BODY CAVITIES

Definition: A body cavity is a fluid filled space inside an organism's body that holds and protects internal organs and other structures.

Spaces found in the body containing special internal organs.

Division of body cavities

The two largest human body cavities are;

- The ventral cavity
- The dorsal cavity

These two body cavities are further sub-divided into smaller body cavities.

NB: Human body cavities are separated by membranes and other structures.

1. **The ventral cavity.**

The ventral cavity is a large cavity which sits anteriorly to the spine.

It includes the following;

- Thoracic cavity
- Abdominal cavity
- Pelvic cavity

i. **Thoracic cavity**

This is the space which lies superior to the diaphragm

Thoracic cavity fills the chest region.

Structures which bound thoracic cavity/boundaries

Inferiorly: Diaphragm

Anteriorly: Sternum

Posteriorly: Thoracic vertebrae

Laterally: Ribs and their costal cartilages

NB: The diaphragm forms the floor of the thoracic cavity and separates it from the abdominal cavity.

Thoracic cavity is further sub divided into;

- **Pleural cavity** – Houses the lungs
- **Pericardial cavity**- Houses the heart
- **Mediastinum** – Houses – the heart
    - Thymus gland
    - Portion of oesophagus
    - Trachea
    - Great blood vessels (aorta & venacava)
    - Lymph nodes
    - Essential nerves
    - Vagus Nerve & Phrenic Nerve

NB: Mediastinum houses the above structures except the lungs.

<u>Organs enclosed within thoracic cavity</u>

- The heart
- The lungs
- Great blood vessels (aorta, venacava)
- Trachea bronchial tree
- Lymphatic vessels
- Lymph nodes
- Nerves e.g. vagus Nerve, Phrenic Nerve

- Thymus gland
- Portion of oesophagus

ii. The abdominal cavity

This cavity lies inferior to the diaphragm. The diaphragm separates thoracic and abdominal cavities.

The abdominal cavity is where majority of the body internal organs lie. These organs are sometimes referred to as visceral and they include the following;

- The liver
- The stomach
- The spleen
- The gall bladder
- The pancreas
- Adrenal glands
- Kidneys (right & left)
- The small intestine (Duodenum, jejunum & ilium)
- The large intestines
- Blood vessels (arteries & veins)
- Appendix

Structures which bound abdominal cavity/boundaries

Posteriorly – lumbar spine

Anteriorly- abdominal muscles

Inferiorly – the dome of pelvic floor

Superiorly – diaphragm

Laterally – six lower ribs

- Extension of abdominal muscles on the latera sides

iii. **Pelvic cavity**

<u>Organs enclosed within pelvic cavity</u>

i. Proximal urethra

ii. Uterus

iii. Fallopian tubes

iv. Ovaries

v. Upper vagina

vi. Urinary bladder

vii. Distal ureters

viii. Cervix

ix. Prostate glands

x. Terminal sigmoid colon

xi. Rectum

xii. Anal canal

NB: Sometimes the abdominal and pelvic cavities are combined and referred to as the abdomino-pelvic cavity.

2. **Dorsal cavity**

It is found at the posterior or back of the body.

This includes the following cavities

- The cranial cavity
- The spinal cavity (vertebral cavity)

i. Cranial cavity

- It fills the upper part of the skull
- It is a bean shaped cavity

Structures which bound cranial cavity/boundaries

Anteriorly – frontal bone

Posteriorly – occipital bone

Laterally – temporal bone

Superiorly – parietal bone

Inferiorly – Ethmoid bone

iv. Spheroid bone

Organ enclosed in cranial cavity

- Brian

ii. Spinal cavity/vertebral cavity

- It is a very long, narrow thread like cavity inside the vertebral column.
- It runs through the length of the trunk.
- The spinal cavity has gaps where nerves enter or exit.
- The cranial cavity is continuous with the spinal cavity.

Structures which bound spinal cavity/boundaries

Anteriorly – bodies of vertebral bones

- Intervertebral discs.
- Anterior longitudinal ligament

Posteriorly – Vertebral laminae

- Ligamenta flava/ yellow ligament

- Posterior longitudinal ligament

Laterally – Pedicles of vertebral bones

- Intervertebral foramina

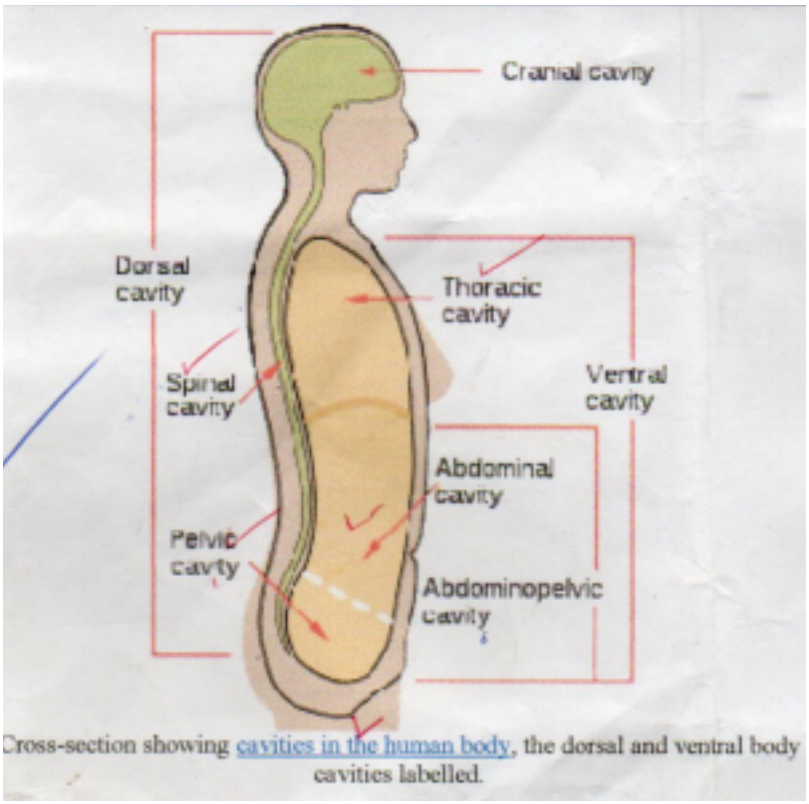
Organ enclosed in spinal cavity

- Spinal cord

Functions of body cavities

- They house delicate organs
- They protect internal organs
- Anatomical structures are described in terms of the cavity in which they reside.
- Structures like the lungs, heart, stomach and intestines can expand and contract without distorting other tissues or disrupting the activity of nearby organs.

Diagram showing all body cavities



Cross-section showing cavities in the human body, the dorsal and ventral body cavities labelled.

Structures which bound pelvic cavity (boundaries)

Anteriorly- Pubic symphysis, pubic bone

Laterally – the two innominate bones of pelvis

Posteriorly – coccyx/sacrum

Superiorly- pelvic inlet

Inferiorly- pelvic floor muscles or pelvic diaphragm e.g. lavetor ani

MEMBRANES

Definition: It is a thin sheet of epithelial and connective tissue that covers or lines internal organs

Types of membranes

- Mucous membranes
- Synovial membranes
- Serous membranes

i. Mucous membrane

It is a moist lining of

- Alimentary canal
- Respiratory tract
- Genito-urinary tract

Cells which produce mucous are called gublet cells.

Functions

- Protects the lining from mechanical injury.
- Trap duct in the respiratory tract.
- Prevent entry of foreign particles into the alveoli.

ii. Synovial membranes

- Found lining joints and tendons
- Made of flat epithelial cells.

Functions

- Secretes synovial fluid (a clear sticky oily fluid)
- Lubricates the joints.

iii. Serous membrane

- These are membranes which lines all body cavities
- They secretes a watery fluid (serous fluid)

Functions

- Prevent friction between organs

THE ABDOMEN

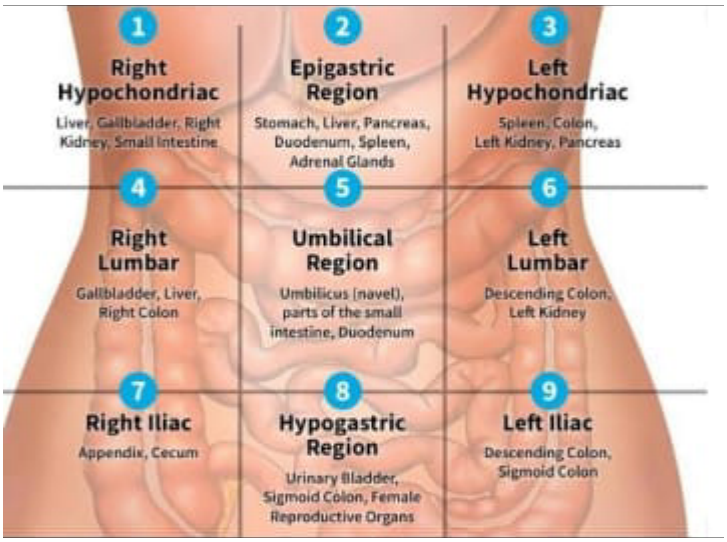
This is the area of the trunk which lies below the diaphragm.

The abdominal cavity is the upper 2/3 of this area.

The pelvic cavity is the lower 1/3 of this area.

The abdomen can be further sub-divided into 9 regions for the purpose of clinical examination as shown in the figure below.

Each region also shows the organs which are located there specifically.



Serous membranes lining body cavities

1. Pleura: This lines thoracic cavity

   It consists of 2 layers

   Parietal pleura- lines inner wall of thoracic cavity

   Visceral pleura lines the lungs

NB: Between parietal and visceral pleura there is a potential space called pleural cavity. This cavity is filled with pleural fluid which prevents friction between the two pleural layers.

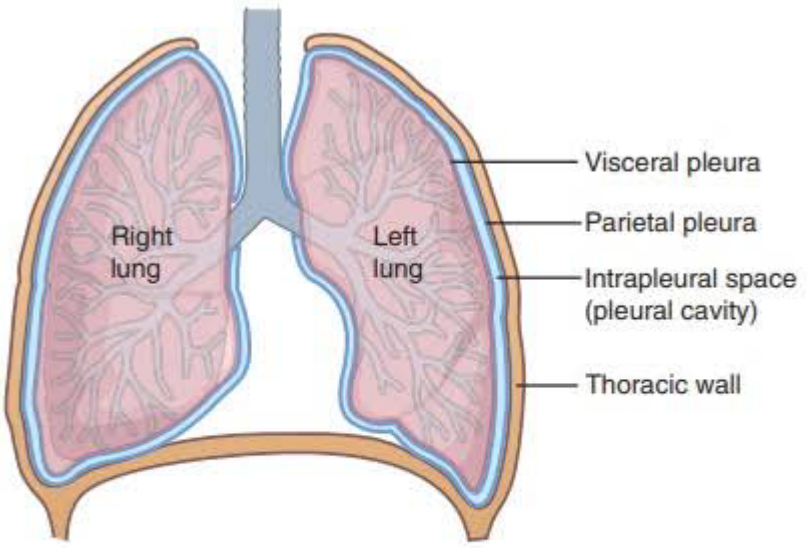


FIGURE 21-7 The lungs reside in the pleural cavities, subdivisions of the thoracic cavity. They are lined with a serous membrane called the pleura. The intrapleural space is located between the visceral and parietal pleura.

2. Pericardium: This lines the heart
3. Peritoneum: This lines abdominal and pelvic cavities. It consists of 2 layers

    Parietal peritoneum- lines inner wall of abdominal and pelvic cavities.

    Visceral peritoneum- lines abdominal and pelvic organs.

Between the two layers there is a potential space called the peritoneal cavity.

This cavity contains

i. Mesentery – is a fold of peritoneum which connects small intestine to posterior abdominal wall.
ii. Ligaments
iii. Omentum

Retroperitoneal organs

Some organs in the abdomen lies on the posteriorly behind the peritoneum and are thus called retroperitoneal organs (meaning behind the peritoneum).

These includes; Kidneys (left & right), pancreas, lymph nodes, ureters, abdominal aorta, inferior venacava and adrenal glands.

Intraperitoneal organs

Other organs lie inside the visceral peritoneum and are called intraperitoneal organs.

These includes: stomach, spleen, liver, jejunum, ilium, sigmoid colon and appendix.

4. Meninges – lines the brain and spinal cord.

    It consists of 3 layers

    Dura matter- outer layer

    Arachnoid matter- middle layer

    Pia matter- this is the inner layer which lies completely on top of

brain.

NB: Between dura and arachnoid matter there is a potential space called sub-dura space.

Between arachnoid and pia matter is another potential space called sub-arachnoid space. This is where we have cerebrospinal fluid (CSF) flowing.