ANATOMY OF PERICARDIUM

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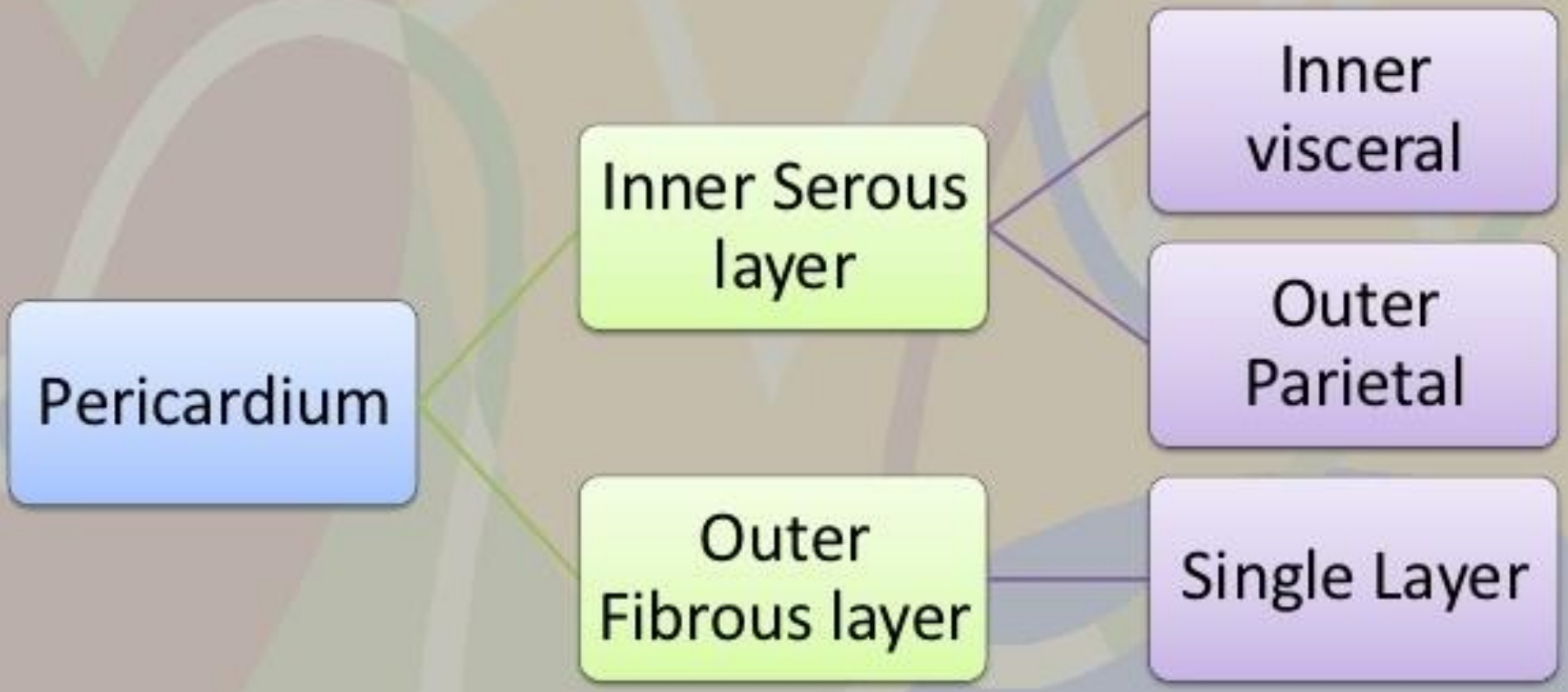
Pericardium

- Fibroserous sac surrounding heart & root of great vessels.
- Two components: outer fibrous pericardium
  Inner serous pericardium
- Outer parietal layer inner visceral layer
- Two are continuous at root of great vessels
- Narrow fluid filled space -pericardial cavity

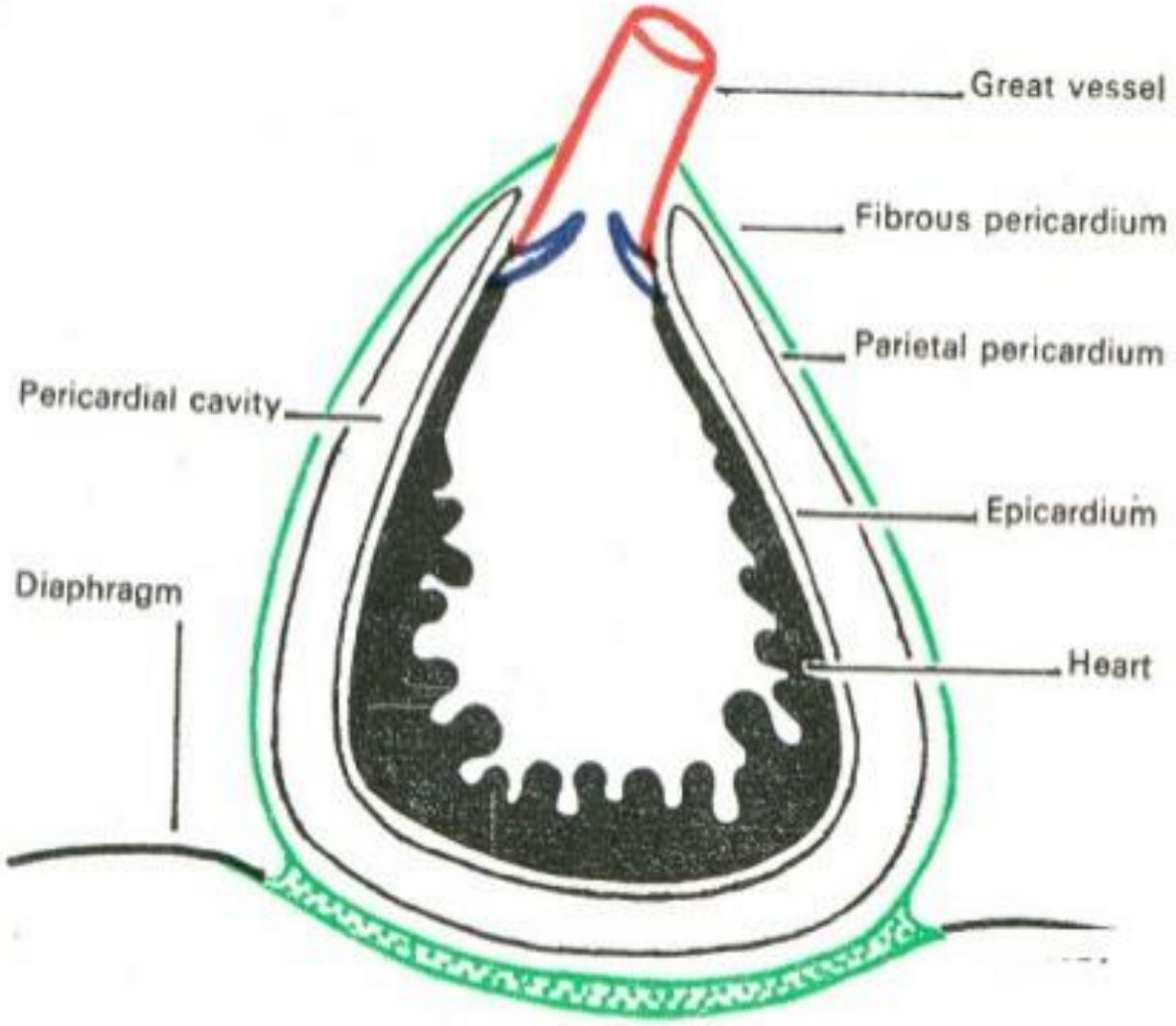
- Located in the middle mediastinum
- It's a double walled fibroserous membrane
- Fibrous pericardium "embryological origin", collagen and elastic fibers
- Serous pericardium "mesothelium"
  - partial
  - visceral "epicardium"
- Pericardial fluid volume & pressure

The functions of the pericardium:

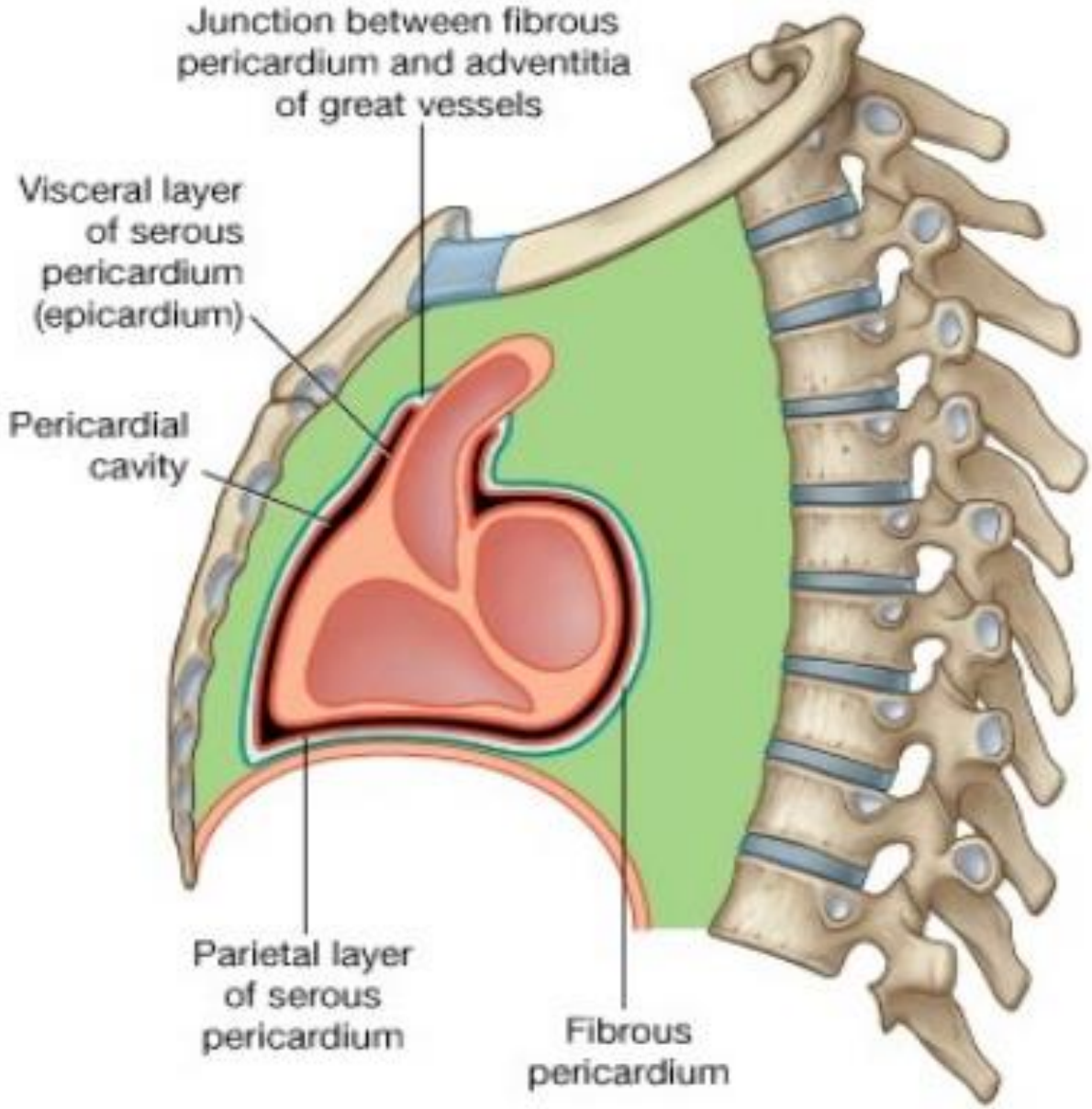
- Maintains the position of the heart
- Barrier to infections
- Lubrication between visceral and partial layers


Pericardium
Inner Serous layer
Outer Fibrous layer
Inner visceral
Outer Parietal
Single Layer

Layers of Pericardium



Sagittal section : Pericardium



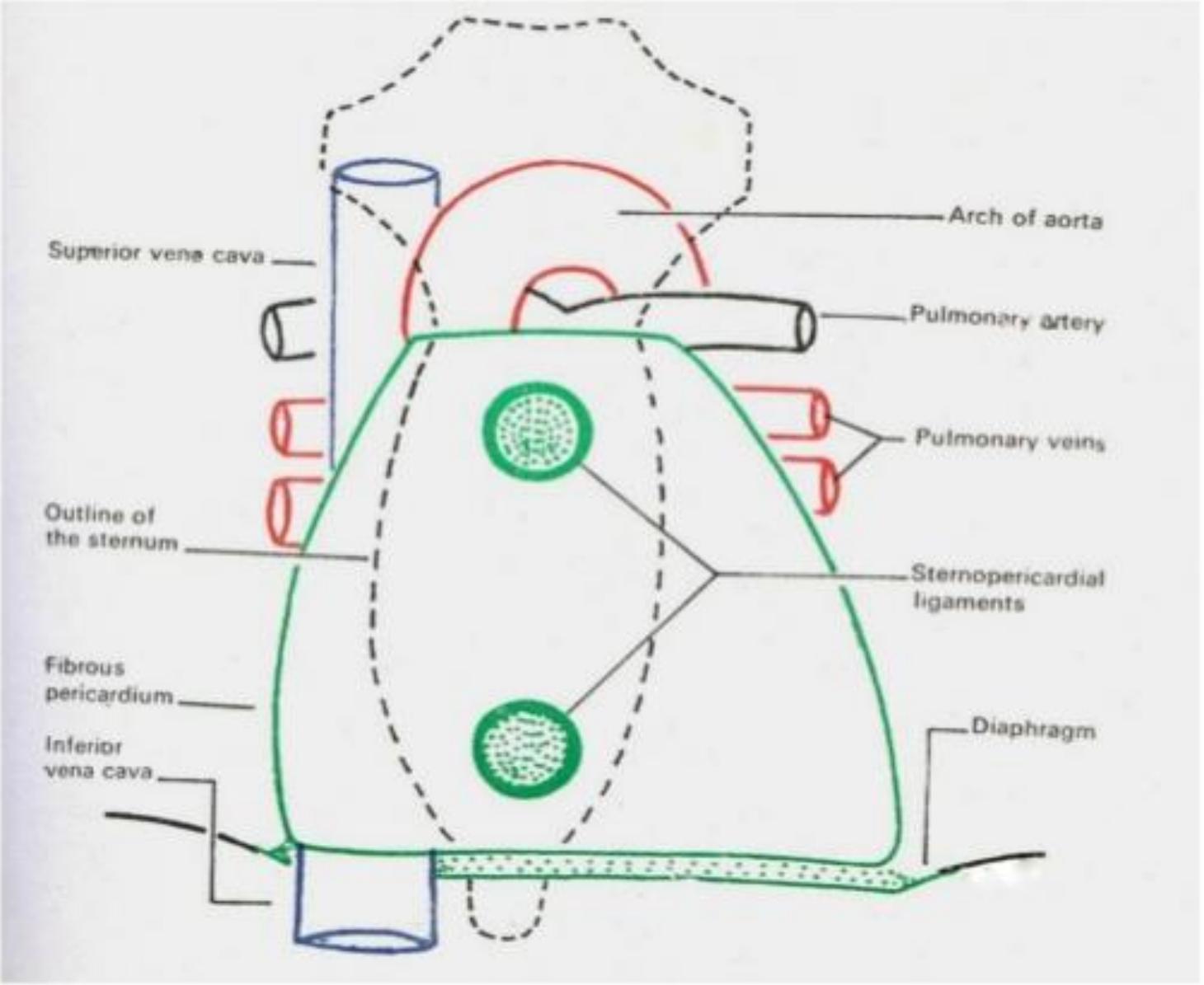
Fibrous Pericardium:

- Apex blunt,fused to roots of great vessels and PTfascia
- Base inseparable from the diaphragm (central tendon)

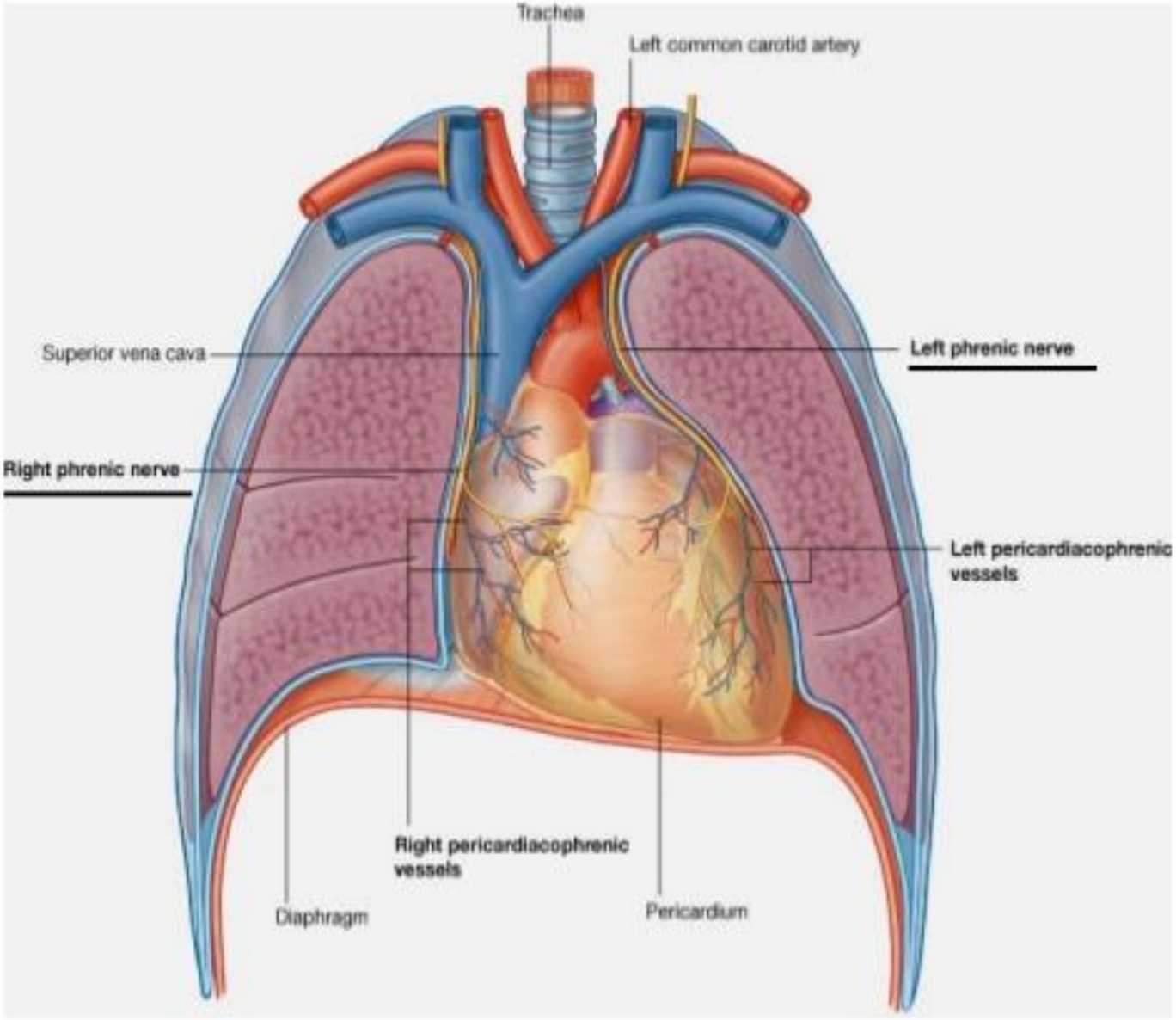
- Ant attached to sternum by Sternopericardial lig.
- Post related to principal bronchi & oesophagus
- On each side related to mediastinal pleura, Phrenic nerve

- Phrenic N innervating diaphragm passes through FP & innervates it
- Protects heart from sudden overfilling

Fibrous Pericardium - relations

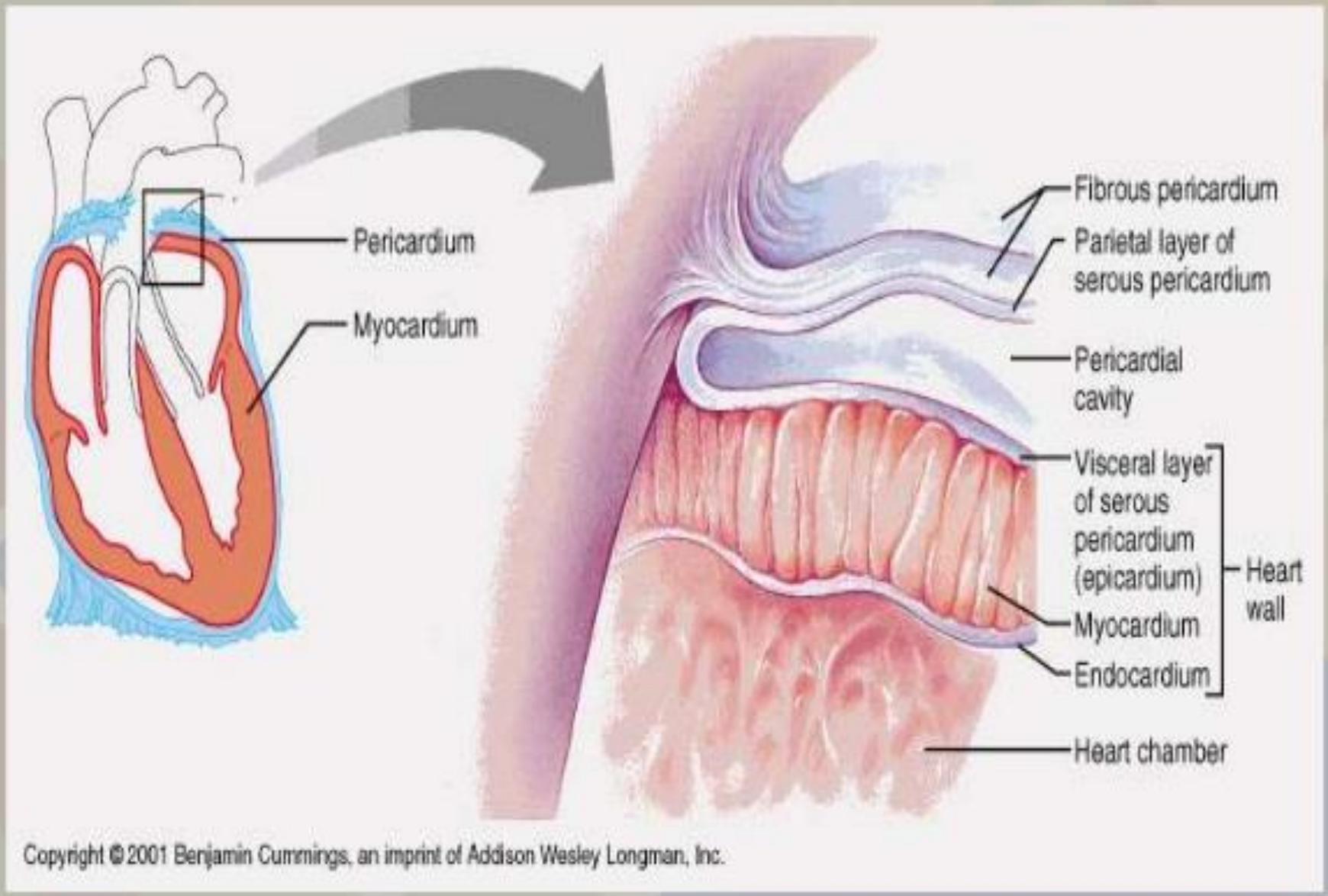


Phrenic nerve innervations



Serous Pericardium:

- Thin double layered serous membrane lined by Mesothelium
- Outer Parietal and inner Visceral Pericardium
- two layers continuous with each other at the root of great vessels (ascg aorta, SVC, IVC, pulm trunk & pulm veins)
- Visceral layer - adherent to the heart
- P cavity is a potential space b/w these two layers
- Contains a thin film of capillary fluid that helps to lubricate



CONTENTS OF PERICARDIUM

- Heart with the cardiac vessels & nerves
- Ascending aorta
- Lower half of superior vena cava
- Terminal part of inferior vena cava
- Terminal parts of pulmonary veins

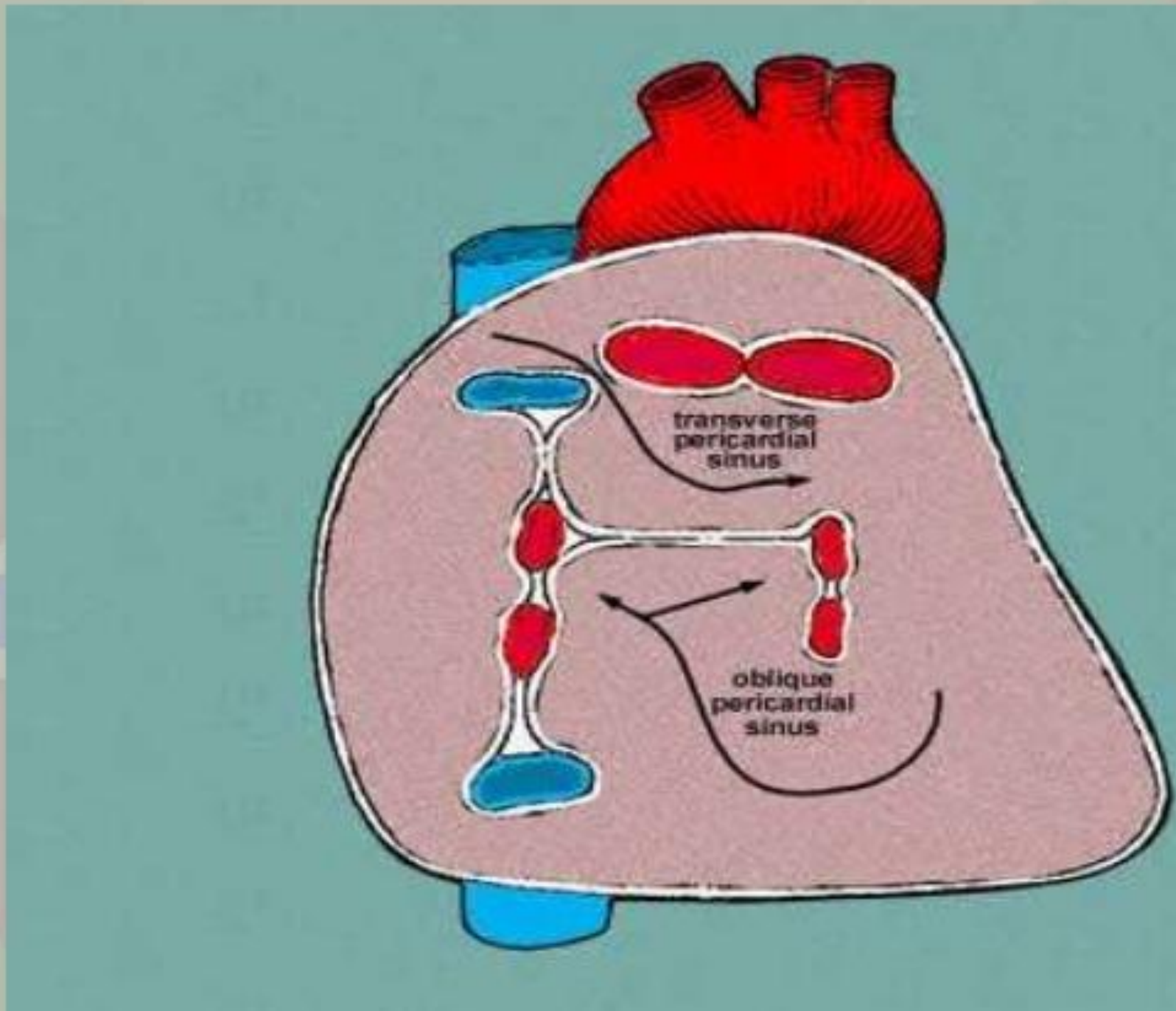
SINUSES OF PERICARDIUM

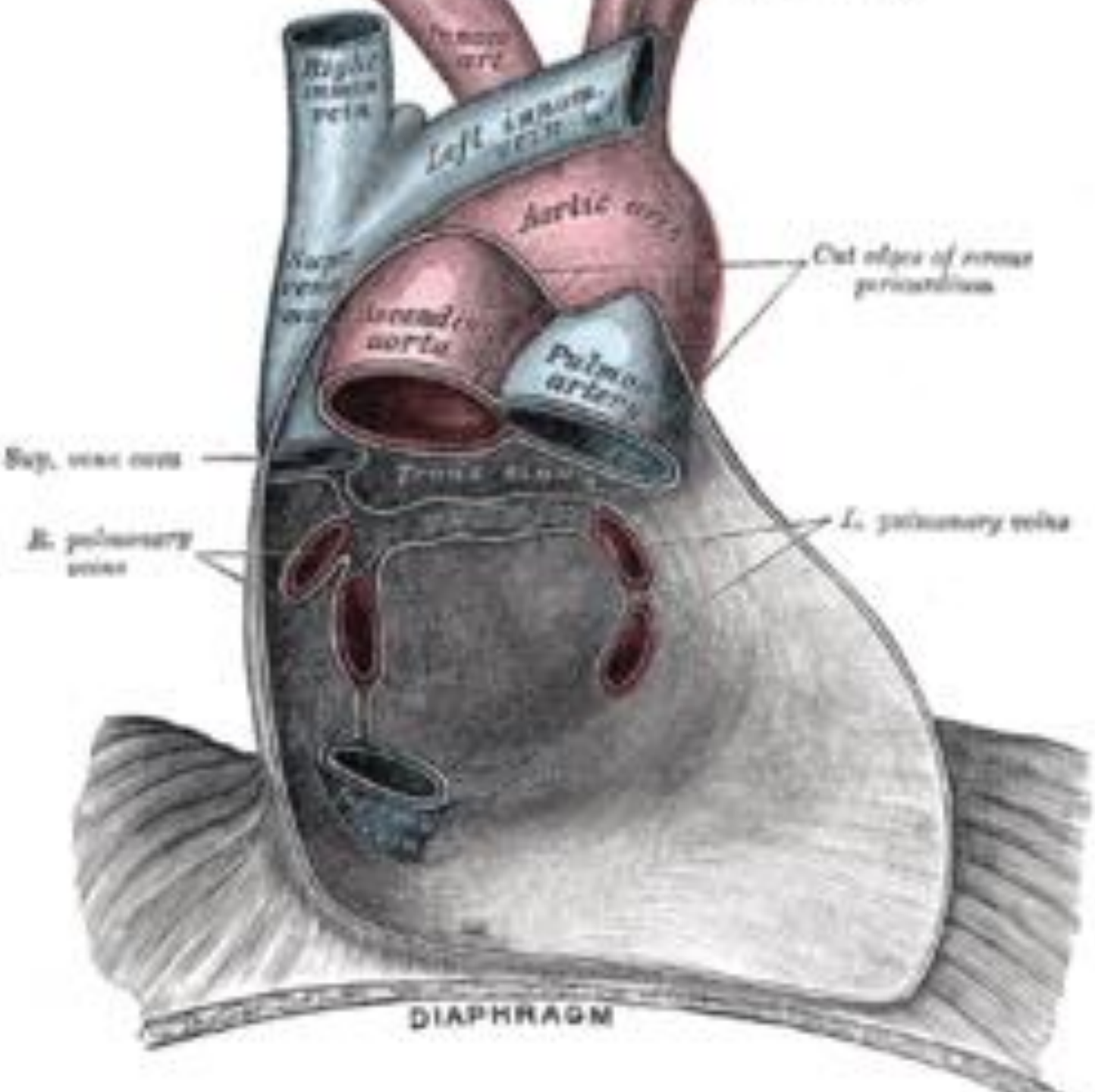
- There r 2 sinuses of pericardium
- Transverse sinus
- Oblique sinus

- TRANVERSE SINUS….
- Horizontal gap b/w arterial & venous ends of heart tubes.

TRANSVERSE SINUS

- Tunnel-shaped passage posterior to the aorta and pulmonary trunk , and anterior to the superior vena cava.
- This sinus is clinically important because passing one end of clamp through the sinus, and the other end anterior to the aorta/pulmonary trunk will allow complete blockage of blood output.
- This is performed during some heart surgeries.


transverse
pericardial
sinus
oblique
pericardial
sinus


Aortic arch
Cut edges of serous pericardium
Pulmo. artery
Sup. vena cava
R. pulmonary veins
L. pulmonary veins
DIAPHRAGM

OBLIQUE SINUS

- The oblique sinus is an inverted U-shaped reflection of the venae cavae and pulmonary veins.
- It lies behind the atria (particularly the left atrium), and in between left and right pulmonary veins.

Vascular supply and lymphatic drainage:

- The arteries are derived from the internal thoracic, the musculophrenic arteries and the descending thoracic aorta.

- The veins are tributaries of the azygous system.

Innervation:

- The pericarduium is innervated by the vagus, together with the phrenic nerves and the sympathetic trunks

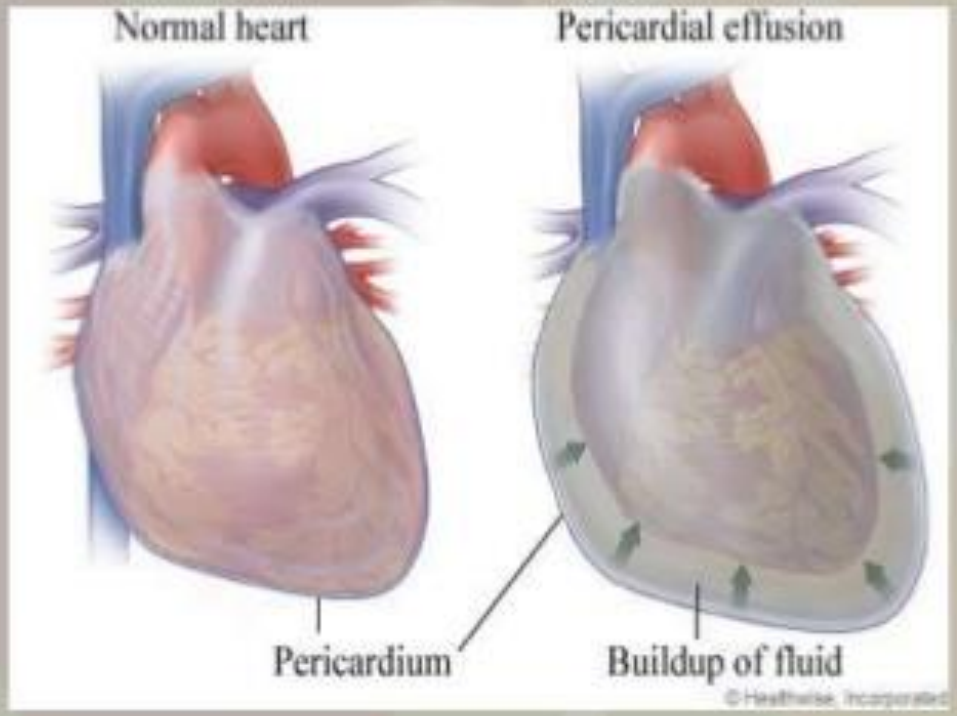
Applied:

- **Pericarditis:** Inflammation of the pericardium
- **Pericardial Effusion:** Excess fluid within pericardial sac- may lead to **Cardiac Tamponade** compressing the heart
- **Constrictive Pericarditis:** Abnormal thickening of the pericardium compresses the heart impairing heart function

Applied aspects:

Pericardial effusion:

- Accumulation of excess fluid in the pericardial space.
- When this obstructs the beating of heart, it is termed cardiac tamponade.
- Symptoms are severe edema, low BP, shortness of breath, dizziness, chest pain, cough, rapid pulse.
- Causes are inflammation, rheumatoid arthritis, surgery, cancer, infection, kidney failure, hemorrhage, trauma or idiopathic.


Normal heart
Pericardial effusion
Pericardium
Buildup of fluid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- Treatment: Giving NSAIDS, excess fluid drained using a needle or in severe cases, surgery.

PERICARDITIS:

- Inflammation of the pericardium.

- Infections that can cause pericarditis include viral infections, bacterial infections, tuberculosis, and fungal infections. Patients with AIDS frequently develop infections that produce pericarditis.

- Autoimmune disorders that can cause pericarditis include rheumatoid arthritis, lupus, and scleroderma.

- Pericarditis occurs in up to 15% of patients who have acute myocardial infarctions (heart attacks). There is also a late form of post-heart-attack pericarditis, called Dressler's syndrome, that occurs weeks to months after the heart attack.

- Some of the drugs that can produce pericarditis include procainamide, hydralazine, phenytoin, and isoniazid.

- Many forms of cancer can metastasize (spread) to the pericardial sac, and produce pericarditis.In many cases, no definite cause for pericarditis can be identified - this is called “idiopathic" pericarditis.”
- The most common symptom caused by pericarditis is chest pain. The pain can severe, and is often made worse by changing position or with deep breathing. Patients can also have shortness of breath, or fever.
- Pericarditis can produce complications, namely tamponade, chronic pericarditis, and constriction. These complications - which are discussed below – can produce reduced cardiac pumping, lung congestion, and organ failure.

- Acute pericarditis is treated by a) identifying the underlying cause, b) treating the underlying cause, c) giving anti-inflammatory drugs (to reduce inflammation and help prevent chronic problems), and d) giving analgesics to control the pain. Most cases of acute pericarditis resolve within a few weeks, and leave no permanent cardiac problems.

- Tamponade is treated by draining the fluid from the pericardial sac, usually via a tiny catheter. Removing the fluid relieves the pressure on the heart, and restores normal cardiac function almost immediately.

- Chronic pericarditis is treated by identifying and treating the underlying cause, if possible. If recurrent pericardial effusions become a problem, surgery can be done to create a permanent opening that allows the fluid to drain from the pericardial sac, thus preventing tamponade.

- Constrictive pericarditis is a very difficult therapeutic problem. Symptoms can be treated with bed rest, diuretics, and digitalis, but definitive treatment requires surgery to strip the thickened pericardial lining from the heart. This surgery is usually quite difficult


THANKYOU