

Medulla oblongata (MO)

1. It is located between the exit of the 1st spinal nerve and pons Varoli (length 20–25 mm)
2. Its gray matter contains nuclei of cranial nerves (XII., XI., X., IX.)
3. Vital centra are located in reticular formation (for breathing, swallowing, coughing, vomiting, cardiovascular system...)
4. Its dorsocranial part opens and forms caudal part of IV. ventricle (sulcus medianus, eminentia medialis, sulci limitantes, trigonum nervi hypoglossi, trigonum nervi vagi – ala cinerea, fovea inferior)
5. White matter (run here motoric and sensory tracts) forms funiculus anterior, lateralis and posterior - they are separated by fissura mediana anterior, sulcus lateralis anterior (XII.) and posterior (IX., X., XI.) and sulcus medianus posterior
6. Funiculus anterior has widening as pyramis medullae oblongatae (it contains corticospinal or „pyramid“ tract)
7. Funiculus lateralis has widening - oliva, axons of cranial nerves (XII., X., IX.) leave MO behind the oliva, XII. cranial nerve leaves MO in front of oliva !!!!!
8. Funiculus posterior contains mainly sensory tracts (fasciculus gracilis and cuneatus – clava and tuberculum cuneatum, tuberculum cinereum)
9. Between inferior pedunculi is velum medullare inferius with plexus choroideus of IV. ventricle, apertura mediana-Magendii, aperturae laterales - Luschke)

foramen caecum, fibrae arcuatae externae, pedunculus cerebellaris inferior

Pons Varoli

1. Located between medulla oblongata and mesencephalon, length about 25 mm
2. Source of V. – VIII. cranial nerves, get out of fissure between pons and medulla oblongata (bulbopontine groove- sulcus bulbopontinus)
3. Dorsal side (old part) forms rostral part of fossa rhomboidea (fourth ventricle) sulcus medianus, eminentia medialis, sulci limitantes, colliculus facialis, area vestibularis, tuberculum acusticum, striae medullares, fovea superior, locus coeruleus
4. On the lateral side are pedunculi cerebellares medii (young part) (pontocerebellar angle – exit of V. cranial nerve). Extrapyramidal (cortico-ponto-cerebellar) tracts enter through pedunculi cerebellares medii to the cerebellum
5. On the ventral side is located sulcus basilaris (aa. vertebrales form here an a. basilaris)

Mesencephalon

Extends from the pons to the diencephalon, a source of III. and IV.

cranial nerves, centrum of optic–motor and acoustic–motor reflexes
its nuclei support coordination of the head and eyes movements

1. Ventrally are – crura cerebri (white matter), between them *fossa interpeduncularis* (exit of III. cranial nerve, substantia perforata posterior), crura have fibers from motor part of cortex cerebri to motor nuclei of brain stem and medulla spinalis
2. On transverse cut are visible *tectum, tegmentum and crura cerebri*
3. Dorsally – tectum with corpora quadrigemina (colliculi superiores and inferiores with brachia colliculi running to diencephalon, colliculi superiores –optic–motoric reflexes and visual tract, colliculi inferiores – acoustic–motor reflexes and auditory pathway)
4. Below colliculi inferiores is exit of IV. cranial nerve – only this nerve gets out of the dorsal side of brain stem (frenulum veli medullaris superioris)
5. Border between tectum and tegmentum forms *aqueductus cerebri* (Silvii) – canal 15–20 mm, connecting III. and IV. ventricles
6. Border between crura and tegmentum forms substantia nigra, near it is located nucleus ruber

Fossa rhomboidea – IV. brain ventricle

- It has a rhombic shape, bottom is formed by dorsal parts of medulla oblongata and pons Varoli
- Rostrally continues into *aquaeductus cerebri*, caudally into *canalis centralis*
- Sulcus medianus, sulci limitantes - form border between basal plate – as a source of motor neurons and dorsal plate so call alar plate – as a source of sensory neurons)
- Pars inferior (with nuclei of XII., XI., X., IX. cranial nerves) is overlaped by velum medullare inferius (located between pedunculi inferiores cerebelli)
- Pars intermedia (with nuclei of VIII., VII., VI. cranial nerves) is overlaped by fastigium of cerebellum
- Pars superior of IV. ventricle of brain – (with nuclei of V. cranial nerve) is overlaped by velum medullare superius (located between pedunculi superiores cerebelli)

Somatomotor nuclei have:

XII. – hypoglossus
VI. abducens
IV. – trochlearis
III. – oculomotorius

Branchiomotor nuclei have:

V. – trigeminus

VII. – facialis
IX. – glossopharyngeus
X. –vagus

Visceromotor nuclei have

III. – oculomotorius
VII. – facialis
IX. – glossopharyngeus
X. –vagus

Sensory nuclei have:

V. – trigeminus
VII. – facialis
VIII. – vestibulocochlearis
IX. – glossopharyngeus
X. – vagus