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**Q2.Write about Pericardium and its types.**

**Ans. Pericardium** The pericardium is a fibroserous sac that encloses the heart and the roots of the great vessels. It has two layers, a serous layer and a fibrous layer. The space between two layers is called pericardial space or pericardial cavity. A fluid is present in this space which is called pericardial fluid. Its function is to restrict excessive movements of the heart as a whole and to serve as a lubricated container in which the different parts of the heart can contract. It also protects the heart and great vessels against infection.

Position of Pericardium  
 The pericardium is present within the middle mediastinum, posterior to the body of the sternum and the 2nd to the 6th costal cartilages and anterior to the 5th to the 8th thoracic vertebrae.  
  
**Layers of Pericardium  
  
(1) Fibrous Pericardium**   
It is the strong fibrous part of the sac.   
It is the superficial layer of the pericardium.   
It is firmly attached below to the central tendon of the diaphragm.

It fuses with the outer coats of the great blood vessels passing through it namely, the aorta, the pulmonary trunk, the superior and inferior venae cavae, and the pulmonary veins.   
Itis attached in front to the sternum by the sternopericardial ligaments.  
This part of pericardium protect the heart, anchoring it to the surrounding walls, and preventing it from overfilling with blood.

**2) Serous pericardium**The serous pericardium lines the fibrous pericardium and coats the heart. It is divided into two layers, Parietal and Visceral layers.

**Parietal pericardium**The parietal layer is fused to and inseparable from the fibrous pericardium,  
**visceral pericardium**The visceral pericardium is the part of the epicardium.  
  
(When the visceral layer of serous pericardium comes into contact with heart (not the great vessels) it is known as the epicardium.)

**Nerve Supply of the Pericardium**  
  
The fibrous pericardium and the parietal layer of the serous pericardium are supplied by the phrenic nerves.   
The visceral layer of the serous pericardium is supplied by branches of the sympathetic trunks and the vagus nerves.  
 **Blood supply of pericardium**  
Fibrous pericardium and the parietal layer of serous pericardium is supplied by pericardiophrenic and musculophrenic arteries which are the branches of internal thoracic artery.  
Visceral layer of serous pericardium is supplied by the branches of coronary arteries.

The veins drains into azygos veins and pericardiophrenic veins and then into internal thoracic vein.

**Q3.Write a detail note on Pleura.**

**Ans. Pleura** .The pleura is a double layered membrane which covers the thoracic cavity.  
 Each pleura has two parts,  
 **(1) Parietal Pleura (Parietal layer)**It lines the thoracic wall, covers the thoracic surface of the diaphragm and the lateral aspect of the mediastinum and extends into the root of the neck to line the undersurface of the suprapleural membrane at the thoracic outlet.

**(2) Visceral pleura (Visceral layer)**This layer completely covers the outer surfaces of the lungs and extends into the depths of the interlobar fissures.   
 The two layers become continuous with one another by means of a cuff of pleura that surrounds the structures entering and leaving the lung at the hilum of each lung.   
 To allow the movement of the pulmonary vessels and large bronchi during respiration, the pleural cuff hangs down as a loose fold called the pulmonary ligament.

**Pleural cavity .** It is a slit like space between the parietal and visceral pleura. It is also known as pleural space.  
 **Pleural fluid .** It is a tissue fluid present between visceral and parietal pleura.   
It reduces the friction between two layers of pleurae and also permits their movements.

The parietal pleurae is divided into different parts according to the region in which it lies or the surface that it covers.   
  
**(1) Cervical pleura** It extends up into the neck, lining the undersurface of the suprapleural membrane. It reaches a level 1 to 1.5 inch (2.5 to 4 cm) above the medial third of the clavicle.  
  
**(2) Costal pleura** It lines the inner surfaces of the ribs, the costal cartilages, the intercostal spaces, the sides of the vertebral bodies, and the back of the sternum.

**3)Diaphragmatic pleura**

The diaphragmatic pleura covers the thoracic surface of the diaphragm.  
 **(4) Mediastinal pleura**

The mediastinal pleura covers and forms the lateral boundary of the mediastinum.   
At the hilum of the lung, it is reflected as a cuff around the vessels and bronchi and here becomes continuous with the visceral pleura.

It is thus seen that each lung lies free except at its hilum, where it is attached to the blood vessels and bronchi that constitute the lung root.

**Nerve Supply of the Pleura**  
**The parietal pleura is supplied by:**

The costal pleura is segmentally supplied by the intercostal nerves.  
The mediastinal pleura is supplied by the phrenic nerve.  
The diaphragmatic pleura is supplied over the domes by the phrenic nerve and around the periphery by the lower six intercostal nerves.  
It is sensitive to pain, temperature, touch and pressure.  
  
**The visceral pleura is supplied by**:

The autonomic nerve supply from the pulmonary plexus.  
It is sensvtive to stretch but is insensitive to common sensations such as pain and touch.

**Q1.Write a detail note on Diaphragm.**

**Ans. Diaphragm :**

The diaphragm is the primary muscle used in respiration, which is the process of breathing. This dome-shaped muscle is located just below the [lungs](https://www.healthline.com/human-body-maps/lung) and [heart](https://www.healthline.com/human-body-maps/heart). It contracts continually as you breathe in and out.

## **Diaphragm anatomy and function**

The diaphragm is a thin skeletal muscle that sits at the base of the chest and separates the abdomen from the chest. It contracts and flattens when you inhale. This creates a vacuum effect that pulls air into the lungs. When you exhale, the diaphragm relaxes and the air is pushed out of lungs.

It also has some nonrespiratory functions as well. The diaphragm increases abdominal pressure to help the body get rid of vomit, urine, and feces. It also places pressure on the esophagus to prevent [acid reflux](https://www.healthline.com/health/gerd).

The phrenic nerve, which runs from the neck to the diaphragm, controls the movement of the diaphragm.

There are three large openings in the diaphragm that allow certain structures to pass between the chest and the abdomen.

These openings include the:

* **Esophageal opening.** The esophagus and [vagus nerve](https://www.healthline.com/human-body-maps/vagus-nerve), which controls much of the digestive system, pass through this opening.
* **Aortic opening.** The [aorta](https://www.healthline.com/human-body-maps/descending-thoracic-aorta), the body’s main artery that transports blood from the heart, passes through the aortic opening. The [thoracic duct](https://www.healthline.com/human-body-maps/thoracic-duct), a main vessel of the lymphatic system, also passes through this opening.
* **Caval opening.** The [inferior vena cava](https://www.healthline.com/human-body-maps/inferior-vena-cava), a large vein that transports blood to the heart, passes through this opening.

## **Diaphragm conditions**

A range of health conditions can affect or involve the diaphragm.

### **Hiatal hernia**

A [hiatal hernia](https://www.healthline.com/health/hiatal-hernia) happens when the upper part of the stomach bulges through the esophageal opening of the diaphragm. Experts aren’t sure why it happens, but it could be caused by:

* age-related changes in the diaphragm
* injuries or birth defects
* chronic pressure on surrounding muscles from coughing, straining, or heavy lifting

They’re [more common](https://www.mayoclinic.org/diseases-conditions/hiatal-hernia/diagnosis-treatment/drc-20373385) in people who are over the age of 50 or obese.

Small hiatal hernias usually don’t cause any symptoms or require treatment. But a larger hiatal hernia may cause some symptoms, including:

* [heartburn](https://www.healthline.com/symptom/heartburn)
* acid reflux
* trouble swallowing
* chest pain that sometimes radiates to the back

Larger hiatal hernias sometimes require surgical repair, but other cases are usually manageable with over-the-counter [antacid medication](https://www.healthline.com/health/antacids). Proton pump inhibitors can also help to reduce acid production and heal any damage to the esophagus.

### **Diaphragmatic hernia**

A [diaphragmatic hernia](https://www.healthline.com/health/diaphragmatic-hernia) happens when at least one abdominal organ bulges into the chest through an opening in the diaphragm. It’s sometimes present at birth. When this happens, it’s called a congenital diaphragmatic hernia (CDH).

Injuries from an accident or surgery can also cause a diaphragmatic hernia. In this case, it’s called an acquired diaphragmatic hernia (ADH).

Symptoms can vary depending on the size of the hernia, the cause, and the organs involved. They may include:

* difficulty breathing
* rapid breathing
* rapid heart rate
* blueish-colored skin
* bowel sounds in the chest

Both an ADH and CDH require immediate surgery to remove the abdominal organs from the chest cavity and repair the diaphragm.

### **Cramps and spasms**

A diaphragmatic [cramp](https://www.healthline.com/health/diaphragm-pain) or [spasm](https://www.healthline.com/health/diaphragm-spasm) can cause chest pain and shortness of breath that can be mistaken for a [heart attack](https://www.healthline.com/health/heart-disease/heart-attack-symptoms). Some people also experience sweating and anxiety during a diaphragm spasm. Others describe feeling like they can’t take a full breath during a spasm.

During a spasm, the diaphragm doesn’t rise back up after exhalation. This inflates the lungs, causing the diaphragm to tighten. This can also cause a cramping sensation in the chest. Vigorous exercise can cause the diaphragm to spasm, which often results in what people call a side stitch.

Diaphragm spasms usually go away on their own within a few hours or days.

### Diaphragmatic flutter

Diaphragmatic flutter is a rare condition that’s often mistaken for a spasm. During an episode, someone might feel the fluttering as a pulsing sensation in the abdominal wall.

It can also cause:

* shortness of breath
* chest tightness
* chest pain
* abdominal pain

### Phrenic nerve damage

Several things can damage the phrenic nerve, including

* traumatic injuries
* surgery
* cancer in the lungs or nearby lymph nodes
* spinal cord conditions
* [autoimmune disease](https://www.healthline.com/health/autoimmune-disorders)
* neuromuscular disorders, such as [multiple sclerosis](https://www.healthline.com/health/multiple-sclerosis)
* certain viral illnesses

This damage can cause dysfunction or paralysis of the diaphragm. But phrenic nerve damage doesn’t always cause symptoms. When it does, possible symptoms include:

* shortness of breath when lying flat or exercising
* morning headaches
* trouble sleeping
* chest pain

## **Symptoms of a diaphragm condition**

A condition affecting the diaphragm can cause symptoms similar to those of a heart attack. Seek emergency treatment if you experience chest pain or pressure that extends to your jaw, neck, arms, or back.

Symptoms of a diaphragm condition may include:

* difficulty breathing when lying down
* shortness of breath
* chest, shoulder, back, or abdominal pain
* pain in your lower ribs
* a fluttering or [pulsing sensation in the abdomen](https://www.healthline.com/health/pulse-in-stomach)
* bluish-colored skin
* heartburn
* trouble swallowing
* regurgitation of food
* upper abdominal pain after eating
* [hiccups](https://www.healthline.com/health/why-do-we-hiccup)
* side pain