



King Saud University
College of medicine
Cardiovascular block

3

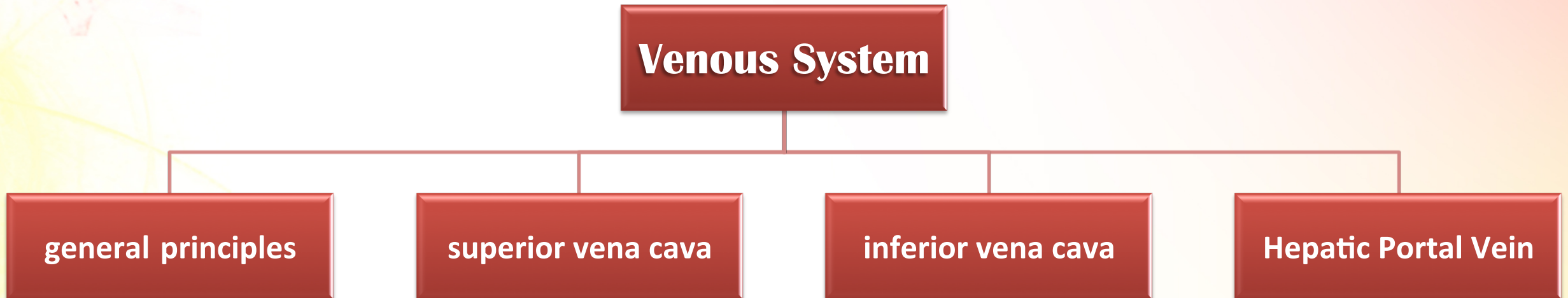
Venous System

For any comments
Please don't hesitate to
contact us by
anatomy433@live.com

Start with "بِسْمِ اللَّهِ"

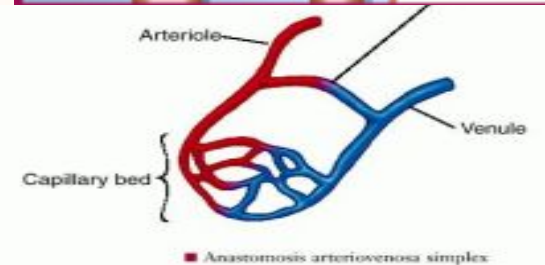
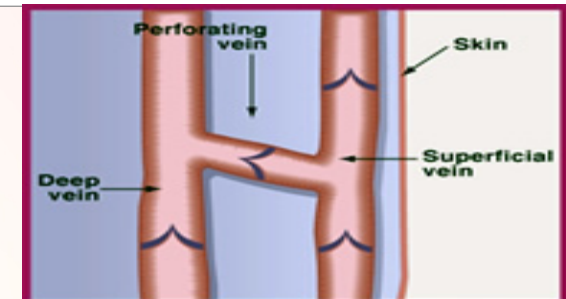
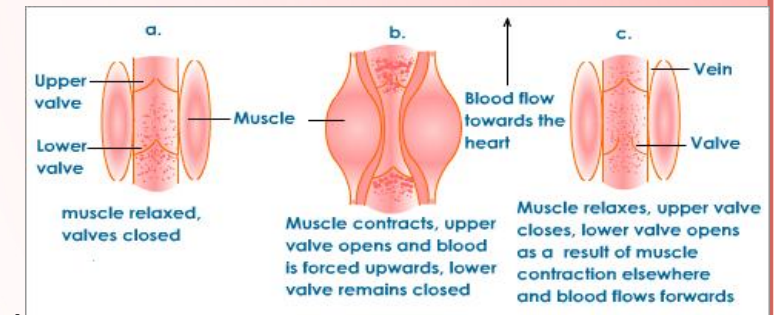
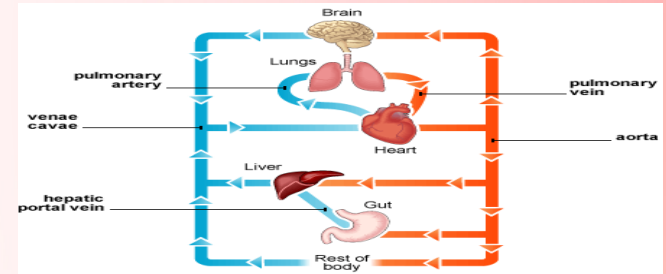
You should

- Define veins, and understand the general principles of venous system.
- Describe the superior & inferior Vena Cava and their tributaries.
- List major veins and their tributaries in the body.
- Describe the Portal Vein.
- Describe the Portocaval Anastomosis.



general principles of venous system

- Veins are the vessels that carry blood **towards the heart**.
- All veins, carry **deoxygenated blood**, except the pulmonary and umbilical veins, which carry oxygenated (arterial) blood from the lungs (postnatal) and from the placenta (prenatal) respectively
- Veins have **valves** that allow unidirectional blood flow.
- The flow of blood depends on the **peripheral muscular activity**
- Veins begin as venules, which unite into vessels of increasing size to form veins
- Arranged as **superficial and deep veins**, draining the superficial and deep parts of the body respectively. Deep veins are paired with arteries. Superficial veins usually have unrelated to those of arteries, because there are very few superficial arteries.
- Vary considerably in their locations and branching
- Communicate with each other forming extensive anastomoses which provides for collateral return blood flow in case of venous obstruction.

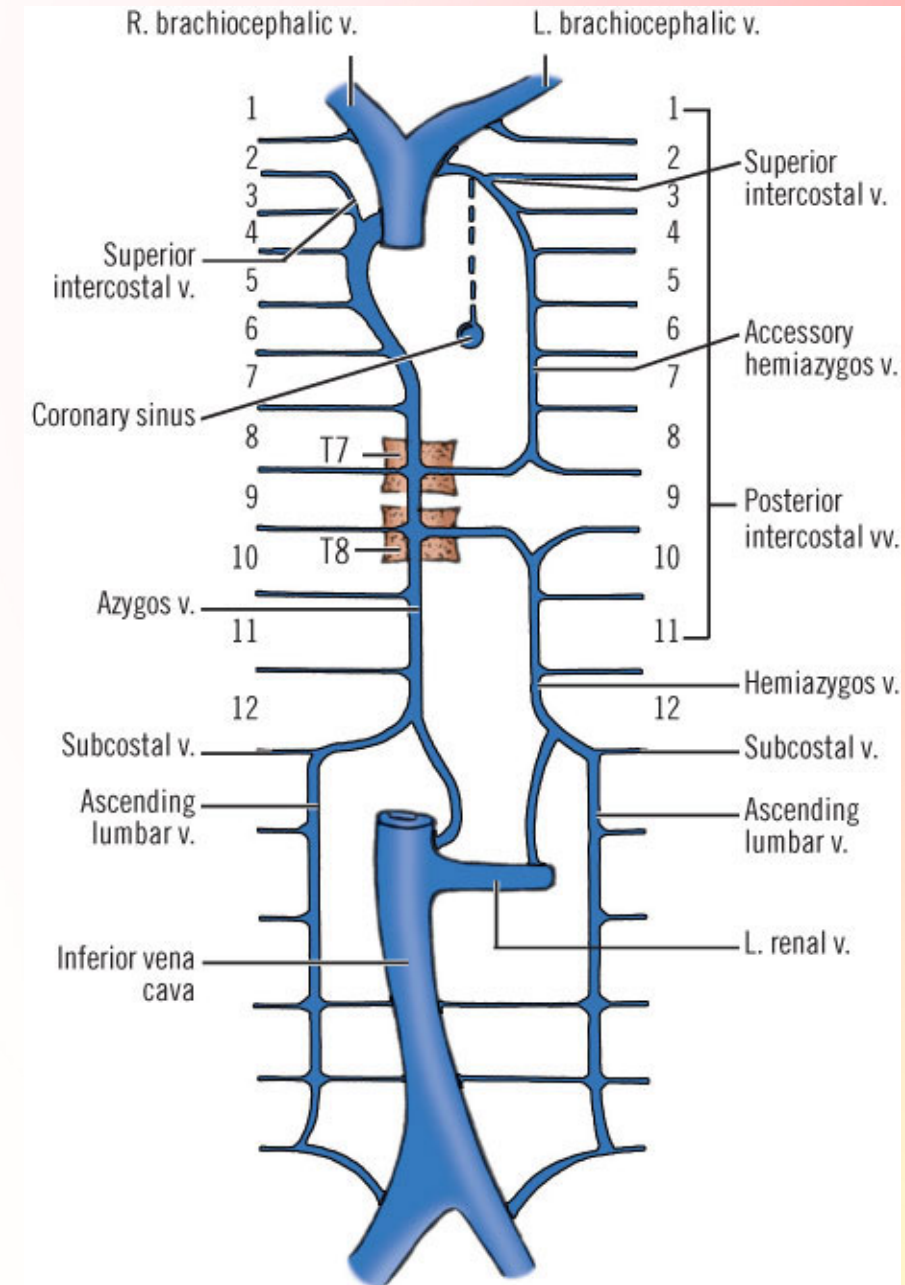
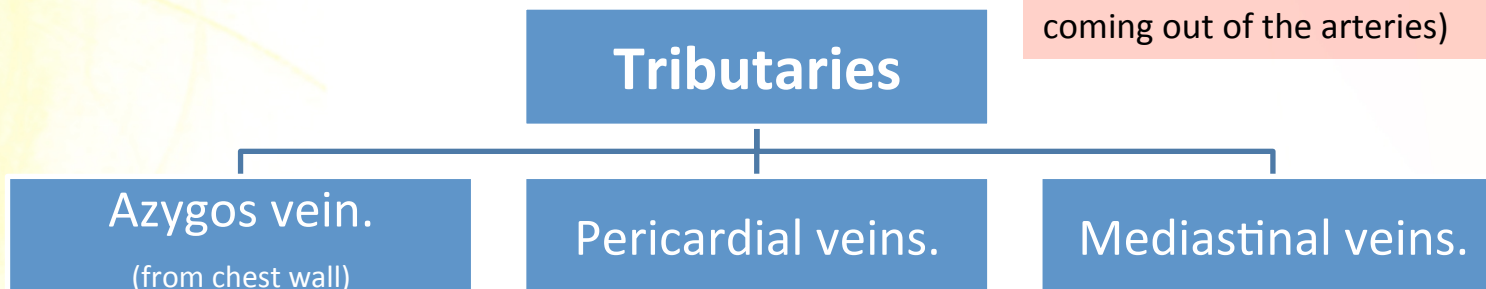


- Venous blood from the body is drained into the **right atrium** by two major veins :-
- The **superior vena cava** ;brings blood from all parts above the diaphragm: the head, neck, brain, upper limbs, and much of the chest and lungs.
- The **inferior vena cava** ;brings blood from all parts below the diaphragm: abdomen, pelvis, perineum and lower limbs.

The Superior Vena Cava

- Formed by the union of the 2 (**right & left**) **brachiocephalic veins**.
 - Each **brachiocephalic vein** is formed by the union of **internal jugular and subclavian veins**.
 - Drains into the right atrium.

Tributaries: the smaller veins being received by a larger one (similar to the branches coming out of the arteries)



Veins of the Head and Neck

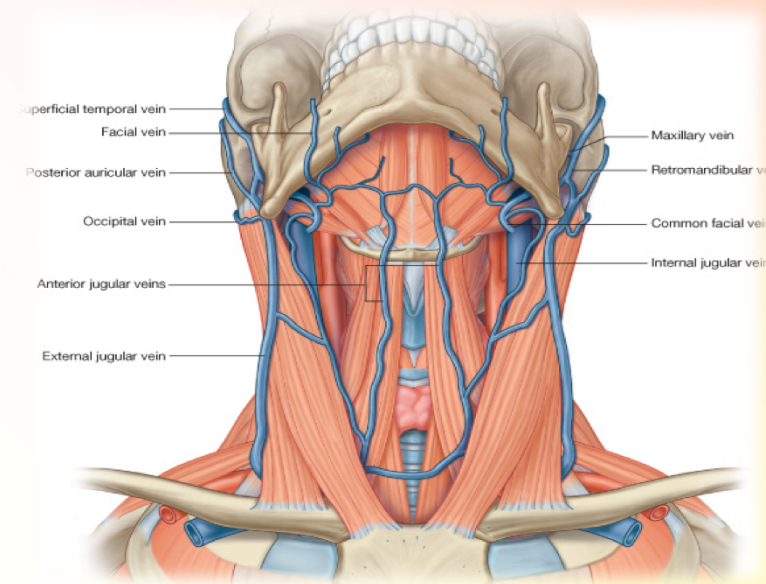
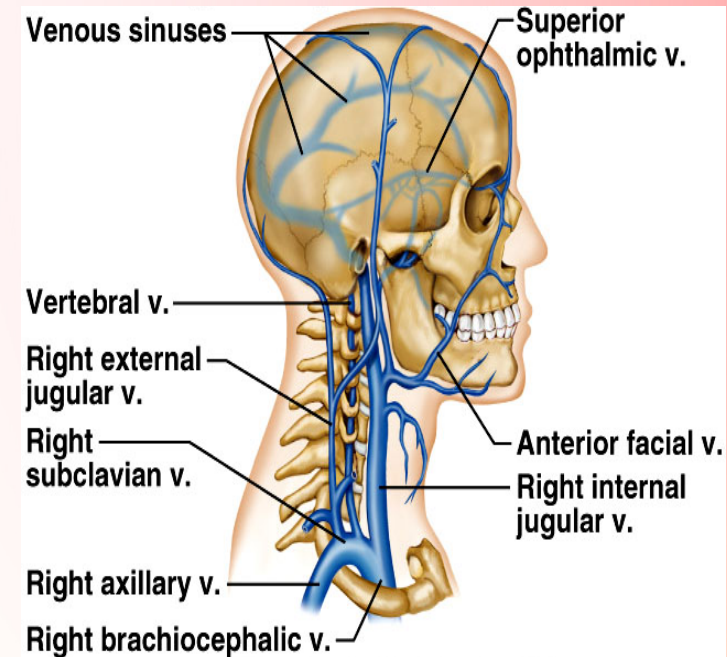
Superficially Veins:

External Jugular Veins

- Lies superficial to the sternomastoid muscle
- It passes down the neck and it is the only tributary of the subclavian vein.
- It drains blood from:
 - **Outside of the skull**
 - **Deep parts of the face.**

Anterior jugular veins

- It begins in the upper part of the neck by the union of the submental veins.
- It descends close to the median line of the neck, medial to the sternomastoid muscle.
- At the lower part of the neck, it passes laterally beneath that muscle to drain into the external jugular vein.
- Just above the sternum the two anterior jugular veins communicate by a transverse vein to form the jugular arch.

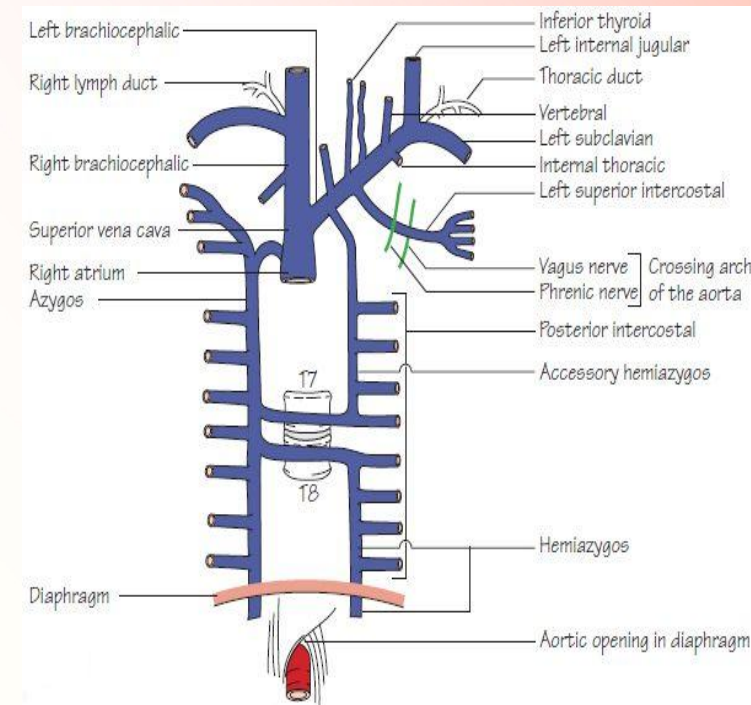
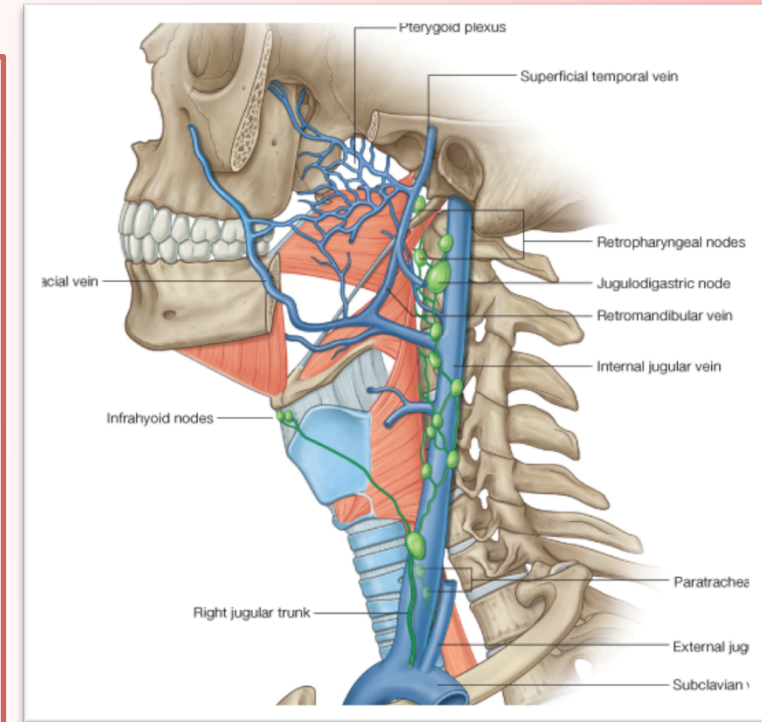


❖ Deeply veins: Internal Jugulars vein:-

- Drains blood from the head, brain, face & neck.
- It descends in the neck along with the internal and common carotid arteries and vagus nerve, within the carotid sheath.
- Joins the subclavian vein to form the brachiocephalic vein.
- Tributaries:
 - ✓ Superior thyroid, Lingual, Facial, Occipital veins
 - ✓ Dural venous sinuses
- Small **emissary veins** connect the superficial veins with the dural venous sinuses, a fact of clinical interest as a possible avenue for infections to enter the cranial cavity.

➤ Veins of the Thorax

- **From the viscera:**
 - The bronchial, esophageal and pericardial veins drain into superior vena cava or azygos vein
- **From the wall:**
 - The posterior intercostal veins drain into azygos and hemiazygos veins
 - The anterior intercostal veins drain into the internal thoracic veins which drains into the corresponding brachiocephalic veins



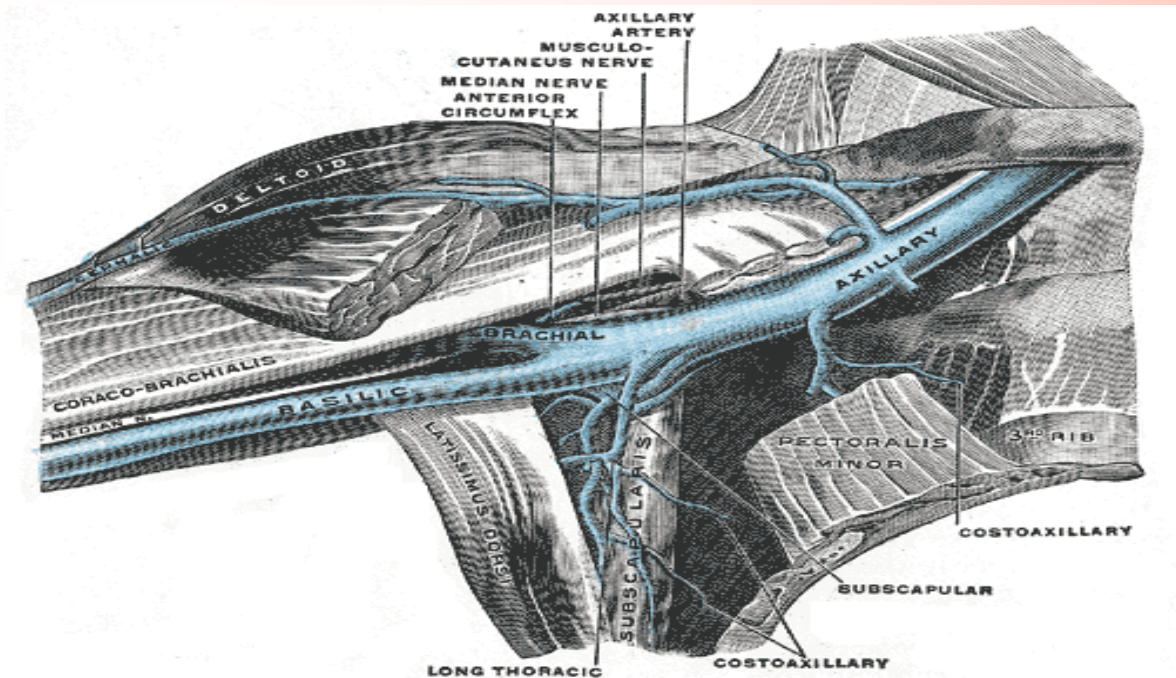
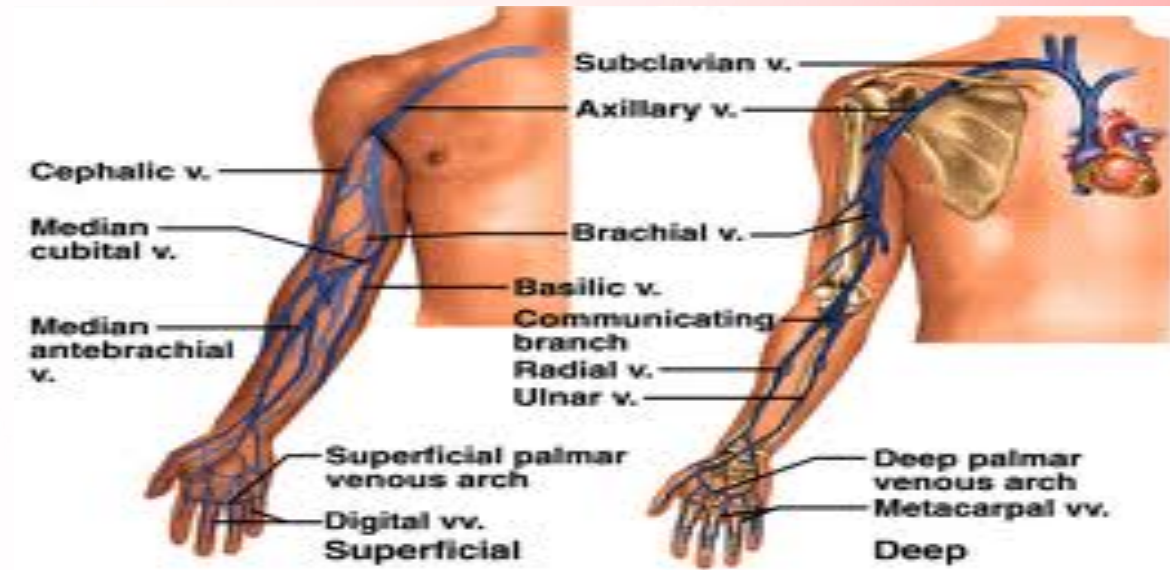
Veins of the Upper Limb

Superficial:

- Cephalic
- Basilic
- Median cubital

Deep:

- Venae comitantes of the Radial artery.
- Venae comitantes of the ulnar artery.
- Venae comitantes of the brachial artery.
- Axillary vein
- Subclavian: continuation of axillary, at the outer border of the first rib

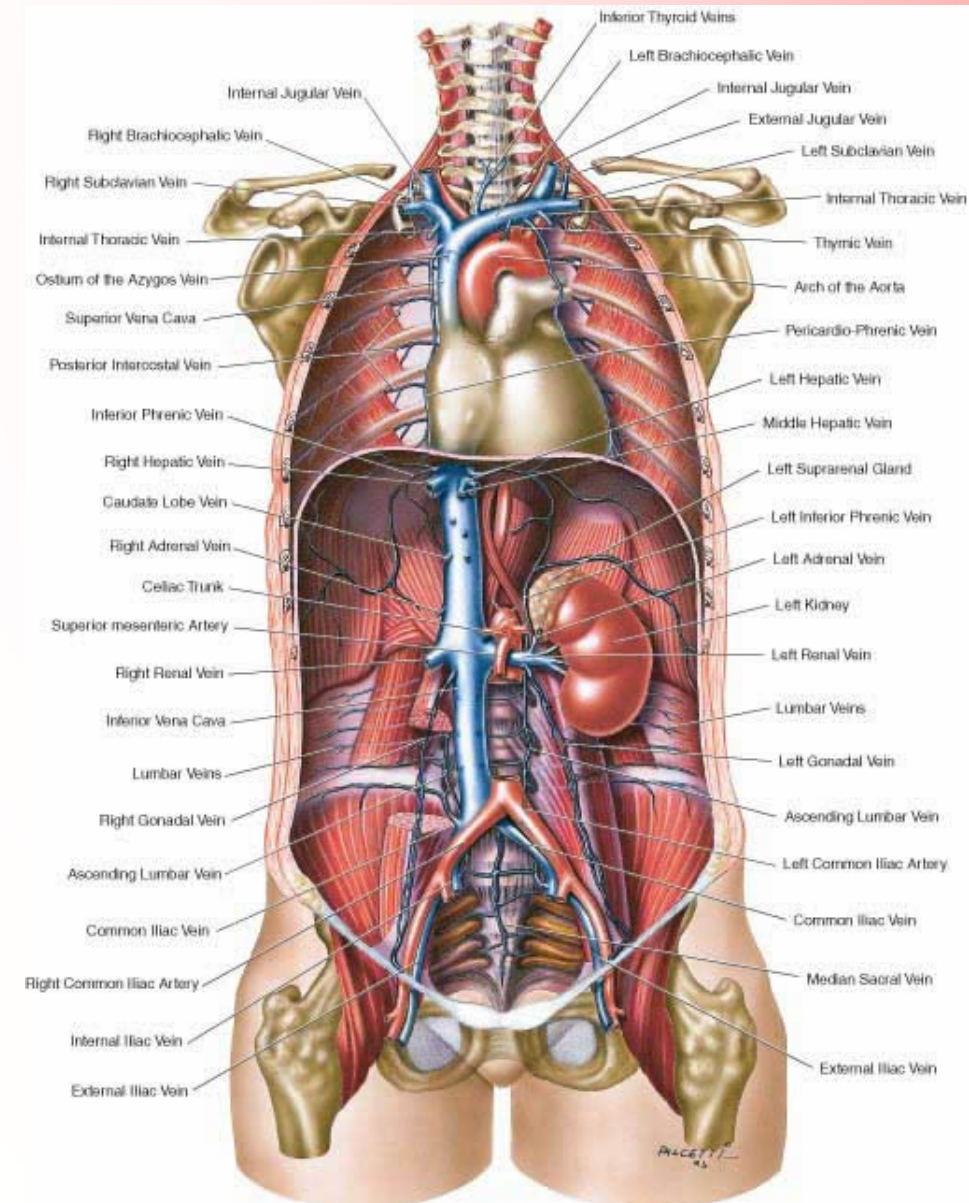


The Inferior Vena Cava

- Formed by the union of the **two common iliac veins**, at the level of L5.
- **Tributaries**
 - Inferior phrenic ,
 - Right supra renal (the left vein drains into the left renal vein), Two Renal veins , Hepatic veins, Four paired Lumbar veins
 - Right gonadal (left gonadal drains into left renal vein)

Veins of the Abdomen

- Veins from the abdominal walls drain into the **inferior vena cava**
- Veins returning from the digestive tract, pancreas, and spleen merge to form the **hepatic portal vein**, which does not join the inferior vena cava. Instead, it enters liver and pours the blood into a network of sinusoids in the liver. This collection of two capillary beds (the intestinal capillaries and the hepatic sinusoids) and the hepatic portal vein connecting them is called the **hepatic portal circulation**.



Hepatic Portal Vein

- **Drains** the GIT, spleen, pancreas and gall bladder
- **Delivers** this blood to the liver
- **Formation:** Formed by the union of the superior mesenteric vein and the splenic vein. The inferior mesenteric vein drains into the splenic vein
- Liver is drained by **hepatic veins** which open into the **inferior vena cava**

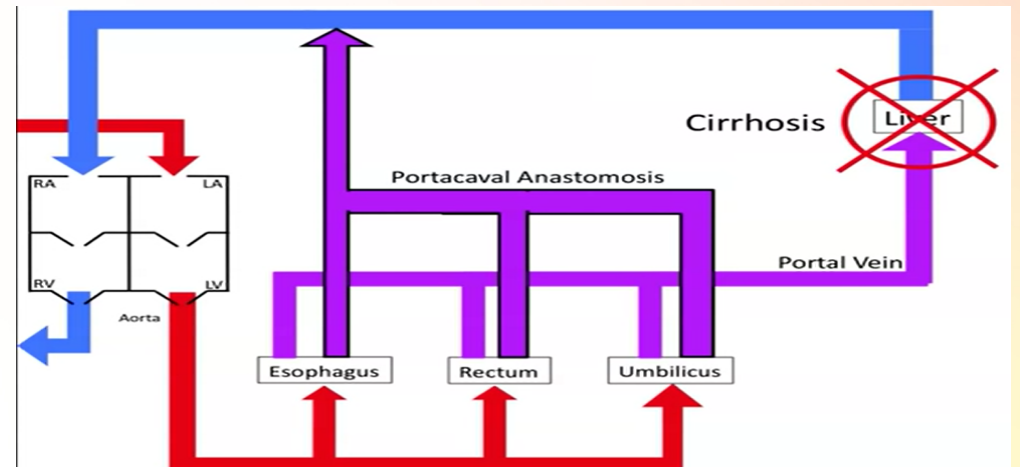
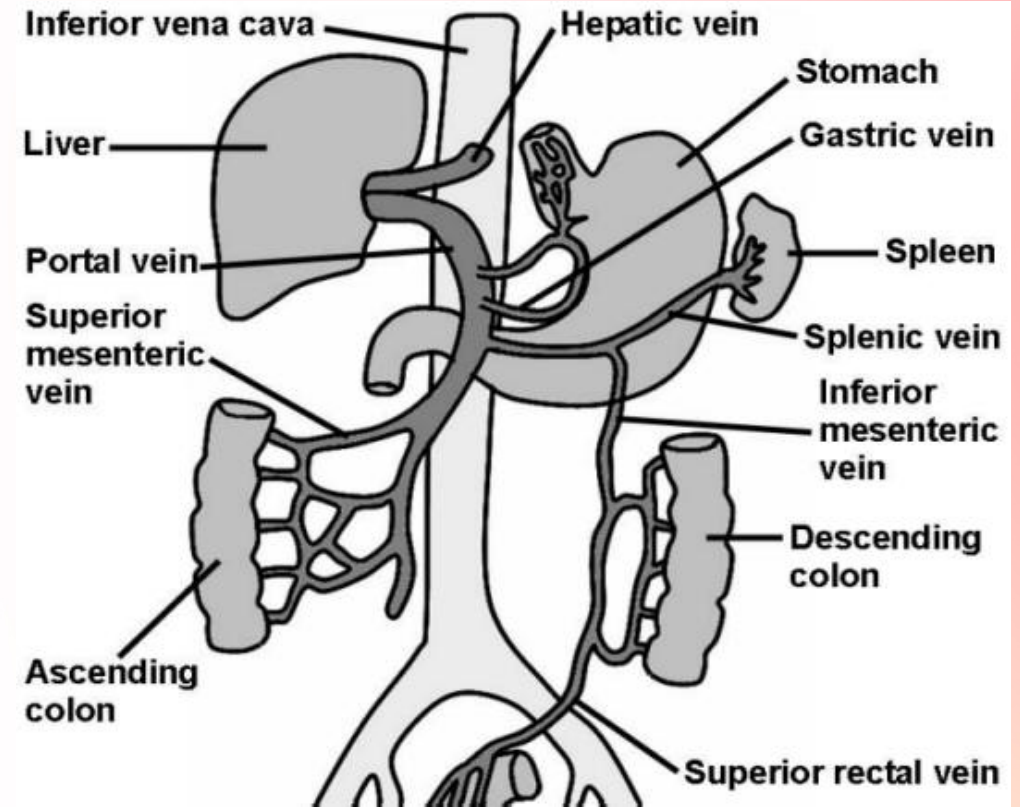
- **Portocaval Anastomosis**

- ❖ A portacaval anastomosis (also known as portal systemic anastomosis) is a specific type of anastomosis that occurs between the veins of portal circulation and those of systemic circulation.
- ❖ The anastomotic channels become dilated (varicosed) in case of portal hypertension.

(معنى الكلام انه اذا صار أي مشاكل في وصول الدم عن طريق الكبد الى الفين يكون عندنا طرق أخرى ما تشتغل الا اذا صارت هذي المشاكل ويسبب لنا امراض متعددة مع ارتفاع ضغط البورتل سريكليشن)

- I **strongly** recommend you to watch this video : {4min}

<http://youtu.be/nxfOfihRf0k>

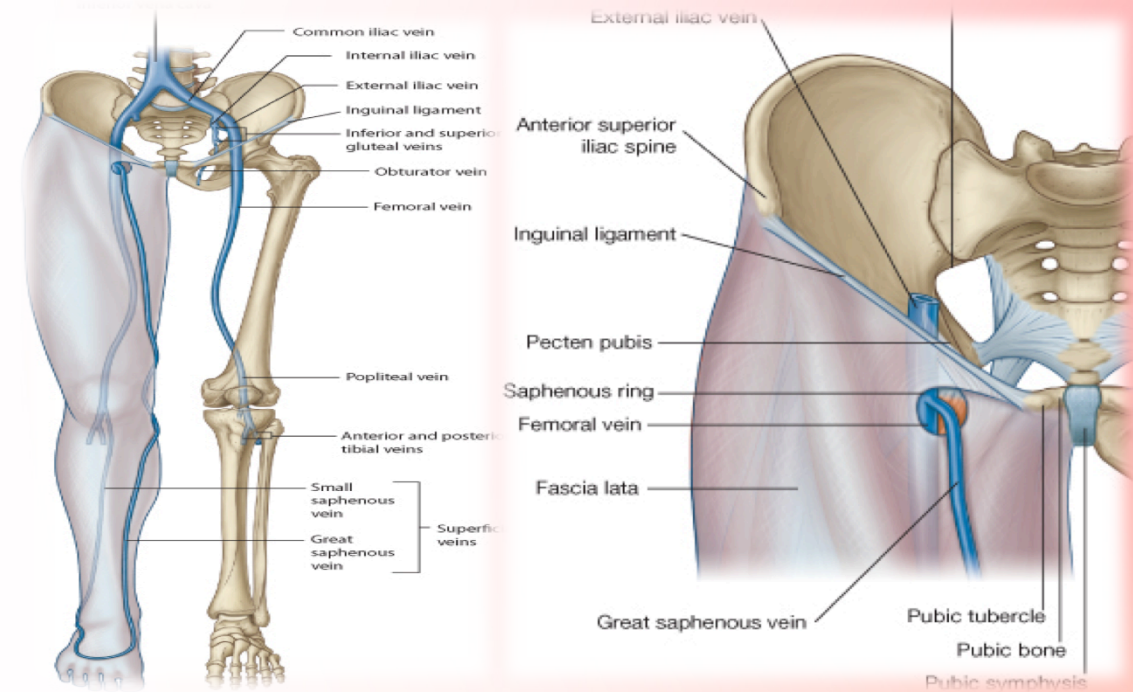


Veins of the Lower Limb

Deep:

- Venae comitantes of the anterior tibial artery.
- Venae comitantes of the posterior tibial artery.
- Popliteal, Femoral, External Iliac

Superficial:



Great saphenous

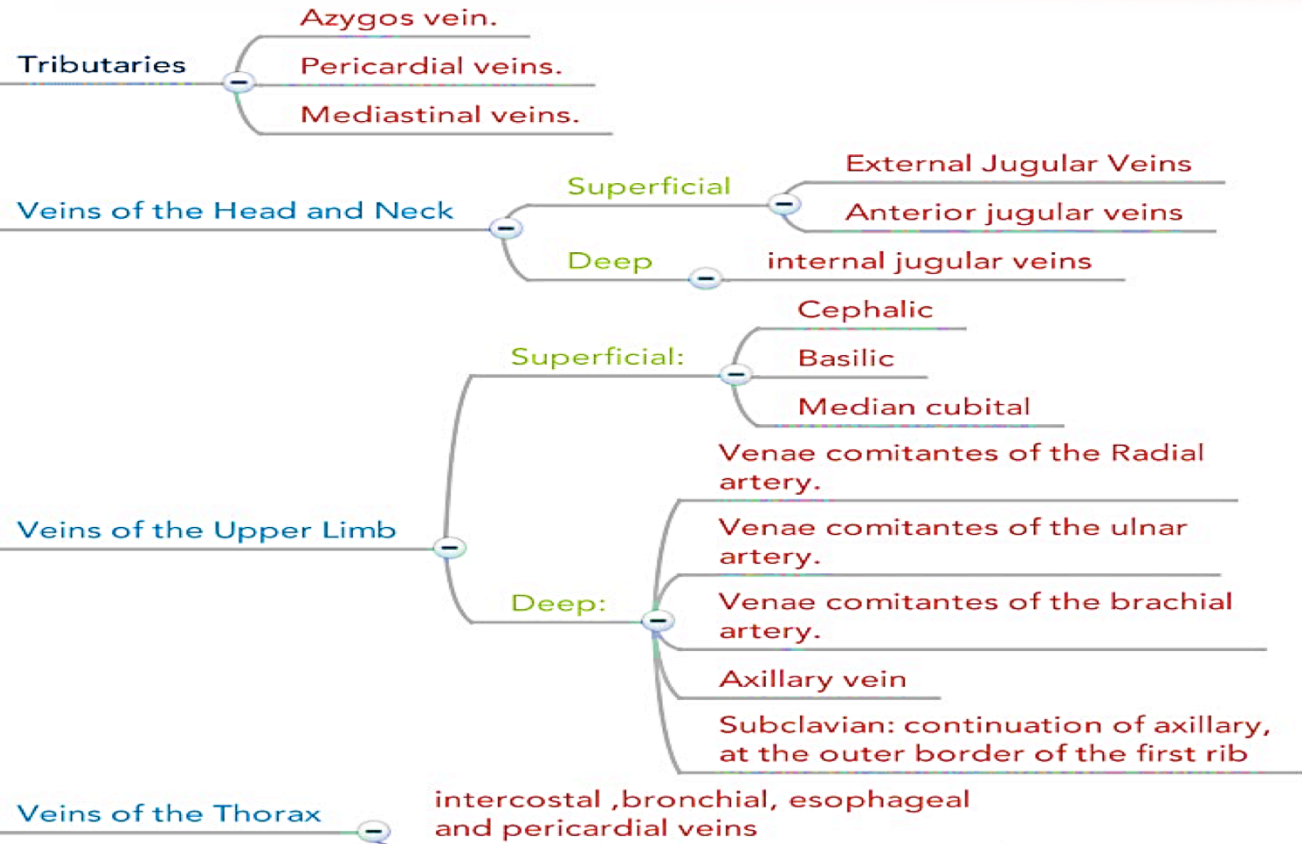
- **The longest vein in the body**
- Begins from the medial end of the dorsal venous arch of the foot.
- Passes upward in front of the medial malleolus with the saphenous nerve.
- Hooks through the lower part of the saphenous opening in the deep fascia to joins the femoral vein about 1.5 in. (4 cm) below and lateral to the pubic tubercle.
- **The great saphenous vein is used in venous grafting and saphenous cut down (take care of the saphenous nerve)**

Small saphenous

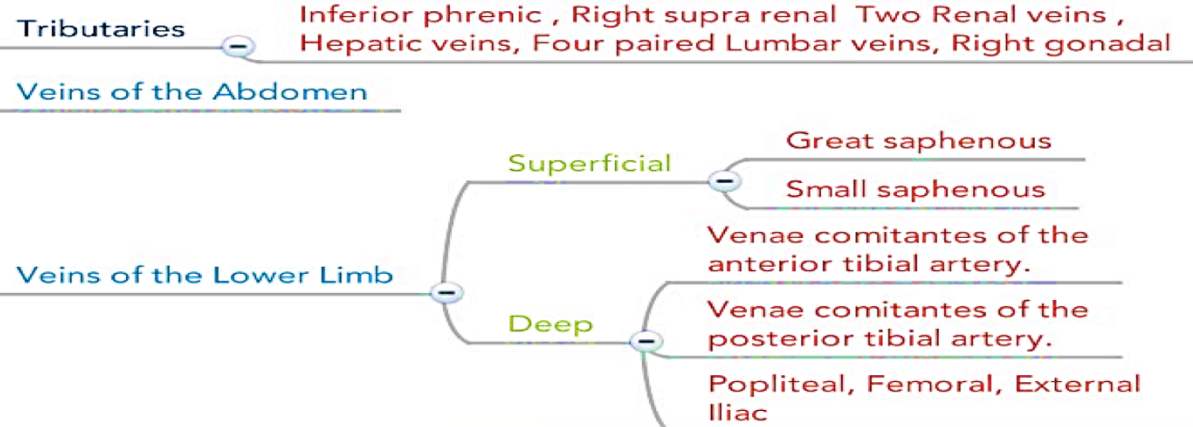
- Arises from the lateral end of the dorsal venous arch.
- Ascends behind the lateral malleolus in company with the sural nerve
- **Anastomosis freely with great saphenous vein.**

Venous System

1 The Superior Vena Cava



5 The Inferior Vena Cava



Summary

MCQS

1) Which one of the following drains into the inferior vena cava :

- a) Portal vein
- b) Left gonadal
- c) Renal vein
- d) Left supra renal

2) One of the tributaries of the portal vein is :

- a) Superior mesenteric
- b) hepatic vein
- c) the inferior vena cava
- d) Renal vein

3) All those organs are drained in the superior vena cava except:

- a- lungs
- b- upper limb
- c- gonadal
- d- Neck

4) Dural venous sinuses are tributaries of :

- a. External Jugular Veins
- b. internal Jugular Veins
- c. Anterior Jugular Veins
- d. Inferior Jugular Veins

Useful Videos:

- <http://youtu.be/sl6yXy3u2sl>
- <http://youtu.be/ZQd73stLZl8>



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