

# Frequently Asked Questions, MCQs, Viva Voce

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## Frequently Asked Questions — Walls of Thorax

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### 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.

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### 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.

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

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

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

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

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### 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.

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### 6. What are the actions of intercostal muscles?

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

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

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### 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.

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## 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.
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## 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).

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## 10. Where does the internal thoracic artery terminate?

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

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## 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.

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

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- **Anterior part:** Parasternal (internal mammary) nodes.
  - **Posterior part:** Posterior intercostal nodes ? Thoracic duct.
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## 13. What are the branches of the internal thoracic artery?

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

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#### 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.

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#### 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).

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

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- **Greater:** T5–T9

- **Lesser:** T10–T11

- **Least:** T12

? They carry preganglionic sympathetic fibres to abdominal ganglia.

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#### 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.

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#### 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.

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#### 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.

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#### 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.

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## 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

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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

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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

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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

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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

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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

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7. Internal thoracic artery is a branch of:

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

**Answer:** c) Subclavian artery

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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

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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

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**10.** Hemiazygos vein drains into:

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

**Answer:** a) Azygos vein

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**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

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**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

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**13.** Greater splanchnic nerve arises from:

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

**Answer:** c) T5–T9

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**14.** Least splanchnic nerve arises from:

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

**Answer:**

d)

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**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

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**16.** In intercostal neuralgia, pain follows:

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

**Answer:** c) Nerve dermatome

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**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

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**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

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**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

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**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**

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**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.

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

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

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

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

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

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

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

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

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**Q6. What is the nerve supply of intercostal muscles?**

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

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**Q7. What is the action of intercostal muscles?**

?

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

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**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).

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**Q10. From where do the anterior intercostal arteries arise?**

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

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

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

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**Q12. Where does the azygos vein open?**

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

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

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

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**Q14. What are the tributaries of the azygos vein?**

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

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**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**.

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**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.

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**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.
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**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.

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**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).

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**Q20. What are the splanchnic nerves and their origins?**

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- **Greater splanchnic nerve:** T5–T9
  - **Lesser splanchnic nerve:** T10–T11
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- **Least splanchnic nerve: T12**
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**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.

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**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.

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**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.

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**Q24. What is intercostal neuralgia?**

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

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**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.

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