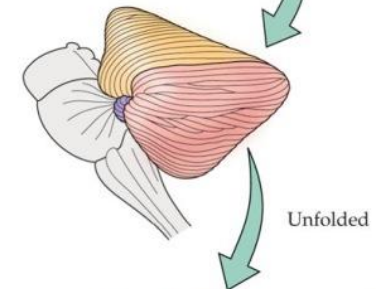
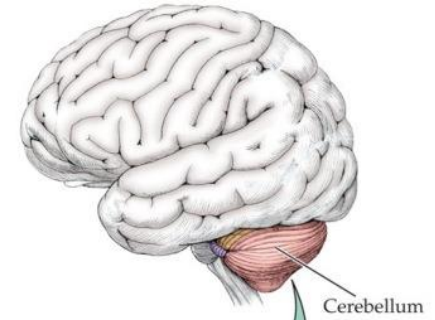


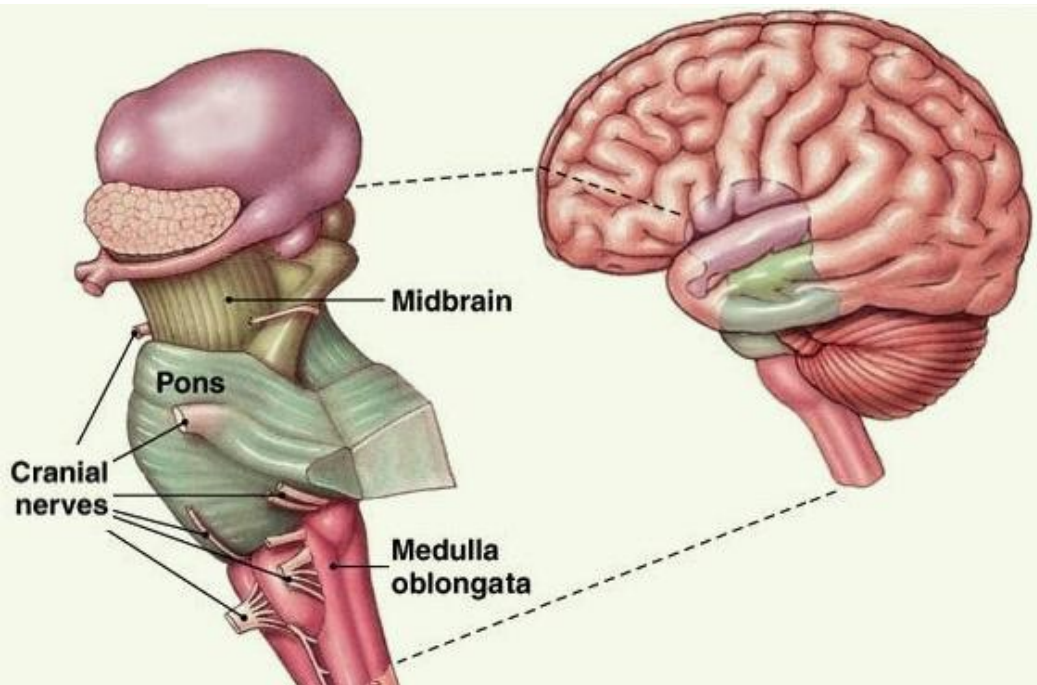
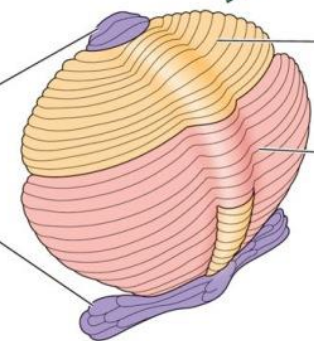
Brain Stem, Cerebellum, Spinal Cords & Tracts



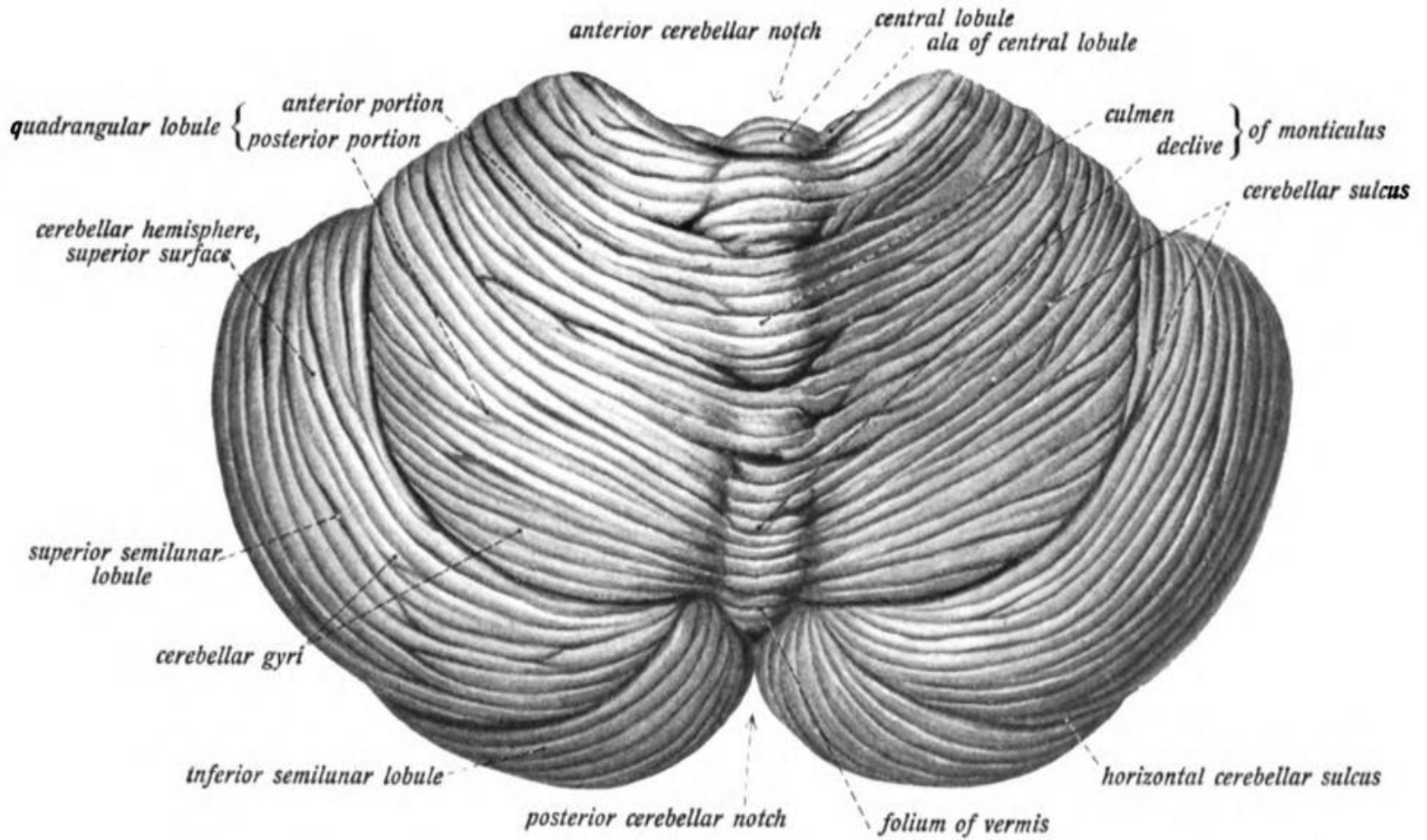
Vestibulocerebellum:
Balance, postural adjustments, coordination of eye movements

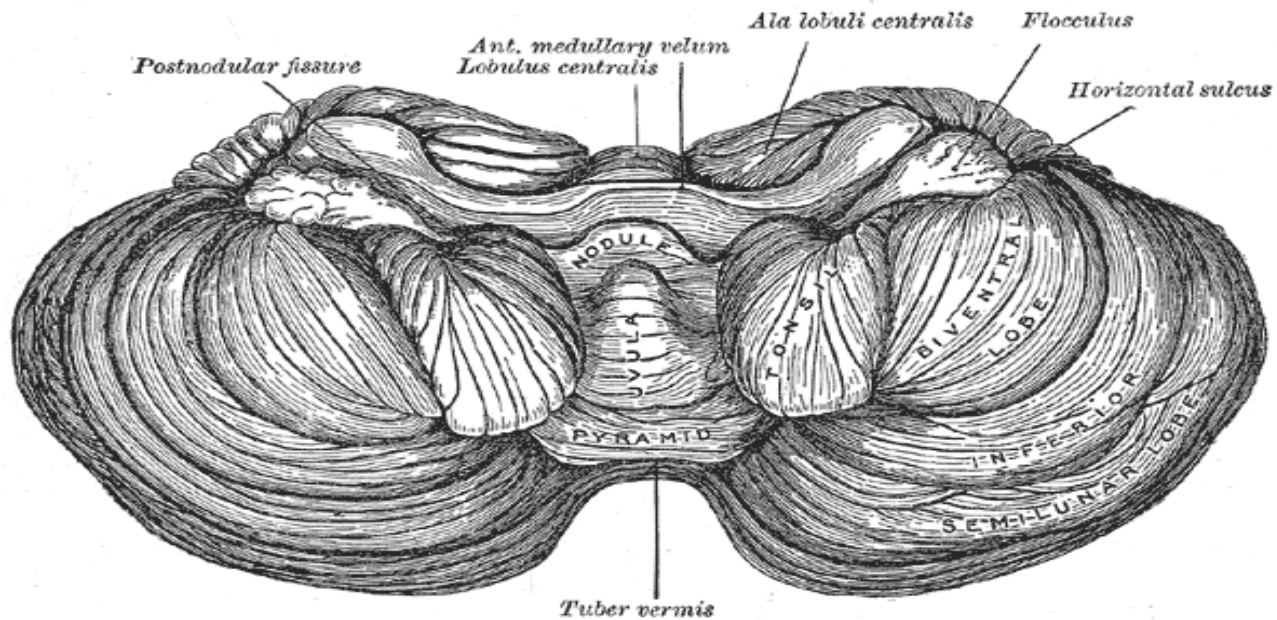
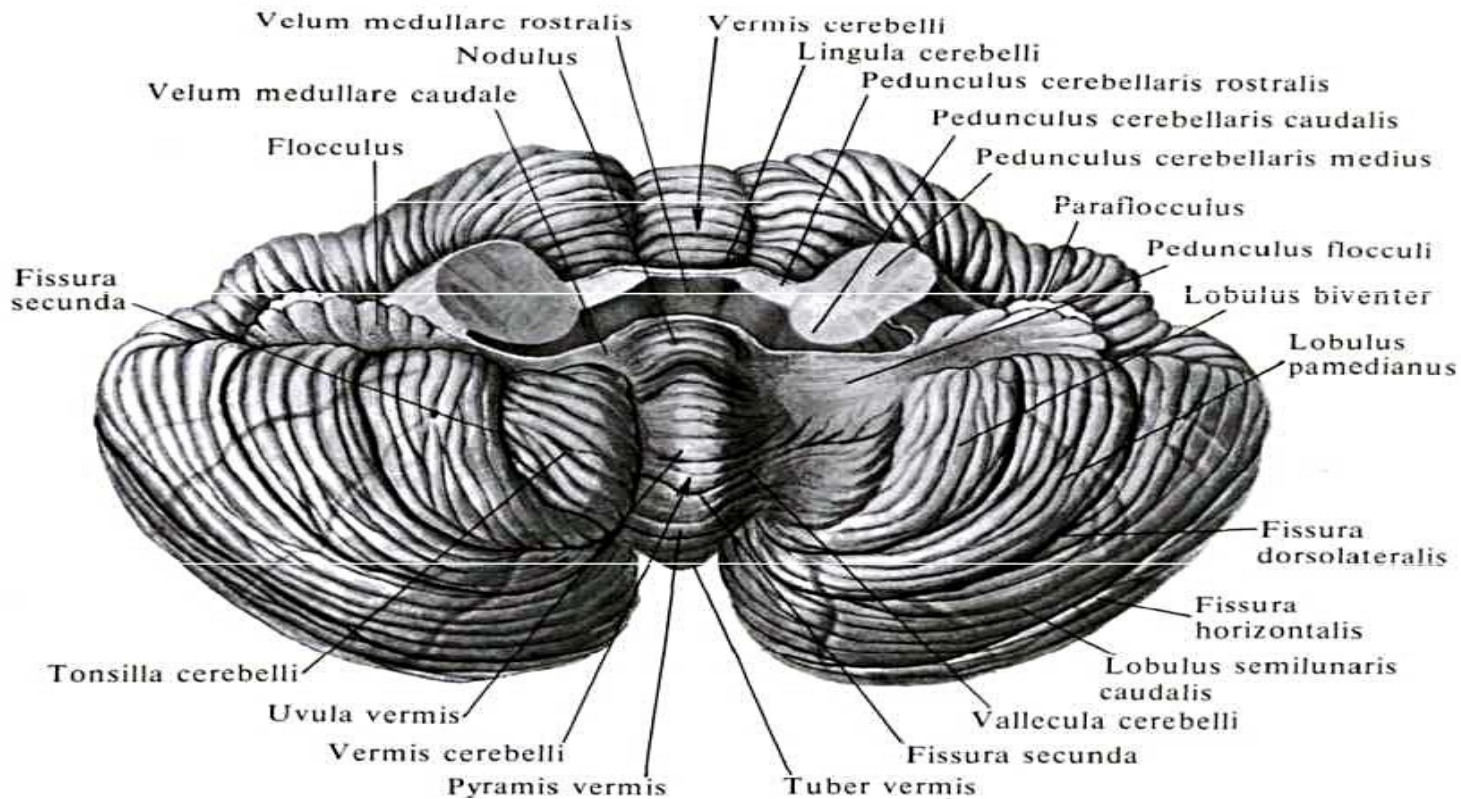
Spinocerebellum:
Control of muscle tone and coordination

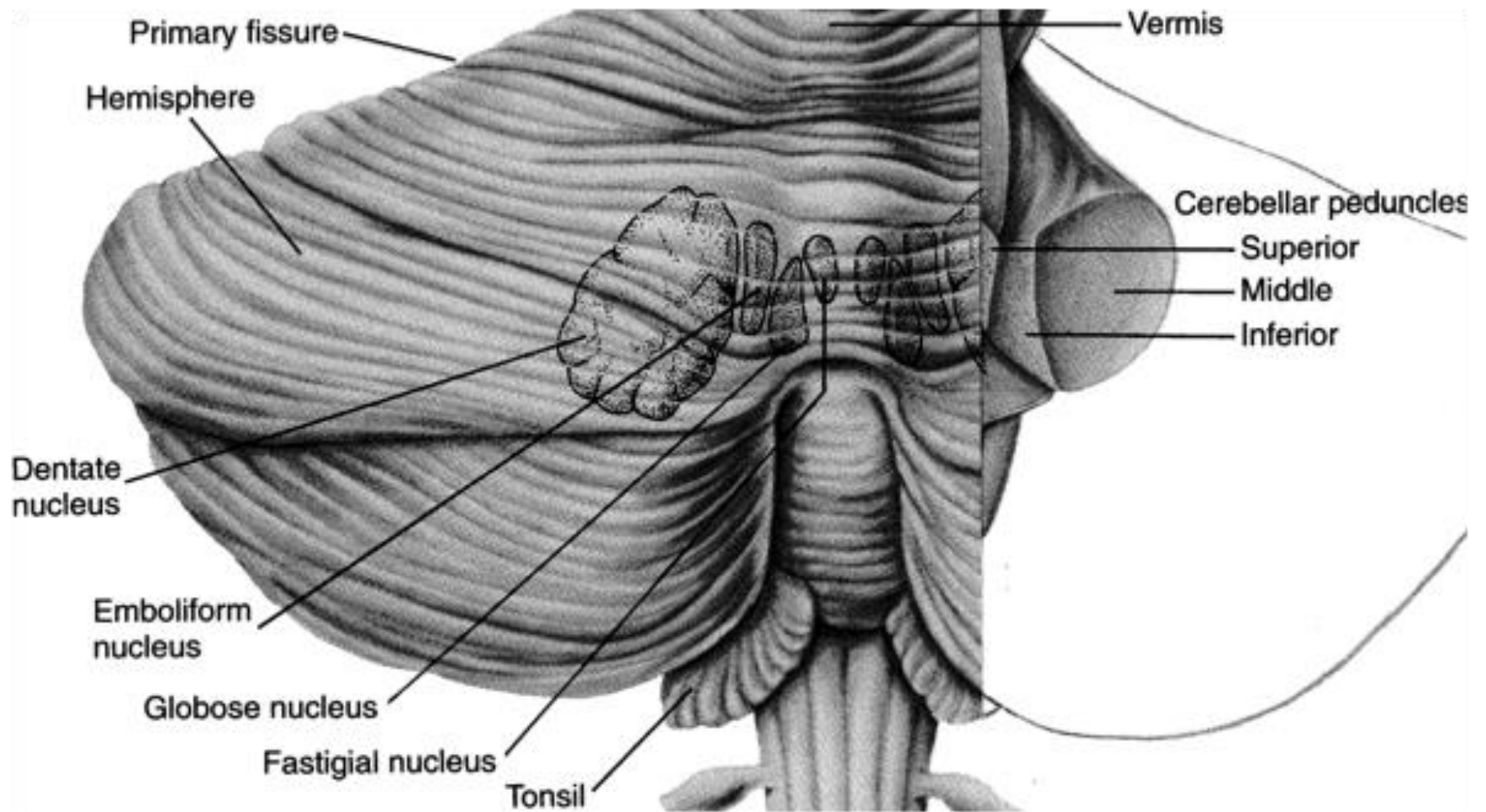
Cerebrocerebellum:
Motor planning, learning and memory

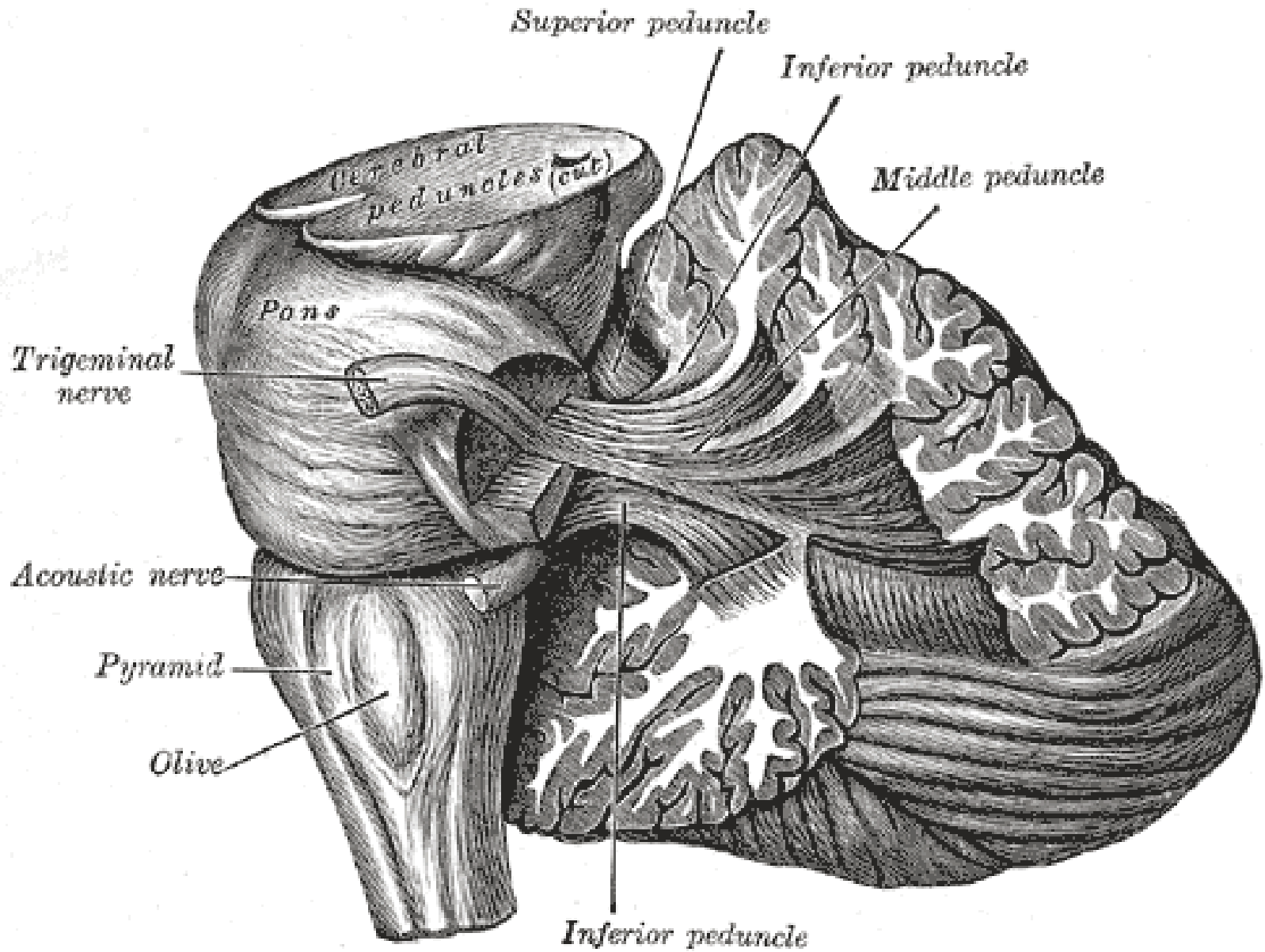


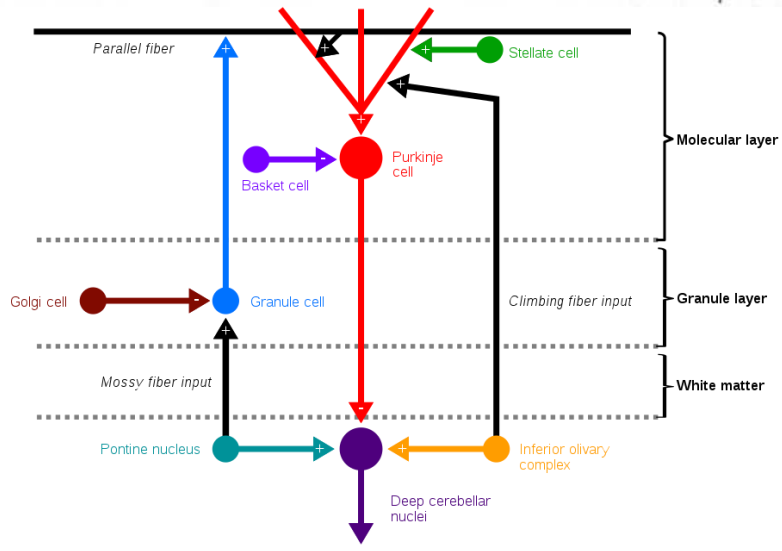
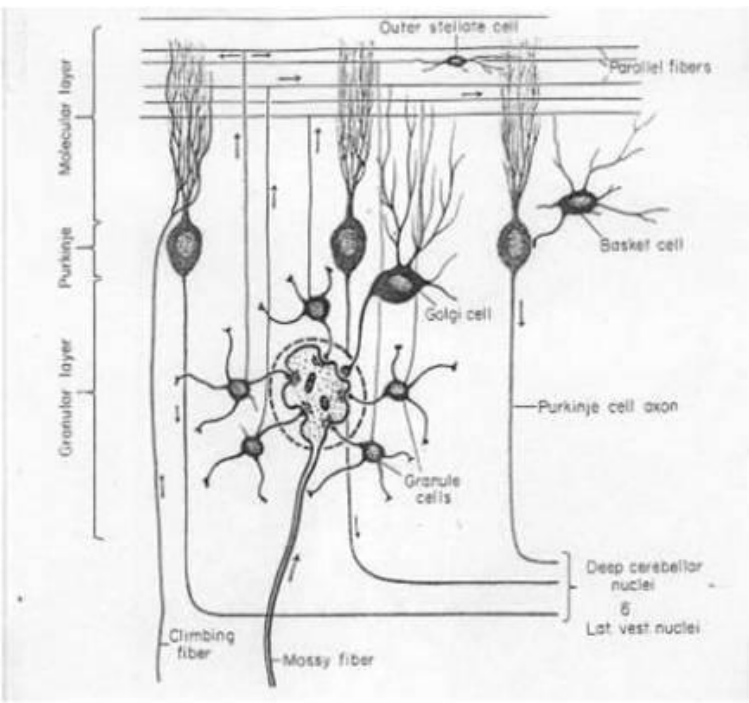
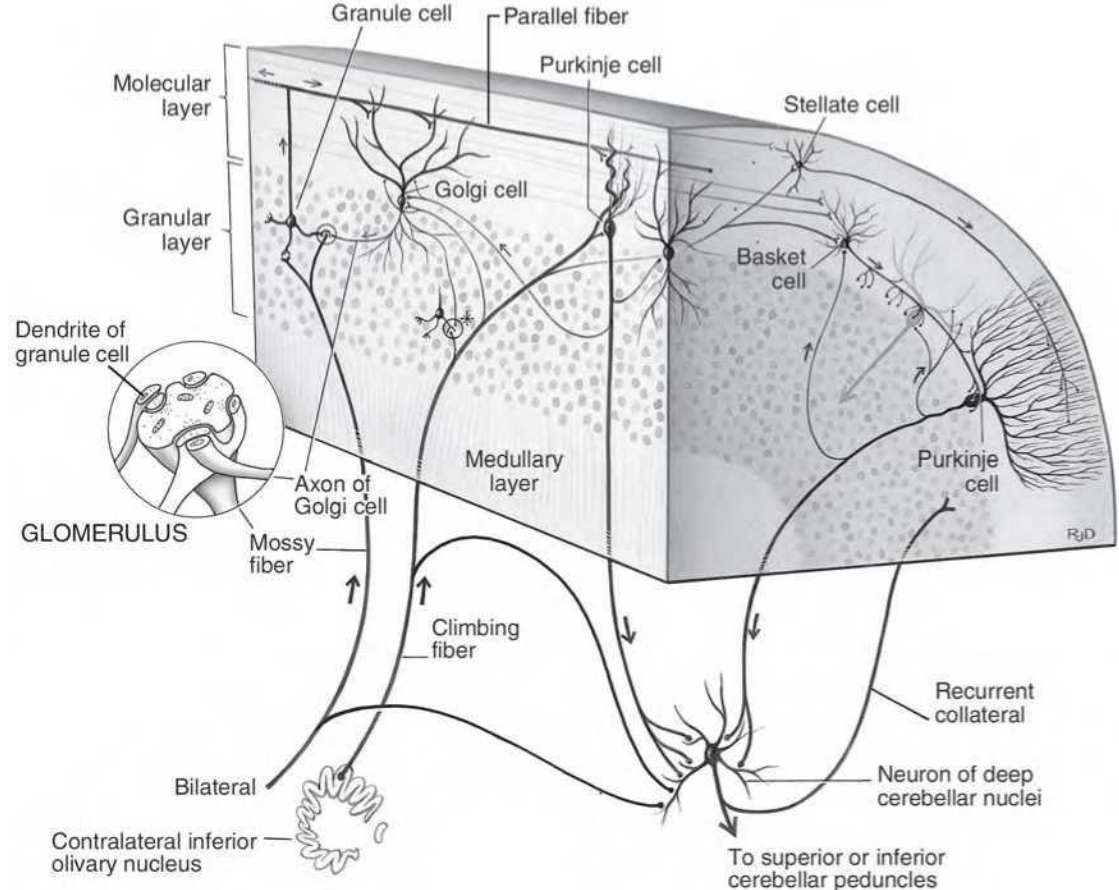
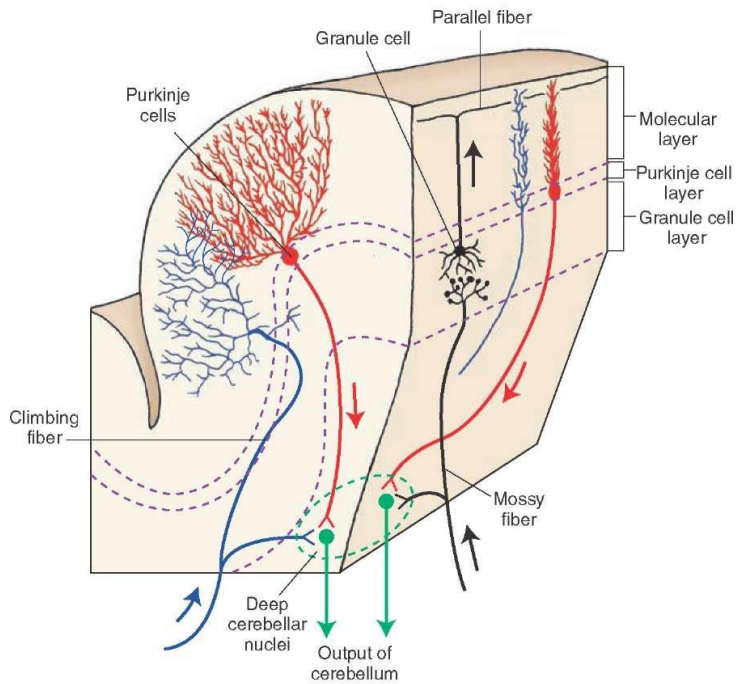
MUDr. Azzat Al-Redouan

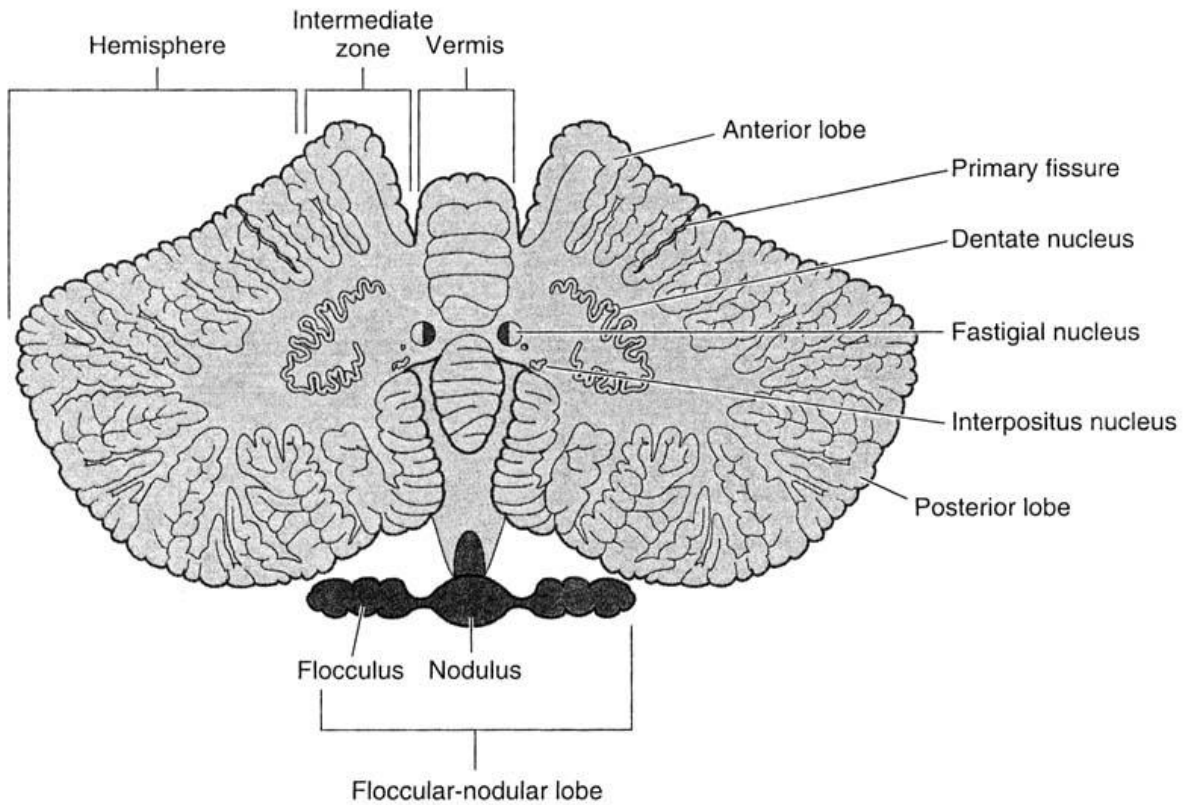
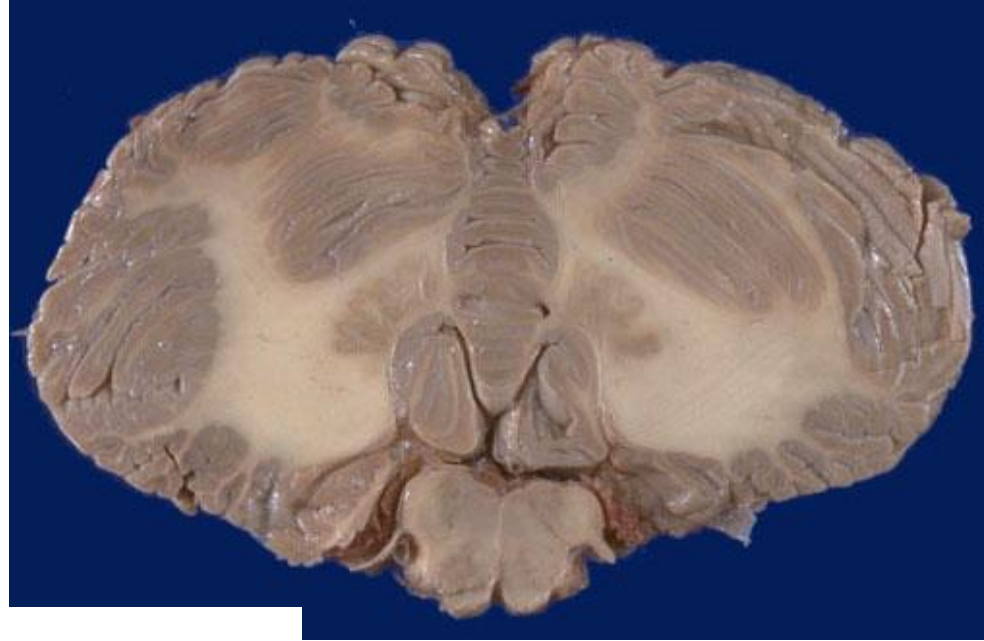


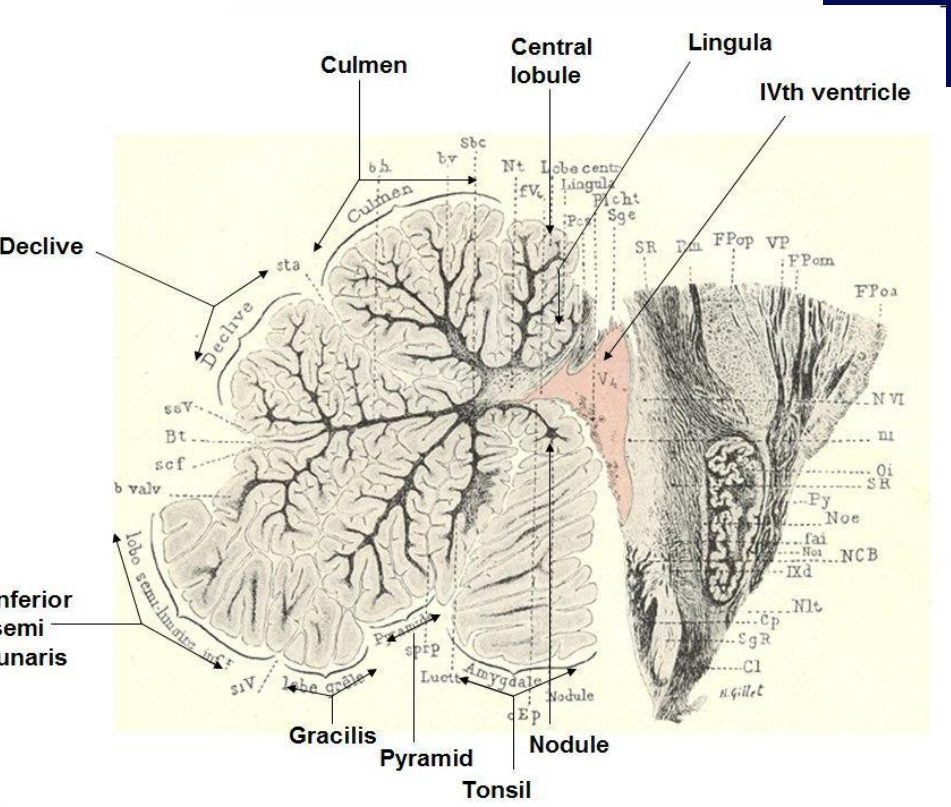


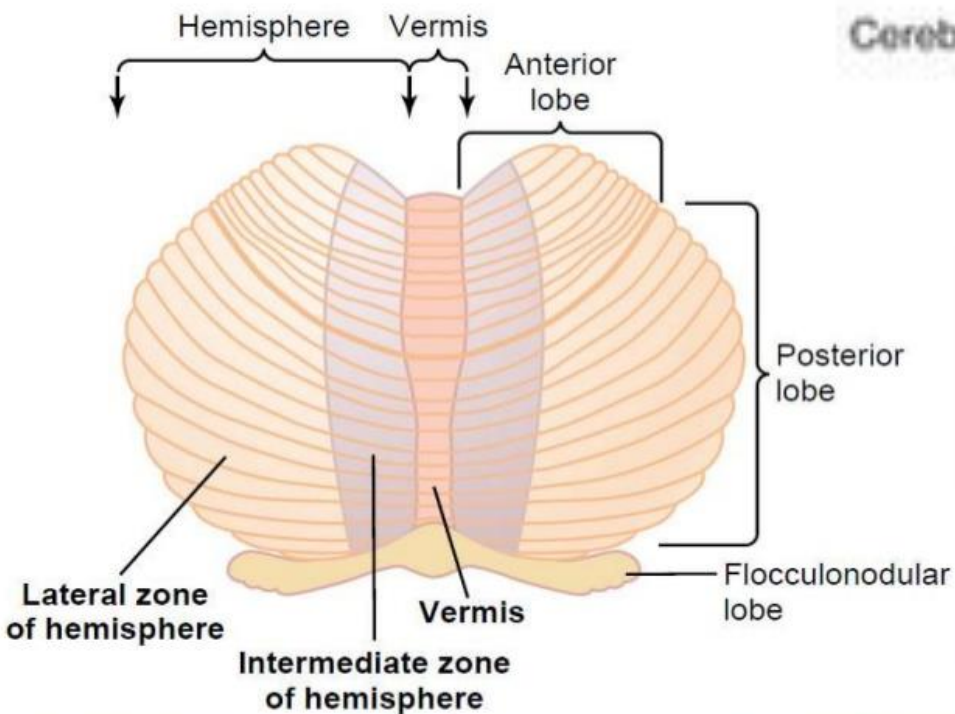
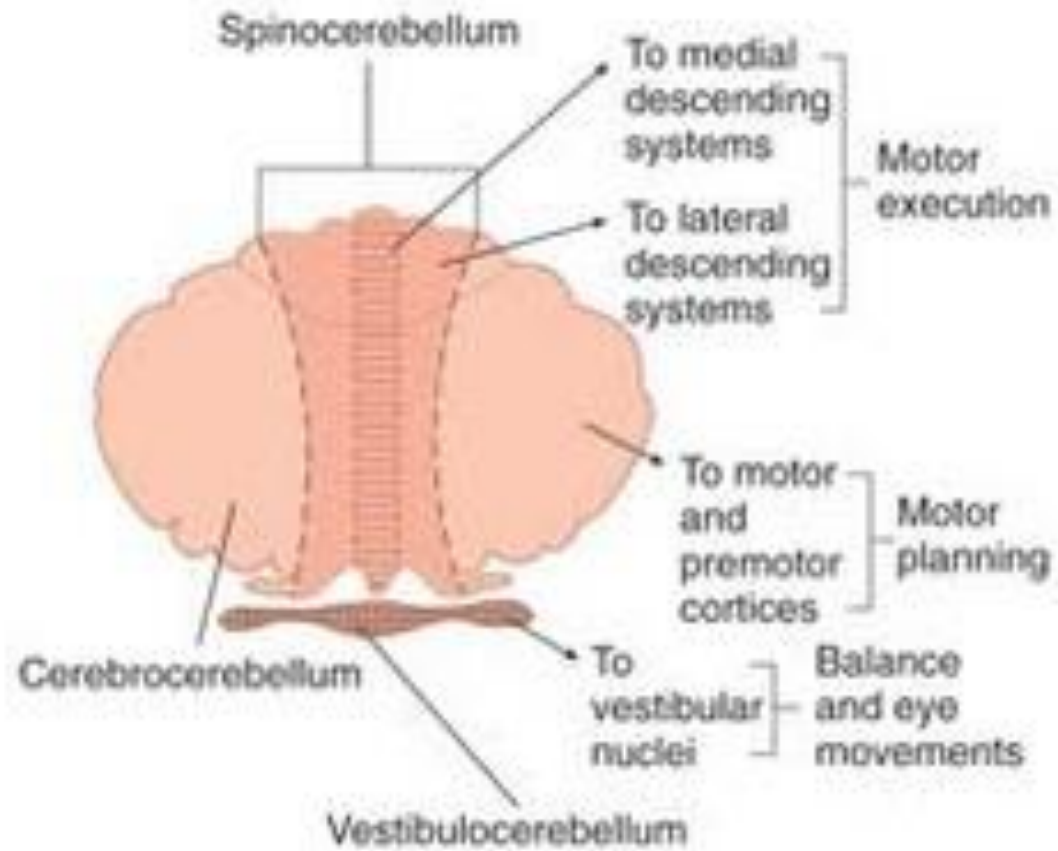








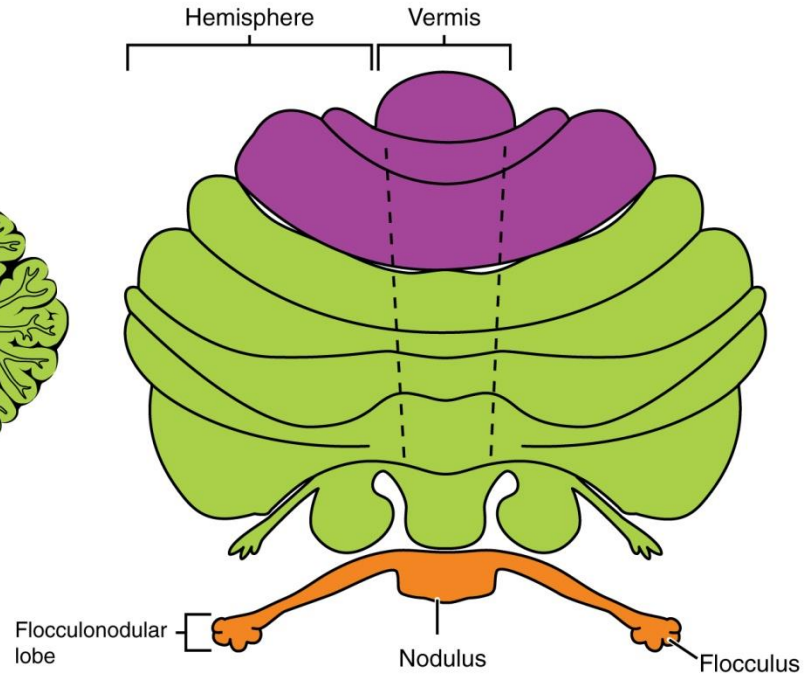




Midsagittal section of cerebellum



Superior view of an "unrolled" cerebellum



Anterior Lobe

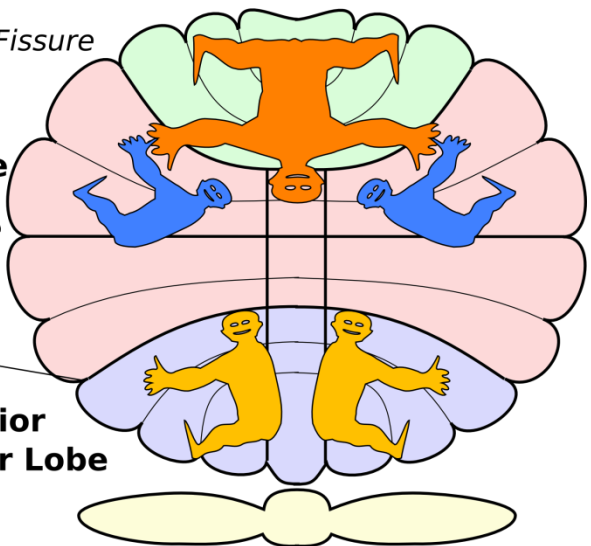
Primary Fissure

Superior Posterior Lobe

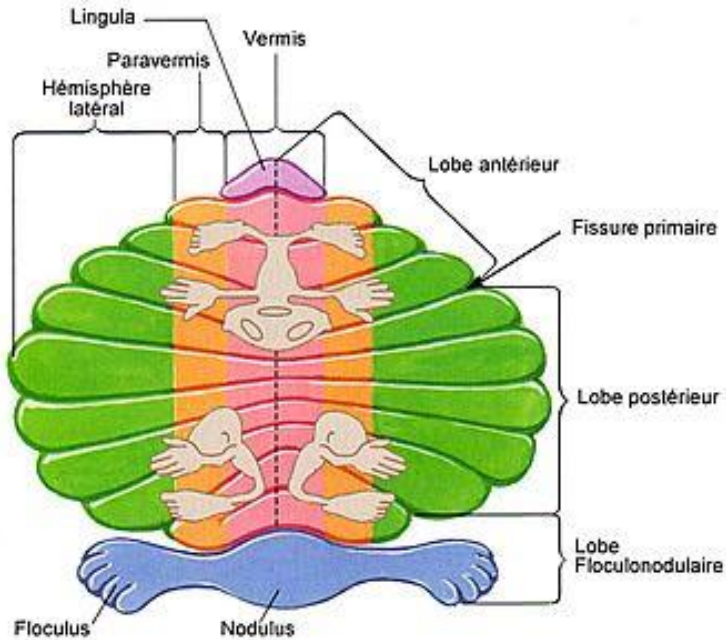
Horizontal Fissure

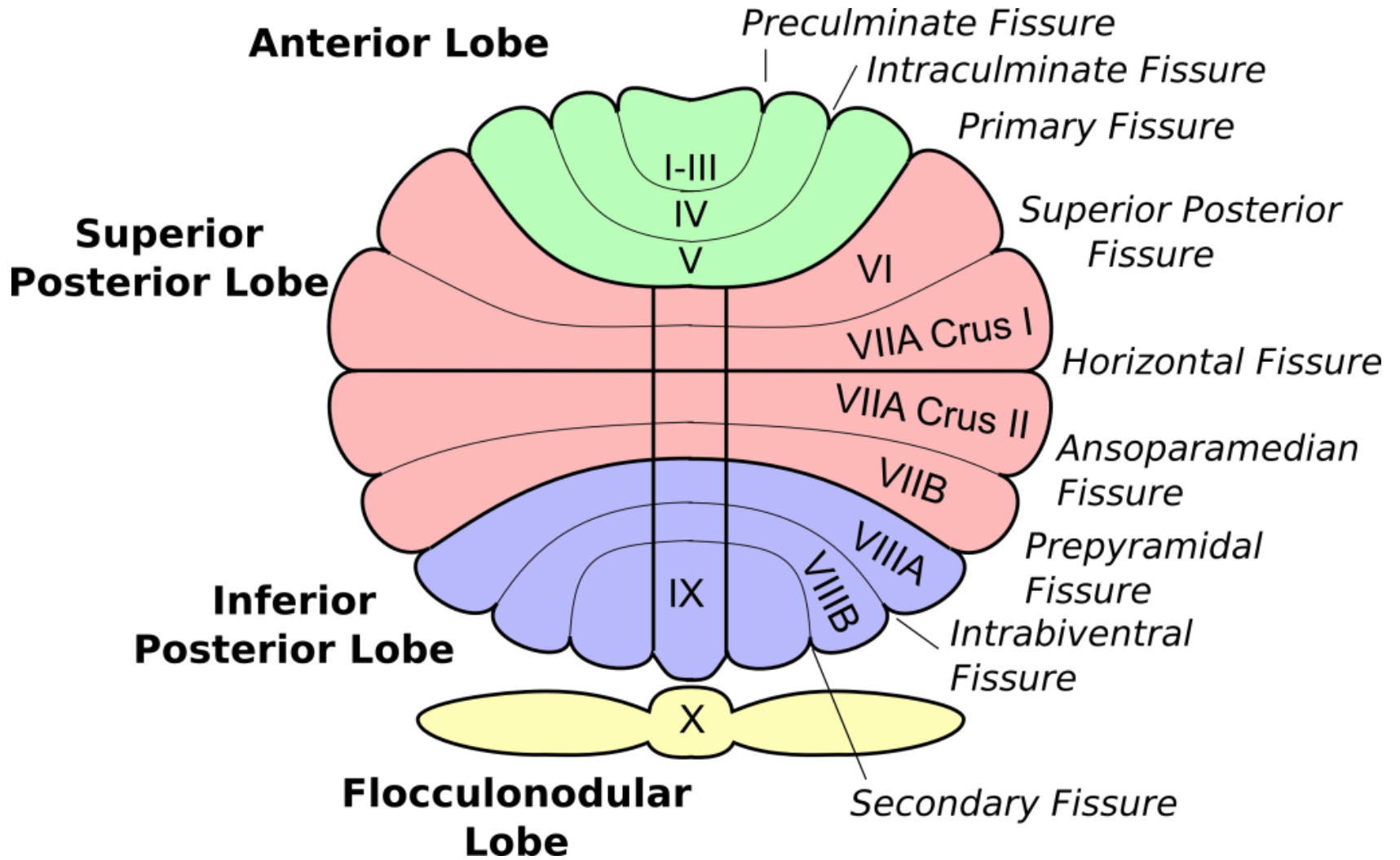
Prepyramidal Fissure

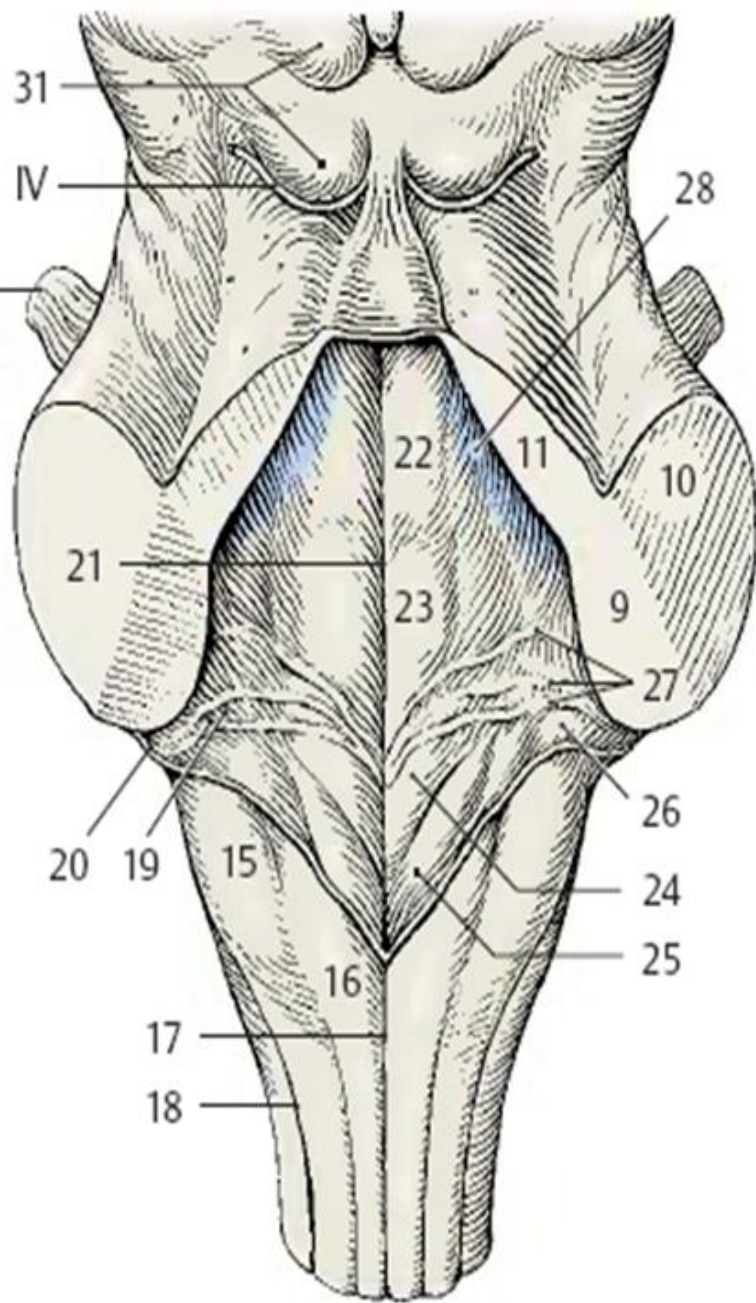
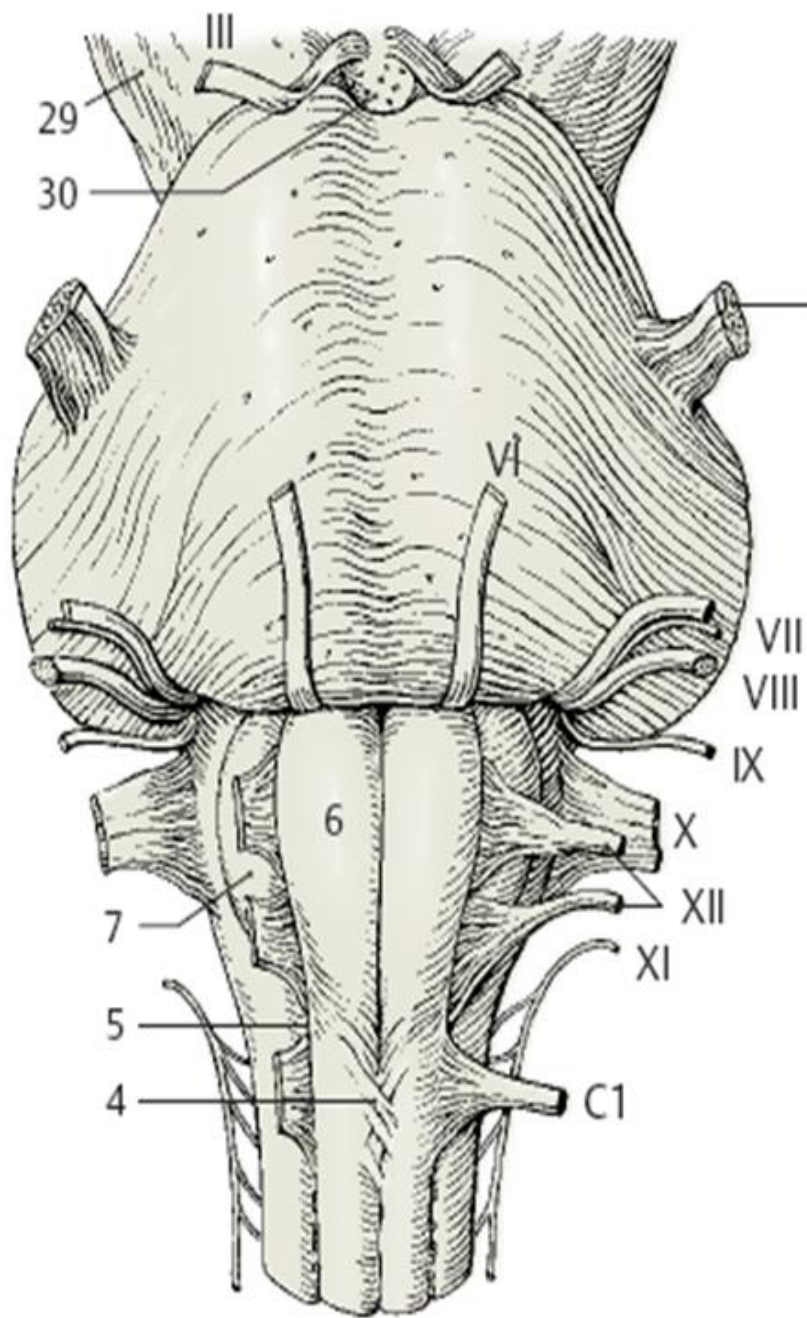
Inferior Posterior Lobe

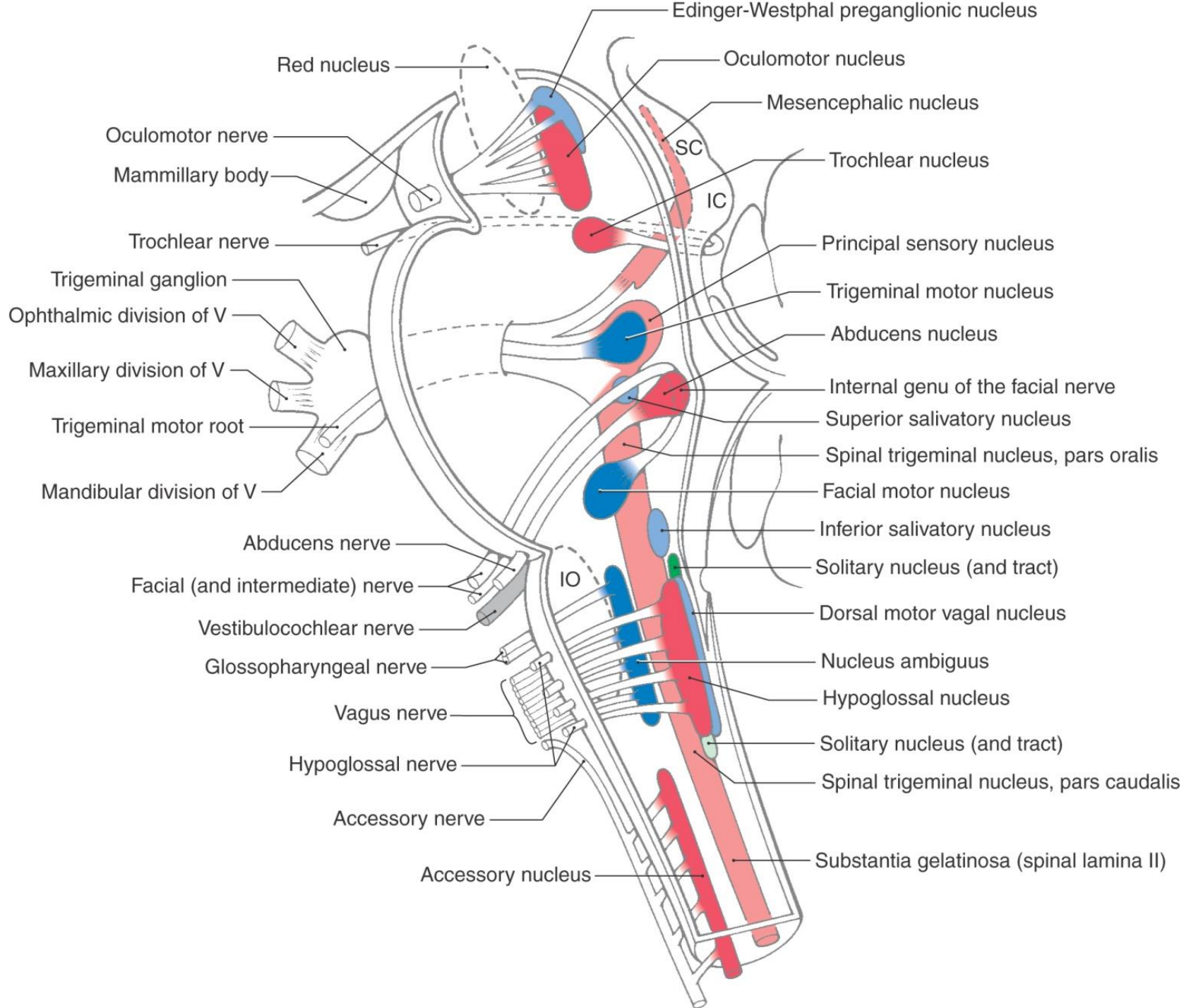


Flocculonodular Lobe

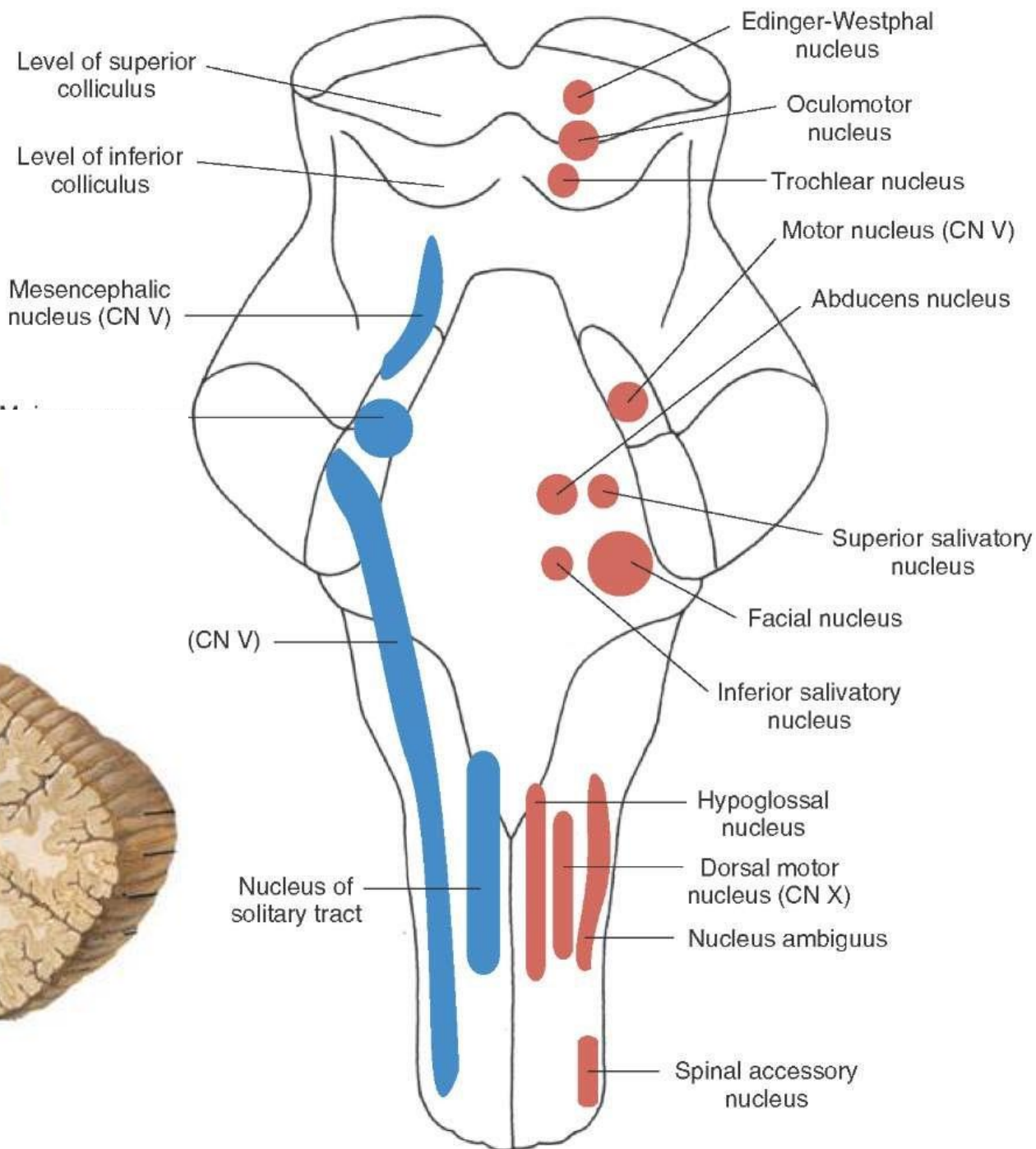
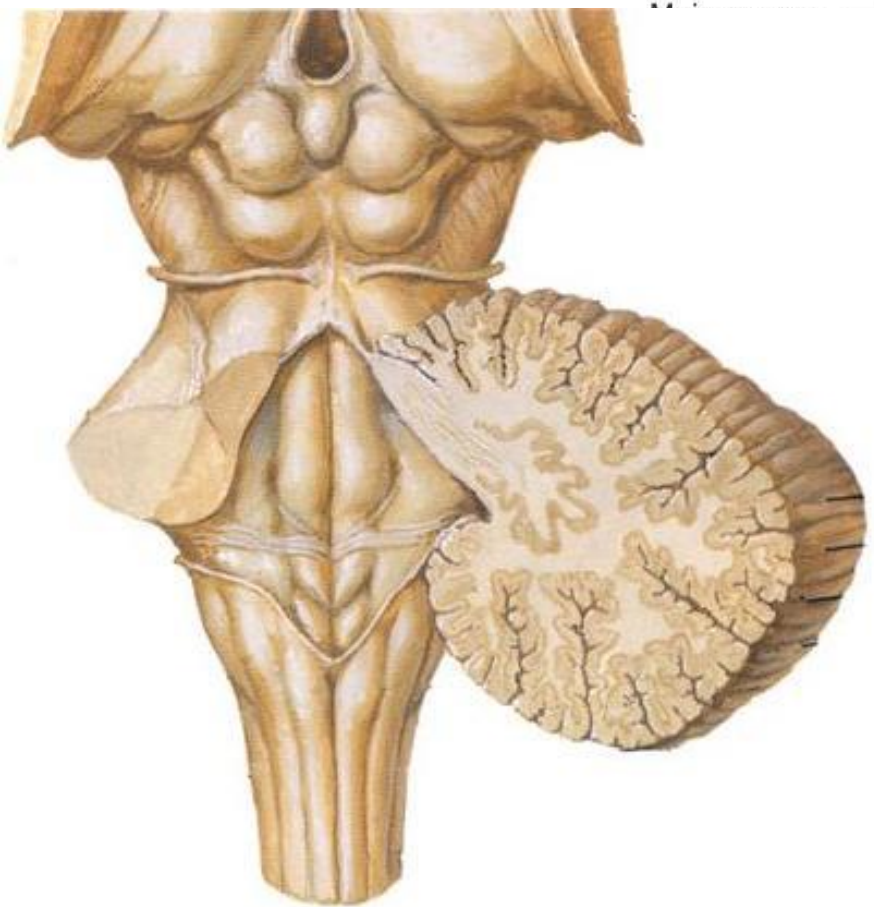


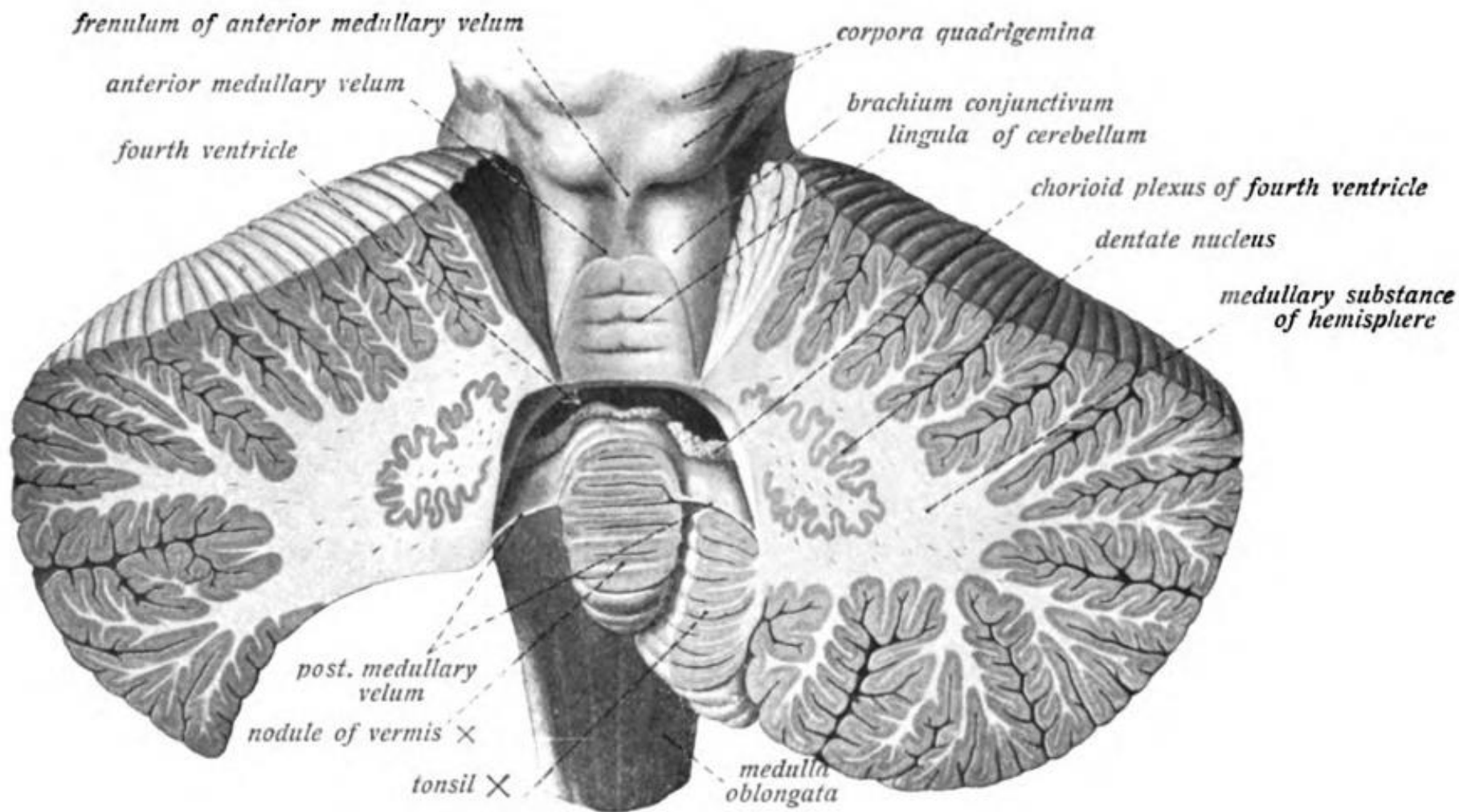




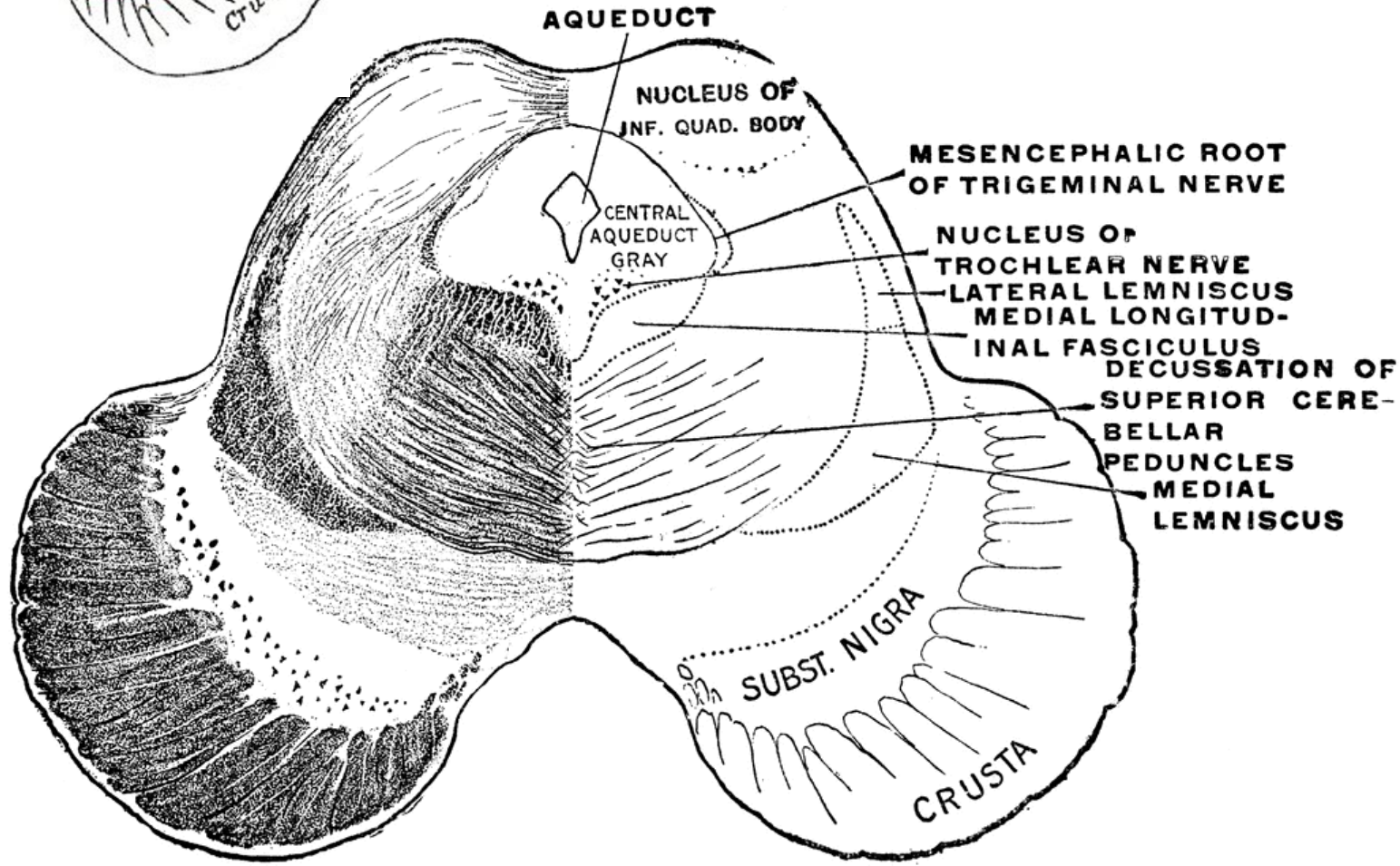
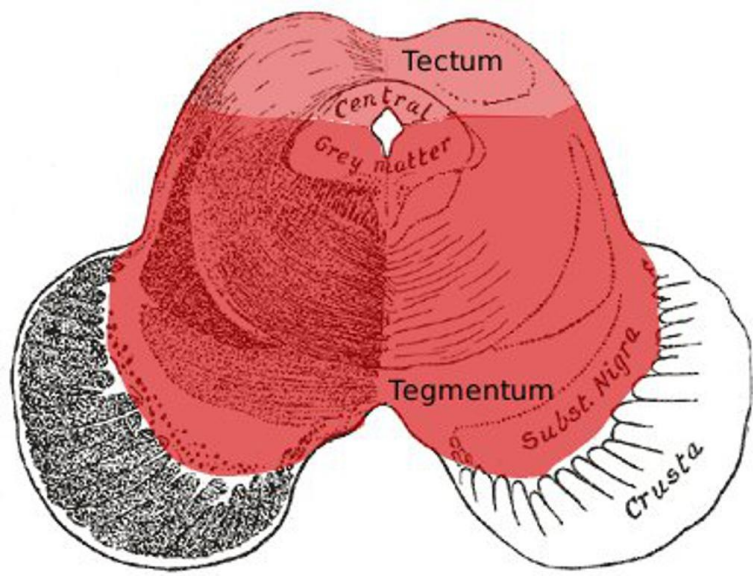


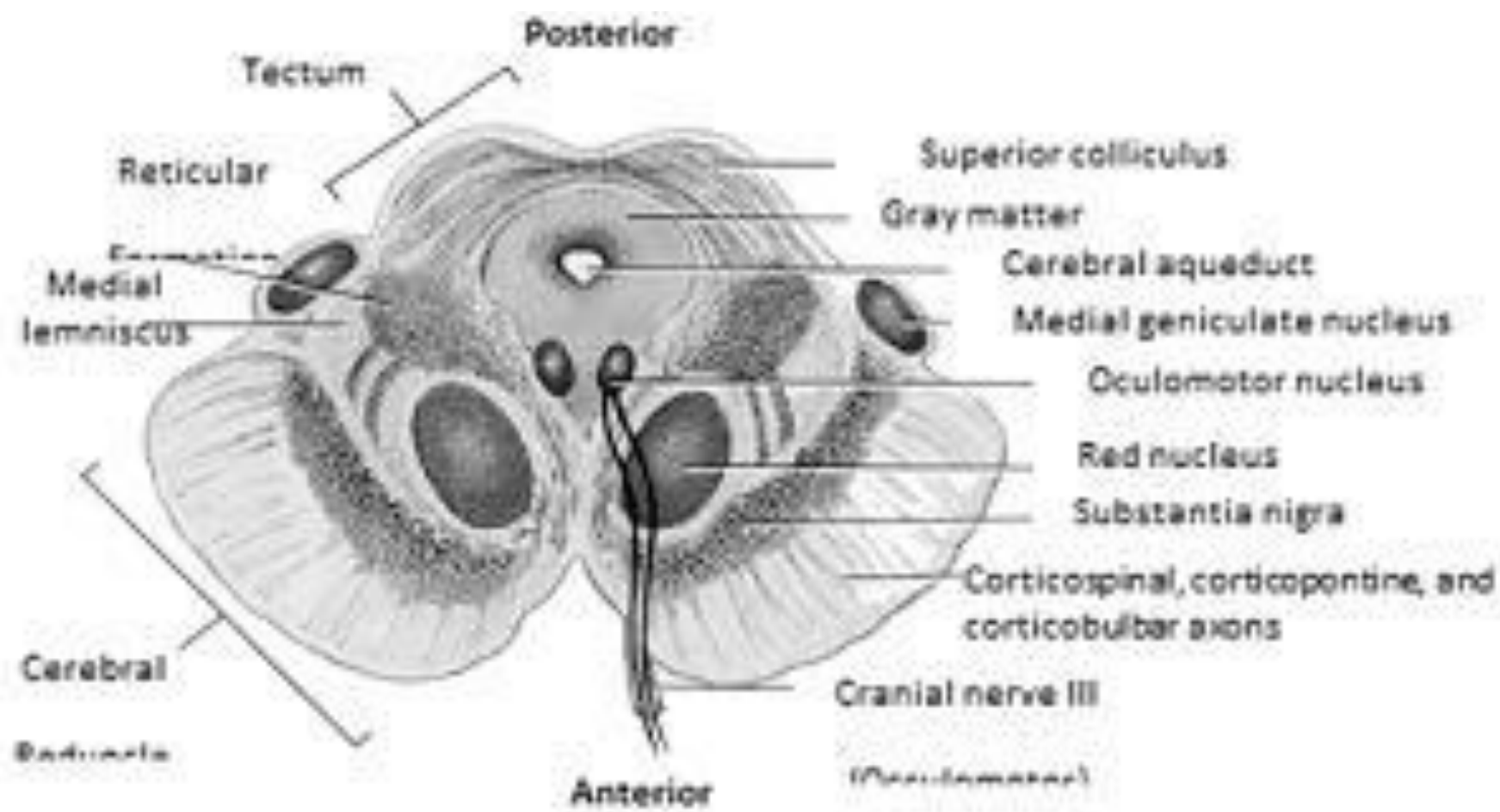
Rhomboid Fossa



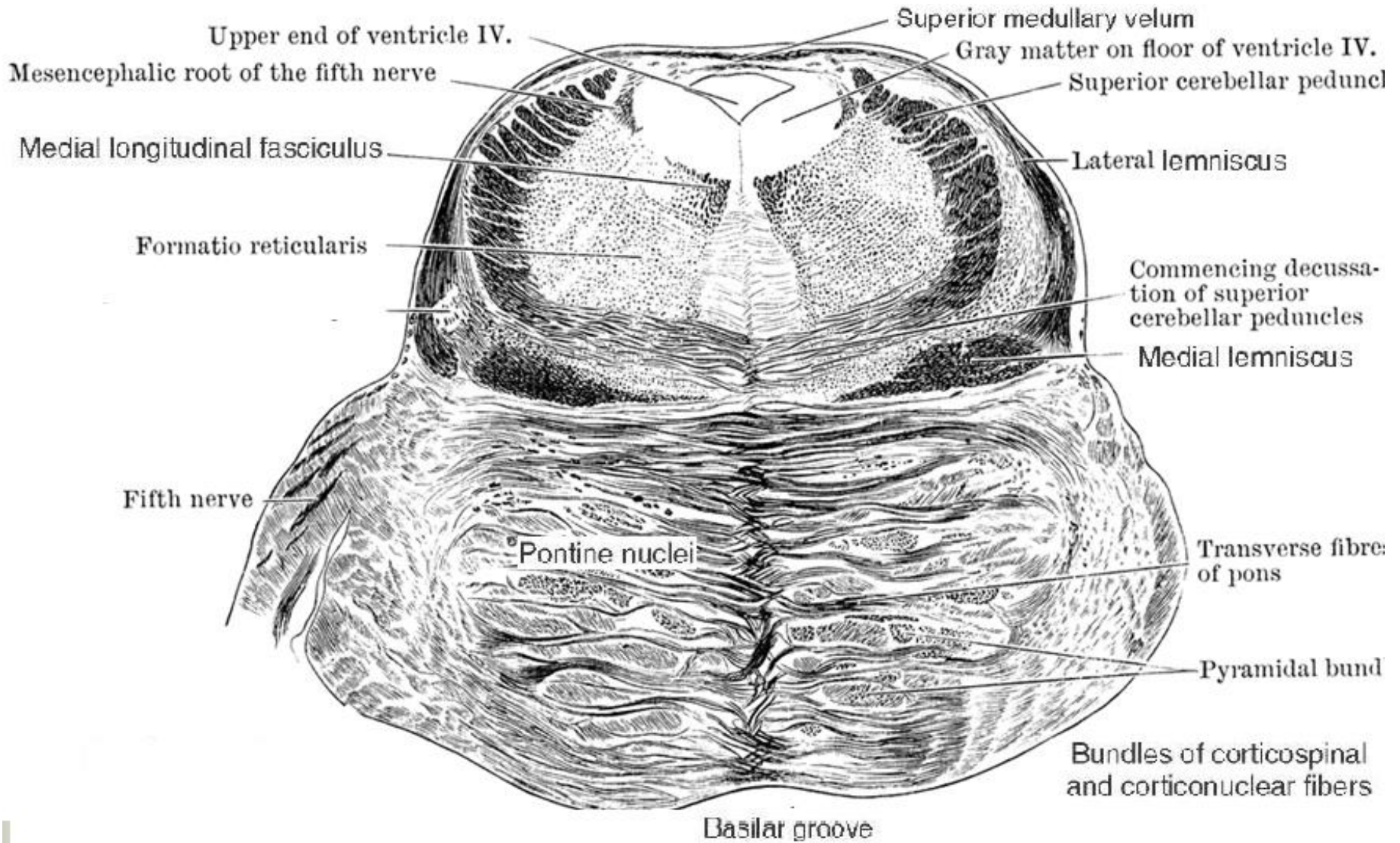


Mesencephalon

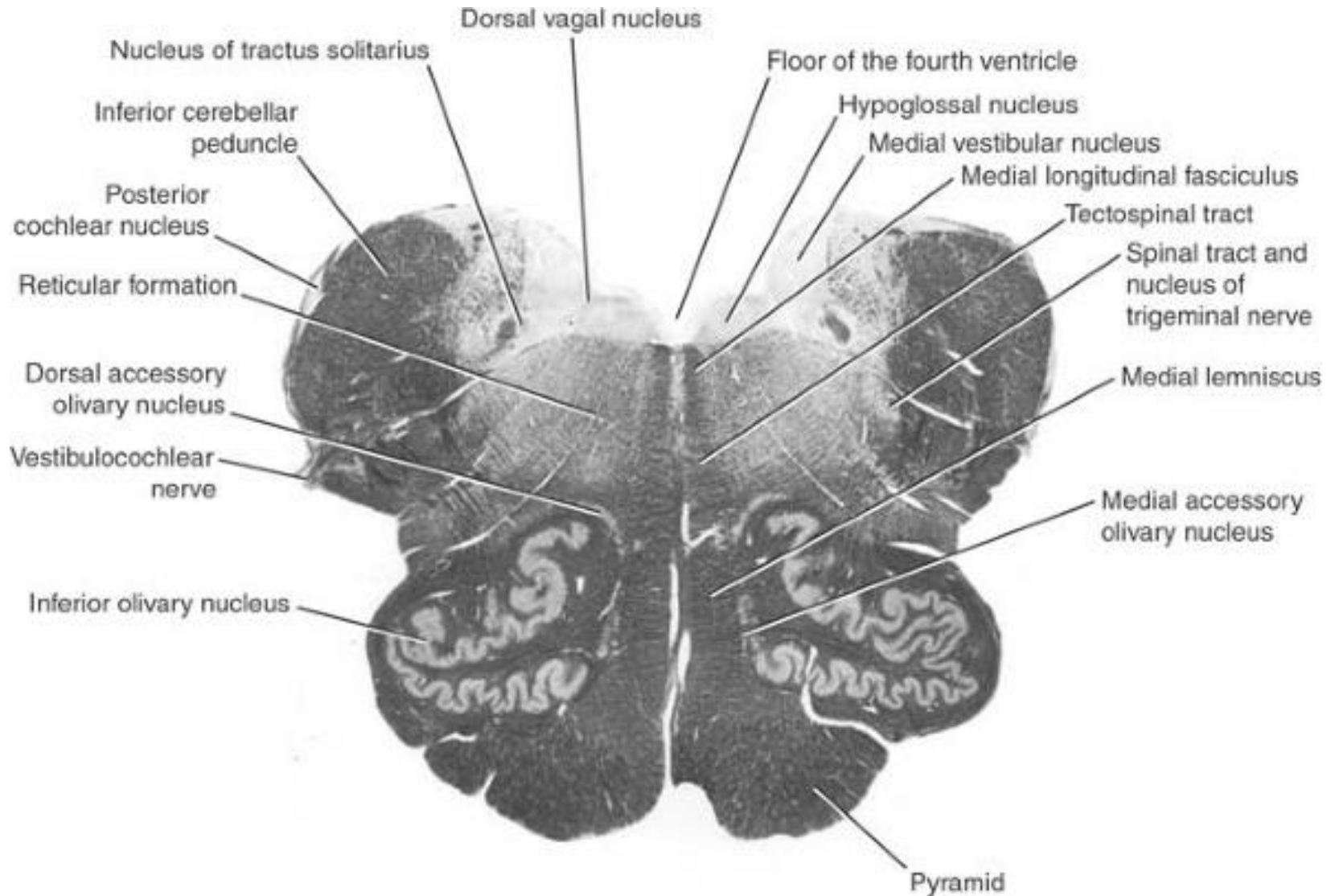


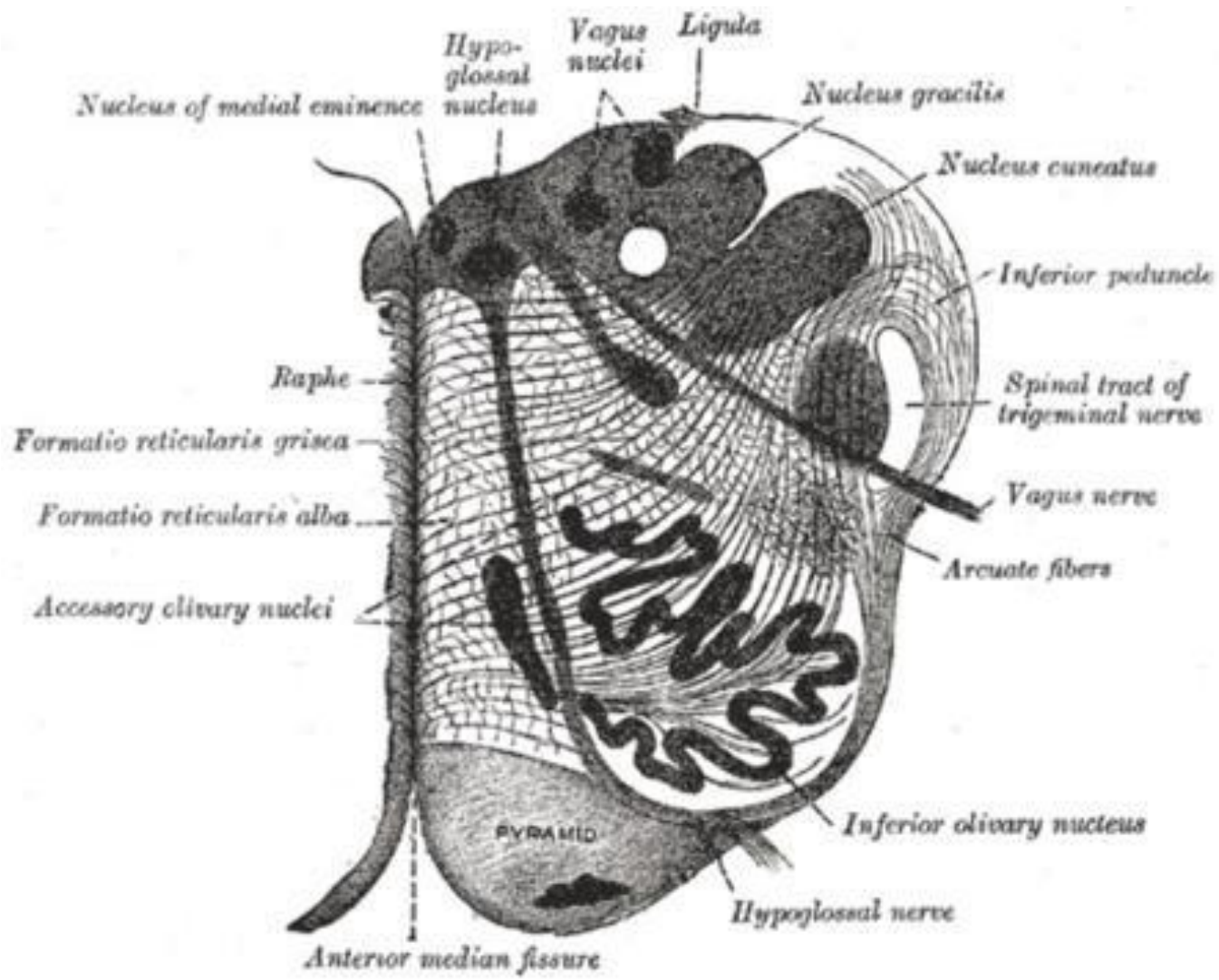


Pons

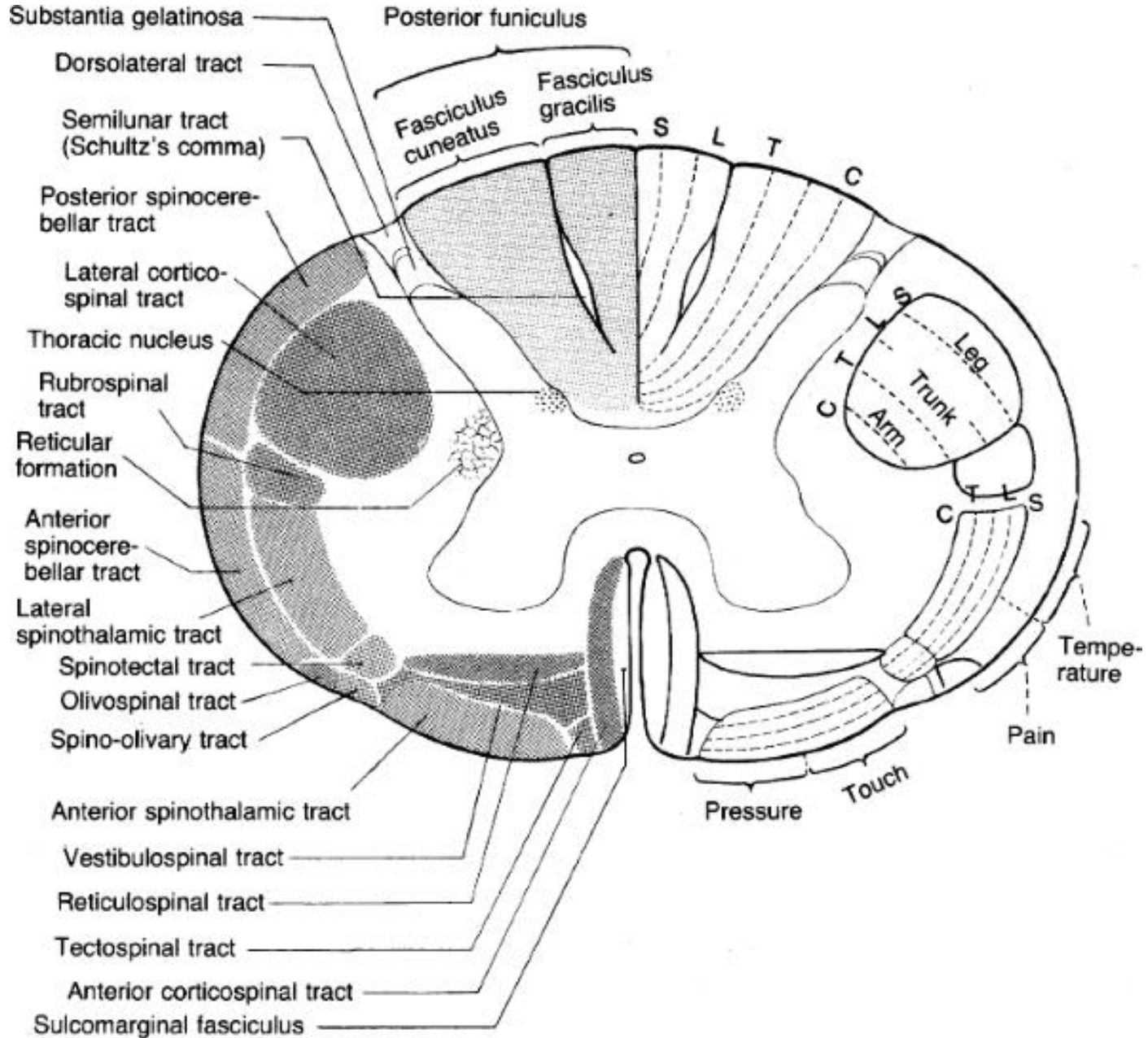


Medulla oblongata

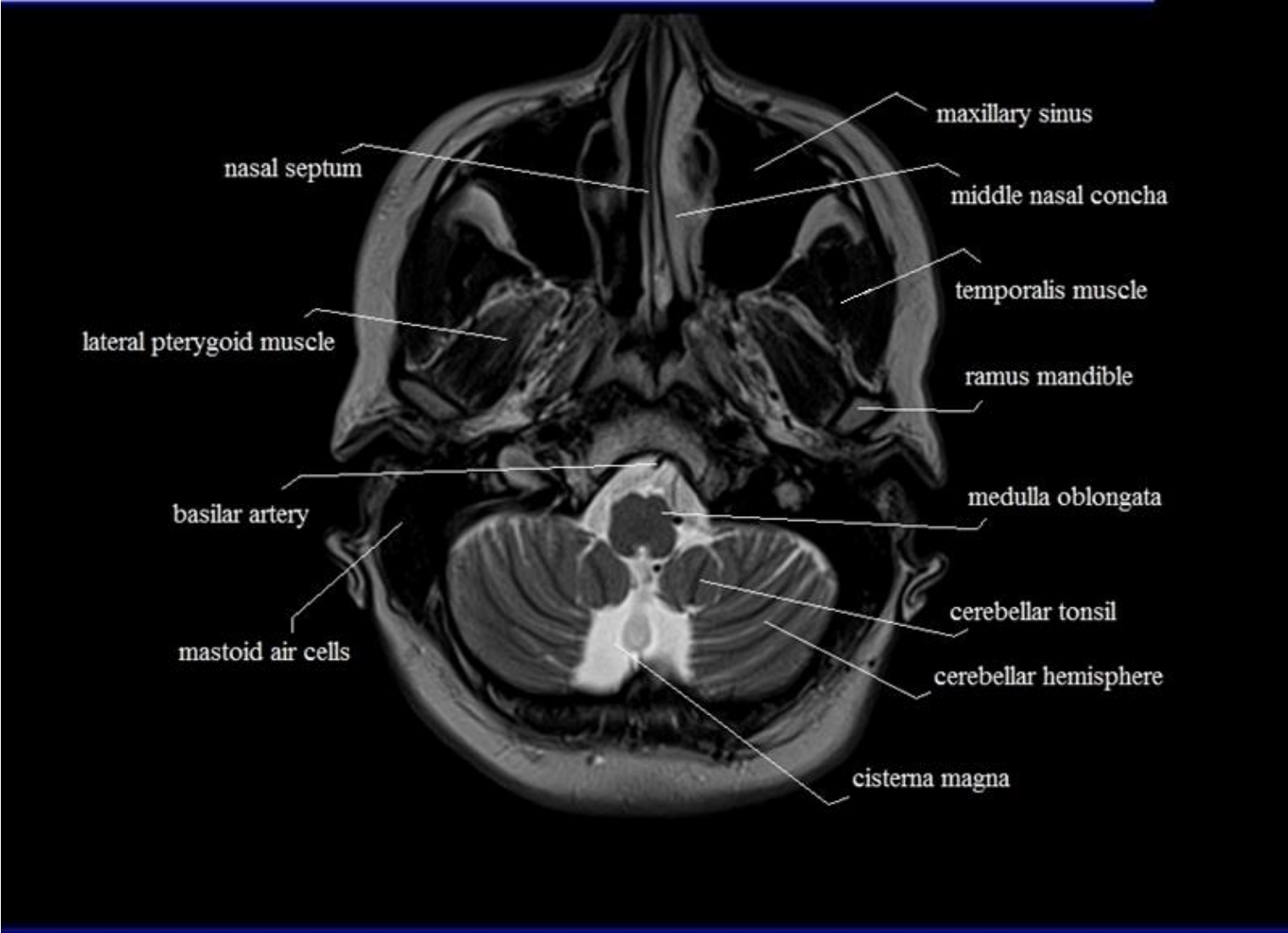


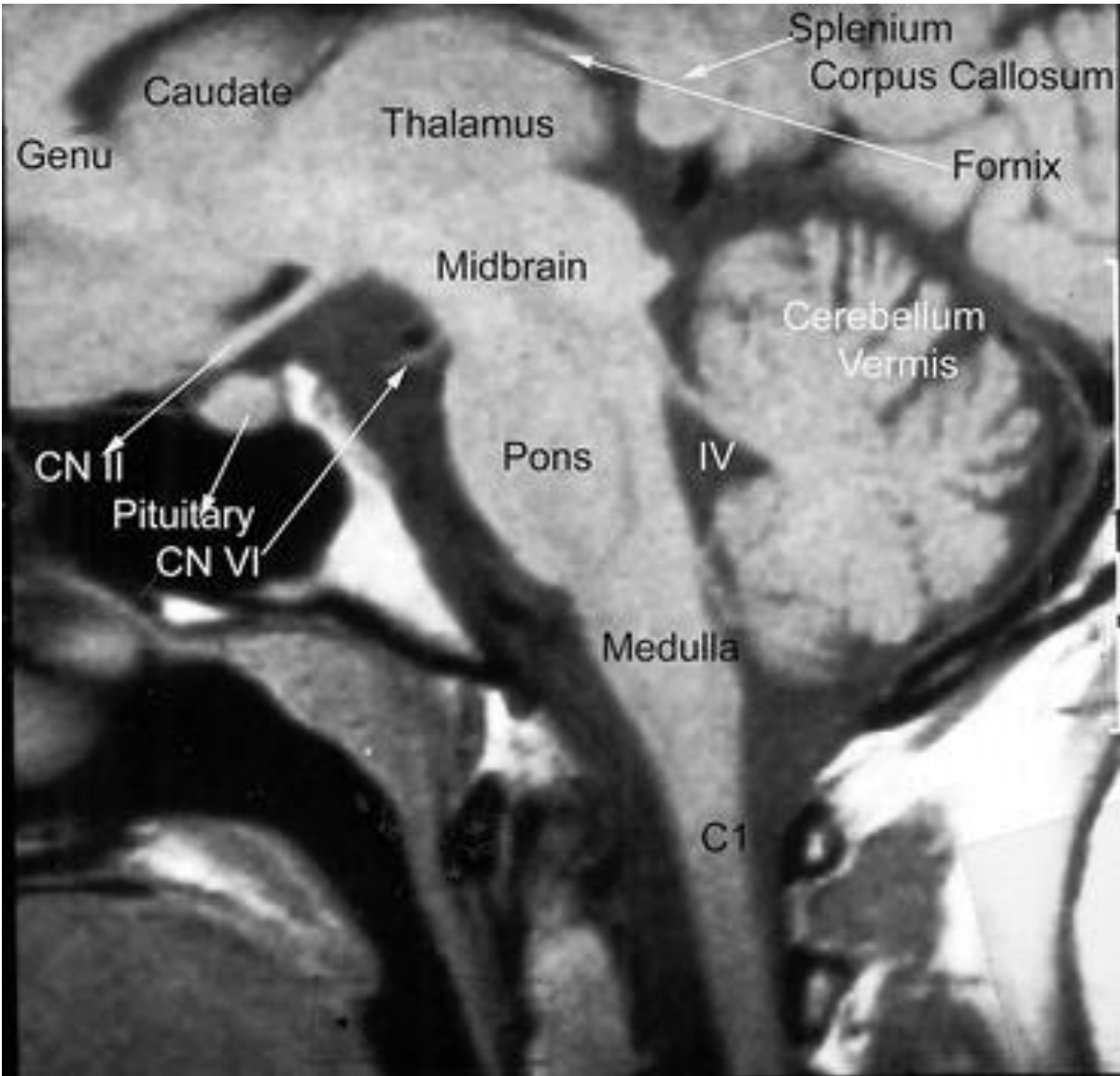


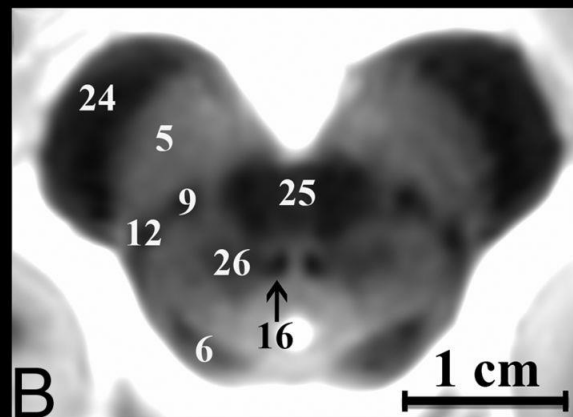
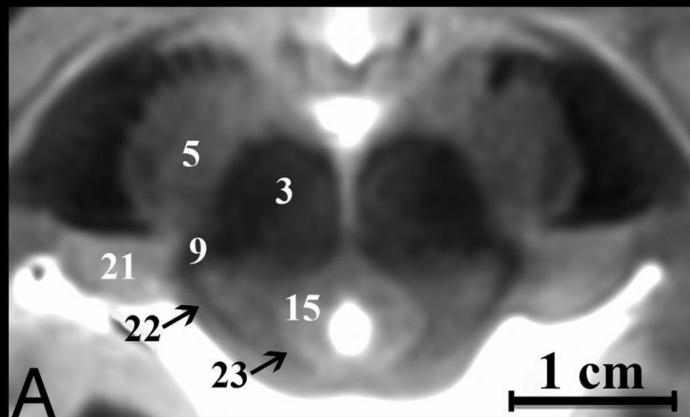
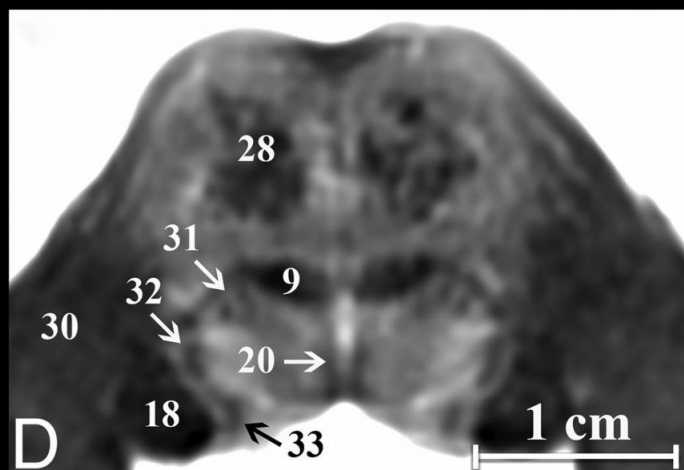
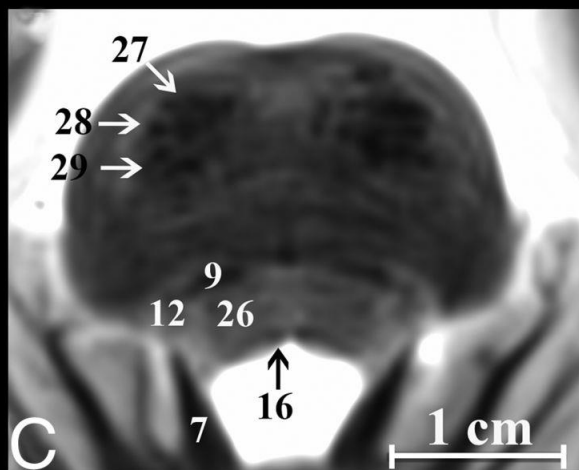
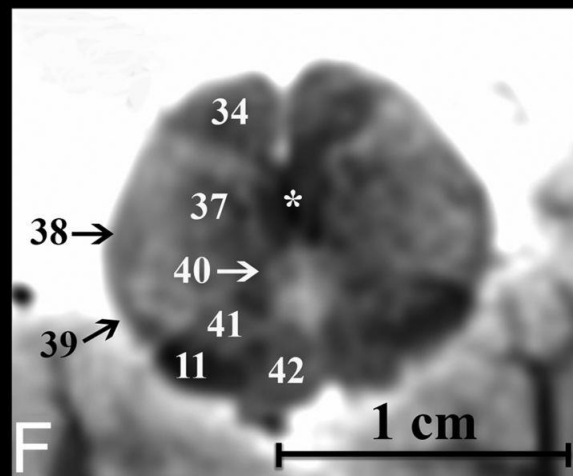
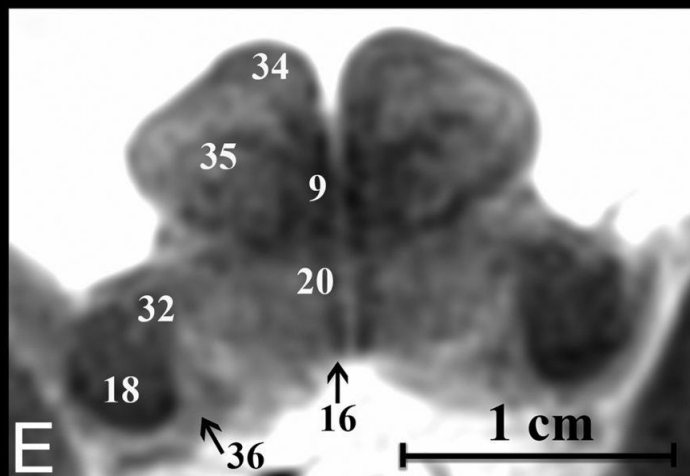
Spinal Cord

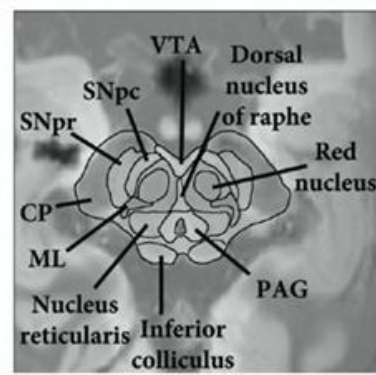
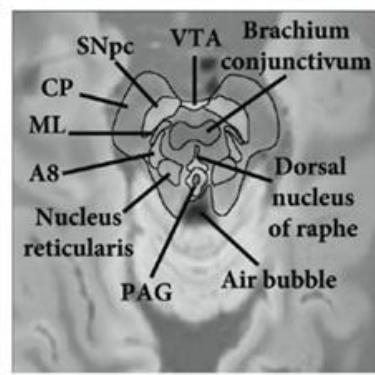
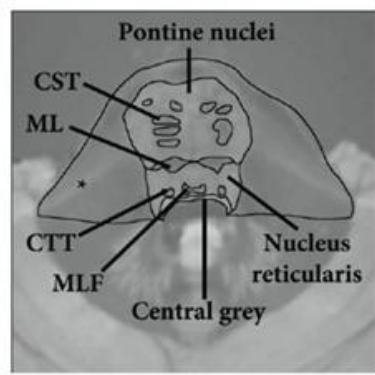
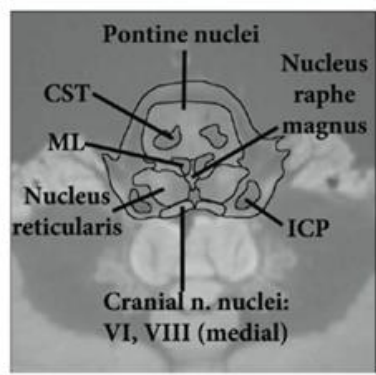
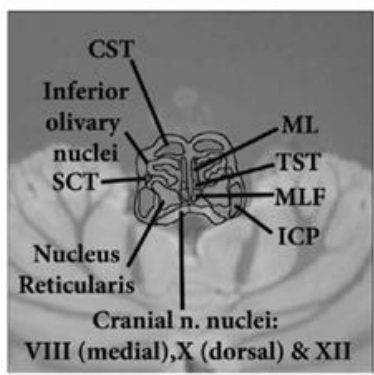
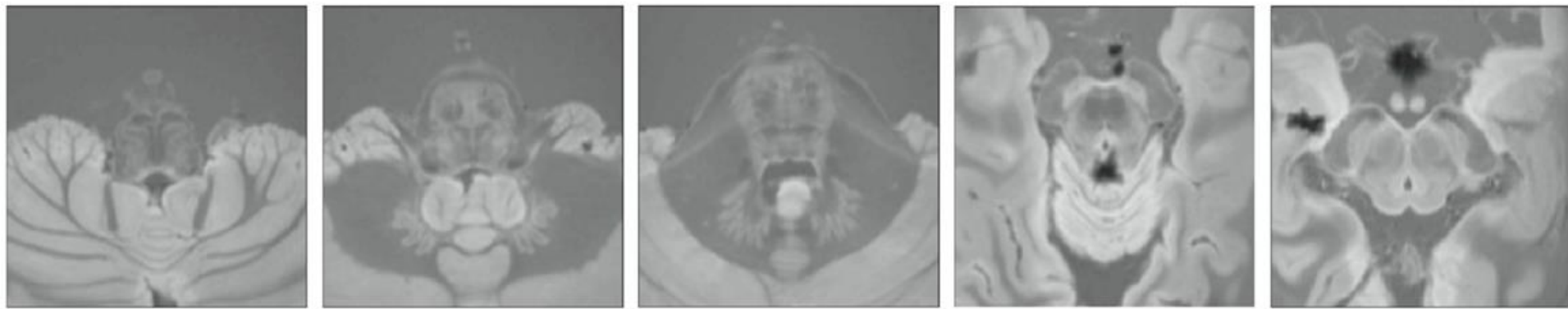
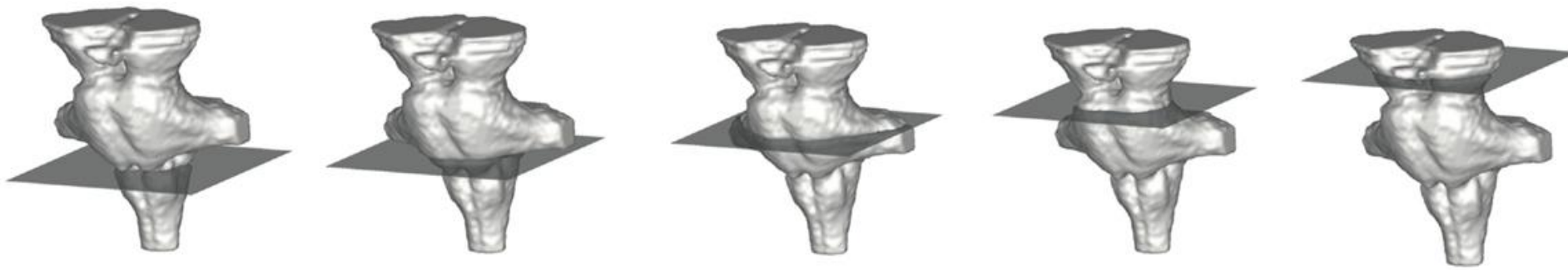


MRI

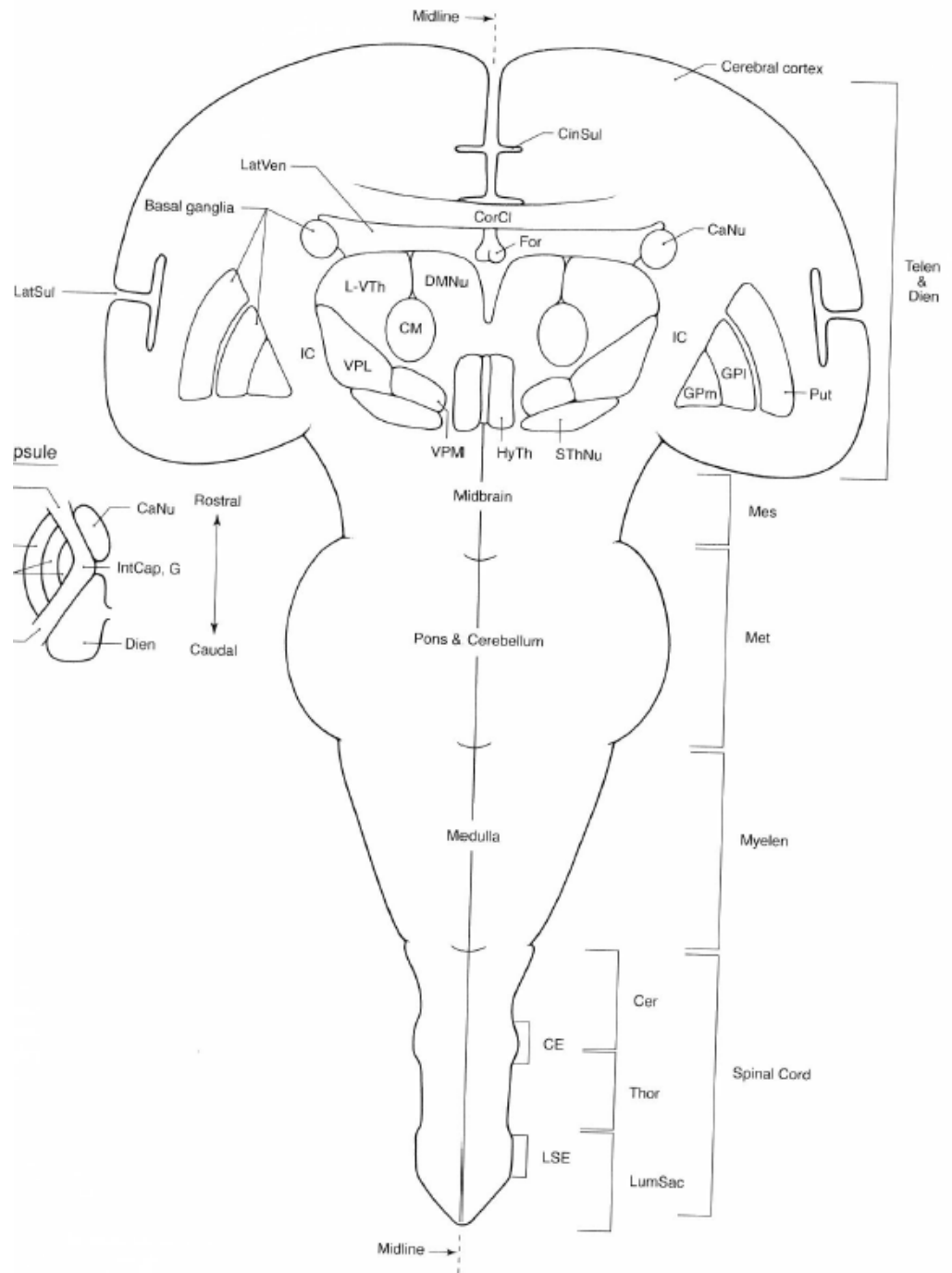


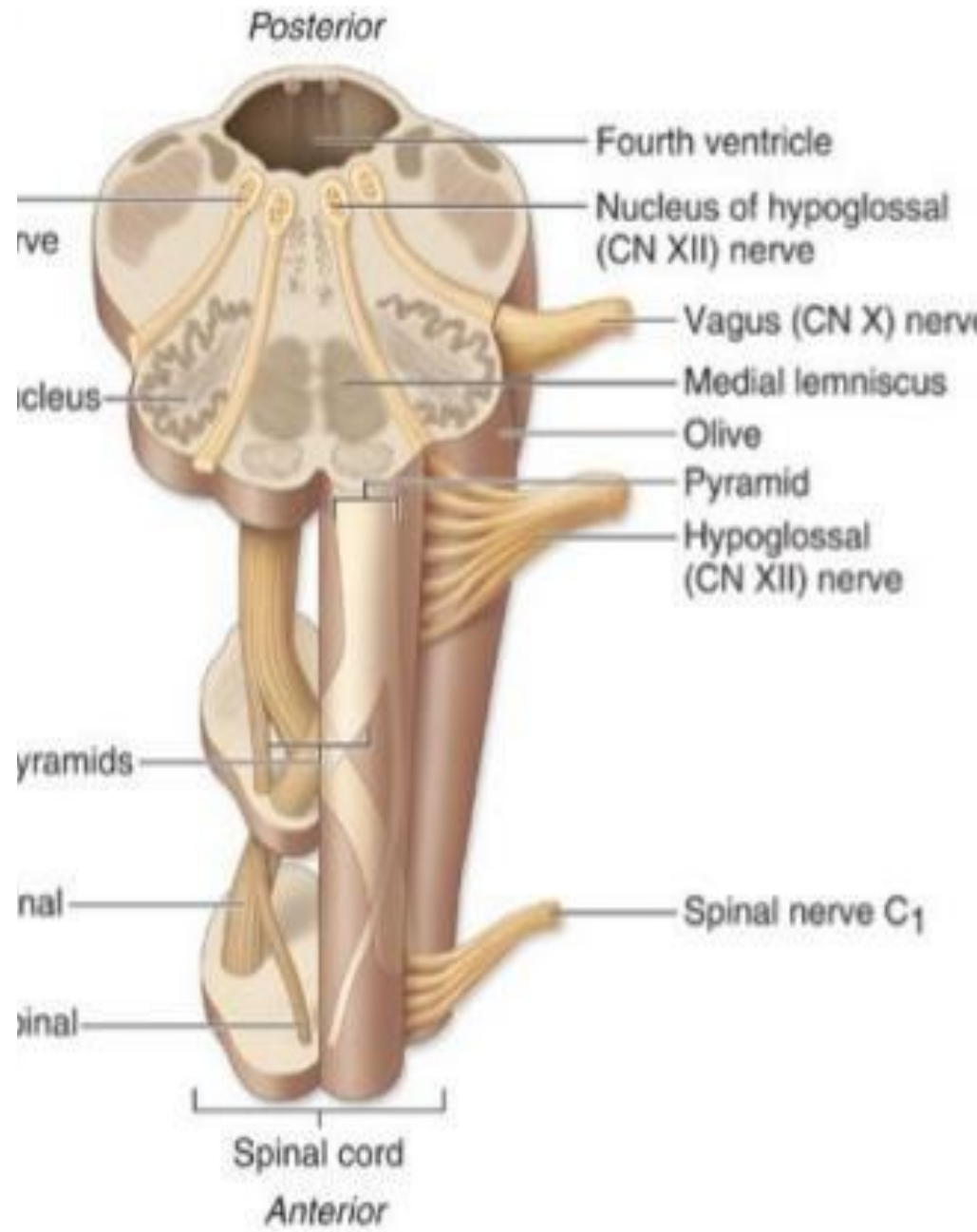
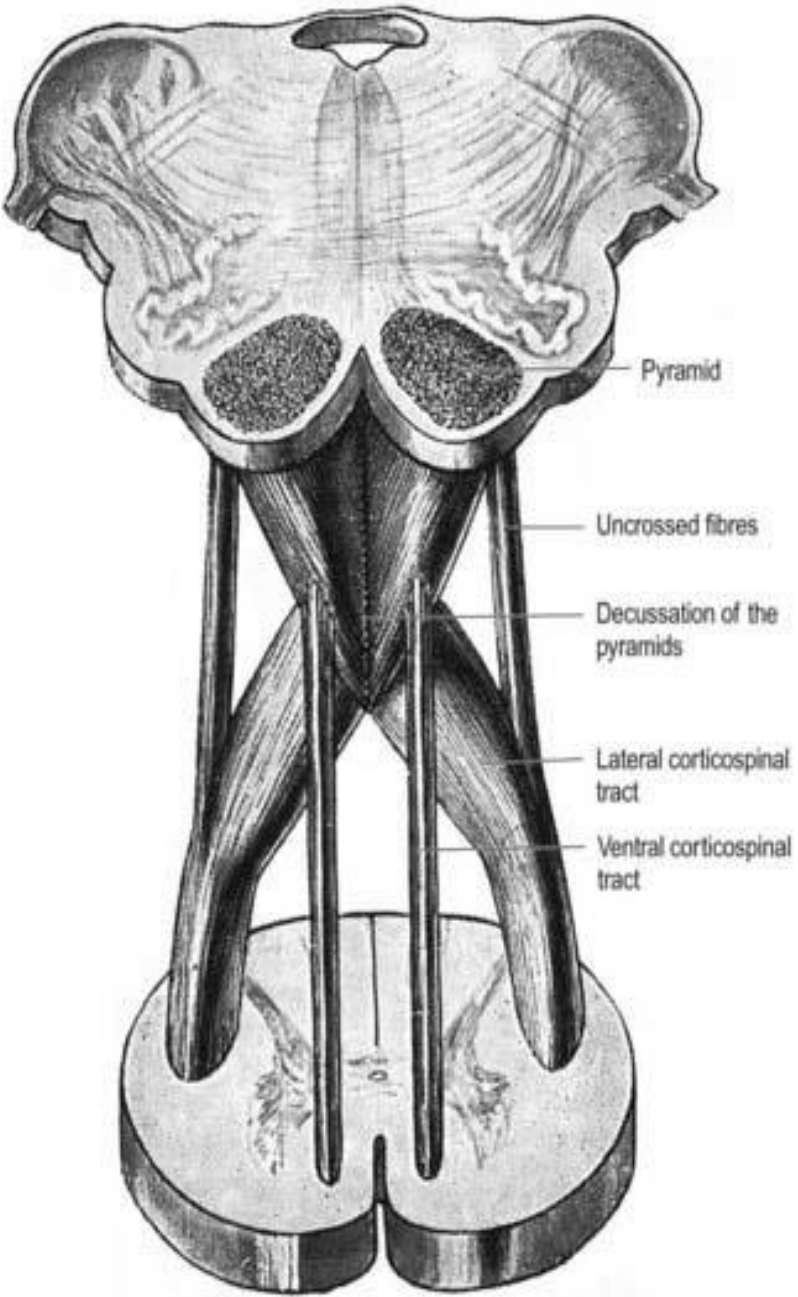


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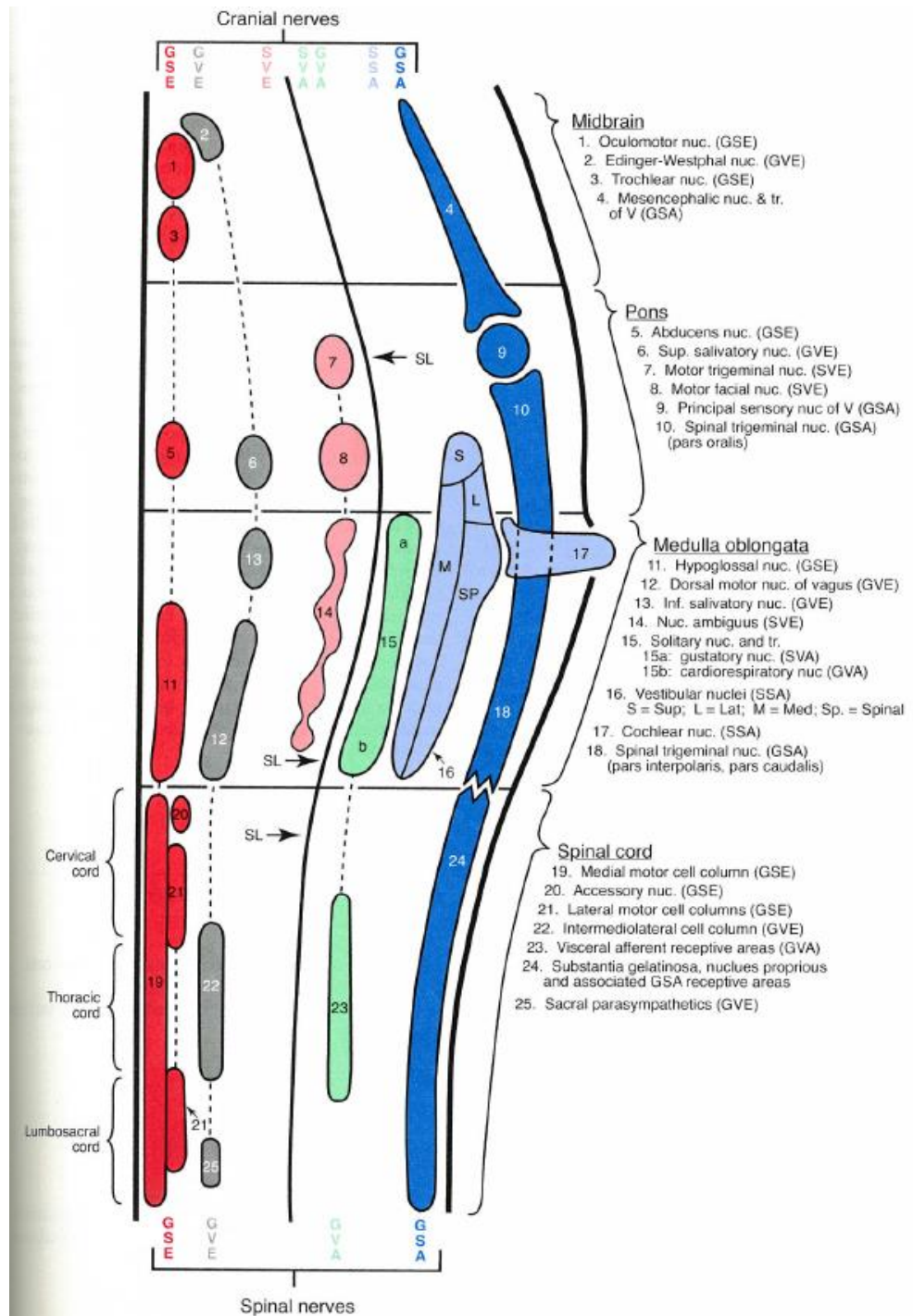


TRACTS

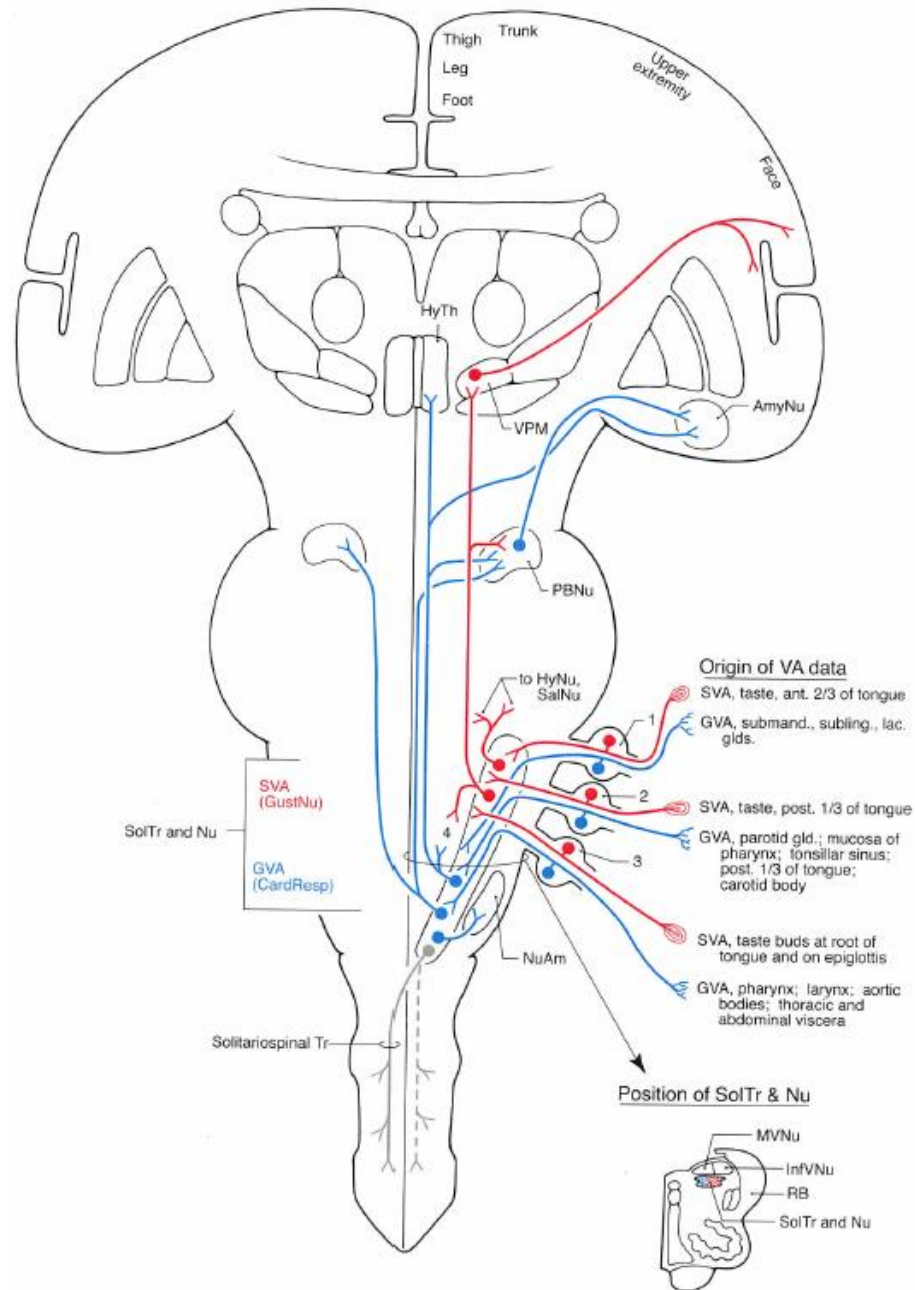




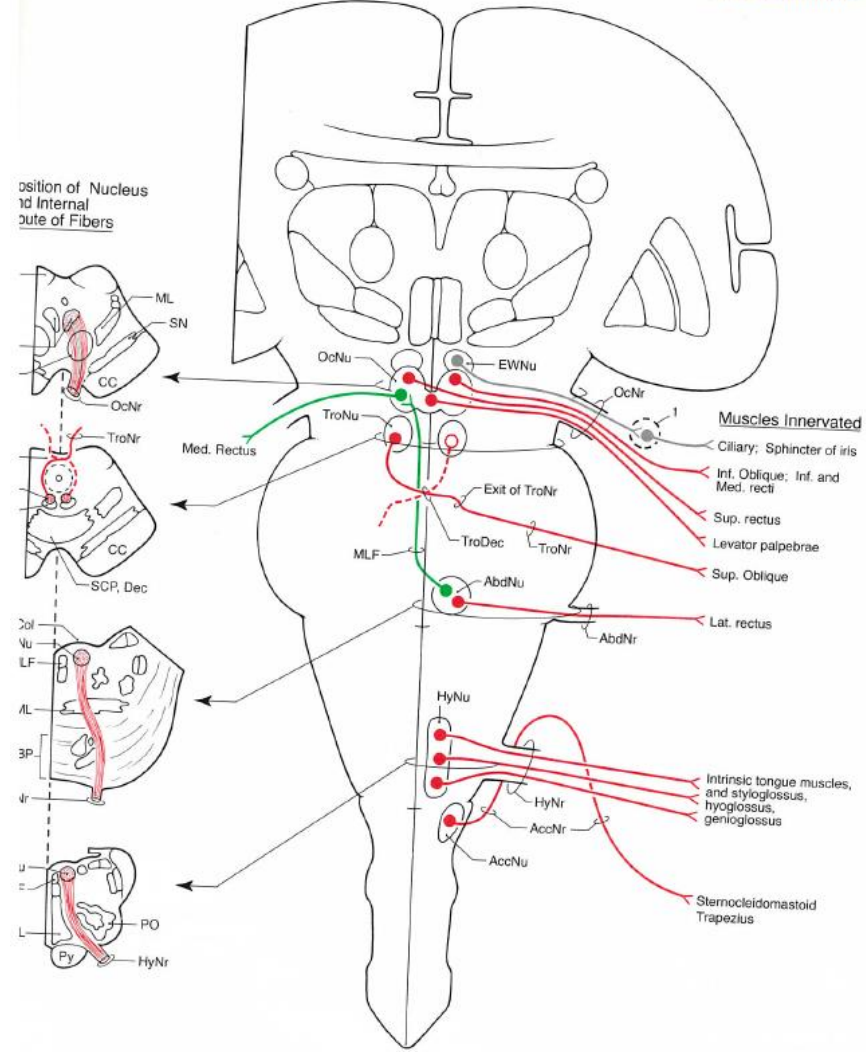
CNS Nuclei



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

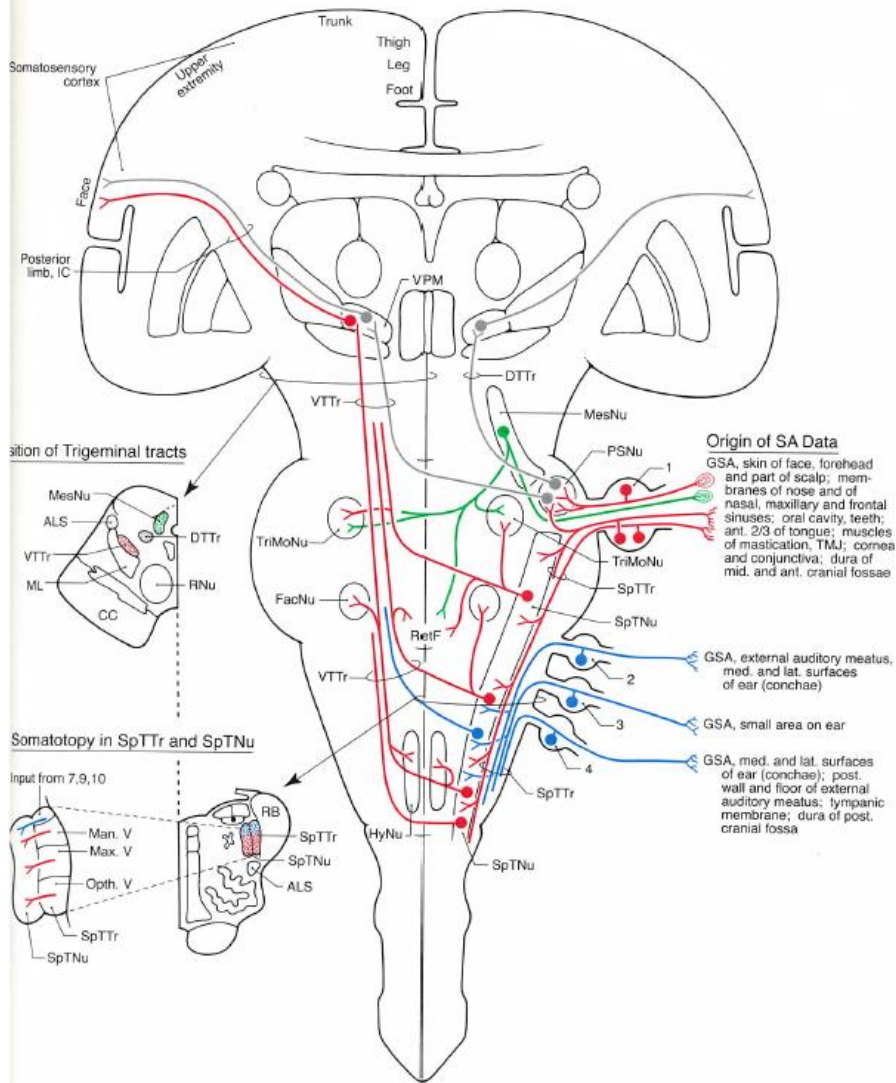
Damage to hypoglossal root

- Deviation of the tongue to the left on protrusion

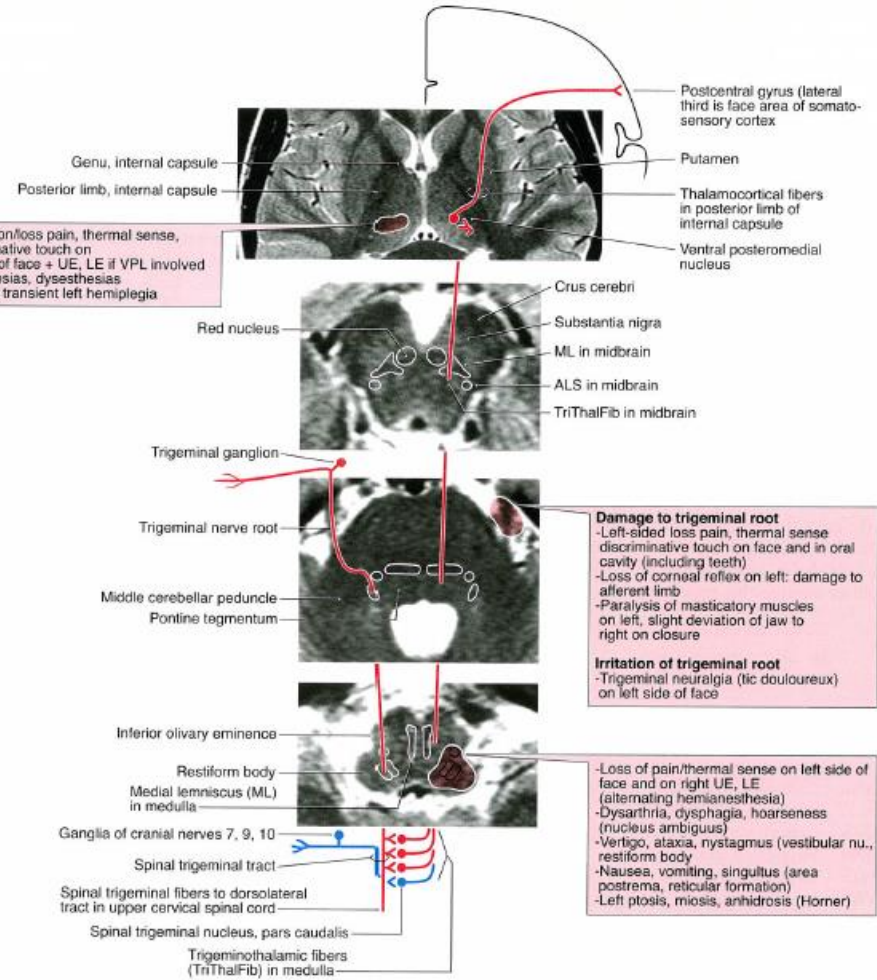
Hypoglossal deficits from other causes

- 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

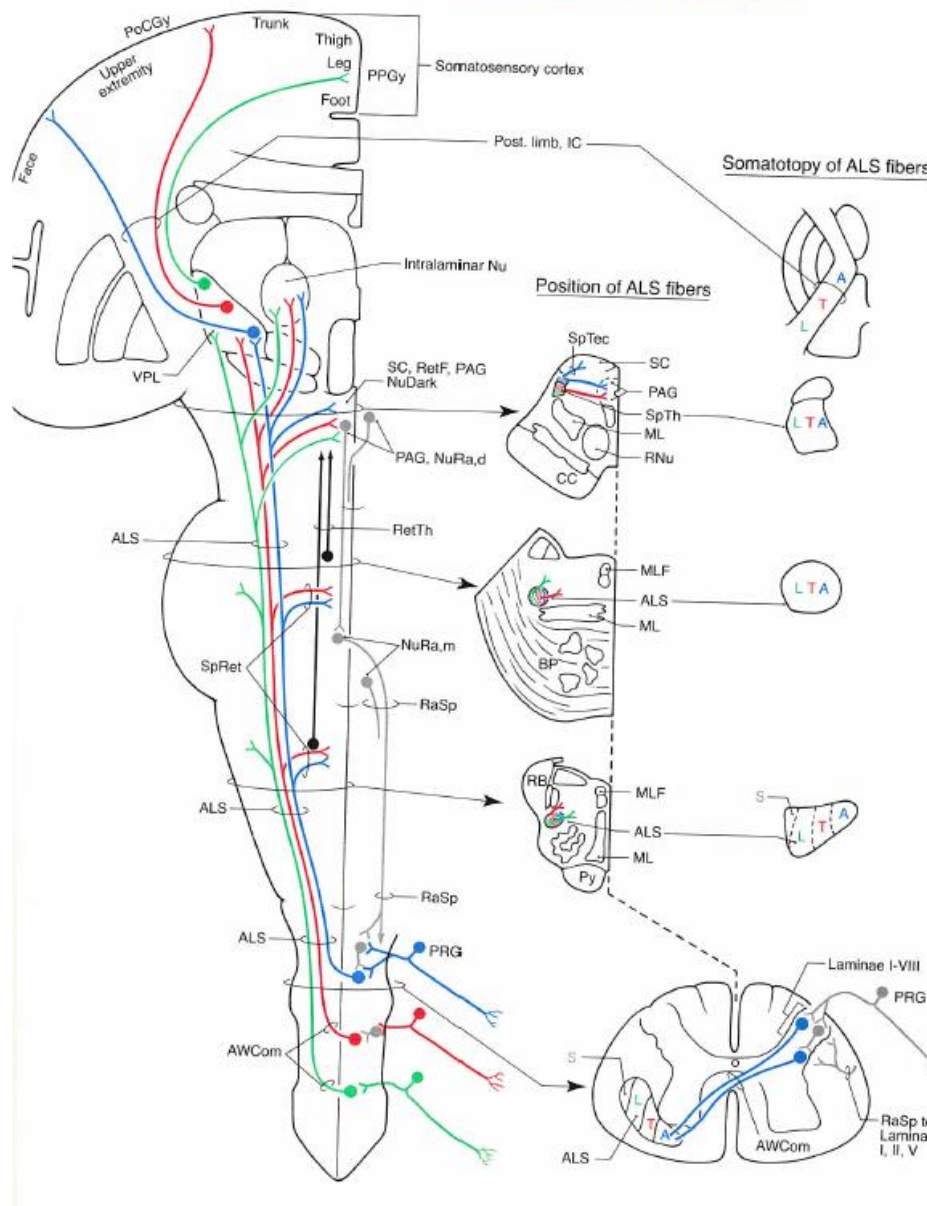
8-9 Trigeminal Pathways in Anatomical Orientations



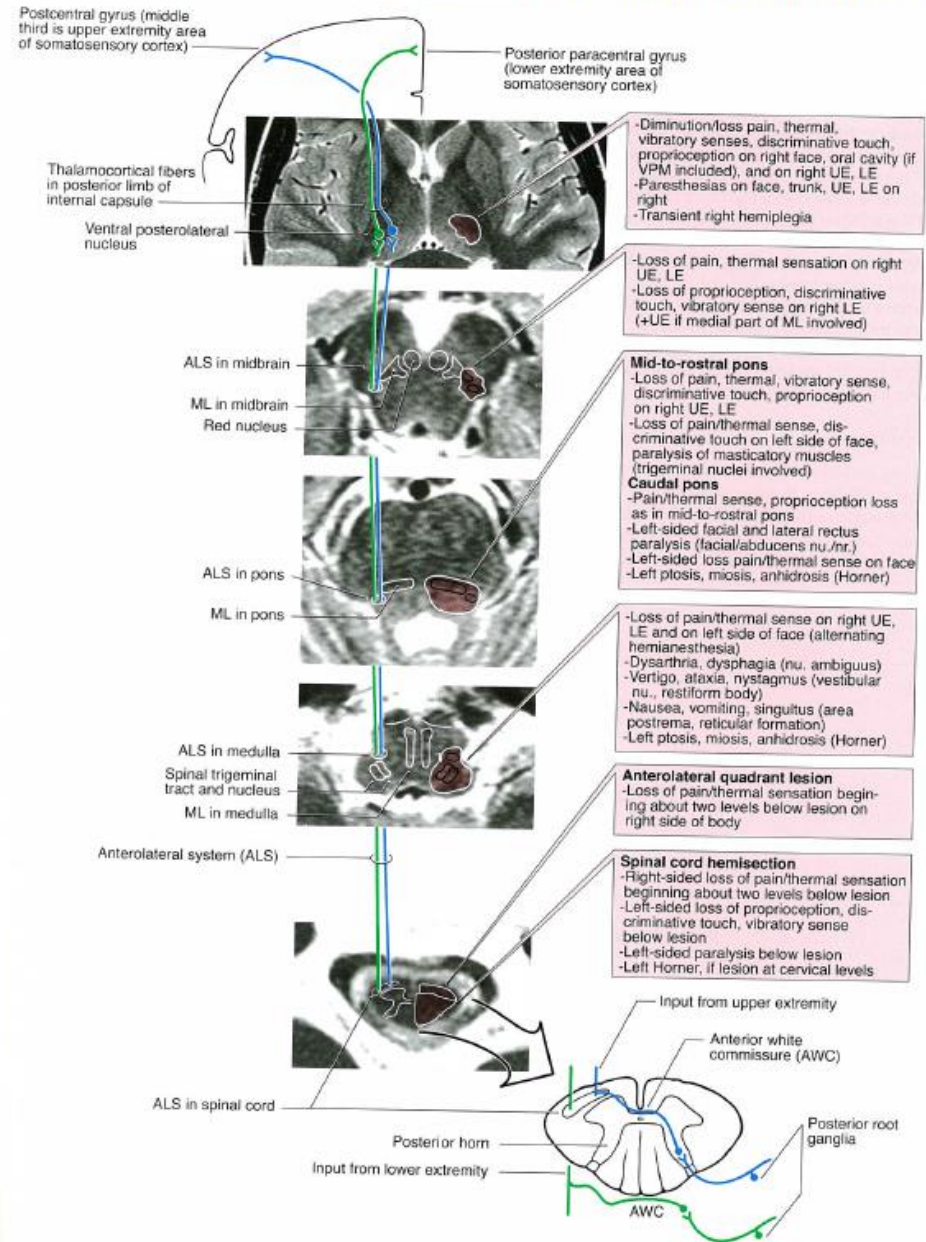
Trigeminal Pathways in Clinical Orientation: Representative Lesions and Deficits



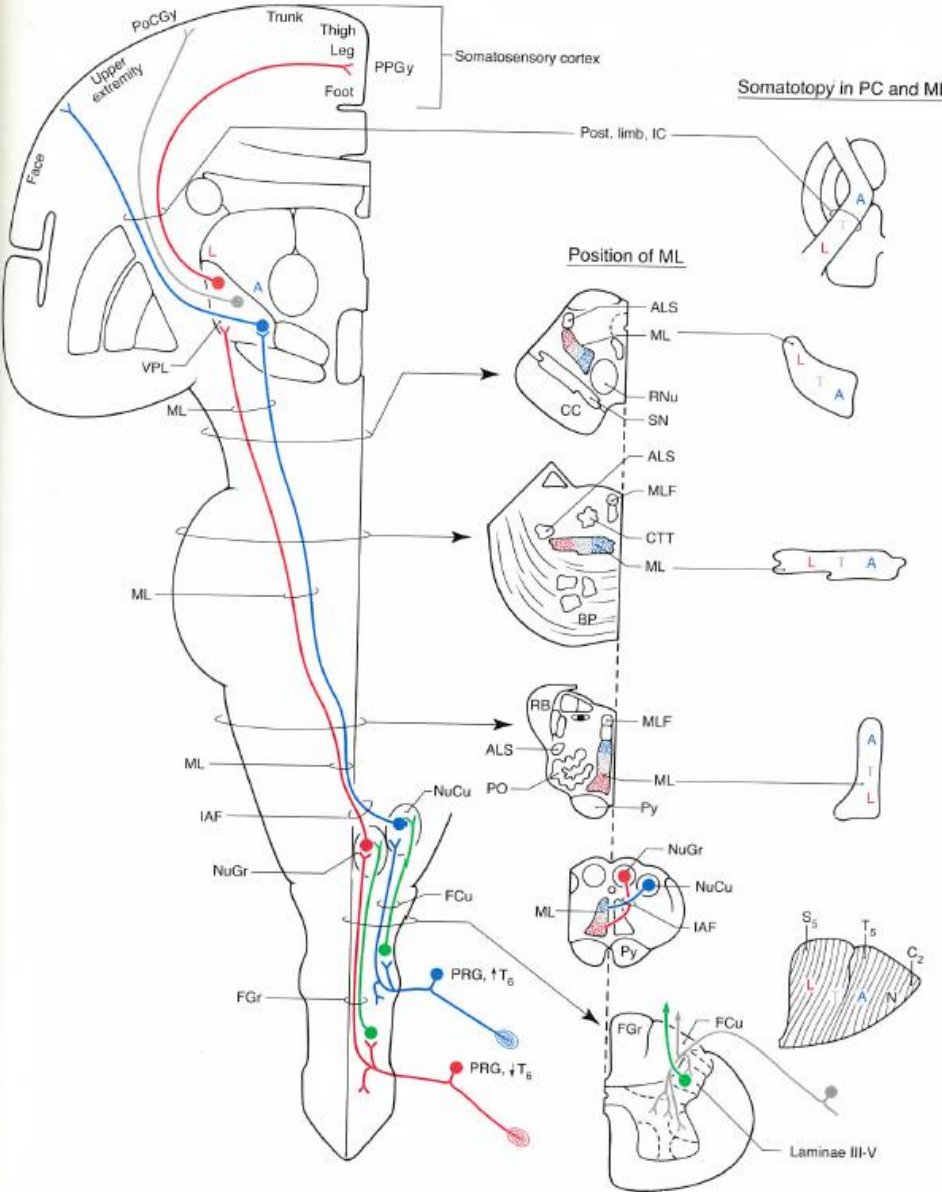
8-6 Anterolateral System in Anatomical Orientation



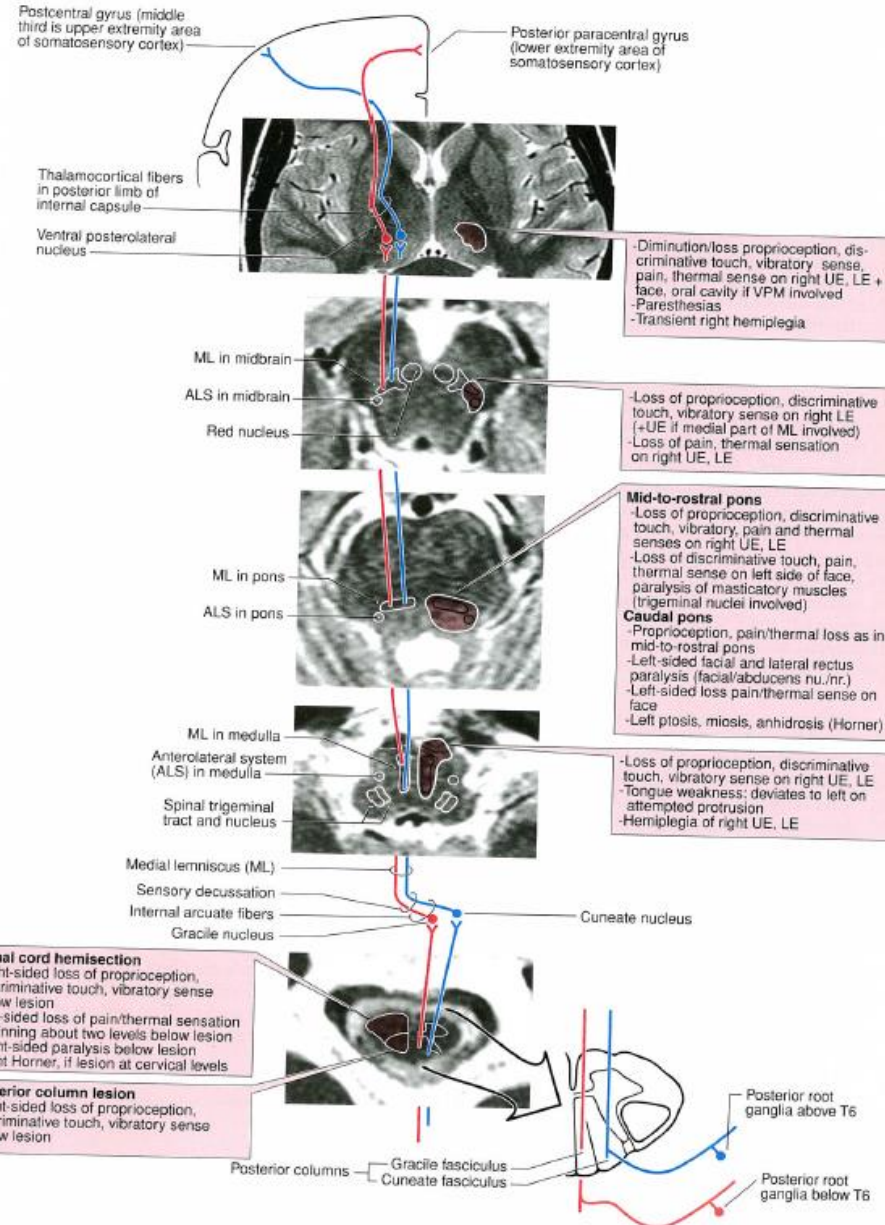
Anterolateral System in Clinical Orientation: Representative Lesions and Deficits



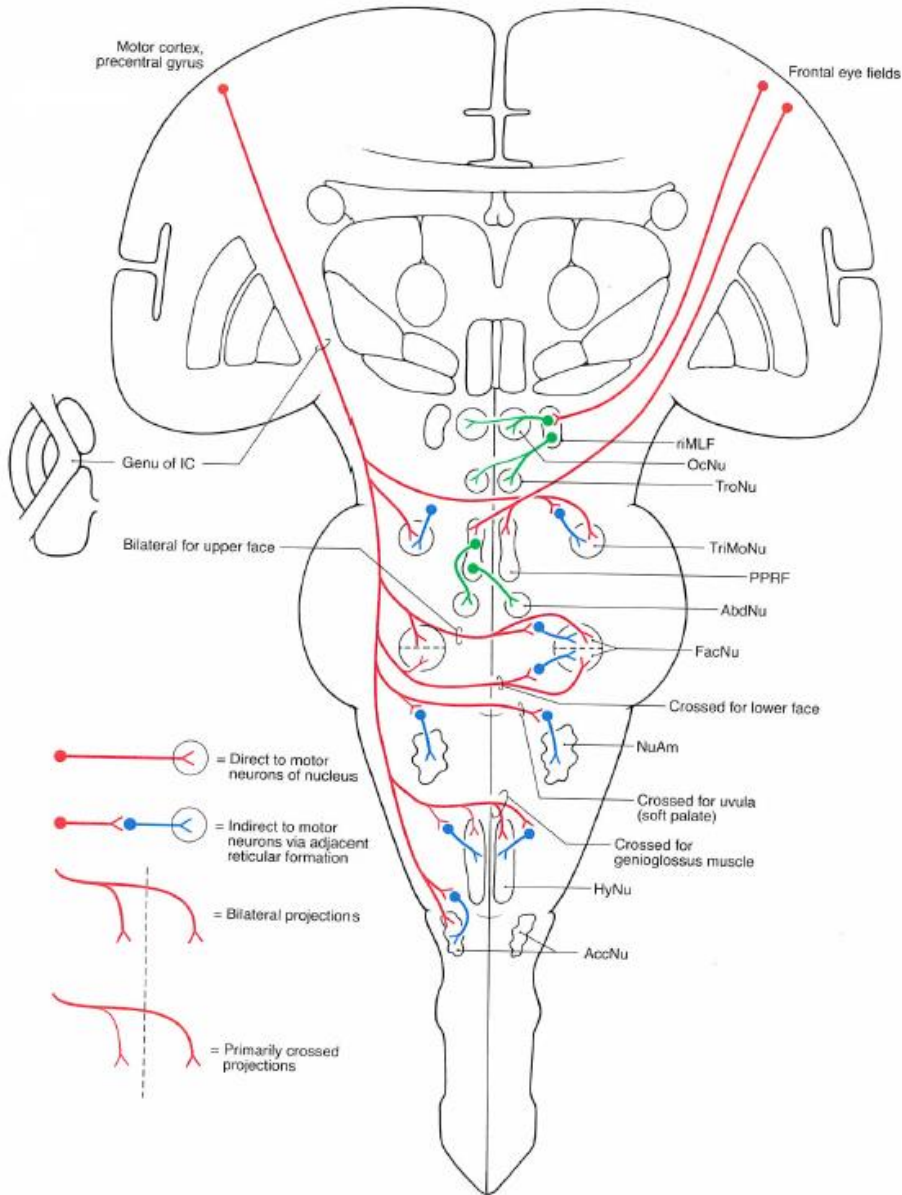
84 Posterior (Dorsal) Column-Medial Lemniscus System in Anatomical Orientation



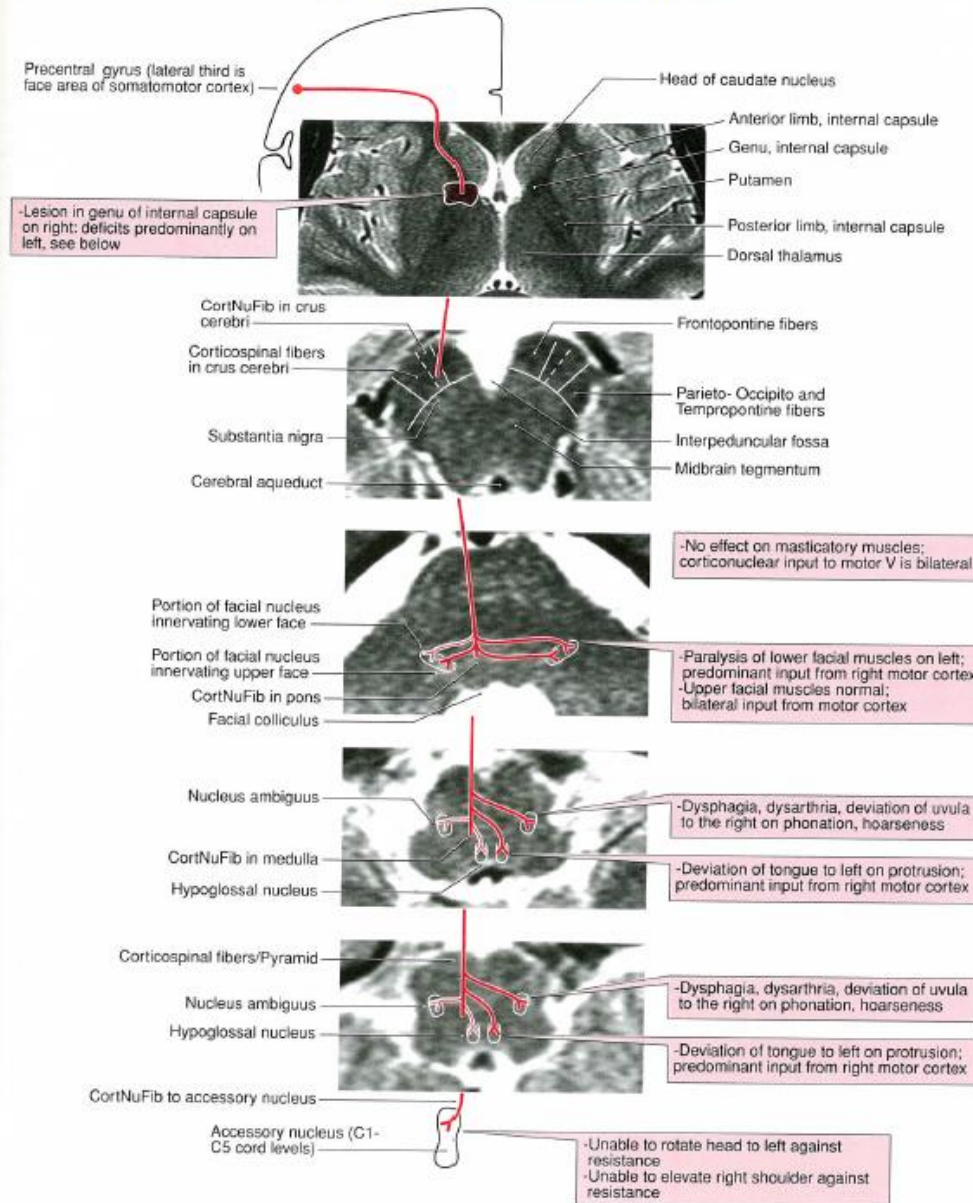
Posterior Column-Medial Lemniscus System in Clinical Orientation: Representative Lesions and Deficits



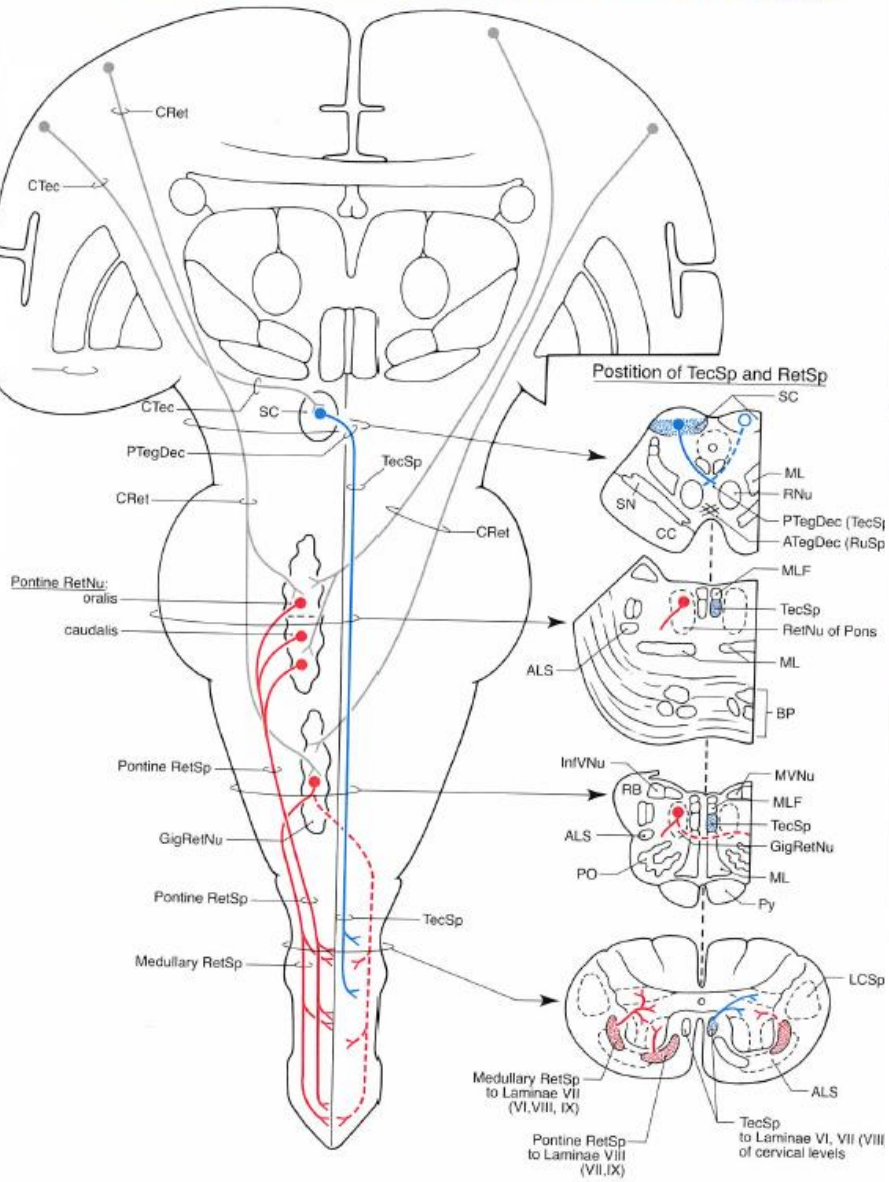
8-15 Corticonuclear (Corticobulbar) Fibers in Anatomical Orientation



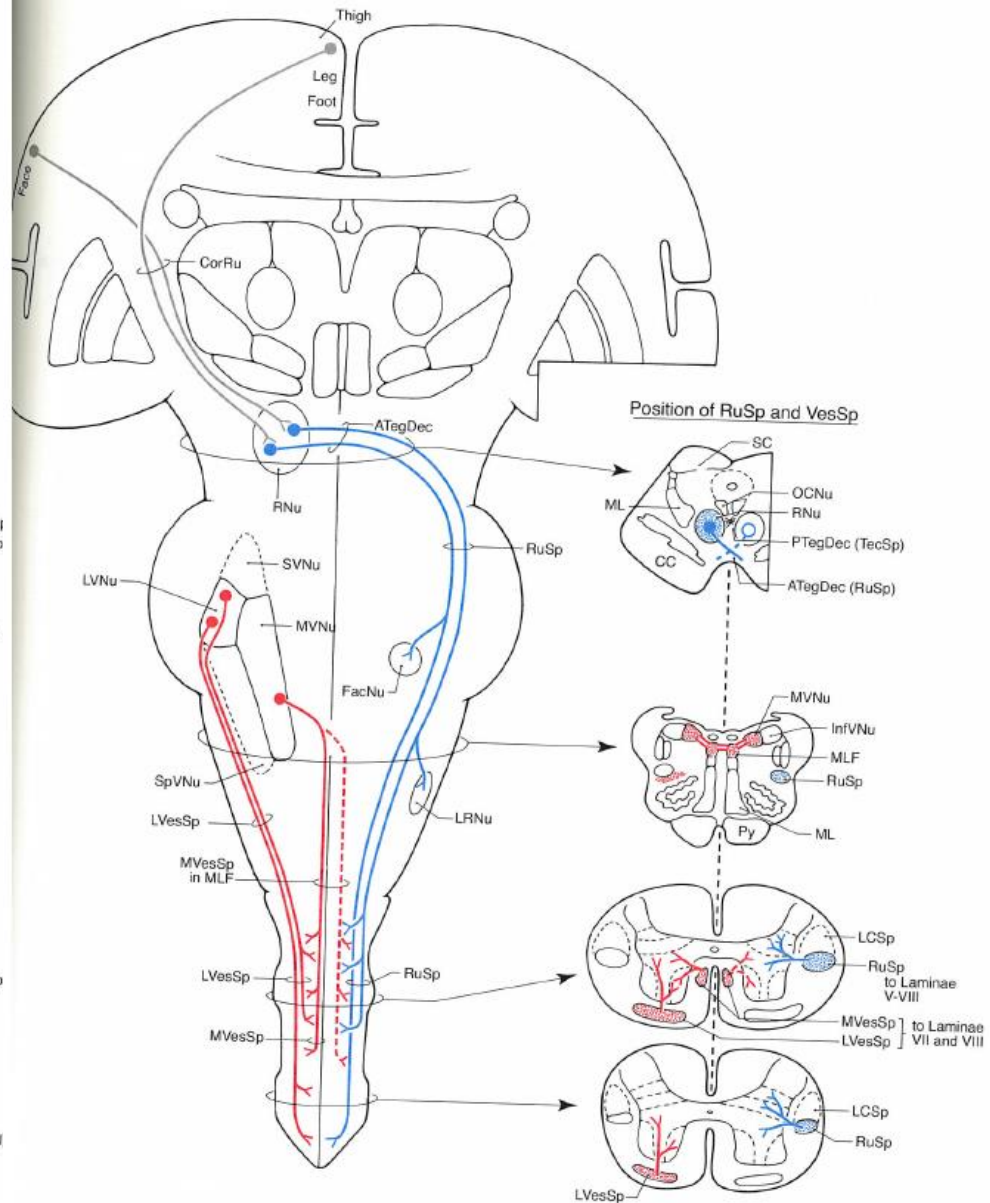
Corticonuclear (Corticobulbar) Fibers in Clinical Orientation: Representative Lesions and Deficits



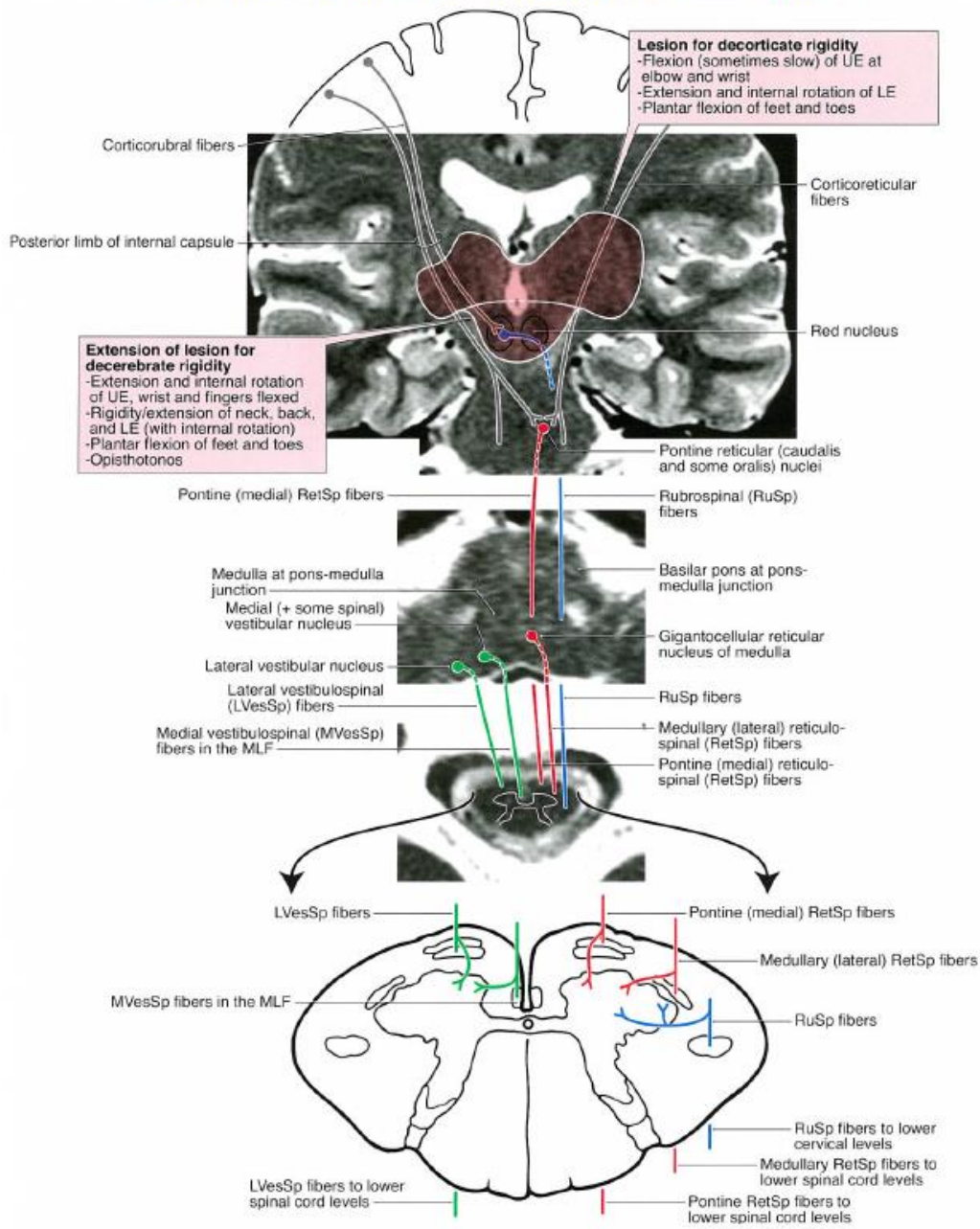
8-17 Tectospinal and Reticulospinal Tracts in Anatomical Orientation



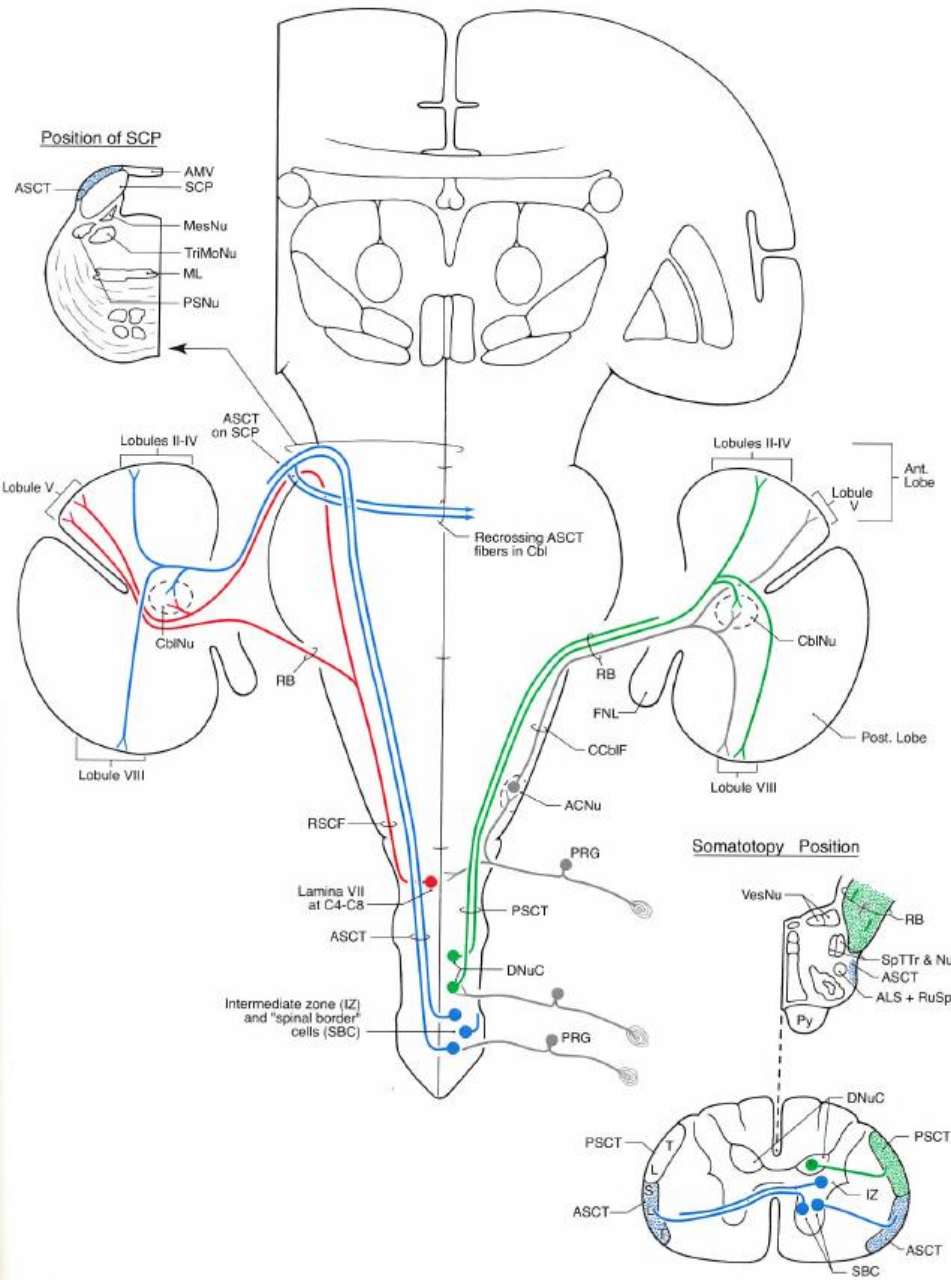
8-18 Rubrospinal and Vestibulospinal Tracts in Anatomical Orientation



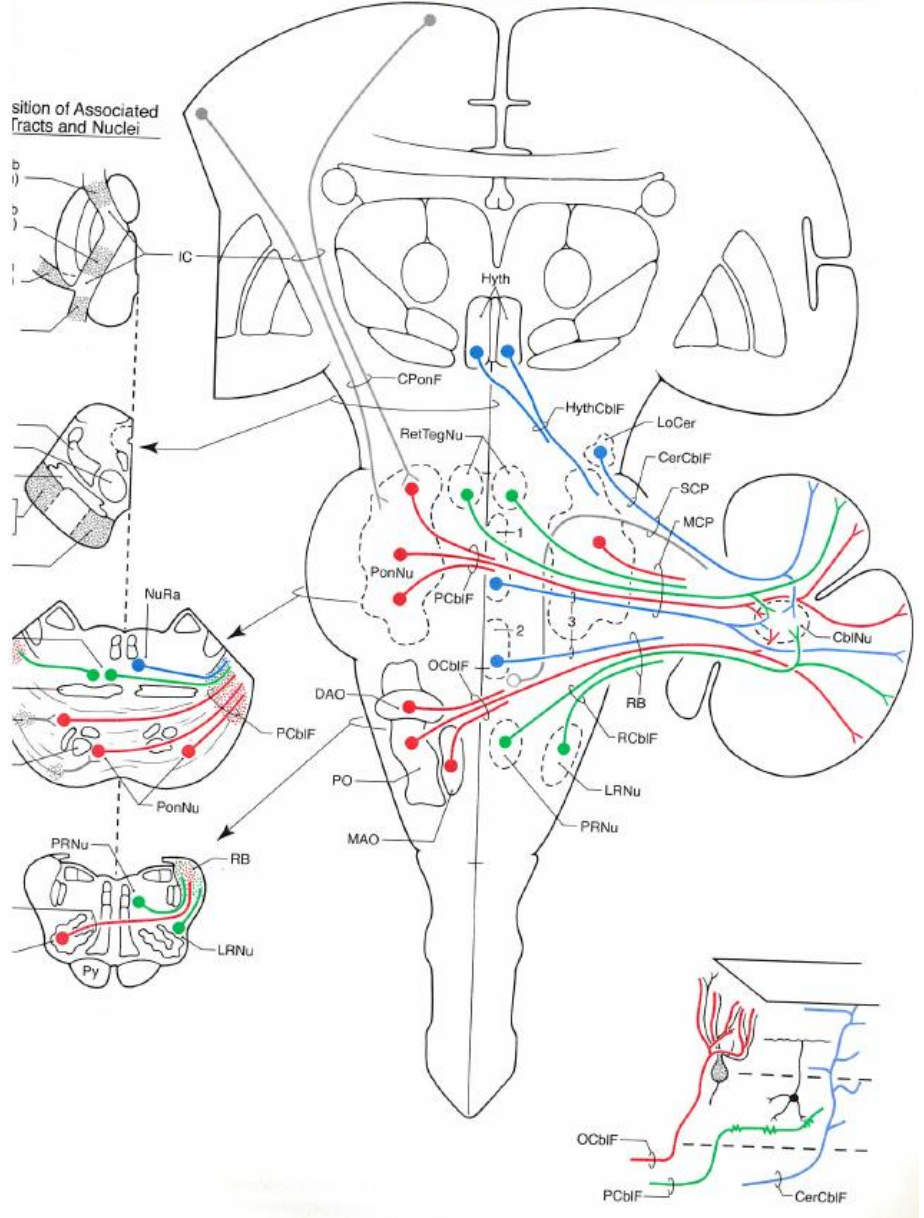
Rubrospinal, Reticulospinal, and Vestibulospinal Fibers: Clinical Orientation— Lesions Affecting Their Influence on Spinal Motor Neurons



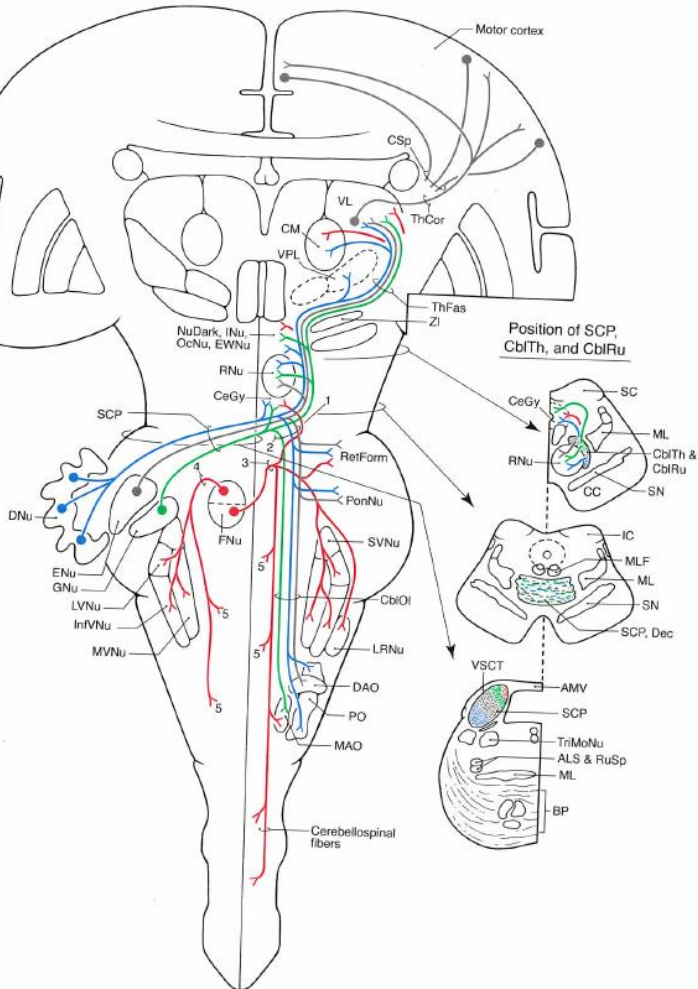
8-25 Spinocerebellar Tracts in Anatomical Orientation



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

brain lesion
 - Lesions of red nucleus, root of 3rd nerve, cerebellothalamic fibers (Claude L'Évêque syndrome)
 - Bilateral oculomotor paralysis
 - Ataxic tremor (red nuc.) and ataxia (subs. nigra) on left
 - Bilateral cerebellar tremor
 - Bilateral proprioceptive loss

Brainstem lesion
 - Usually bilateral
 - Ataxia, wide-based stance
 - Inability to walk-in-tandem or on heels
 - Nystagmus

Cortex + nuclei lesion
 - Left-sided intention tremor (finger-nose test)
 - Dysynergia, ataxia, hypotonia, unsteady gait
 - Dysidiadochokinesia
 - Rebound phenomenon
 - Dysmetria (heel-to-shin test) (also hypermetria/hypometria)
 - Dysarthria, nystagmus, static tremor
 - Lesion on left = deficits on left

Cortex lesion only
 - Ataxia, tremor (static/kinetic), unsteady gait, dysmetria
 - Lesion on left = deficits on left
 - Deficits usually transient, full recovery commonly seen

Labels on the right side of the scan:
 - Cerebral cortex (motor area)
 - Corticospinal fiber
 - Thalamocortical fiber
 - Ventral lateral nucleus (pars caudalis)
 - Thalamic fasciculus
 - Red nucleus
 - Corticospinal fiber in crus cerebri
 - Cerebellothalamic fibers (also cerebellorubral fibers)
 - Crossed descending cerebellar projections to pons and medulla

Labels on the left side of the scan:
 - Body of caudate nucleus
 - Superior cerebellar peduncle
 - Reticular formation
 - Cerebellar efferent fibers forming the superior cerebellar peduncle
 - Dentate nucleus
 - Emboliform nucleus
 - Globose nucleus

Labels at the bottom of the scan:
 - Principal olivary nucleus
 - Dorsal accessory olivary nucleus
 - Medial accessory olivary nucleus