

MAJOR BODY VEINS



Khaleel Alyahya, PhD, MEd
King Saud University
School of Medicine
@khaleelya

OBJECTIVES

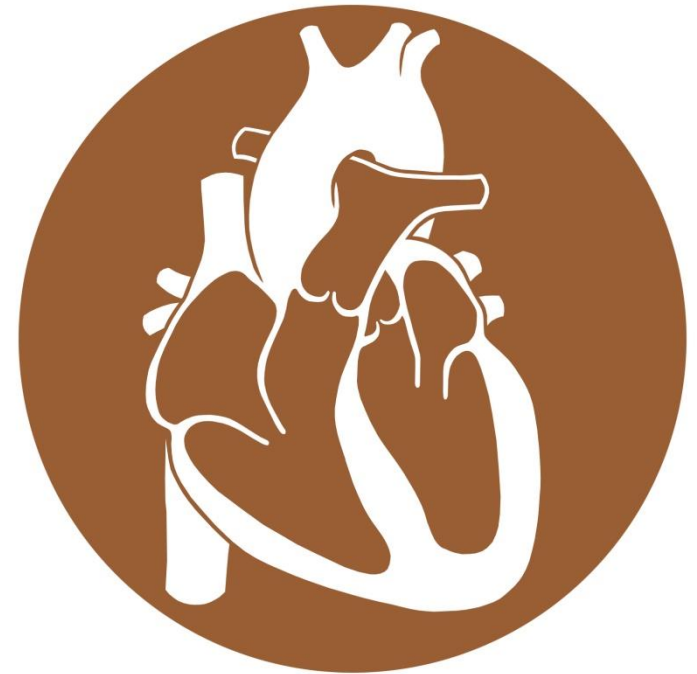
At the end of the lecture, the student should be able to:

- Define veins and understand the general principle of venous system.**
- Describe the superior & inferior Vena Cava.**
 - formation and their tributaries
- List major veins and their tributaries in;**
 - head & neck
 - thorax & abdomen
 - upper & lower limbs
- Describe the Portal Vein.**
 - formation & tributaries.
- Describe the Portocaval Anastomosis.**
 - formation, sites and importance



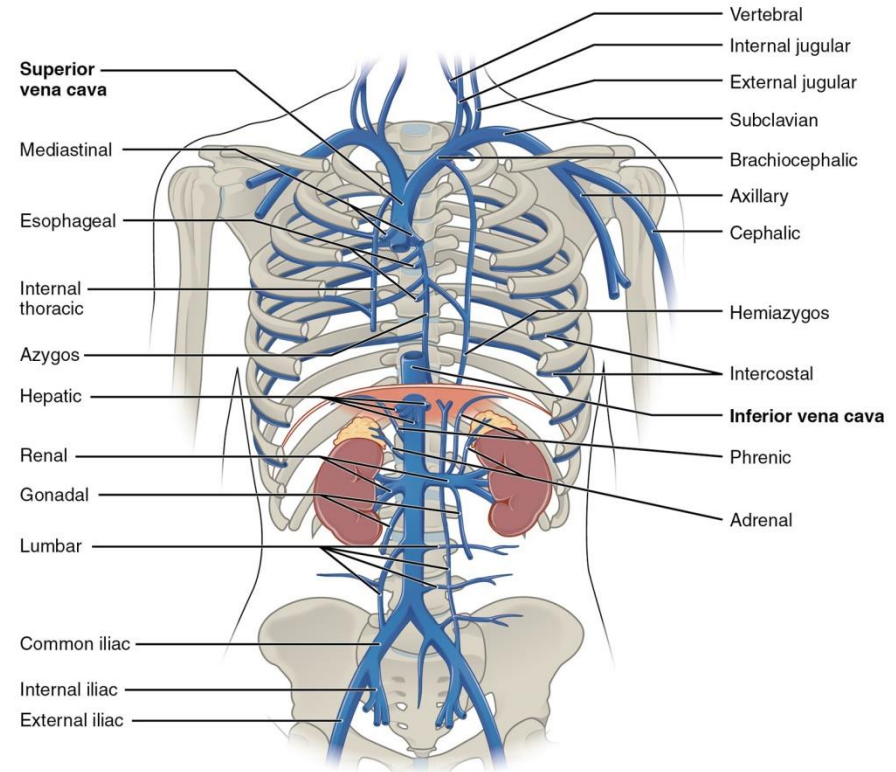
VEINS

- ❑ **Veins are blood vessels that bring blood back to the heart.**
- ❑ **All veins carry deoxygenated blood**
 - with the exception of the pulmonary veins and umbilical veins
- ❑ **There are two types of veins:**
 - Superficial veins: close to the surface of the body
 - **NO corresponding arteries**
 - Deep veins: found deeper in the body
 - **With corresponding arteries**
- ❑ **Veins of the systemic circulation:**
 - **Superior and inferior vena cava with their tributaries**
- ❑ **Veins of the portal circulation:**
 - **Portal vein**



SUPERIOR VENA CAVA

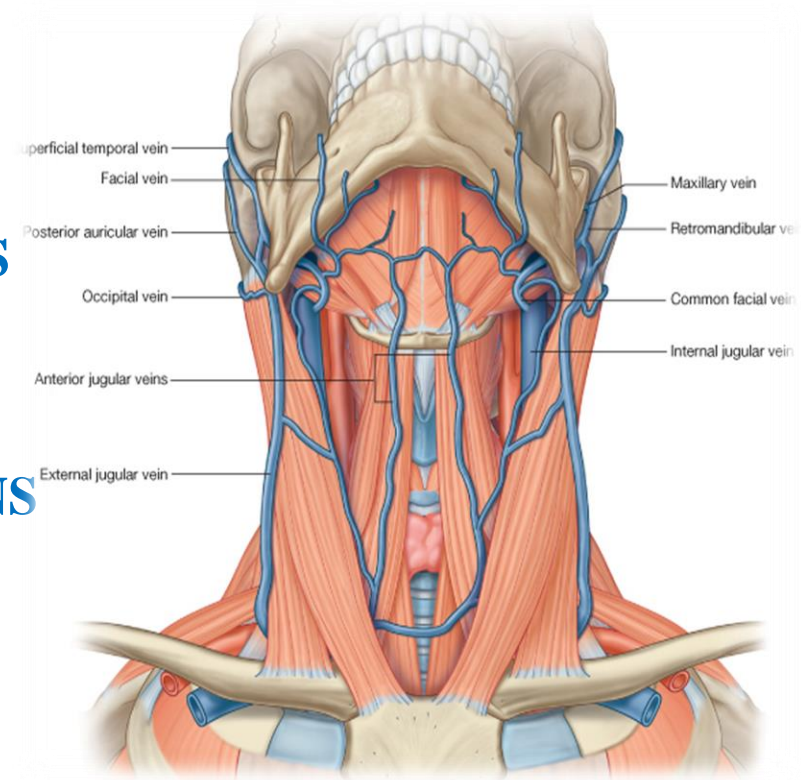
- ❑ **Formed by the union of the right and left brachiocephalic veins.**
 - **Brachiocephalic veins are formed by the union of internal jugular and subclavian veins.**
- ❑ **Drains venous blood from:**
 - **Head, neck, thoracic wall & upper limbs**
- ❑ **It Passes downward and enter the right atrium.**
- ❑ **Receives azygos vein on the posterior aspect just before it enters the heart.**



VEINS OF HEAD & NECK

TWO DIVISIONS:

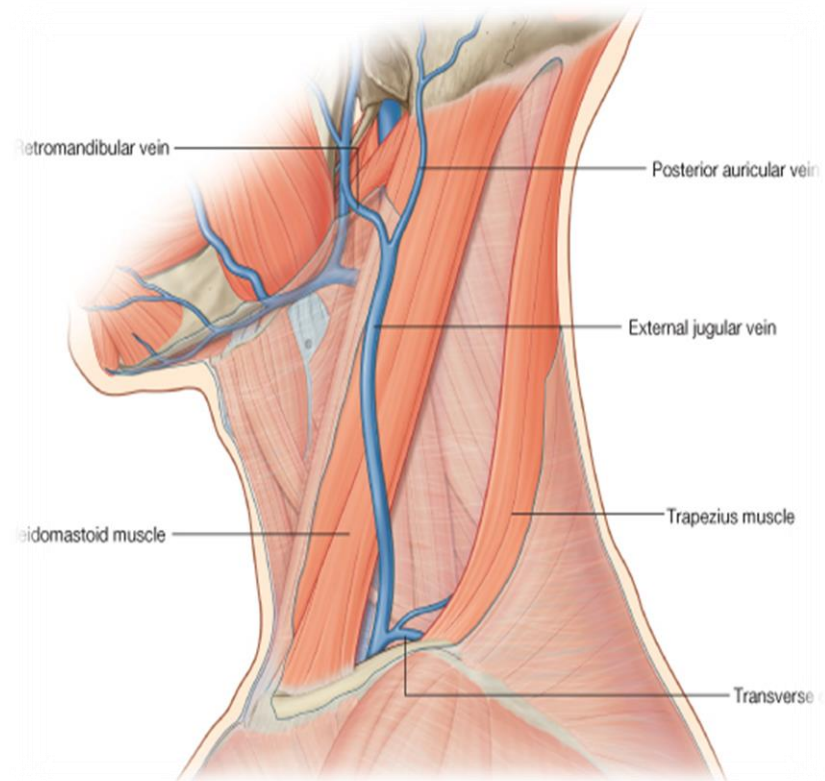
- **SUPERFICIAL VEINS**
 - **EXTERNAL JUGULAR VEINS**
 - **ANTERIOR JUGULAR VEINS**
- **DEEP VEINS**
 - **INTERNAL JUGULARS VEINS**



SUPERFICIAL VEINS OF HEAD & NECK

EXTERNAL JUGULAR VEINS

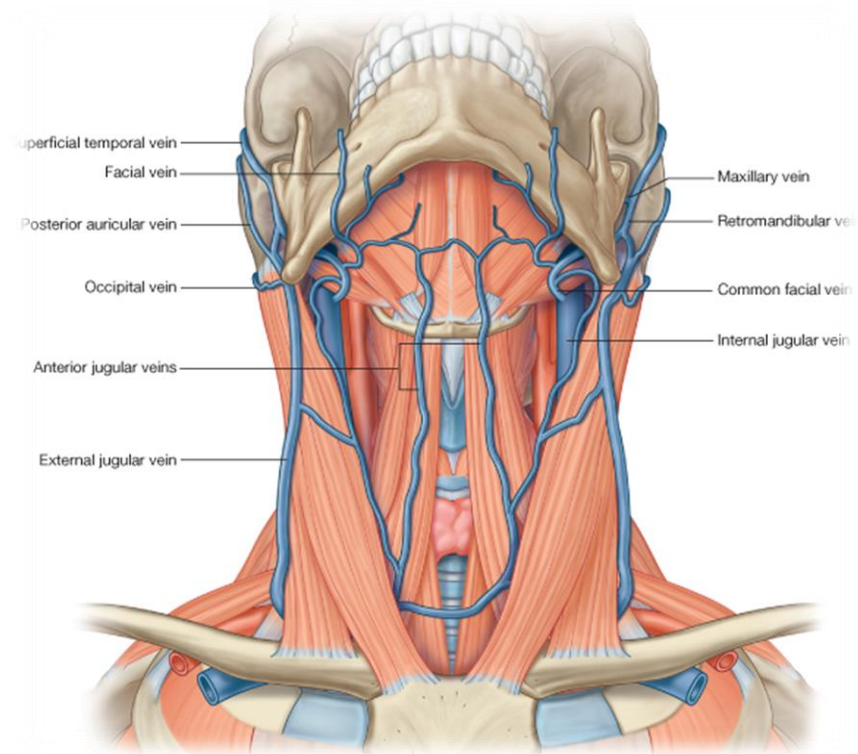
- **Lies superficial to the sternomastoid muscle**
- **It passes down the neck and it is the only tributary of the subclavian vein.**
- **Formed by the junction of the posterior division of the retromandibular vein (temporomaxillary vein) with the posterior auricular vein.**
- **It drains blood from:**
 - **Outside of the skull**
 - **Deep parts of the face.**



SUPERFICIAL VEINS OF HEAD & NECK

ANTERIOR JUGULAR VEINS:

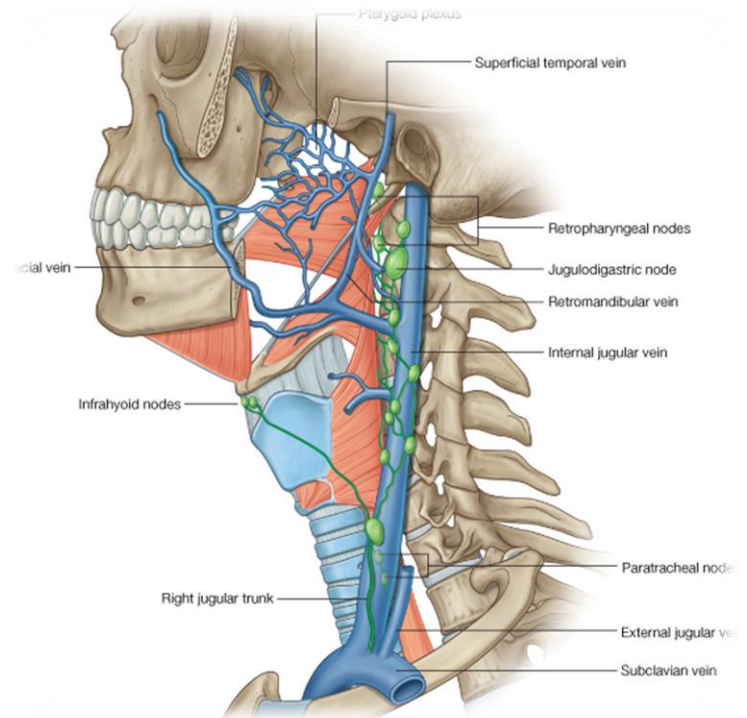
- It begins in the upper part of the neck by the union of the submental veins.
- It descends close to the median line of the neck, medial to the sternomastoid muscle.
- At the lower part of the neck, it passes laterally beneath that muscle to drain into the external jugular vein.
- Just above the sternum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



DEEP VEINS OF HEAD & NECK

INTERNAL JUGULARS VEIN:

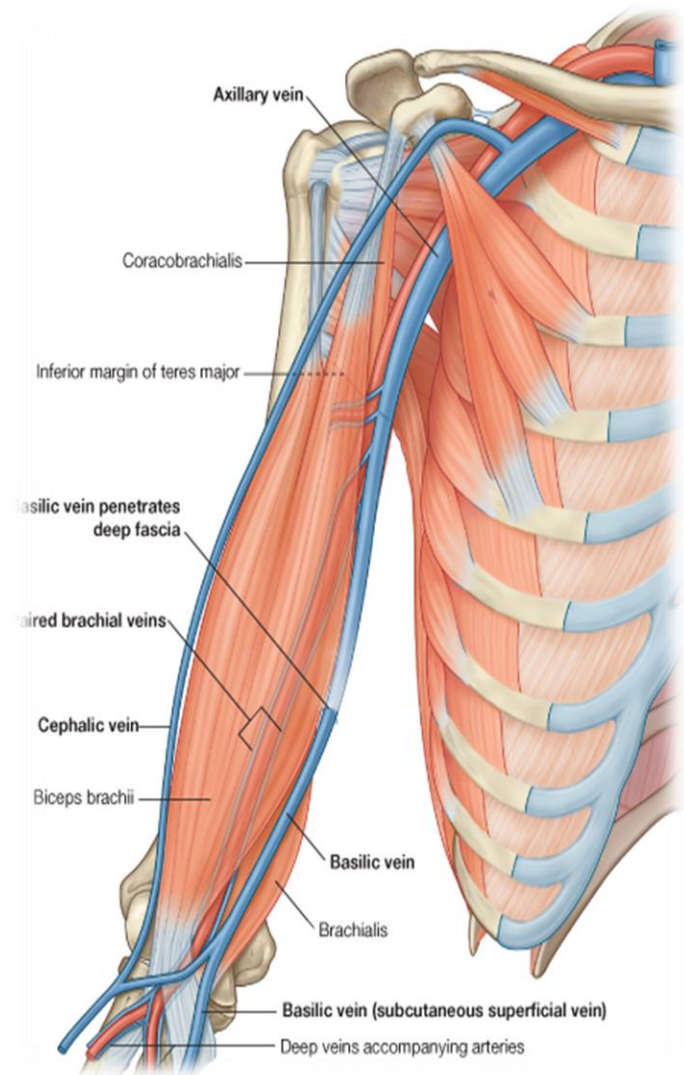
- Drains blood from the head, brain, face & neck.
- It descends in the neck along with the internal and common carotid arteries and vagus nerve, within the **carotid sheath**.
- Joins the subclavian vein to form the brachiocephalic vein.
- Tributaries:
 - Superior thyroid
 - Lingual
 - Facial
 - Occipital veins
 - Dural venous sinuses



VEINS OF UPPER LIMBS

TWO DIVISIONS:

- SUPERFICIAL VEINS
- DEEP VEINS



VEINS OF UPPER LIMBS

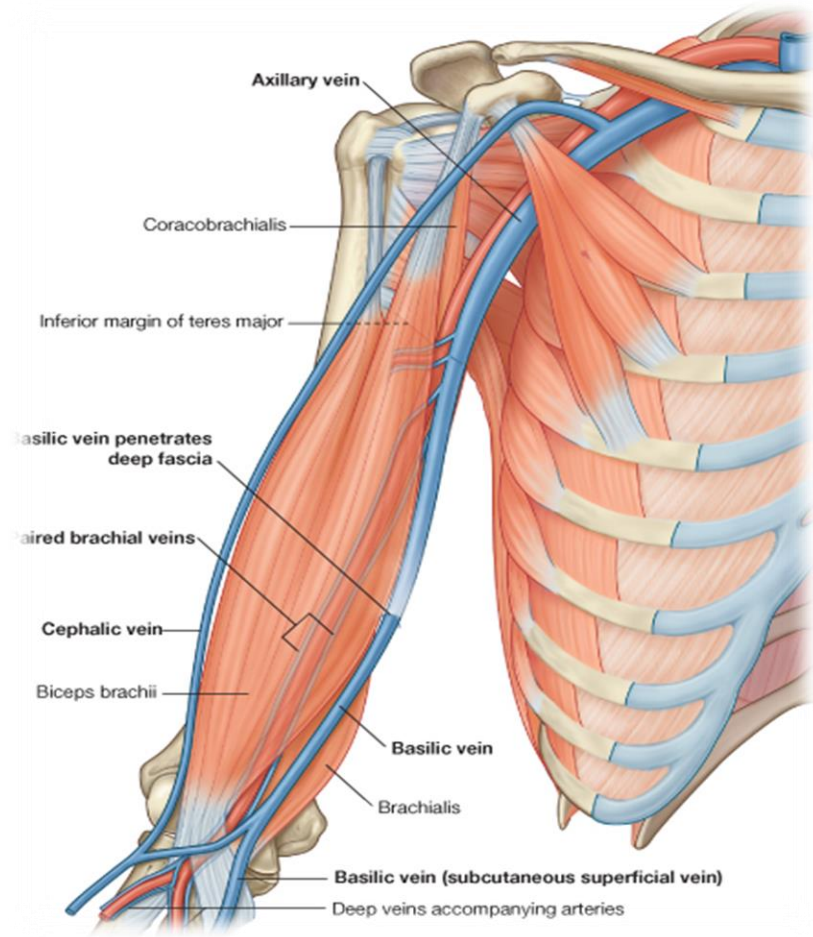
SUPERFICIAL VEINS

■ CEPHALIC VEIN

- Ascends in the superficial fascia on the lateral side of the biceps.
- Drains into the Axillary vein.

■ BASILIC VEIN

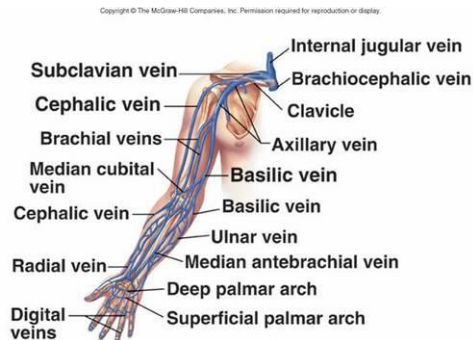
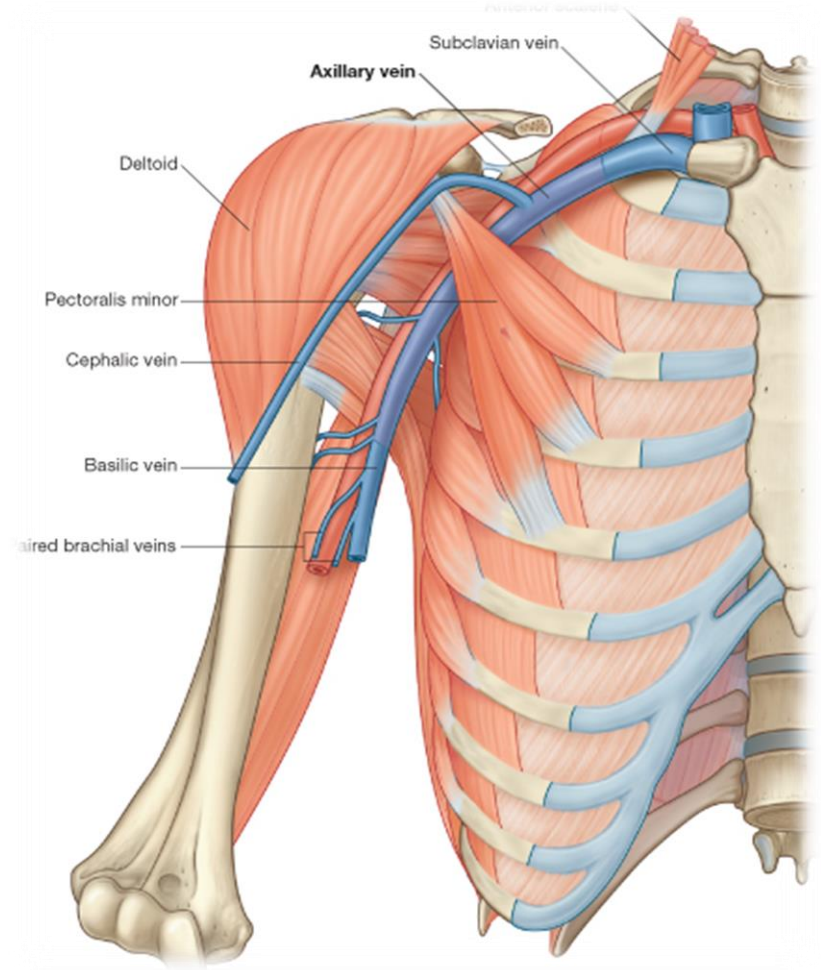
- Ascends in the superficial fascia on the medial side of the biceps.
- Halfway up the arm, it pierces the deep fascia
- At the lower border of the teres major it joins the venae comitantes of the brachial artery to form the Axillary vein.



VEINS OF UPPER LIMBS

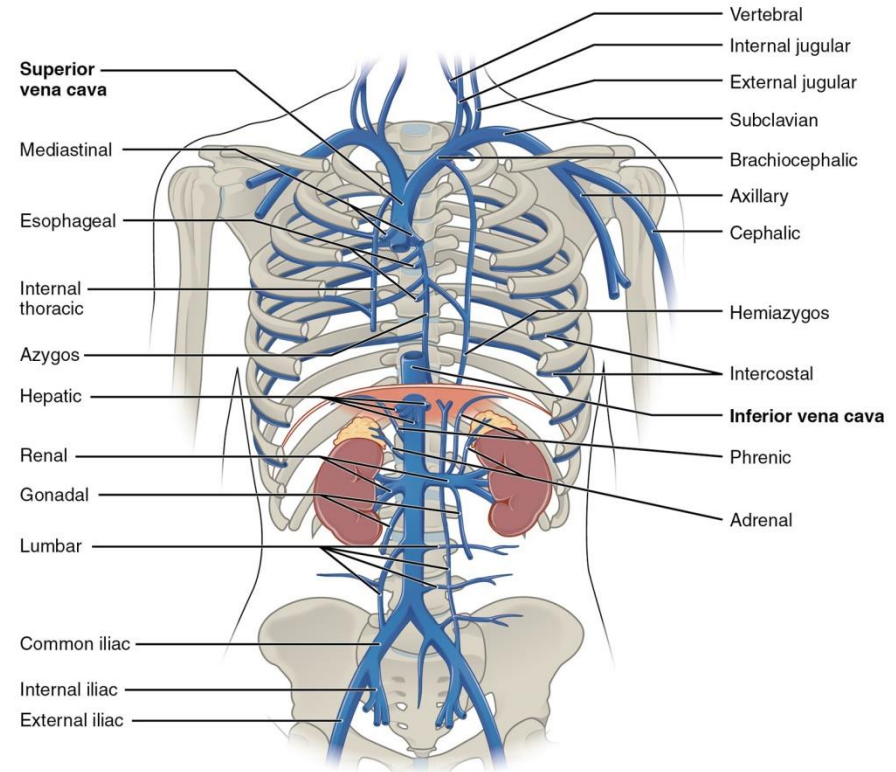
DEEP VEINS

- **VENAE COMMITANTES**
 - Which accompany all the large arteries
 - Usually in pairs
- **AXILLARY VEIN**
 - Formed by the union of basilic vein and the venae comitantes of the brachial artery.



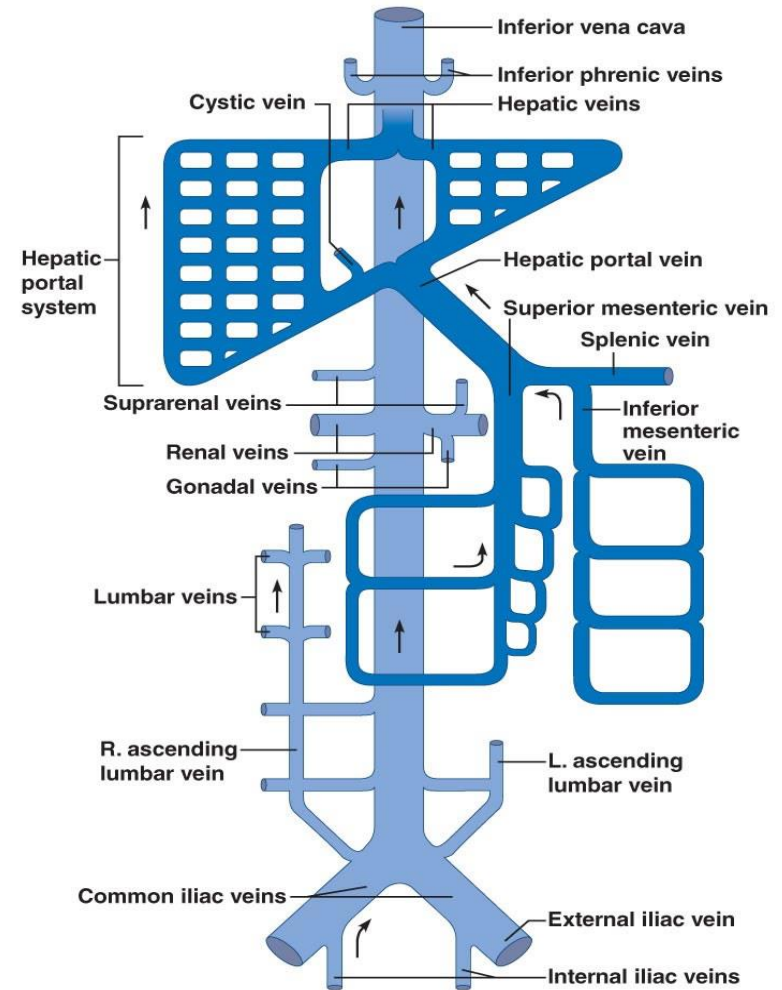
INFERIOR VENA CAVA

- ❑ **Drains most of the blood from the body below the diaphragm to the right atrium.**
- ❑ **Formed by the union of the two common iliac veins behind the right common iliac artery at the level of the 5th lumbar vertebra.**
- ❑ **Ascends on the right side of the aorta**
- ❑ **Pierces the central tendon of diaphragm at the level of the 8th thoracic vertebra.**



TRIBUTARIES OF INFERIOR VENA CAVA

- Two common iliac veins
- Median sacral vein
- Four paired lumbar veins
- Right gonadal vein
 - the left vein drains into the left renal vein
- Paired renal veins
- Right suprarenal vein
 - the left vein drains into the left renal vein
- Hepatic veins
- Paired inferior phrenic vein

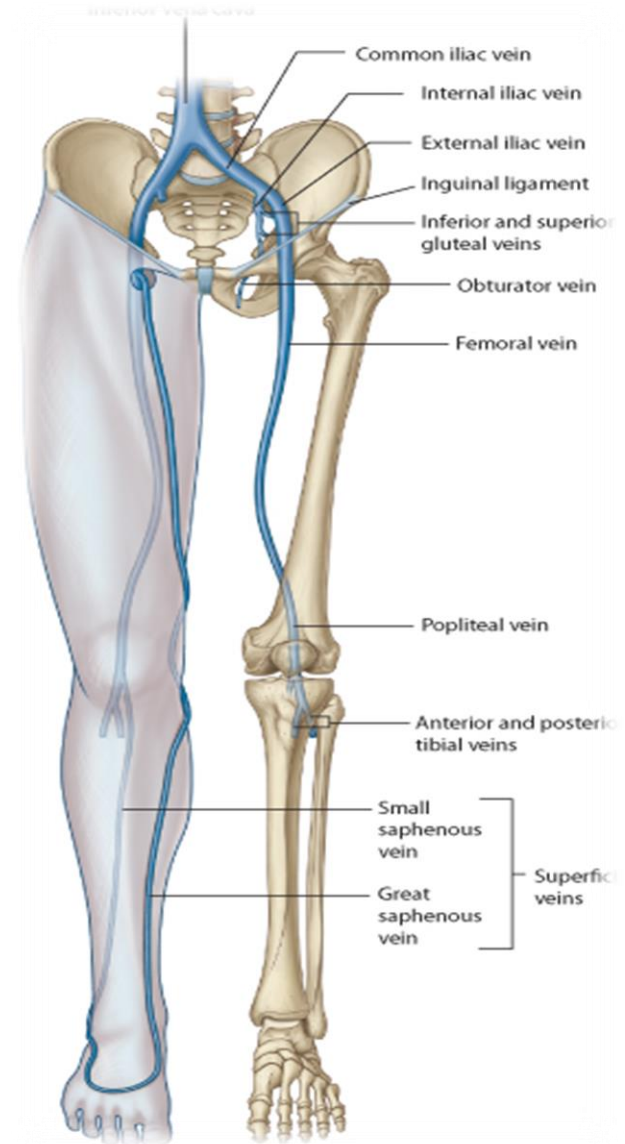


(a) Schematic flowchart.

VEINS OF LOWER LIMBS

TWO DIVISIONS:

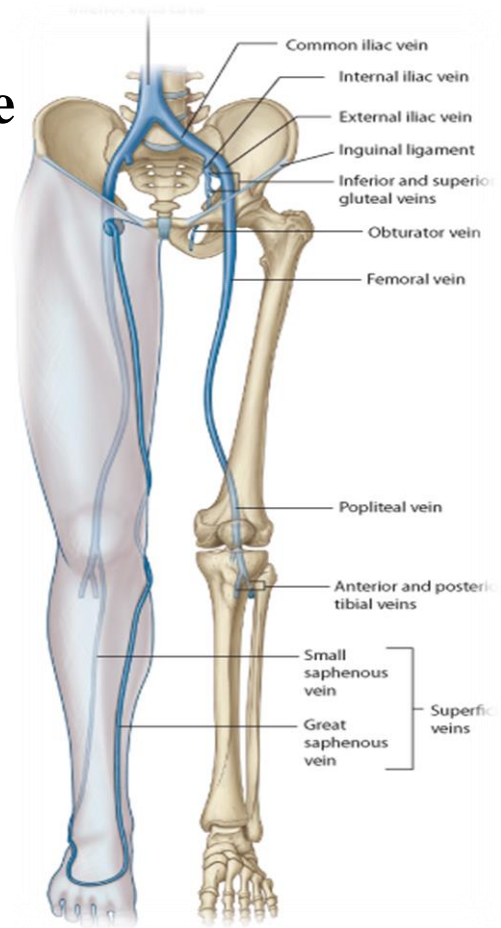
- SUPERFICIAL VEINS
- DEEP VEINS



VEINS OF LOWER LIMBS

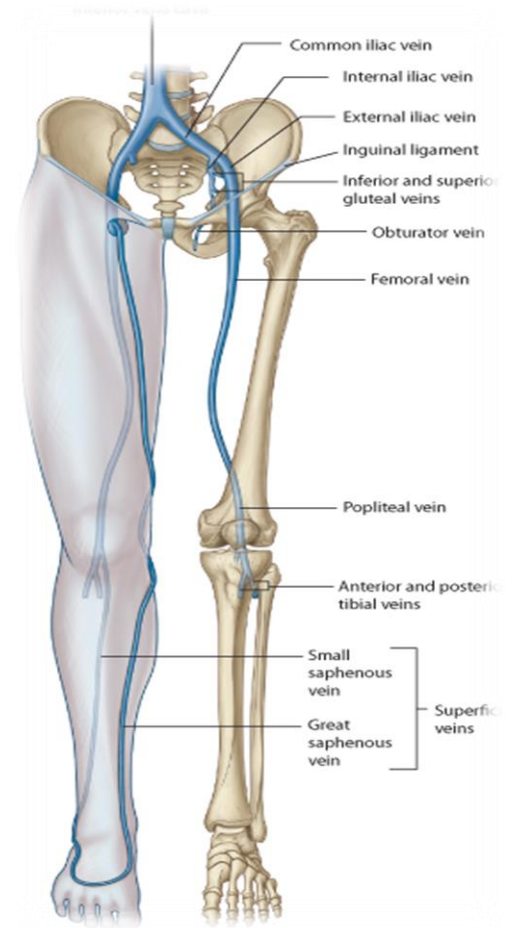
SUPERFICIAL VEINS

- Form a network in the subcutaneous tissue
- Pattern is variable
- They are the tributaries of the:
 - Great (long) saphenous vein
 - Small (short) saphenous vein



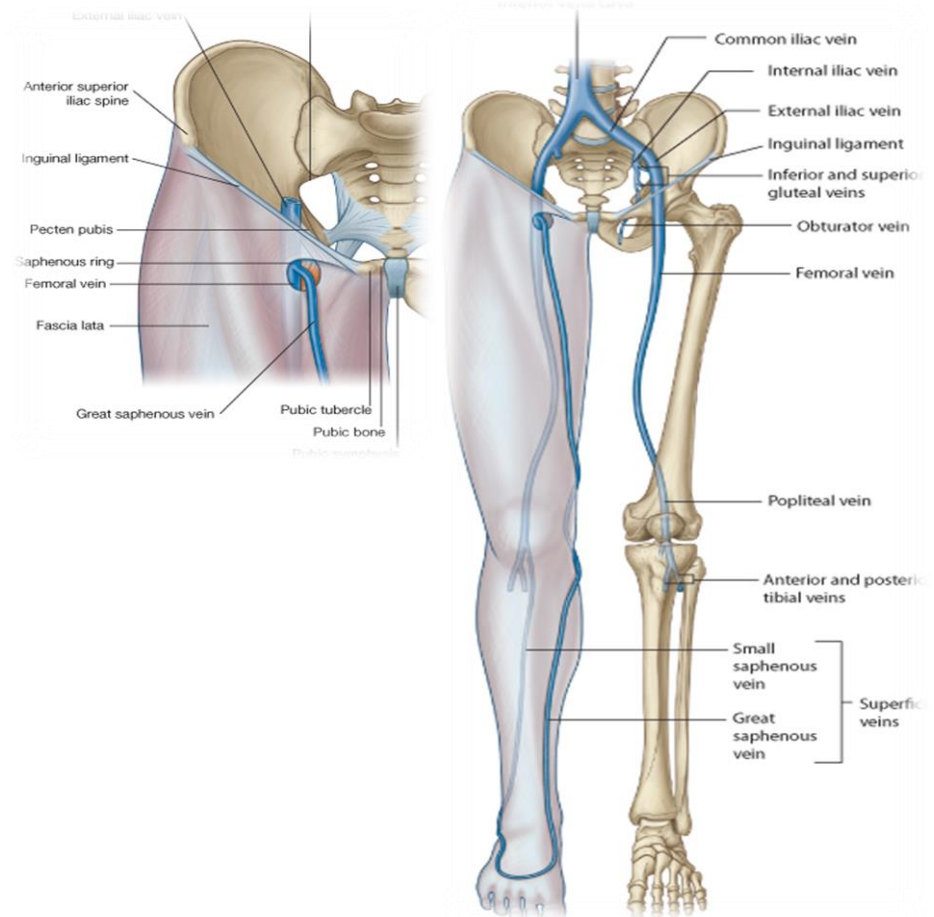
GREAT SAPHENOUS VEIN

- **The longest vein**
- **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.**
- **Then it ascends in accompany with the saphenous nerve in the superficial fascia over the medial side of the leg.**



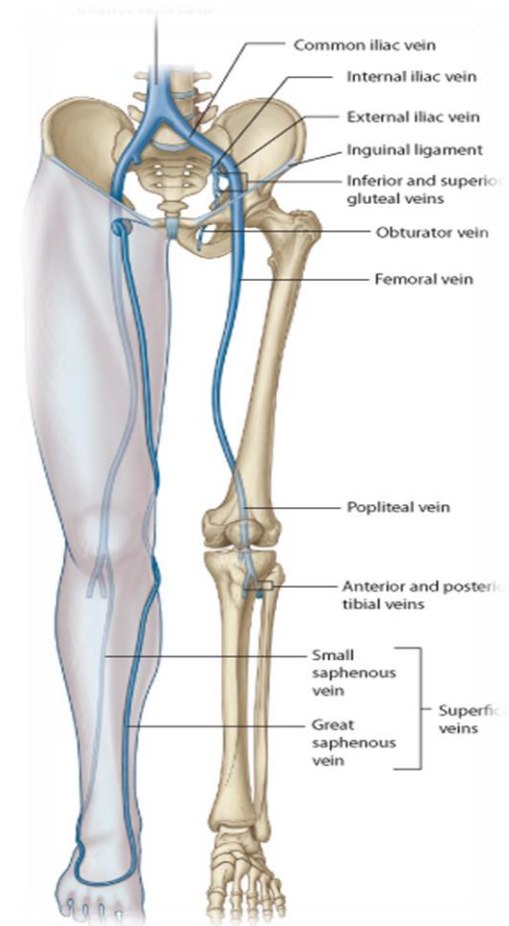
GREAT SAPHENOUS VEIN

- Ascends obliquely upwards, and lies behind the medial border of the patella.
- Passes behind the knee and curves forward around the medial side of the thigh.
- 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.



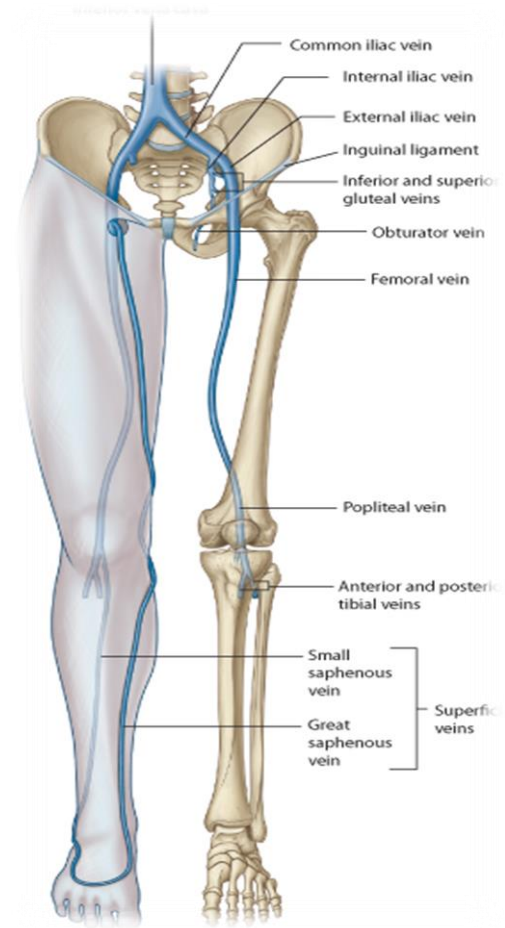
GREAT SAPHENOUS VEIN

- It is connected to the small saphenous vein by one or two branches that pass behind the knee.
- Numerous perforating veins connect the great saphenous vein with the deep veins.
- The perforating veins have valves which allow blood flow from superficial to deep veins.
- The great saphenous vein is used in venous grafting and saphenous cut down (take care of the saphenous nerve)



SMALL SAPHENOUS VEIN

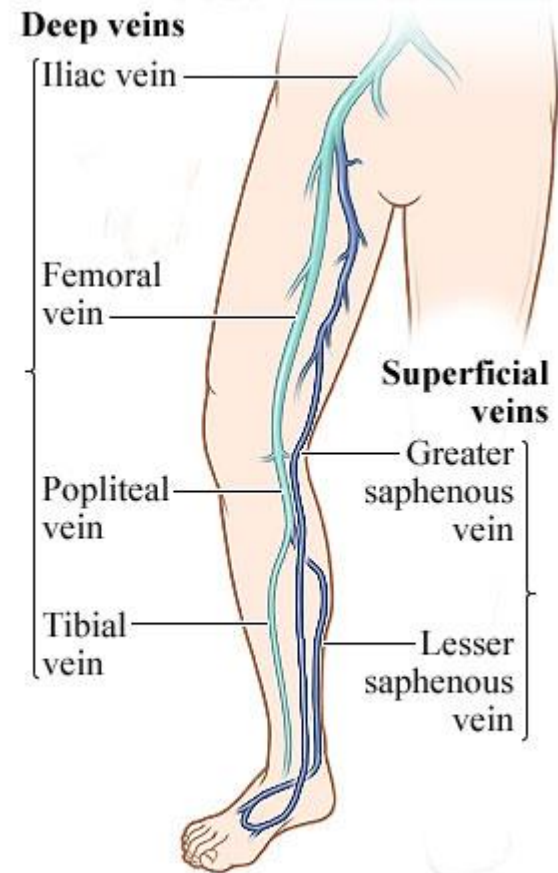
- Arises from the lateral end of the dorsal venous arch.
- Ascends behind the lateral malleolus in company with the sural nerve.
- Follows the lateral border of the tendocalcaneus and then runs up to the middle of the back of the leg.
 - Pierces the deep fascia in the lower part of the popliteal fossa
 - Drains into the popliteal vein
 - Has numerous valves along its course.
 - Anastomosis freely with great saphenous vein.



VEINS OF LOWER LIMBS

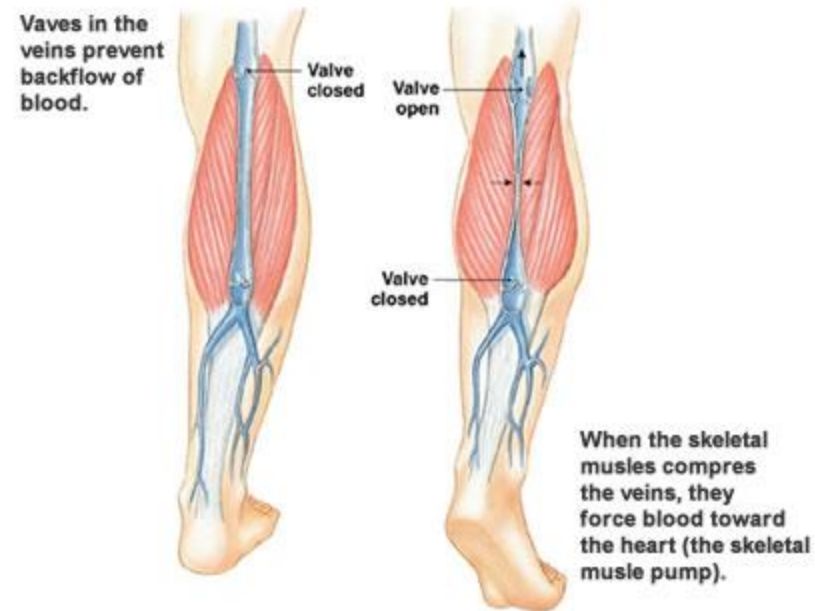
DEEP VEINS

- Comprise the venae comitantes, which accompany all the large arteries, usually in pairs.
- Venae comitantes unite to form the popliteal vein, which continues as the femoral vein.
- Receive blood from superficial veins through perforating veins.



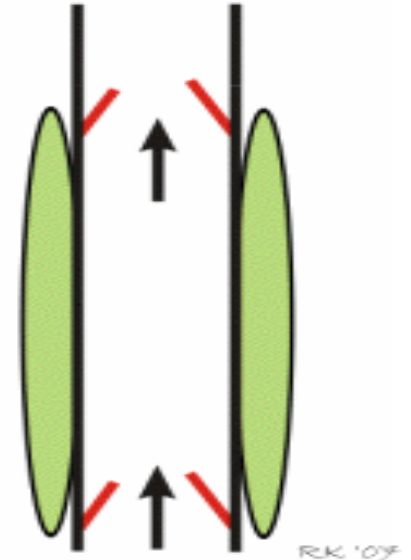
MECHANISM OF VENOUS RETURN FROM LOWER LIMB

- ❑ Much of the saphenous blood passes from superficial to deep veins through the perforating veins
- ❑ The blood is pumped upwards in the deep veins by the contraction of the **calf muscles** (calf pump).
- ❑ This action of **calf pump** is assisted by the tight sleeve of deep fascia surrounding these muscles.



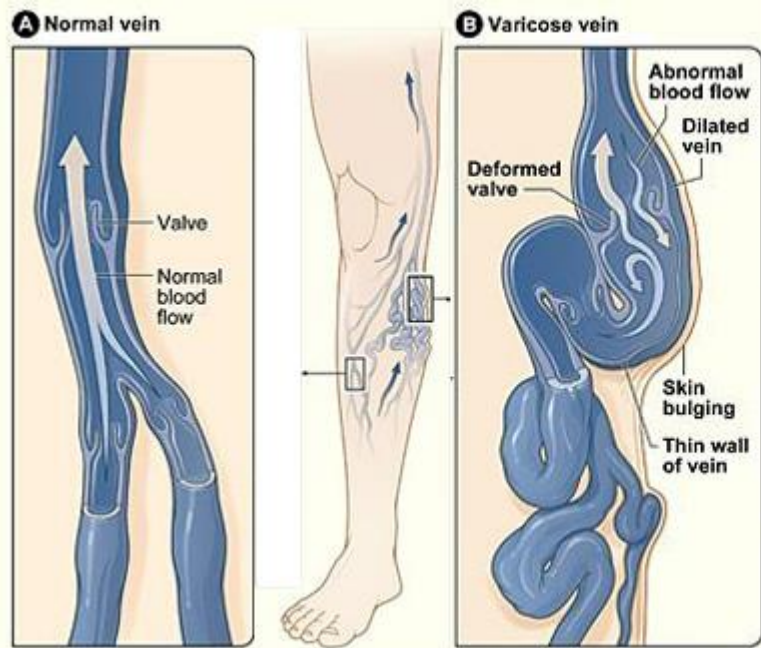
FACTORS AIMING BLOOD RETURN

- ❑ **Muscle Contraction.**
 - Rhythmical contraction of limb muscles as occurs during normal locomotory activity (walking, running, swimming) promotes venous return by the muscle pump mechanism.
- ❑ **Respiratory Pump**
 - During respiratory inspiration, the venous return increases because of a decrease in right atrial pressure.
- ❑ **Decreased Venous Compliance**
 - Sympathetic activation of veins decreases venous compliance, increases central venous pressure and promotes venous return.
- ❑ **Gravity**
 - The effects of gravity on venous return seem paradoxical because when a person stands up hydrostatic forces cause the right atrial pressure to decrease and the venous pressure in the dependent limbs to increase.



VARICOSE VEINS

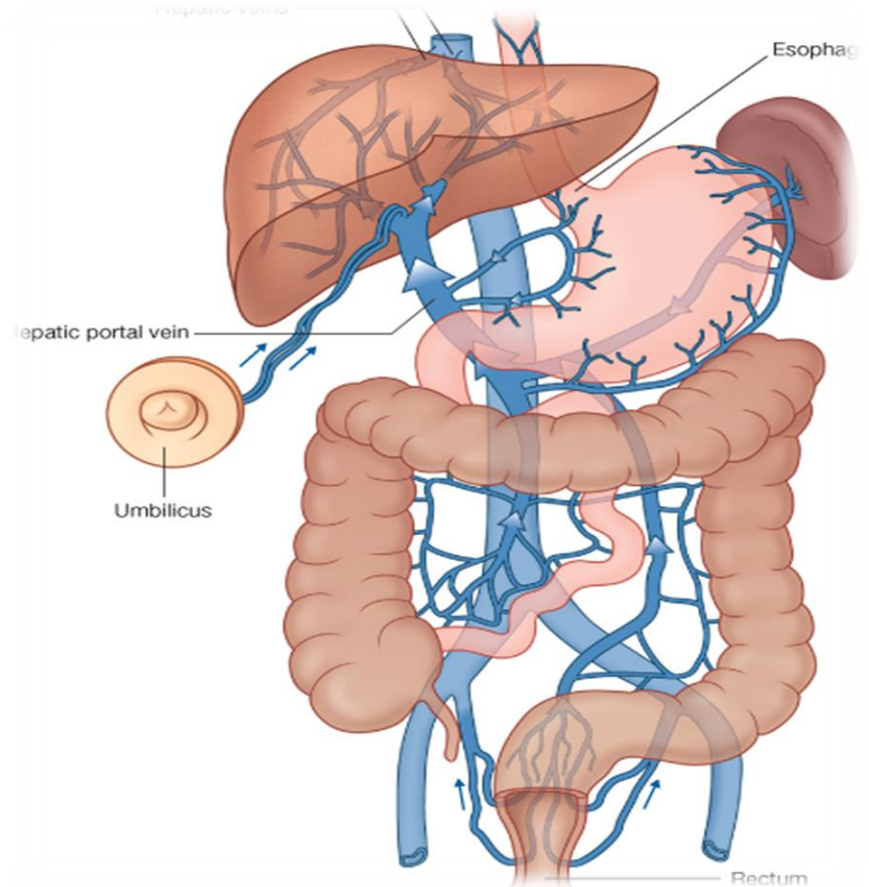
- If the valves in the perforating veins become incompetent, the direction of blood flow is reversed and the veins become varicose. Most common in posterior & medial parts of the lower limb, particularly in old people.



PORTAL CIRCULATION

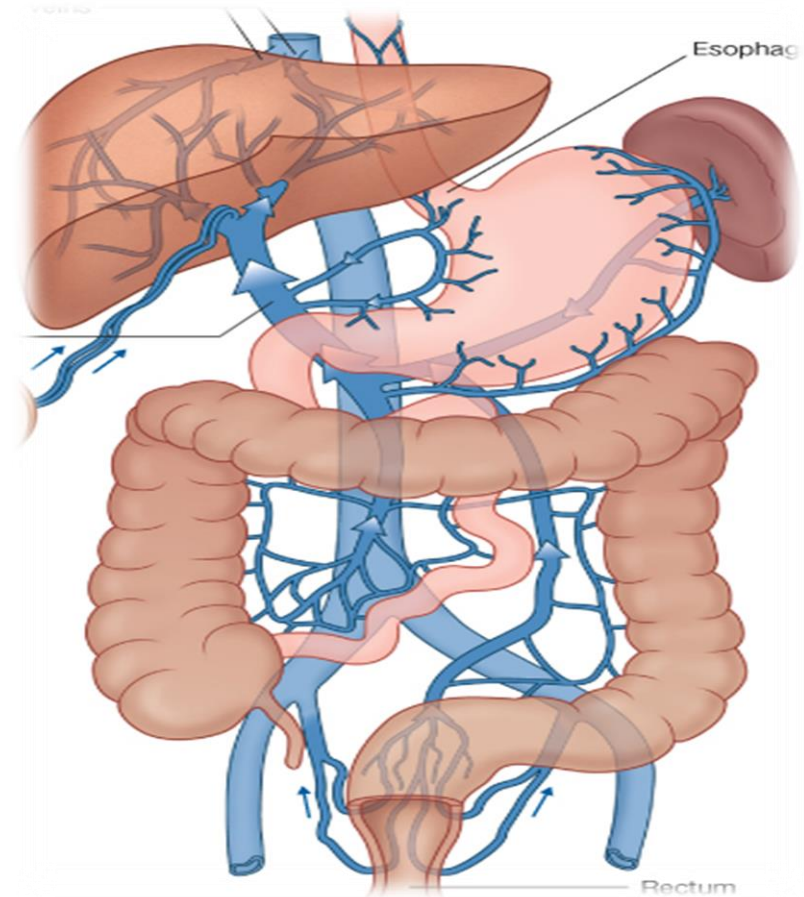
❑ A portal venous system is a series of veins or venules that directly connect two capillary beds.

❑ Examples of such systems include the hepatic portal vein and hypophyseal portal system.



HEPATIC PORTAL VEIN

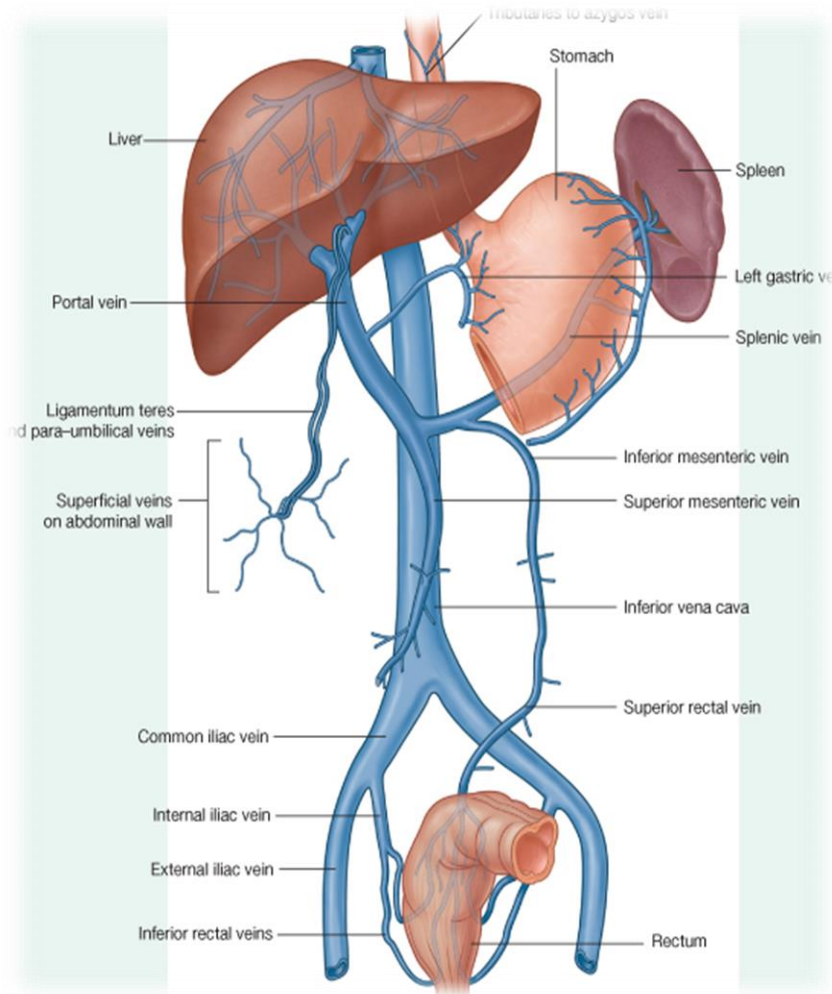
- ❑ Drains blood from the gastrointestinal tract and spleen
- ❑ It is formed by the union of the superior mesenteric and splenic veins.
- ❑ Immediately before reaching the liver, the portal vein divides into right and left that enter the liver.
- ❑ Tributaries: Gastric and cystic veins



PORTOCAVAL ANASTOMOSIS

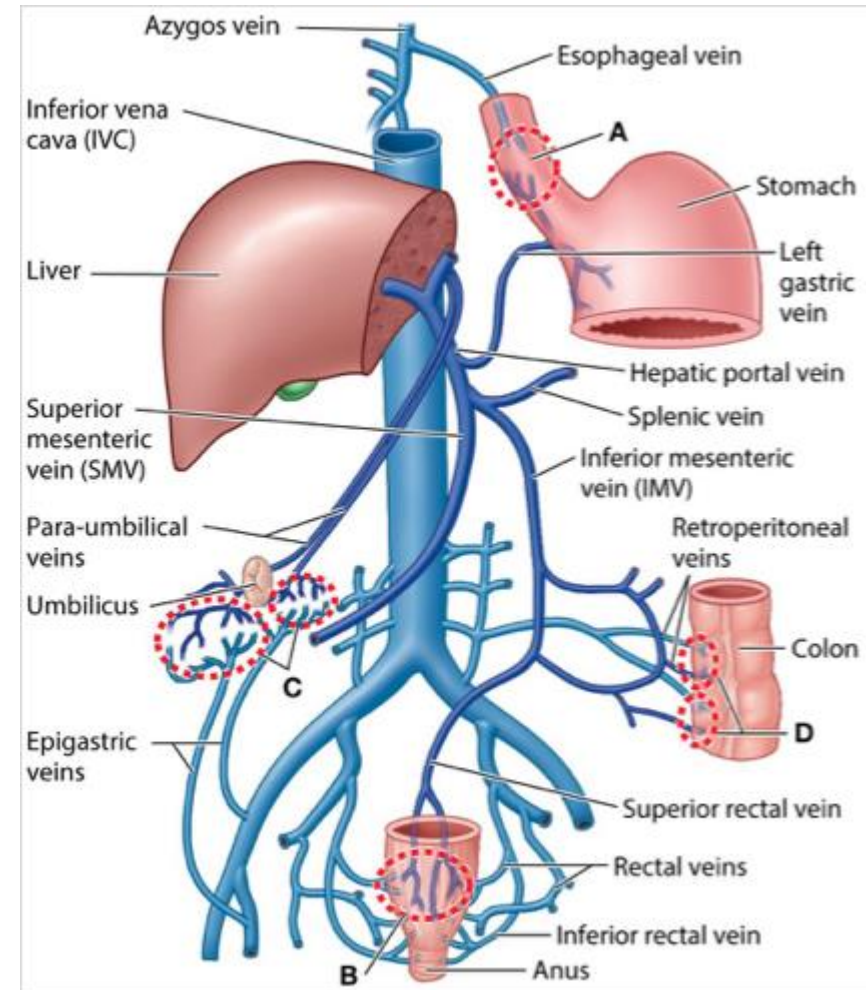
❑ A portacaval anastomosis (also known as portal systemic anastomosis) is a specific type of anastomosis that occurs between the veins of portal circulation and those of systemic circulation.

❑ The anastomotic channels become dilated (varicosed) in case of portal hypertension.



SITES OF PORTOCAVAL ANASTOMOSIS

- ❑ **Lower end of esophagus:** left gastric vein & azygos vein
- ❑ **Lower part of rectum:** (Hemorrhoids) superior and middle rectal veins & inferior rectal vein
- ❑ **Para umbilical region:** (Caput Medusae) Para umbilical veins & superficial epigastric vein
- ❑ **Retroperitoneal:** Veins draining colon & veins of the posterior abdominal wall
- ❑ **Bare area of liver:** There is some anastomosis between portal venous channels in the liver and azygous system of veins above the diaphragm.



Any
QUESTIONS!