

FAQs, MCQs and Viva Voce

Frequently Asked Questions — Thoracic Cavity and Pleurae

1. What are the main divisions of the thoracic cavity?

? The thoracic cavity is divided into **three compartments**:

- **Right pleural cavity** (contains right lung)
 - **Left pleural cavity** (contains left lung)
 - **Mediastinum** (central space containing heart, great vessels, trachea, and oesophagus)
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2. What is pleura?

? The **pleura** is a **serous membrane** made of mesothelium, forming a closed sac around each lung. It has two layers — **parietal pleura** lining the thoracic wall and **visceral pleura** covering the lung surface.

3. What is the difference between parietal and visceral pleura?

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- **Parietal pleura**: Lines thoracic cavity; **pain sensitive** (somatic supply).
 - **Visceral pleura**: Covers lung; **insensitive to pain** (autonomic supply).
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4. Name the parts of the parietal pleura.

? Costal, diaphragmatic, mediastinal, and cervical pleura (cupula).

5. What is the pleural cavity?

? It is a **potential space** between the parietal and visceral pleura containing a thin film of

serous fluid that allows smooth gliding of the lung during respiration.

6. What is the pulmonary ligament?

? A **double fold of mediastinal pleura** extending downward from the root of the lung, allowing **descent of the lung root** during inspiration.

7. What are pleural recesses?

? These are potential spaces where pleurae of adjacent regions come into contact.

- **Costodiaphragmatic recess** (deepest, for lung expansion).
 - **Costomediastinal recess** (shallow, near cardiac notch).
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8. What is the nerve supply of the pleura?

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- **Parietal pleura:** Intercostal nerves (costal part), phrenic nerve (central part).
 - **Visceral pleura:** Autonomic fibres (sympathetic and vagus).
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9. Which part of pleura is pain-sensitive?

? The **parietal pleura** only — especially the **costal** and **diaphragmatic parts**.

10. What is the clinical significance of pleural recesses?

? They serve as **reservoirs** for pleural fluid and are important sites for **pleural effusion** and **thoracocentesis** (needle aspiration).

11. What are the boundaries of the costodiaphragmatic recess?

?

- **Outer wall:** Costal pleura

- **Inner wall:** Diaphragmatic pleura
 - **Medial wall:** Mediastinal pleura
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12. What is pleurisy?

? Inflammation of pleura, producing **sharp chest pain** due to friction between inflamed pleural layers.

13. Why is pain in diaphragmatic pleurisy referred to the shoulder?

? Because the **phrenic nerve (C4)** supplies the **diaphragmatic pleura** and the **skin over the shoulder**, causing referred pain to the **C4 dermatome**.

14. What is pleural effusion?

? Accumulation of fluid in the **pleural cavity**, commonly due to infection, tuberculosis, or heart failure.

15. What is pneumothorax?

? Presence of air in the pleural cavity, causing **collapse of the lung** due to loss of negative intrapleural pressure.

16. What is haemothorax and empyema?

?

- **Haemothorax:** Accumulation of blood in pleural cavity.
 - **Empyema:** Accumulation of pus in pleural cavity.
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17. What is the nerve supply responsible for referred pain from pleura to the shoulder?

? **Phrenic nerve (C4)** — irritation of mediastinal or central diaphragmatic pleura causes **shoulder tip pain**.

18. What is paracentesis thoracis (pleural tap)?

? A procedure to remove fluid from the pleural cavity; the needle is inserted **just above the upper border of a rib**, usually in the **8th intercostal space, midaxillary line**.

19. What is the difference between pleural cavity and pericardial cavity?

?

- **Pleural cavity:** Surrounds each lung.
 - **Pericardial cavity:** Surrounds the heart, lying within the mediastinum.
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20. Why is the pleura clinically important?

? Because pleural diseases (effusion, pneumothorax, empyema, fibrosis) directly affect **lung expansion** and **respiration**, and understanding pleural anatomy is essential for **surgical and diagnostic procedures** like chest drainage or thoracotomy.

Multiple Choice Questions — Thoracic Cavity and Pleurae

1. The thoracic cavity is divided into how many compartments?

- a) 1
- b) 2
- c) 3
- d) 4

Answer: c) 3

2. The central compartment of the thoracic cavity is called the:

- a) Pleural cavity
- b) Mediastinum
- c) Pericardial cavity
- d) Thoracic inlet

Answer:

b)

3. The pleura is derived embryologically from:

- a) Endoderm
- b) Ectoderm
- c) Mesoderm
- d) Neural crest

Answer: c) Mesoderm

4. Parietal pleura develops from:

- a) Splanchnopleuric mesoderm
- b) Somatopleuric mesoderm
- c) Neural crest
- d) Endoderm

Answer: b) Somatopleuric mesoderm

5. Visceral pleura develops from:

- a) Splanchnopleuric mesoderm
- b) Somatopleuric mesoderm
- c) Ectoderm
- d) Endoderm

Answer: a) Splanchnopleuric mesoderm

6. The space between the visceral and parietal pleura is called:

- a) Mediastinum
- b) Pleural cavity
- c) Thoracic duct
- d) Pericardial sac

Answer: b) Pleural cavity

7. The pleural cavity normally contains:

- a) Air
- b) Blood
- c) Serous fluid

d) Lymph

Answer: c) Serous fluid

8. The pleural cavity is a:

- a) True cavity
- b) Potential space
- c) Synovial space
- d) Lymphatic sinus

Answer: b) Potential space

9. Which part of pleura covers the lung surface?

- a) Parietal pleura
- b) Visceral pleura
- c) Mediastinal pleura
- d) Costal pleura

Answer: b) Visceral pleura

10. The parietal pleura lines all except:

- a) Thoracic wall
- b) Diaphragm
- c) Lung surface
- d) Mediastinum

Answer: c) Lung surface

11. Which of the following is not a part of the parietal pleura?

- a) Costal
- b) Diaphragmatic
- c) Mediastinal
- d) Pulmonary

Answer: d) Pulmonary

12. The cervical pleura is also known as:

- a) Pleural cupula
- b) Costal pleura

c) Mediastinal pleura

d) Apical pleura

Answer: a) Pleural cupula

13. The cervical pleura extends above the first rib by about:

a) 0.5 cm

b) 1 cm

c) 2.5 cm

d) 4 cm

Answer: c) 2.5 cm

14. The pleural fluid is secreted by:

a) Costal pleura

b) Diaphragmatic pleura

c) Mesothelial cells

d) Endothelial cells

Answer: c) Mesothelial cells

15. The pulmonary ligament is a:

a) Fold of visceral pleura

b) Fold of mediastinal pleura

c) Ligament of pericardium

d) Fibrous tissue of lung root

Answer: b) Fold of mediastinal pleura

16. The costodiaphragmatic recess lies between:

a) Costal and mediastinal pleura

b) Costal and diaphragmatic pleura

c) Mediastinal and diaphragmatic pleura

d) Costal and cervical pleura

Answer: b) Costal and diaphragmatic pleura

17. The costodiaphragmatic recess is deepest at:

a) Midclavicular line

- b) Midaxillary line
- c) Scapular line
- d) Parasternal line

Answer: b) Midaxillary line

18. The costomediastinal recess is prominent on which side?

- a) Right
- b) Left
- c) Both
- d) Neither

Answer: b) Left

19. The pleural reflections are:

- a) Junction lines of two parts of parietal pleura
- b) Folds of visceral pleura
- c) Adhesions between pleural layers
- d) Lymphatic channels

Answer: a) Junction lines of two parts of parietal pleura

20. Which part of pleura is insensitive to pain?

- a) Parietal pleura
- b) Visceral pleura
- c) Costal pleura
- d) Mediastinal pleura

Answer: b) Visceral pleura

21. The parietal pleura is supplied by:

- a) Autonomic nerves
- b) Intercostal and phrenic nerves
- c) Vagus nerve
- d) Sympathetic chain

Answer: b) Intercostal and phrenic nerves

22. The visceral pleura is supplied by:

- a) Intercostal nerves
- b) Vagus and sympathetic nerves
- c) Phrenic nerve
- d) Recurrent laryngeal nerve

Answer: b) Vagus and sympathetic nerves

23. Pain from costal pleura is referred along:

- a) Neck
- b) Abdomen
- c) Intercostal spaces
- d) Shoulder

Answer: c) Intercostal spaces

24. Pain from diaphragmatic pleura is referred to:

- a) Epigastrium
- b) Umbilicus
- c) Shoulder tip
- d) Back

Answer: c) Shoulder tip

25. The nerve responsible for referred shoulder pain in pleurisy is:

- a) Vagus
- b) Phrenic
- c) Intercostal
- d) Sympathetic

Answer: b) Phrenic

26. The pleural cavity extends up to which rib in the midaxillary line?

- a) 6th
- b) 8th
- c) 10th
- d) 12th

Answer: c) 10th

27. The lung margin crosses the 6th rib in:

- a) Midclavicular line
- b) Midaxillary line
- c) Paravertebral line
- d) Scapular line

Answer: a) Midclavicular line

28. The pleural cavity extends below the lung margin by about:

- a) One rib
- b) Two ribs
- c) Three ribs
- d) Four ribs

Answer: b) Two ribs

29. Thoracocentesis (pleural tap) is done in which intercostal space?

- a) 4th
- b) 5th
- c) 6th
- d) 8th

Answer: d) 8th

30. In pleural tap, the needle should be inserted:

- a) Below the lower border of rib
- b) Above the upper border of rib
- c) Through the middle of rib
- d) In the costal cartilage

Answer: b) Above the upper border of rib

31. The main blood supply to the parietal pleura is via:

- a) Bronchial arteries
- b) Intercostal and internal thoracic arteries
- c) Pulmonary arteries
- d) Azygos veins

Answer: b) Intercostal and internal

32. The venous drainage of parietal pleura is mainly into:

- a) Pulmonary veins
- b) Azygos and internal thoracic veins
- c) Bronchial veins
- d) Pericardiophrenic veins

Answer: b) Azygos and internal thoracic veins

33. The lymphatic drainage of parietal pleura is into:

- a) Bronchopulmonary nodes
- b) Posterior intercostal and internal mammary nodes
- c) Hilar nodes
- d) Tracheobronchial nodes

Answer: b) Posterior intercostal and internal mammary nodes

34. The pleural cupula is strengthened by which fascia?

- a) Endothoracic fascia
- b) Sibson's fascia
- c) Prevertebral fascia
- d) Buccopharyngeal fascia

Answer: b) Sibson's fascia

35. Which of the following conditions is due to air in the pleural cavity?

- a) Hydrothorax
- b) Pneumothorax
- c) Haemothorax
- d) Empyema

Answer: b) Pneumothorax

36. Fluid accumulation in pleural cavity is called:

- a) Pneumothorax
- b) Pleural effusion
- c) Hydronephrosis

d) Hydrocele

Answer: b) Pleural effusion

37. Blood in pleural cavity is termed:

- a) Haemothorax
- b) Pneumothorax
- c) Empyema
- d) Hydrothorax

Answer: a) Haemothorax

38. Pus in pleural cavity is termed:

- a) Pneumothorax
- b) Empyema
- c) Hydrothorax
- d) Chylothorax

Answer: b) Empyema

39. Milky fluid in pleural cavity is due to injury of:

- a) Azygos vein
- b) Internal thoracic artery
- c) Thoracic duct
- d) Bronchial veins

Answer: c) Thoracic duct

40. Referred shoulder pain in pleurisy is due to involvement of:

- a) Intercostal nerves
- b) Phrenic nerve
- c) Vagus nerve
- d) Sympathetic chain

Answer: b) Phrenic nerve

41. The visceral pleura receives blood supply from:

- a) Bronchial arteries
- b) Pulmonary arteries

- c) Intercostal arteries
- d) Internal thoracic arteries

Answer: a) Bronchial arteries

42. The parietal pleura is supplied by which arteries?

- a) Bronchial
- b) Intercostal
- c) Pulmonary
- d) Coronary

Answer: b) Intercostal

43. Which nerve supplies the costal pleura?

- a) Vagus
- b) Intercostal
- c) Phrenic
- d) Sympathetic

Answer: b) Intercostal

44. Which nerve supplies the mediastinal pleura?

- a) Vagus
- b) Phrenic
- c) Intercostal
- d) Sympathetic

Answer: b) Phrenic

45. Which part of the pleura is related to the pericardium?

- a) Mediastinal pleura
- b) Costal pleura
- c) Diaphragmatic pleura
- d) Cervical pleura

Answer: a) Mediastinal pleura

46. The costodiaphragmatic recess is obliterated first in:

- a) Pneumothorax

- b) Pleural effusion
- c) Pulmonary fibrosis
- d) Pneumonia

Answer: b) Pleural effusion

47. Which of the following conditions causes lung collapse?

- a) Pleural effusion
- b) Pneumothorax
- c) Empyema
- d) Haemothorax

Answer: b) Pneumothorax

48. In dry pleurisy, the characteristic sound heard is:

- a) Pleural rub
- b) Rales
- c) Crepitation
- d) Wheeze

Answer: a) Pleural rub

49. Which structure lies closest to the cupula of the pleura?

- a) Subclavian artery
- b) Internal thoracic artery
- c) Common carotid artery
- d) Superior vena cava

Answer: a) Subclavian artery

50. During central line (subclavian) insertion, pleural injury leads to:

- a) Chylothorax
- b) Pneumothorax
- c) Haemothorax
- d) Empyema

Answer: b) Pneumothorax

Viva Voce — Thoracic Cavity and Pleurae

Q1. What are the main compartments of the thoracic cavity?

? The thoracic cavity has **three compartments** — right pleural cavity, left pleural cavity, and the **mediastinum** in the centre.

Q2. What is pleura?

? A **serous membrane** made of mesothelium that forms a **closed sac** around each lung, allowing frictionless movement during respiration.

Q3. Name the two layers of pleura.

? **Parietal pleura** and **visceral pleura**.

Q4. What is the main difference between parietal and visceral pleura?

? Parietal pleura lines the thoracic cavity and is **pain-sensitive**.

Visceral pleura covers the lungs and is **insensitive to pain**.

Q5. What are the parts of the parietal pleura?

? **Costal**, **diaphragmatic**, **mediastinal**, and **cervical (cupula)** pleura.

Q6. Which part of the pleura covers the diaphragm?

? The **diaphragmatic pleura**.

Q7. Which part of the pleura forms the lateral wall of the mediastinum?

? The **mediastinal pleura**.

Q8. What is the cupula of pleura?

? The **cervical pleura** that extends into the root of the neck above the first rib.

Q9. What structure strengthens the cervical pleura?

? **Sibson's fascia (suprapleural membrane)**.

Q10. What is the pleural cavity?

? A **potential space** between parietal and visceral pleura containing a thin film of **serous fluid**.

Q11. What is the function of pleural fluid?

? It **lubricates** the pleural surfaces and allows **smooth lung movement** during respiration.

Q12. What is the pulmonary ligament?

? A **double fold of mediastinal pleura** below the lung root that allows descent of the lung root during inspiration.

Q13. What are pleural recesses?

? Potential spaces where pleural layers come in contact; they allow lung expansion during deep inspiration.

Q14. Name the pleural recesses.

? **Costodiaphragmatic** and **costomediastinal** recesses.

Q15. Which recess is deeper?

? The **costodiaphragmatic recess**, especially along the **midaxillary line**.

Q16. Which side shows a larger costomediastinal recess?

? The **left side**, near the **cardiac notch** of the left lung.

Q17. What is the nerve supply of parietal pleura?

? **Intercostal nerves** (costal and peripheral diaphragmatic pleura) and **phrenic nerve** (mediastinal and central diaphragmatic pleura).

Q18. What is the nerve supply of visceral pleura?

? **Autonomic nerves** from the **vagus** and **sympathetic trunks**.

Q19. Which part of pleura is sensitive to pain?

? **Parietal pleura**, not the visceral pleura.

Q20. Why is the visceral pleura insensitive to pain?

? It is supplied by **autonomic nerves**, which do not carry somatic pain fibres.

Q21. Why does irritation of diaphragmatic pleura cause shoulder pain?

? Because it is supplied by the **phrenic nerve (C4)**, and pain is referred to the **C4 dermatome** (shoulder tip).

Q22. What is the blood supply of the parietal pleura?

? **Intercostal, internal thoracic, and musculophrenic arteries.**

Q23. What is the venous drainage of the parietal pleura?

? **Azygos, internal thoracic, and musculophrenic veins.**

Q24. What is the lymphatic drainage of the pleura?

?

- **Parietal pleura:** Internal mammary, intercostal, and posterior mediastinal nodes.
 - **Visceral pleura:** Bronchopulmonary nodes at the hilum.
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Q25. What is pleurisy?

? **Inflammation of pleura** producing sharp pain during breathing due to friction between inflamed pleural surfaces.

Q26. What is pleural effusion?

? **Collection of fluid** in the pleural cavity, compressing the lung and restricting expansion.

Q27. What is pneumothorax?

? Presence of **air in pleural cavity**, leading to **lung collapse**.

Q28. What is haemothorax?

? **Blood accumulation** in the pleural cavity, usually after trauma.

Q29. What is empyema?

? **Pus in pleural cavity** due to infection.

Q30. What is chylothorax?

? **Lymph (chyle) accumulation** in pleural cavity from thoracic duct injury.

Q31. Why is the pleura clinically important in chest injuries?

? Because even a small breach can allow **air entry**, leading to **pneumothorax** and lung collapse.

Q32. Where is the needle inserted for pleural tap (thoracocentesis)?

? **Above the upper border** of a rib, usually in the **8th intercostal space** in the **midaxillary line**.

Q33. Why should the needle be inserted above the rib and not below it?

? To avoid injury to **intercostal vein, artery, and nerve** that run along the **lower border** of the rib.

Q34. What happens if pleural fluid accumulates excessively?

? The **costodiaphragmatic recess** is obliterated, and the **lung is compressed**.

Q35. What is the normal relationship of the pleura to ribs?

?

- Midclavicular line ? pleura at 8th rib.
 - Midaxillary line ? pleura at 10th rib.
 - Paravertebral line ? pleura at 12th rib.
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Q36. What are the corresponding lung levels to pleural reflections?

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- Midclavicular ? lung 6th rib, pleura 8th rib.
 - Midaxillary ? lung 8th rib, pleura 10th rib.
 - Paravertebral ? lung 10th rib, pleura 12th rib.
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Q37. What is a tension pneumothorax?

? A life-threatening condition where air enters pleural cavity but cannot escape, raising pressure and shifting the **mediastinum to the opposite side**.

Q38. Why is pleural friction rub heard in dry pleurisy?

? Because the pleural layers become roughened and rub against each other during respiration.

Q39. Why does the left costomediastinal recess exist?

? Due to the **cardiac notch** of the left lung.

Q40. What is the clinical importance of Sibson's fascia?

? It protects the **pleural cupula** during procedures like **subclavian vein catheterization**, reducing the risk of **pneumothorax**.

Q41. What happens if the thoracic duct is injured?

? **Chylothorax** — milky fluid collects in the left pleural cavity.

Q42. How does pleural effusion appear on X-ray?

? **Blunting of costophrenic angle** and a **meniscus-shaped shadow**.

Q43. What are the effects of fibrosis of the pleura?

? **Restricted lung movement, dyspnea, and mediastinal shift** toward the affected side.

Q44. Which part of pleura is related to pericardium?

? **Mediastinal pleura**.

Q45. Which condition obliterates the pleural cavity?

? **Pleural adhesions** following chronic pleurisy or tuberculosis.

Q46. Which nerve supplies both the diaphragm and its pleura?

? **Phrenic nerve (C3–C5).**

Q47. What is the physiological importance of negative intrapleural pressure?

? It keeps the **lungs inflated** and prevents collapse.

Q48. Which structure separates the two pleural cavities?

? The **mediastinum.**

Q49. Which is the most dependent part of the pleural cavity in standing position?

? The **costodiaphragmatic recess.**

Q50. Which clinical procedure makes use of pleural anatomy knowledge?

? **Thoracocentesis** (pleural tap) and **chest tube drainage.**
