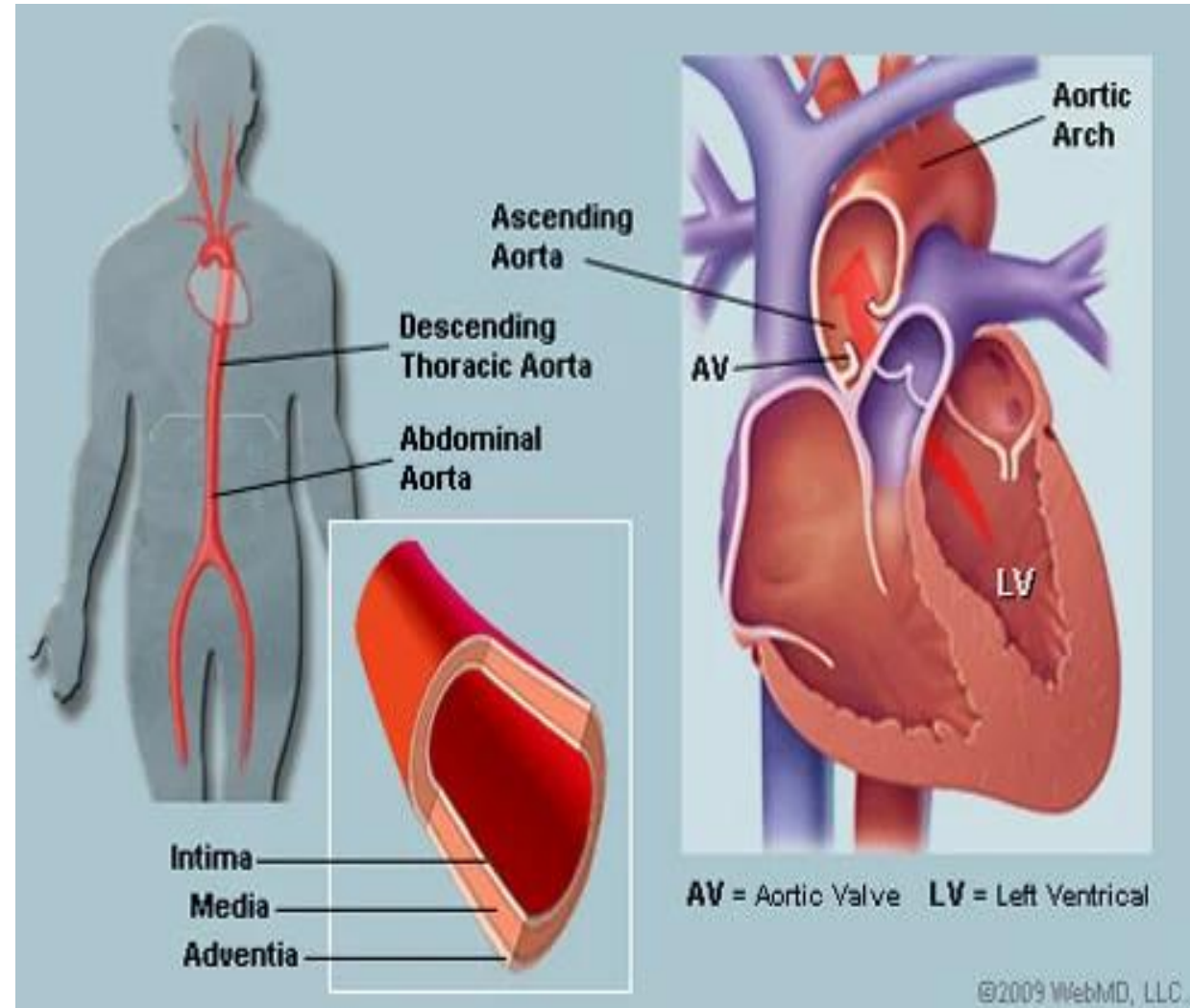


# Blood vessels of the thorax & abdomen

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# ASCENDING AORTA

- **Origin:** It arises from the left ventricle, at the level of 3rd left intercostal space.
- **Termination:** at the 2nd right costal cartilage
- It has three sinuses:
  - a. Anterior
  - b. left posterior
  - c. right posterior
- **Branches:**
  - 1. Right coronary artery: arise from the anterior aortic sinus
  - 2. Left coronary artery: arise from the left posterior aortic sinus

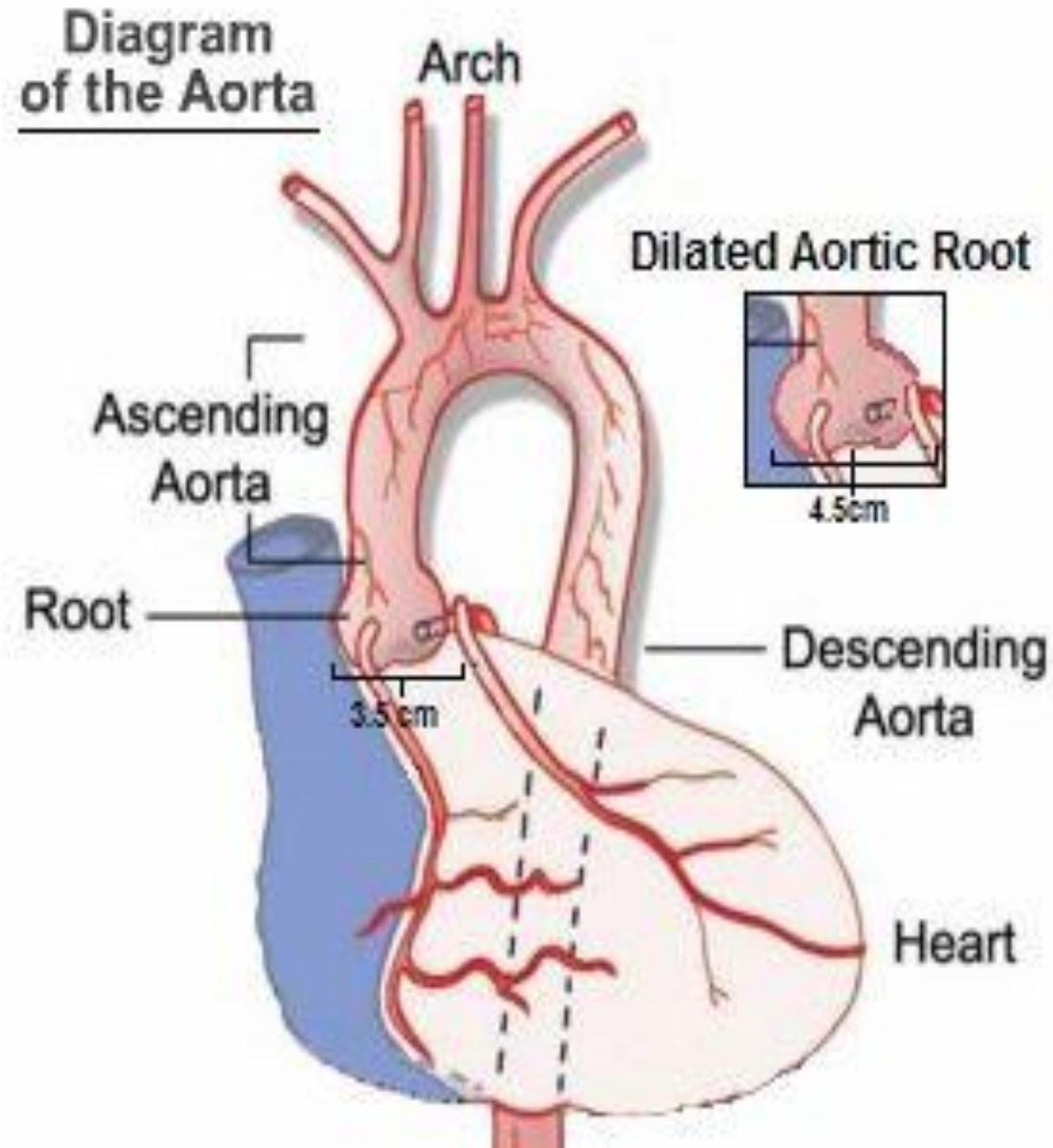


# ARCH OF THE AORTA

**Begins:** at the right border of sternum, at the level of right 2<sup>nd</sup> costal cartilage.

**Ends:** at the left side of lower border of fourth thoracic vertebra.

**Course:** it inclines from right to the left and from the front to the back. It rises to a height corresponding to the centre of manubrium sterni and lies in its entire course within the superior mediastinum

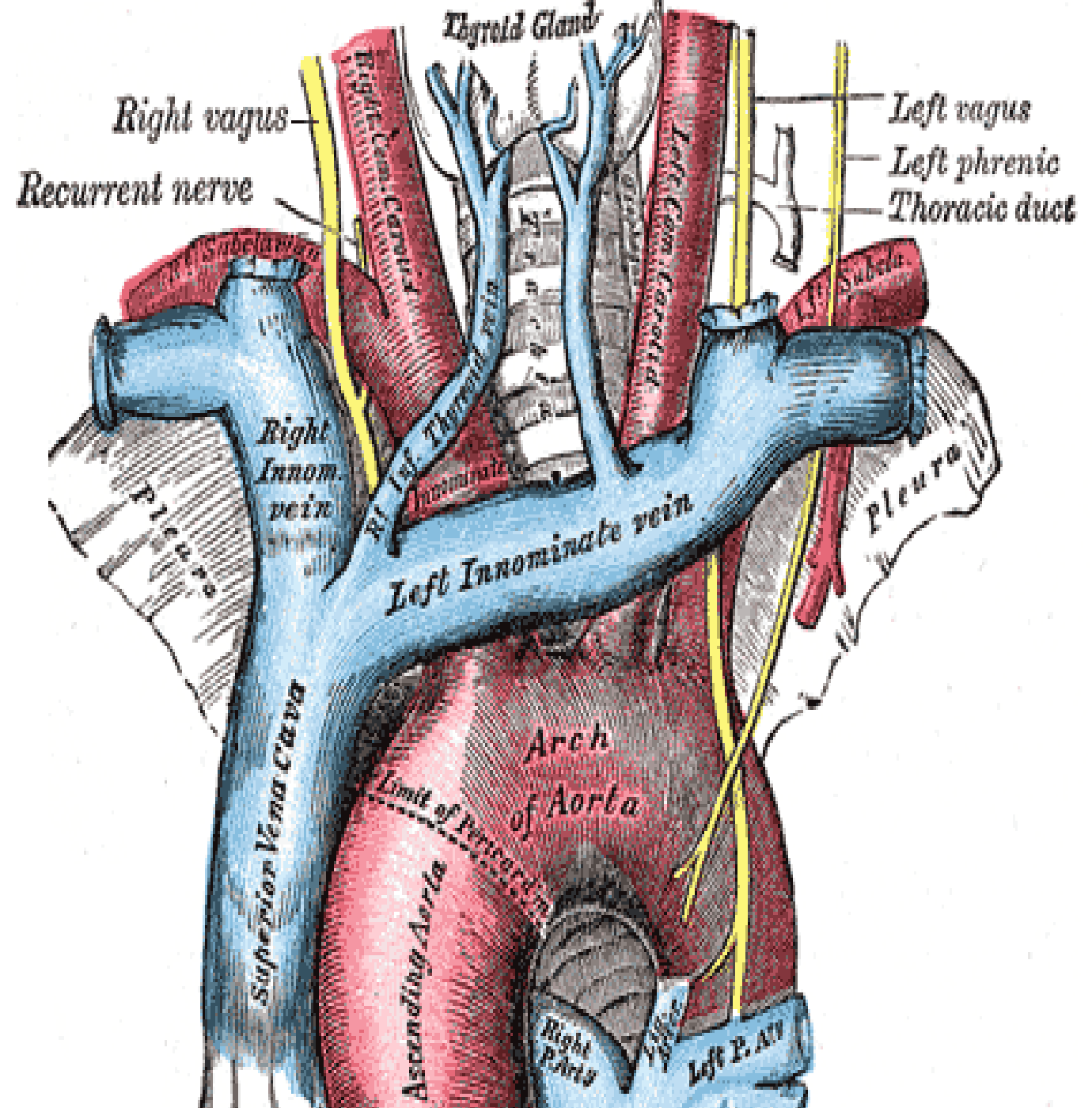


## BRANCHES

- A. Brachiocephalic (innominate) artery.
- B. Left common carotid artery.
- C. Left subclavian artery.
- Occasionally, a fourth branch referred to as thyroidea ima artery may originate from the arch of aorta.

## Points to be noted in the course of arch of aorta

- A. The arch of aorta arches over the root of left lung.
- B. It begins and ends at the same level, i.e., at sternal angle.
- C. It begins anteriorly and ends posteriorly.



# RELATIONS OF AORTIC ARCH

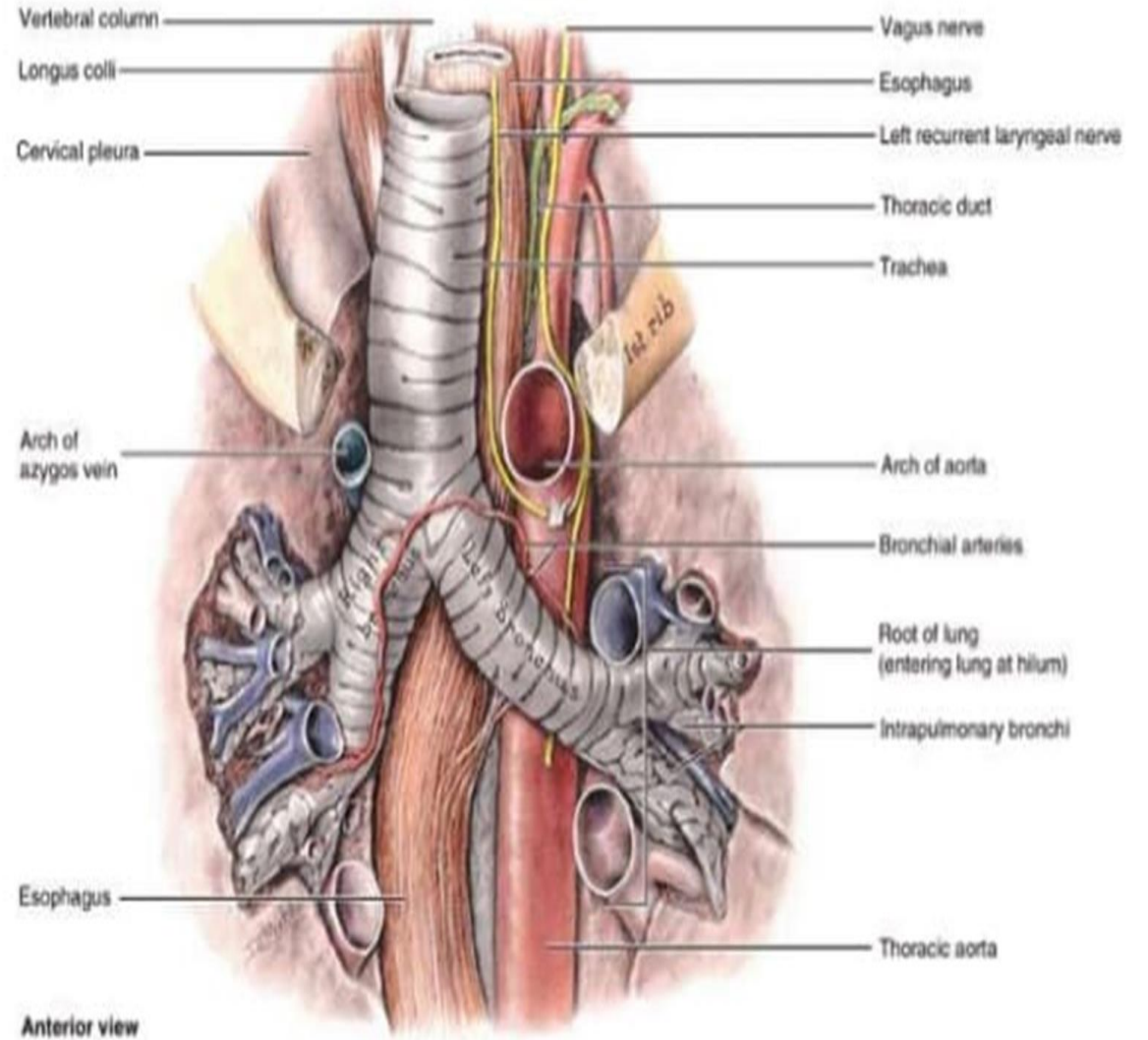
## • ANTERIORLY AND TO THE LEFT

- PLEURA
- LUNG
- PHRENIC N.
- PERICARDIOPHRENIC VESSELS
- VAGUS N.



## • POSTERIORLY AND TO THE RIGHT

- TRACHEA
- ESOPHAGUS
- LEFT RECURRENT N.
- THORACIC DUCT
- DEEP CARDIAC PLEXUS



# RELATIONS OF AORTIC ARCH

- **SUPERIORLY**

- ITS THREE BRANCHES
- LEFT BRACHIOCEPHALIC V.
- THYMUS

- **INFERIORLY**

- PULMONARY A.
- ARTERIAL LIGAMENT
- LEFT RECURRENT N.
- LEFT PRINCIPAL BRONCHUS
- SUPERFICIAL CARDIAC PLEXUS



## **\*\* Relations = contents of the superior mediastinum**

### **1) Superiorly:**

- 1- The three branches of the aortic arch,
  - a- Brachiocephalic artery.
  - b- Left common carotid artery.
  - c- Left subclavian artery.
- 2- Left brachiocephalic vein crosses in front the 3 arteries.

### **2) Inferiorly;**

- 1- Left pulmonary artery.
- 2- Left bronchus.
- 3- Ligamentum arteriosum.
- 4- Left recurrent laryngeal nerve.

### **3) Posterior:**

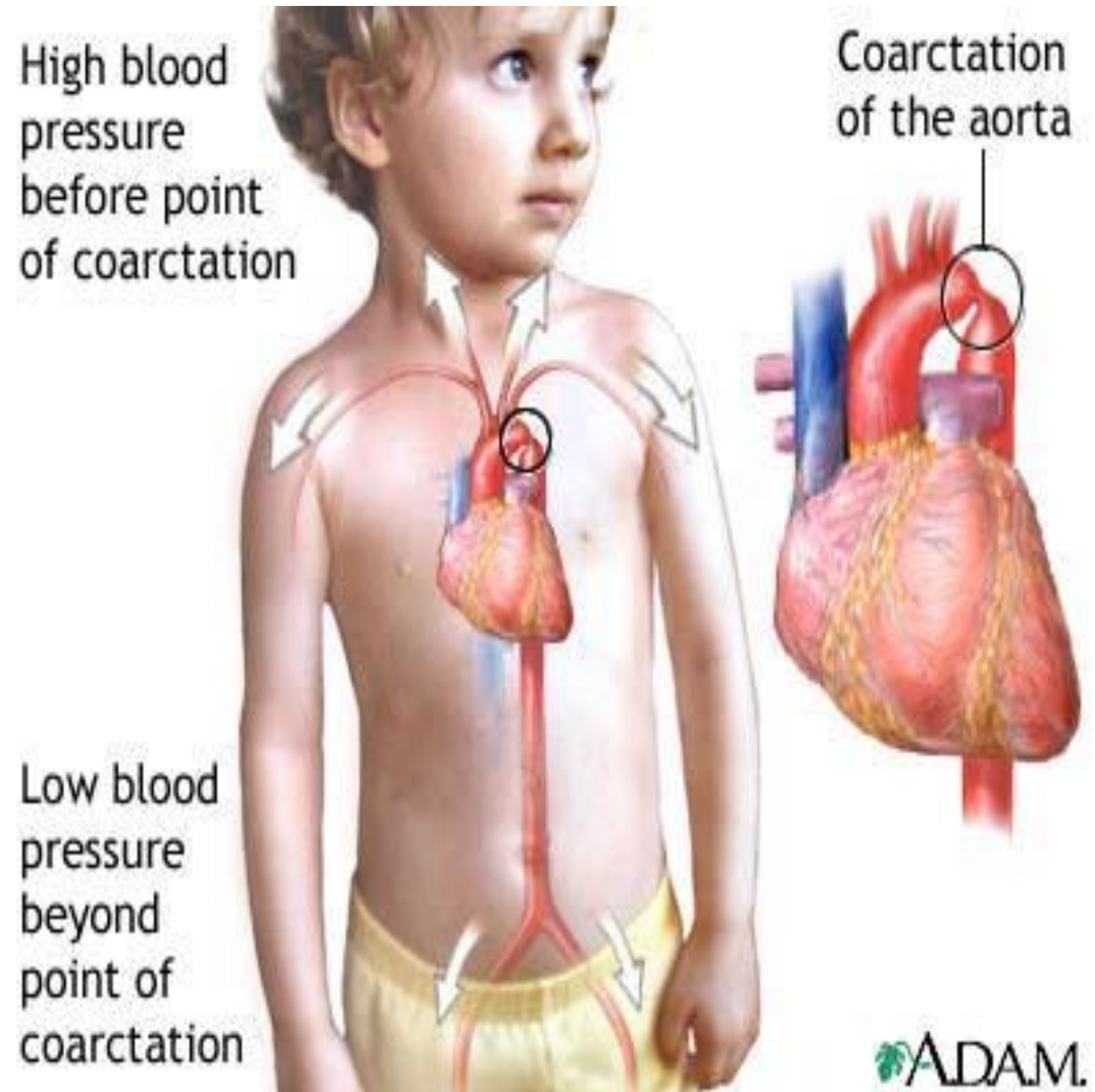
- |                                                                             |              |                          |
|-----------------------------------------------------------------------------|--------------|--------------------------|
| 1- Trachea.                                                                 | 2- Esophagus | 4-. Deep cardiac plexus. |
| 3- Left recurrent laryngeal nerve ( <i>between trachea and esophagus</i> ). |              |                          |

### **4) Anterior,**

- 1- Manubrium sterni and thymus gland.
- 2- Left pleura and lung
- 3- Left phrenic nerve.
- 4-Left vagus nerve
- 5- Left superior intercostal vein

## Applied anatomy

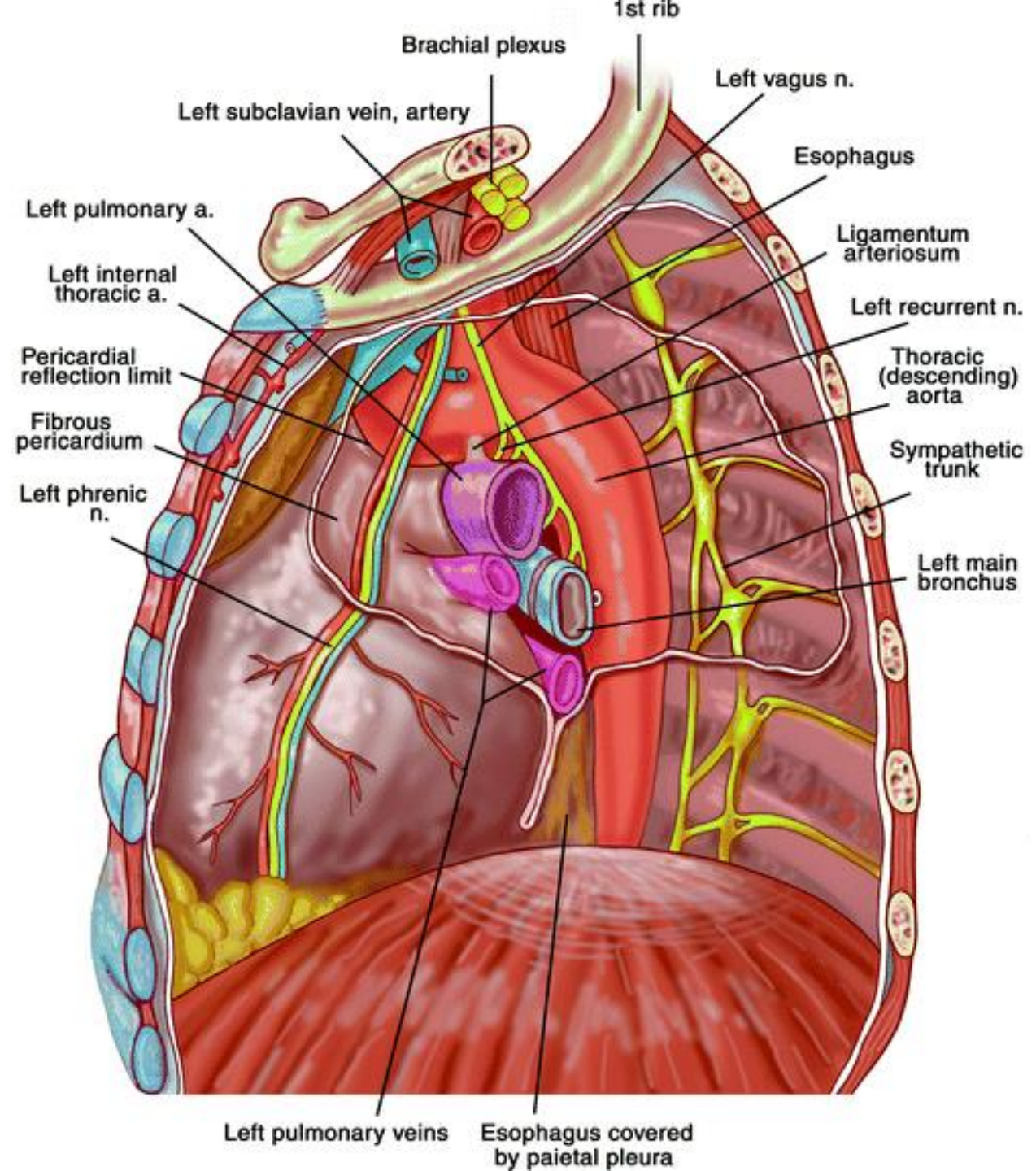
- Immediately distal to origin of left subclavian artery, the arch of the aorta narrows. This is known as aortic isthmus. This is the common site of coarctation of aorta
- Ascending aorta is also common site for aneurysm.



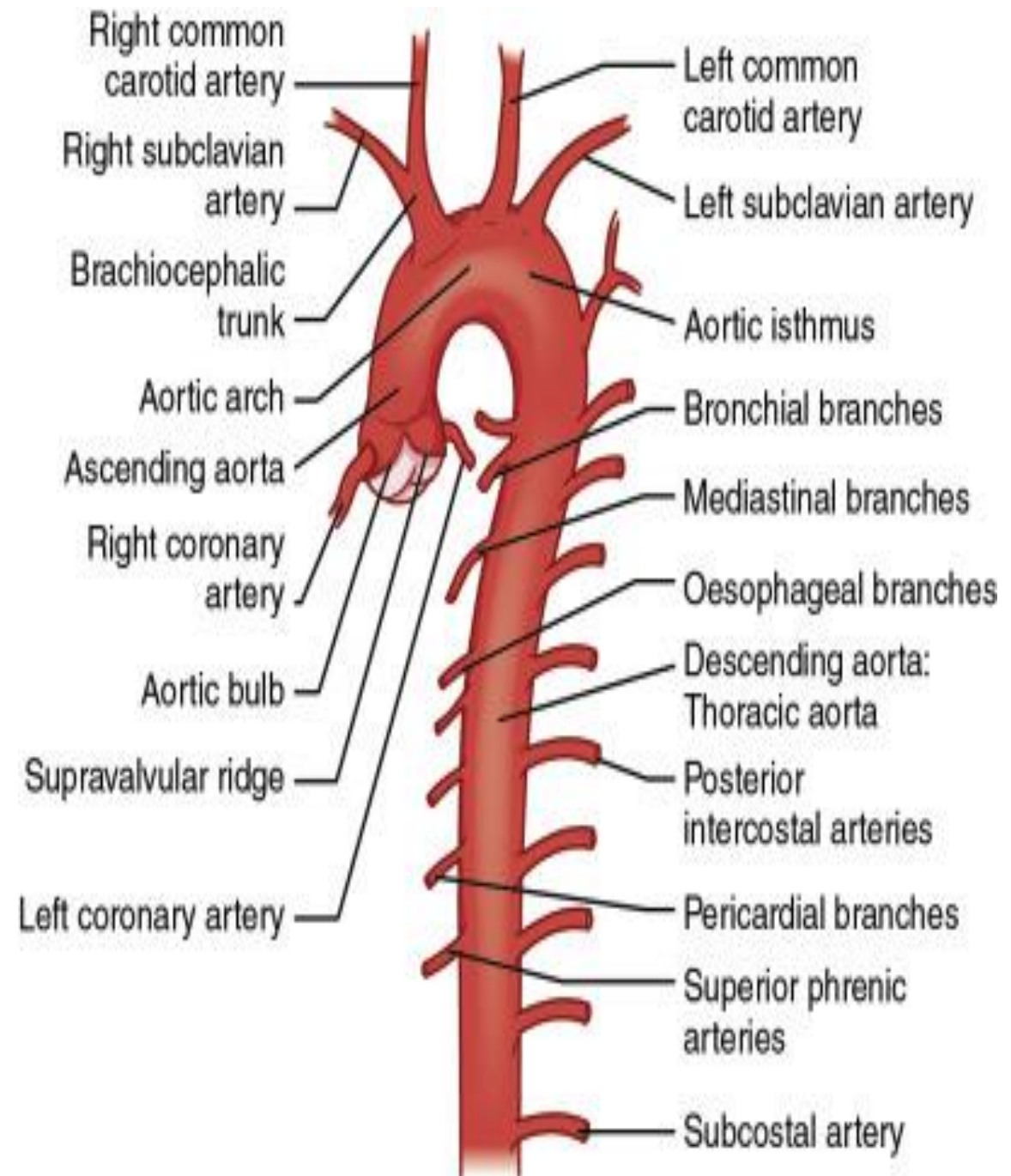


# DESCENDING AORTA

- The descending aorta is the section of the **thoracic aorta** which is contained in the posterior mediastinum.
- It originates leveled along with the lower boundary of the **T4 vertebra**, consistent with the aortic arch, and also terminates anterior to the lower boundary of the **T12 vertebra** within the **aortic hiatus**.
- it initially begins to the left of the vertebral column but approaches the midline as it descends. It leaves the thorax via the **aortic hiatus** in the diaphragm, and becomes the abdominal aorta.

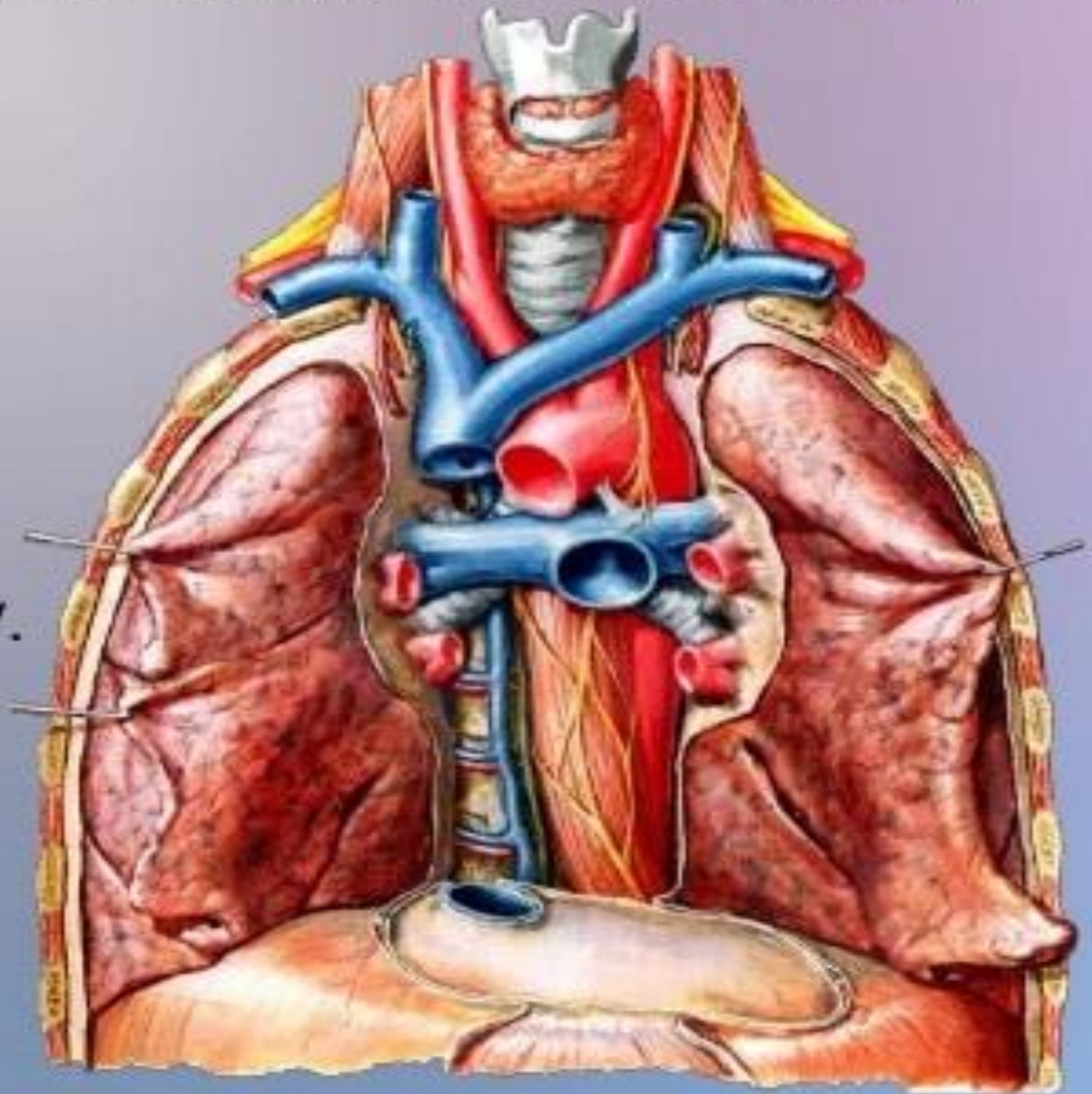


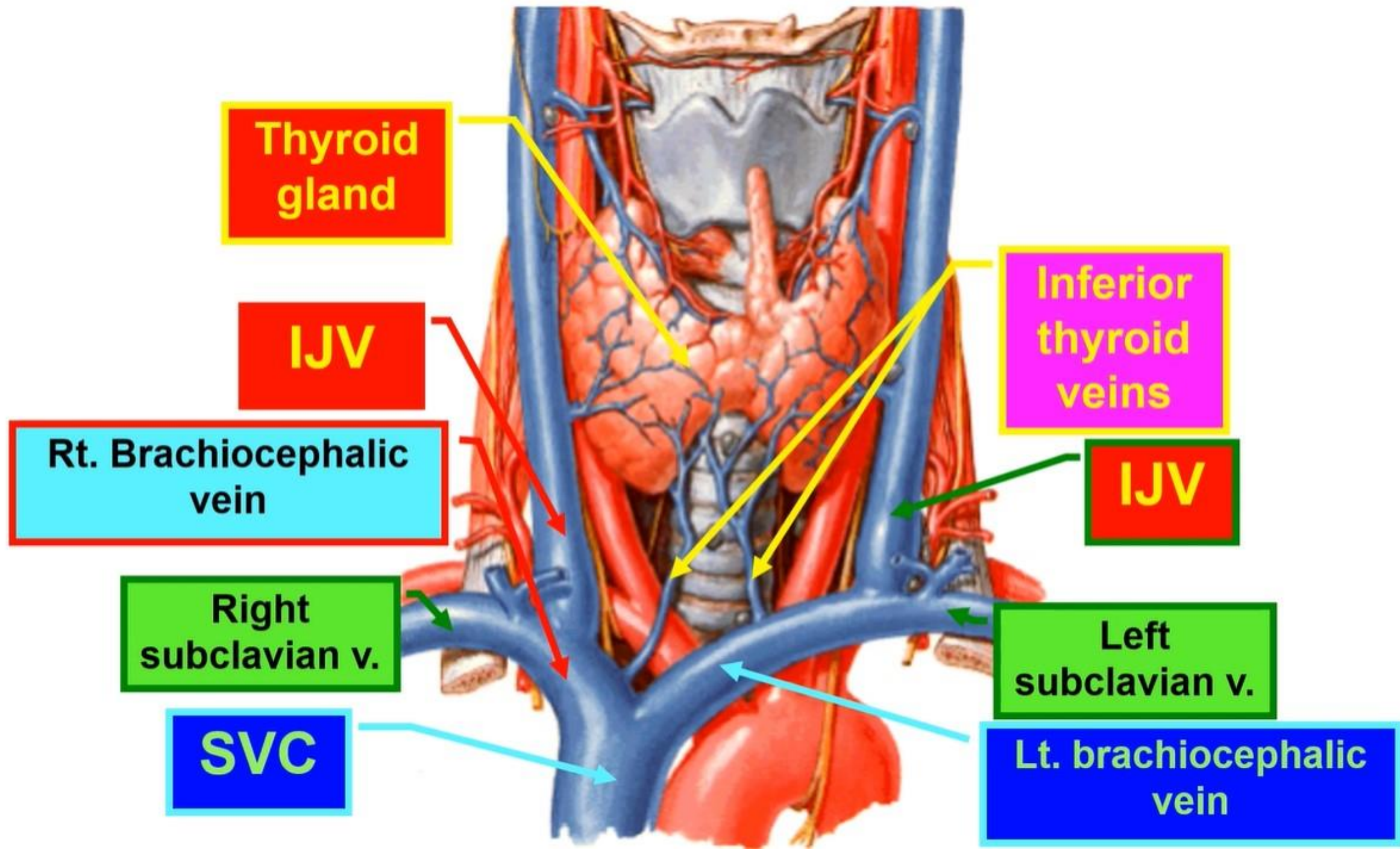
- **Branches**
- **A. Parietal branches:**
- **1. Posterior intercostals arteries**
- **2. Subcostal artery**
- **3. Phrenic branches**
- **2. Subcostal artery**
- **3. Phrenic branches**
- **B. Visceral branches**
- **1. Pericardial branches**
- **2. Bronchial arteries**
- **3. Mediastinal branches**
- **4. Esophageal**



# RELATIONS OF THORACIC AORTA

- **ANTERIORLY**
  - LEFT ROOT OF LUNG
  - PERICARDIUM
  - ESOPHAGUS
- **POSTERIOR**
  - HEMIAZYGOS V.
  - ACCESSORY HEMIAZYGOS V.
- **RIGHT**
  - AZYGOS V.
  - THORACIC DUCT
- **LEFT** — MEDIASTINAL PLEURA





- **Tributaries of left brachiocephalic vein**

1. Left **subclavian** vein.
2. Left **internal jugular** V.
3. Left **internal thoracic** vein.
4. Left **inferior thyroid** vein.
5. Left **vertebral** vein.
6. Left **first posterior intercostal** vein.
7. Left **superior intercostal** vein.

- **Tributaries of right brachiocephalic vein**

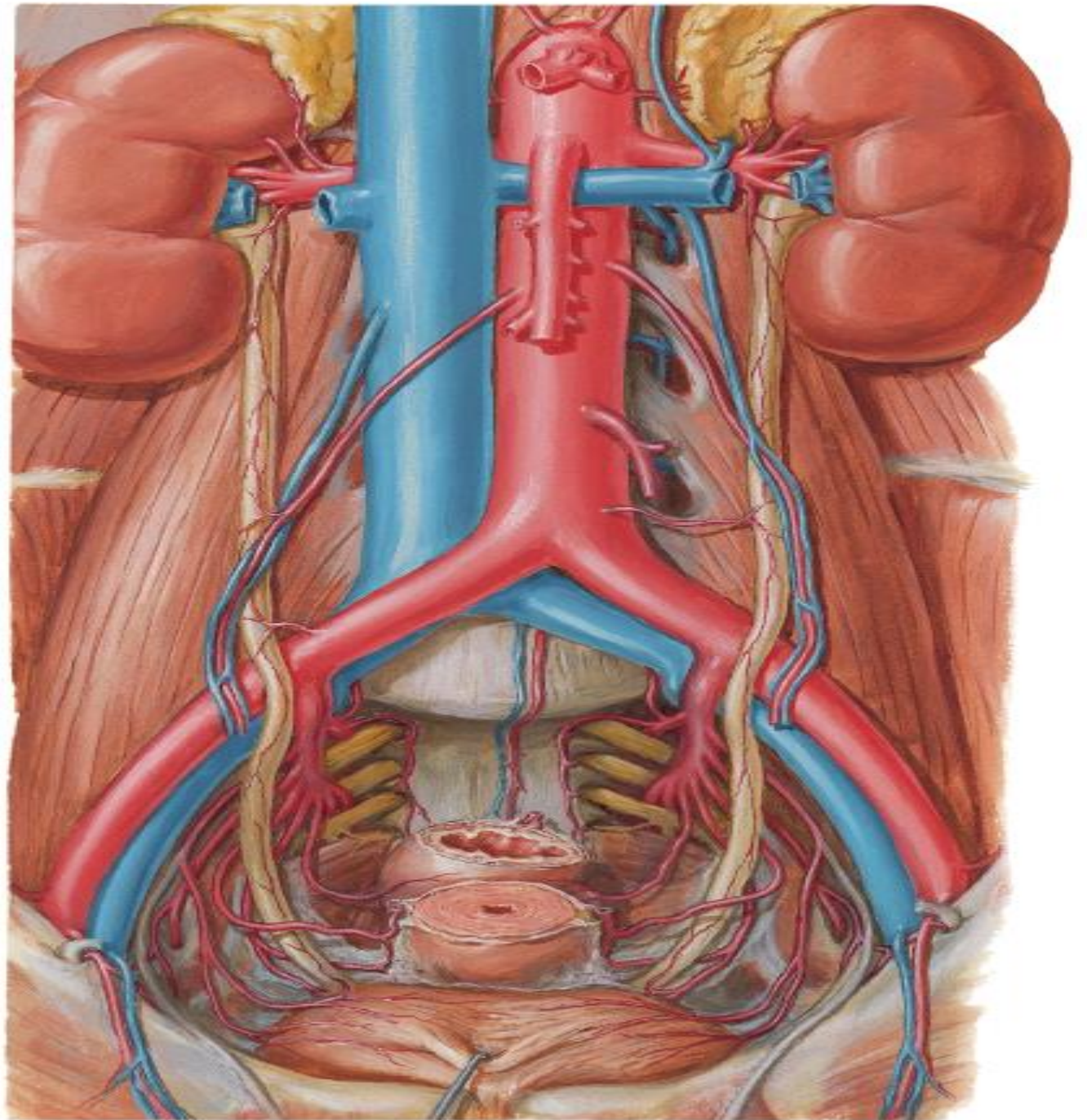
1. Right **subclavian** vein.
2. Right **internal jugular** V
3. Right **internal thoracic** vein.
4. Right **inferior thyroid** vein.
5. Right **vertebral** vein.
6. Right first **posterior intercostal** vein

□ **N.B; Right superior intercostal vein ends in the arch of azygos vein.**

# Abdominal aorta

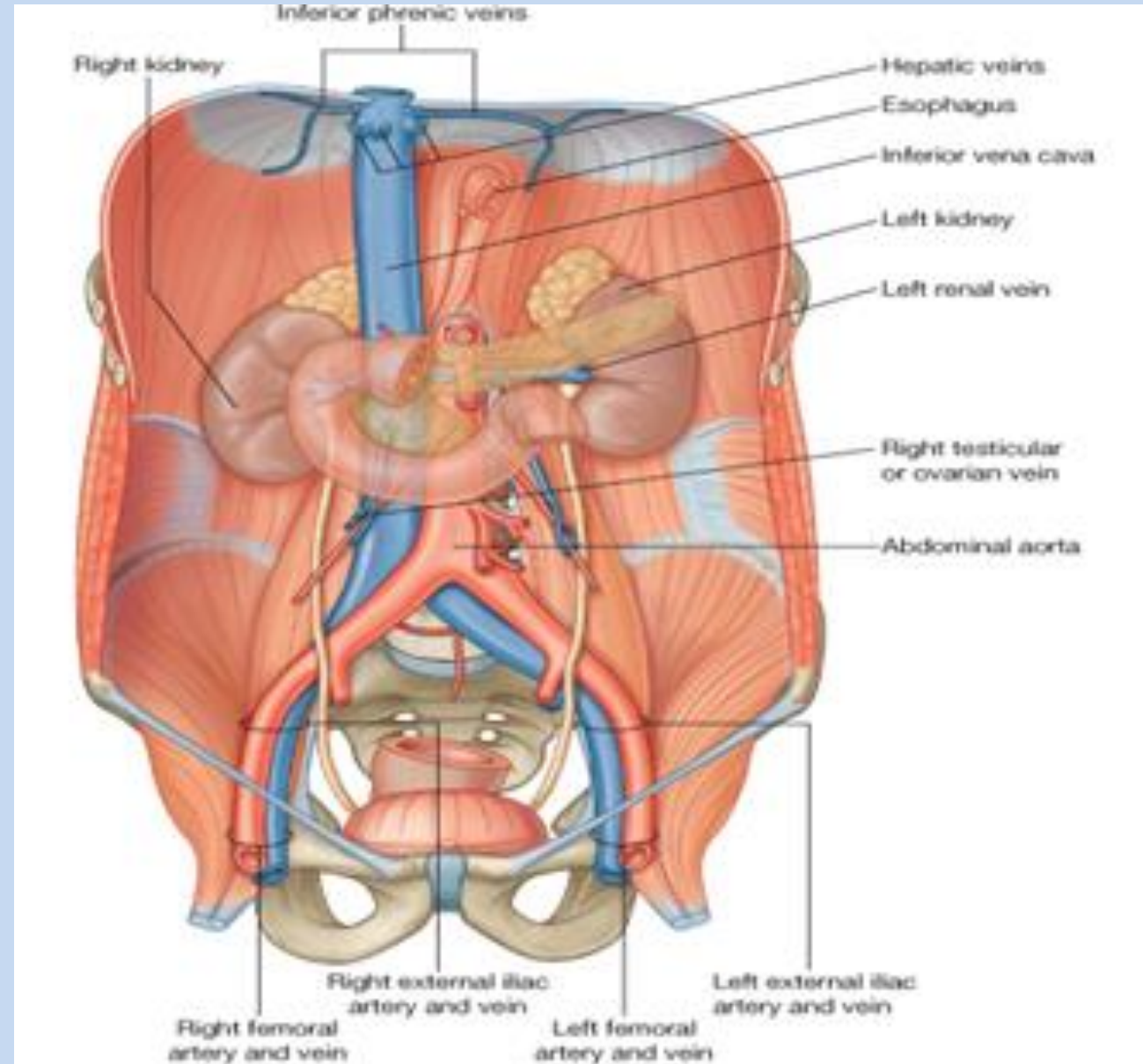
**Beginning:** It enters the abdomen opposite 12<sup>th</sup> thoracic vertebra through aortic opening of the diaphragm.

**Termination:** It ends by dividing into 2 common iliac arteries opposite the 4th lumbar vertebra.



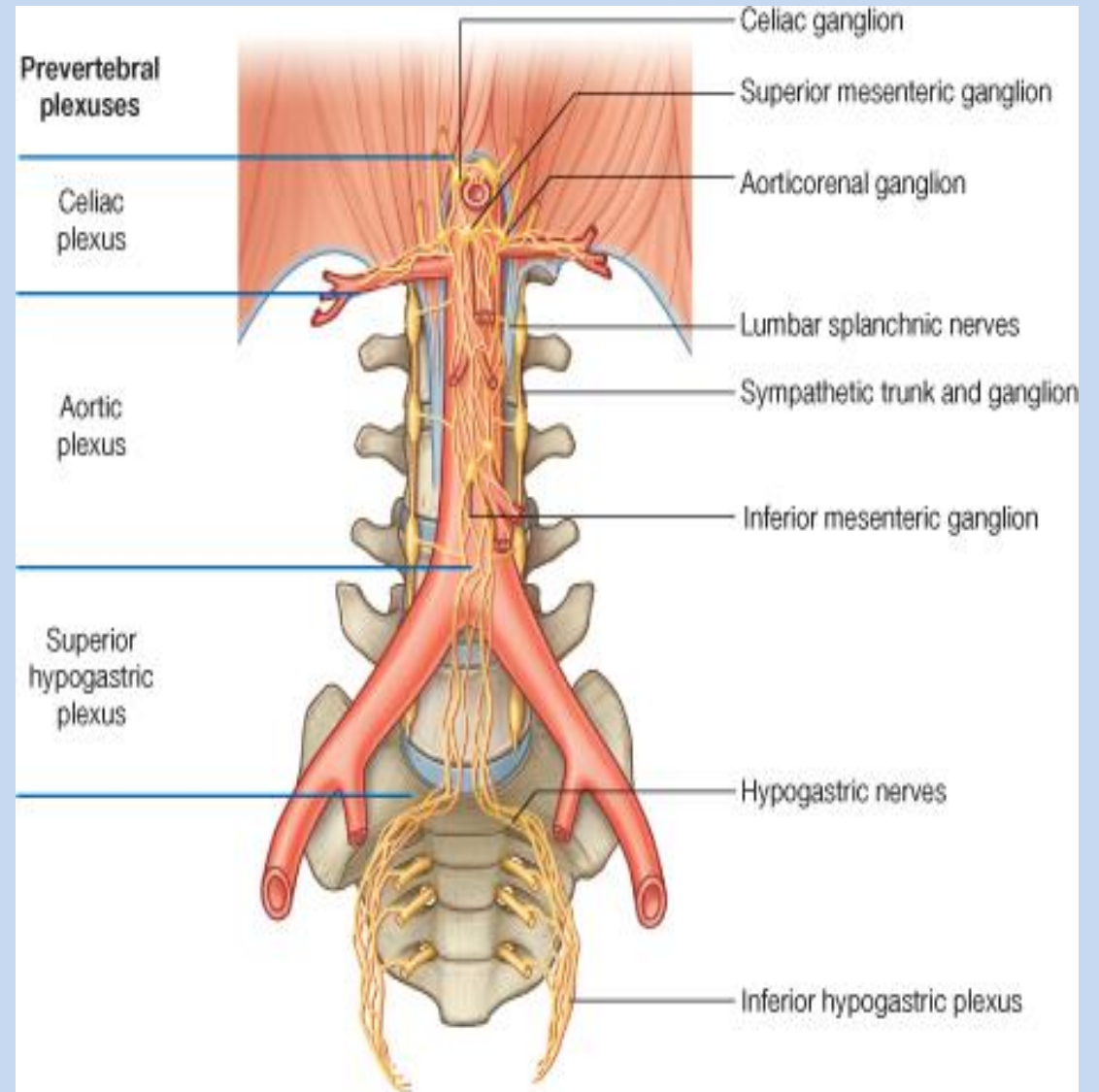
## Anterior relations from superior to inferior:

1. Celiac ganglia and plexus.
2. Body of the pancreas.
3. Splenic and left renal veins.
4. (3<sup>rd</sup> part) of the duodenum.
5. Superior mesenteric vessels and root of mesentery.
6. coils of small intestine.



# Posterior relations:

1. Lumbar vertebrae (1-4) and intervertebral discs.
2. Anterior longitudinal ligament.
3. 3<sup>rd</sup> and 4<sup>th</sup> lumbar veins.



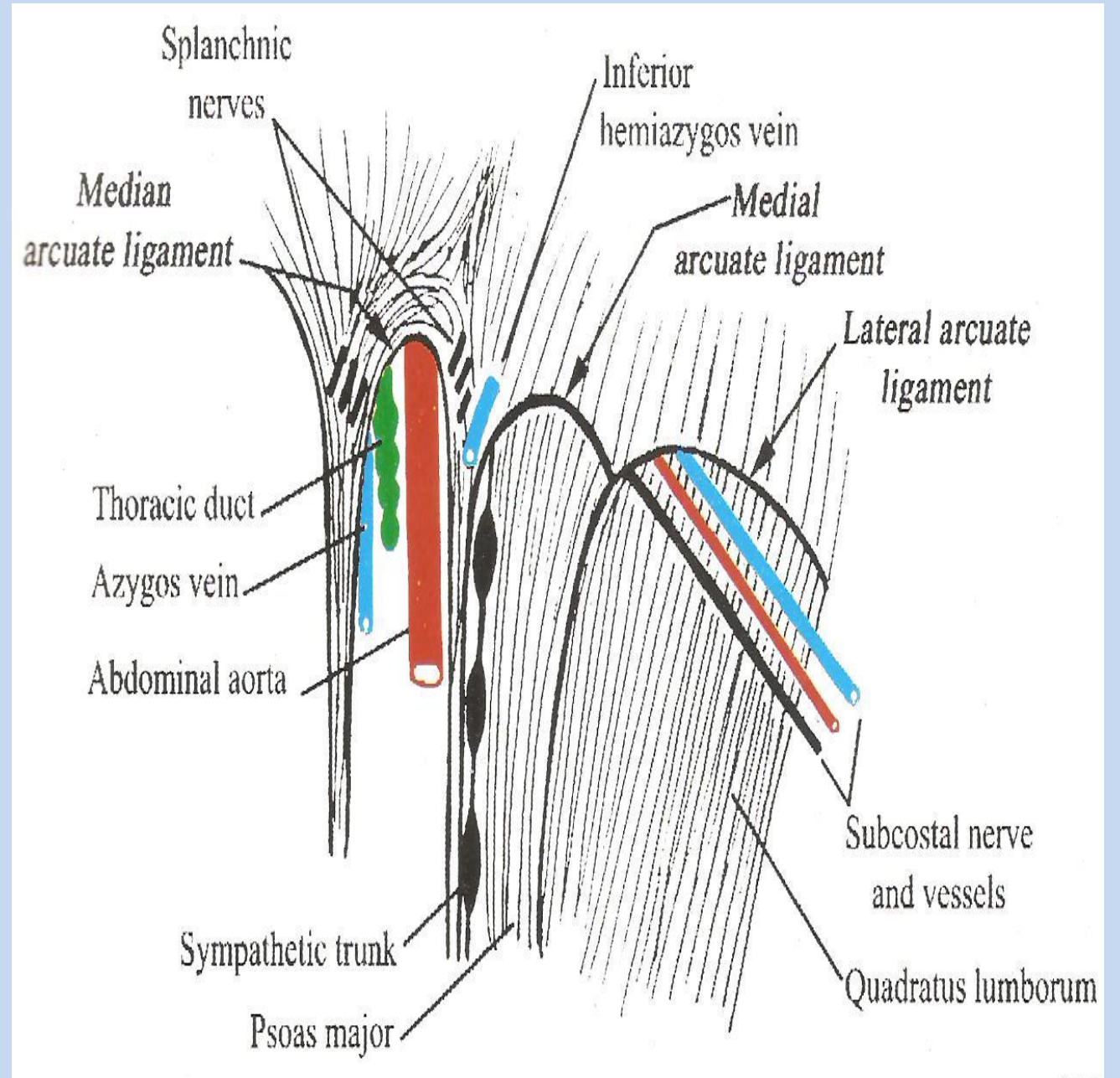


## On the right:

- 1) Azygos vein.
- 2) Cisterna chili and thoracic duct.
- 3) Right crus of the diaphragm.
- 4) Inferior vena cava.

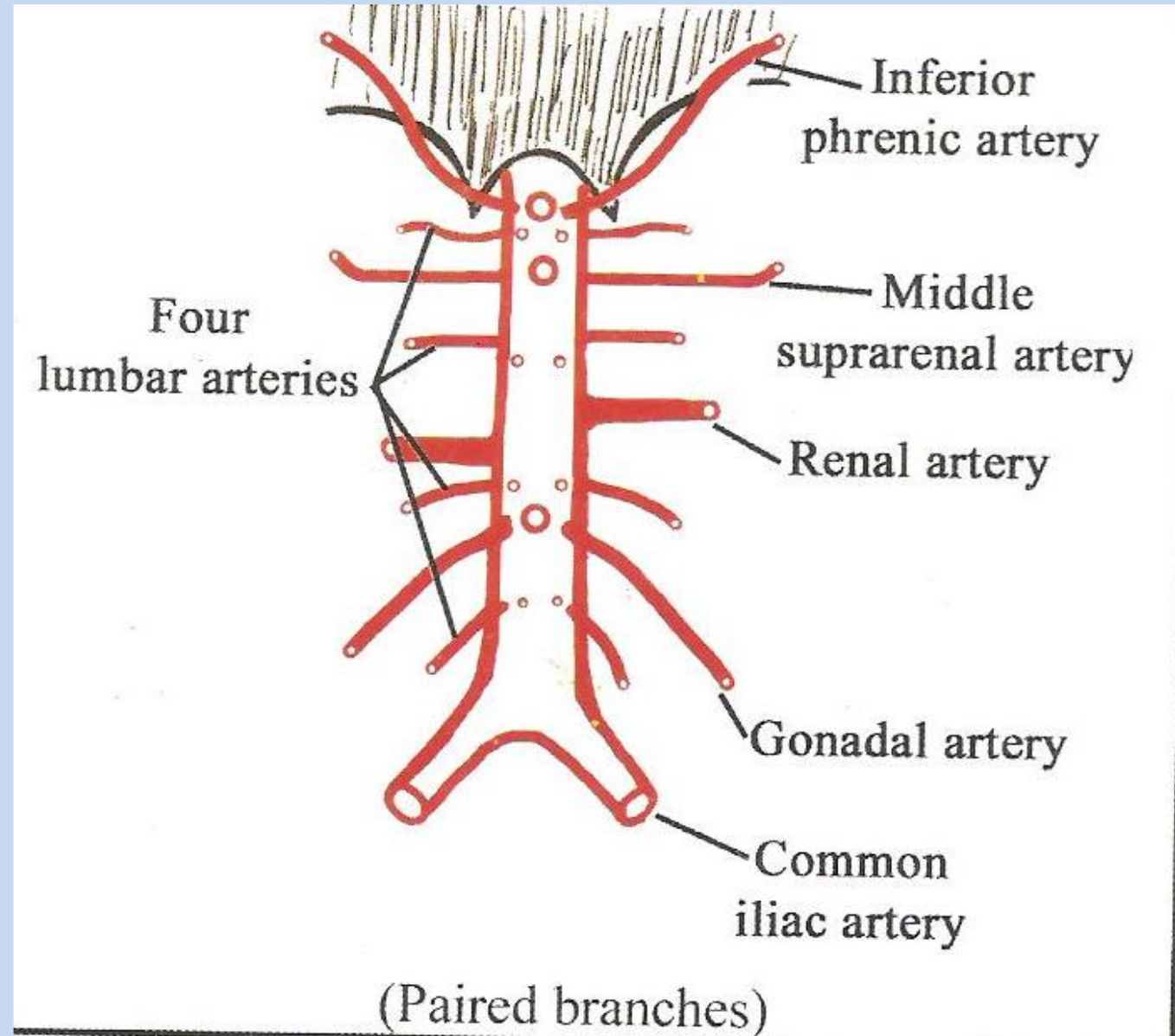
## On the left:

1. Left crus of the diaphragm.
2. Duodeno- jejunal junction.
3. Left Sympathetic trunk.
4. coils of small intestine.
5. Inferior mesenteric vessels.



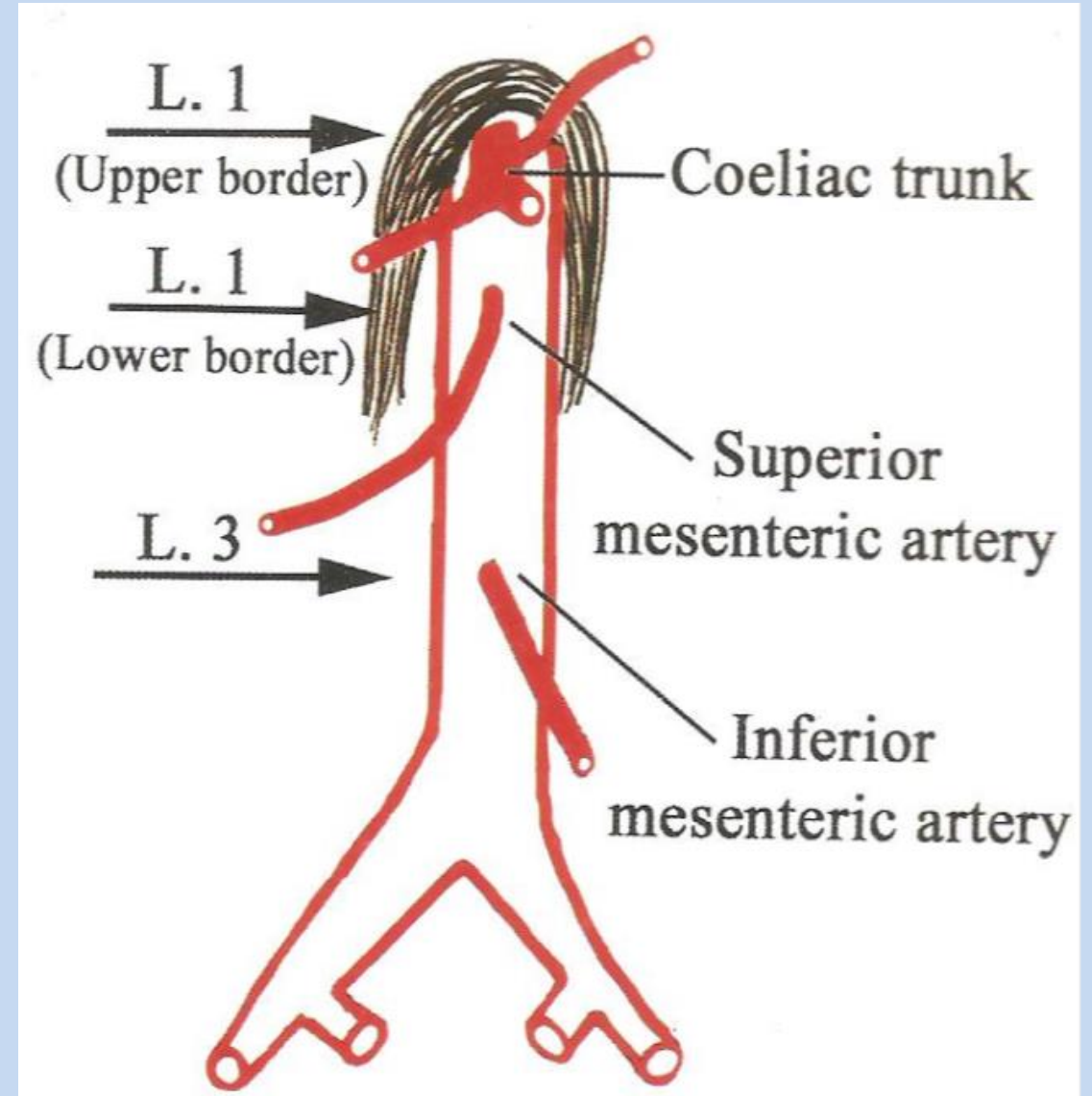
## Paired branches of abdominal aorta

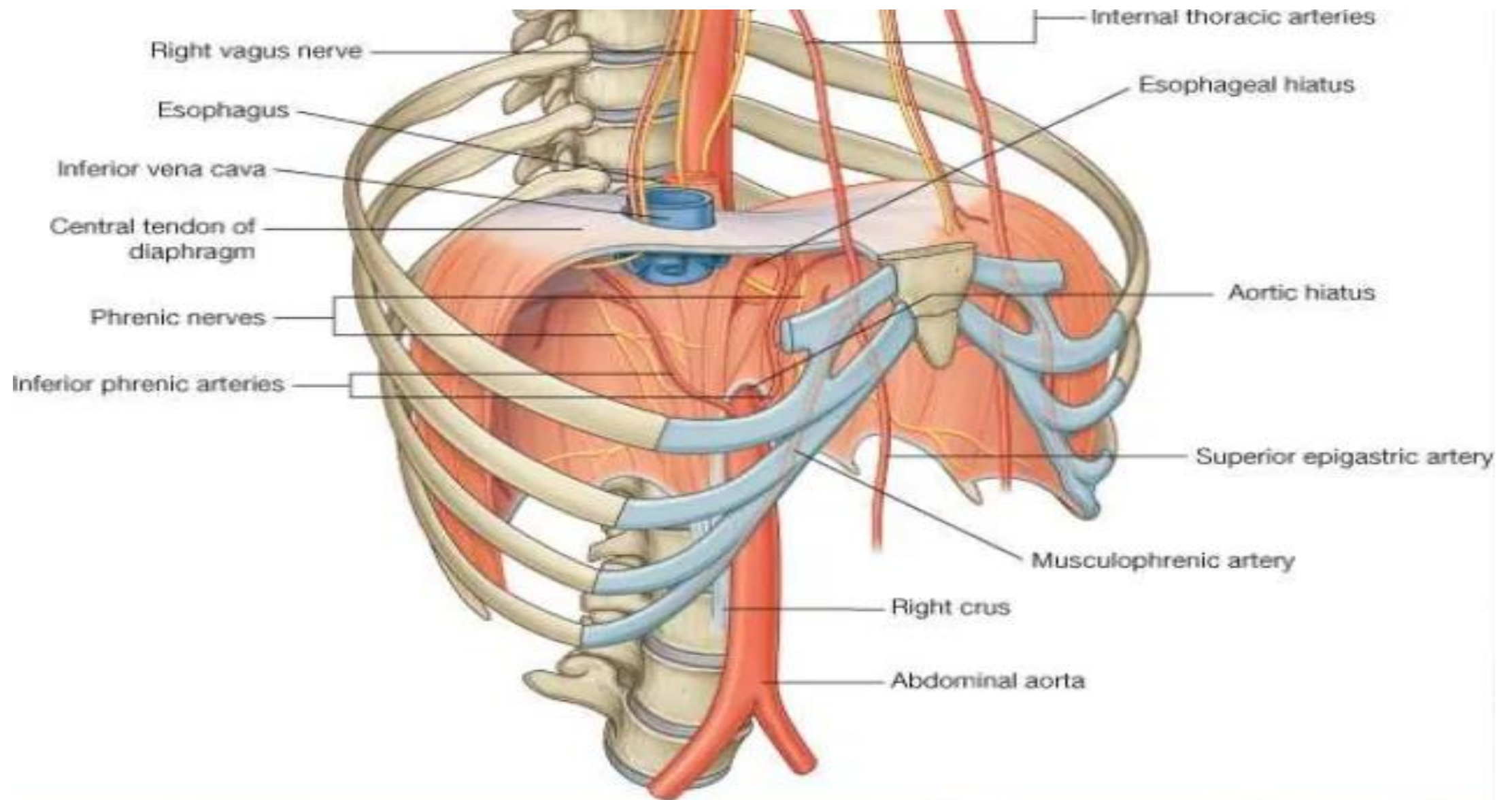
Branch	Vertebral level
Inferior phrenic	L1 (upper border)
Middle suprarenal	L1 (lower border)
renal	L2
gonadal	L3
four lumbar	L1-L4
Common iliac	L4



## Single branches of abdominal aorta

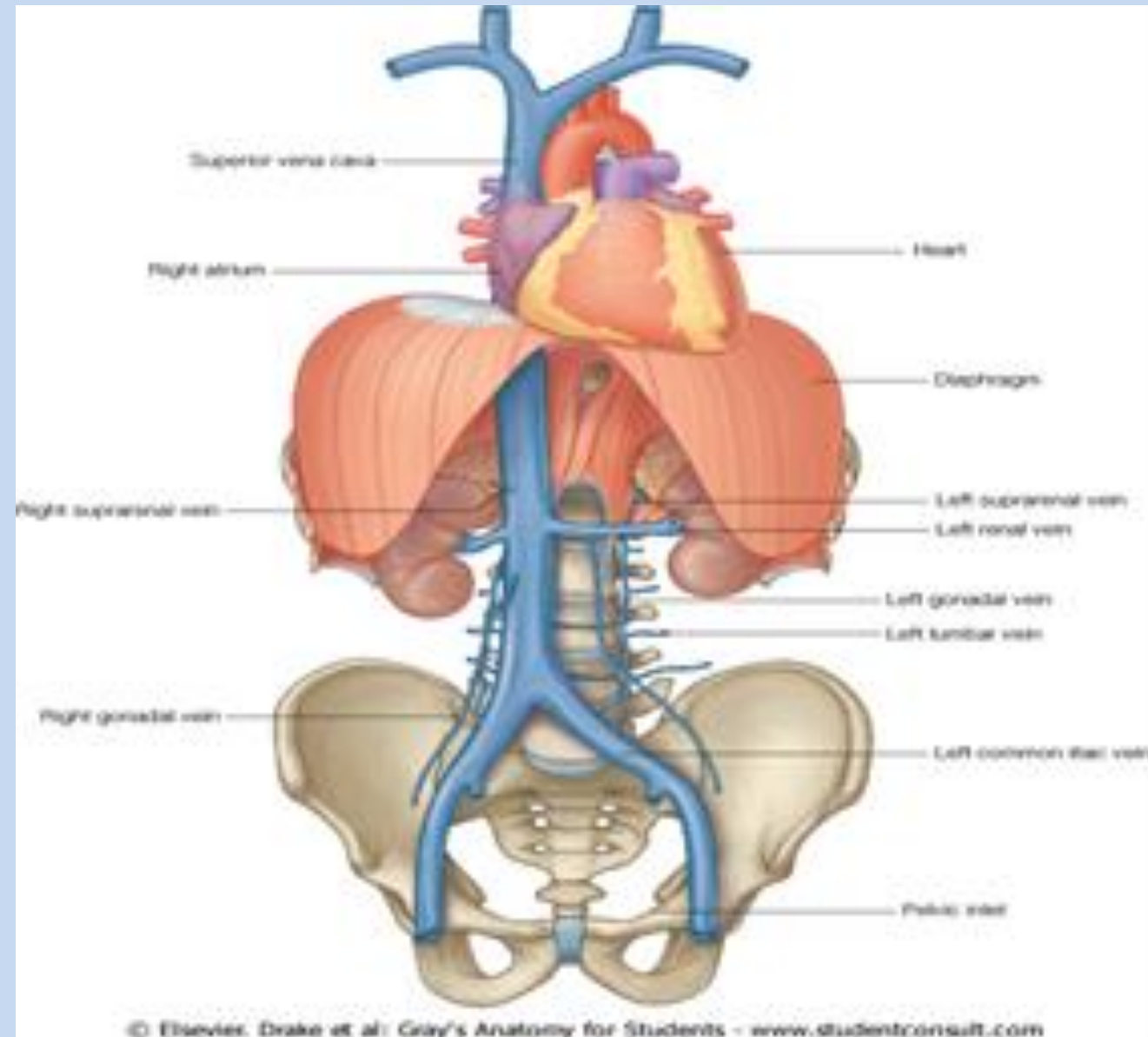
Branch	Vertebral level
<u>coeliac</u> trunk	L1 (upper border)
<u>superior mesenteric</u> artery	L1 (lower border)
<u>inferior mesenteric</u> artery	L3
<u>median sacral</u> artery	L4





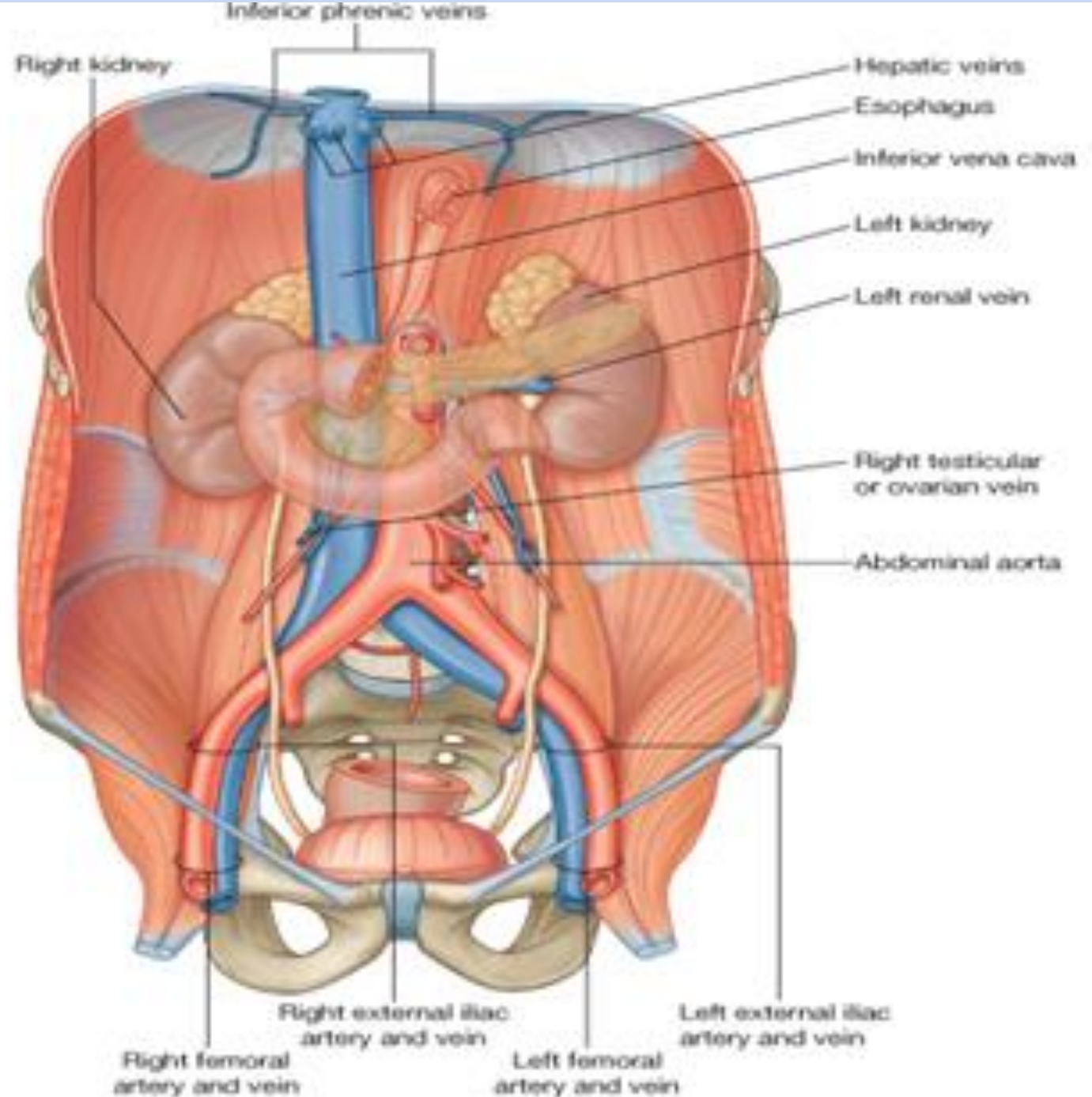
## Inferior vena cava (IVC)

- It is the largest vein in the body. It is formed by union of **two common iliac veins at 5<sup>th</sup> lumbar vertebra**.
- It ascends on the right side of aorta, passes through the caval opening of diaphragm by piercing its central tendon **opposite T8** and drains into the **right atrium**.



## Anterior relations:

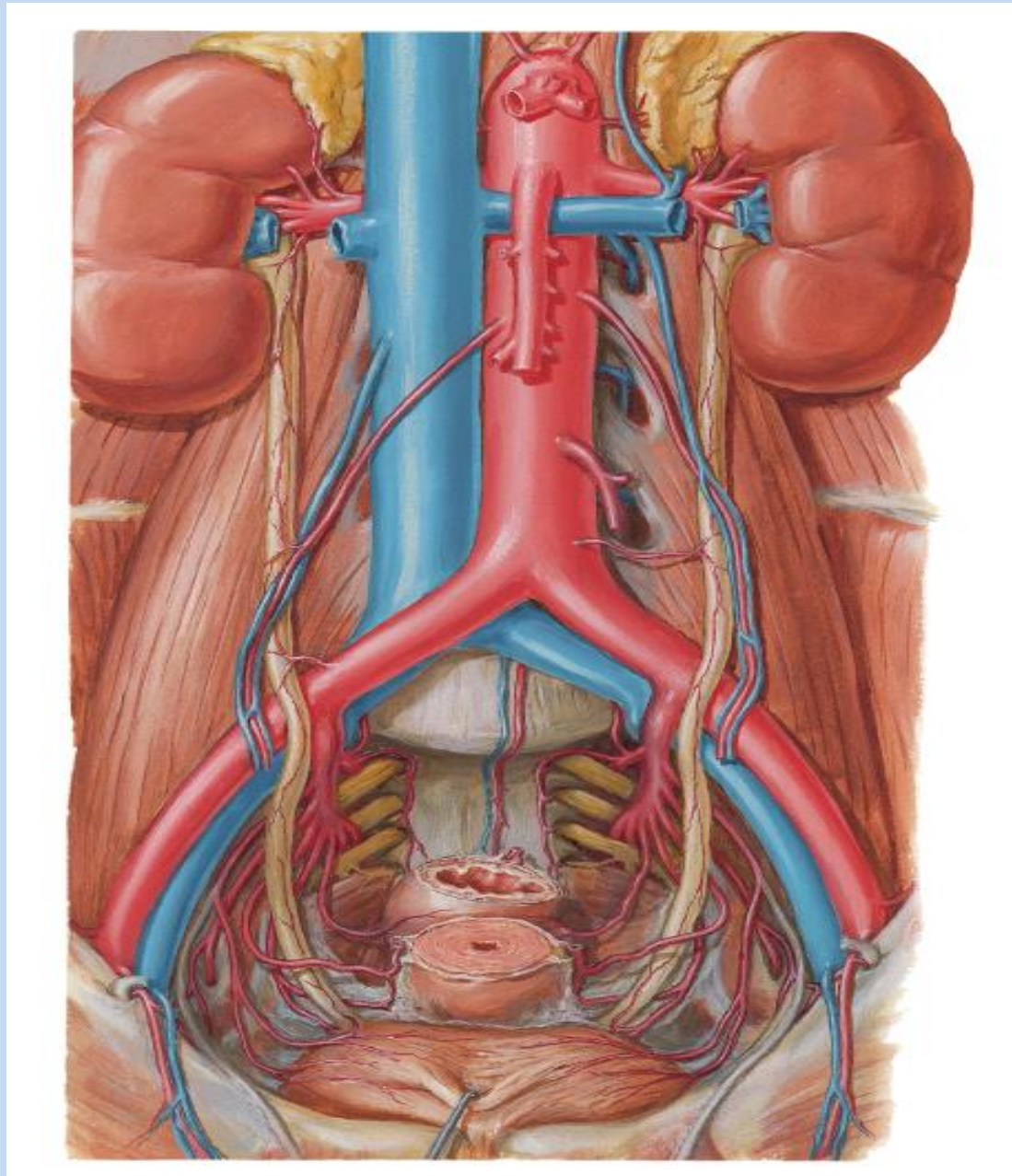
1. Posterior surface of the liver
2. 1<sup>st</sup> part of the duodenum
3. head of the pancreas
4. 3<sup>rd</sup> part of the duodenum
5. right gonadal and common iliac arteries
6. peritoneum
7. coils of small intestine.



**Posterior relations:**

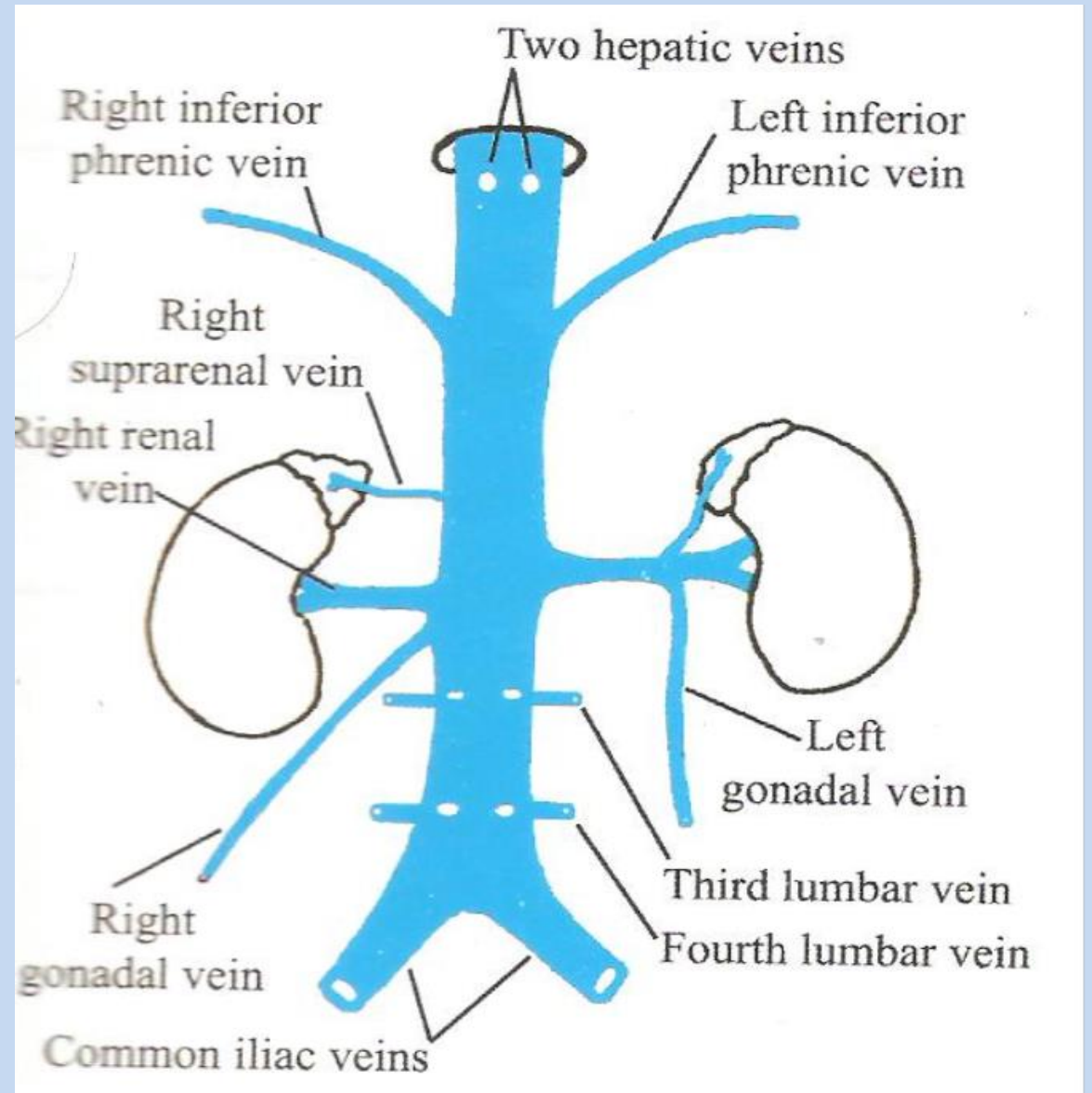
**Lower part:** is related to vertebral column, anterior longitudinal ligament, right sympathetic trunk.

**Upper part:** is related to right crus of the diaphragm, right renal artery, right middle suprarenal artery, right suprarenal gland, right celiac ganglion and right phrenic artery.



# Tributaries of I.V.C:-

1. Two common iliac veins: - they unite together forming I.V.C.
2. Two pairs of lumbar veins: 3<sup>rd</sup>, 4<sup>th</sup>.
3. Right gonadal vein.
4. Two renal veins (Rt. & Lt.).
5. Right supra renal vein.
6. Two inferior phrenic veins.
7. Two hepatic veins.





THANK YOU