

## Fourth Ventricle


**LAQ-19** Describe floor of fourth ventricle under following heads

1. Gross anatomy,
2. Development,
3. Applied anatomy, and
4. Communications

### 1. Gross anatomy

A. **Introduction:** Fourth ventricle is a cavity of rhombencephalon. It is situated between pons, medulla in front and cerebellum behind.

#### B. Morphology


- a. **Shape:** Rhomboid .
- b. **Angles:** It has four angles.
  - I. One rostral,
  - II. One caudal, and
  - III. Two laterals.

C. **Formation:** It is formed by posterior surface of

- a. Lower part of pons.
- b. Upper part of medulla.

D. **Contents:** Nuclei of VIth, VIIth, VIIIth, IXth, Xth and XIth cranial nerves.

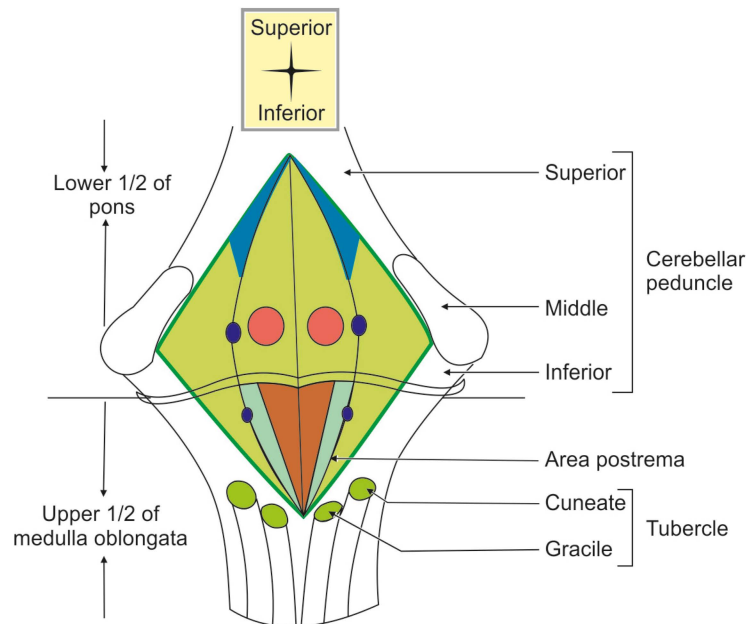
#### E. Features

- a. **Median sulcus:** It divides entire floor into two equal parts.
- b. **Median eminence:** It is a longitudinal elevation on either side of median sulcus.
- c. **Sulcus limitans:** It limits the median eminence laterally. It divides each  $\frac{1}{2}$  into medial and lateral areas.  
 Medial area contains motor nuclei  "m" for "m" and lateral area contains sensory nuclei.
- d. **Superior fovea:** It is the depression present at intermediate widest part present on the sulcus limitans.
- e. **Inferior fovea:** It is the depression present on the caudal part of sulcus limitans.

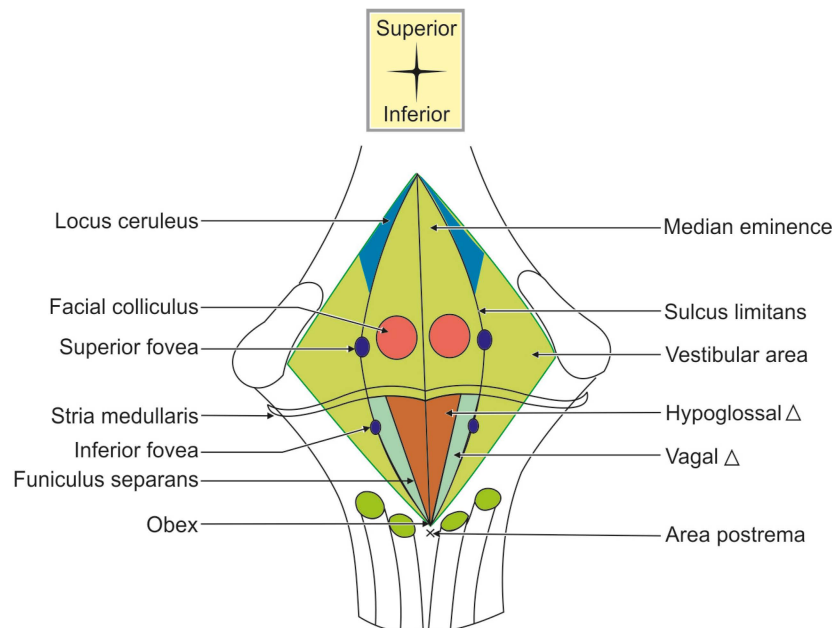
F. **Division:** The floor is described into

a. Upper ▲ lar area

I. It is formed by posterior surface of lower part of pons.



**Fig. 7.1:** Posterior surface of lower part of pons and upper part of medulla oblongata showing floor of fourth ventricle



**Fig. 7.2:** Boundaries and contents of floor of the fourth ventricle

II. In the upper part of superior fovea, it presents a **bluish grey** discolored area called locus ceruleus (*Locus*—point, *ceruleus*—dark colour).

III. Colour is due to melanin formed by substantia ferruginea (**blue**). It belongs to reticular formation.

IV. It is rich in noradrenaline.

b. Lower ▲ lar area

I. It is formed by posterior surface of upper part of medulla oblongata.

II. It consists of a raised ▲ lar area present on the median eminence called hypoglossal triangle.

III. It shows following nuclei deep to the

- i. Hypoglossal nuclei situated medially, and
- ii. Intercalatus nuclei (perihypoglossal nuclear complex) situated laterally.

IV. **Vagal ▲**: It is the area between hypoglossal ▲ and vestibular area. It overlies dorsal nucleus of vagus.

V. **Funiculus separans**: It is a narrow ependymal thickening and separates vagal and area postrema.

VI. Area postrema (*post*—beyond, *trema*—opening):

- i. It is a small tongue-shaped area, present inferolaterally.
- ii. It is composed of highly vascular neuroglial and neuronal tissue.
- iii. It is devoid of blood-brain barrier.
- iv. It is closely related to vomiting and respiratory centres.

VII. Calamus scriptorius (*Calamus*—reed, *scriptorius*—relating to script): It is the lowest part of floor which resembles the pointed nib of a writing pen called calamus scriptorius.

VIII. Obex (*Obex*—bolt): It is meeting point of lower area.

c. Junction of upper and lower parts:

I. **Facial colliculus**: Present on the median eminence at the level of superior fovea. It is caused by

- i. Axons of facial nerve (VIIth cranial nerve), and
- ii. Nucleus of abducent nerve (VIth cranial nerve).

II. **Vestibular area**: Rounded elevation present lateral to sulcus limitans overlies vestibular nuclei.

III. Striae medullaris (auditory striae)

## 2. Development

A. Upper ▲ lar: Isthmus rhombencephalon.

B. Intermediate part: Metencephalon.

C. Lower ▲ lar: Myelencephalon.

### 3. Applied anatomy

- Lesion of floor of IVth ventricle may result into loss of control of swallowing, respiration, movements of tongue.
- The tumour in the floor may produce symptoms and signs of cerebellar deficiency. It may press vital nuclear centre and produce cardiac irregularities, tachycardia and irregular respiration.
- **Hydrocephalus:** The blockage of the foramina leads to accumulation of cerebrospinal fluid proximal to the foramen in the brain. <sup>NEET</sup>

### 4. Communications

**Table 7.1:** Communication of the fourth ventricle at different angles

Location	From	Through	To
• Superior angle	• IIIrd ventricle	• Cerebral aqueduct	• IVth ventricle
• Inferior angle	• IVth ventricle	• Central canal	• Medulla oblongata
• Lateral angle		• Foramen of Luschka	• Subarachnoid space
• Roof		• Foramen of Magendie	