

Frequently Asked Questions, MCQs, Viva Voce

Frequently Asked Questions — Walls of Thorax

1. What are the layers of the thoracic wall from superficial to deep?

? Skin ? Superficial fascia ? Deep fascia ? Muscles (external, internal, and innermost intercostals) ? Endothoracic fascia ? Parietal pleura.

2. How many intercostal spaces are present in the thorax?

? There are **11 intercostal spaces** on each side and **1 subcostal space** below the 12th rib.

3. What structures are present in a typical intercostal space?

? Each space contains **three layers of intercostal muscles, intercostal vessels, intercostal nerve, and lymphatics.**

4. What is the order of structures in the costal groove?

? From above downward: **Vein – Artery – Nerve (V-A-N).**

5. What is the nerve supply of intercostal muscles?

? All intercostal muscles are supplied by the **intercostal nerves (T1–T11).**

? The **subcostal nerve (T12)** supplies the area below the 12th rib.

6. What are the actions of intercostal muscles?

? **External intercostals:** Elevate ribs ? inspiration.

? **Internal and innermost intercostals:** Depress ribs ? expiration.

7. What are the branches of an intercostal nerve?

? Rami communicantes, collateral branch, lateral cutaneous branch, anterior cutaneous branch, muscular branches, pleural and peritoneal branches.

8. What is the difference between typical and atypical intercostal nerves?

? **Typical (T3–T6):** confined to thoracic wall.

? **Atypical:**

- **T1:** joins brachial plexus.
- **T2:** gives intercostobrachial nerve.
- **T7–T11:** supply anterior abdominal wall.

9. What are the sources of blood supply to intercostal spaces?

? **Posterior intercostal arteries** (from thoracic aorta) and **anterior intercostal arteries** (from internal thoracic and musculophrenic arteries).

10. Where does the internal thoracic artery terminate?

? At the **6th intercostal space**, dividing into **superior epigastric** and **musculophrenic arteries**.

11. Into which veins do the intercostal veins drain?

? **Right side:** Azygos vein.

? **Left side:** Accessory hemiazygos, hemiazygos, and superior intercostal veins.

? **Anteriorly:** Into internal thoracic and musculophrenic veins.

12. What is the lymphatic drainage of the intercostal spaces?

?

- **Anterior part:** Parasternal (internal mammary) nodes.
- **Posterior part:** Posterior intercostal nodes ? Thoracic duct.

13. What are the branches of the internal thoracic artery?

? Pericardiophrenic, mediastinal, anterior intercostal, perforating branches, superior epigastric, and musculophrenic arteries.

14. What are the tributaries of the azygos vein?

? Right posterior intercostal veins (5th–11th), right superior intercostal vein, hemiazygos and accessory hemiazygos veins, oesophageal and mediastinal veins.

15. What are the components of the sympathetic trunk in the thorax?

? 11 sympathetic ganglia on each side, grey and white rami communicantes, and visceral branches forming **splanchnic nerves** (greater, lesser, least).

16. What are the greater, lesser, and least splanchnic nerves?

?

- **Greater:** T5–T9

- **Lesser:** T10–T11

- **Least:** T12

? They carry preganglionic sympathetic fibres to abdominal ganglia.

17. Why is the azygos system clinically important?

? It forms a **collateral pathway** between the **superior and inferior vena cava**, maintaining venous return if either is obstructed.

18. What is the significance of the internal thoracic artery in surgery?

? Commonly used in **coronary artery bypass graft (CABG)** due to its resistance to atherosclerosis and reliable blood flow.

19. What is the clinical significance of intercostal nerve arrangement?

? During **thoracocentesis** or **chest tube insertion**, the needle must be introduced **just above the upper border of a rib** to avoid damaging the neurovascular bundle.

20. Which conditions are associated with thoracic sympathetic trunk lesions?

? Lesion of upper thoracic ganglia (T1) can cause **Horner's syndrome**—ptosis, miosis, and anhidrosis on the same side.

Multiple Choice Questions — Walls of Thorax

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1. In the costal groove of a rib, the structures from above downwards are:

- a) Nerve, artery, vein
- b) Artery, vein, nerve
- c) Vein, artery, nerve
- d) Vein, nerve, artery

Answer: c) Vein, artery, nerve

2. The intercostal nerves are:

- a) Anterior primary rami of thoracic spinal nerves
- b) Posterior primary rami of thoracic spinal nerves
- c) Branches of sympathetic chain
- d) Branches of vagus nerve

Answer: a) Anterior primary rami of thoracic spinal nerves

3. The first intercostal nerve:

- a) Supplies the skin of the chest wall
- b) Joins the brachial plexus
- c) Gives rise to intercostobrachial nerve
- d) Supplies serratus anterior

Answer: b) Joins the brachial plexus

4. The intercostobrachial nerve is derived from:

- a) 1st intercostal nerve
- b) 2nd intercostal nerve
- c) 3rd intercostal nerve
- d) 4th intercostal nerve

Answer: b) 2nd intercostal nerve

5. Posterior intercostal arteries of the lower nine spaces arise from:

- a) Internal thoracic artery
- b) Thoracic aorta
- c) Musculophrenic artery
- d) Costocervical trunk

Answer: b) Thoracic aorta

6. Anterior intercostal arteries for upper six spaces arise from:

- a) Musculophrenic artery
- b) Internal thoracic artery
- c) Thoracic aorta
- d) Superior intercostal artery

Answer: b) Internal thoracic artery

7. Internal thoracic artery is a branch of:

- a) Thyrocervical trunk
- b) Costocervical trunk
- c) Subclavian artery
- d) Axillary artery

Answer: c) Subclavian artery

8. Internal thoracic artery terminates in:

- a) 4th intercostal space
- b) 5th intercostal space
- c) 6th intercostal space
- d) 7th intercostal space

Answer: c) 6th intercostal space

9. The azygos vein opens into the:

- a) Right atrium
- b) Superior vena cava
- c) Inferior vena cava
- d) Right brachiocephalic vein

Answer: b) Superior vena cava

10. Hemiazygos vein drains into:

- a) Azygos vein
- b) Inferior vena cava
- c) Superior vena cava
- d) Left brachiocephalic vein

Answer: a) Azygos vein

11. Accessory hemiazygos vein drains:

- a) Lower left posterior intercostal veins
- b) Upper left posterior intercostal veins
- c) Right posterior intercostal veins
- d) Anterior intercostal veins

Answer: b) Upper left posterior intercostal veins

12. The sympathetic trunk lies:

- a) Behind heads of ribs
- b) Anterior to necks of ribs
- c) On the bodies of vertebrae
- d) In the midaxillary line

Answer: b) Anterior to necks of ribs

13. Greater splanchnic nerve arises from:

- a) T1–T4
- b) T2–T5
- c) T5–T9
- d) T10–T12

Answer: c) T5–T9

14. Least splanchnic nerve arises from:

- a) T5
- b) T10
- c) T11
- d) T12

Answer:

d)

15. During thoracocentesis, the needle is inserted:

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

Answer: b) Above the upper border of rib

16. In intercostal neuralgia, pain follows:

- a) Muscle plane
- b) Vascular territory
- c) Nerve dermatome
- d) Lymphatic drainage

Answer: c) Nerve dermatome

17. Internal thoracic artery is clinically important because:

- a) It supplies the lungs
- b) It is used in coronary bypass graft
- c) It drains into azygos vein
- d) It supplies abdominal muscles

Answer: b) It is used in coronary bypass graft

18. The thoracic duct lies:

- a) To the left of azygos vein and behind oesophagus
- b) To the right of azygos vein and in front of aorta
- c) Between aorta and azygos vein
- d) Behind vertebral column in midline

Answer: c) Between aorta and azygos vein

19. The sympathetic trunk gives rise to:

- a) Cardiac and pulmonary branches
- b) Greater, lesser and least splanchnic nerves
- c) Grey and white rami communicantes

d) All of the above

Answer: d) All of the above

20. The azygos system serves as:

- a) A collateral pathway between SVC and IVC
- b) A venous drainage of pericardium only
- c) A lymphatic channel
- d) A branch of the aorta

Answer: a) A collateral pathway between SVC and IVC

ChatGPT said:

Viva Voce — Walls of Thorax

Q1. What is the extent of the thoracic wall?

? It extends from the root of the neck above to the diaphragm below and from the sternum in front to the vertebral column behind.

Q2. How many intercostal spaces are present in the thorax?

? Eleven on each side, plus one subcostal space below the 12th rib.

Q3. What are the muscles present in an intercostal space?

? External intercostal, internal intercostal, and innermost intercostal muscles.

Q4. What is the arrangement of intercostal vessels and nerve in the costal groove?

? From above downward: **Vein – Artery – Nerve (V-A-N)**.

Q5. Between which muscles does the intercostal neurovascular bundle lie?

? Between the **internal intercostal** and **innermost intercostal** muscles (in the neurovascular plane).

Q6. What is the nerve supply of intercostal muscles?

? Intercostal nerves (anterior primary rami of thoracic spinal nerves T1–T11).

Q7. What is the action of intercostal muscles?

?

- **External intercostals:** Elevate ribs (inspiration).
- **Internal and innermost intercostals:** Depress ribs (expiration).

Q8. What are the branches of a typical intercostal nerve?

? Rami communicantes, collateral branch, lateral cutaneous branch, anterior cutaneous branch, muscular branches, and pleural/peritoneal branches.

Q9. What is the origin of posterior intercostal arteries?

? From the **thoracic aorta**, except the first two (from the **superior intercostal artery** of costocervical trunk).

Q10. From where do the anterior intercostal arteries arise?

? From the **internal thoracic artery** (upper six spaces) and **musculophrenic artery** (lower spaces).

Q11. What is the termination of the internal thoracic artery?

? At the **6th intercostal space**, dividing into the **superior epigastric** and **musculophrenic arteries**.

Q12. Where does the azygos vein open?

? Into the **superior vena cava** after arching over the right lung root.

Q13. What is the function of the azygos system of veins?

? Provides a **collateral venous pathway** between the **superior and inferior vena cava**.

Q14. What are the tributaries of the azygos vein?

? Right posterior intercostal veins, hemiazygos vein, accessory hemiazygos vein, oesophageal, mediastinal, and pericardial veins.

Q15. What is the course of the hemiazygos vein?

? Ascends on the **left side of the vertebral column** and crosses to the **right side at T8** to join the **azygos vein**.

Q16. What is the accessory hemiazygos vein?

? A vein draining the **upper left posterior intercostal veins (5th–8th)**, crossing to join the **azygos vein** near T8.

Q17. What is the lymphatic drainage of intercostal spaces?

?

- **Anterior part:** Parasternal (internal mammary) nodes.
- **Posterior part:** Posterior intercostal nodes ? Thoracic duct or bronchomediastinal trunk.

Q18. What is the extent of the thoracic sympathetic trunk?

? From the **neck of the 1st rib** to the **body of the 12th thoracic vertebra**, continuous above with the **cervical** and below with the **lumbar** parts.

Q19. How many ganglia are present in the thoracic sympathetic trunk?

? Usually **11 ganglia**, corresponding to the **T1–T12 spinal nerves** (the first often fused with the inferior cervical ganglion).

Q20. What are the splanchnic nerves and their origins?

?

- **Greater splanchnic nerve:** T5–T9
- **Lesser splanchnic nerve:** T10–T11

- Least splanchnic nerve: T12

Q21. What is Horner's syndrome and its cause?

? Caused by lesion of **T1 sympathetic ganglion or trunk** ? produces **ptosis, miosis, and anhidrosis** on the affected side.

Q22. What is the clinical importance of the internal thoracic artery?

? Commonly used in **coronary artery bypass graft (CABG)**; must be preserved during chest wall surgery.

Q23. During thoracocentesis, why is the needle inserted above the upper border of a rib?

? To avoid injury to the **intercostal vein, artery, and nerve** that lie in the **costal groove** on the lower border of the rib.

Q24. What is intercostal neuralgia?

? Pain radiating along the course of an **intercostal nerve** due to its inflammation, compression, or irritation.

Q25. What is herpes zoster (shingles)?

? A **viral infection** (reactivation of varicella-zoster virus) affecting the **dorsal root ganglion**, causing a painful rash along a thoracic dermatome.