trigeminal Pathways in Clinical Orientation: Representative Lesions and Deficits



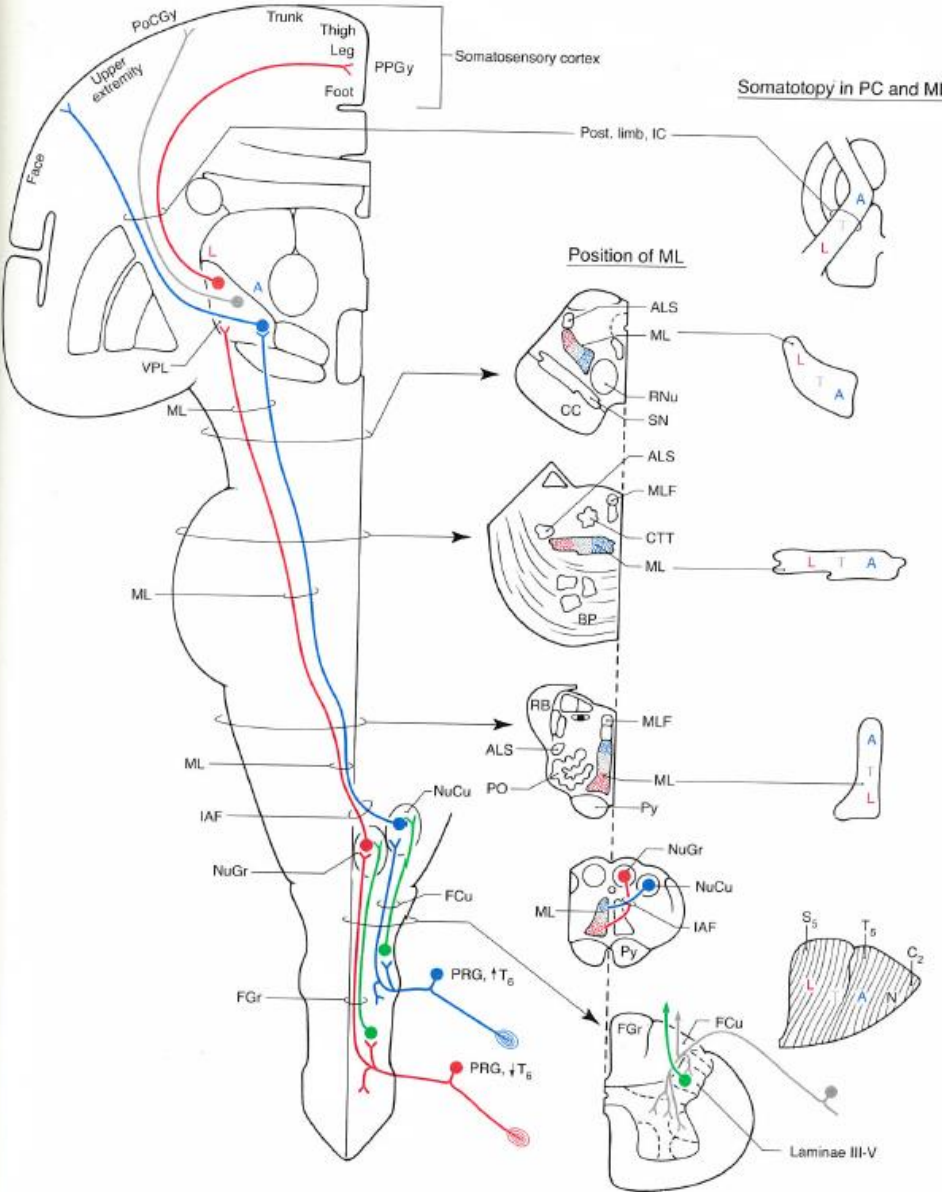
8-6 Anterolateral System in Anatomical Orientation



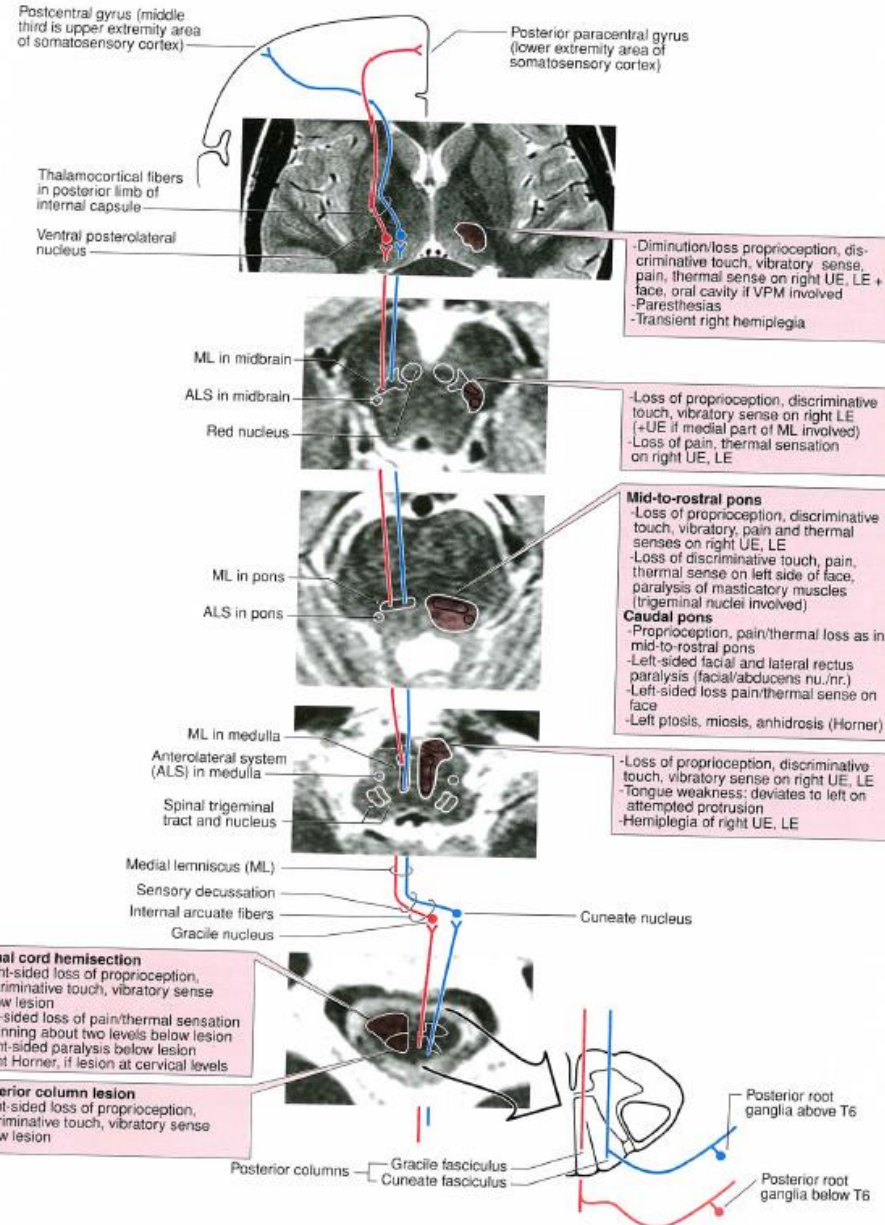
Anterolateral System in Clinical Orientation: Representative Lesions and Deficits



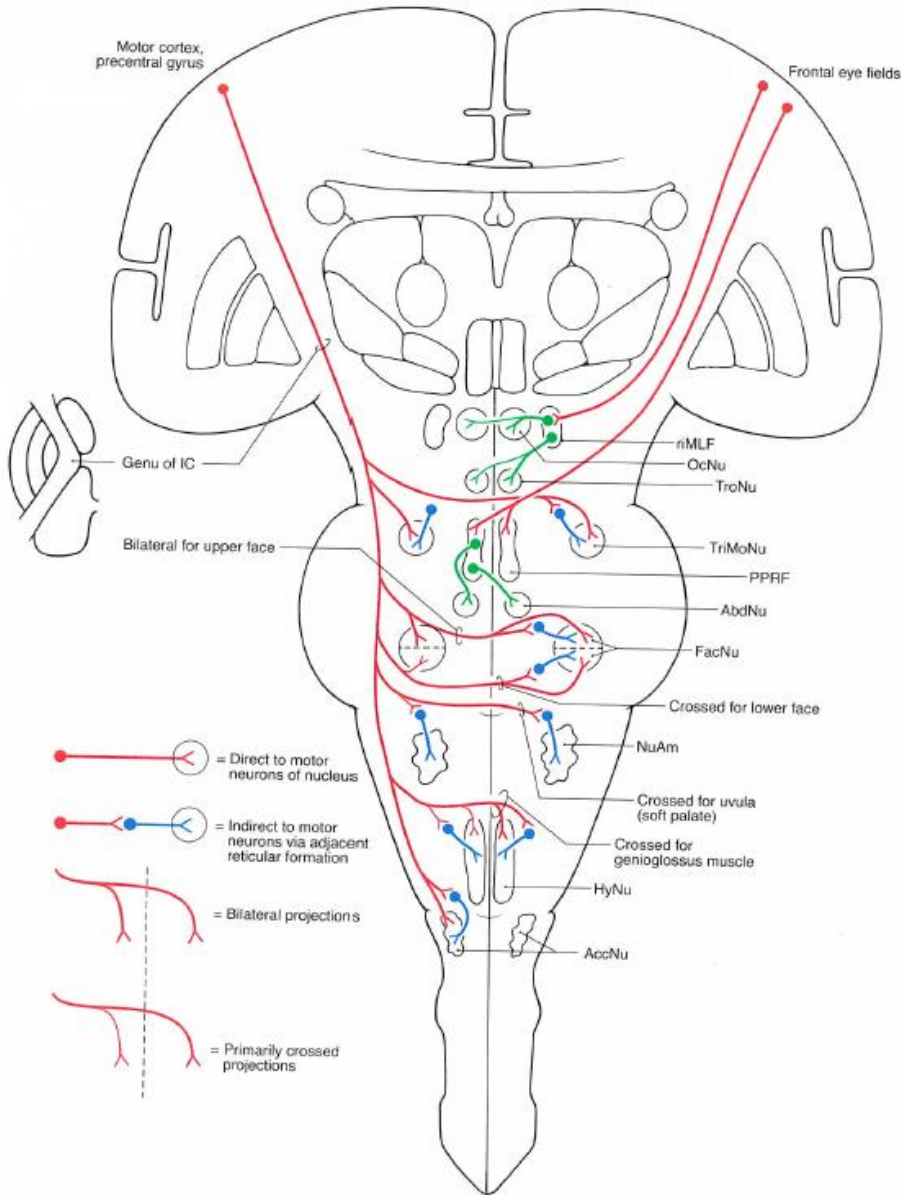
84 Posterior (Dorsal) Column-Medial Lemniscus System in Anatomical Orientation



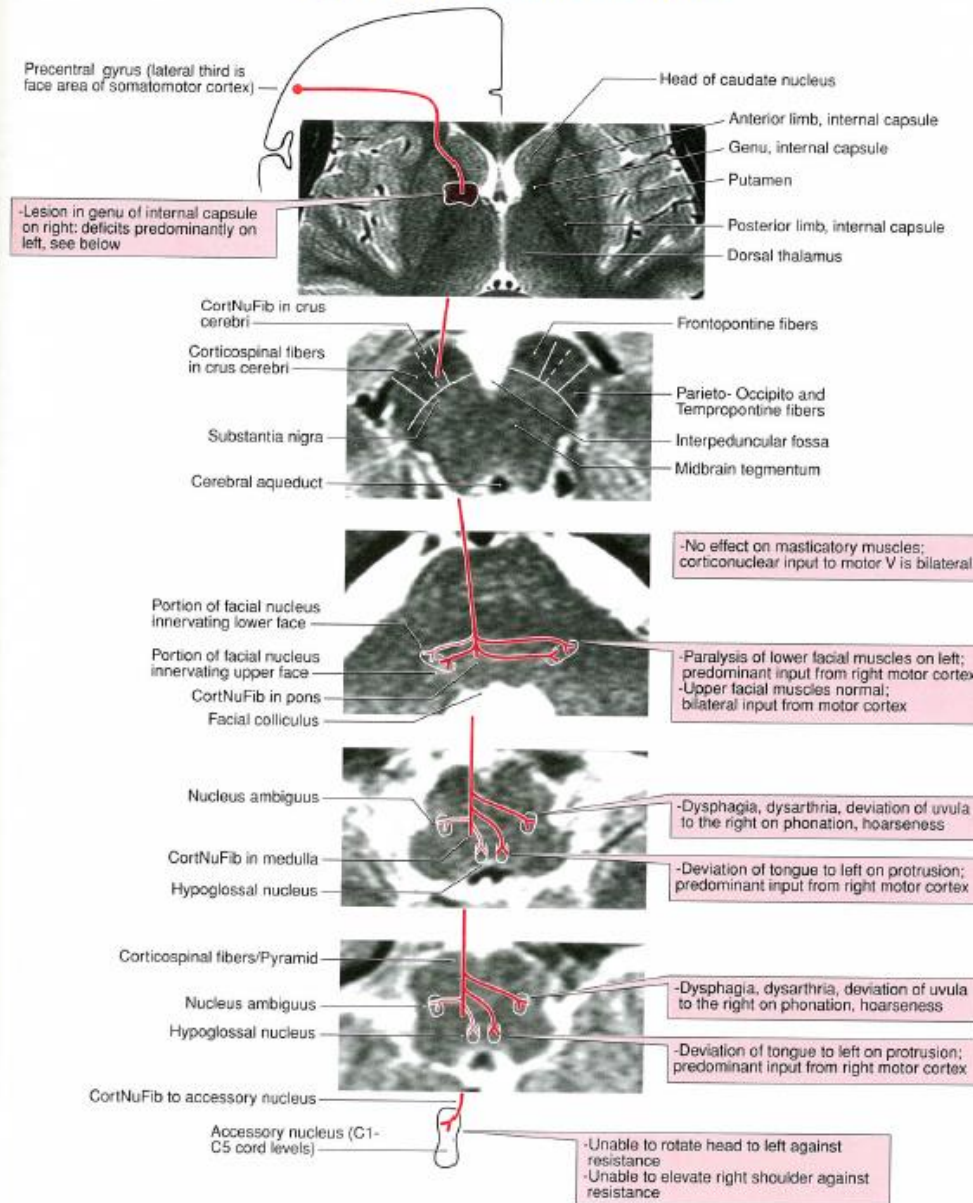
Posterior Column-Medial Lemniscus System in Clinical Orientation: Representative Lesions and Deficits



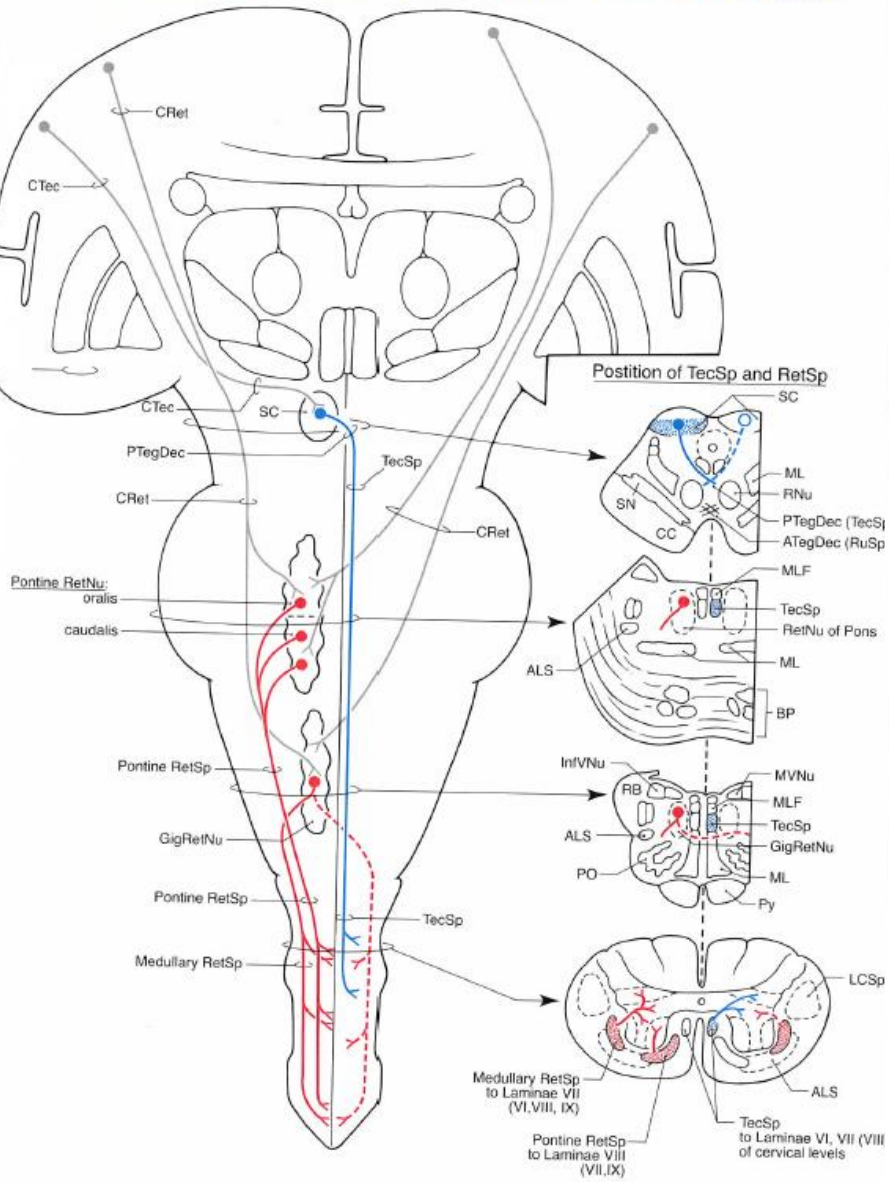
8-15 Corticonuclear (Corticobulbar) Fibers in Anatomical Orientation



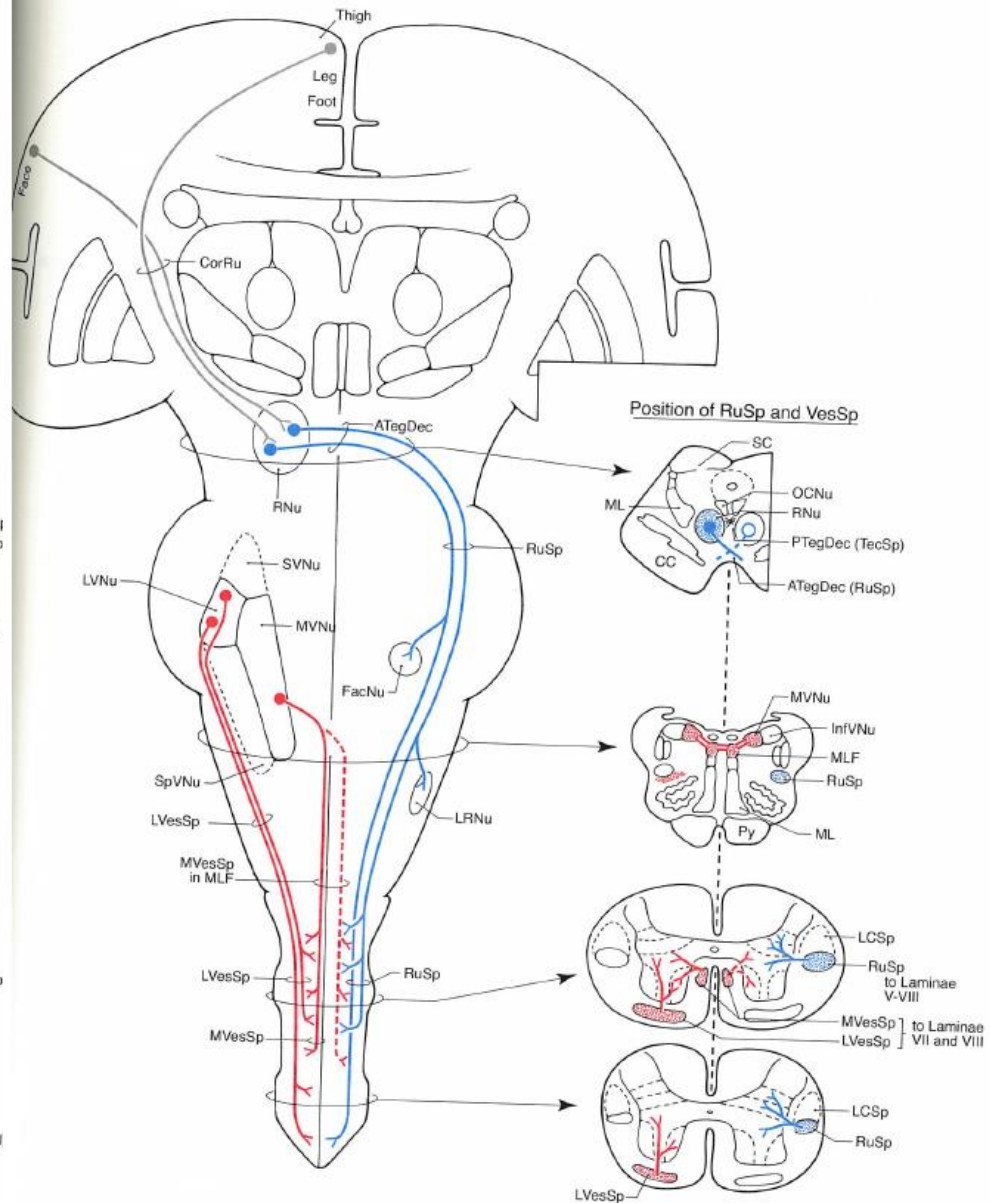
Corticonuclear (Corticobulbar) Fibers in Clinical Orientation: Representative Lesions and Deficits



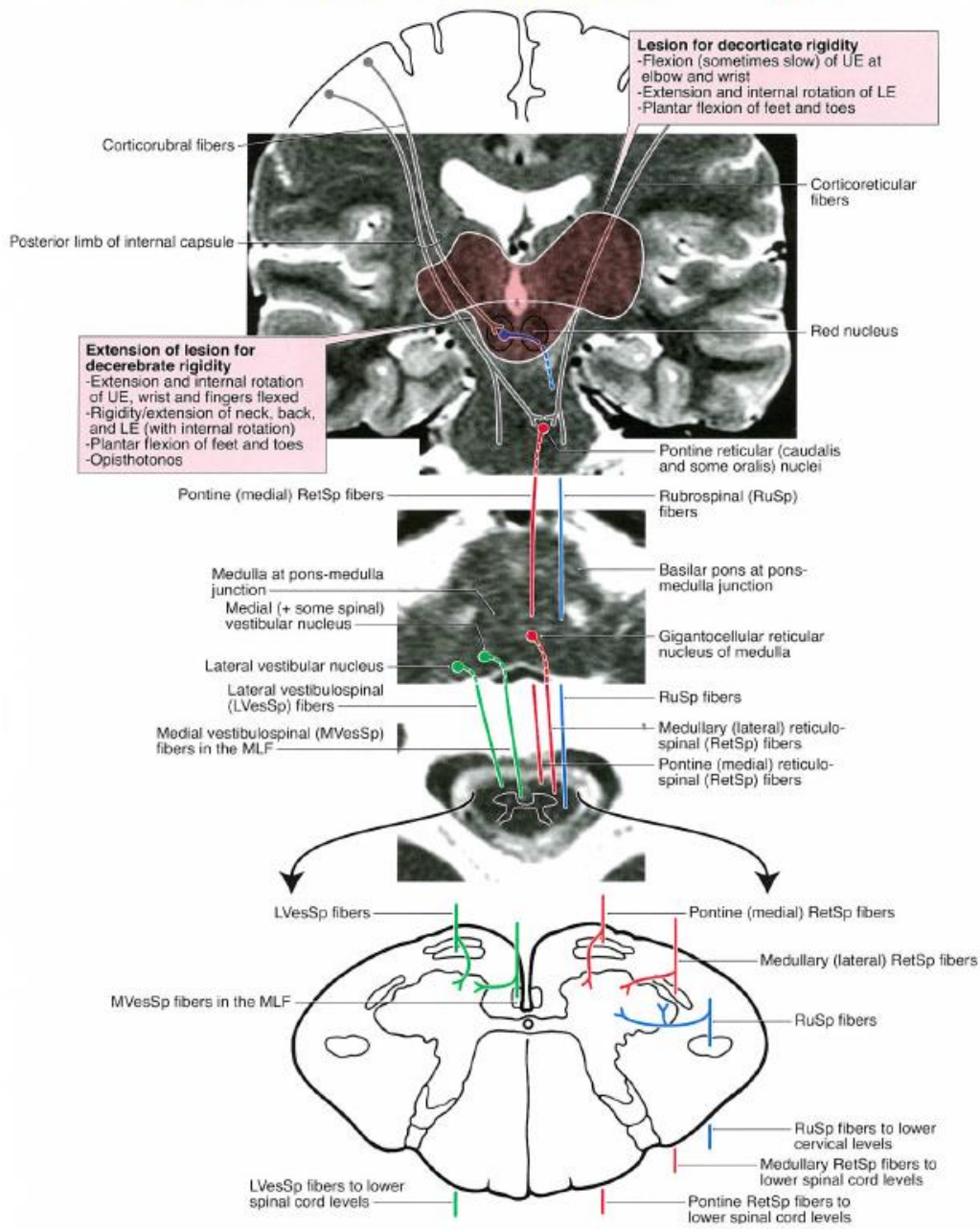
8-17 Tectospinal and Reticulospinal Tracts in Anatomical Orientation



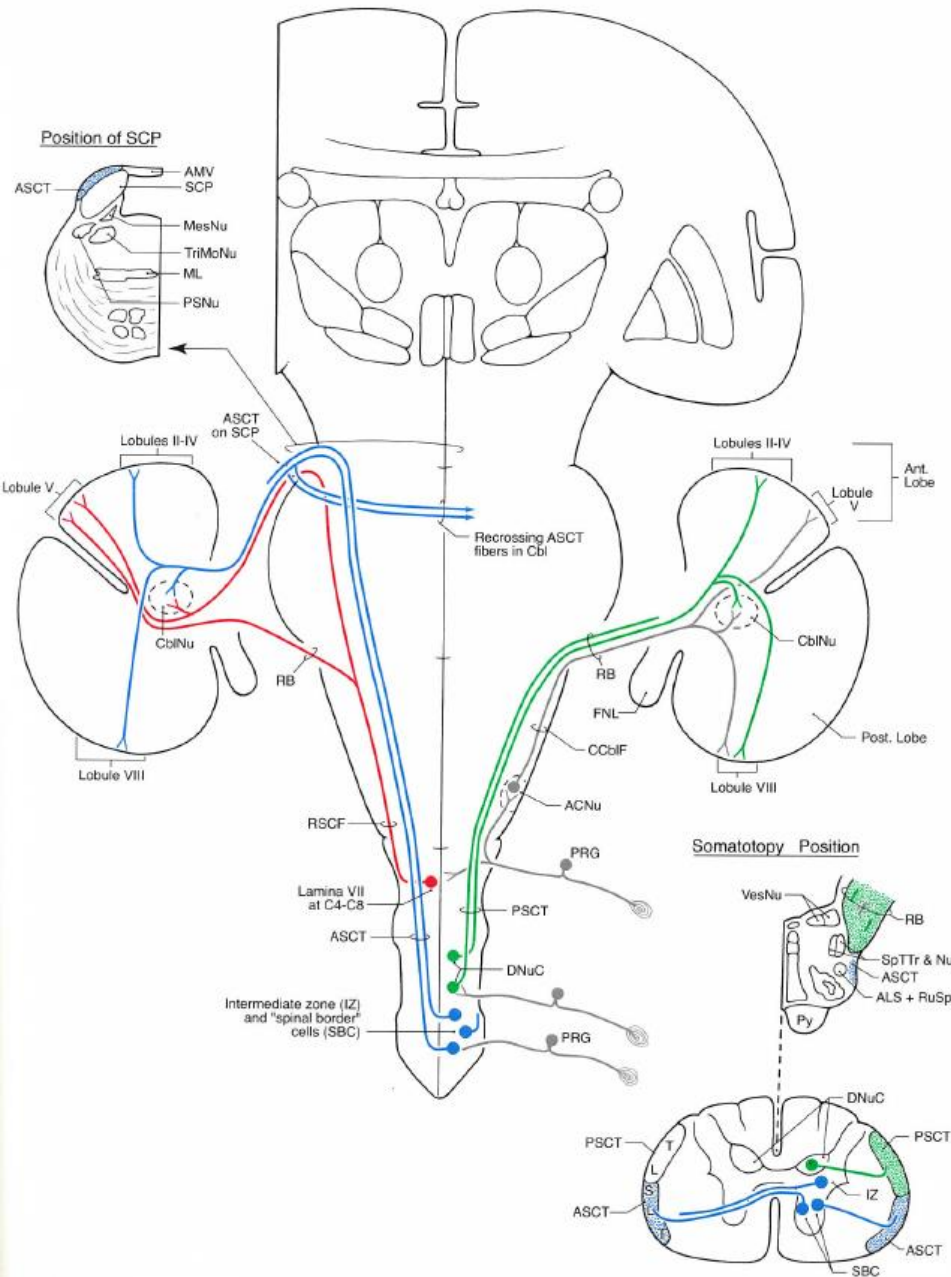
8-18 Rubrospinal and Vestibulospinal Tracts in Anatomical Orientation



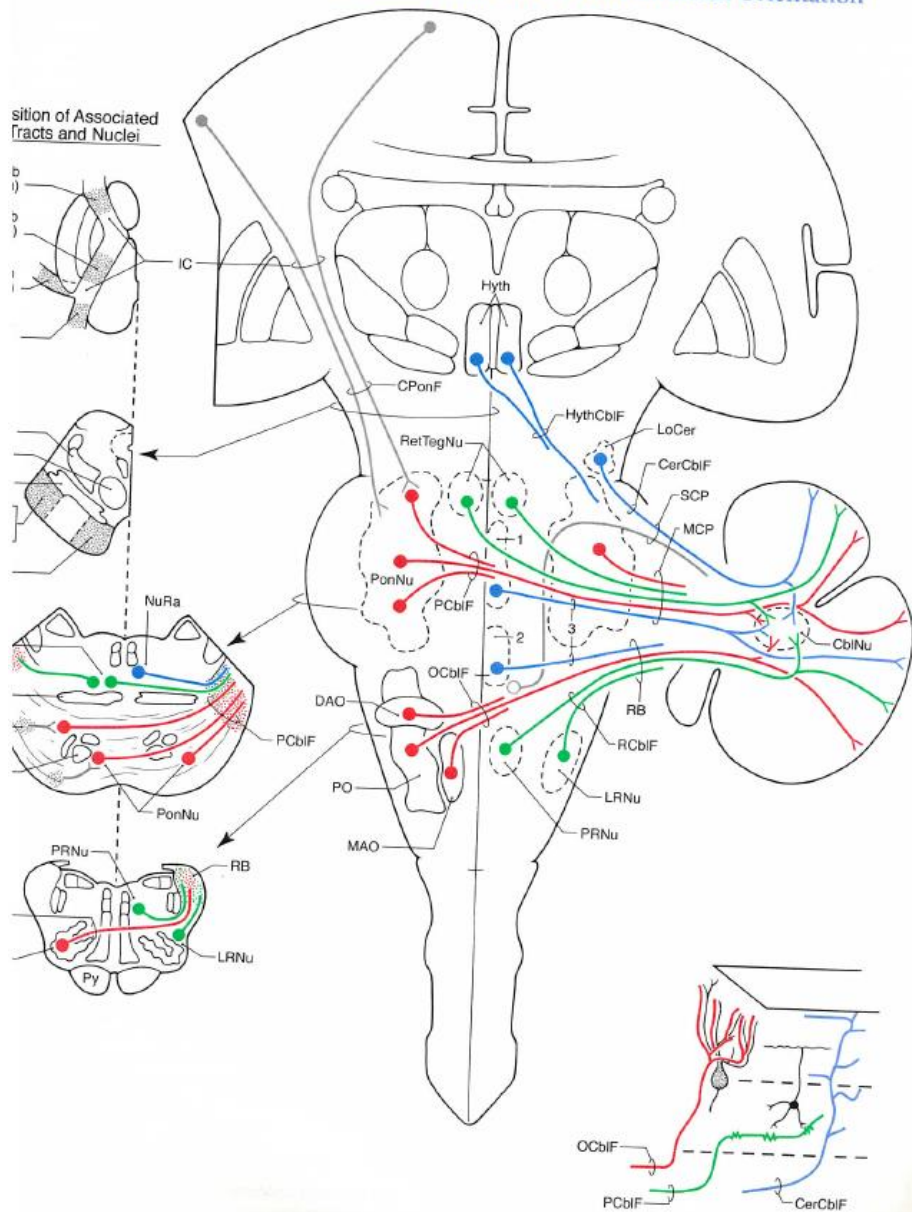
Rubrospinal, Reticulospinal, and Vestibulospinal Fibers: Clinical Orientation— Lesions Affecting Their Influence on Spinal Motor Neurons



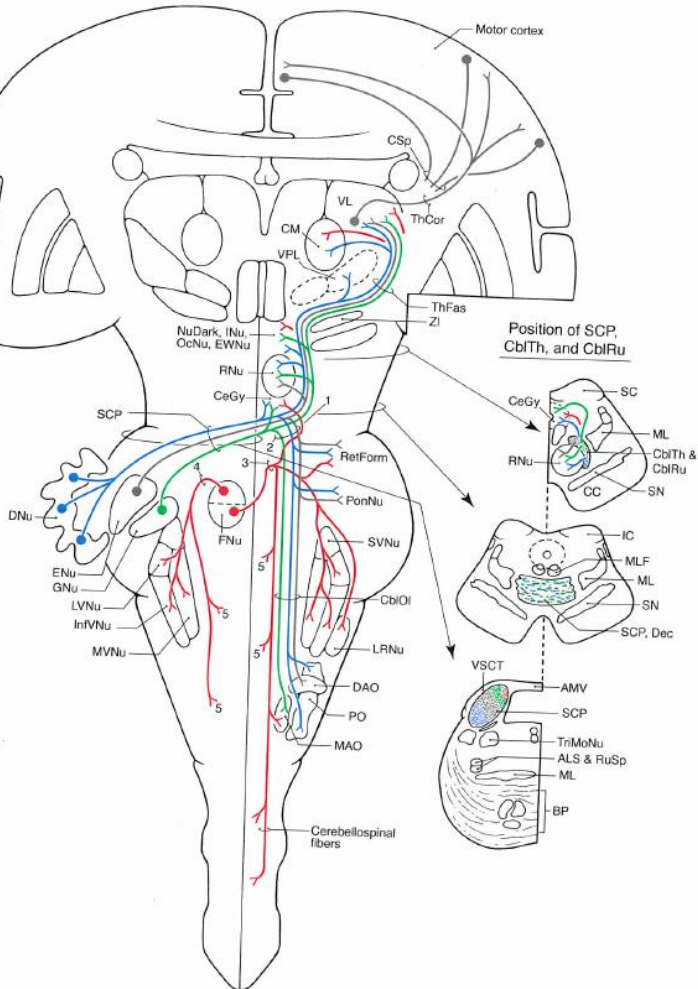
8-25 Spinocerebellar Tracts in Anatomical Orientation



8-26 Pontocerebellar, Reticulocerebellar, Olivocerebellar, Ceruleocerebellar, Hypothalamocerebellar, and Rapheocerebellar Fibers in Anatomical Orientation



8-28 Cerebellar Efferent Fibers in Anatomical Orientation



Cerebellar Efferent Fibers in Clinical Orientation: Representative Lesions and Deficits

