

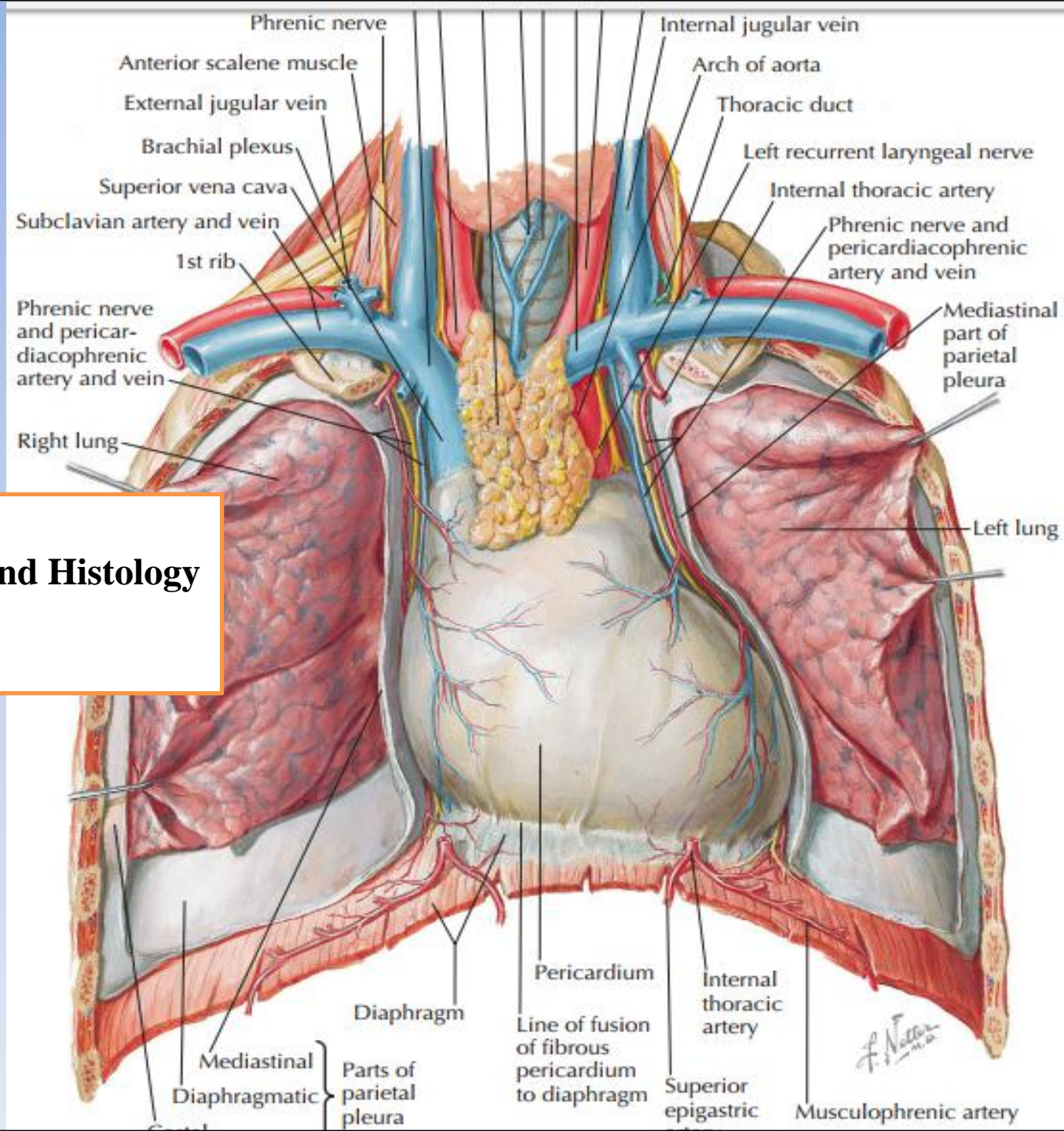
Anatomy

Slide

Sheet

CVS

2017



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Objectives

To discuss mediastinum and its boundaries

To discuss and explain the contents of the superior mediastinum

To describe the great veins of the superior mediastinum

To describe the Arch of the aorta and its branches

To know about other none vascular structures in the superior mediastinum

CHEST CAVITY

The chest cavity is bounded by the chest wall and below by the diaphragm

It extends upward into the root of the neck about one fingerbreadth

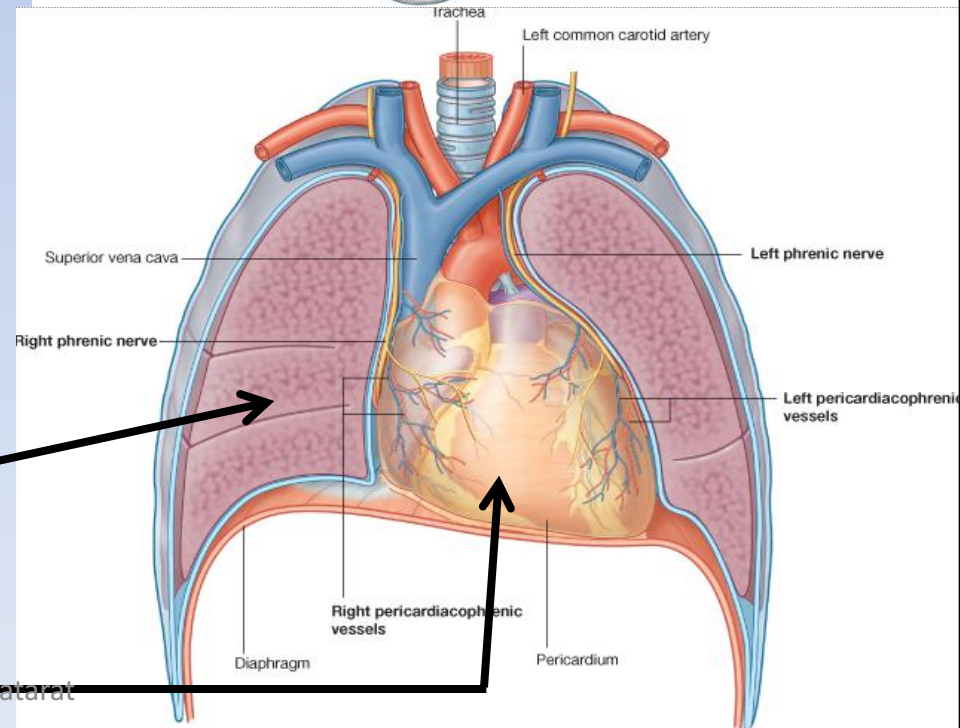
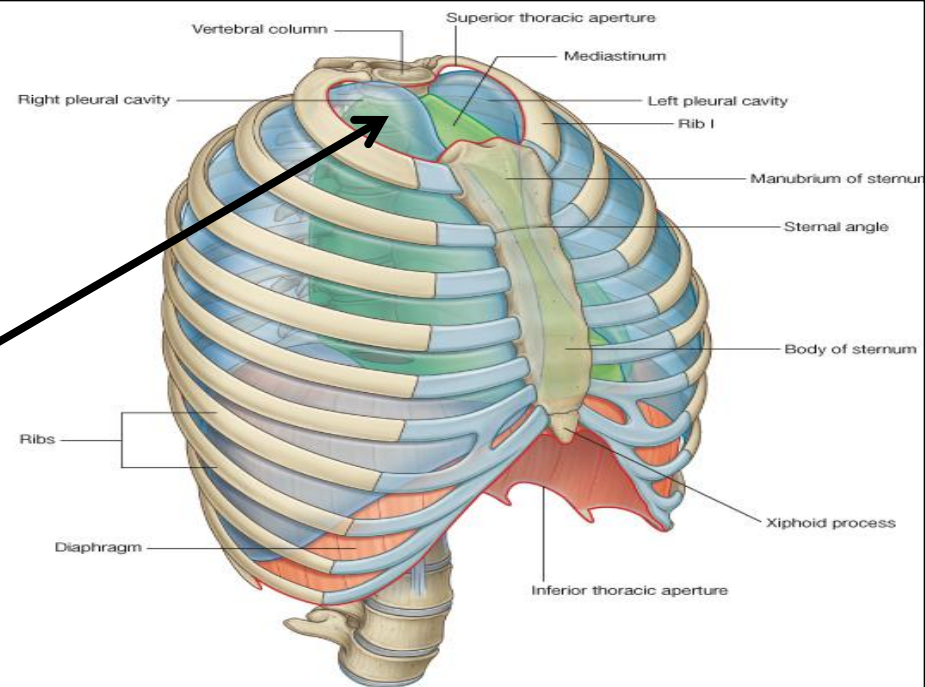
above the clavicle on each side

The diaphragm, separates the chest from the abdominal viscera

The chest cavity can be divided into

MEDIAN PARTITION CALLED THE MEDIASTINUM

LATERALLY PLACED PLEURAE AND LUNGS



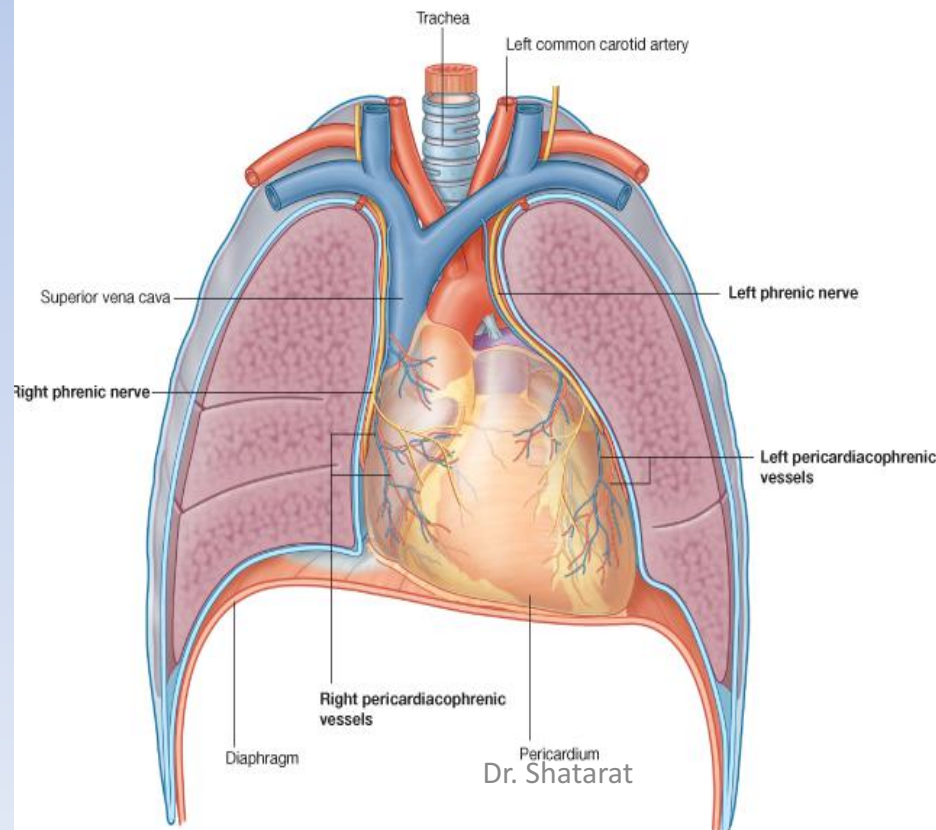
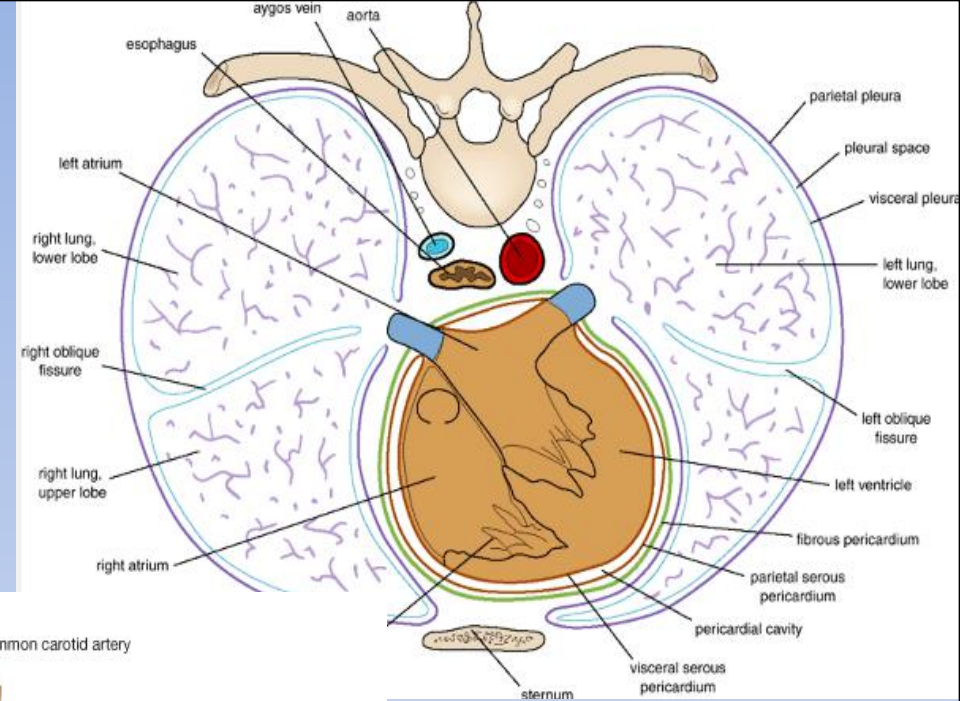
1-The Mediastinum extends

Superiorly: to the thoracic outlet and the root of the neck

Inferiorly: to the diaphragm

Anteriorly: to the sternum

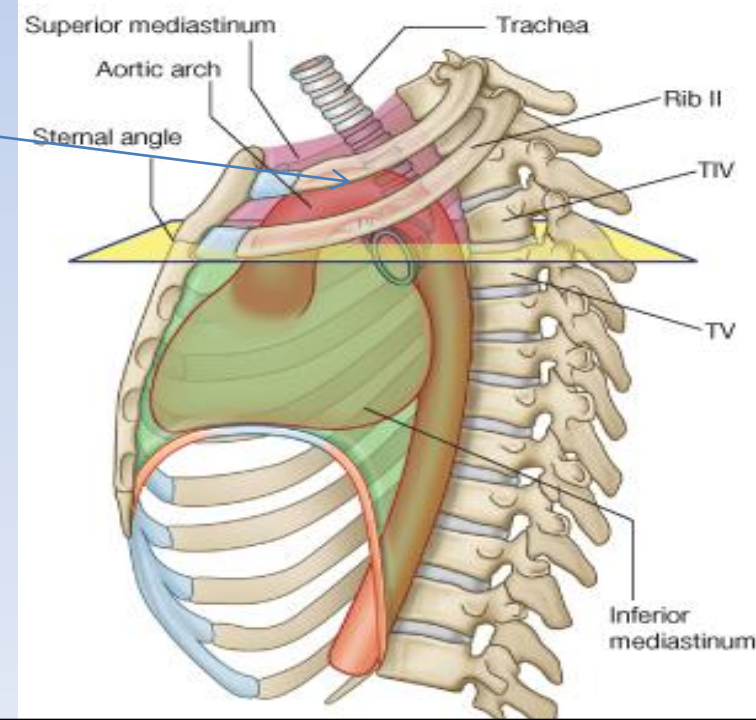
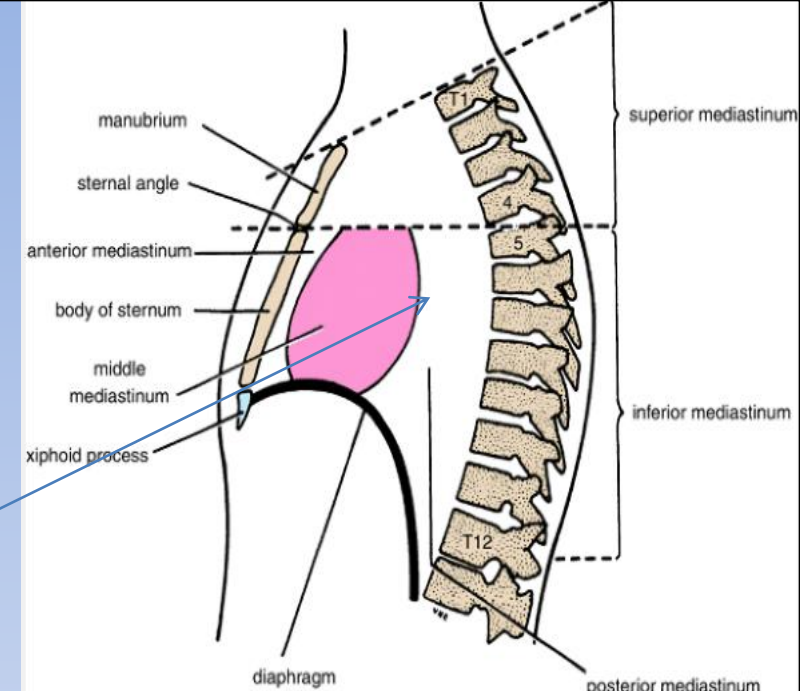
Posteriorly: to the vertebral column



Dr. Shatarat

An imaginary plane passing from the sternal angle anteriorly to the lower border of the body of the fourth thoracic vertebra posteriorly divides the mediastinum into

SUPERIOR AND INFERIOR MEDIASTINA



THE INFERIOR MEDIASTINUM is further subdivided into:

1-THE MIDDLE MEDIASTINUM

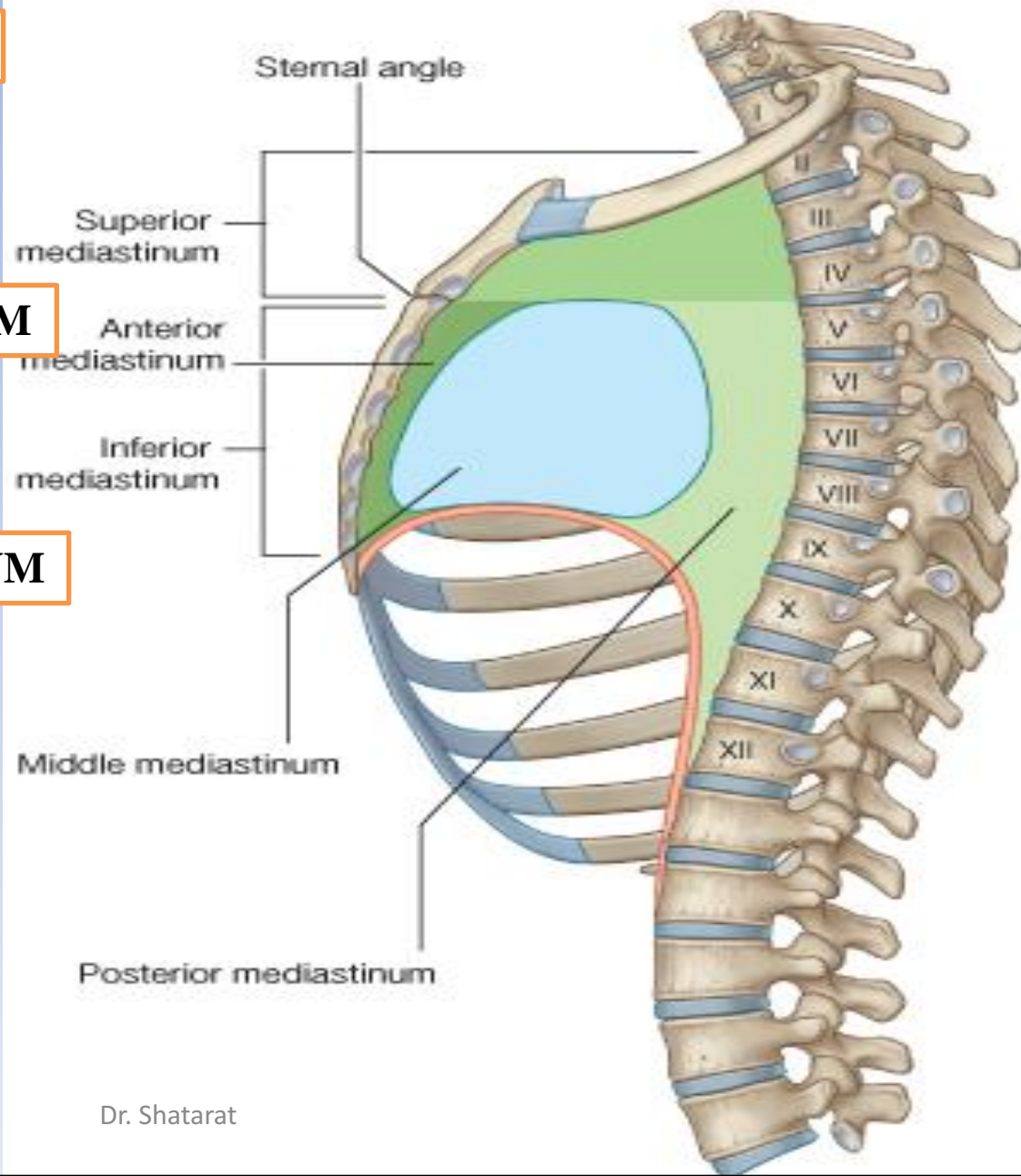
consists of
the pericardium and heart

2-THE ANTERIOR MEDIASTINUM

is a space between the
pericardium and the sternum

3-THE POSTERIOR MEDIASTINUM

lies between
THE PERICARDIUM
And
THE VERTEBRAL
COLUMN

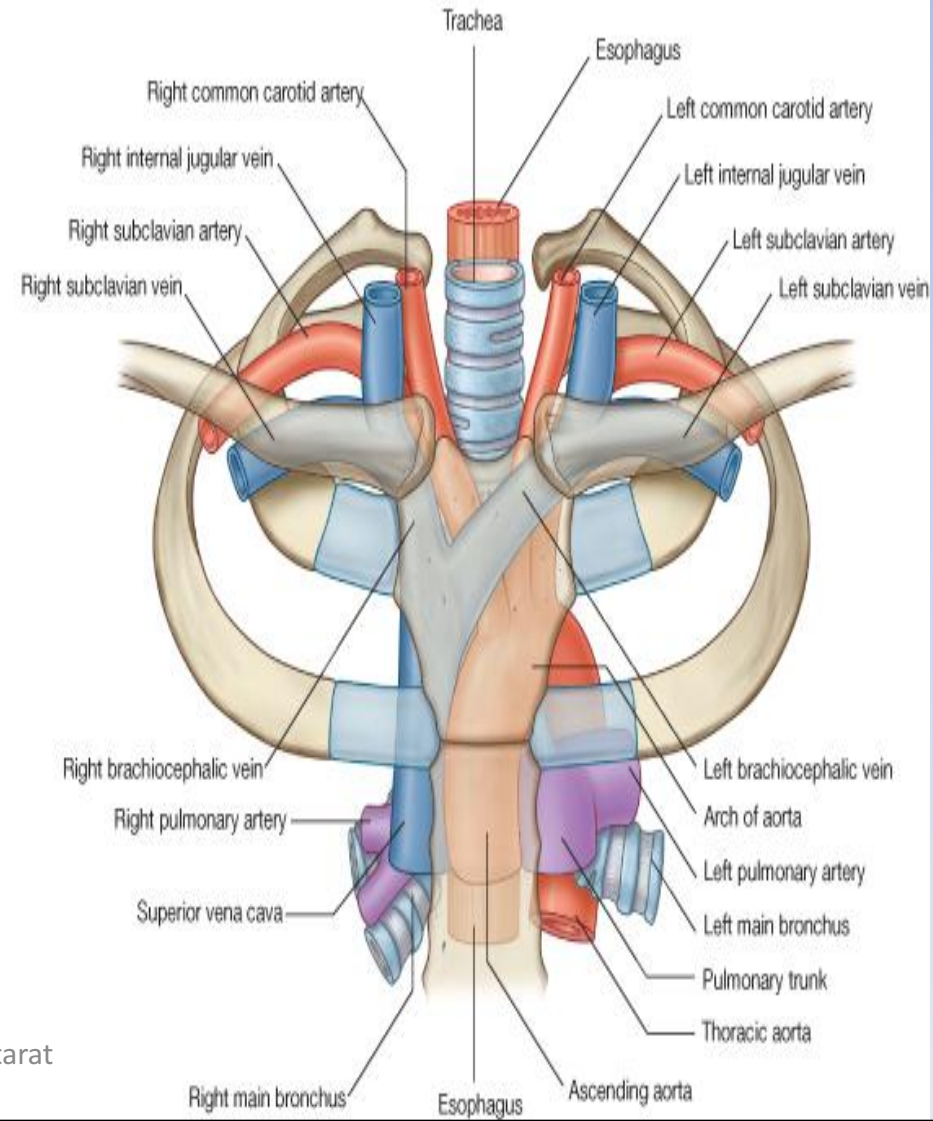
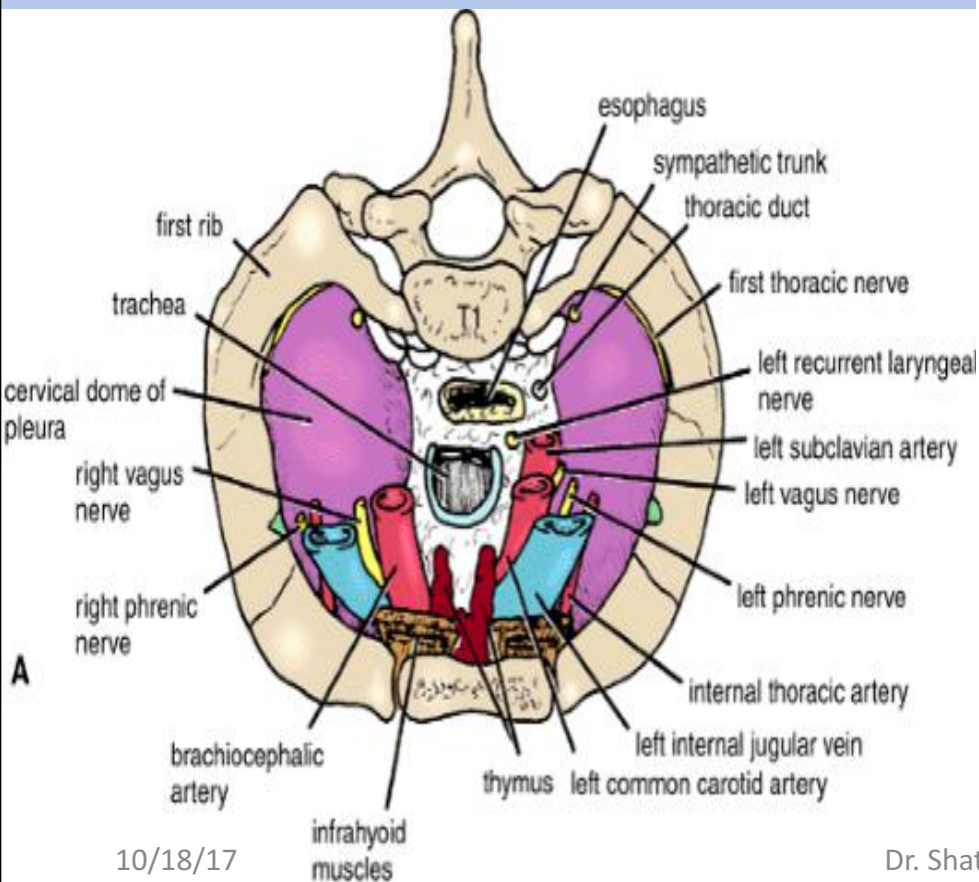


THE SUPERIOR MEDIASTINUM

- (a) THYMUS
- (b) LARGE VEINS
- (c) LARGE ARTERIES
- (d) TRACHEA
- (e) ESOPHAGUS
- (f) THORACIC DUCT
- (g) SYMPATHETIC TRUNKS

THE SUPERIOR MEDIASTINUM

is bounded in front by the manubrium sterni and behind by the first four thoracic vertebrae



1-Brachiocephalic Veins

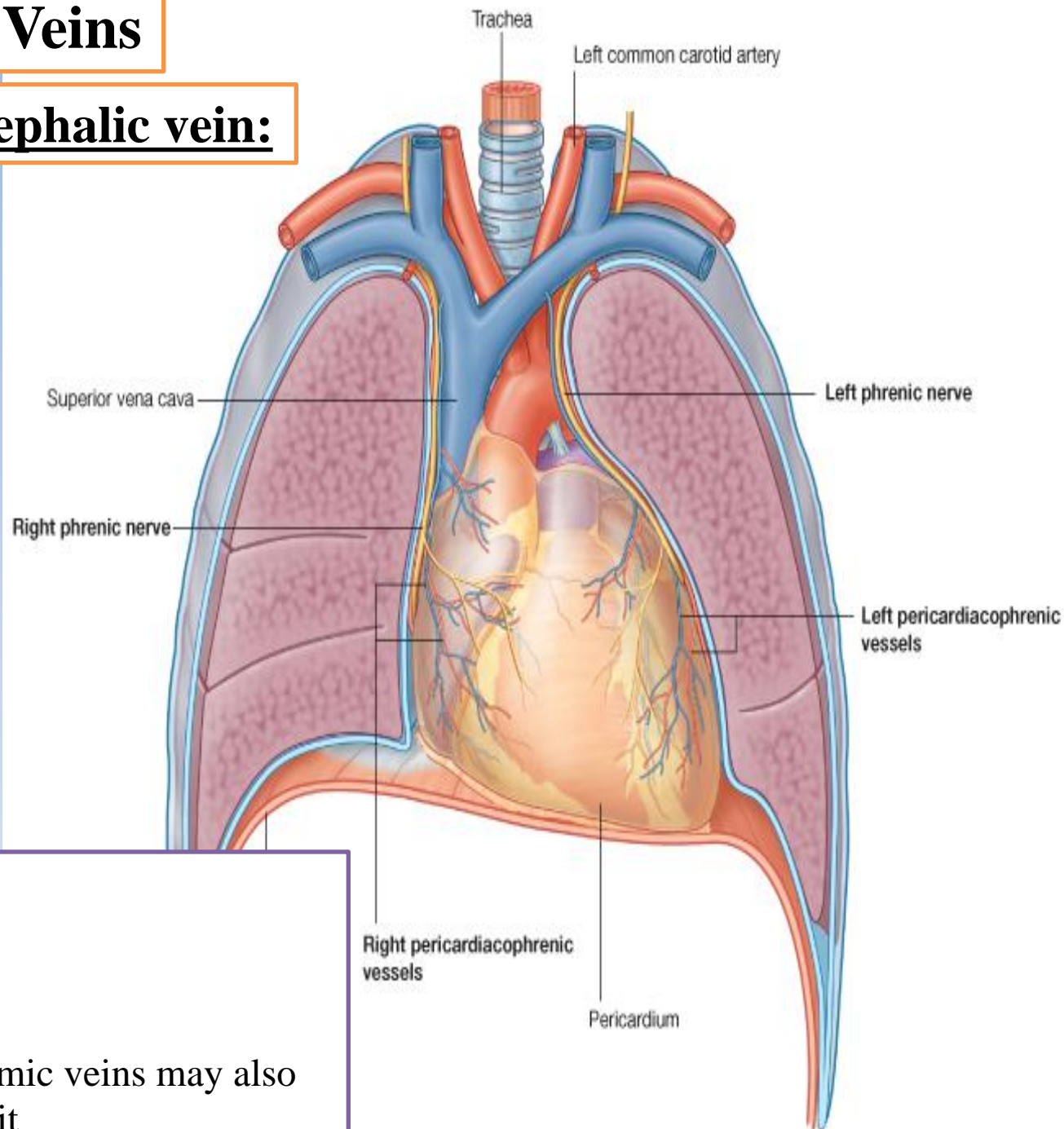
A-The right brachiocephalic vein:

- ❖ formed by the union of the right subclavian and the right internal jugular veins
- ❖ Begins posterior to the medial end of the right clavicle
- ❖ it is shorter than the left one and more vertical

Venous tributaries

Include the vertebral veins first posterior intercostal internal thoracic veins.

The inferior thyroid and thymic veins may also drain into it



B-The left brachiocephalic vein:

Is formed by the union of *the LEFT subclavian* and *the LEFT internal jugular veins*

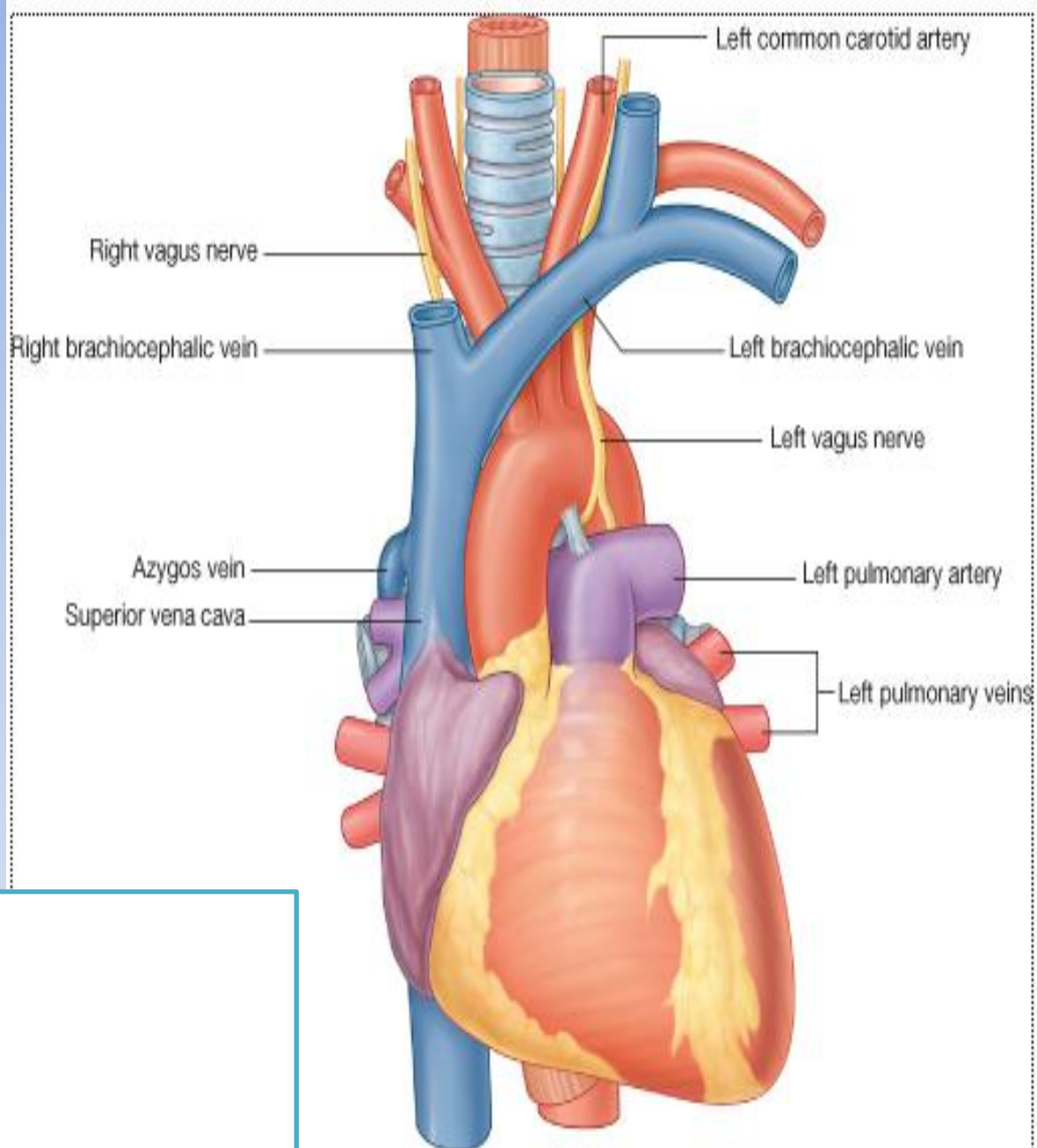
❖ **Begins posterior to the medial end of the left clavicle**

- ❖ It passes obliquely and it is longer than the right one)
- ❖ It joins the right brachiocephalic vein to form **the superior vena cava**

Venous tributaries

Include
the vertebral
first posterior intercostal vein
left superior intercostal vein
inferior thyroid vein
internal thoracic veins.

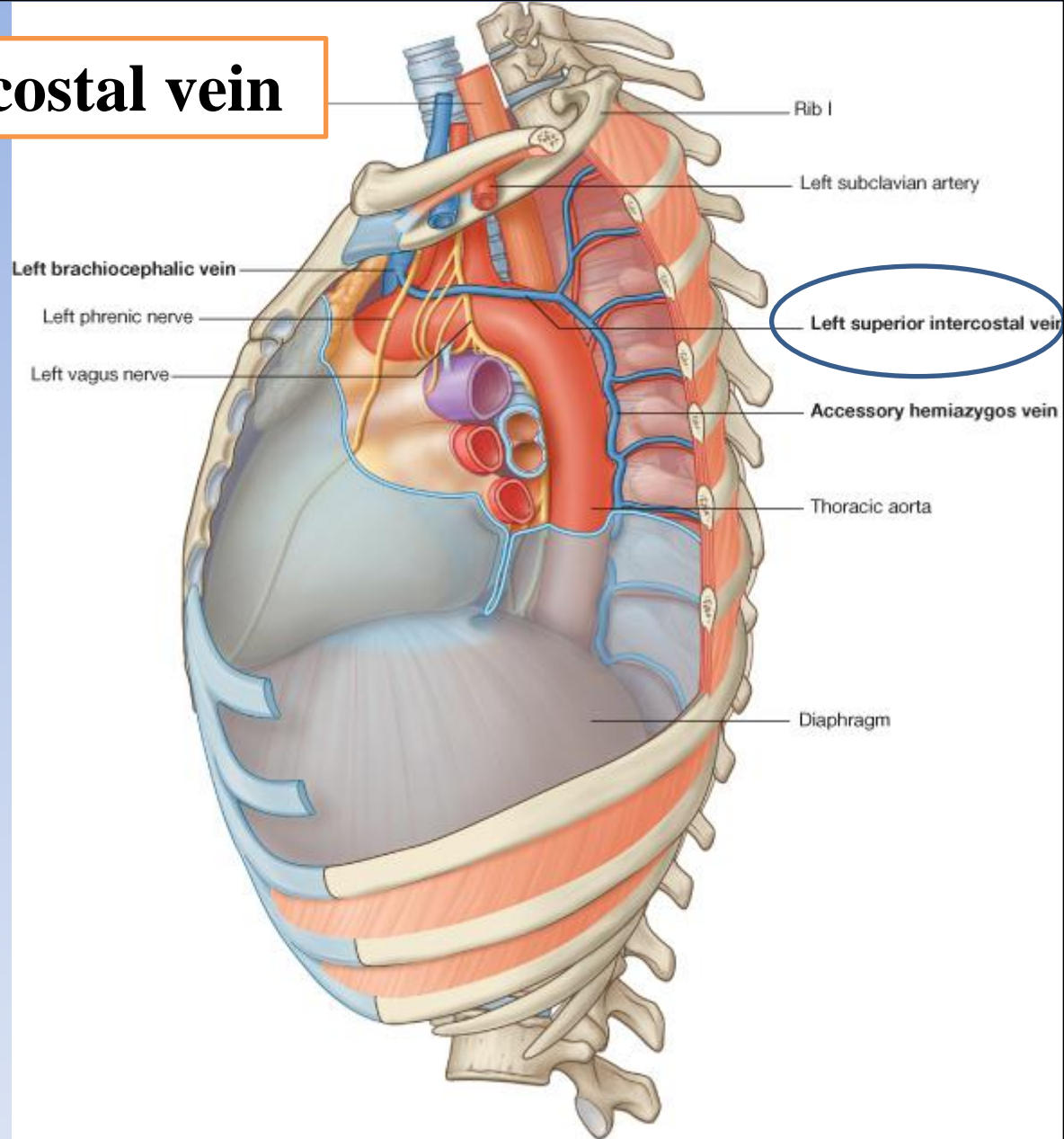
It may also receive thymic and pericardial veins



The left superior intercostal vein

It drains

- ❖ The second, third and sometimes the fourth posterior intercostal veins
- ❖ Usually, it drains the left bronchial veins
- ❖ Sometimes the left pericardiophrenic vein.

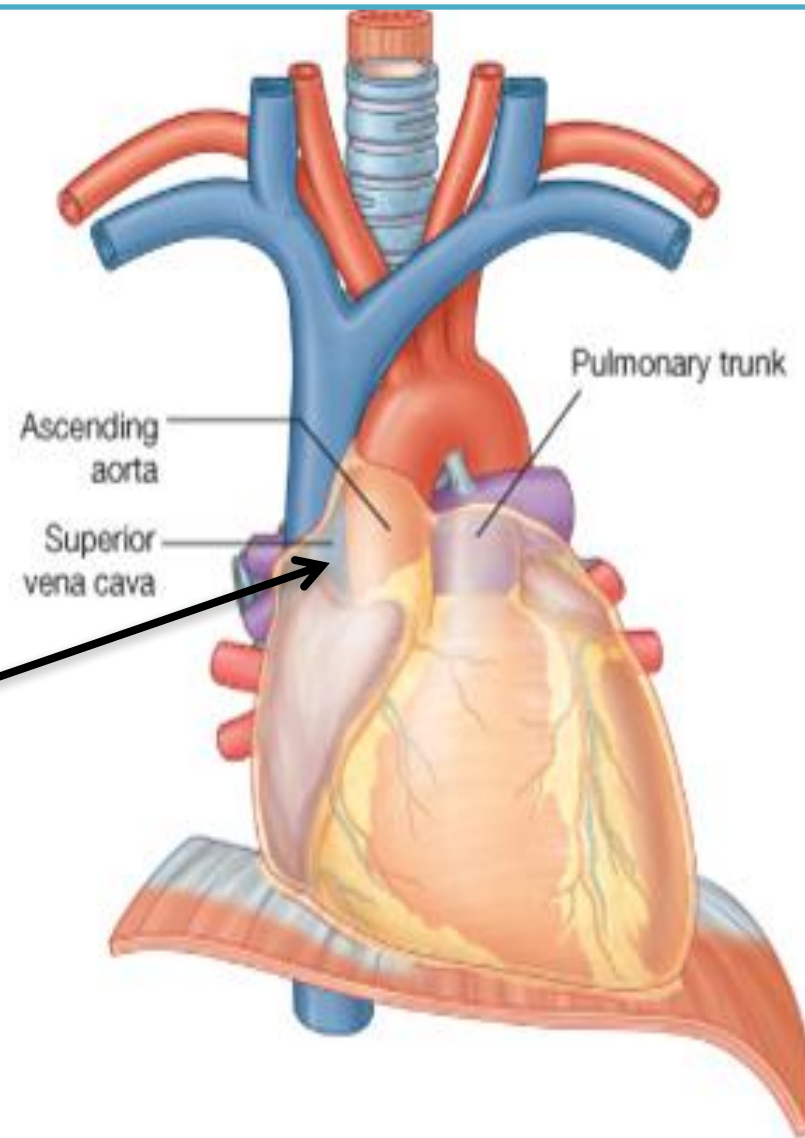


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2-Superior Vena Cava

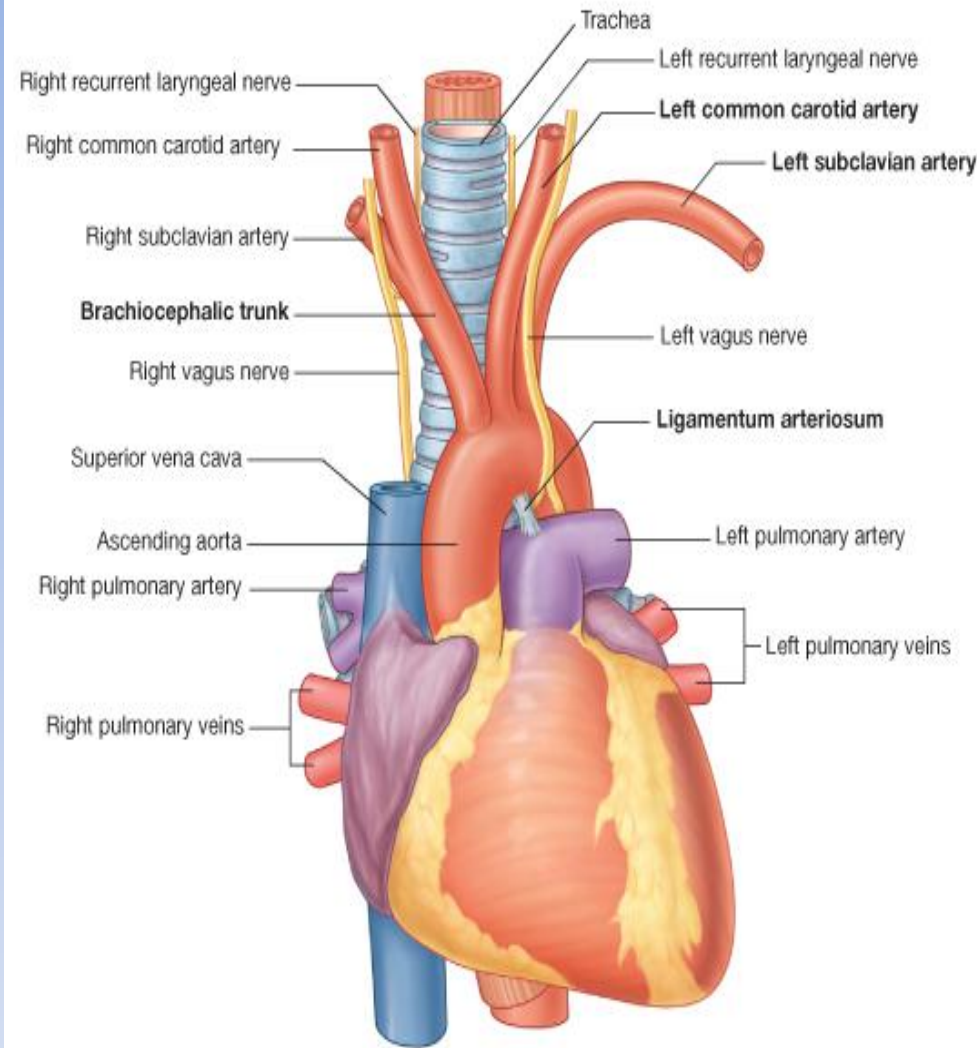
Generally, it receives venous return from the upper half of the body, above the diaphragm

- The superior vena cava contains all the venous blood from **the head and neck and both upper limbs**
- It is a large-diameter (24 mm), but short
- is formed by the union of **the two brachiocephalic veins** posterior to the lower edge of **the right first costal cartilage**
- Terminates at the lower edge of the right third costal cartilage, where it joins the right atrium
- The lower half of the superior vena cava is within the pericardial sac and is therefore contained in the middle mediastinum.
- The **vena azygos** joins the posterior aspect of the superior vena cava just before it enters the and may also receive pericardial and mediastinal veins



Arch of the Aorta

- is a continuation of the ascending aorta (what does this mean?)
 - It lies behind the manubrium sterni **extending as high as the midlevel of the manubrium of sternum**
- It arches upward, backward, and to the left
 - The arch is initially anterior and finally lateral to the trachea
 - The arch is initially anterior and finally lateral to the trachea
- Ends at the level of the sternal angle where it becomes continuous with the descending aorta.



Branches

A-THE BRACHIOCEPHALIC ARTERY

B-The left common carotid artery

C-The left subclavian artery

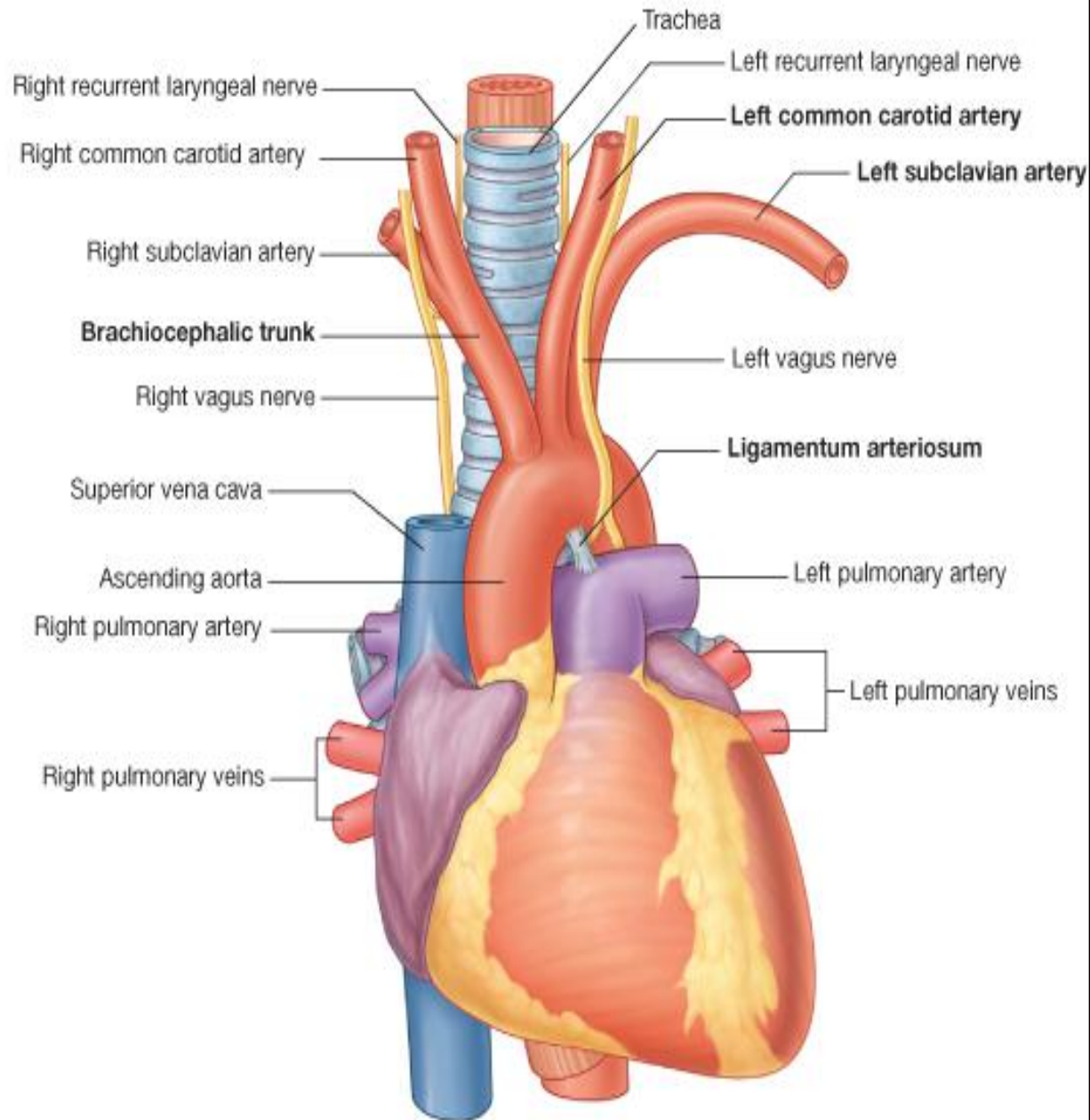
Occasionally, the brachiocephalic trunk has a small branch, the **thyroid ima artery**, which contributes to the vascular supply of the thyroid gland

A-THE BRACHIOCEPHALIC ARTERY

- ❖ The first branch of the arch of aorta from the right side
- ❖ It is the largest of the three branches
- ❖ arises from the convex surface of the aortic arch
 - *Behind the right sternoclavicular joint*

It divides into:

- 1-THE RIGHT
SUBCLAVIAN ARTERY**
- 2-RIGHT COMMON
CAROTID ARTERY**



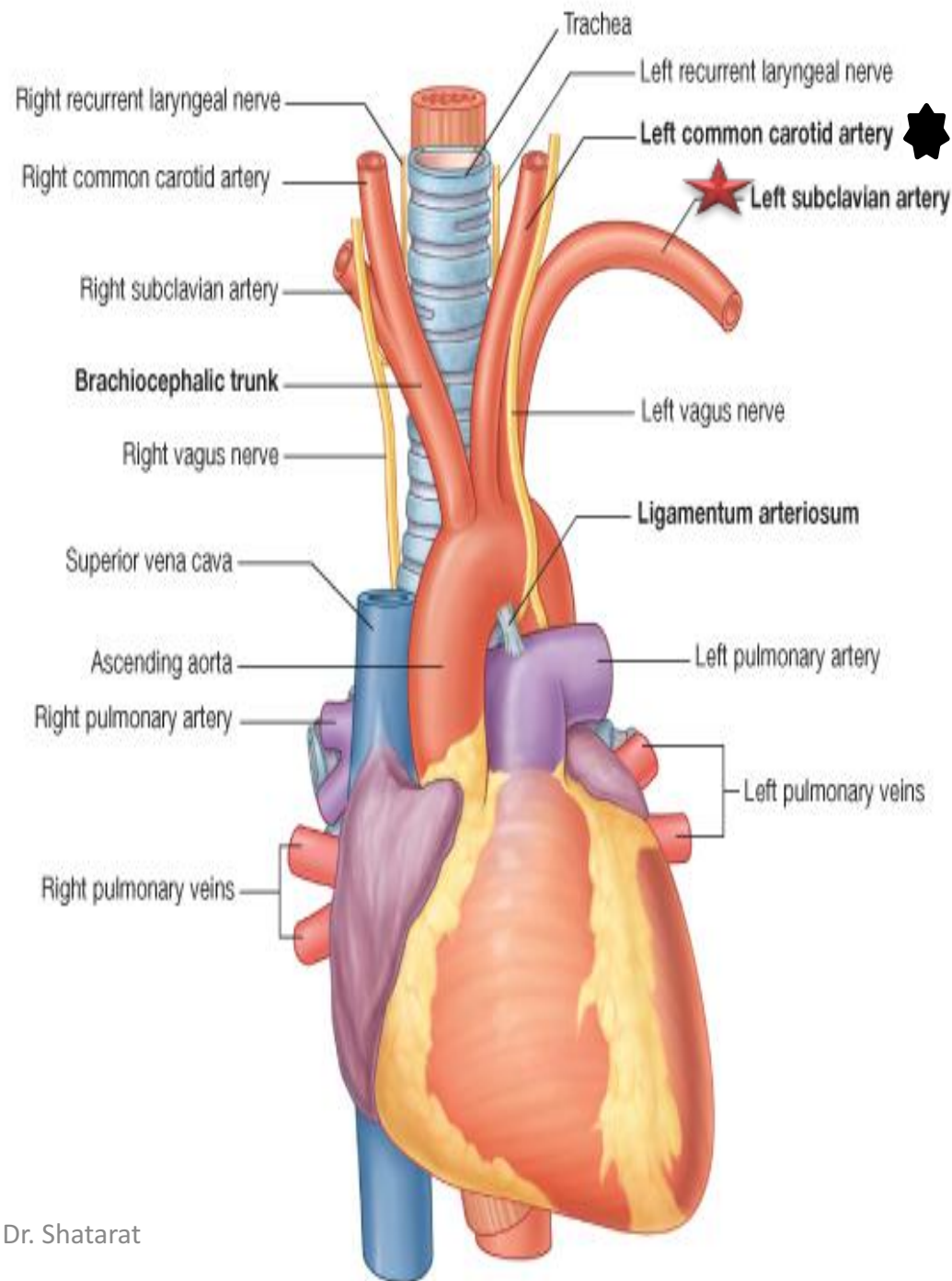
b-The left common carotid artery ☆

- Arises from the convex surface of the aortic
- It runs upward and to the left of the trachea and enters the neck behind the left sternoclavicular joint.

☆ ***c-The left subclavian artery***

Why we call it subclavian?

- arises from the aortic arch
- Runs in a groove in the first rib

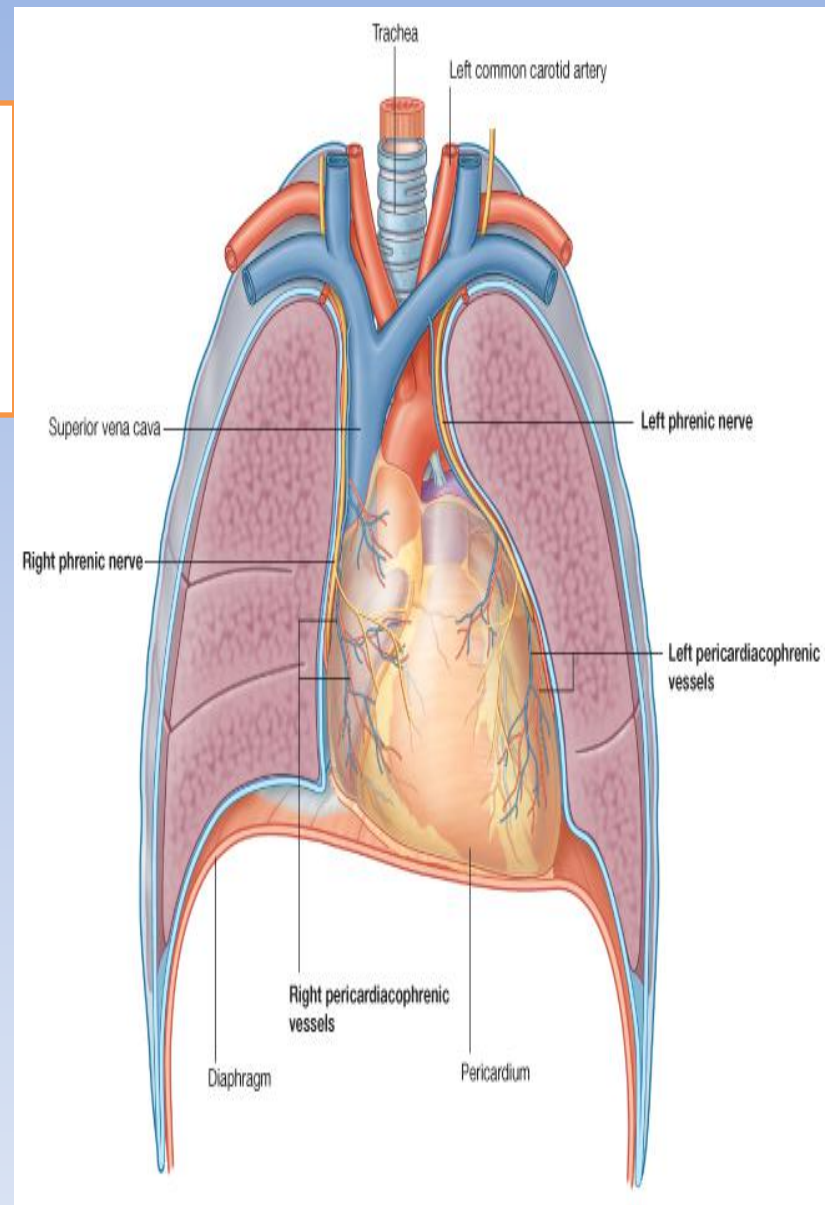


Phrenic Nerves

➤ *The phrenic nerves arise from the anterior rami of the third, fourth, and fifth cervical nerves*

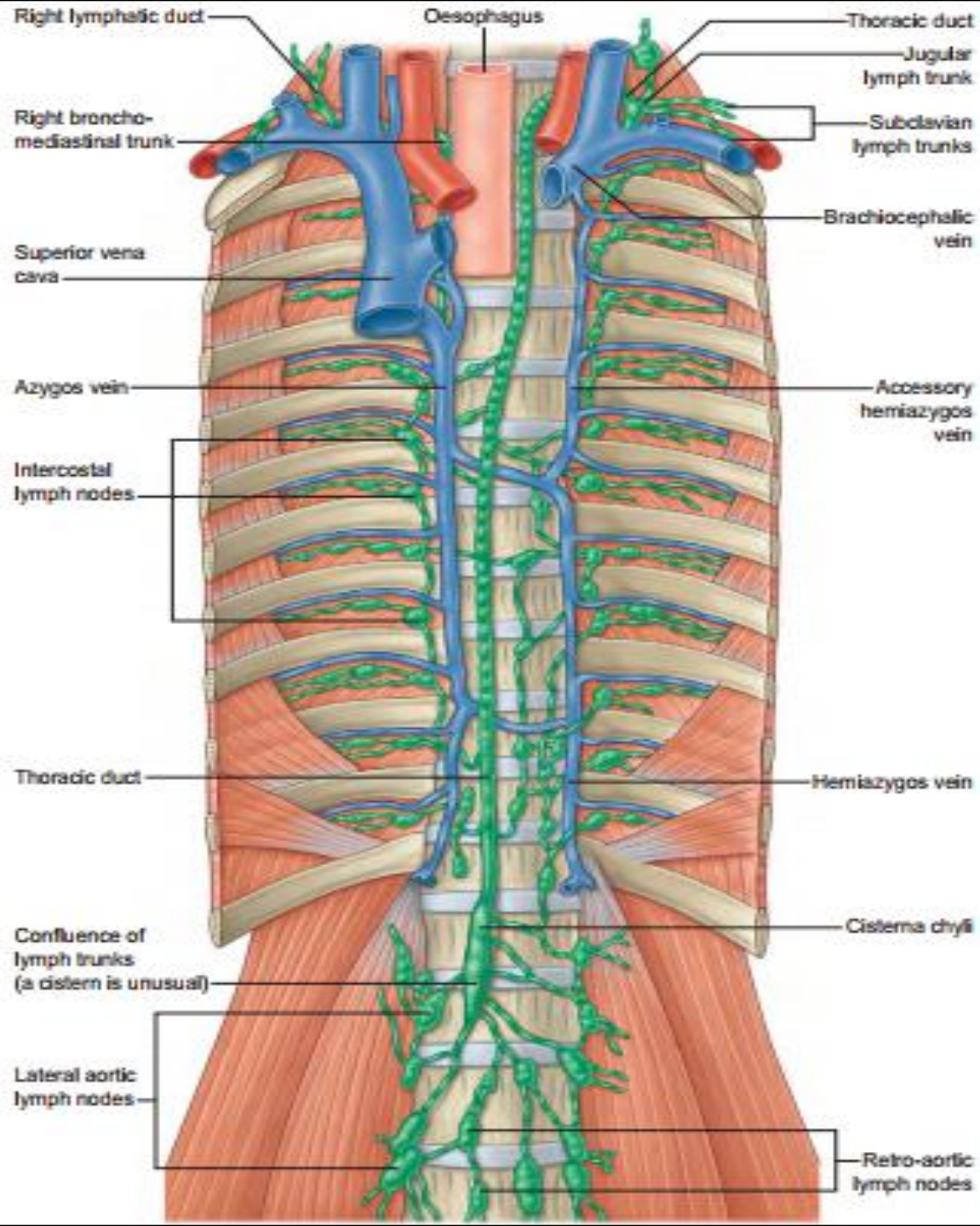
• It passes in front of the root of the lungs

Supplies the diaphragm



MEDIASTINAL LYMPH NODES

are classified into regional lymph node stations by thoracic surgeons for the purposes of staging lung cancer



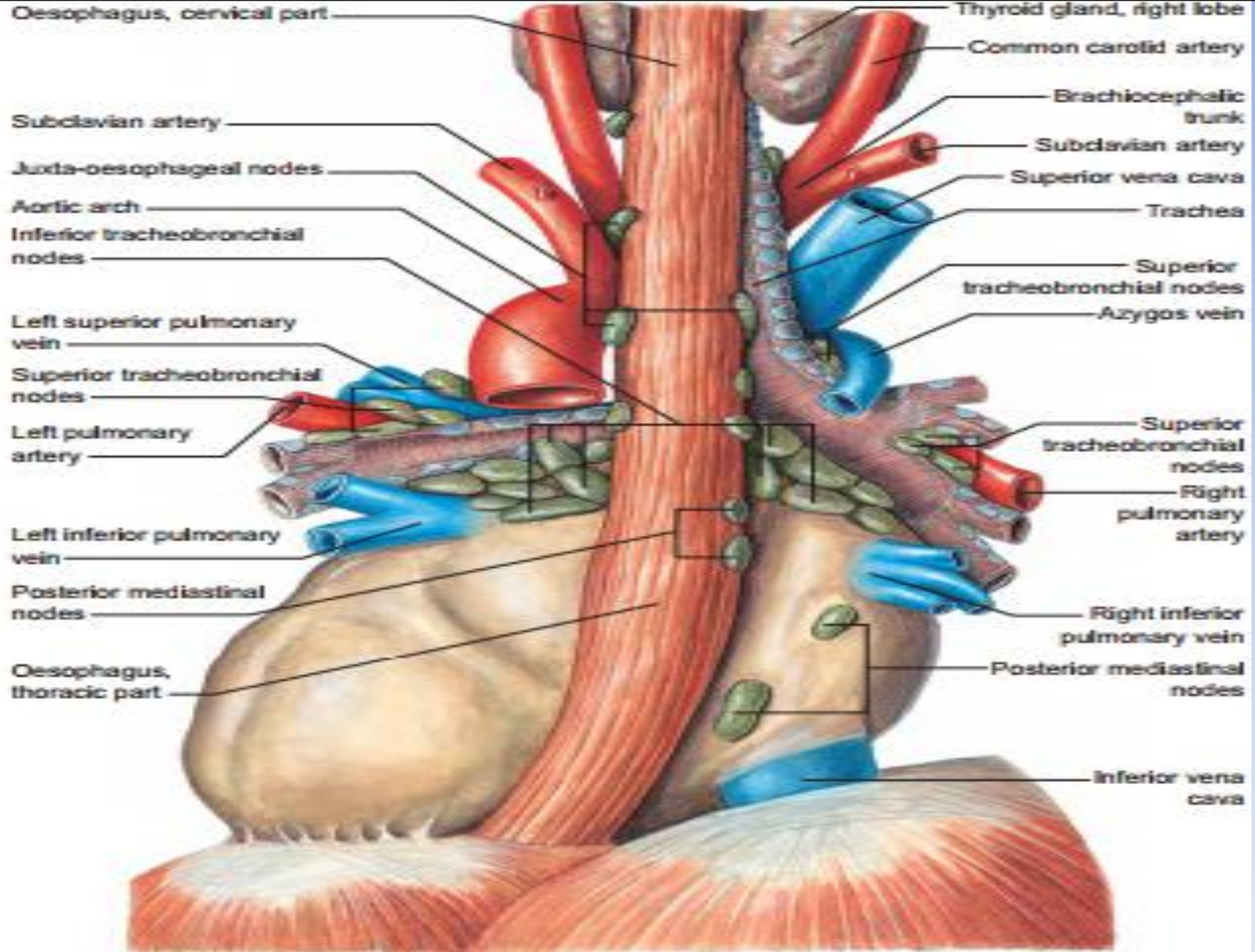


Fig. 55.4 Thoracic lymph nodes. (From Sobotta 2006.)

Venous access for central and dialysis lines

Large systemic veins are used to establish central venous access for administering large amounts of fluid, drugs, and blood. Most of these lines (small bore tubes) are introduced through venous puncture into the axillary, subclavian, or internal jugular veins

Brachiocephalic veins: an overlooked approach for central venous catheterization.

[Badran DH¹](#), [Abder-Rahman H](#), [Abu Ghaida J](#)

<https://www.ncbi.nlm.nih.gov/pubmed/12203378>

How about
Reading this

Doppler ultrasound-guided brachiocephalic central line insertion in cardiac surgery: An overlooked approach revisited

Massad I.M., Alhadidy A.M., Elsmady M.M., Abu-Abeeleh M.M., Attyat B.A., Abu-Ali H.M., Abder-Rahman H., Abu-Ghaida J.H., Badran D.H.

<http://eurjanat.com/web/paper.php?id=08030153>

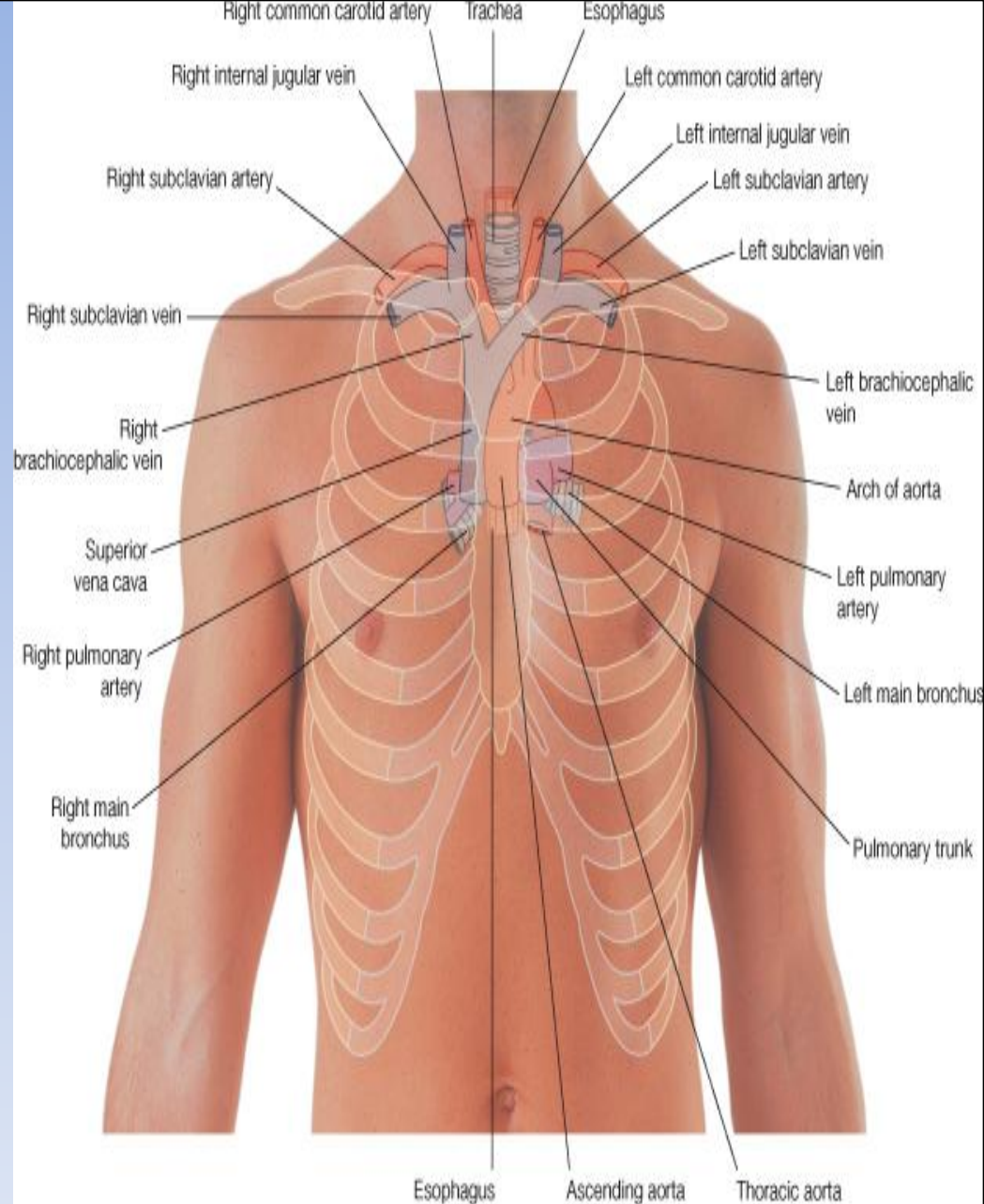
Because the superior and inferior vena cava are oriented along the same vertical axis, a guide-wire, catheter, or line can be passed from the superior vena cava through the right atrium and into the inferior vena cava. This is a common route of access for procedures such as:

transjugular liver biopsy

On each side,
the internal jugular and subclavian veins
join to form
the brachiocephalic veins
behind the sternal ends of the clavicles
near the
sternoclavicular joints

The brachiocephalic veins unite to form
the **superior vena cava**
behind the lower border of the costal
cartilage of the right first rib.

The arch of aorta begins and ends at the
transverse plane between the sternal
angle anteriorly and vertebral level
TIV/V posteriorly. The arch may reach
as high as the midlevel of the
manubrium of sternum.



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