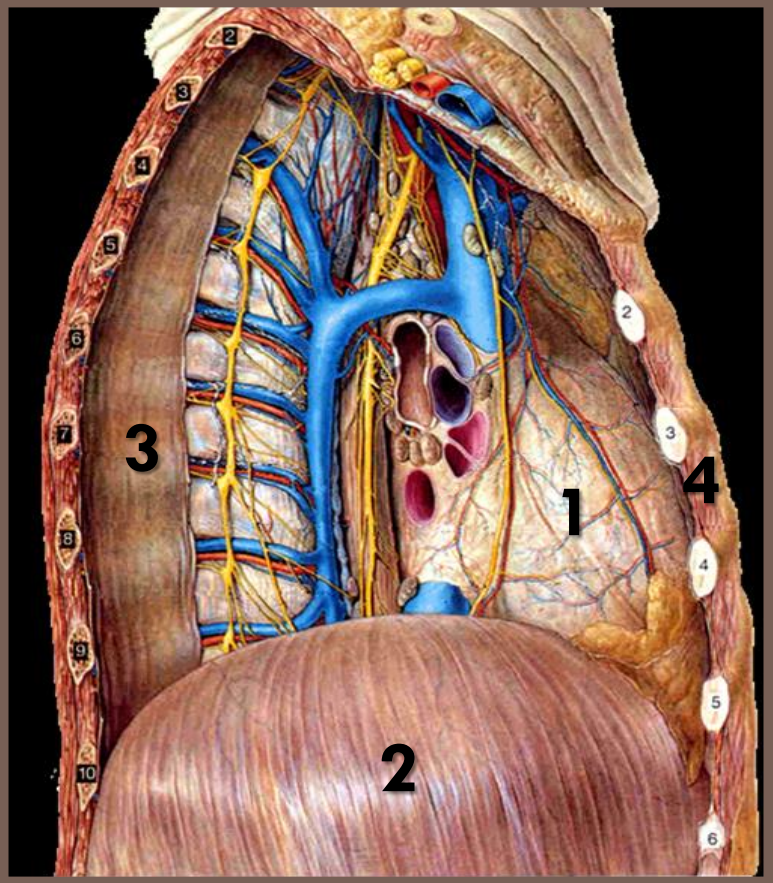
THE MEDIASTINUM



Identify:

1) Heart
2) Diaphragm
3) Thoracic vertebra
4) Sternum

Prof. Ahmed Fathalla Ibrahim

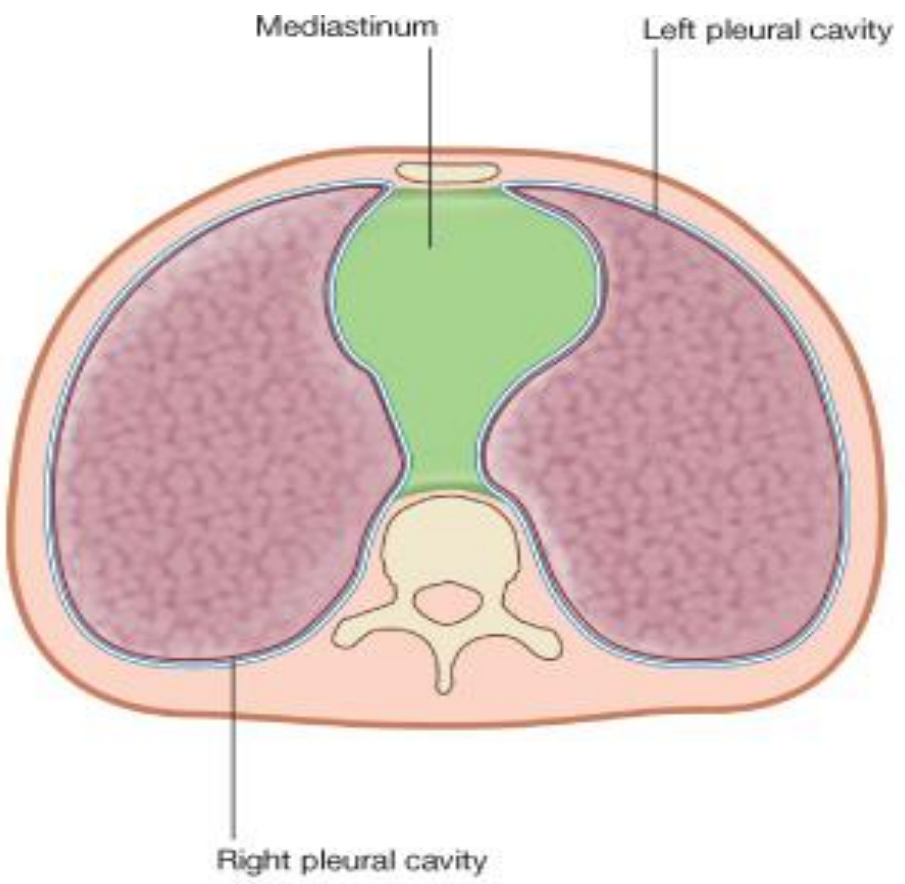
OBJECTIVES

At the end of the lecture, students should be able to:

- Define the ***"Mediastinum".***
- Differentiate between the divisions of the mediastinum.
- List the boundaries and contents of each division.
- Describe the relations between the important structures in each division.

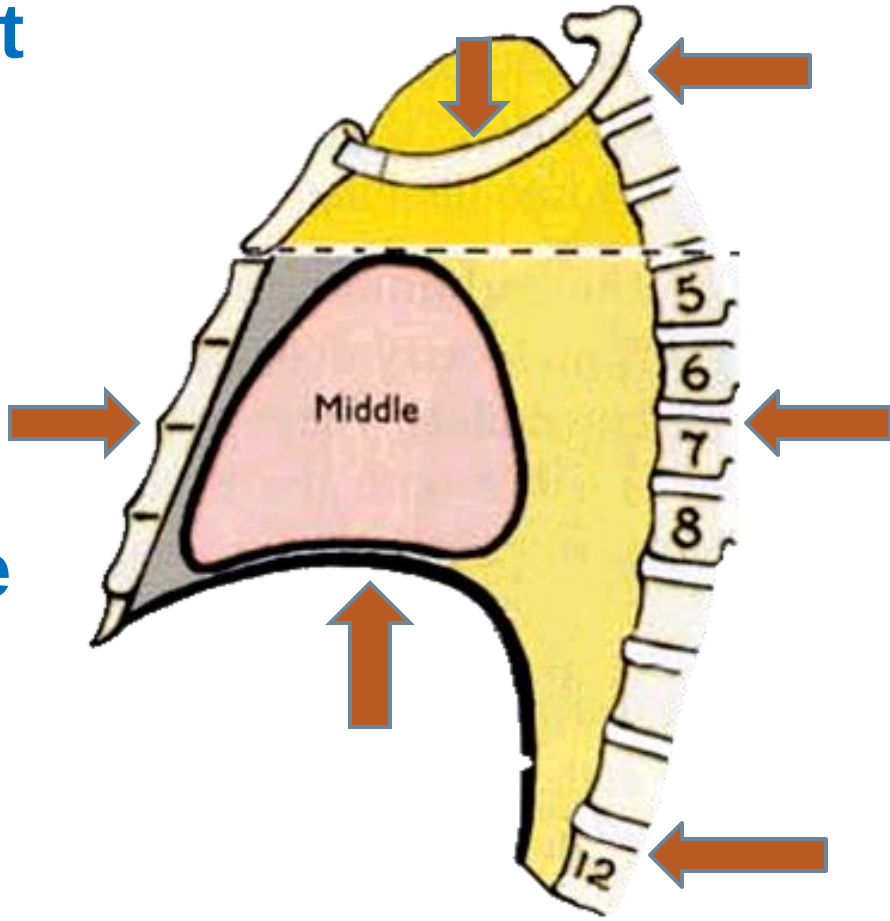
THE MEDIASTINUM

- It is a partition between right & left pleural sacs & lungs.
- It includes all the structures which lie in the intermediate compartments of the thoracic cavity.



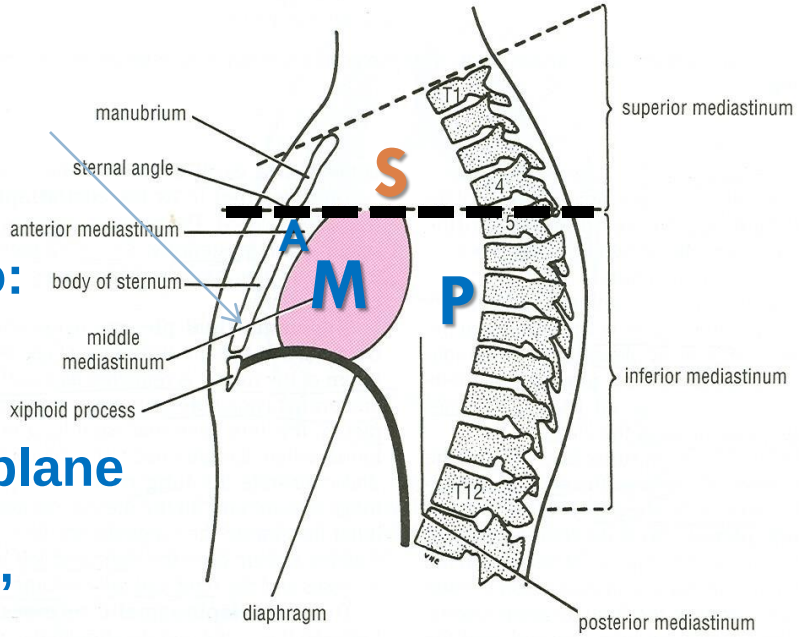
BOUNDARIES OF MEDIASTINUM

- **Superior:** Thoracic outlet
- **Inferior:** Diaphragm
- **Anterior:** Sternum
- **Posterior:** Thoracic vertebrae
- **Lateral:** Lungs & pleurae



DIVISIONS OF THE MEDIASTINUM

It is divided by a **horizontal plane** extending from sternal angle to lower border of 4th thoracic vertebra into:



1. **Superior mediastinum (S):** above the plane
2. **Inferior mediastinum:** below the plane,

Inferior mediastinum is subdivided into:

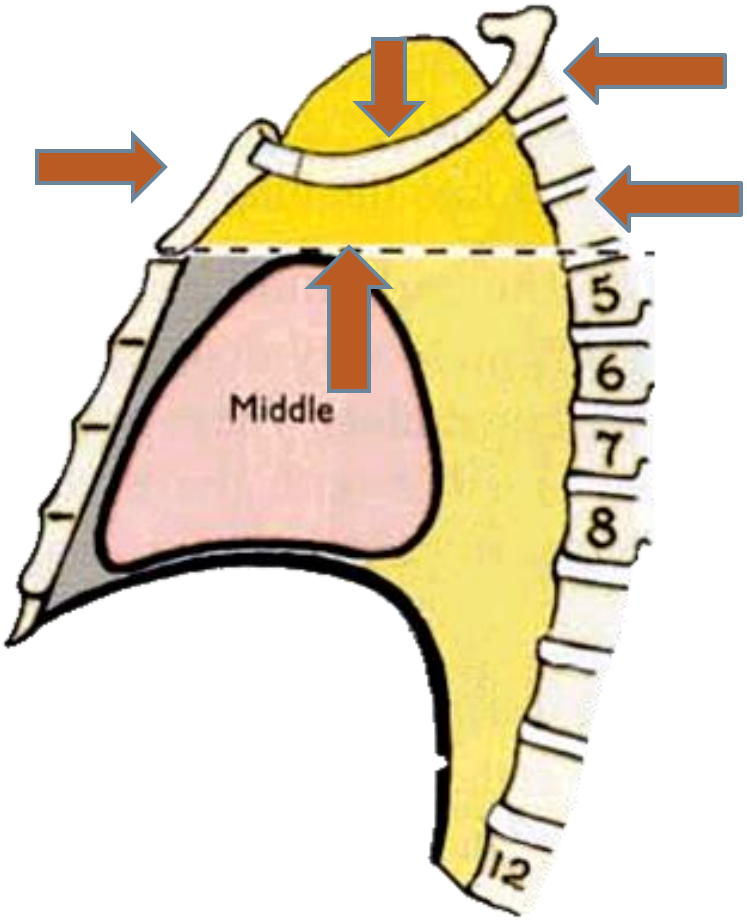
Middle mediastinum (M): contains heart

Anterior mediastinum (A): in front of heart

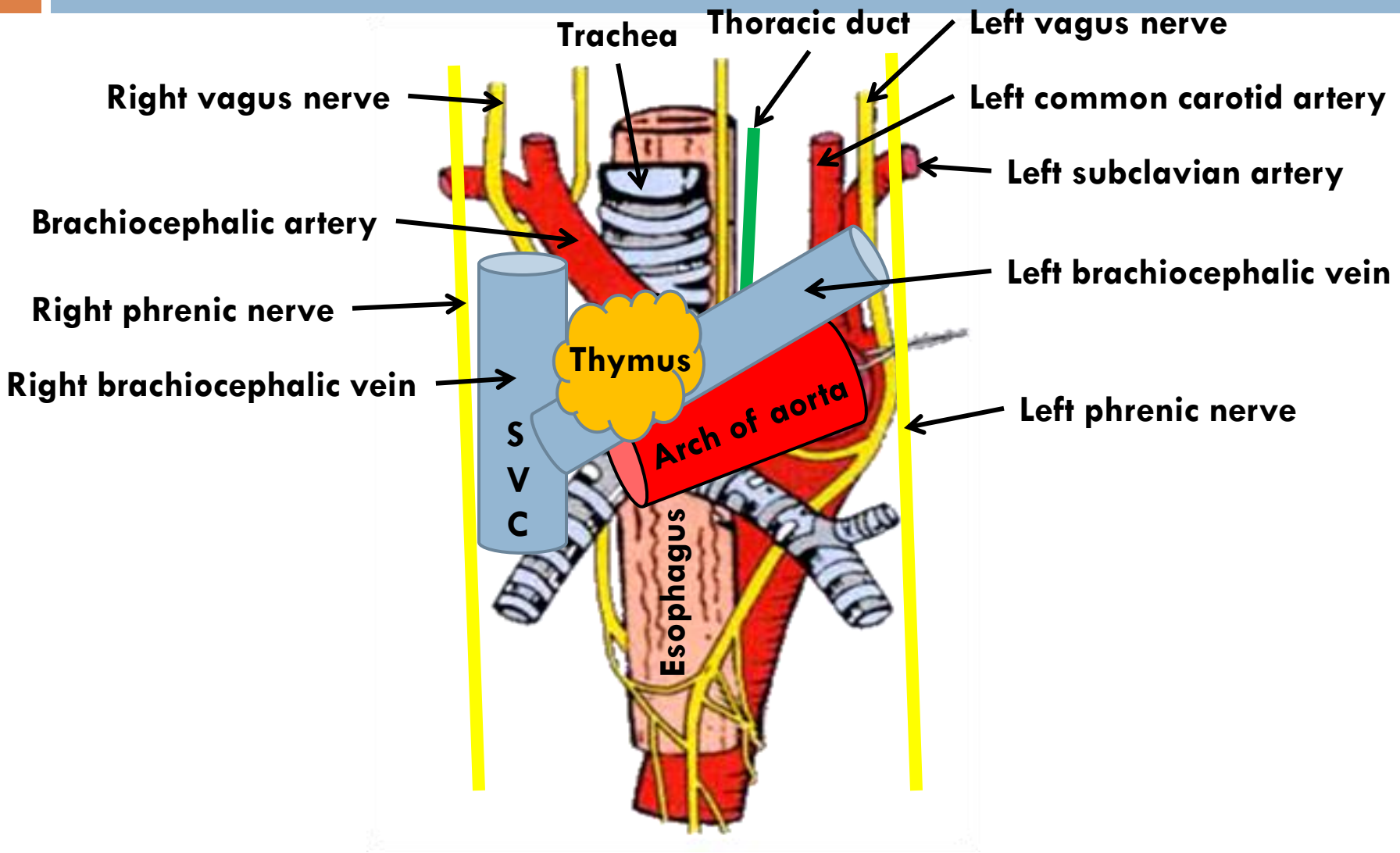
Posterior mediastinum (P): behind heart

BOUNDARIES OF SUPERIOR MEDIASTINUM

- **Superior:** Thoracic outlet
- **Inferior:** Horizontal plane
- **Anterior:** Manubrium of sternum
- **Posterior:** Upper 4 thoracic vertebrae
- **Lateral:** lungs & pleurae



CONTENTS OF SUPERIOR MEDIASTINUM



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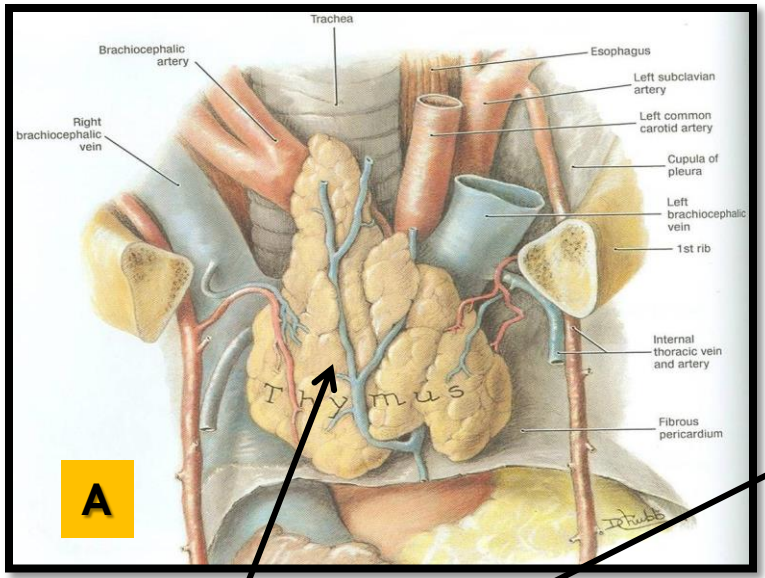
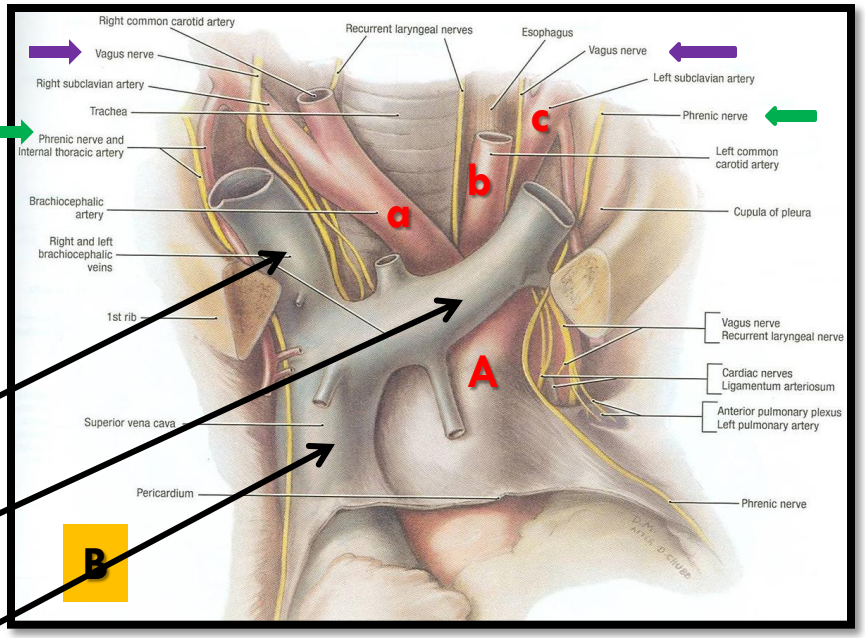
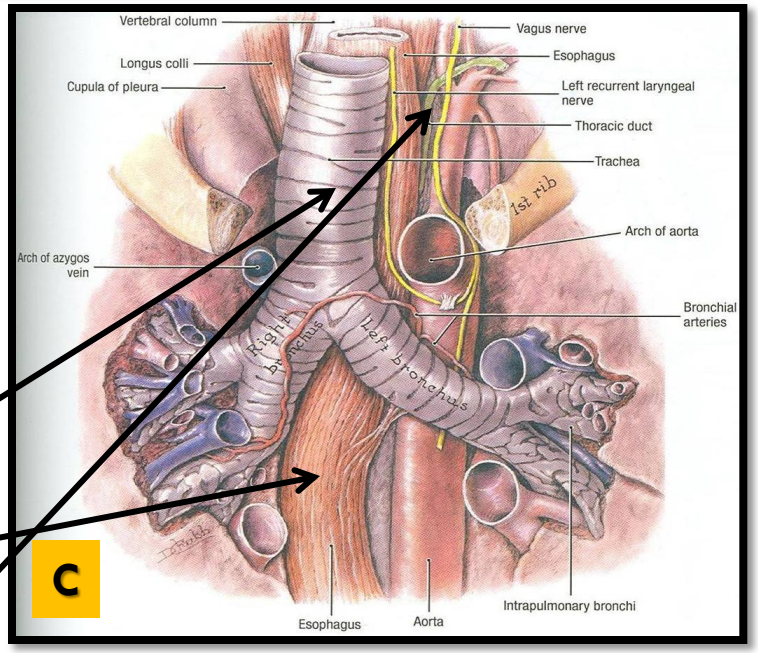




FROM SUPERFICIAL TO DEEP:

1. Thymus gland
2. Veins:
   - -Right & left brachiocephalic
   - -Superior vena cava
3. Arteries:
   - -Arch of aorta (A) & its branches
   - a-Brachiocephalic artery
   - b-Left common carotid
   - c-Left subclavian
4. Nerves:
   - - Right & left vagus
   - -Right & left phrenic

5. Trachea
6. Esophagus
7. Thoracic duct
8. Lymph nodes

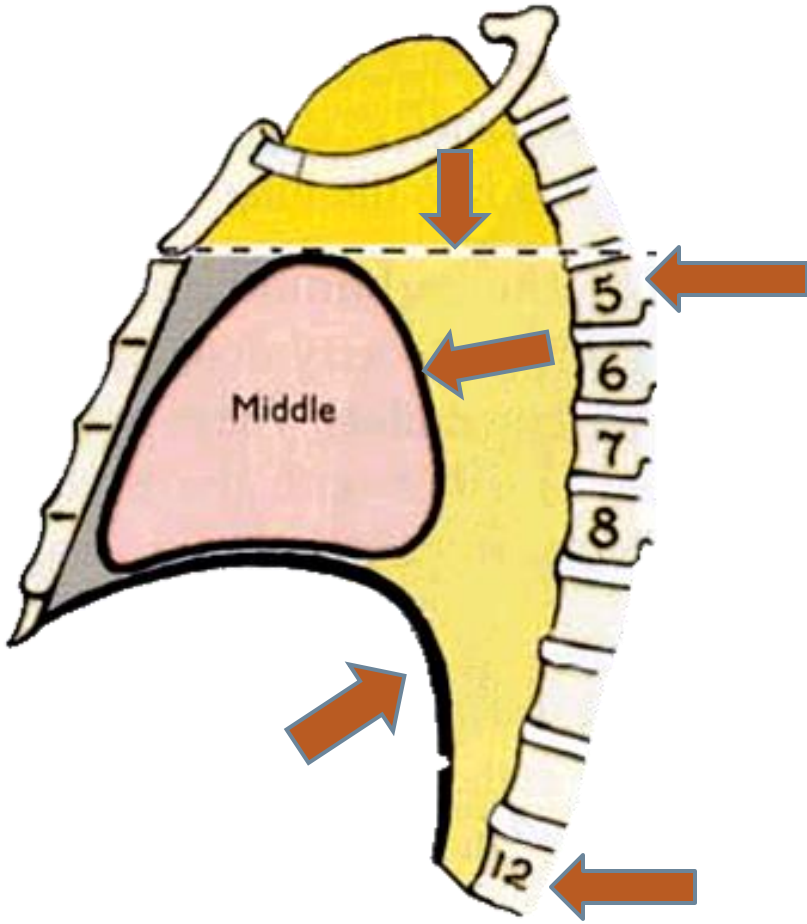


CONTENTS OF SUPERIOR MEDIASTINUM

- **4 ARTERIES:** arch of aorta, brachiocephalic, left common carotid, left subclavian
- **4 NERVES:** right & left vagus, right & left phrenic
- **3 VEINS:** right & left brachiocephalic, SVC
- **2 TUBES:** trachea & esophagus
- **1 GLAND:** thymus
- **1 DUCT:** thoracic duct

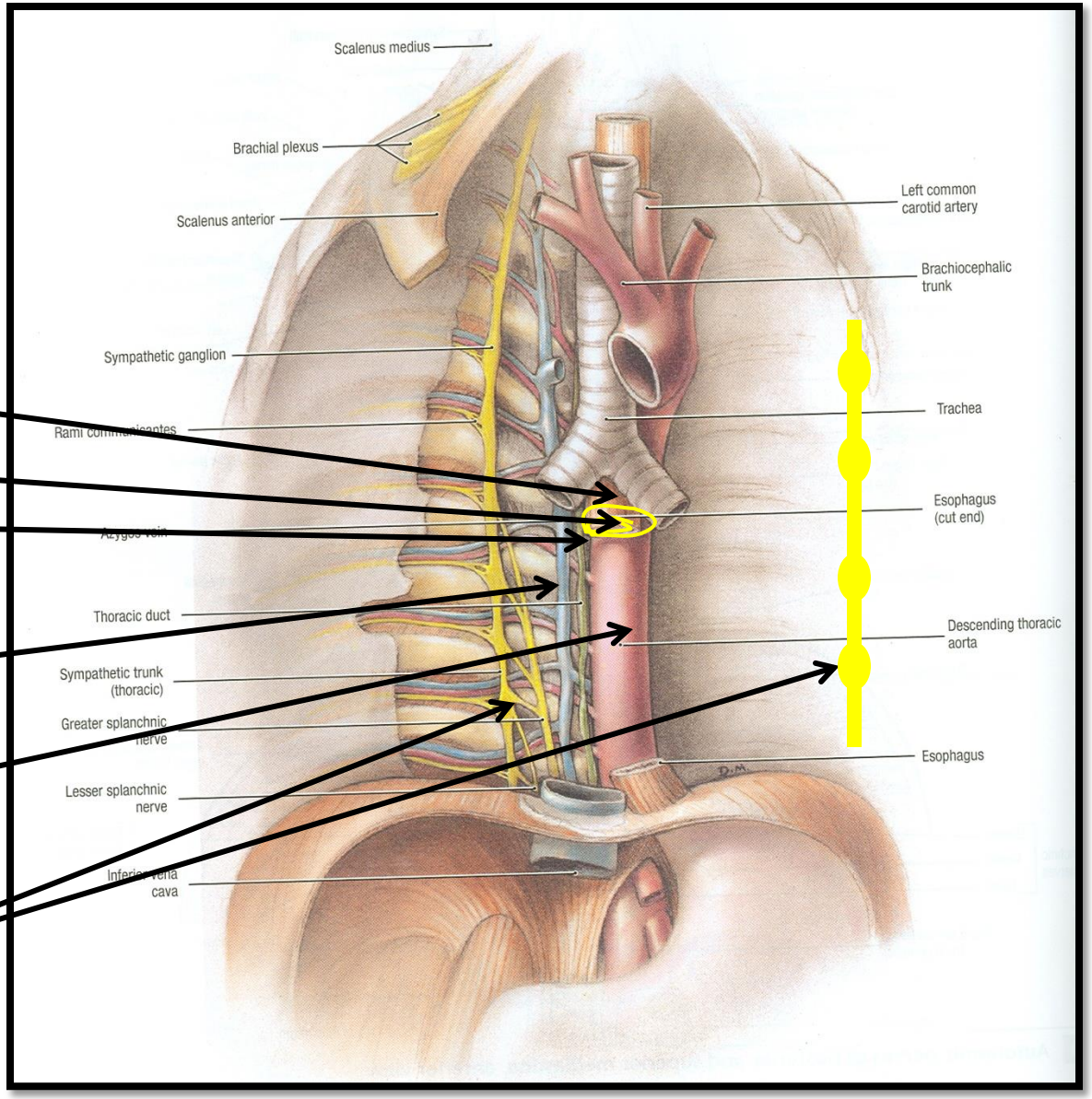
BOUNDARIES OF POSTERIOR MEDIASTINUM

- **Superior:** Horizontal plane
- **Inferior:** Diaphragm
- **Anterior:** Heart
- **Posterior:** Thoracic vertebrae from T5 to T12
- **Lateral:** Lungs & pleurae

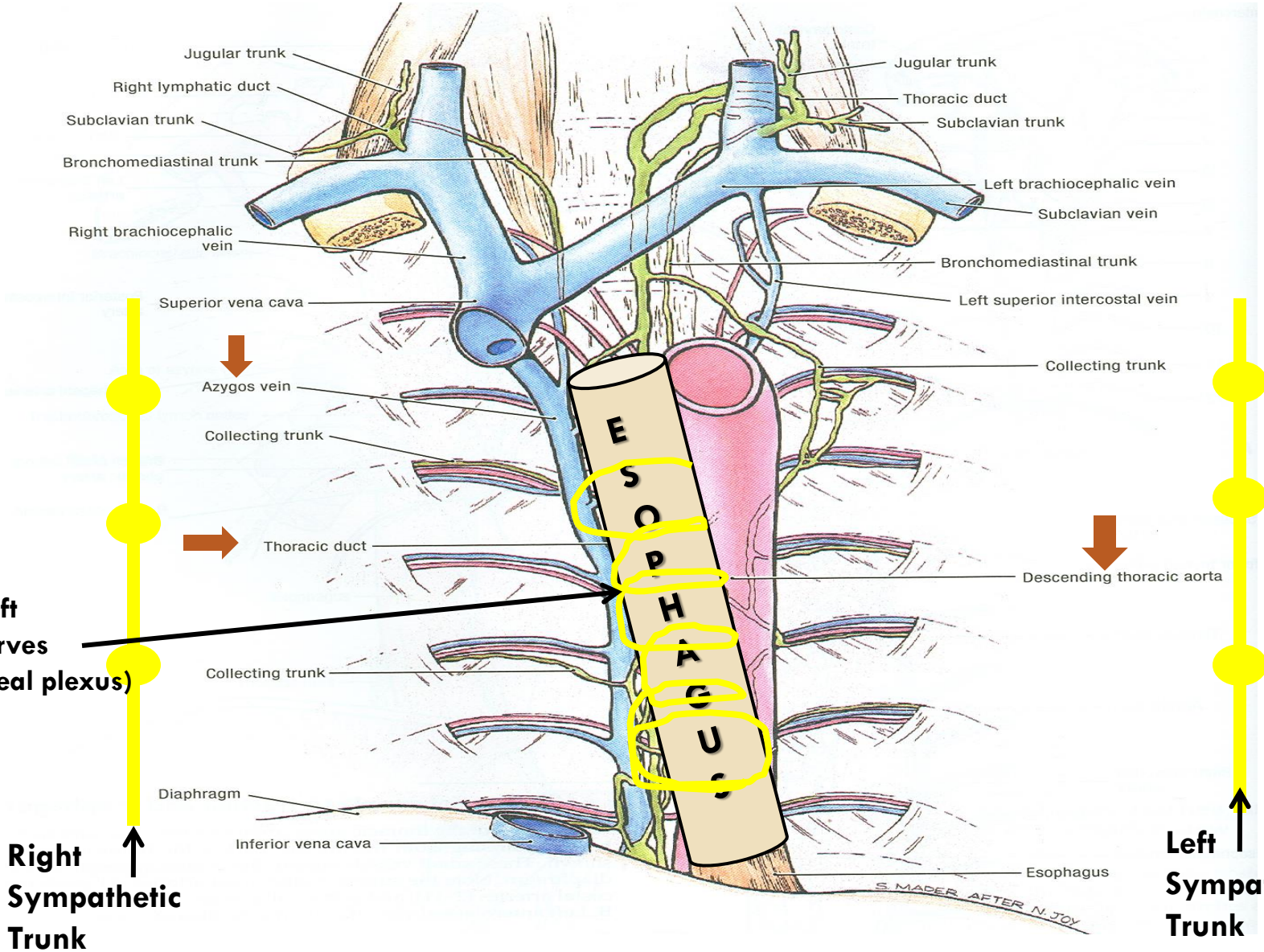


CONTENTS OF POSTERIOR MEDIASTINUM

1. Esophagus
2. Vagus nerves: around esophagus
3. Thoracic duct: posterior to esophagus
4. Azygos vein: posterior & to the right of esophagus
5. Descending aorta: posterior & to the left of esophagus
6. Right & left sympathetic trunks
7. Lymph nodes



CONTENTS OF POSTERIOR MEDIASTINUM



Right & left Vagus nerves (esophageal plexus)

Right Sympathetic Trunk

Left Sympathetic Trunk

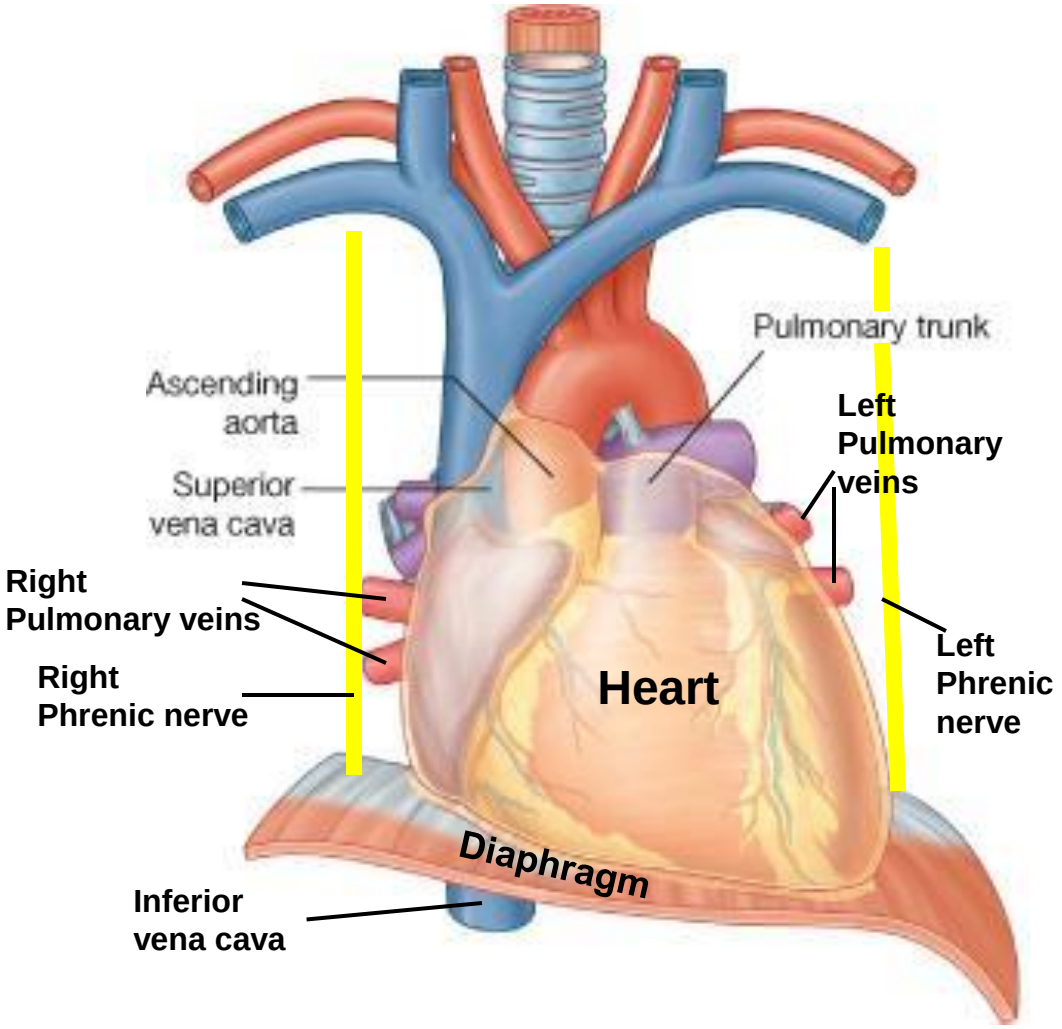
MIDDLE MEDIASTINUM

SITE:

- Between anterior & posterior mediastinum

CONTENTS:

- Heart & pericardium
- Ascending Aorta
- Pulmonary trunk
- Superior & inferior vena cava
- Right & left pulmonary veins
- Right & left phrenic nerves
- Lymph nodes



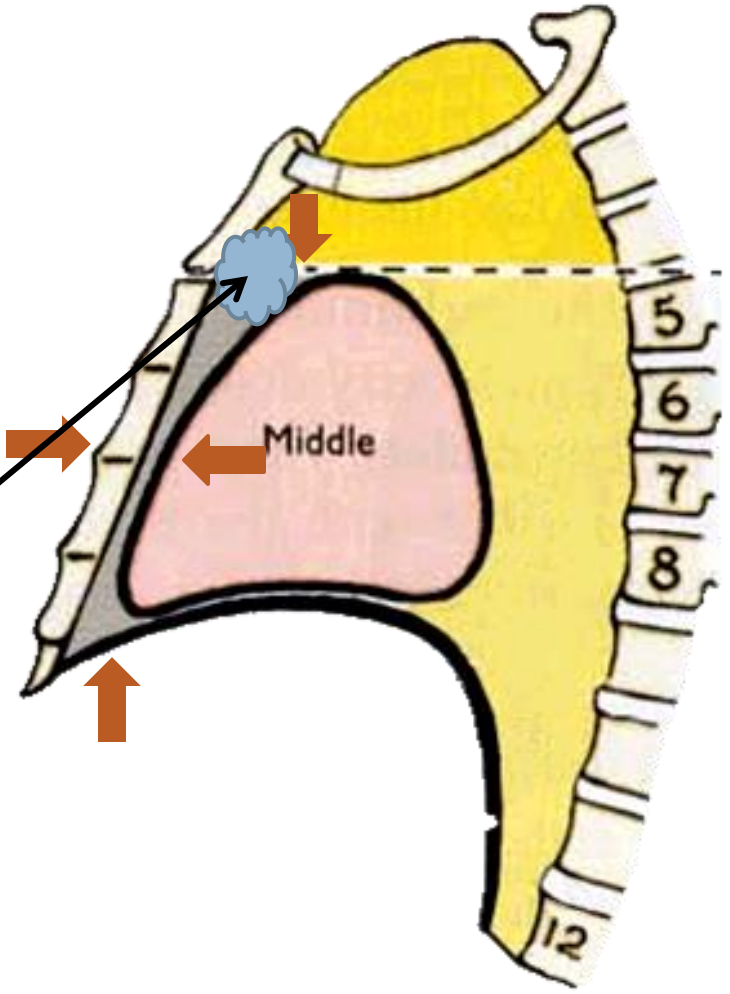
ANTERIOR MEDIASTINUM

BOUNDARIES:

- **Superior:** Horizontal plane
- **Inferior:** Diaphragm
- **Anterior:** Body & xiphoid process of sternum
- **Posterior:** Heart
- **Lateral:** Lungs & pleurae

CONTENTS:

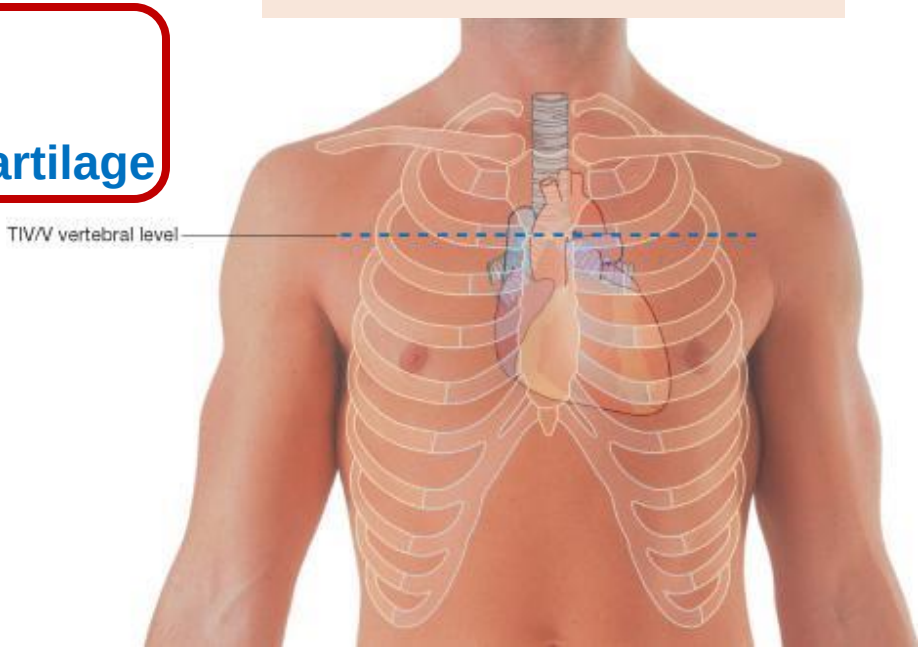
- Thymus gland
- Lymph nodes

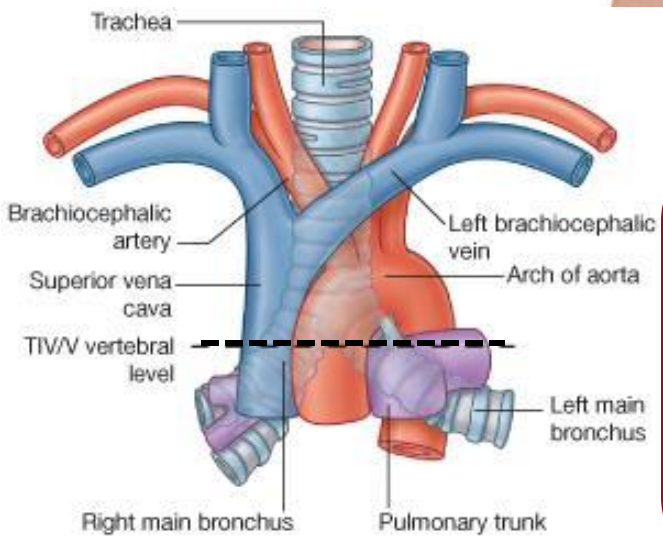


LEVEL OF T4

Level of:

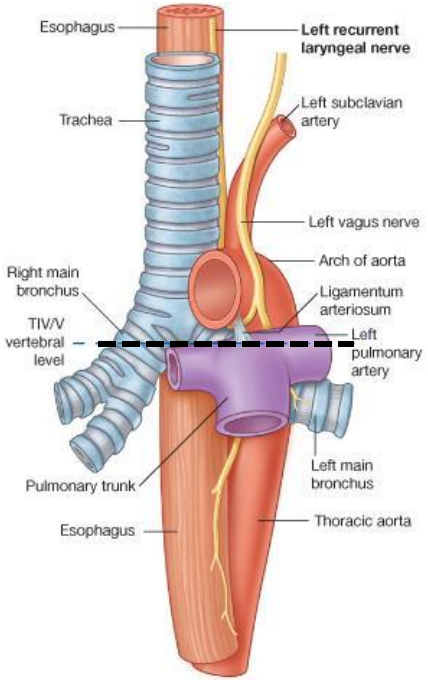
- ❑Sternal angle
- ❑Second costal cartilage





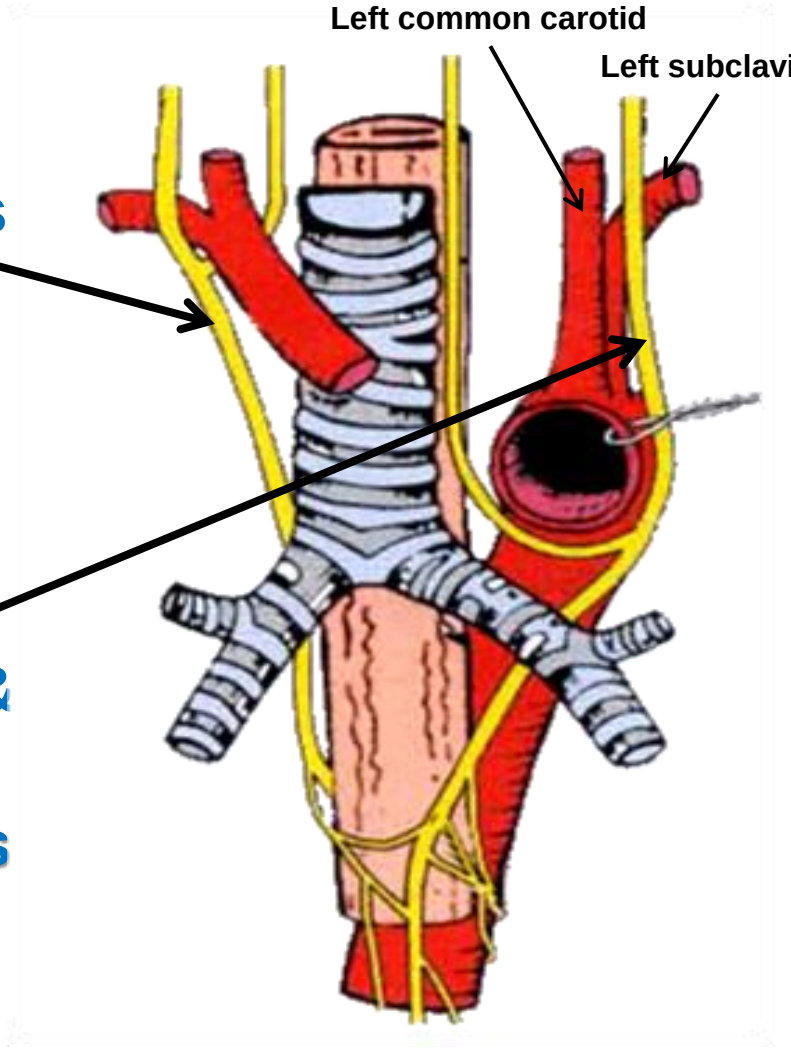
Level of:

- ❑Bifurcation of trachea
- ❑Bifurcation of pulmonary trunk
- ❑Beginning & termination of arch of aorta



VAGUS NERVE

- It is the 10th cranial nerve.
- **The right vagus** descends to the right side of trachea, forms **the posterior esophageal plexus** & continues in abdomen as **posterior gastric nerve.**
- **The left vagus** descends between left common carotid & left subclavian arteries, forms **the anterior esophageal plexus** & continues in abdomen as **anterior gastric nerve.**



PHRENIC NERVE

ROOT VALUE:

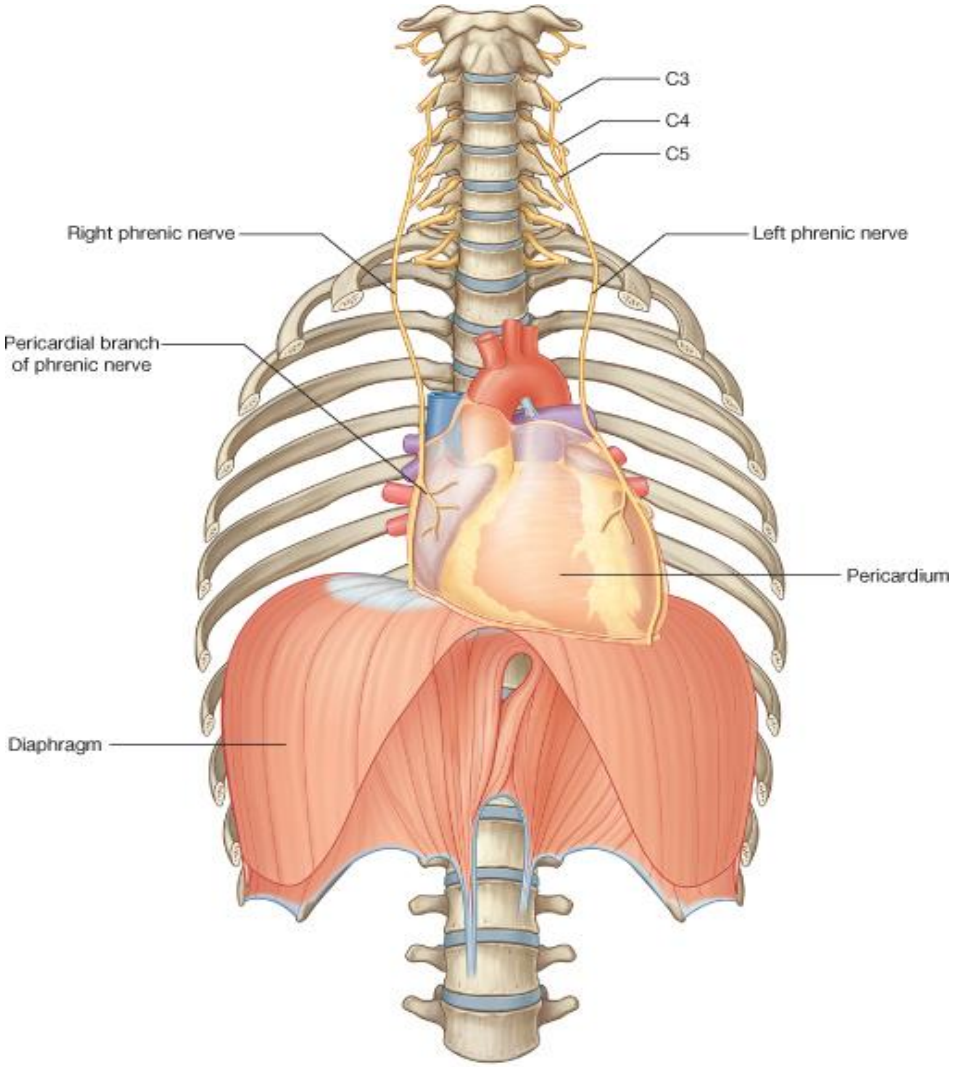
- $C_{3,4,5}$

COURSE IN THORAX:

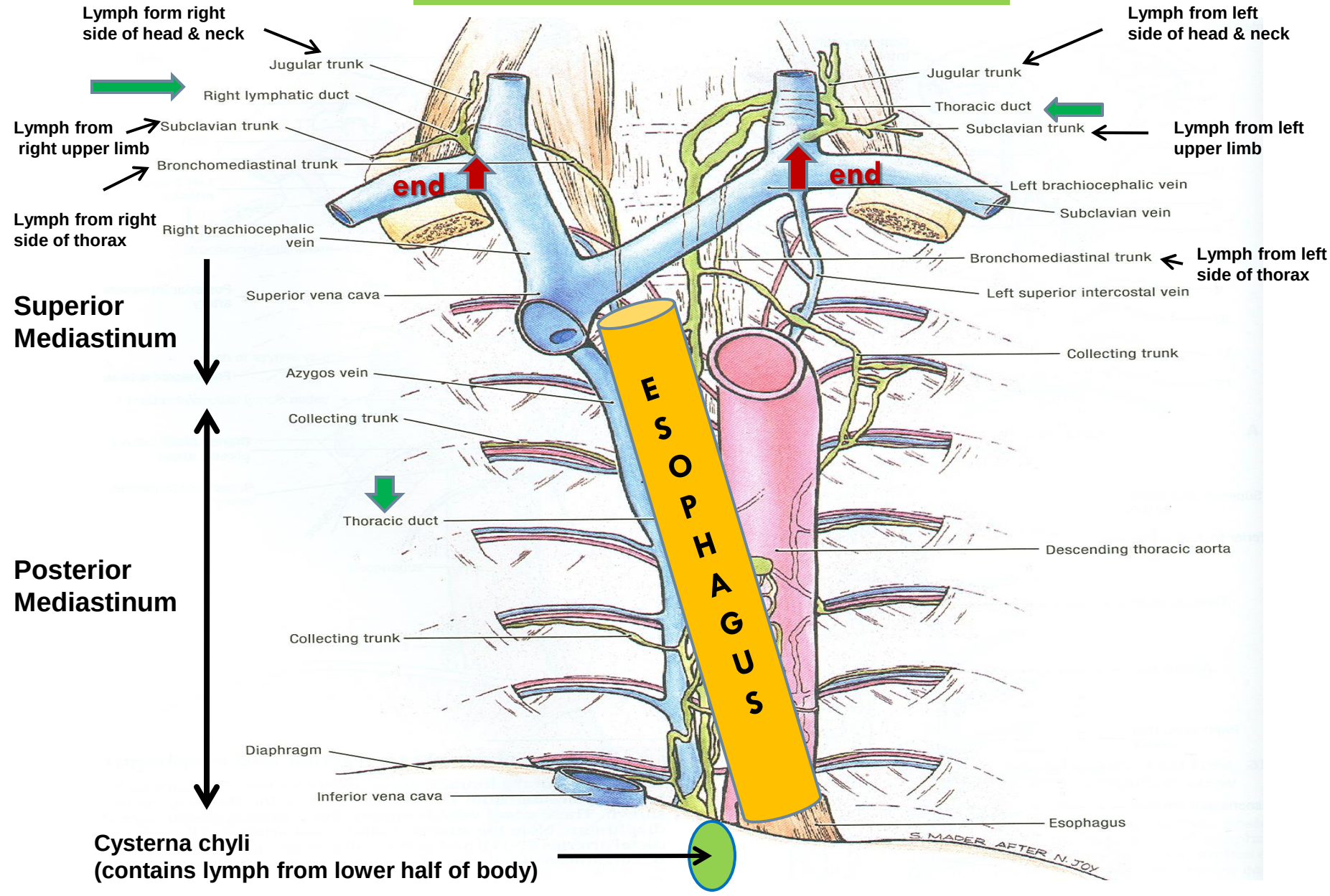
- **The right phrenic descends on the right side of SVC & heart.**
- **The left phrenic descends on the left side of heart.**
- **Both nerves terminate in the diaphragm**
- **SUPPLY:**

  1) Motor & sensory fibers to diaphragm

  2) Sensory fibers to pleurae & pericardium



LYMPHATIC VESSELS IN THORAX



THORACIC DUCT

BEGINNING:

- It is the continuation of cysterna chyli.

COURSE:

- It passes through **aortic opening of diaphragm**.
- It ascends in **posterior** mediastinum (posterior to esophagus).
- It ascends in **superior** mediastinum (to the left of esophagus).

TRIBUTARIES: It receives:

- Lymphatics from all body **EXCEPT:** right side of thorax, right upper limb & right side of head & neck.

END:

- It ends in the left brachiocephalic vein.

AORTA

ASCENDING AORTA:

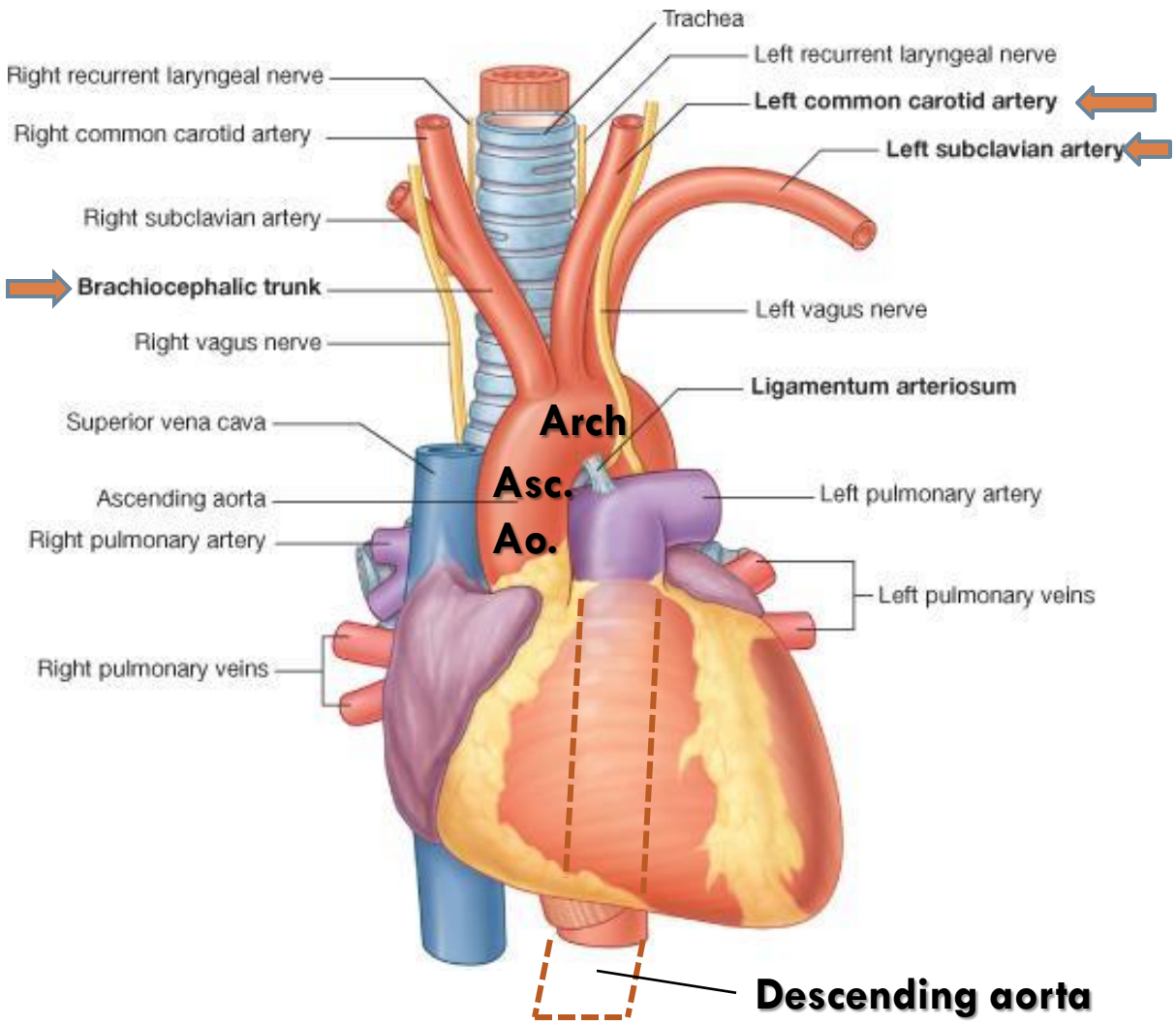
- **Beginning:** at aortic orifice of left ventricle.
- **Course:** in middle mediastinum
- **End:** continues as arch of aorta (at level of T4)

ARCH OF AORTA:

- **Course:** in superior mediastinum
- **End:** continues as descending thoracic aorta (at level of T4)

DESCENDING AORTA:

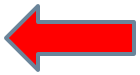
- **Course:** in posterior mediastinum
- **End:** continues as abdominal aorta through diaphragm




QUESTIONS

QUESTION 1

- **Which one of the following structures is present in the superior mediastinum?**

1) **Ascending aorta**
2) **Arch of aorta** 
3) **Descending aorta**
4) **Pulmonary trunk**

QUESTION 2

- **Which one of the following structures is present in both superior & posterior mediastinum?**

1) **Superior vena cava**
2) **Pulmonary trunk**
3) **Trachea**
4) **Esophagus** 

QUESTION 3

- Which one of the following structures lies on the left side of esophagus in the posterior mediastinum?

1) Superior vena cava
2) Descending aorta 
3) Azygos vein
4) Pulmonary trunk


THANK YOU