

Clinical Anatomy of Mediastinum and Mnemonics

Clinical Anatomy — Mediastinum

1. Mediastinal Widening

- Seen on **chest X-ray or CT** when the mediastinum appears broader than normal.
 - **Causes:**
 - **Aortic aneurysm** (especially of the arch).
 - **Lymphadenopathy** (tuberculosis, lymphoma, metastasis).
 - **Mediastinal tumors** (thymoma, teratoma, thyroid mass).
 - **Hemorrhage or trauma.**
 - Important because it may **compress trachea, esophagus, or great veins**, causing **dyspnea, dysphagia, and venous congestion.**
-

2. Mediastinal Shift

- Displacement of mediastinal structures toward or away from one lung.
- **Shift toward one side:** due to **lung collapse (atelectasis)** or **fibrosis** pulling the mediastinum.

- **Shift away from one side:** due to **pleural effusion, pneumothorax, or large mass** pushing it.
 - **Clinical sign:** displacement of **trachea and apex beat**.
-

3. Superior Vena Cava (SVC) Obstruction

- Usually caused by **bronchogenic carcinoma** or **mediastinal lymph node enlargement**.
 - Results in **distension of veins of face, neck, and upper limb** with **facial swelling and cyanosis**.
 - Collateral venous channels (azygos system, internal thoracic, and vertebral veins) enlarge to bypass obstruction.
-

4. Aortic Aneurysm

- **Aneurysmal dilation** of the **arch or descending aorta** may compress surrounding structures:
 - **Trachea** ? Cough and dyspnea
 - **Esophagus** ? Dysphagia
 - **Recurrent laryngeal nerve** ? Hoarseness of voice
 - **Sympathetic trunk** ? Horner's syndrome
 - May present as **mediastinal widening** on radiograph or **pulsatile mass** in the chest.
-

5. Mediastinitis

- **Infection or inflammation** of mediastinal connective tissue, often from **esophageal perforation**, **tracheostomy**, or **cardiac surgery**.
 - Causes severe **chest pain, fever, and respiratory distress**.
 - Can spread rapidly due to the **loose areolar tissue** of the mediastinum.
-

6. Mediastinal Emphysema

- Presence of **air in the mediastinum**, usually due to **alveolar rupture**, **tracheobronchial tear**, or **esophageal perforation**.
 - Air may spread to the neck and face causing **subcutaneous emphysema** (crackling on palpation).
 - Seen on radiographs as streaks of radiolucency in the mediastinum.
-

7. Mediastinal Tumors

- Tumors may arise from any mediastinal structure:
 - **Anterior mediastinum:** thymoma, teratoma, thyroid mass, lymphoma.
 - **Middle mediastinum:** pericardial cyst, enlarged lymph nodes.
 - **Posterior mediastinum:** neurogenic tumors, esophageal masses.
 - Symptoms result from **compression** of trachea, esophagus, or major vessels.
 - **Diagnosis:** CT/MRI or **mediastinoscopy with biopsy**.
-

8. Thymic Enlargement

- Enlargement of **thymus** (thymoma or thymic hyperplasia) may cause:
 - **Pressure on trachea or SVC**, producing cough or venous congestion.
 - Association with **myasthenia gravis** (autoimmune weakness).
-

9. Pericardial Effusion and Cardiac Tamponade

- Accumulation of fluid in the **pericardial cavity** (within middle mediastinum) compresses the heart.
 - Causes **distended neck veins, hypotension, muffled heart sounds** (Beck's triad).
 - Emergency drainage by **pericardiocentesis** is life-saving.
-

10. Esophageal Lesions in Posterior Mediastinum

- **Esophageal carcinoma** may produce **dysphagia** due to encroachment on the lumen and invasion of adjacent structures (trachea, aorta).
 - **Hiatus hernia** and **esophageal varices** also relate to this region.
-

11. Azygos Vein Dilatation

- Enlargement occurs in **SVC obstruction** or **right heart failure** as a collateral drainage route.
 - Visible on X-ray as a **paratracheal shadow** on the right side.
-

12. Chylothorax

- Injury to the **thoracic duct** during surgery or trauma causes leakage of **chyle (lymph rich in fat)** into the pleural cavity.
 - Leads to **milky pleural effusion** requiring drainage.
-

13. Posterior Mediastinal Neurogenic Tumors

- Common in children; arise from **sympathetic ganglia or nerve sheaths**.
 - May cause **back pain, Horner's syndrome, or paraplegia** by spinal compression.
-

14. Diagnostic Mediastinoscopy

- Performed through a small incision above the suprasternal notch to **inspect or biopsy mediastinal lymph nodes or masses**.
 - Helps diagnose **tuberculosis, sarcoidosis, or metastasis**.
-

15. Referred Pain from Mediastinum

- **Pain from pericardium or diaphragmatic pleura** (phrenic nerve) may be referred to the **shoulder tip** (C4 dermatome).
 - **Pain from esophagus or heart** may radiate to **substernal or left arm region**.
-

The mediastinum, though compact, is a **high-risk zone** for **compression syndromes, infections, and tumors**. Its clinical relevance lies in how **pathologies of distinct mediastinal parts** mimic each other through **shared nerve pathways and radiological appearances** —

making thorough anatomical knowledge crucial for accurate diagnosis and management.

Mnemonics — Mediastinum

Mnemonics make the maze-like mediastinum easier to remember. Below are the **simplified and high-yield memory aids** for gross anatomy and clinical recall.

1. Divisions of the Mediastinum

Mnemonic: *"SAMI divides the chest"*

- **S** ? Superior mediastinum
 - **A** ? Anterior mediastinum
 - **M** ? Middle mediastinum
 - **I** ? Inferior mediastinum (posterior part included)
-

2. Boundaries of Mediastinum

Mnemonic: *"SAD PALS"*

- **S** ? Sternum (anterior)
 - **A** ? Aorta and vertebral column (posterior)
 - **D** ? Diaphragm (inferior)
 - **P** ? Pleura (lateral)
 - **A** ? Aperture (thoracic inlet, superior)
-

- **L** ? Lungs (on each side)
 - **S** ? Sternum (repetition helps with orientation in cross sections)
-

3. Superior Mediastinum — Contents (Anterior ? Posterior)

Mnemonic: “*Thymus Veins Arteries Trachea Esophagus Duct Spine*”

? Thymus ? Great Veins ? Arch of Aorta and its branches ? Trachea ? Esophagus ? Thoracic Duct ? Vertebral column.

4. Branches of Arch of Aorta

Mnemonic: “*ABC*”

- **A** ? Arch of Aorta
 - **B** ? Brachiocephalic trunk
 - **C** ? Left Common carotid and Left subclavian arteries
-

5. Relations of Left Recurrent Laryngeal Nerve

Mnemonic: “*ALAS*”

- **A** ? Arch of aorta (nerve hooks under it)
 - **L** ? Ligamentum arteriosum (nerve passes behind it)
 - **A** ? Ascends in tracheoesophageal groove
 - **S** ? Supplies larynx (intrinsic muscles except cricothyroid)
-

6. Contents of Inferior Mediastinum

Mnemonic: *"A Middle Posterior — AMP"*

- **A** ? Anterior mediastinum (Thymus remnants, fat, lymph nodes)
 - **M** ? Middle mediastinum (Heart, pericardium, great vessels)
 - **P** ? Posterior mediastinum (Aorta, Azygos, Thoracic duct, Esophagus, Sympathetic trunks)
-

7. Posterior Mediastinum — Major Contents

Mnemonic: *"DATE VSS"*

- **D** ? Descending aorta
 - **A** ? Azygos and hemiazygos veins
 - **T** ? Thoracic duct
 - **E** ? Esophagus
 - **V** ? Vagus nerves (forming esophageal plexus)
 - **S** ? Sympathetic trunk
 - **S** ? Splanchnic nerves
-

8. Greater, Lesser, and Least Splanchnic Nerves

Mnemonic: *"Great 5-9, Less 10-11, Least 12"*

- **Greater splanchnic** ? T5–T9 ? Celiac ganglion
 - **Lesser splanchnic** ? T10–T11 ? Aorticorenal ganglion
 - **Least splanchnic** ? T12 ? Renal plexus
-

9. Anterior Mediastinal Tumors — The “4 Ts”

Mnemonic: “4 Ts”

- **T**hymoma
 - **T**eratoma
 - **T**hyroid (ectopic or retrosternal goitre)
 - **T**errible lymphoma
-

10. Middle Mediastinal Contents

Mnemonic: “Heart Pumps Vital Power”

- **H** ? Heart and pericardium
 - **P** ? Phrenic nerves with pericardiophrenic vessels
 - **V** ? Great vessels (ascending aorta, pulmonary trunk, SVC, IVC)
 - **P** ? Pulmonary veins and arteries
 - **B** ? Main bronchi (Roots of lungs)
-

11. Superior Vena Cava Obstruction — Collateral Pathways

Mnemonic: “A.I.V.”

- **A** ? Azygos vein
- **I** ? Internal thoracic veins
- **V** ? Vertebral venous plexus

These form alternate routes to drain blood into the **inferior vena cava** when the **SVC** is compressed.

12. Mediastinal Layers (Anterior ? Posterior)

Mnemonic: “*Pretty Tall Attractive Elegant Spine*”

? **P**ericardium ? **T**rachea ? **A**orta ? **E**sophagus ? **S**pine

Helps visualize cross-sectional anatomy on CT or MRI.

13. Structures Passing Through Diaphragm

Mnemonic: “*I Ate 10 Eggs At 12*”

- **I (8)** ? Inferior vena cava (T8)
- **Ate (10)** ? Esophagus (T10)
- **12 (12)** ? Aorta (T12)

These correspond to their vertebral levels and mediastinal associations.

14. Causes of Mediastinal Widening

Mnemonic: “*3 A’s + 3 M’s*”

- Aortic aneurysm
 - Aortic dissection
 - Azygos vein enlargement
 - Mediastinal tumor
 - Metastasis
 - Massive lymphadenopathy
-

15. Mediastinal Pain Radiation

Mnemonic: "*MEDI-ASTINUM*"

- **M** ? Myocardial ischemia
 - **E** ? Esophageal spasm
 - **D** ? Diaphragmatic irritation
 - **I** ? Inflammatory pericarditis
 - All can radiate to **left shoulder, neck, or arm** via **phrenic or sympathetic nerves**.
-

16. Levels of Key Openings in Posterior Mediastinum

Mnemonic: "*VET*"

- **V** ? Vena cava (T8)

- **E** ? Esophagus (T10)
 - **T** ? Thoracic aorta (T12)
-

17. Referred Pain in Mediastinal Disorders

Mnemonic: *"Phrenic feels the Pain"*

? Any inflammation involving **pericardium or diaphragmatic pleura** produces **shoulder pain (C3–C5 dermatomes)** via **phrenic nerve**.

18. Orientation Trick for Mediastinal Imaging

Mnemonic: *"Vessels-Vagus-Vertebra"*

From **front to back** in CT sections — great **vessels**, then **vagus/esophagus**, then **vertebral bodies**.

These mnemonics neatly compress the mediastinum's **complicated anatomy, divisions, and clinical associations** into **memorable cues**, perfect for **viva and rapid recall before exams**.