

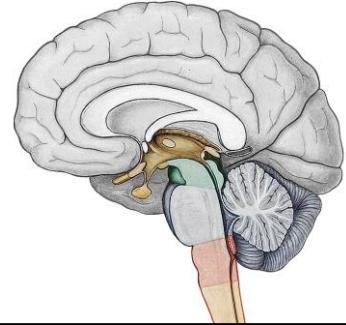
## Brain stem

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Department of Anatomy

## BRAIN STEM

medulla oblongata  
pons Varoli  
mesencephalon



## Medulla oblongata

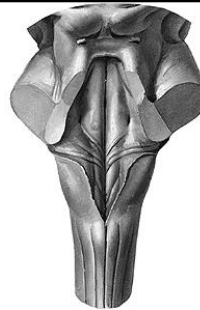


- Continuation of the spinal cord (20–25mm) (bulbus medullae spinalis)
- from the C1 spinal nerves (decussatio pyramidum) to the pons Varoli
- sulcus bulbopontinus (VI., VII., VIII.)
- fissura mediana anterior (foramen caecum)
- sulcus lateralis anterior (XII.)
- sulcus lateralis posterior (IX., X., XI.)
- sulcus medianus posterior
- pyramis et oliva medullae oblongatae

## Dorsal side of the medulla oblongata

(inferior part of the fossa rhomboidea)

- sulcus medianus posterior
- sulcus intermedius posterior
- faciculus gracilis – clava (tuberculum ncl. gracilis)
- fasciculus cuneatus – tuberculum cuneatum
- tuberculum cinereum
- pedunculi cerebellares inferiores
- tenia ventriculi quarti
- tela choroidea ventriculi quarti



## Pons Varoli

Between the medulla oblongata and the mesencephalon (25 – 30 mm)

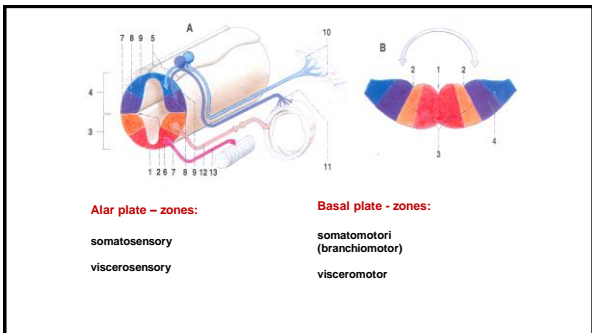
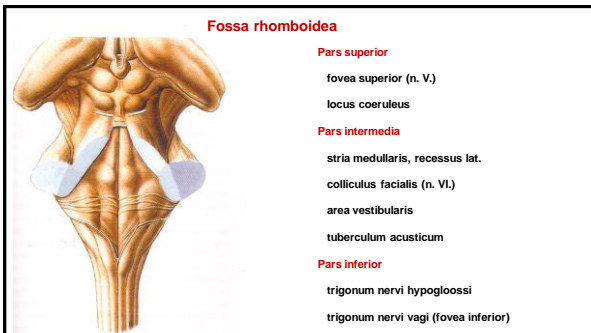
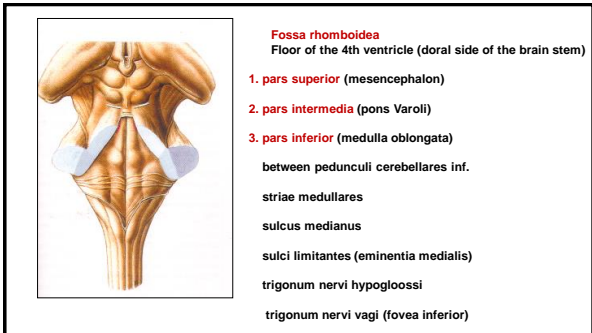
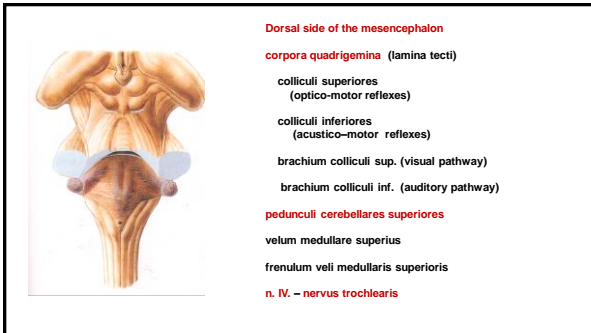
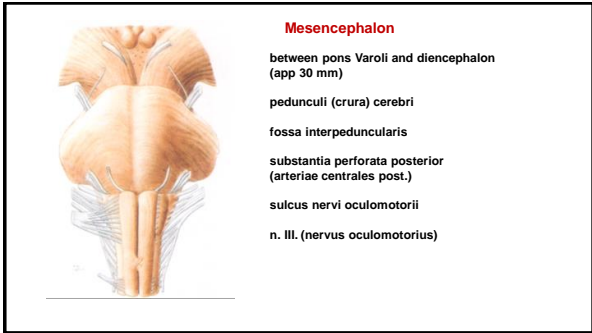
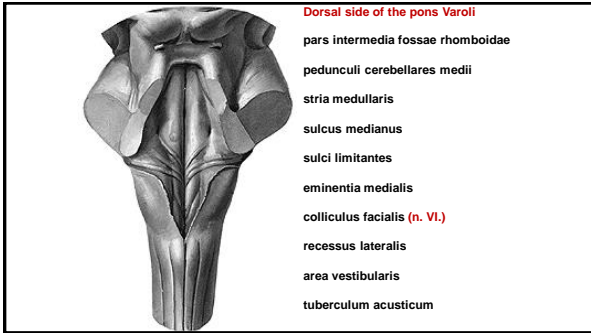
- sulcus basilaris (a. basilaris)
- sulcus bulbopontinus
- VI. – nervus abducens
- VII. – nervus facialis
- VIII. – nervus vestibulocochlearis
- pedunculi cerebellares medii
- V. – nervus trigeminus



## Lateral side of the pons Varoli

- pedunculus cerebellaris medius
- nervus trigeminus
- angulus pontocerebellaris
- trigeminofacial line





### Cranial nerve nuclei on the floor of the 4th ventricle

- 1 - ncl. motorius (originis) n. III.
- 2 - ncl. motorius (originis) n. IV.
- 3 - ncl. motorius (originis) n. VI.
- 4 - ncl. motorius (originis) n. XII.
- 5 - ncl. motorius (originis) n. VII.
- 6 - ncl. motorius (masticatorius) n. V.
- 7 - ncl. motorius (originis) n. IX.
- 8 - ncl. parasympathicus n. III (incl. E.W.)
- 9 - ncl. parasympathicus n. VII.
- 10 - ncl. parasympathicus n. IX.
- 11 - ncl. parasympathicus n. X.
- 12 - ncl. solitarius (n. VII, n. IX, n. X, n. X.)
- 13 - ncl. spinalis n. V. (n. VII, n. IX, n. X, n. X.)
- 14 - ncl. principalis n. V.
- 15 - ncl. mesencephalicus n. V.
- 16 - ncll. cochleares et vestibulares

### Medulla oblongata – caudal cross-section

**Somatosensory zone**

- ncl. gracilis + ncl. cuneatus med. (epikritic, discriminative sensation)
- ncl. cuneatus lat. (proprioception UE)
- ncl. tractus spinalis n. V. (protopathic sensation)

**Viscerosensory zone**

- ncl. tractus solitarii (ncl. gustatorius) – n. VII, n. IX, n. X.

**Visceromotor zone**

- ncl. parasympathicus n. X.

**Branchiomotor zone**

- ncl. ambiguus (n. IX, n. X, n. XI)

**Somatomotor zone**

- ncl. originis n. XII.

### Medulla oblongata – caudal cross-section

**Sensory zone**

- fasciculus gracilis + fasciculus cuneatus
- fibrae arcuatae infernae – decussatio lemniscorum – lemniscus med.
- tractus spinalis n. V.
- tr. spino-cerebellaris ant. + post.

**Viscerosensory zone**

- tractus solitarii – n. VII, n. IX, n. X.

**Somatomotor zone**

- Pyramidal t. decussatio pyramidum – tr. cortico-spinalis ant. + lat.
- extrapyramidal tracts
- tr. rubro-spinalis, reticulo-spinalis, vestibulo – spinalis, tecto – spin.

**FLM, RF**

### Medulla oblongata – rostral cross-section

**Somatomotor zone – ncl. originis n. XII.**

**Branchiomotor zone – ncl. ambiguus (n. X.)**

**Visceromotor zone – ncl. parasympathicus n. X.**

**Viscerosensory zone – ncl. tractus solitarii – n. X.**

**Somatosensory zone**

- ncl. cuneatus lat. (prop. UE)
- ncl. tractus spinalis n. V.

**Sensory zone**

- ncll. cochleares

**Interneurons – ncl. olivares inf.**

**RF**

### Medulla oblongata – rostral cross-section

**Tracts:**

**Pedunculus cerebellaris inf.**

- tr. spino-cerebellaris post.
- tr. olivo-cerebellaris
- tr. cuneo-cerebellaris
- tr. vestibulo-cerebellaris

**Sensory tracts**

- lemniscus medialis
- tr. spino-cerebellaris ant.

**Motor tracts:**

- tr. cortico-spinal, rubro-spin, vestibulo-spin, tecto-spin.

**FLM, FLD**

### Pons Varoli – caudal cross-section

**Somatomotor zone – ncl. originis (motorius) n. VII.**

**Branchiomotor zone – ncl. motorius n. VII.**

**Visceromotor zone – ncl. parasympathicus n. VII.**

**Viscerosensory zone – ncl. tr. spinalis (sensorius principalis) n. V.**

**Somatosensory zone – ncl. cuneatus lat.**

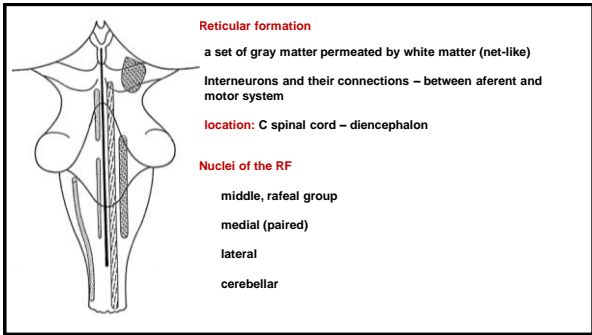
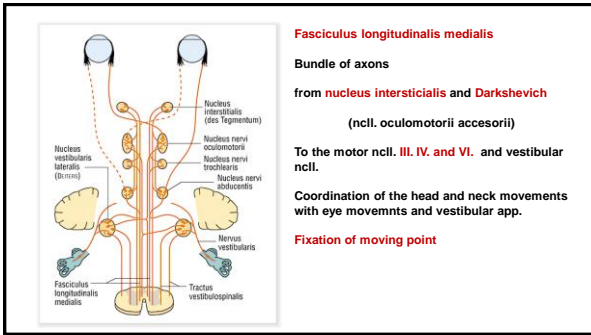
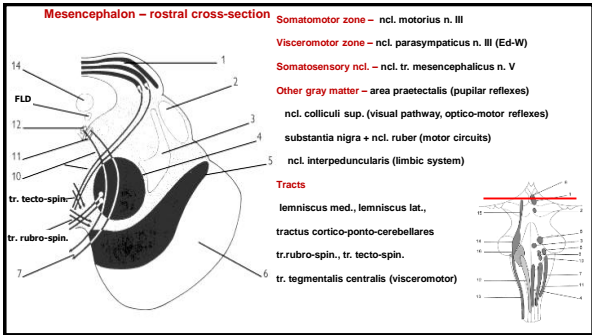
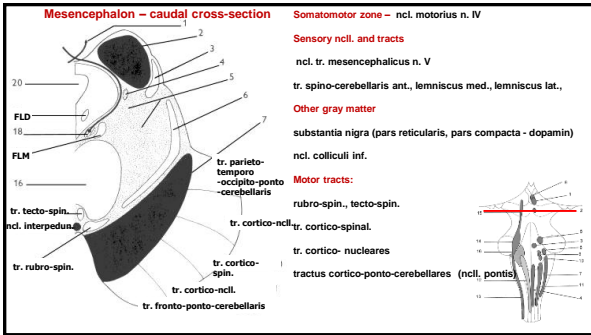
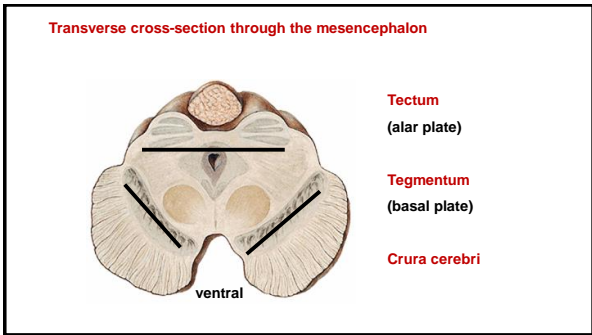
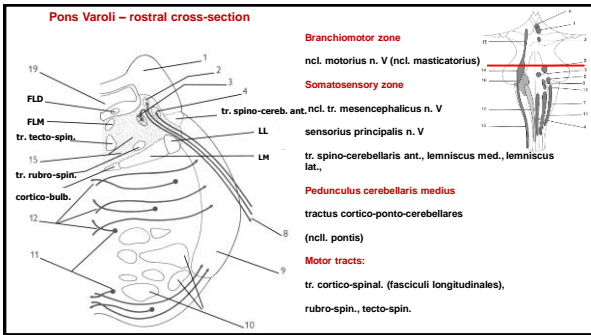
**Sensory zone – ncll. cochleares**

**White matter – sensory tracts**

- tr. spino-cerebellaris ant., lemniscus med., lemniscus lat.,
- Pedunculus cerebellaris medius
- tractus cortico-ponto-cerebellares (ncll. Pontis)

**Motor tracts:**

- tr. cortico-spinal. (fasciculi longitudinales), rubro-spin, tecto-spin.



### Function of the Reticular Formation

**Activatory and inhibitory function of the CNS (ARAS – regulation of sleeping) connection and coordination of appropriate parts of the CNS**

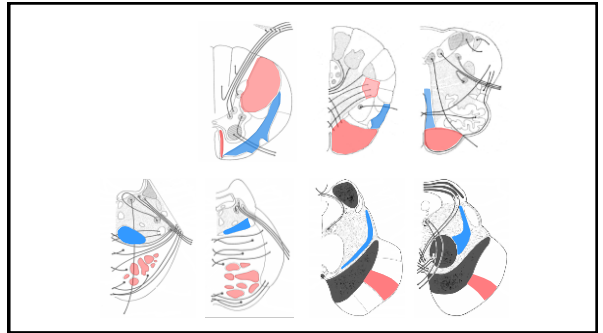
#### Centre of reflexes

(life centers – heart action, breathing, suction reflex, defense reflexes – cough, vomiting...)

carries **phylogenetically old information** (mainly visceral)

Influence on **nociceptive information** (pain)

**neurosecretion**



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