10.5: Human Body Cavities

Contain the Brain

You probably recognize the colorful object in Figure \(\PageIndex{1}\) as a human brain. The brain is arguably the most important organ in the human body. Fortunately for us, the brain has its own special "container," called the cranial cavity. The cranial cavity enclosing the brain is just one of several cavities in the human body that form "containers" for vital organs.

What Are Body Cavities?

The human body, like that of many other multicellular organisms, is divided into a number of body cavities. A **body cavity** is a fluid-filled space inside the body that holds and protects internal organs. Human body cavities are separated...
by membranes and other structures. The two largest human body cavities are the ventral cavity and the dorsal cavity. These two body cavities are subdivided into smaller body cavities. Both the dorsal and ventral cavities and their subdivisions are shown in Figure 2.

Figure 2: The ventral cavity includes the thoracic and abdominopelvic cavities and their subdivisions. The dorsal cavity includes the cranial and spinal cavities. (Public domain; NCI (original) / Mysid (SVG) via Wikimedia Commons).

**Ventral Cavity**

The ventral cavity is at the anterior, or front, of the trunk. Organs contained within this body cavity include the lungs, heart, stomach, intestines, and reproductive organs. You can see some of the organs in the ventral cavity in Figure 3. The ventral cavity allows for considerable changes in the size and shape of the organs within it as they perform their functions. For example, organs such as the lungs, stomach, or uterus can expand or contract without distorting other tissues or disrupting the activities of nearby organs.
The ventral cavity is subdivided into the thoracic and abdominopelvic cavities.

- The **thoracic cavity** fills the chest and is subdivided into two pleural cavities and the pericardial cavity. The pleural cavities hold the lungs, and the pericardial cavity holds the heart.
- The **abdominopelvic cavity** fills the lower half of the trunk and is subdivided into the abdominal cavity and the pelvic cavity. The abdominal cavity holds digestive organs and the kidneys, and the pelvic cavity holds reproductive organs and organs of excretion.

### Dorsal Cavity

The **dorsal cavity** is at the posterior, or back, of the body, including both the head and the back of the trunk. The dorsal cavity is subdivided into the cranial and spinal cavities.
• The cranial cavity fills most of the upper part of the skull and contains the brain.
• The spinal cavity is a very long, narrow cavity inside the vertebral column. It runs the length of the trunk and contains the spinal cord.

The brain and spinal cord are protected by the bones of the skull and the vertebrae of the spine. They are further protected by the meninges, a three-layer membrane that encloses the brain and spinal cord. A thin layer of cerebrospinal fluid is maintained between two of the meningeal layers. This clear fluid is produced by the brain, and it provides extra protection and cushioning for the brain and spinal cord.

Feature: My Human Body

The meninges membranes that protect the brain and spinal cord inside their cavities may become inflamed, generally due to a bacterial or viral infection. This condition is called meningitis. Meningitis can lead to serious long-term consequences such as deafness, epilepsy, or cognitive deficits, especially if not treated quickly. Meningitis can also rapidly become life-threatening, so it is classified as a medical emergency.

Learning the symptoms of meningitis may help you or a loved one get prompt medical attention if you ever develop the disease. Common symptoms include fever, headache, and neck stiffness. Other symptoms may include confusion or altered consciousness, vomiting, and an inability to tolerate light or loud noises. Young children often exhibit less specific symptoms, such as irritability, drowsiness, or poor feeding.

Meningitis is diagnosed with a lumbar puncture (commonly known as a "spinal tap"), in which a needle is inserted into the spinal canal to collect a sample of cerebrospinal fluid. The fluid is analyzed for the presence of pathogens in a medical lab. If meningitis is diagnosed, treatment consists of antibiotics and sometimes antiviral drugs. Corticosteroids may also be administered to reduce inflammation and the risk of complications such as brain damage. Supportive measures such as IV fluids may also be provided.

Some types of meningitis can be prevented with a vaccine. Ask your health care professional whether you have had the vaccine or should get it. Giving antibiotics to people who have had significant exposure to certain types of meningitis may reduce their risk of developing the disease. If someone you know is diagnosed with meningitis, see your doctor for advice if you are concerned about contracting the disease.

Summary

• The human body is divided into a number of body cavities. A body cavity is a fluid-filled space in the body that holds and protects internal organs. The two largest human body cavities are the ventral cavity and the dorsal cavity.
• The ventral cavity is at the anterior, or front, of the trunk. It is subdivided into the thoracic cavity and abdominopelvic cavity.
• The dorsal cavity is at the posterior, or back, of the body, and includes the head and the back of the trunk. It is subdivided into the cranial cavity and spinal cavity.

Review

1. What is a body cavity?
2. Compare and contrast ventral and dorsal body cavities.
3. Identify the subdivisions of the ventral cavity and the organs each contains.
4. Describe the subdivisions of the dorsal cavity and its contents.
5. Identify and describe all the tissues that protect the brain and spinal cord.
6. What do you think might happen if fluid were to build up excessively in one of the body cavities?
7. Explain why a woman’s body can accommodate a full-term fetus during pregnancy, without damage to her internal organs.
8. Which body cavity does the needle enter in a lumbar puncture?
9. What are the names given to the three body cavity divisions where the heart is located?
10. What are the names given to the three body cavity divisions where the kidneys are located?
11. True or False. The stomach is located in the dorsal cavity.
12. True or False. A body cavity must open to the outside world.
13. True or False. The vertebral column surrounds the spinal cavity.
14. The _________ cavity is directly below the thoracic cavity.
15. What is the name of the fluid that protects the brain and spinal cord?
   A. meningeal
   B. cerebrospinal
   C. lumbar
   D. cranial

Explore More
https://bio.libretexts.org/link?16778#Explore_More

Learn about this man’s personal account of having meningitis here:
Check out this video on a lumbar puncture procedure:
Media, iframe, embed and object tags are not supported inside of a PDF.