

Ventricular System

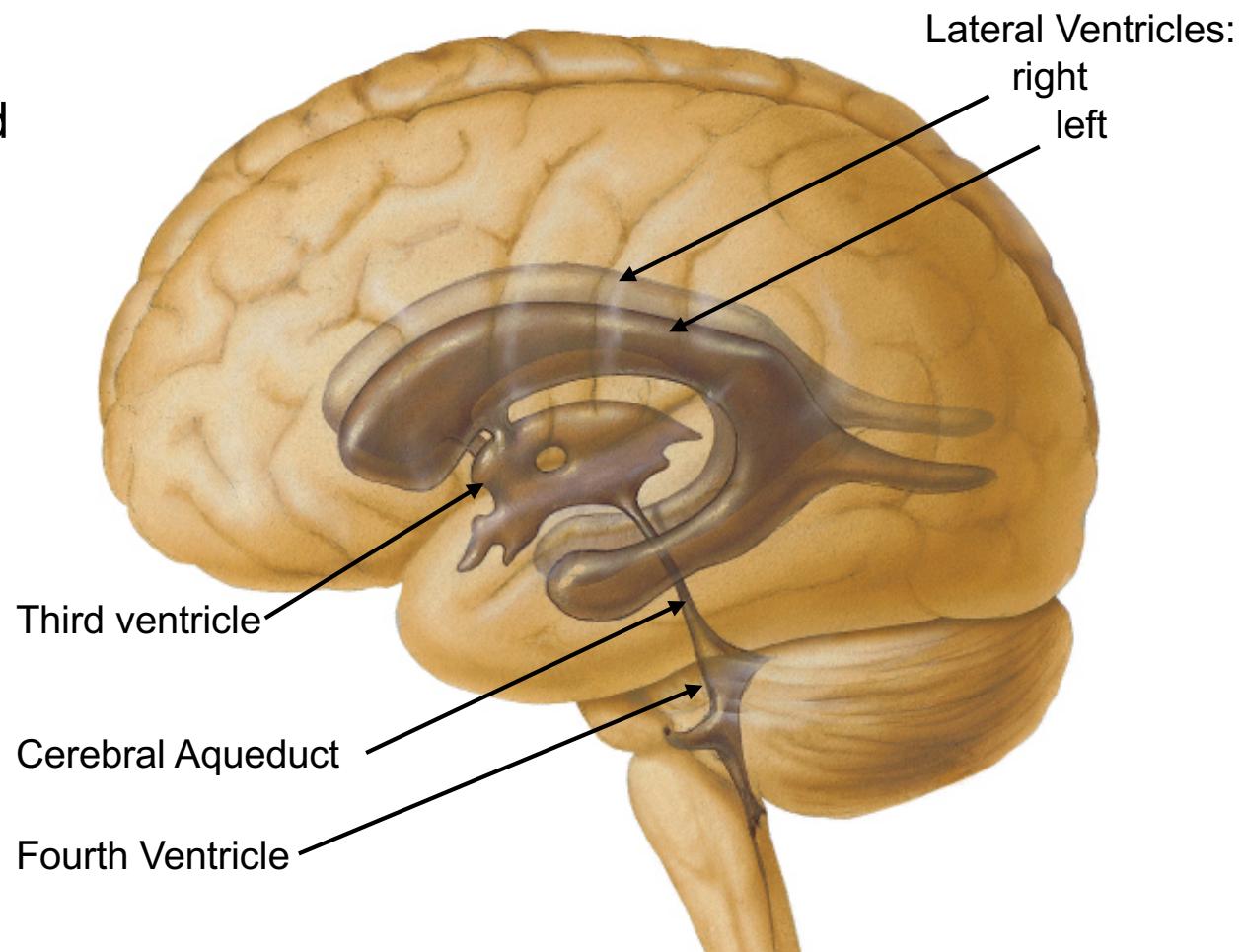
Objectives:

To learn the names, locations and relationships of the ventricular spaces in the brain.

To identify individual ventricles and the structures that form their walls in sagittal, coronal and horizontal slices of the brain.

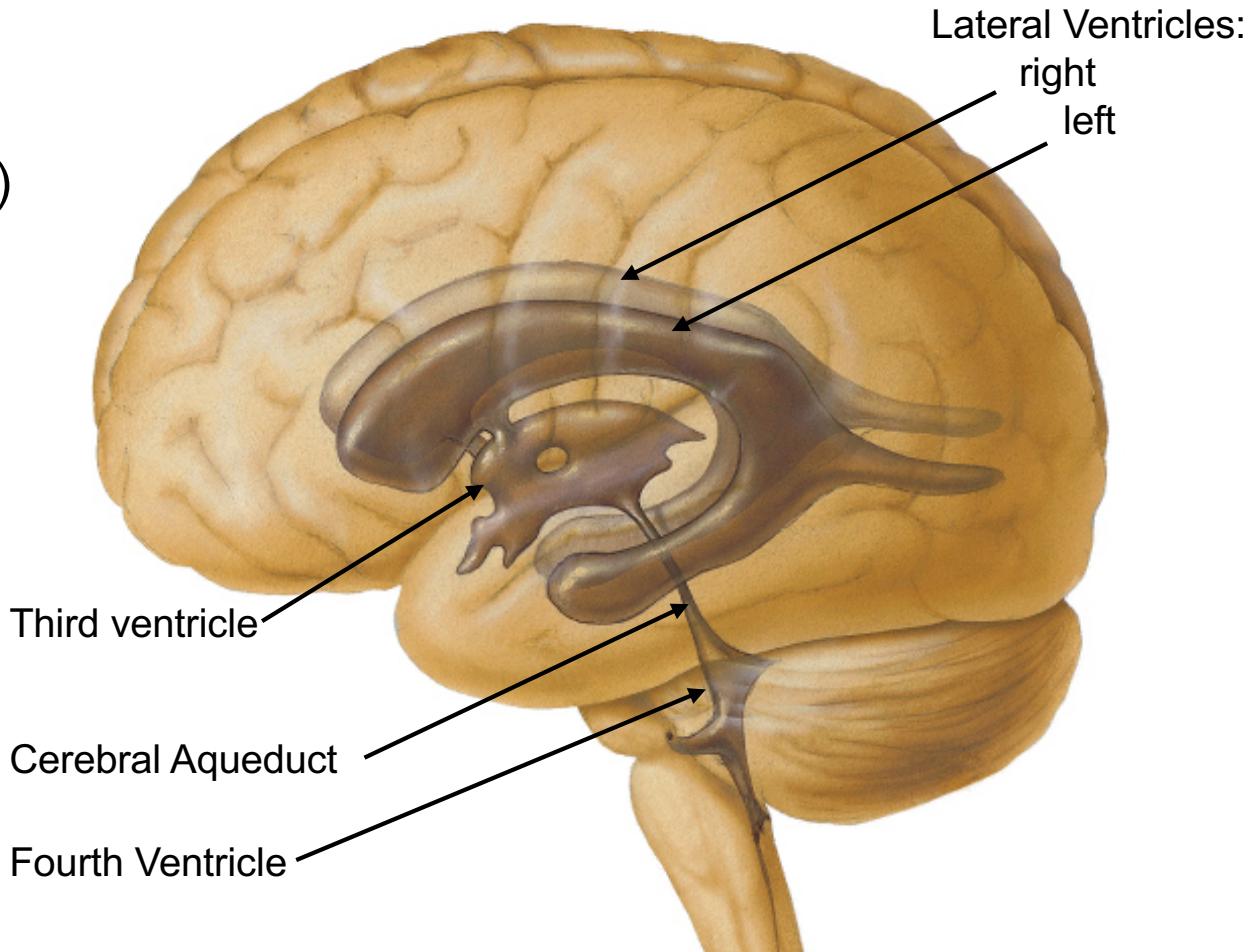
Specimens Required:

Coronal and horizontal brain slices
Hemisected brain
Ventricular cast



Ventricular System

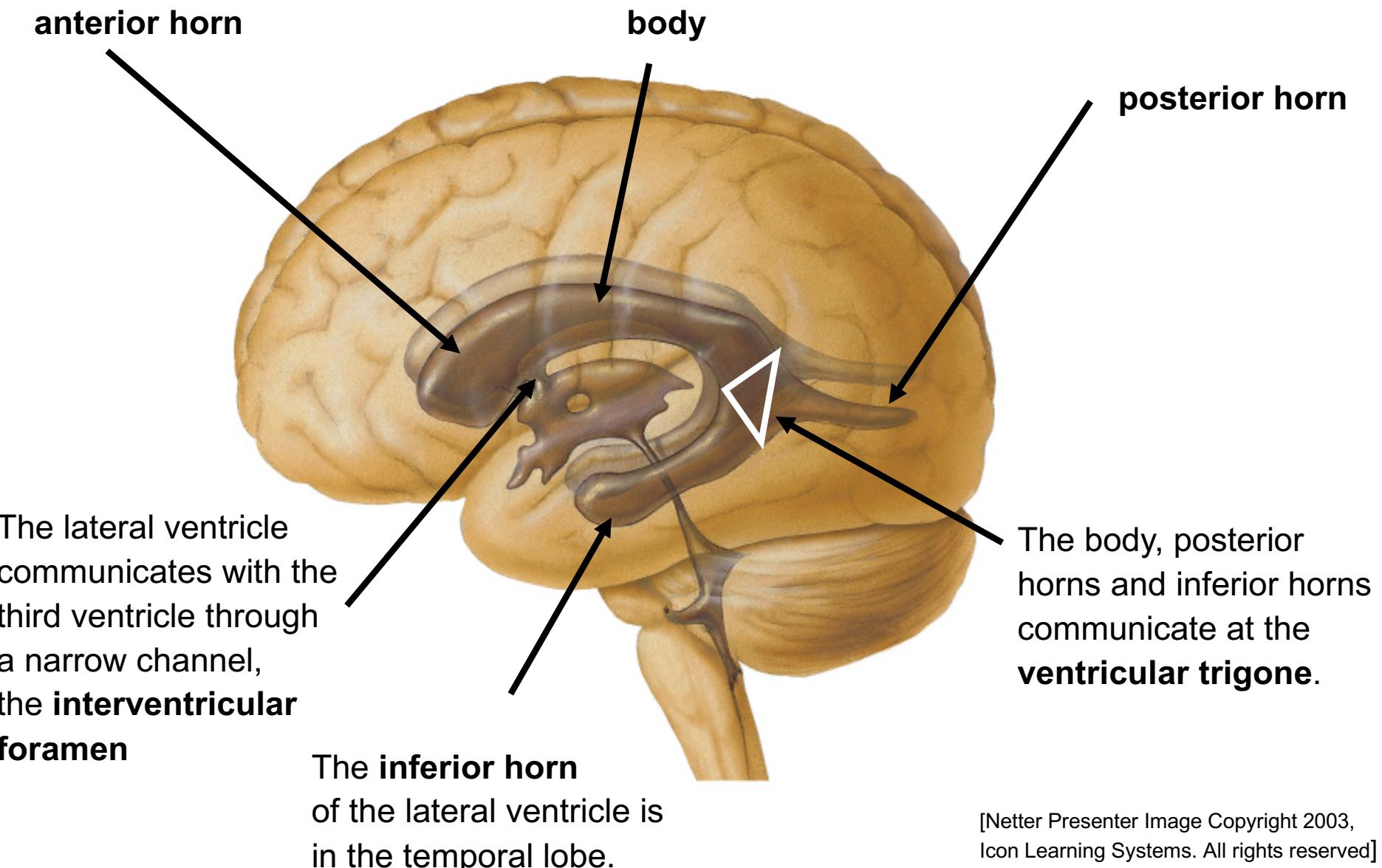
The ventricular system is an interconnected series of spaces within the brain. It extends from the **lateral ventricles** (I and II) in the cerebral hemispheres through the **third ventricle** (III) in the diencephalon, into the **cerebral aqueduct** of the midbrain and into the **fourth ventricle** (IV) of the pons and medulla.



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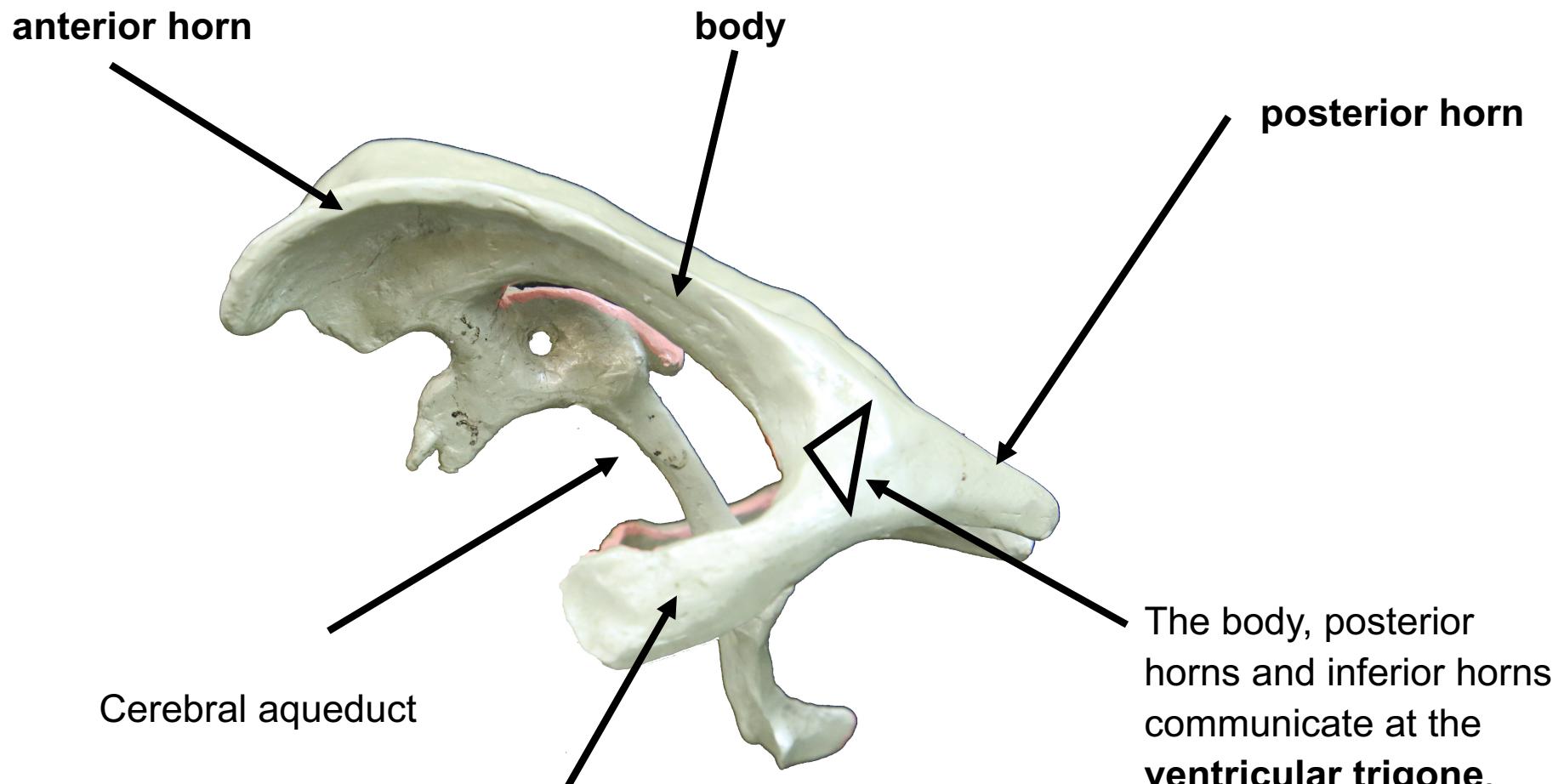
Lateral Ventricle

The lateral ventricle in each cerebral hemisphere extends from the **anterior horn** in the frontal lobe through the **body** in the parietal lobe to the **posterior horn** in the occipital lobe.



Ventricular cast

A cast of the ventricular system. Spaces are now solid



The **inferior horn**
of the lateral ventricle is
in the temporal lobe.

The body, posterior
horns and inferior horns
communicate at the
ventricular trigone.

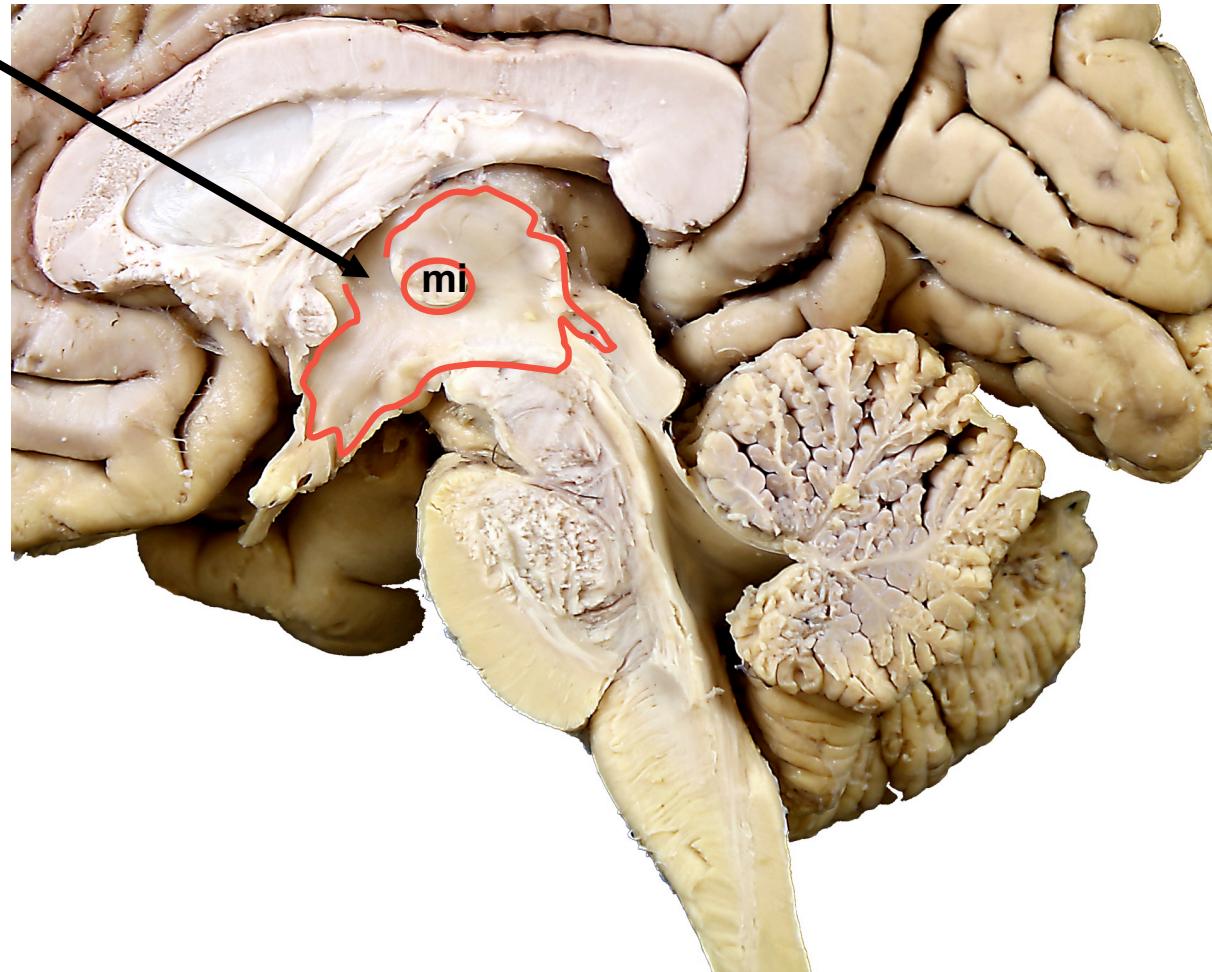
Third Ventricle

The third ventricle, aqueduct and fourth ventricle are unpaired midline spaces in the brain. They can be seen in this median sagittal section.

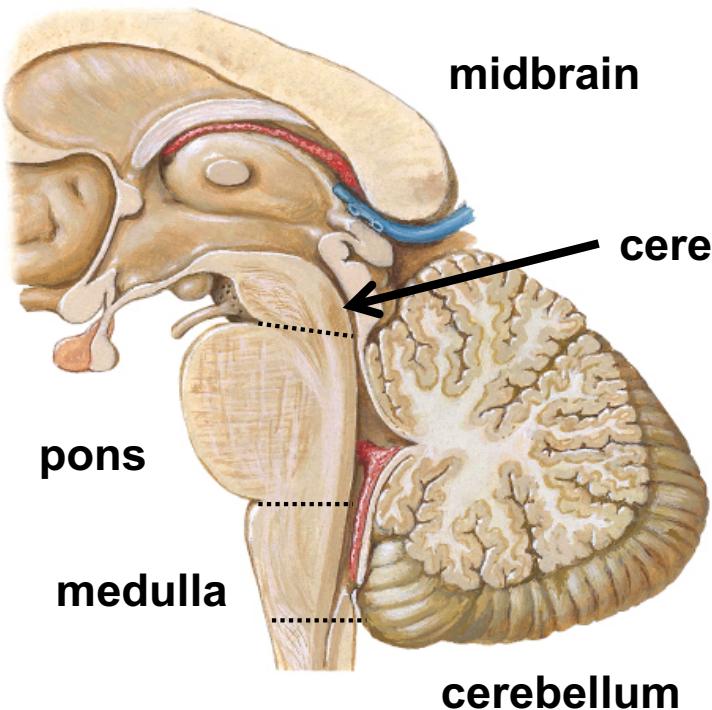
The **interventricular foramen** opens into the anterior part of the third ventricle.

The third ventricle is a narrow cavity.

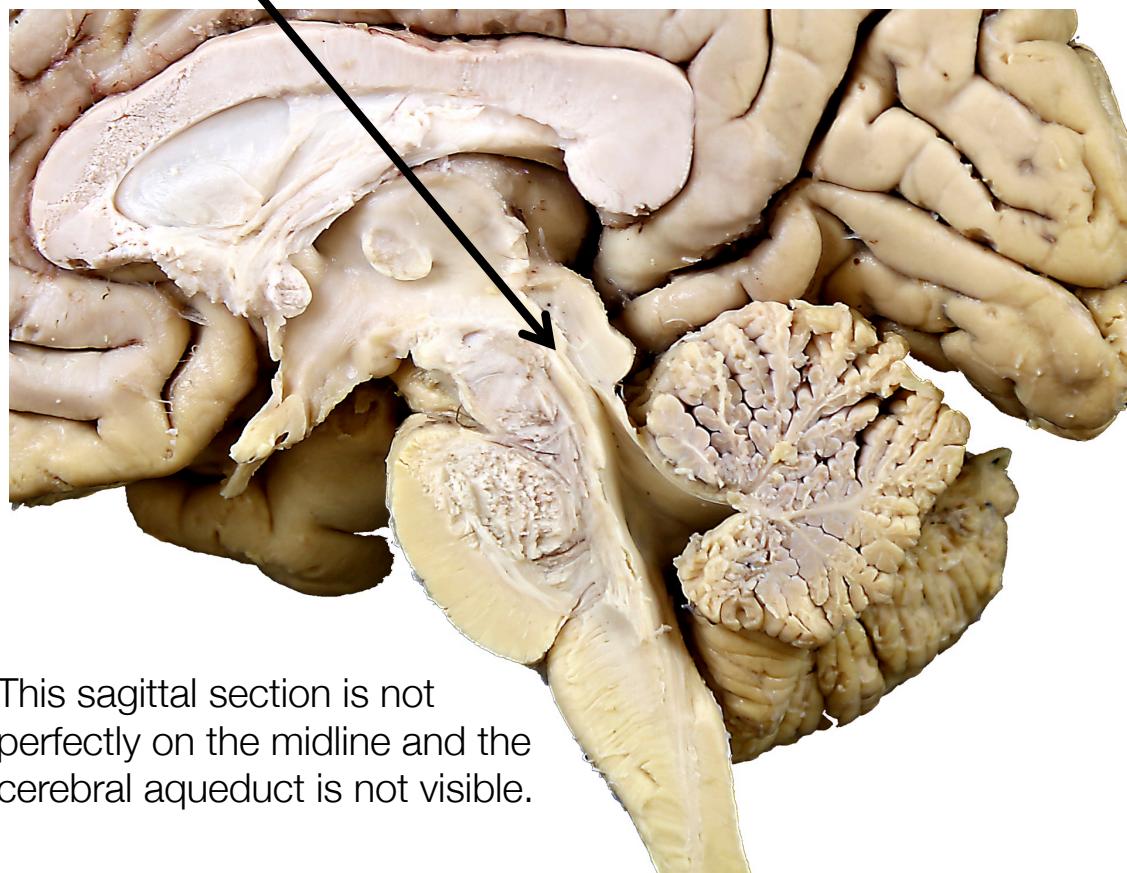
Its walls are formed by the diencephalon. In about 70% of adult humans the left and right thalami are joined by a bridge of tissue, the **massa intermedia**



Cerebral Aqueduct



The third ventricle narrows at the entrance into the **cerebral aqueduct**. The aqueduct is a small channel through the midbrain. Its roof is formed by the **superior colliculi** and **inferior colliculi**.

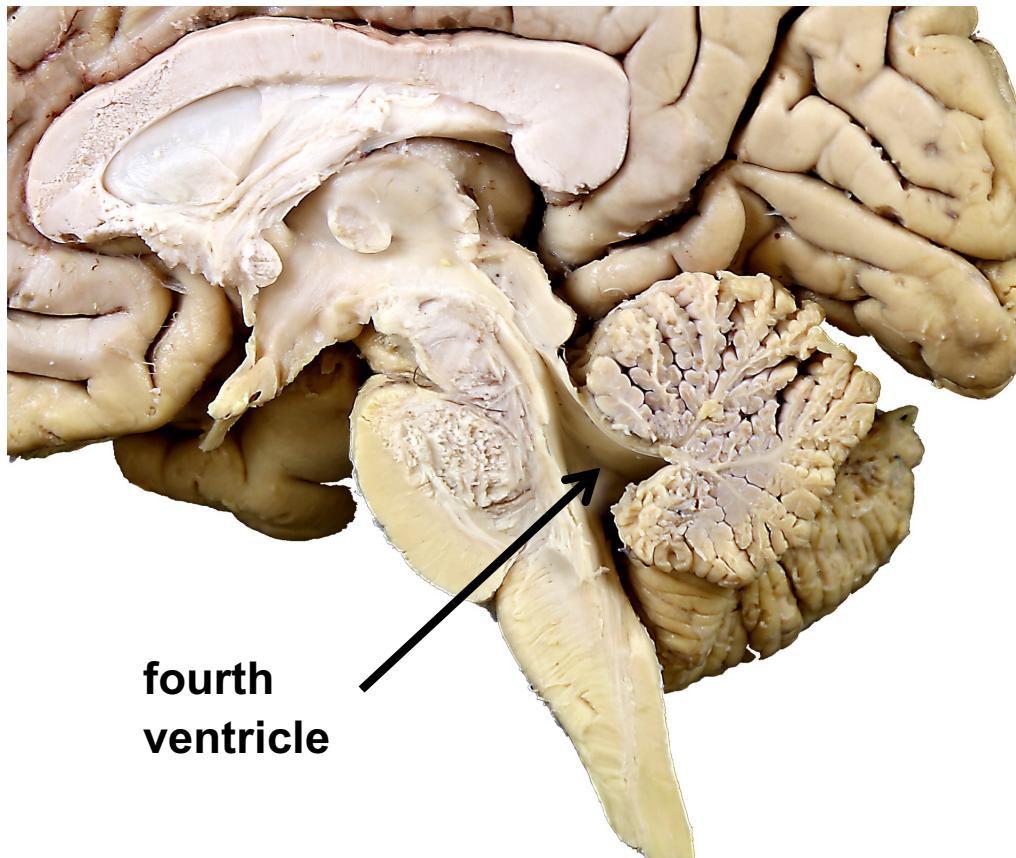


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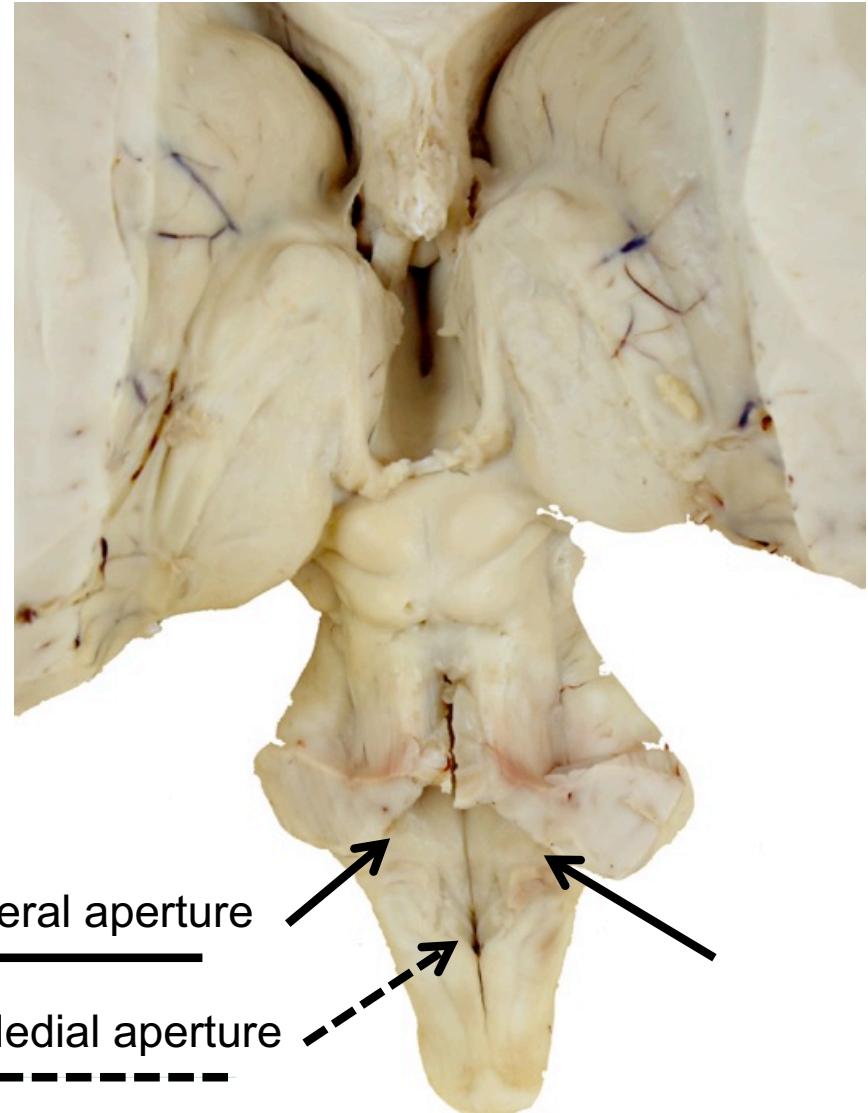
Fourth Ventricle

The cerebral aqueduct opens into the **fourth ventricle** in the upper pons.

dorsal view of the brain stem

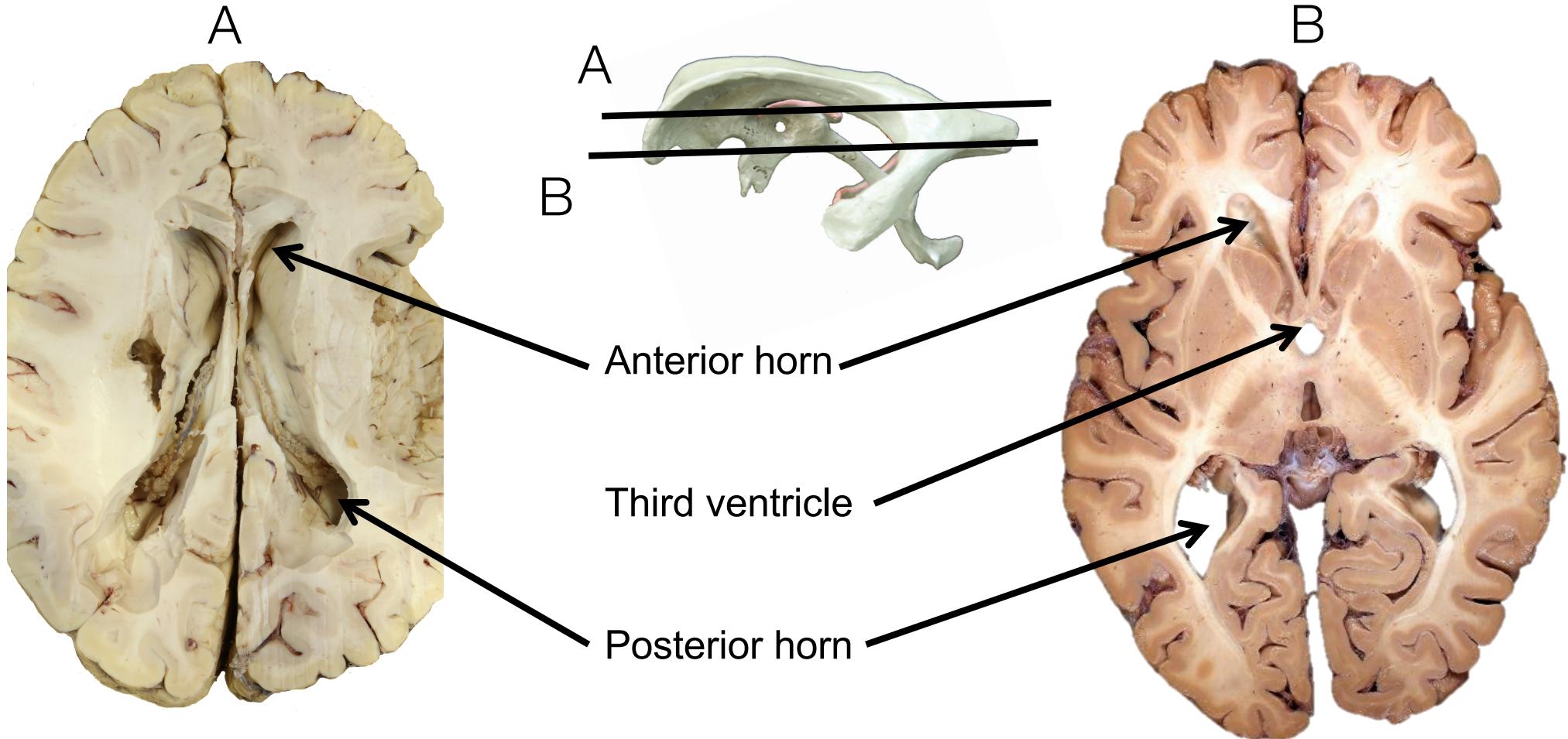


fourth ventricle



The fourth ventricle is wide and flat and opens into the subarachnoid space through one medial and two lateral apertures.

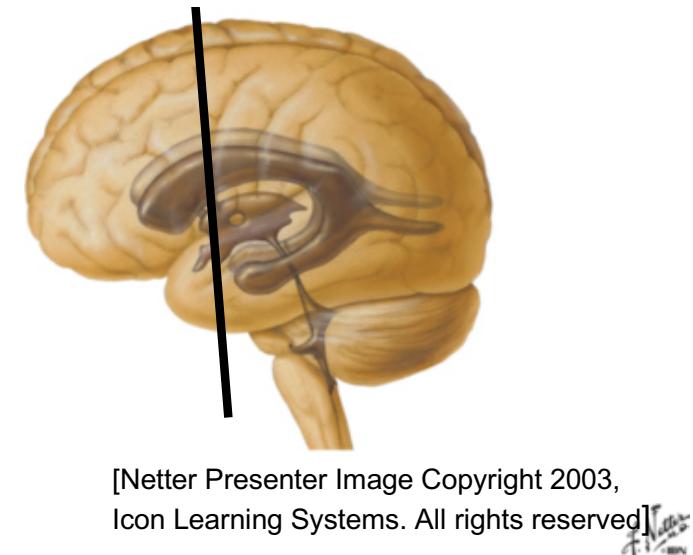
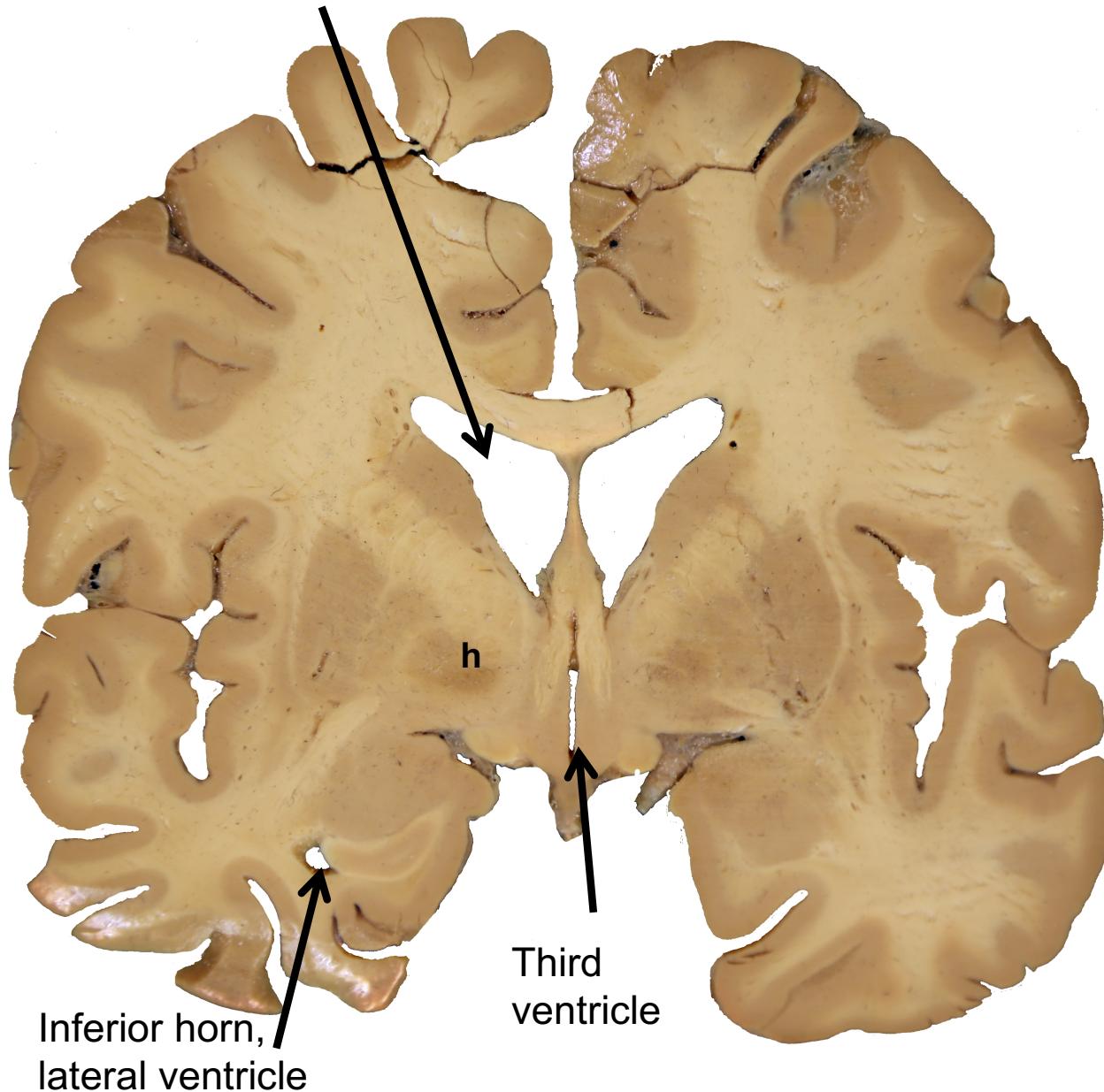
Ventricular System, Horizontal Section



The **corpus callosum (cc)** forms the roof of the lateral ventricles. (Both its anterior and posterior parts are cut in this horizontal section.)

Coronal Section

Anterior horn, lateral ventricle



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The lateral ventricles and third ventricle are visible in a coronal section.

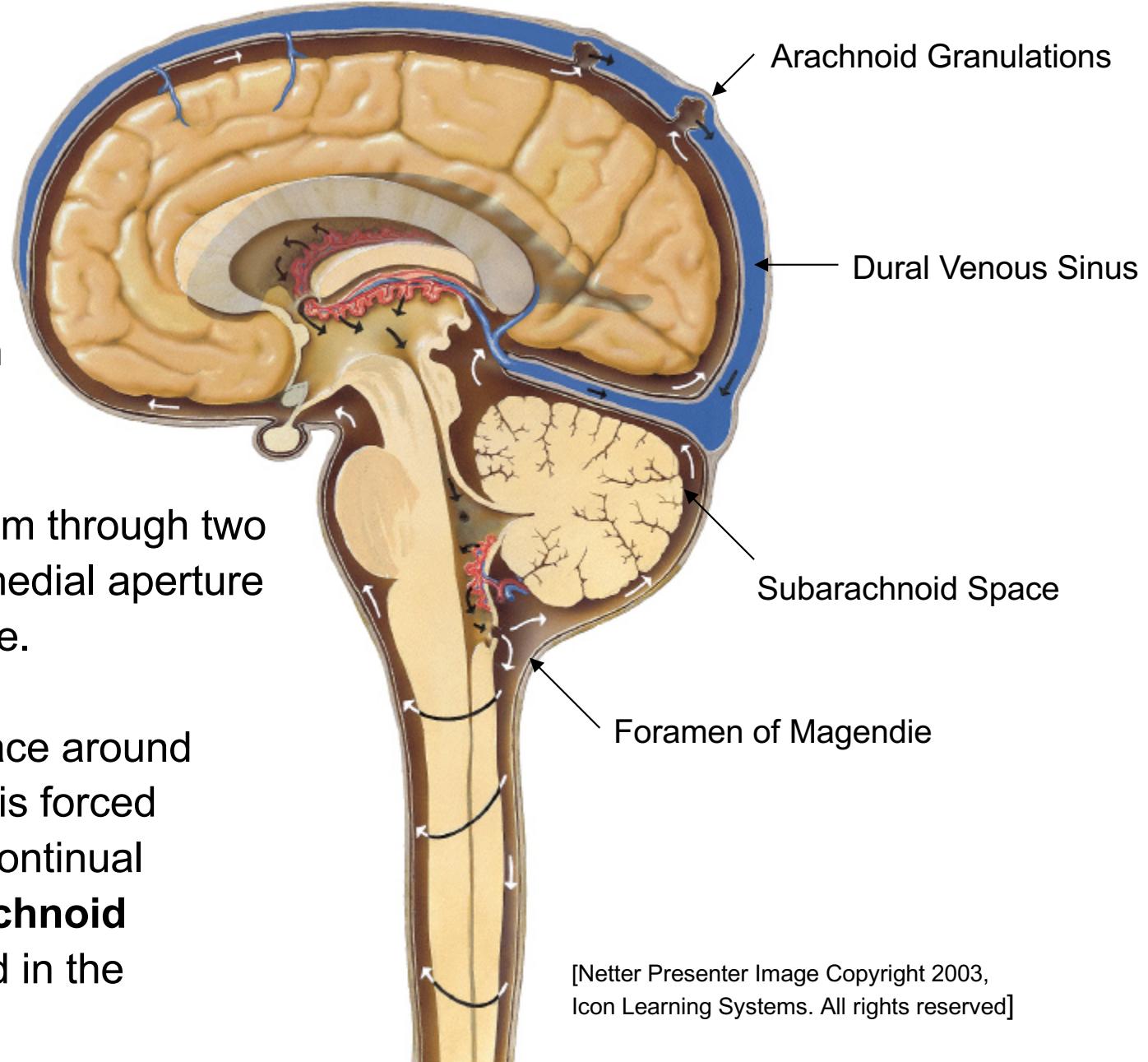
In this anterior section **hypothalamus** form the walls of the third ventricle.

Cerebrospinal Fluid

CSF is created in all ventricles by the choroid plexus and circulates through the lateral and third ventricles, through the aqueduct and into the fourth ventricle.

It exits the ventricular system through two lateral apertures and one medial aperture into the subarachnoid space.

From the subarachnoid space around the brain and spinal cord it is forced by the pressure of active, continual production through the **arachnoid granulations** into the blood in the dural venous sinuses.



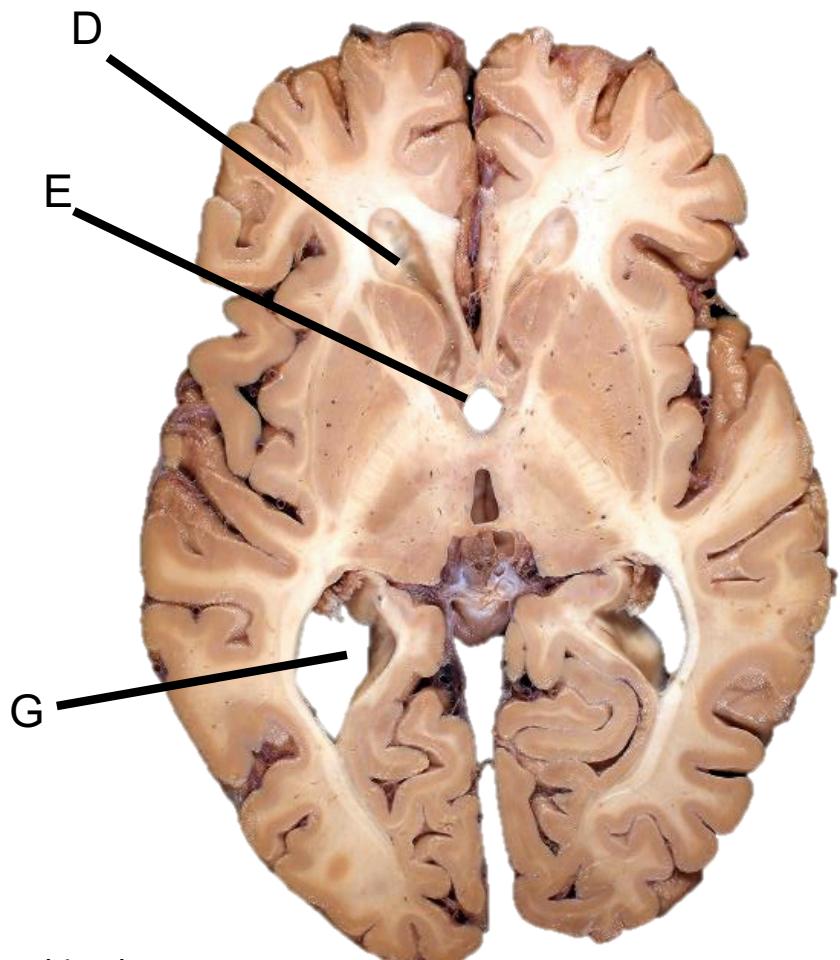
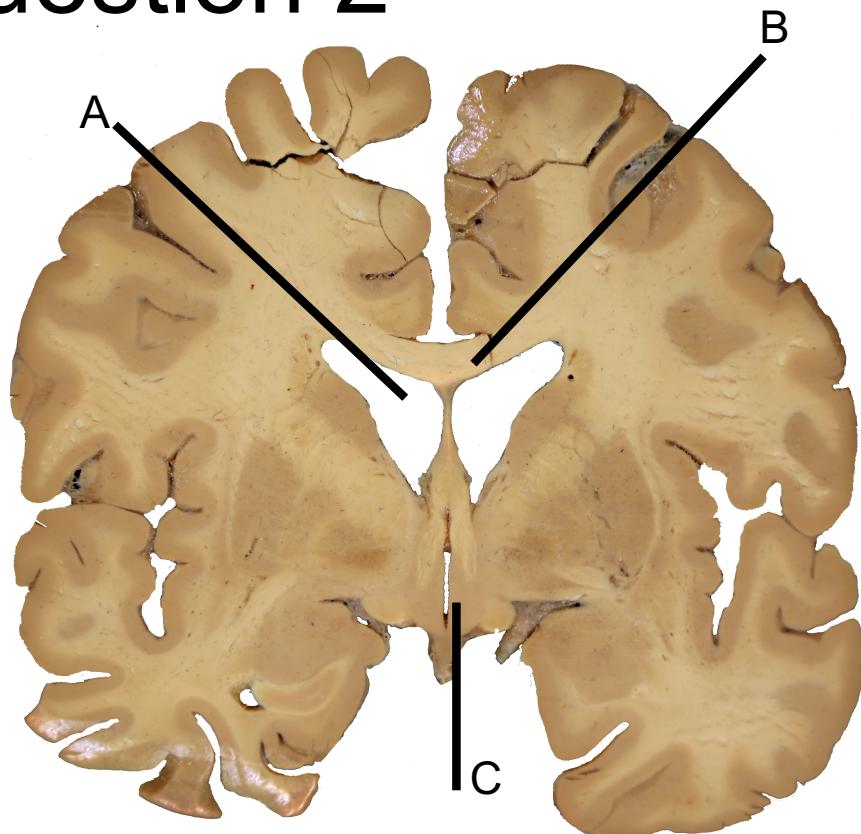
Question 1

For each statement (1 - 6) indicate the part of the ventricular system (A - D) to which it applies.

- A. lateral ventricle
- B. third ventricle
- C. cerebral aqueduct
- D. fourth ventricle
- E. interventricular foramen
- F. medial aperture

- _____ 1. Communicates with both the third and fourth ventricles.
- _____ 2. Communicates with both the lateral and third ventricles.
- _____ 3. Communicates with both the fourth ventricle and the subarachnoid space.
- _____ 4. Its roof is the corpus callosum.
- _____ 5. Part of its roof is the cerebellum.
- _____ 6. Part of its roof is the inferior colliculus.

Question 2



Match each labeled structure in the coronal and horizontal slices (A - G) with the correct identification (1-5).

- 1. lateral ventricle, anterior horn
- 2. lateral ventricle, body
- 3. lateral ventricle, posterior horn
- 4. third ventricle
- 5. corpus callosum

Answer Sheet

Question 1

1. C
2. E
3. F
4. A
5. D
6. C

Question 2

1. D
2. A
3. G
4. C, E
5. B