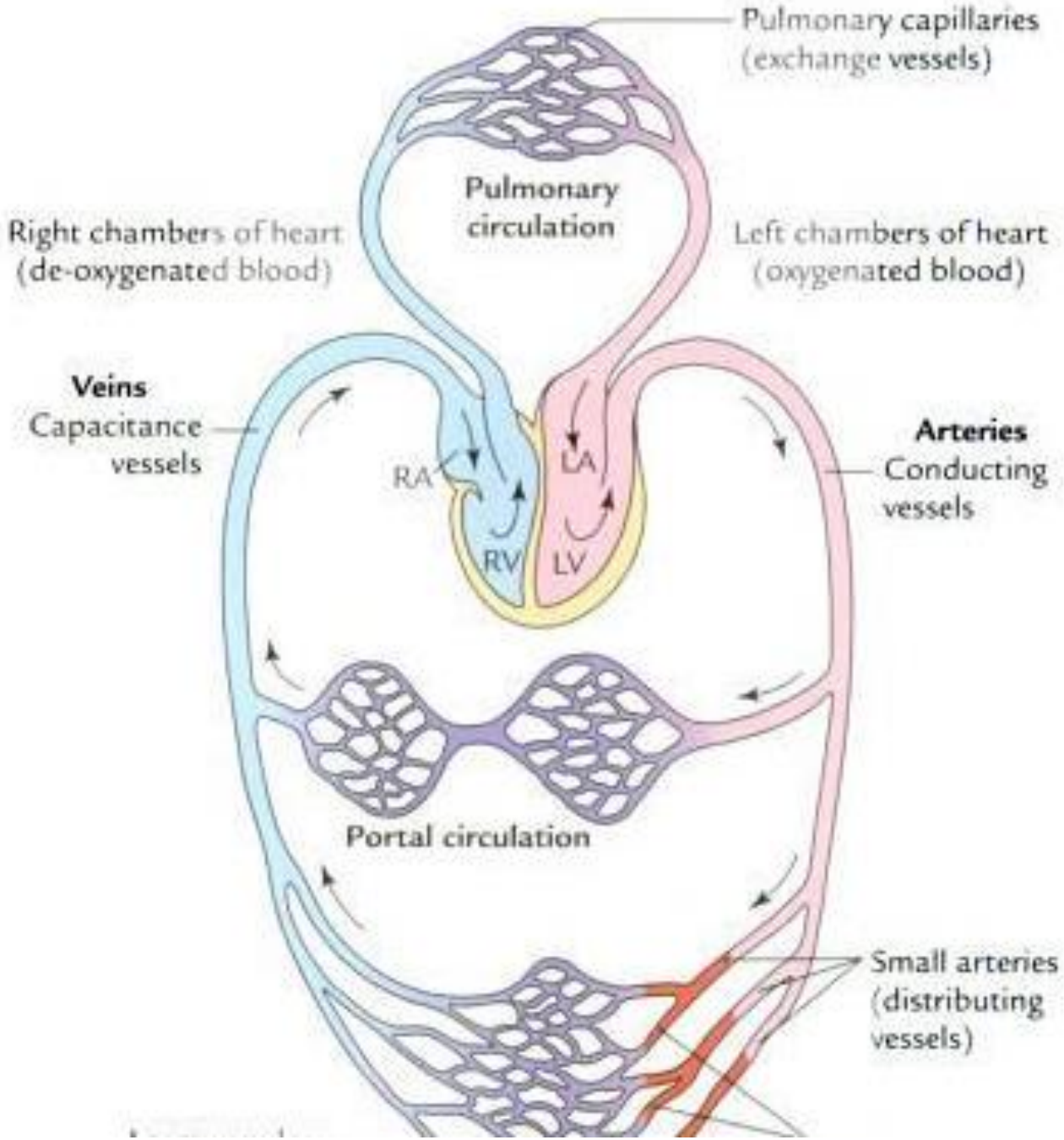
INTRODUCTION TO CVS

- => Components:-
- (1) Heart
- (2) Vessels
- (a) Distributing vessels (Medium- Radial A.)
  (b) Resistance vessels (Arterioles)
  (c) Exchange vessels (Capillaries)
  (d) Reservoir vessels (veins)
  (e) Shunts (Anastomosis)

- => Types of circulation:-
- (1) Systemic circulation
  (2) Pulmonary circulation
  (3) Portal circulation


Pulmonary capillaries
(exchange vessels)
Pulmonary
circulation
Right chambers of heart
(de-oxygenated blood)
Left chambers of heart
(oxygenated blood)
Veins
Capacitance
vessels
RA
LA
RV
LV
Arteries
Conducting
vessels
Portal circulation
Small arteries
(distributing
vessels)

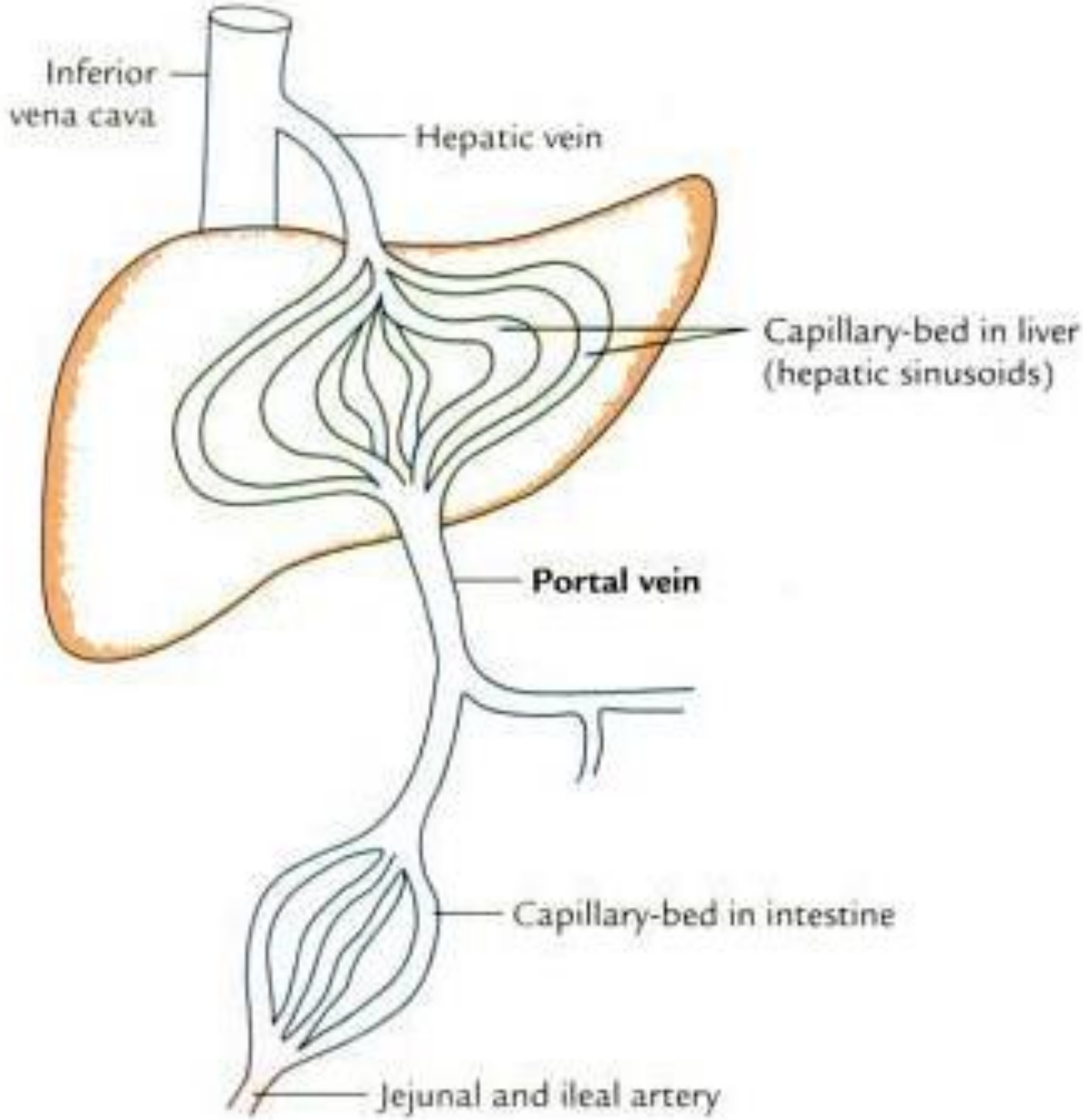


Fig. 10.15 Hepatic portal circulation.

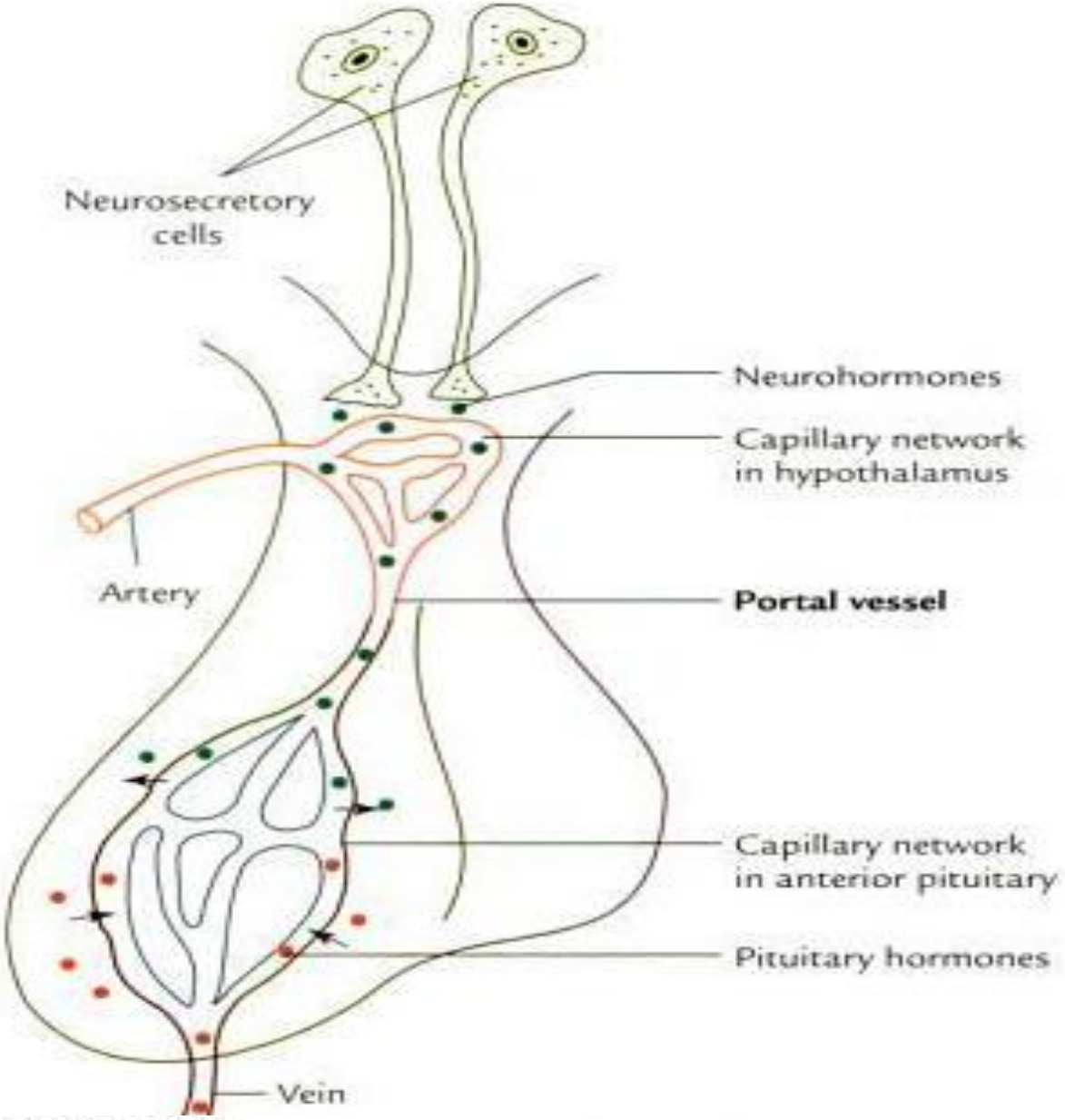


Fig. 10.16 Hypothalamo-hypophyseal portal system.

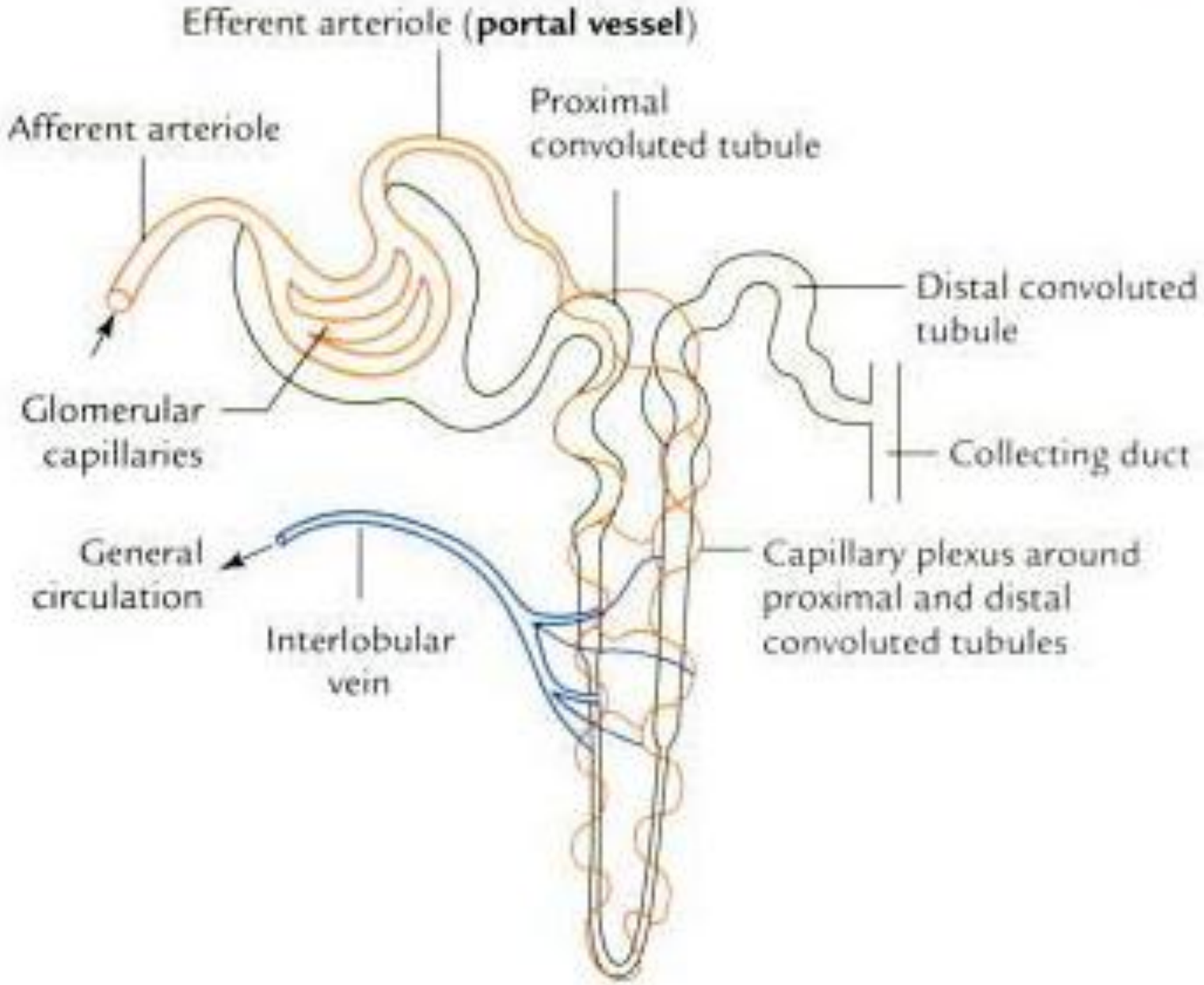


Fig. 10.17 Renal portal circulation.

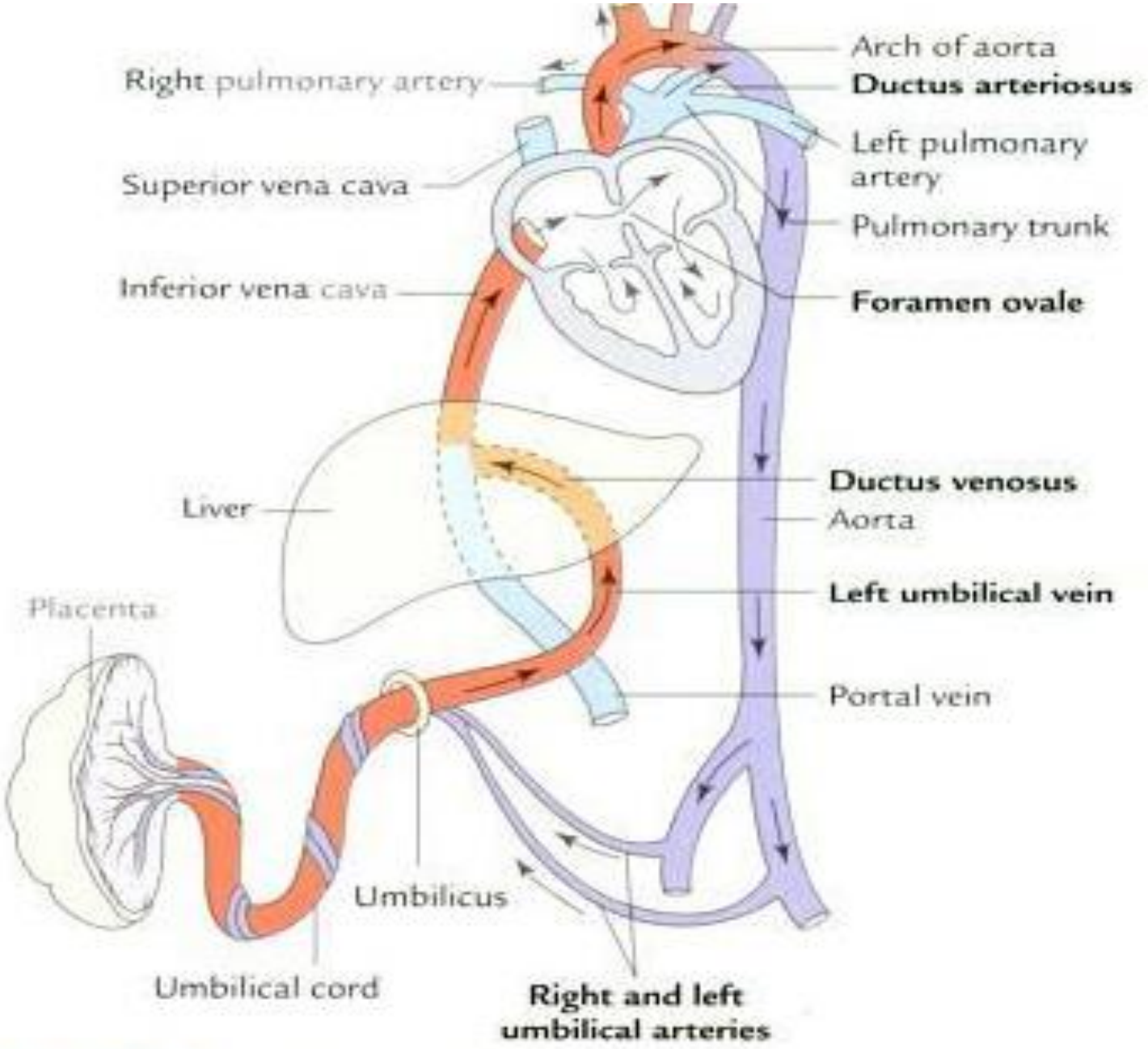
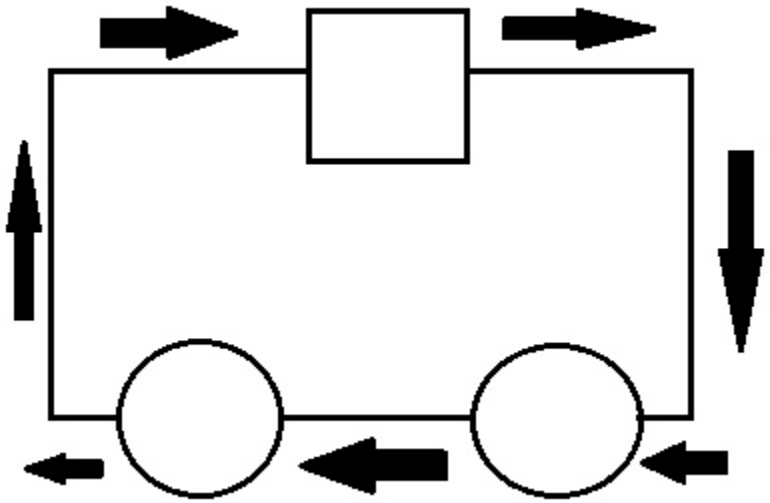
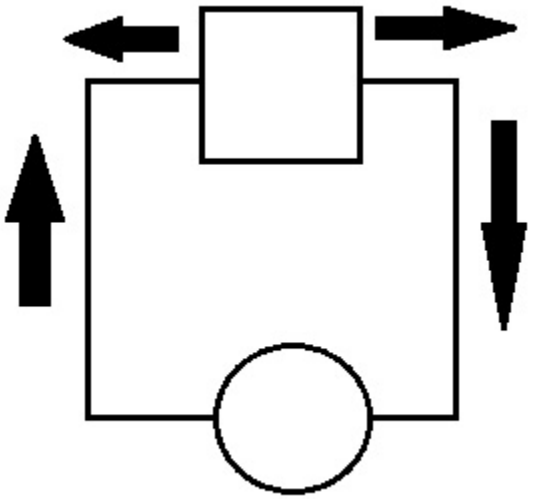


Fig. 10.18 Fetal circulation.

Portal circulation



Systemic circulation

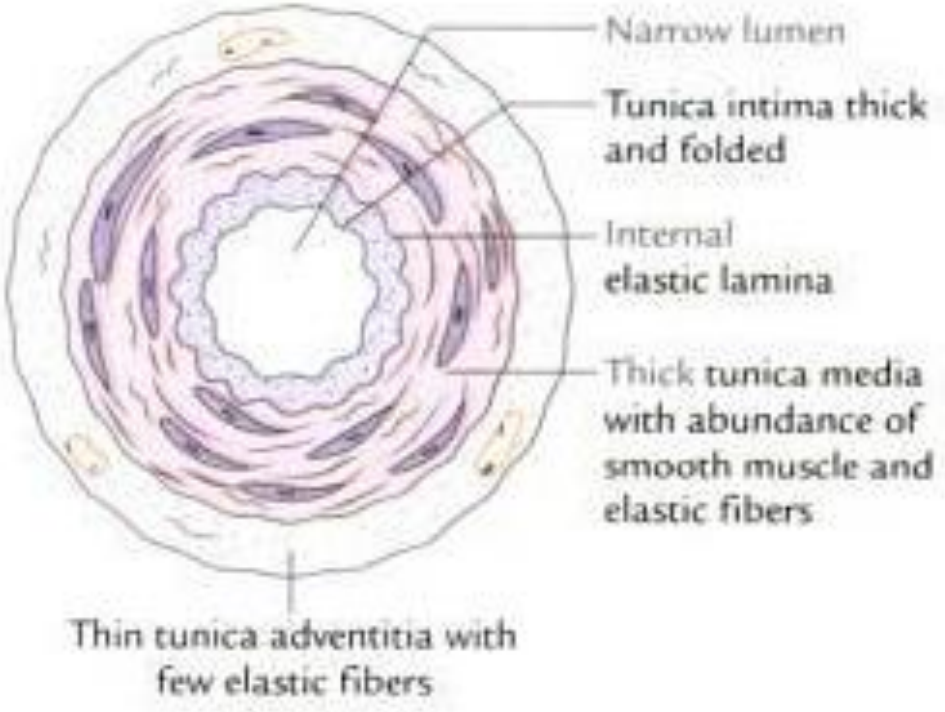


- **=> Arteries:-**
- Large (Elastic) → Aorta & Pulmonary Art.
  Diameter-------10mm
- Medium (Muscular) → Radial A----- 01mm
- Smallest (Muscular) → Arterioles---- 0.1mm

General (Microscopic) Structure

The arterial wall is made of three layers/coats (Fig. 10.6 A and B). From within outwards these are:

1. Tunica intima
2. Tunica media
3. Tunica adventitia



A

Venules	0.1 mm-	Diameter
Medium-sized (Named v.)	01 mm	Diameter
Large veins(V. C)	10 mm	Diameter

Veins:- Poor (muscles and elastic tissue)

Capillaries:- **Less than RBC**

Continuous → Skin

Fenestrated → Glomeruli

Sinusoids;

Wide lumen , incomplete wall → Liver

Factor helping venous return

Pushed, Pulled, Pressed

Valves r never missed

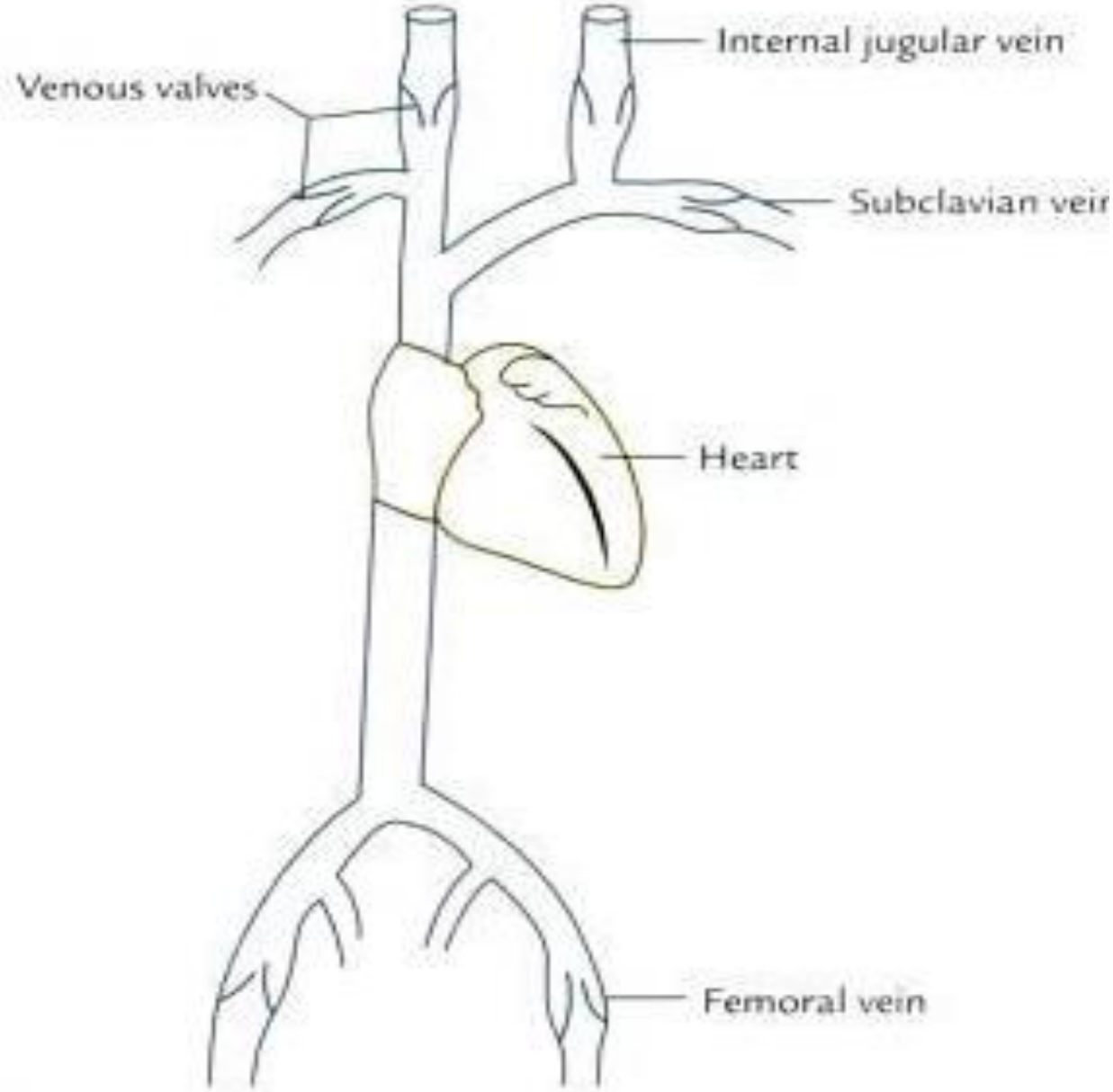


Fig. 10.11 Venous valves near the heart.

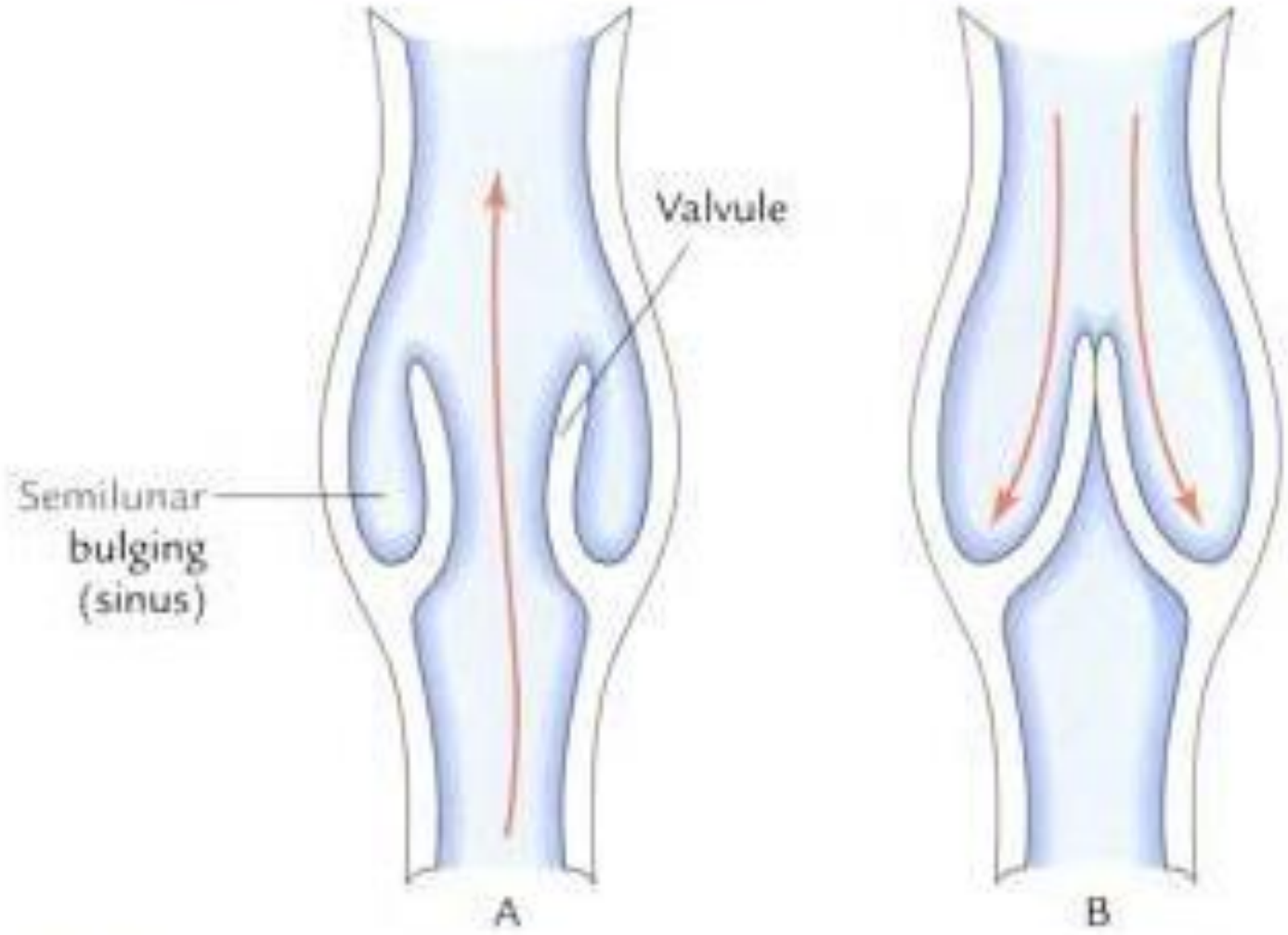


Fig. 10.10 Opening and closing of venous valves: **A**, the valve opens by forward pressure towards the heart; **B**, the valve closes by backward pressure.

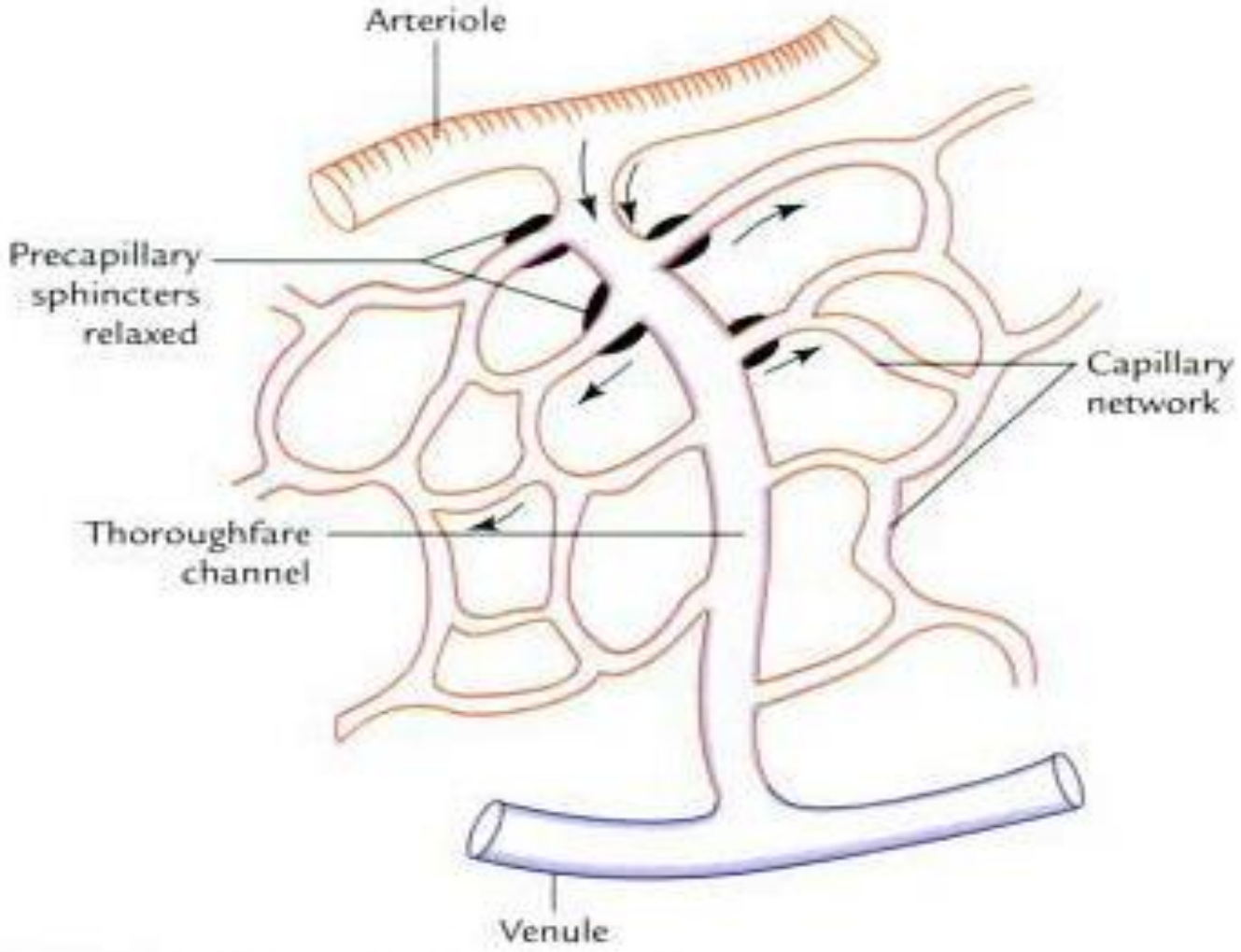


Fig. 10.7 Thoroughfare channels.

- => Anastomosis :-
- Arterial
- Venous
- Av (shunt)
  - (a) skin of nose
  - (b) lips , ear
  - (c) MM of GIT
  - (d) Thoroughfare charnels

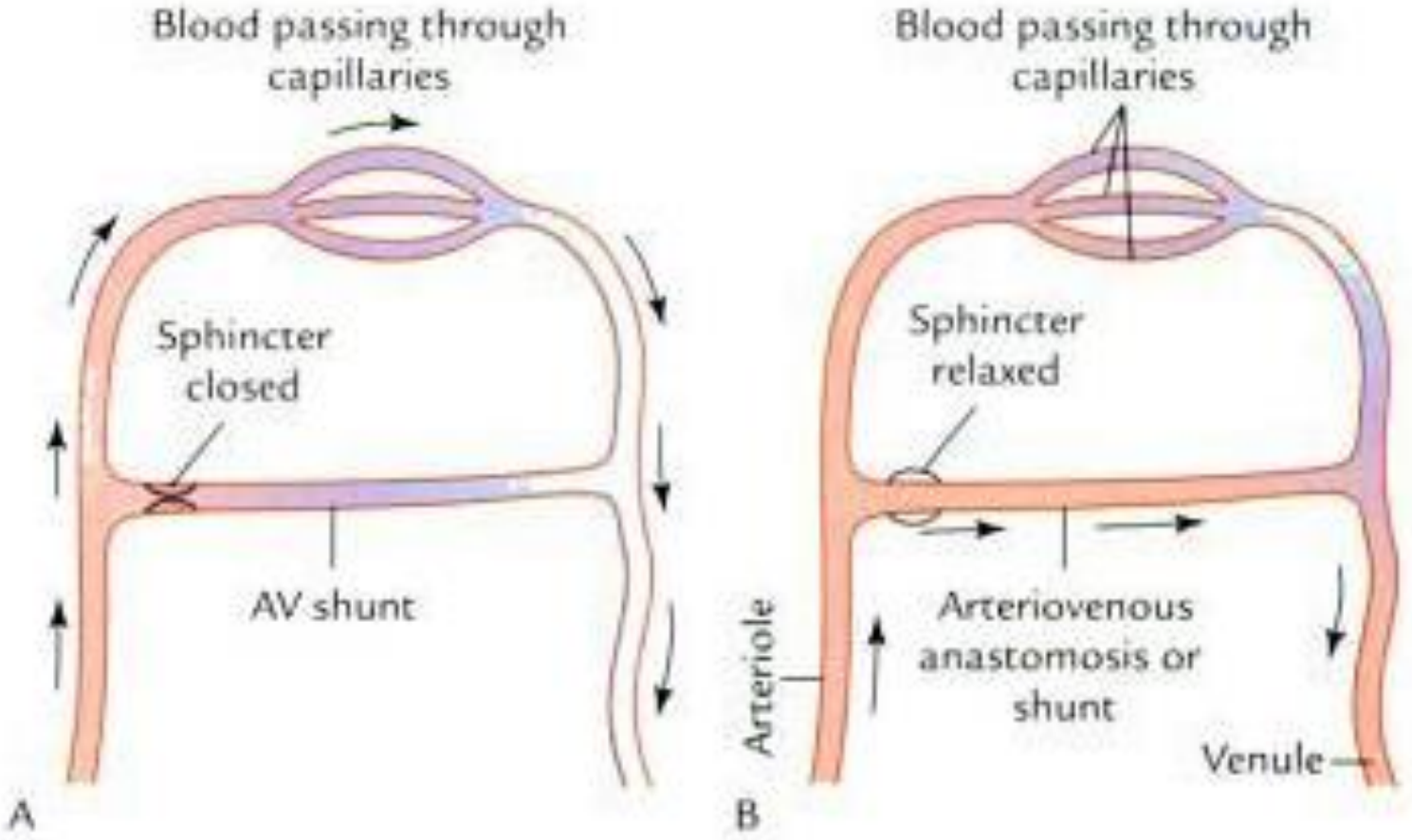


Fig. 10.13 Functioning of arteriovenous anastomoses (or shunt): **A**, blood not passing through shunt because sphincter is closed, hence it is passing through capillaries (when tissue or organ is active); **B**, blood passing through shunt because sphincter is relaxed, hence little or no blood is passing through capillaries (when tissue or organ is at rest).

- => **End – Arteries:-**
- Central artery of retina
- Central brs of cerebral arteries
- Vasa recta of mesenteric A

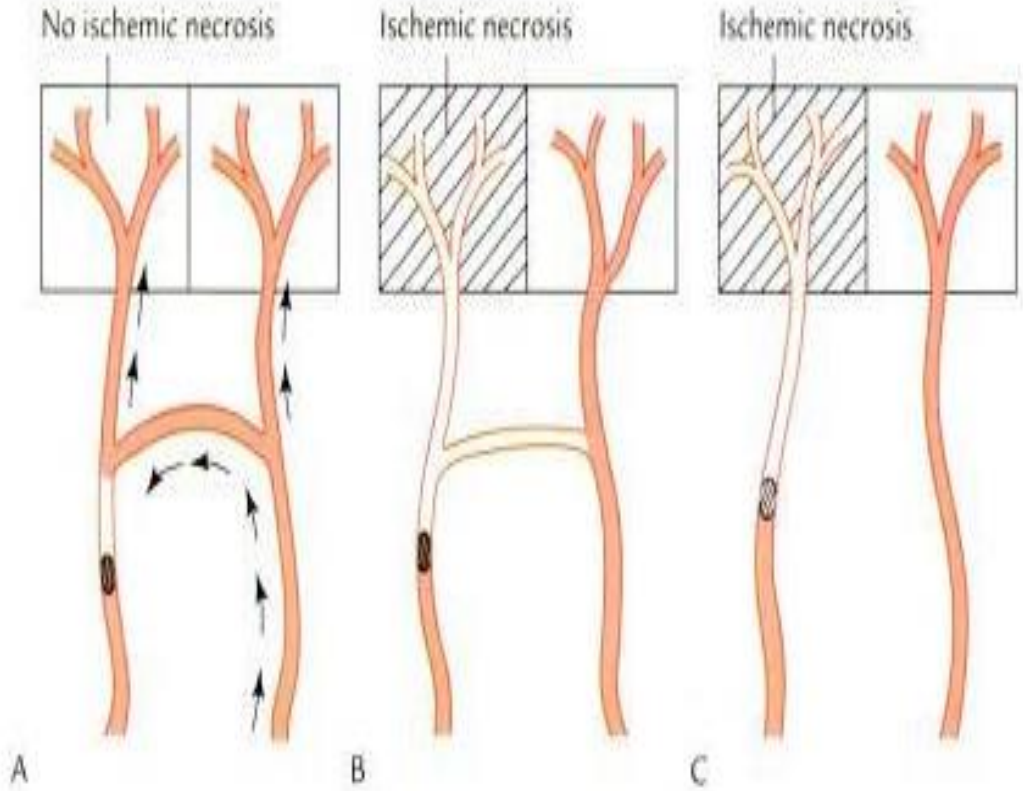


Fig. 10.12 Arterial anastomosis and end arteries: **A,** functional anastomosis; **B,** functional end artery (nonfunctional anastomosis); **C,** anatomical end artery.

=> Applied Anatomy:-

(1)Bp

(2)Hemorrhage

(3)Thrombosis

(4)Embolism

(5)Arteriosclerosis

(6) Phlebitis

(7) Atheroma

(8) Aneurysm

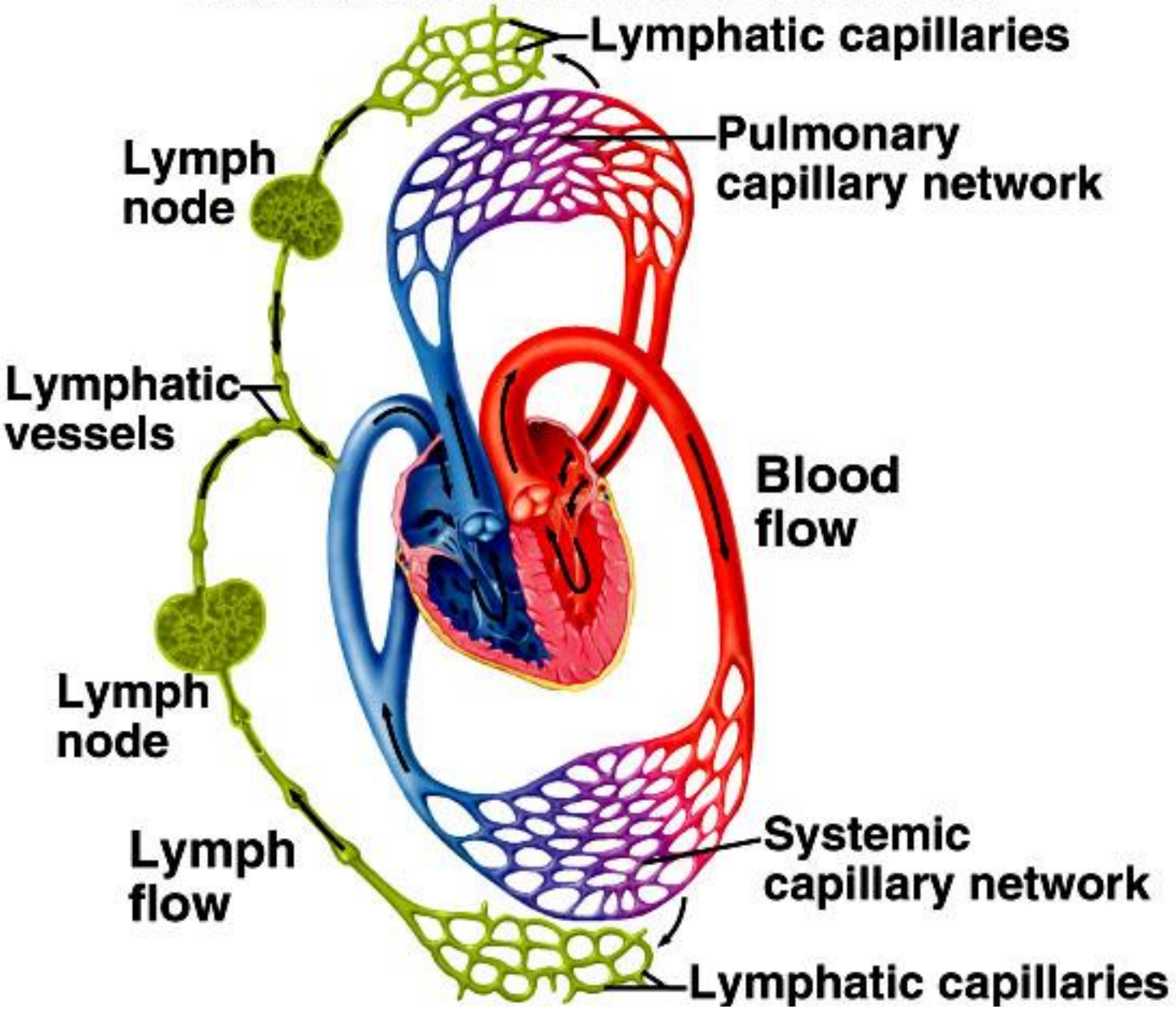
(9) Raynaud`s phenomenon

(10) Phlebothrombosis

(11) Varicose vein


بسم الله الرحمن الرحيم

LYMPH VASCULAR SYSTEM



Collects fluid from tissue spaces and returns it to the blood, this fluid is called **lymph.** The lymph vascular system consists of

lymphatic capillaries.

- Lymphatic vessels and lymphatic ducts. Specialized structures called lymph nodes are situated along the course of lymphatic vessels.

- The lymph nodes remove unwanted particulate matter from the lymph and add lymphocytes to it.
- One way flow from the periphery toward the great veins at root of the neck.

LYMPH

Some fluid moves from the body tissues into the lymphatic capillaries, called lymph

- All the tissues of the body are drained by the lymphatic system except those of
- **the nervous system. Bone marrow and coats of the eyeball.**

- The flow of lymph in lymphatic vessels is caused by the following factors.

(1) contraction of smooth muscle

(2) Pressure by the surrounding skeletal muscles,

(3) the pulsation of adjacent arteries,

(4) Negative pressure within the thorax

LYMPHATIC CAPILLARIES

- Lymphatic capillaries begin as dilated channels with blind (closed) ends.
- lymph capillaries are most abundant near the innermost and outermost surfaces of the body,
- **The dermis of skin and mucous membrane of the respiratory and digestive systems.**

Lymphatic vessels

- The lymphatic capillaries unite to form large collection channels called lymphatic vessels o. They are regularly provided with valves to ensure flow of lymph away from their tissues and toward the venous system. Presence of numerous valves gives lymphatic's **a beaded** appearance.

- Anastomose freely.
- Run parallel to blood vessels. Lymphatic pass through various lymph nodes
- Arranged into a superficial set and a deep set

- The lymphatic vessels from the right side of the head , neck and thorax and from the right upper limb join to form a large lymphatic vessels called **right lymphatic duct**. This duct opens into the **right subclavian vein** near its junction with the right internal jugular vein.

- **Thoracic duct**, which is the largest vessel of the lymph vascular system. This vessel begins in the abdomen as a large irregular lymph sac called cisterna chyli.
- Terminate by emptying into **left subclavian vein** near its junction with the left internal jugular vein.

LYMPH NODES

- Lymphoid tissue found in the pathways of lymphatics. The lymph nodes generally have a
- bean-shaped
- 1 to25 mm in length.
- Deep
- Superficial

Lymph nodes filter out the harmful micro-organisms and other foreign substance from the lymph

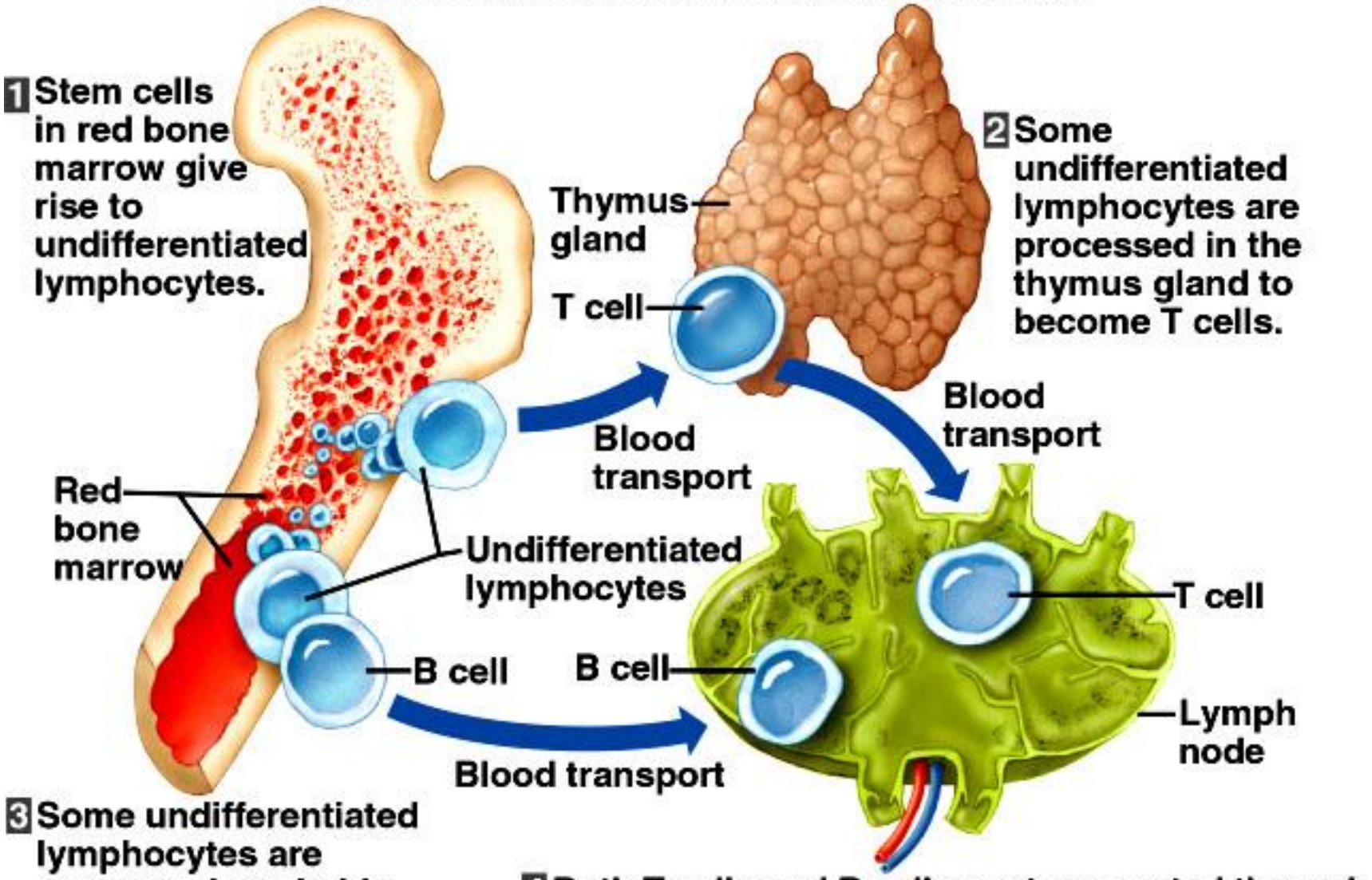
Lymph nodes also add lymphocytes to the venous system.

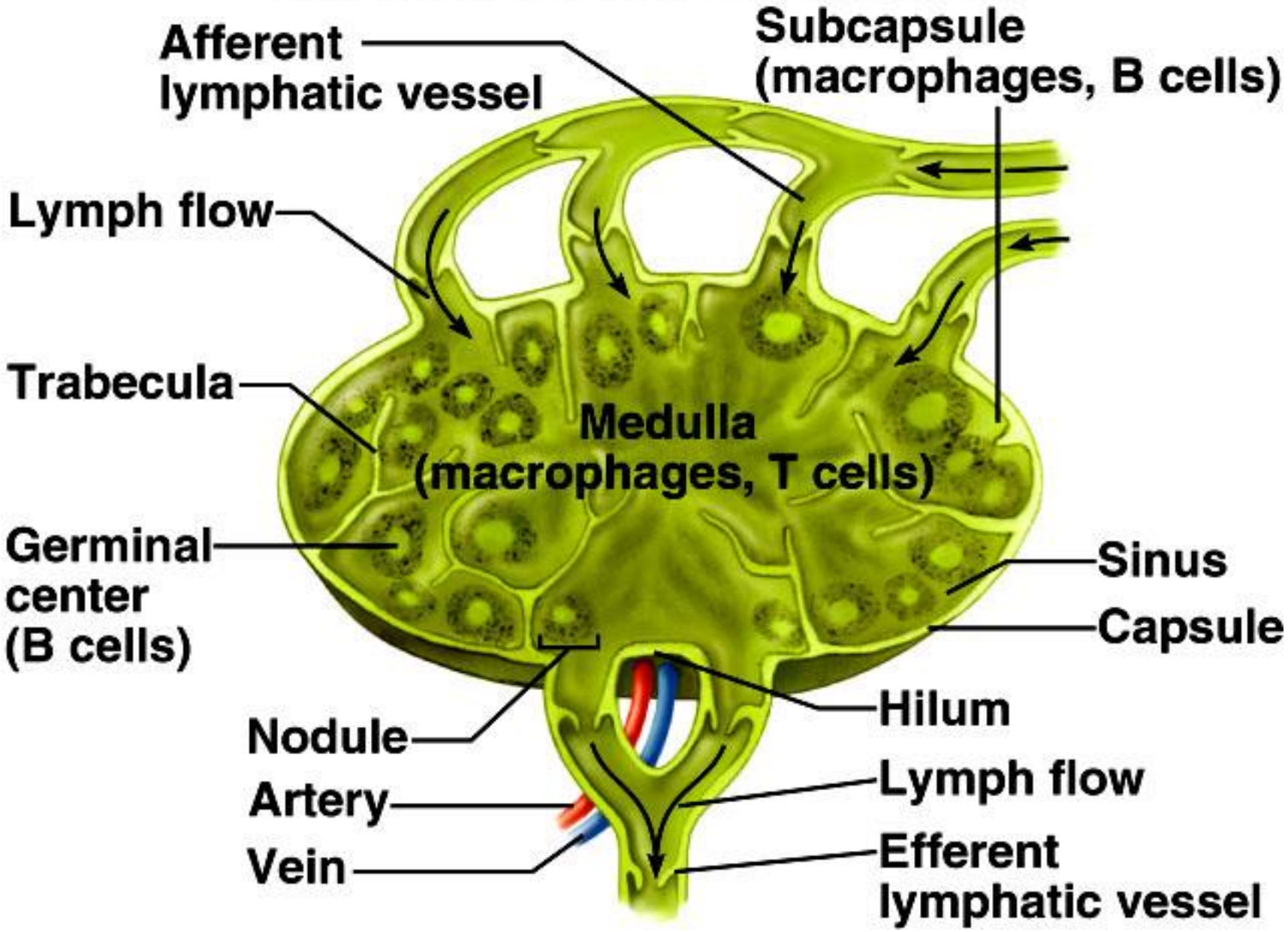
Lymph nodes are also the initiating sites for the specific defenses of the immune system.

- Cancer cells usually spread by way of the lymphatics .

LYMPHOID ORGANS

- The spleen, thymus gland, and the palatine. Pharyngeal and lingual tonsils. All lymphoid organs contain relatively large numbers of lymphocytes.



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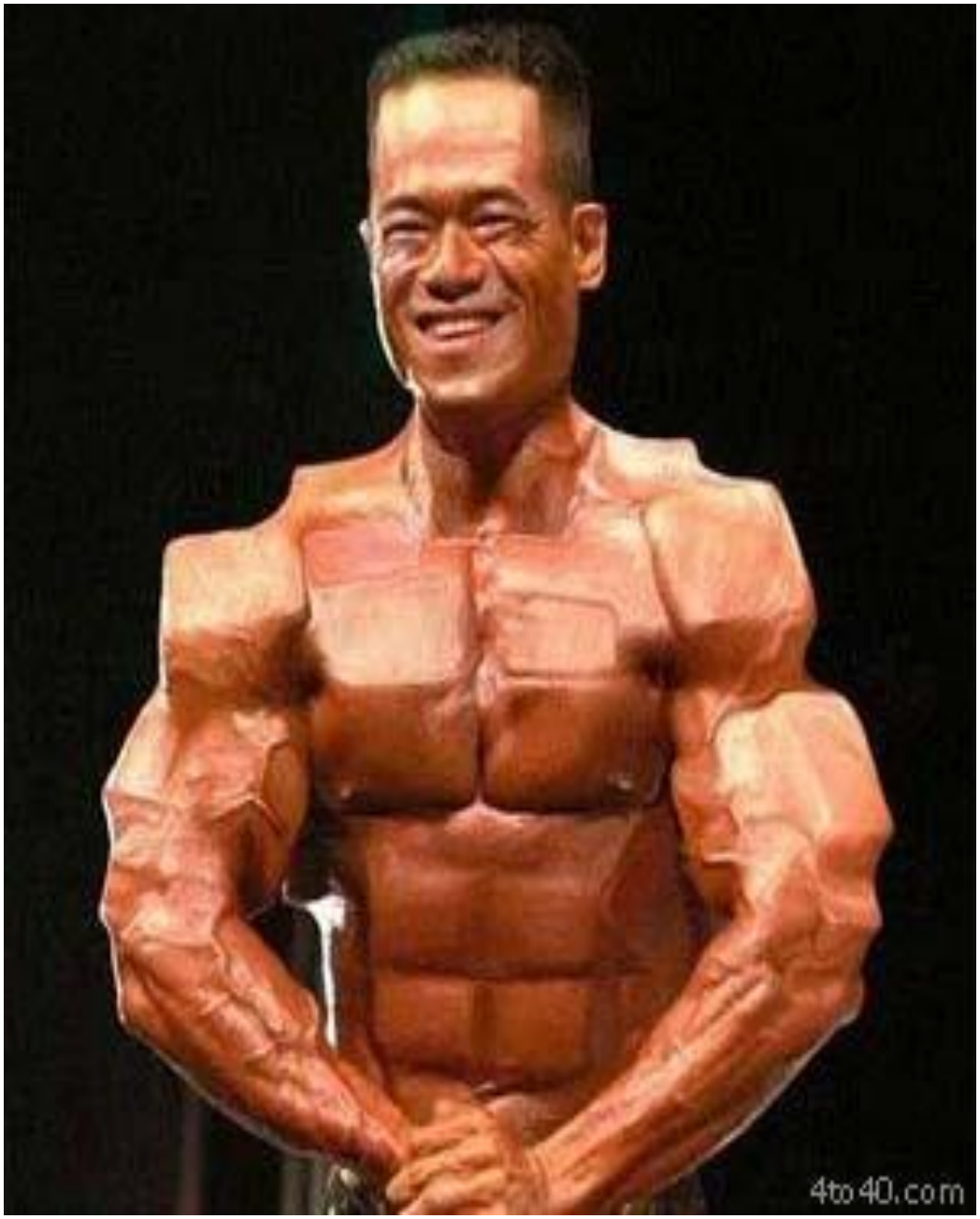

THANKS