MEDICAL EDUCATION RESOURCE

FAQs,MCQs and Viva Voce

Frequently Asked Questions — Thoracic Cavity and Pleurae

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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.

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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).

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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.

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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.

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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**.

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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).

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11. What are the boundaries of the costodiaphragmatic recess?
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- **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.

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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**.

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

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

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16. What is haemothorax and empyema?
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- **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**.

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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**.

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

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- **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

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

a) 1

b) 2

c) 3

d) 4

Answer: c) 3

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

a) Pleural cavity

b) Mediastinum

c) Pericardial cavity

d) Thoracic inlet

Answer: b)

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3. The pleura is derived embryologically from:

a) Endoderm

b) Ectoderm

c) Mesoderm

d) Neural crest

Answer: c) Mesoderm

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4. Parietal pleura develops from:

a) Splanchnopleuric mesoderm

b) Somatopleuric mesoderm

c) Neural crest

d) Endoderm

Answer: b) Somatopleuric mesoderm

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5. Visceral pleura develops from:

a) Splanchnopleuric mesoderm

b) Somatopleuric mesoderm

c) Ectoderm

d) Endoderm

Answer: a) Splanchnopleuric mesoderm

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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

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7. The pleural cavity normally contains:

a) Air

b) Blood

c) Serous fluid

d) Lymph

Answer: c) Serous fluid

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8. The pleural cavity is a:

a) True cavity

b) Potential space

c) Synovial space

d) Lymphatic sinus

Answer: b) Potential space

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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

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10. The parietal pleura lines all except:

a) Thoracic wall

b) Diaphragm

c) Lung surface

d) Mediastinum

Answer: c) Lung surface

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

a) Costal

b) Diaphragmatic

c) Mediastinal

d) Pulmonary

Answer: d) Pulmonary

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12. The cervical pleura is also known as:

a) Pleural cupula

b) Costal pleura

c) Mediastinal pleura

d) Apical pleura

Answer: a) Pleural cupula

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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

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14. The pleural fluid is secreted by:

a) Costal pleura

b) Diaphragmatic pleura

c) Mesothelial cells

d) Endothelial cells

Answer: c) Mesothelial cells

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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

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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

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17. The costodiaphragmatic recess is deepest at:

a) Midclavicular line

b) Midaxillary line

c) Scapular line

d) Parasternal line

Answer: b) Midaxillary line

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18. The costomediastinal recess is prominent on which side?

a) Right

b) Left

c) Both

d) Neither

Answer: b) Left

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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

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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

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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

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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

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23. Pain from costal pleura is referred along:

a) Neck

b) Abdomen

c) Intercostal spaces

d) Shoulder

Answer: c) Intercostal spaces

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24. Pain from diaphragmatic pleura is referred to:

a) Epigastrium

b) Umbilicus

c) Shoulder tip

d) Back

Answer: c) Shoulder tip

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

a) Vagus

b) Phrenic

c) Intercostal

d) Sympathetic

Answer: b) Phrenic

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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

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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

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

a) 4th

b) 5th

c) 6th

d) 8th

Answer: d) 8th

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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

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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

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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

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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

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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

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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

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36. Fluid accumulation in pleural cavity is called:

a) Pneumothorax

b) Pleural effusion

c) Hydronephrosis

d) Hydrocele

Answer: b) Pleural effusion

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37. Blood in pleural cavity is termed:

a) Haemothorax

b) Pneumothorax

c) Empyema

d) Hydrothorax

Answer: a) Haemothorax

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38. Pus in pleural cavity is termed:

a) Pneumothorax

b) Empyema

c) Hydrothorax

d) Chylothorax

Answer: b) Empyema

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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

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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

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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

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42. The parietal pleura is supplied by which arteries?

a) Bronchial

b) Intercostal

c) Pulmonary

d) Coronary

Answer: b) Intercostal

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43. Which nerve supplies the costal pleura?

a) Vagus

b) Intercostal

c) Phrenic

d) Sympathetic

Answer: b) Intercostal

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44. Which nerve supplies the mediastinal pleura?

a) Vagus

b) Phrenic

c) Intercostal

d) Sympathetic

Answer: b) Phrenic

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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

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46. The costodiaphragmatic recess is obliterated first in:

a) Pneumothorax

b) Pleural effusion

c) Pulmonary fibrosis

d) Pneumonia

Answer: b) Pleural effusion

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47. Which of the following conditions causes lung collapse?

a) Pleural effusion

b) Pneumothorax

c) Empyema

d) Haemothorax

Answer: b) Pneumothorax

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

a) Pleural rub

b) Rales

c) Crepitation

d) Wheeze

Answer: a) Pleural rub

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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

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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.

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.

Q36. What are the corresponding lung levels to pleural reflections?

?

- Midclavicular ? lung 6th rib, pleura 8th rib.
- Midaxillary ? lung 8th rib, pleura 10th rib.
- Paravertebral ? lung 10th rib, pleura 12th rib.

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.**