# Mediastinum

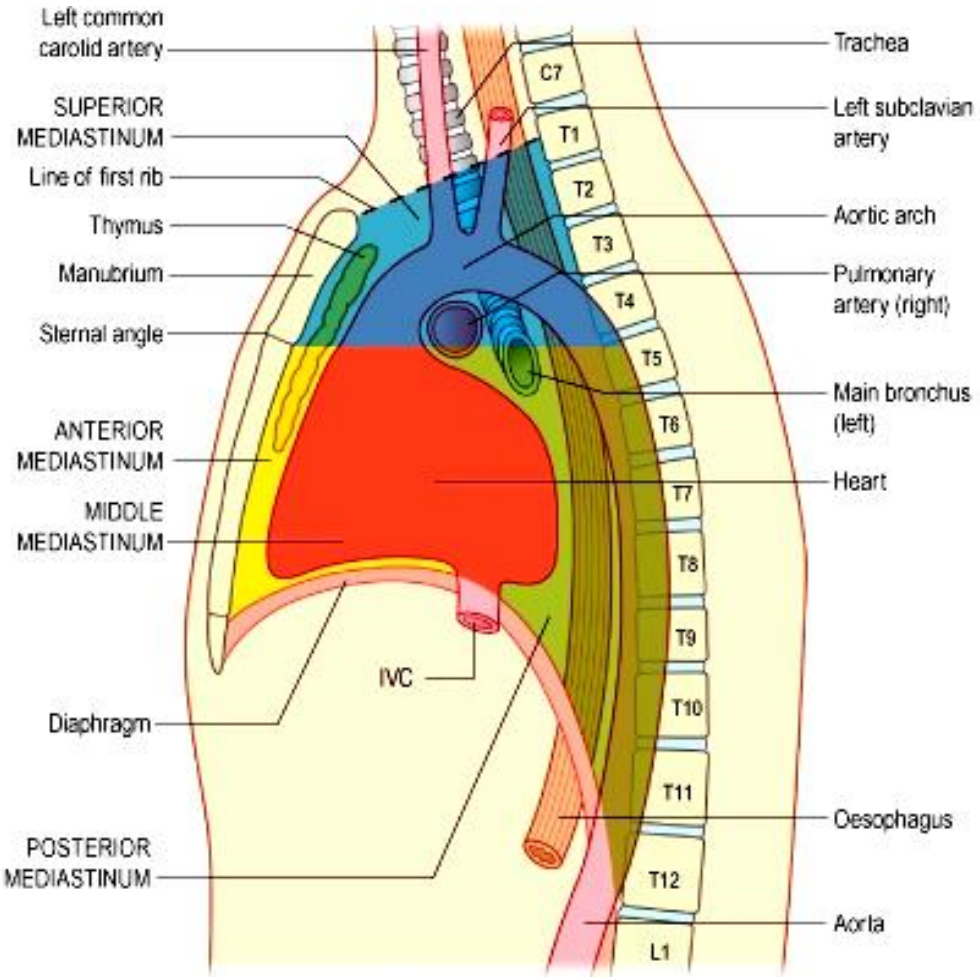
★ **The thoracic cavity is subdivided into:**

**A- Two pleural sacs:** one on each side, invaginated by a **lung**.

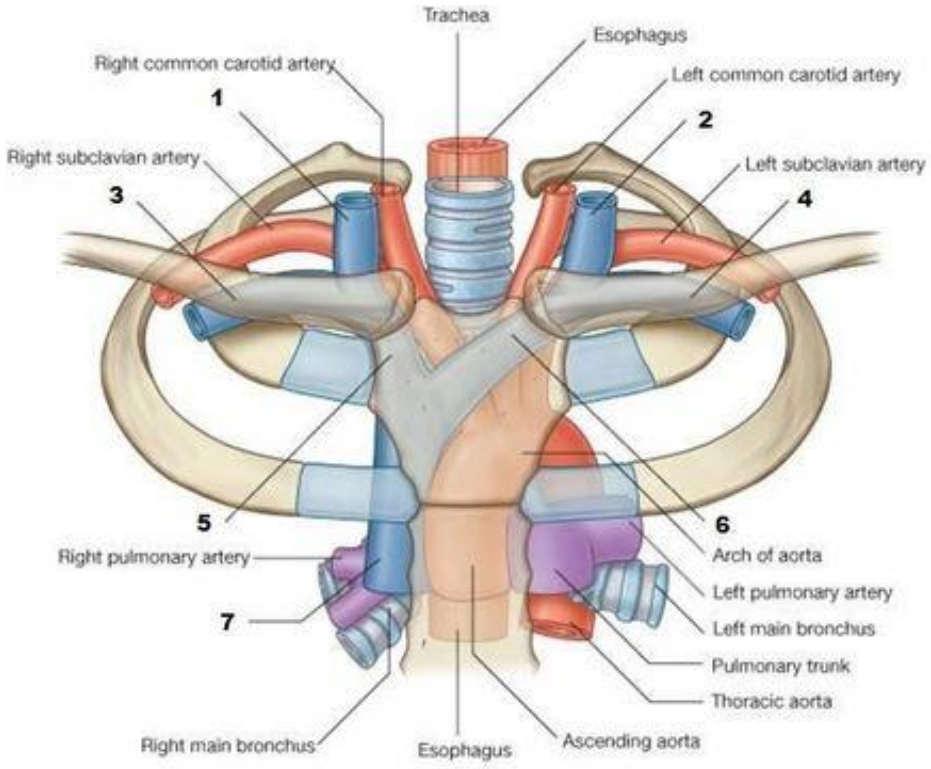
**B- The mediastinum:** a thick median partition between the **2** pleural sacs which extends from the sternum in front to the vertebral column behind and from the thoracic inlet above to the diaphragm below.

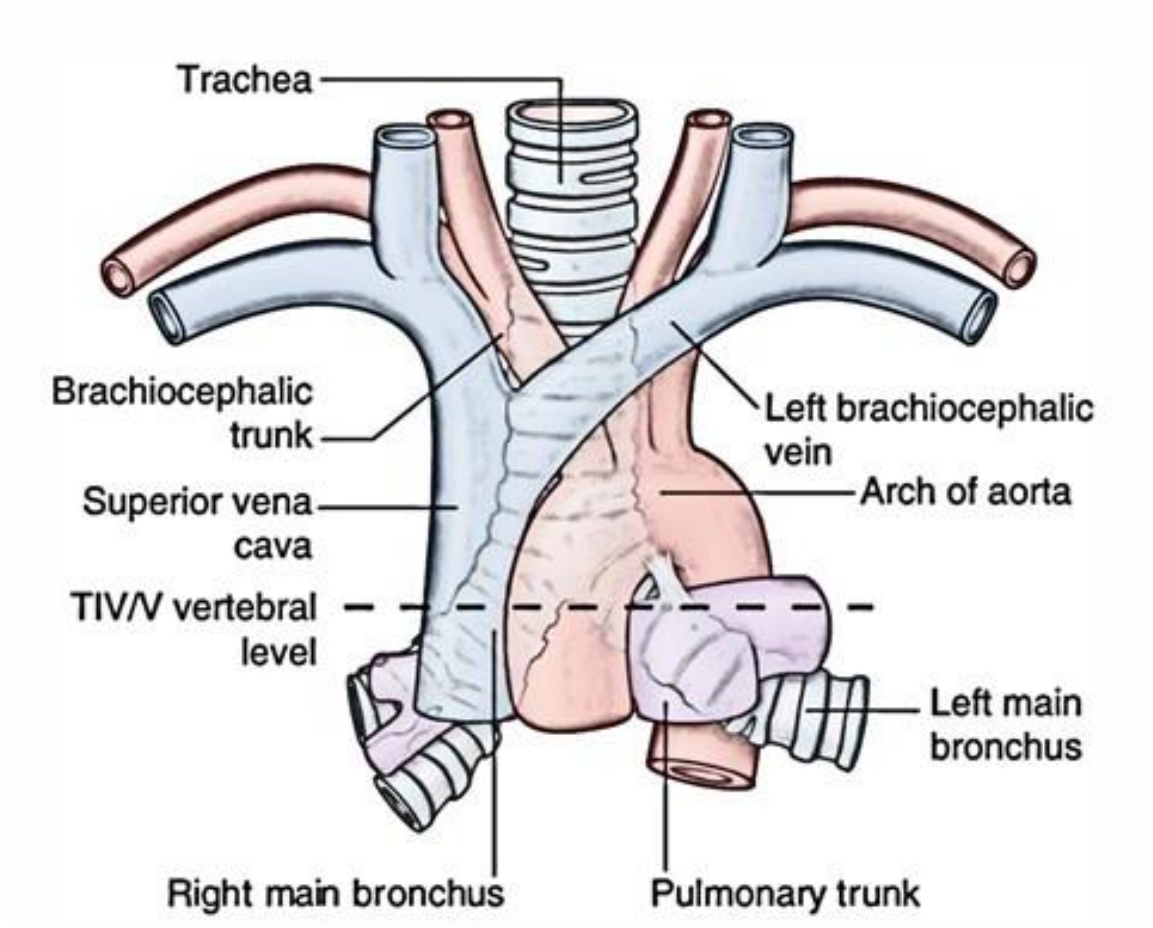
★ **Divisions of the mediastinum:**

❖ The mediastinum is divided by **an imaginary line** passed between the sternal angle of Louis anteriorly and the disc between $T_4$ and $T_5$ vertebrae posteriorly into two main compartments:



## I) Superior mediastinum:



- **Boundaries**
  - **Anterior**: manubrium sterni.
  - **Posterior**: upper 4 thoracic vertebrae.
  - **Superior**: thoracic inlet.
  - **Inferior**: an imaginary line between the angle of Louis and the disc between T4 and T5.
- **Contents:**

**A) Retromanubrial structures: (lymphatic & venous layers)**

- These are structures lies immediately behind the manubrium sterni and arranged **from anterior to posterior as follows:**

1) Remains of **thymus** gland: After puberty it undergoes gradual involution and replaced by fibro-fatty tisuues.
2) **Fat** and anterior mediastinal **lymph nodes**.
3) **Right braciocephalic vein**: descends vertically behind the right margin of the manubrium.
4) **Left braciocephalic vein**: runs obliquely from left to right above the arch of the aorta, crossing the origins of its 3 branches.
5) **Left superior intercostal vein**: ends in the left brachiocephalic vein.
6) Upper ½ of **SVC**: formed by the union of the right and left brachiocephalic veins, descends vertically behind the right margin of the manubrium and its posterior aspect receives the arch of the azygos vein.
7) **Right phrenic nerve** on the right side of right brachio-cephalic vein & superior vena cava.

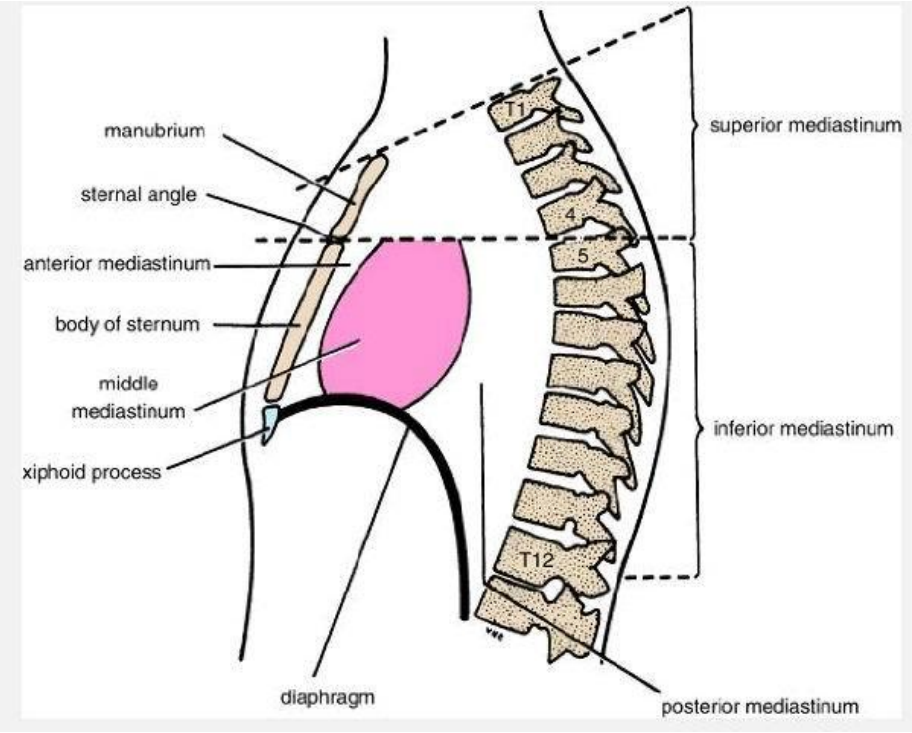
**B) Intermediate structures:( 2 arches & 4 nerves)**

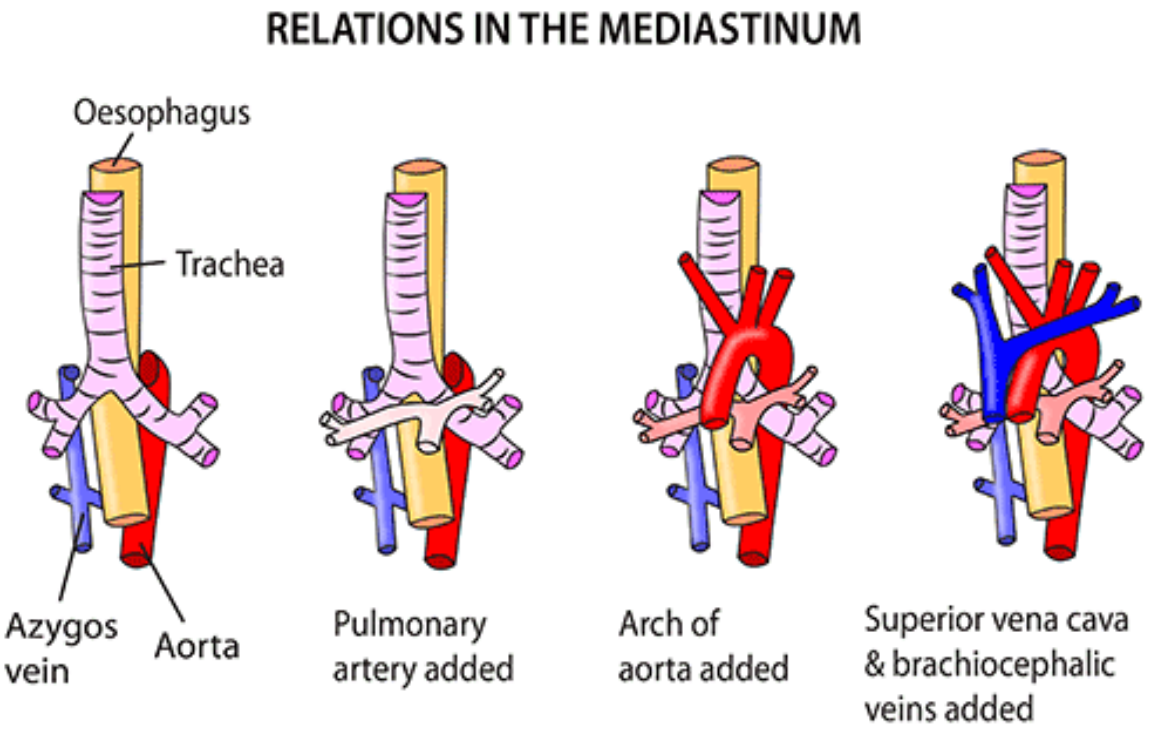
1) **Arterial layer**: **Arch of aorta** and its **3 branches** (brachiocephalic, left common carotid and left subclavian arteries).
2) **Left phrenic & left vagus** nerves: descend between left subclavian and left common carotid arteries then on the left side of aortic arch.
3) **Left recurrent laryngeal nerve:** it arises from the left vagus nerve and curves around the lower aspect of the arch of the aorta.
4) **Superficial cardiac plexus** below arch of aorta.
5) **Arch of azygos**.

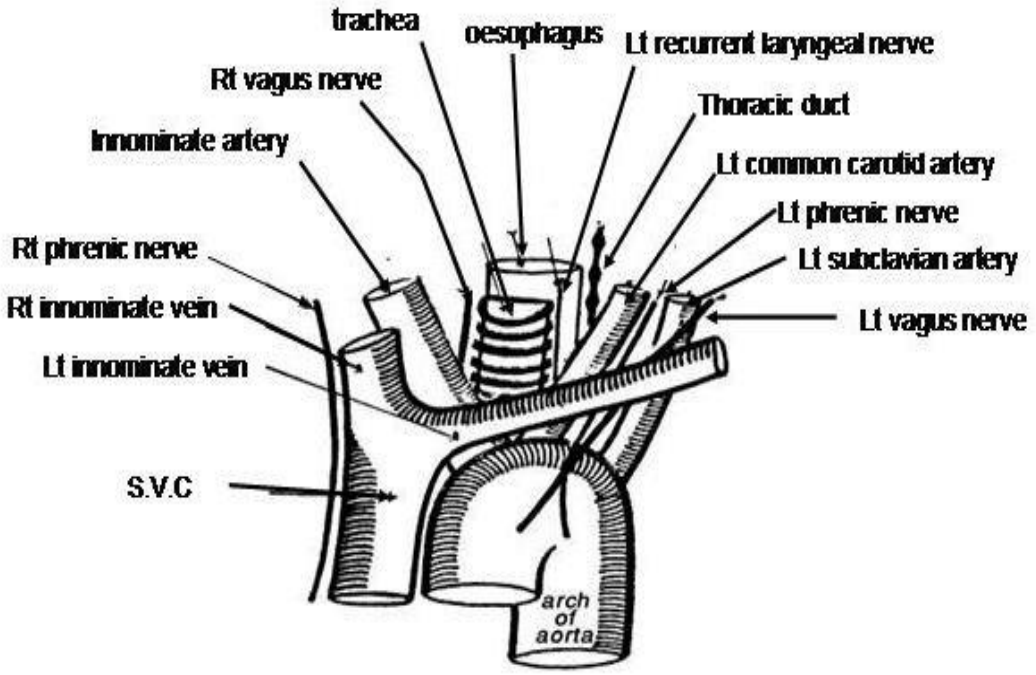
**C) Prevertebral structures**:(3 tubes, 2 nerve)

1) **Trachea** with its **right vagus** on its right side. It descends behind the arch of aorta and its 3 branches.
2) **Oesophagus** : It descends posterior to the trachea .
3) **Thoracic duct**: ascends on the left border of oesophagus .
4) **Left recurrent laryngeal nerve** ascends in between the trachea and oesophagus.

**Divisions of the mediastinum**

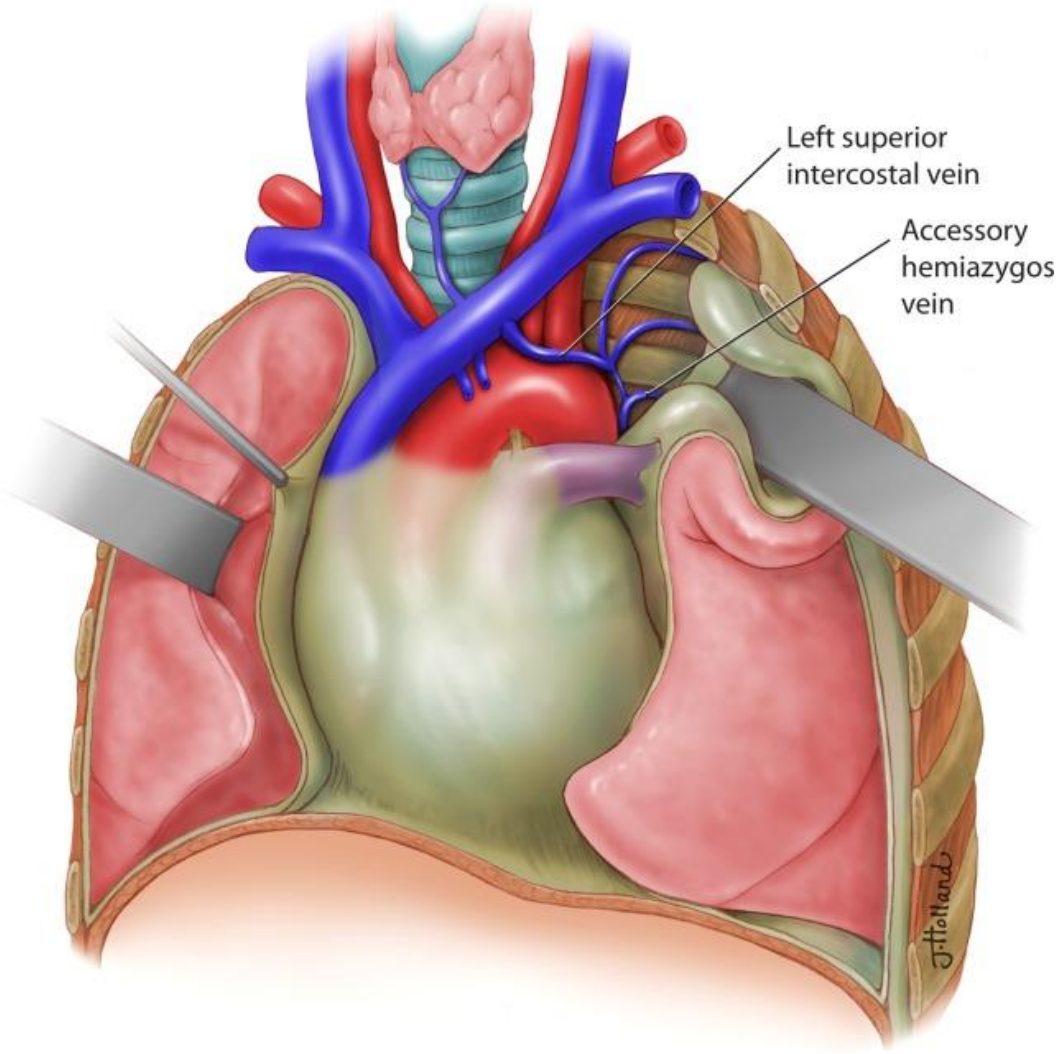





## Contents of the superior mediastinum

★ **Structures of superior mediastinum can be classified from anterior to posterior into fatty lymphatic layer , venous layer , arterial layer , tubular layer.**




## II) Inferior mediastinum:

- **Lies below** a line drawn from the angle of Louis to the disc between T4 and T5 vertebrae.
- It is **divided into**:

### a) Anterior mediastinum:

- It is a narrow space **between** body of **sternum and pericardium**.
- It **contains**: (2 lymphatic tissues & 2 ligaments)
  - Fat, lymph nodes, lower part of thymus gland
  - Superior and inferior sternopericardial ligaments.

### b) Middle mediastinum:

- It lies **between** anterior and posterior mediastinum.

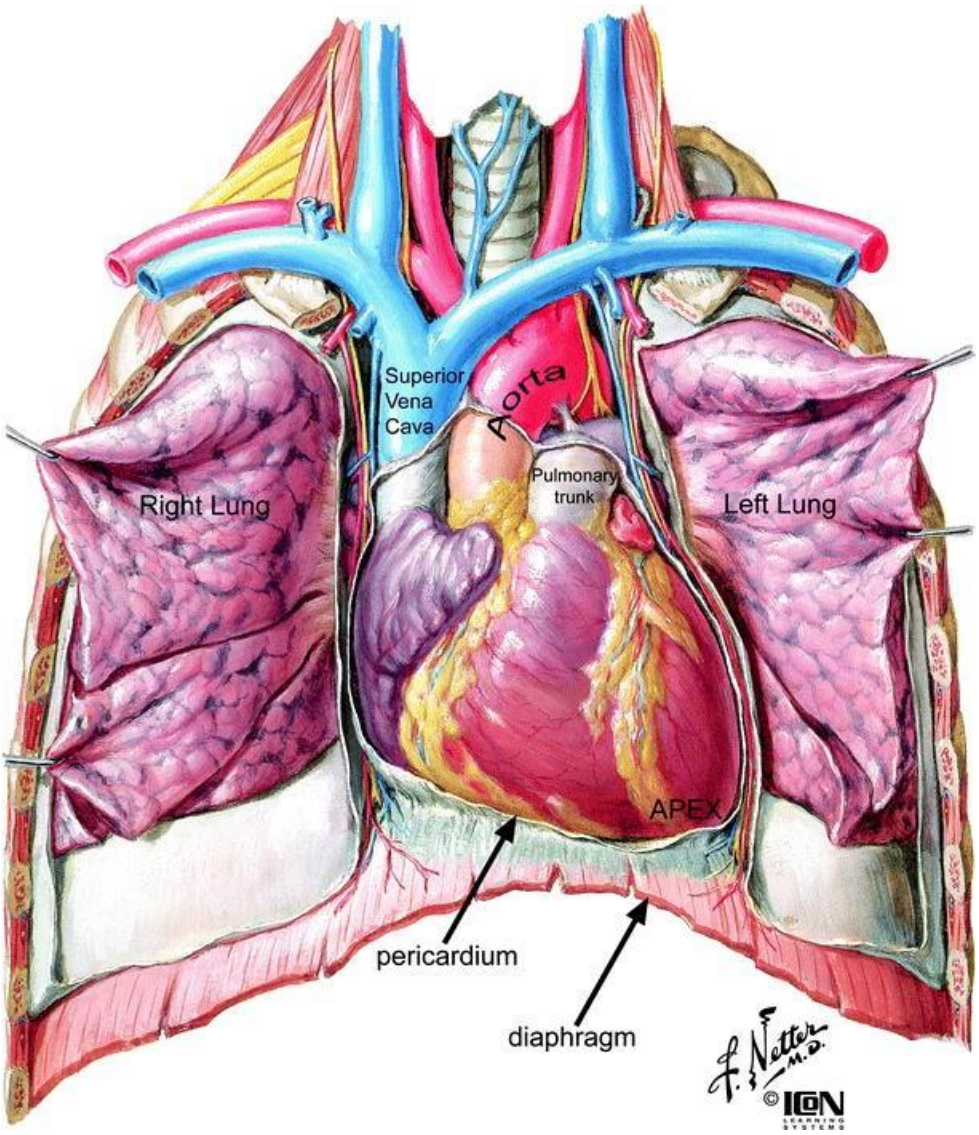
**Mediastinum**

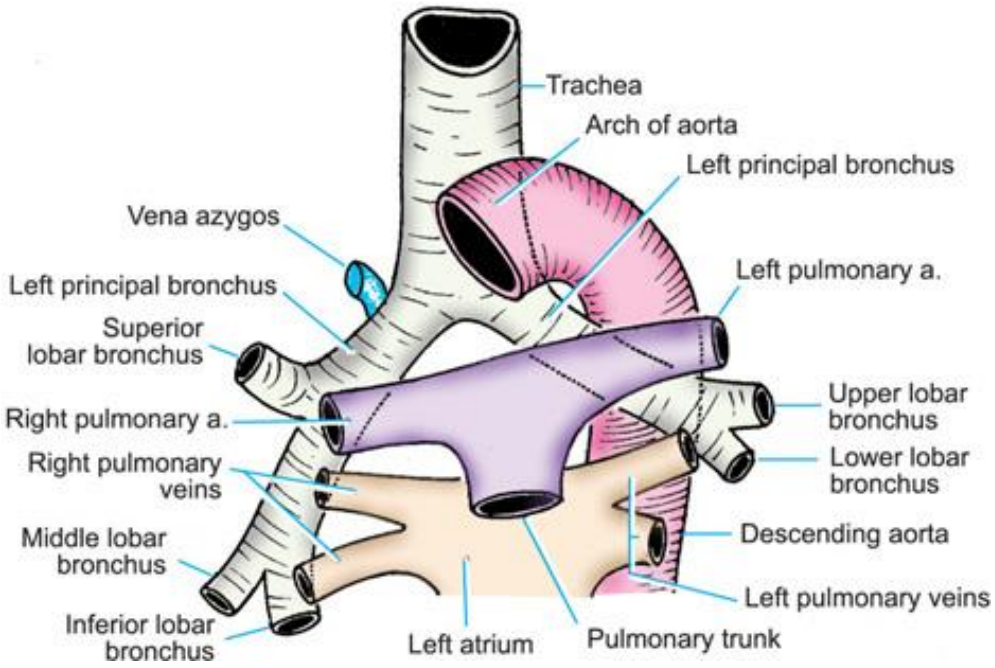
- **Contents:**

1) **Pericardium and structure inside it:** heart, ascending aorta, pulmonary trunk, lower 1/2 of SVC, terminal parts of IVC and 4 pulmonary veins.

2) **Structures outside pericardium:**

- **Bifurcation of trachea** into two bronchi.
- **Deep cardiac plexus** in front of tracheal bifurcation
- Tracheobroncheal **lymph nodes** around tracheal bifurcation.
- **Arteries:** right and left pulmonary arteries.
- **Veins:** 2 right and 2 left pulmonary veins.
- Phrenic nerves & pericardiophrenic vessels on each side of pericardium.



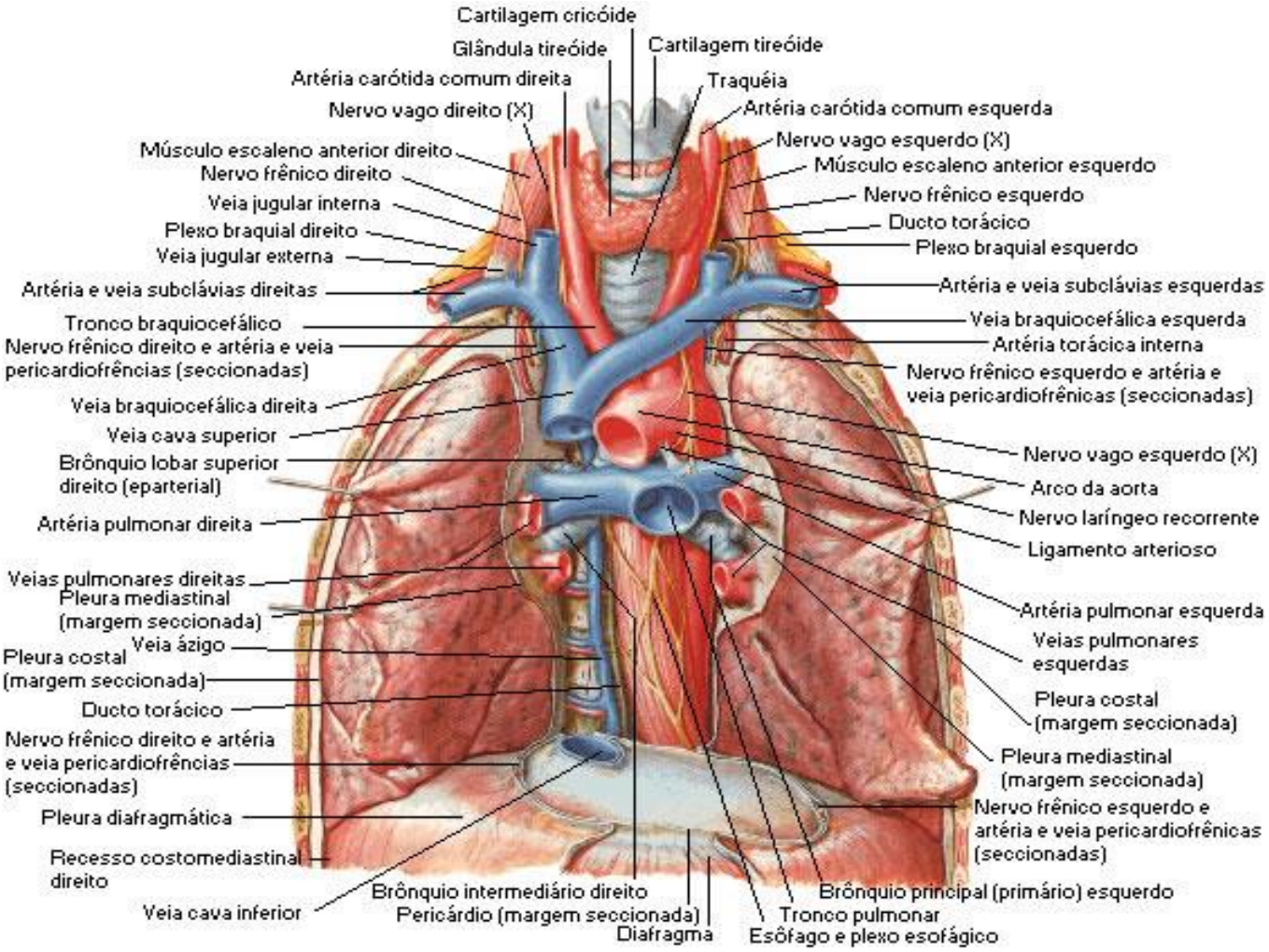



**Middle mediastinum**

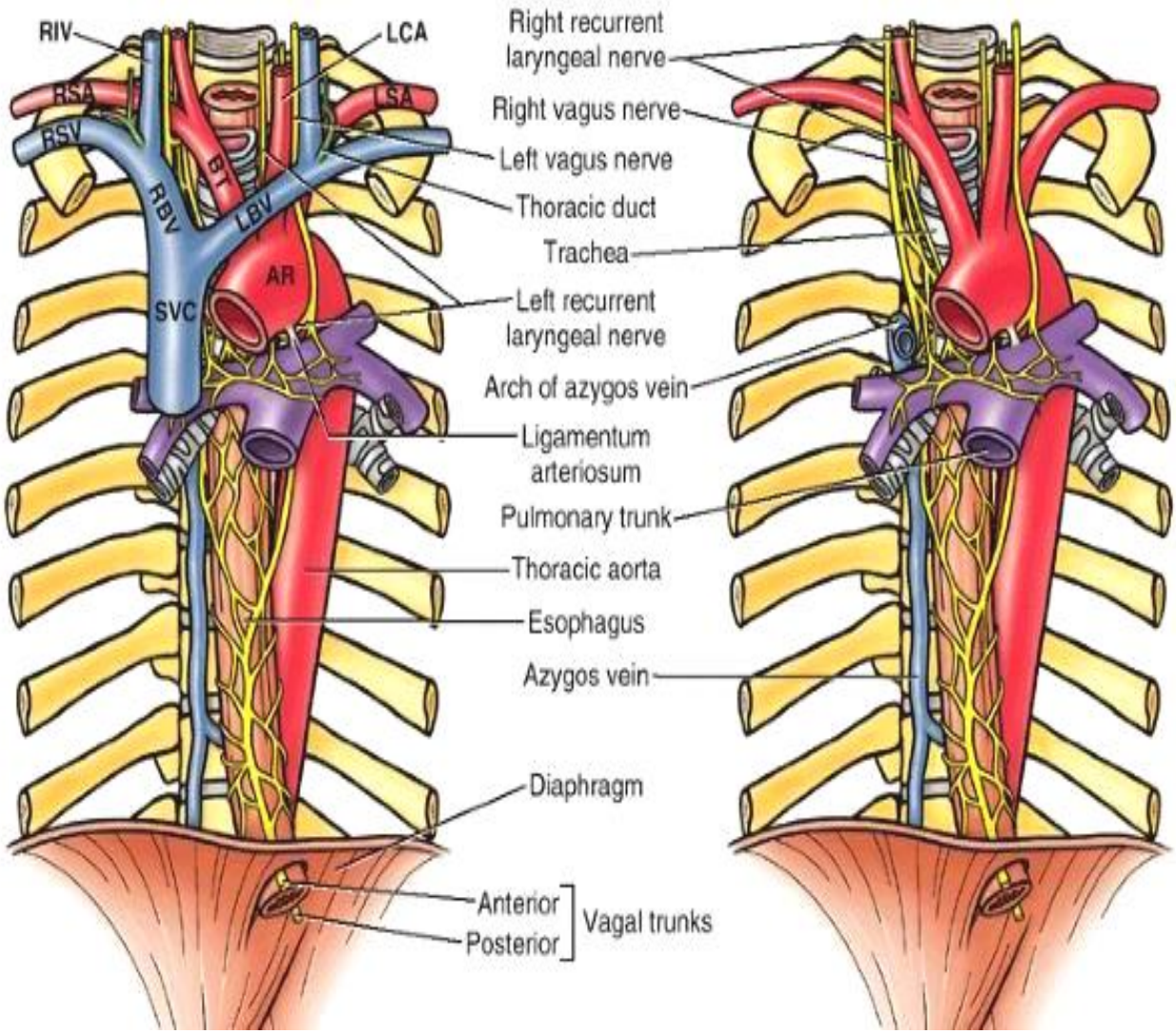
### c) Posterior mediastinum:

- Lies between pericardium and vertical part of diaphragm anteriorly, and lower 8 thoracic vertebrae posteriorly.
- **Contents:**
  1) **Oesophagus**: on right side of descending thoracic aorta till the level of $T_7$ vertebra where it crosses in front of descending thoracic aorta.
  2) **2 vagi** forming oesophageal nerve plexuses .
  3) **Descending thoracic aorta** and its branches:
     - It descends on left side of esophagus till the level of $T_7$ vertebra then crosses behind it).
  4) **Azygos vein and 2 hemiazygos** veins cross from left to right.
  5) **Thoracic duct:** Passes behind the right border of oesophagus till the level of $T_5$ vertebra .
  6) Posterior mediastinal **lymph nodes**.

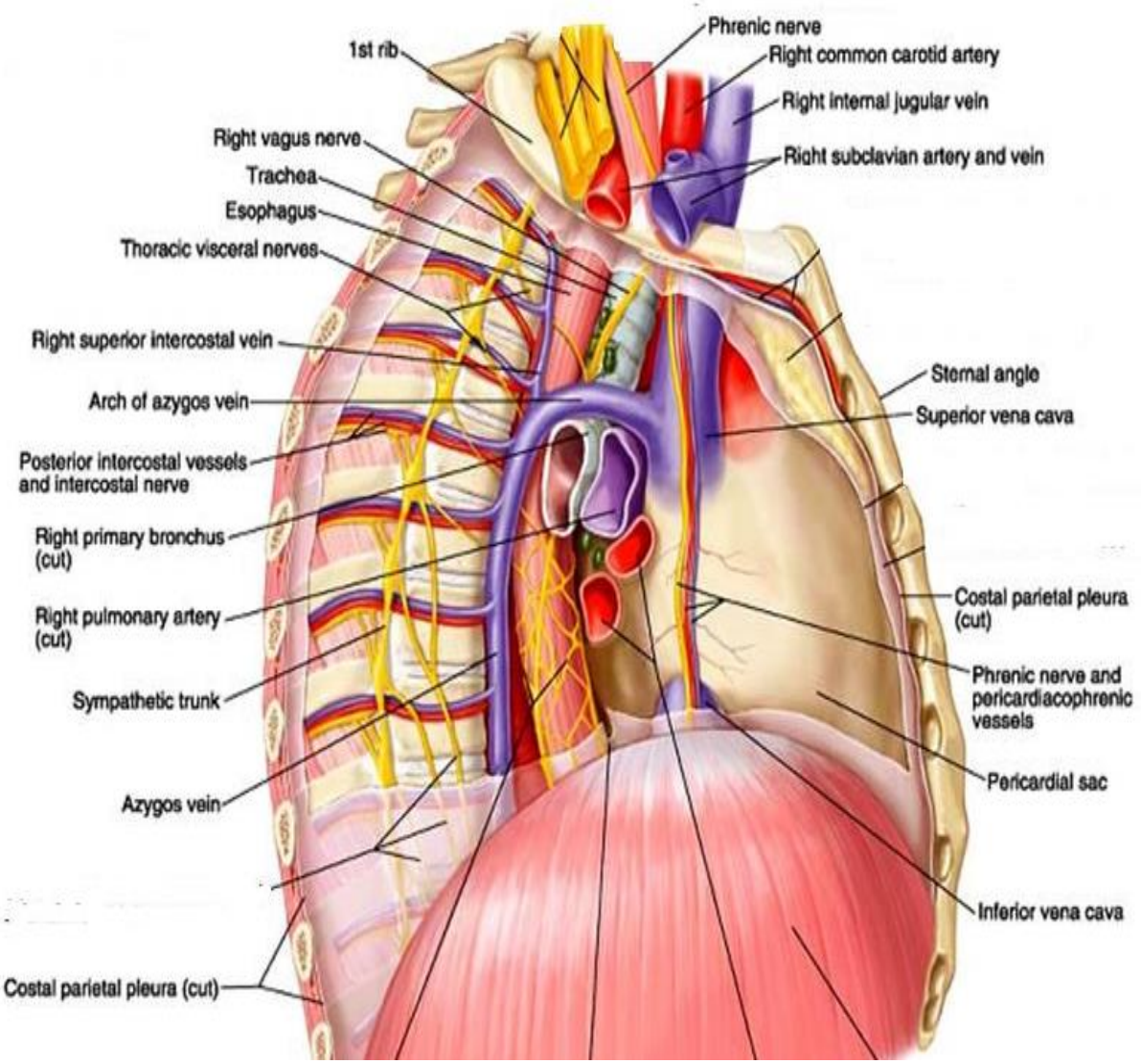
**Mediastinum**



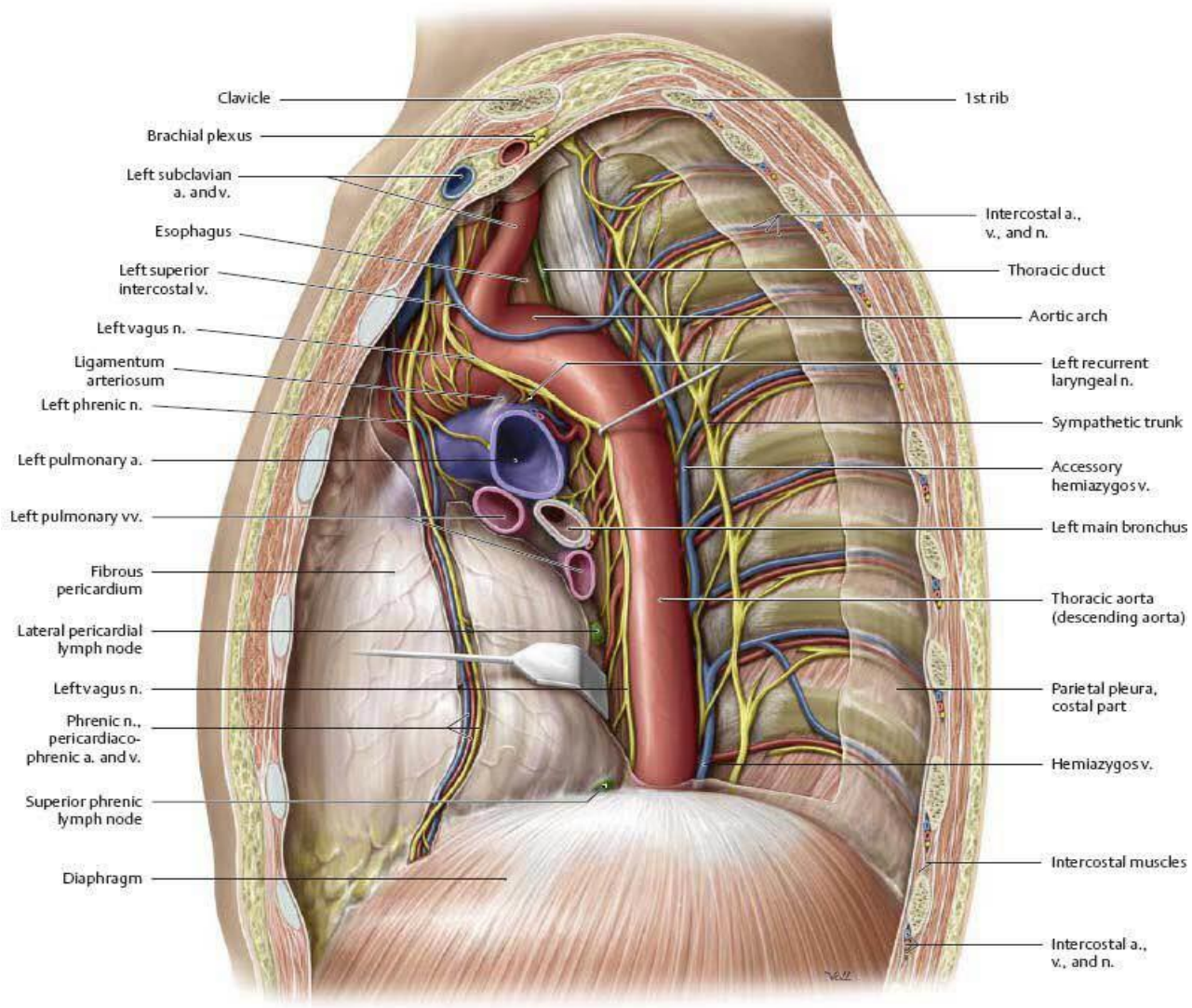

# Posterior mediastinum




## Superior & Posterior mediastinum




# Mediastinum (right lateral view)




**B** Left lateral view, parasagittal section. *Removed:* Left lung and parietal pleura. *Revealed:* Posterior mediastinal structures.

# Mediastinum (left lateral view)

## ★ Applied Anatomy :

1. **Mediastinal syndrome:**
    - Any space occupying lesion in the mediastineum (tumour, lymph nodes enlargement , aneurysm …..etc ) cause compression of mediastinal structures leading to :
        - Compression of superior vena cava and brachiocephalic veins leading to congested oedematous face with congested neck veins.
        - Compression of trachea leading to dyspnea.
        - Compression of esophagus leading to dysphagia.
        - Compression of recurrent laryngeal nerves leading to changes of voice.