

**King Saud University
College of medicine
Respiratory block**



Anatomy Team

433

Mediastinum

رقم المحاضرة

6

Objectives

- 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.***

Color Index

- **Red : Important.**
- **Violet: Explanation.**
- **Gray: Additional Notes.**

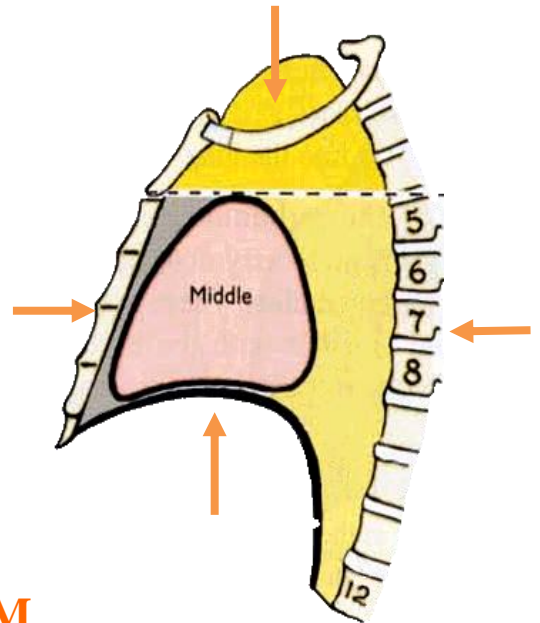
Other colors are for
Coordination

Say " bsm Allah" then start

- **Mediastinum:** It is a thick movable partition between the two pleural sacs & lungs, contains *all* the structures which lie in the intermediate compartment 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
2. Inferior mediastinum: → subdivided into :
 - *Middle mediastinum (M):* contain heart
 - *Anterior mediastinum (A)* in front of heart
 - *Posterior mediastinum(P)* behind heart

Notes:

- ✓ Anything (any structure) passing from the neck to the chest must pass through the thoracic outlet
- ✓ Sternal angle (meeting opposite to costal cartilage, between body of the sternum and the manubrium)
- ✓ Level of T4 =level of the sternal angle

• SUPERIOR MEDIASTIN

| | |
|-----------|----------------------------|
| Superior | Thoracic outlet |
| Inferior | Horizontal plane |
| Anterior | Manubrium of sternum |
| Posterior | Upper 4 thoracic vertebrae |
| & lateral | Lungs & pleurae |

Contents:

Boundaries →

(A) Superficial:

1. Thymus Gland.

Three Veins:

- 2. Left brachiocephalic v.
- 3. Right brachiocephalic v.
- 4. Superior vena cava

(B) Intermediate:

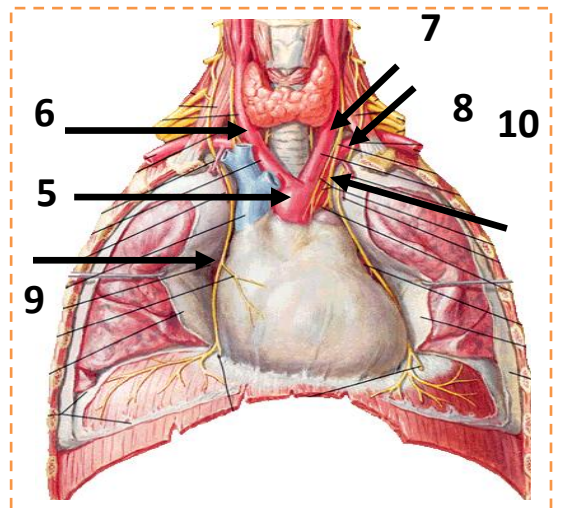
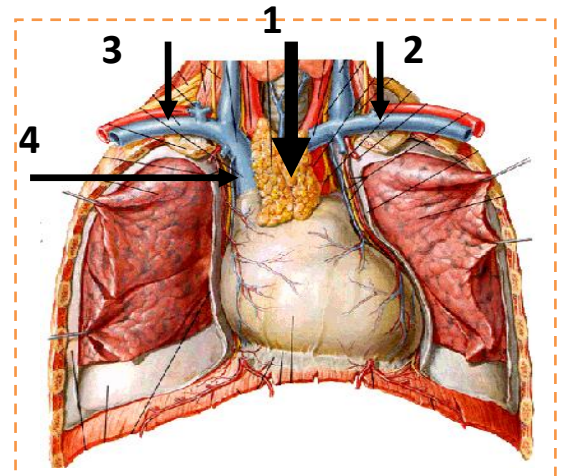
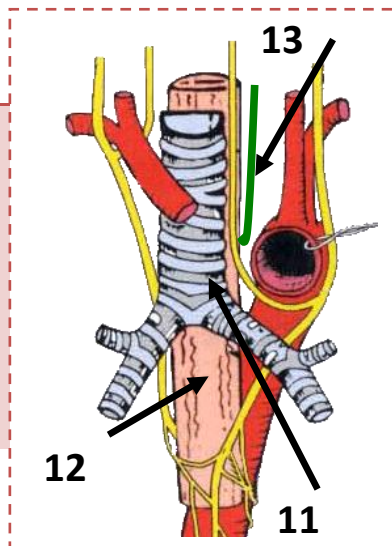
- 5. Arch of aorta & its three branches:
- 6. Brachiocephalic artery.
- 7. L common carotid artery.
- 8. L Subclavian artery

Nerves: :

- 9. Phrenic
- 10. Vagus

(c) Deep:

- 11. Trachea
- 12. Esophagus
- 13. Thoracic Duct



Notes:

- ✓ Superior vena cava → union of right and left brachiocephalic veins
- ✓ Phrenic nerve (more lateral)
- ✓ Vagus nerve (more medial)
- ✓ Thoracic duct = lymph vessel
- ✓ Right phrenic nerve (close to veins)
- ✓ Left phrenic nerve (close to arteries)

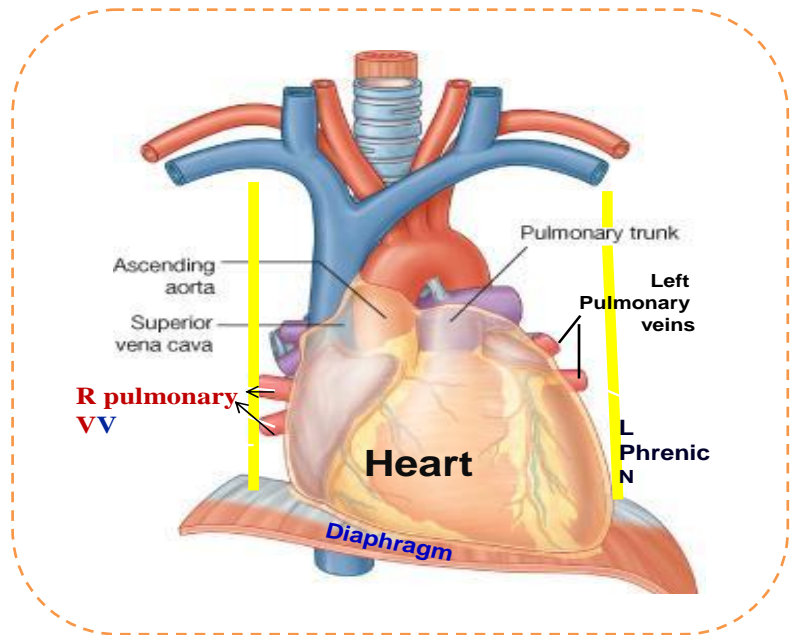
• **Inferior Mediastinum**

1- Middle mediastinum :

contains Heart

CONTENTS:

1. Heart & pericardium
2. Ascending Aorta
3. Pulmonary trunk
4. Superior & inferior vena cava
5. Right & left pulmonary veins
6. Right & left phrenic nerves
7. Lymph nodes



2- Anterior mediastinum:

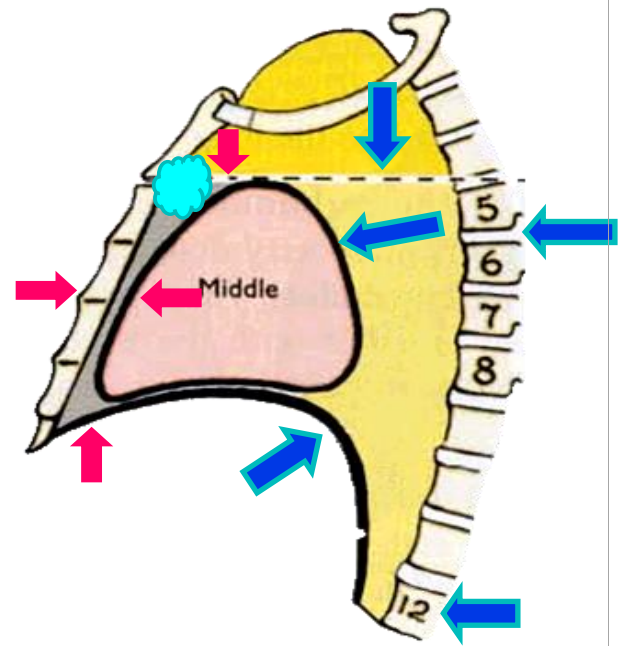
in front of Heart

Boundaries:

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

CONTENTS:

1. Thymus gland
2. Lymph nodes



3- Posterior Mediastinum:

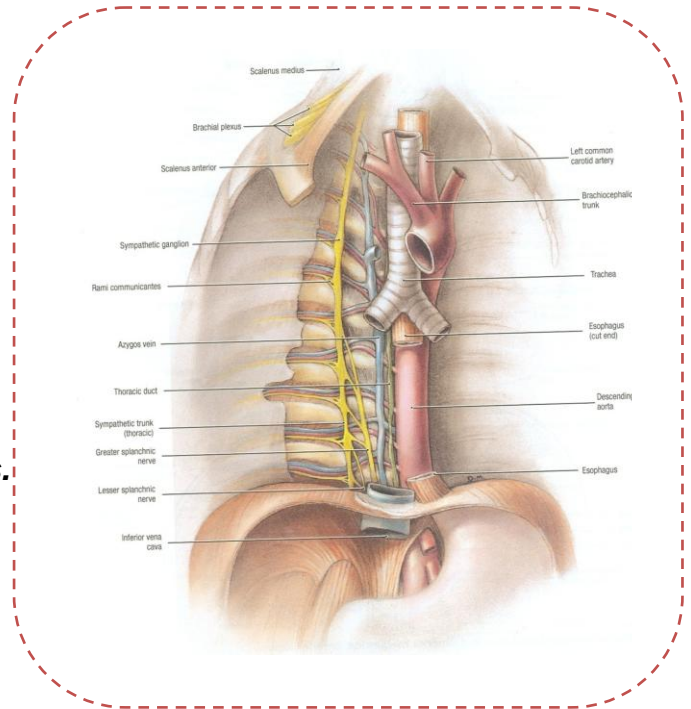
behind Heart

Boundaries:

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

(con't) 3- Posterior Mediastinum:**CONTENTS:**

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.**

**Notes:**

- ✓ 5-12 vertebrae → behind (bounds) the middle posterior portion of the mediastinum
- ✓ Thymus gland → remnants of it in the anterior and part of it in the superior parts of the mediastinum
- ✓ We can find areolar CT in the anterior compartment
- ✓ Main component of the middle mediastinum → heart and pericardium MAINLY
- ✓ Heart location: middle mediastinum (part of the inferior) → this always comes as an MCQ
- ✓ Esophagus passes through the superior and posterior compartments
- ✓ Azygos vein is responsible for the drainage of the thorax → it opens up into the superior vena cava which pours in the heart
- ✓ Primary bronchi → in middle mediastinum
- ✓ Trachea → superior mediastinum
- ✓ So the trachea bifurcates at the border between the superior mediastinum and the middle portion of the inferior mediastinum
- ✓ Thoracic duct starts as a sac (at the cisternae chylae) → takes from pelvis + lower limbs → passes in same opening opposite to the descending aorta (posterior mediastinum → behind the esophagus).
- ✓ The most anterior structure in the POSTERIOR MEDIASTINUM is Esophagus **BUT** in the SUPERIOR MEDIASTINUM it is the most posterior structure .

• PHRENIC NERVES

Root Value:

C3,4,5

* passing through the Superior & Middle mediastina

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

Branches :

1. Motor & Sensory fibers to Diaphragm
2. Sensory fibers to pleurae & pericardium

• VAGUS NERVE:

It is the 10th cranial nerve.

right vagus

Descends to the right side of trachea

Forms the posterior esophageal plexus & continues in abdomen as posterior gastric nerve.

left vagus

Descends between left common carotid & left subclavian arteries

Forms the anterior esophageal plexus & continues in abdomen as anterior gastric nerve.

• AORTA:

| | <u>Beginning</u> | <u>Course</u> | <u>End</u> |
|-------------------------|----------------------------------|---------------------------------|--|
| <u>ASCENDING AORTA</u> | Aortic orifice of left ventricle | In Middle mediastinum | Continues as arch of aorta.(level of T4) |
| <u>ARCH OF AORTA</u> | Level of T4 | In Superior mediastinum | Continues as descending thoracic aorta. (level of T4). |
| <u>DESCENDING AORTA</u> | Level of T4 | In posterior mediastinum | Continues as abdominal aorta through diaphragm. |

• THORACIC DUCT:

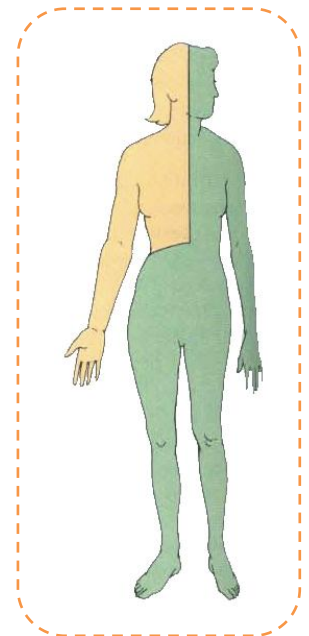
| BEGINNING | COURSE | END |
|---|--|--|
| It is the continuation of Cisterna Chyli (level of L1). | It passes through aortic opening of diaphragm. <ul style="list-style-type: none"> It ascends in Posterior mediastinum (posterior to esophagus). It ascends in Superior mediastinum (to the left of esophagus). | It opens in the left brachiocephalic vein. |

TRIBUTARIES:

It receives:

Lymphatics from all body

EXCEPT: Right side of thorax, Right upper limb & Right side of head & neck.



Notes:

- ✓ Openings in the diaphragm:
 1. Esophageal (T10) → esophagus + right vagus
 2. Vena cava (T8) → inferior vena cava + right phrenic
 3. Aortic (T12) → descending aorta + thoracic duct
 4. Small one for the left phrenic nerve
- ✓ Right and left phrenic give the only motor supply to the diaphragm
- ✓ Thoracic duct posterior to esophagus In the **POSTERIOR MEDIASTINUM**
BUT in the **SUPERIOR MEDIASTINUM** is the left side .
- ✓ Azygos vein: posterior & to the right of esophagus and
 Descending aorta: posterior & to the left of esophagus .

SUMMARY

- ❖ Mediastinum is a thick movable partition between the two pleural sacs & lungs.
- ❖ divided by a horizontal plane into :
 1. Superior mediastinum
 2. Inferior mediastinum: → subdivided into :
 - A. Middle mediastinum
 - B. Anterior mediastinum
 - C. Posterior mediastinum
 - ❖ PHRENIC NERVES
 - ❖ VAGUS NERVE: It is the 10th cranial nerve.
 - ❖ AORTA
 - ❖ & THORACIC DUCT

Multiple Choice Questions

Q1:Content of MIDDLE MEDIASTINUM ?

A-Thymus gland
C-Descending Aorta

B- Ascending Aorta
D-Arch of Aorta

Q2:Site of MIDDLE MEDIASTINUM ?

A-Between anterior & posterior mediastinum
C-Anterior of mediastinum

B-Posterior of mediastinum
D-Between anterior & inferior mediastinum

Q3: What is the root value of phrenic nerve?

A- C3,4,5.
C- T3,4,5.

B- C3,4.

Q4: Where is arch of aorta?

A- Superior mediastinum.
C- Posterior mediastinum.

B- Middle mediastinum.

Q5: Which of these at level of T4:

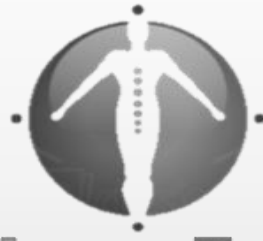
A- Sternal angle.
C- Jugular notch.

B- Xiphoid process.

Q Ans. :

1- B 2-A 3-A

4- A 5- A



Anatomy Team

433

Good luck

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For any comments

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