



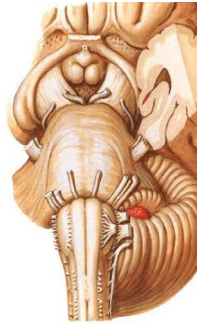
Brainstem I

Medical Neuroscience
Dr. Wiegand



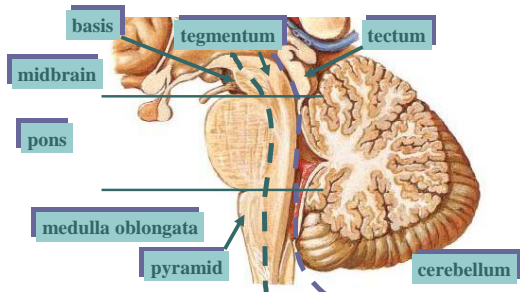
Brainstem Lectures

- o Brainstem I
 - External structure
 - Cerebellum
 - Cranial nerves
- o Brainstem II
 - Internal structure
 - Cranial nerve nuclei
 - Reticular formation
 - Location of selected tracts





Brainstem Organization



● ● ● | Ventral Brainstem



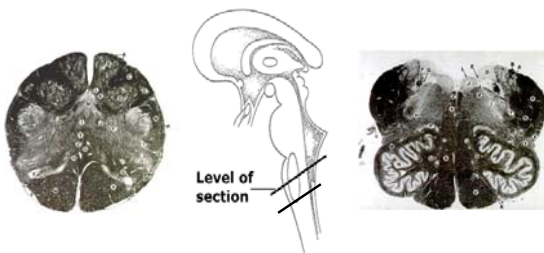
- Cerebral peduncles
- Interpeduncular fossa
- Basilar pons
- Pyramids & decussation
- Olives
- Anterior median fissure
- Olivary sulci
- Bulbopontine sulcus
- Cerebellar angle

● ● ● | Dorsal Brainstem

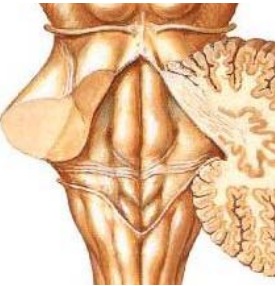


- Colliculi & brachia
- Cerebellar peduncles
- Rhomboid fossa
- Tuberculum Gracilis
- Tuberculum Cuneatus
- Tuberculum Cinereum

● ● ● | "Open" vs. "Closed" Medulla




Dorsal Brainstem – Rhomboid Fossa



- Isthmus
- Velum
- Obex
- Posterior median sulcus
- Medial eminence
- Facial colliculus
- Sulcus limitans
- Stria Medullares
- Trigones
 - Hypoglossal
 - Vagal

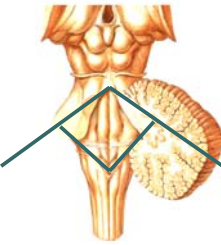

Cerebellum

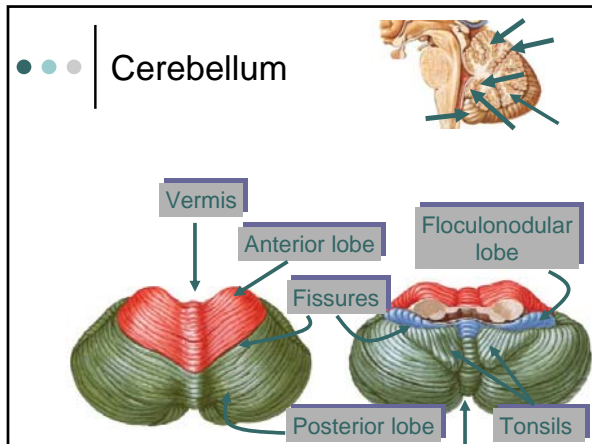
- Outgrowth of pons
- Connects to brainstem through cerebellar peduncles
- Functions
 - Muscle tone regulation
 - Coordinated movement
 - Postural control
 - Motor learning



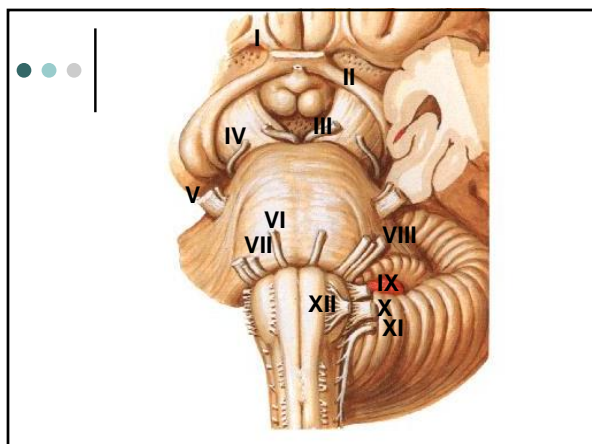
Cerebellum

- Cerebellar cortex surrounding white matter
- Series of fissures and folia




- ● ● Cranial Nerve Functional Classifications
- GSE – motor innervation of somatic musculature
 - SVE – motor innervation of branchiomeric musculature
 - GVE – motor innervation of viscera
 - GVA – sensory input from viscera
 - SVA – taste and smell sensory input
 - GSA – general somatosensory input
 - SSA – special senses of vision and hearing/balance




I, II | Cranial Nerves –
Telencephalon &
Diencephalon

- Olfactory –
 - smell (SVA)
- Optic –
 - vision (SSA)




III, IV | Cranial Nerves –
Mesencephalon



- Oculomotor –
 - extraocular eye muscles (GSE)
 - PSNS to eye (GVE)
- Trochlear –
 - extraocular muscle (sup. oblique) (GSE)

V, VI | Cranial Nerves –
Metencephalon



- Trigeminal –
 - Muscles of mastication (SVE)
 - General sensation of the head and face (GSA)
- Abducens –
 - extraocular muscle (lat. rectus) (GSE)

VII, VIII

Cranial Nerves – Metencephalon



- Facial –
 - Facial expression muscles (SVE)
 - Glands (submandibular, sublingual & lacrimal) (GVE)
 - Taste (SVA)
 - General sensation of ear (GSA)
- Vestibulocochlear –
 - Hearing and balance (SSA)

IX

Cranial Nerves – Myelencephalon

- Glossopharyngeal
 - Stylopharyngeus muscle (SVE)
 - PSNS to parotid gland (GVE)
 - Taste (SVA)
 - Carotid body sensation (GVA)
 - General sensation from ear & tongue (GSA)



X

Cranial Nerves – Myelencephalon

- Vagus
 - Muscles of larynx & pharynx (SVE)
 - PSNS to thorax and upper abdomen (GVE)
 - Sensory from viscera (GVA)
 - General sensation from ear (GSA)
 - Taste (SSA)



XI, XII

Cranial Nerves – Myelencephalon

- Accessory –
 - innervates trapezius and sternocleidomastoid (SVE or GSE)
- Hypoglossal –
 - tongue muscles (GSE)



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Cranial Nerve Groups

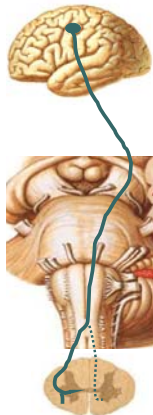


- Parasympathetic
 - III, VII, IX, X
- Motor
 - III, IV, VI, XI, XII
- Sensory
 - I, II, VIII
- Mixed
 - V, VII, IX, X

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Descending Pathway

- Pyramidal or Corticospinal





Ascending Pathways

- o Dorsal Column/Medial Lemniscal Pathway
- o Anterolateral System
- o Spinocerebellar Tracts

