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FACULTY OF NURSING SCIENCES

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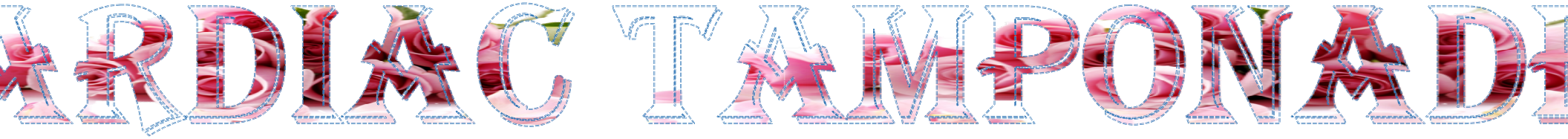

ARDIAC TAMPONAD

Objectives

At the end of the class the student will be able to

- Understand the anatomy and physiology of pericardium
- Define and note the epidemiology of cardiac tamponade
- Identify the etiologies of cardiac tamponade
- Recognize the signs and symptoms and methods of diagnosing the cardiac tamponade
- Understand the treatment options carried out in managing patients with cardiac tamponade
- Discuss the nursing interventions to manage the patients with cardiac tamponade

INTRODUCTION

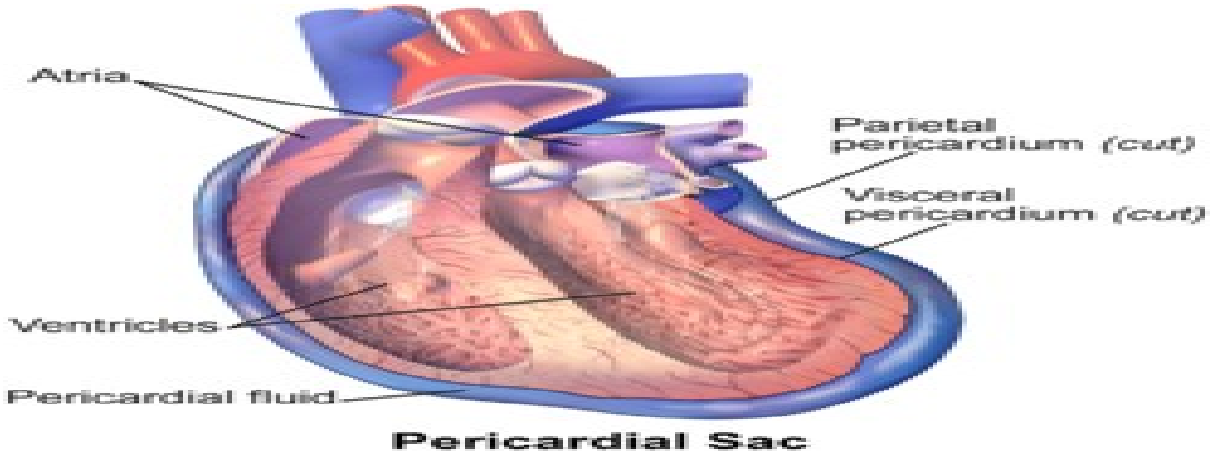
- Cardiac tamponade is a clinical syndrome caused by the accumulation of fluid in the pericardial space, resulting in reduced ventricular filling and subsequent hemodynamic compromise.
- In acute cardiac tamponade, this fluid accumulation occurs quickly, while it happens slowly in subacute cardiac tamponade.

PERICARDIAL Anatomy AND PHYSIOLOGY

Pericardium is the membranes sac surrounding the heart

The pericardium consists of two layers: visceral and parietal pericardium

There is about 50 ml pericardial fluid in the pericardial cavity



Pericardial Sac

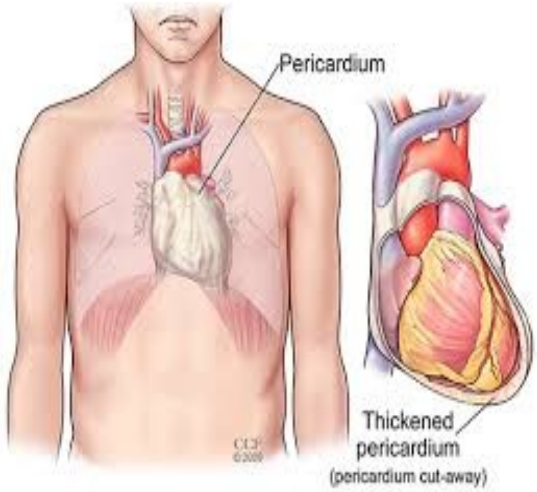
Normal Functions of Pericardium

Maintaining an optimal cardiac shape

Reducing friction between the heart and adjacent structures

Preventing the overfilling of the heart

Protecting the heart from other diseases which are caused by the neighboring organs: inflammation, TB, cancer etc



Definition

Pericardial effusion

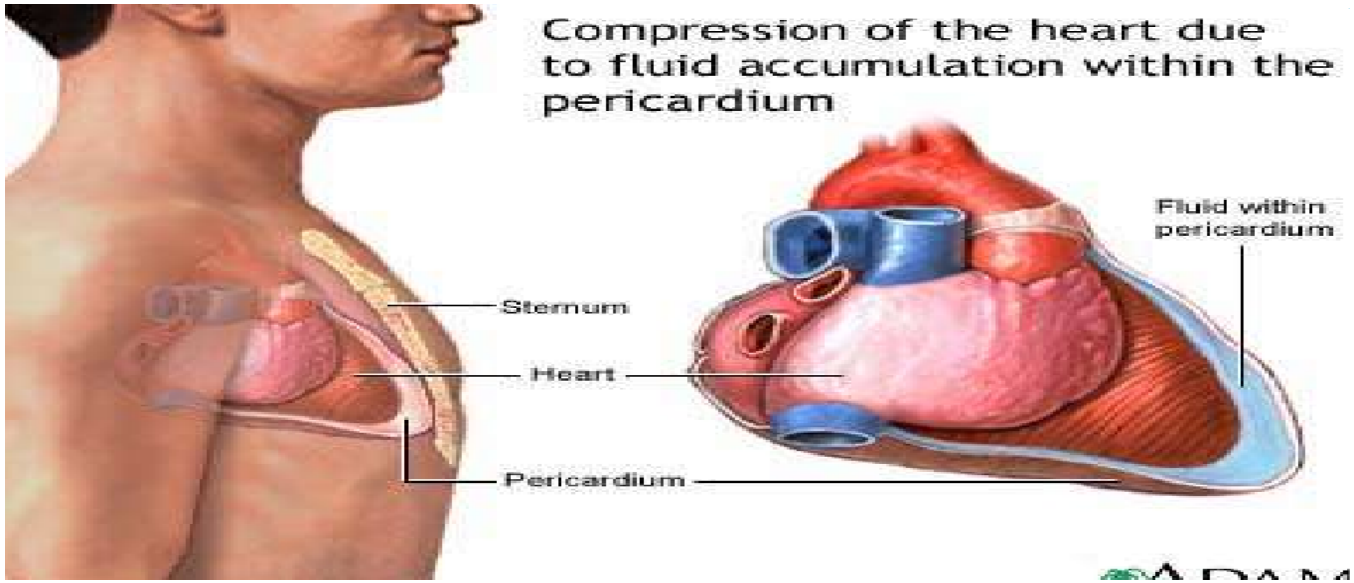
An abnormal accumulation of fluid in the pericardial cavity.

Cardiac Tamponade

Clinical syndrome caused by accumulation of fluid in the pericardial space, resulting in reduced ventricular filling and subsequent hemodynamic compromise

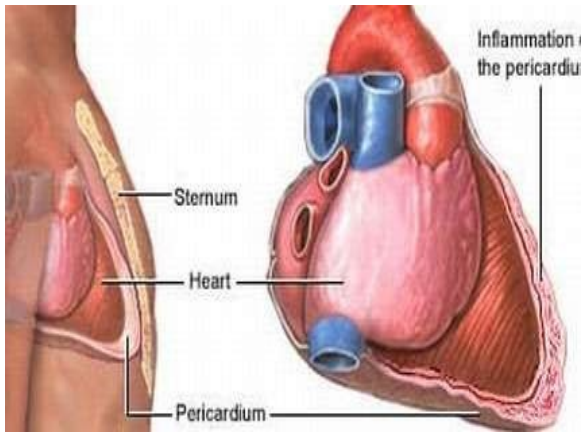
Epidemiology

- **CARDIAC TAMPONADE** occurs in about 2 out of 10,000 people



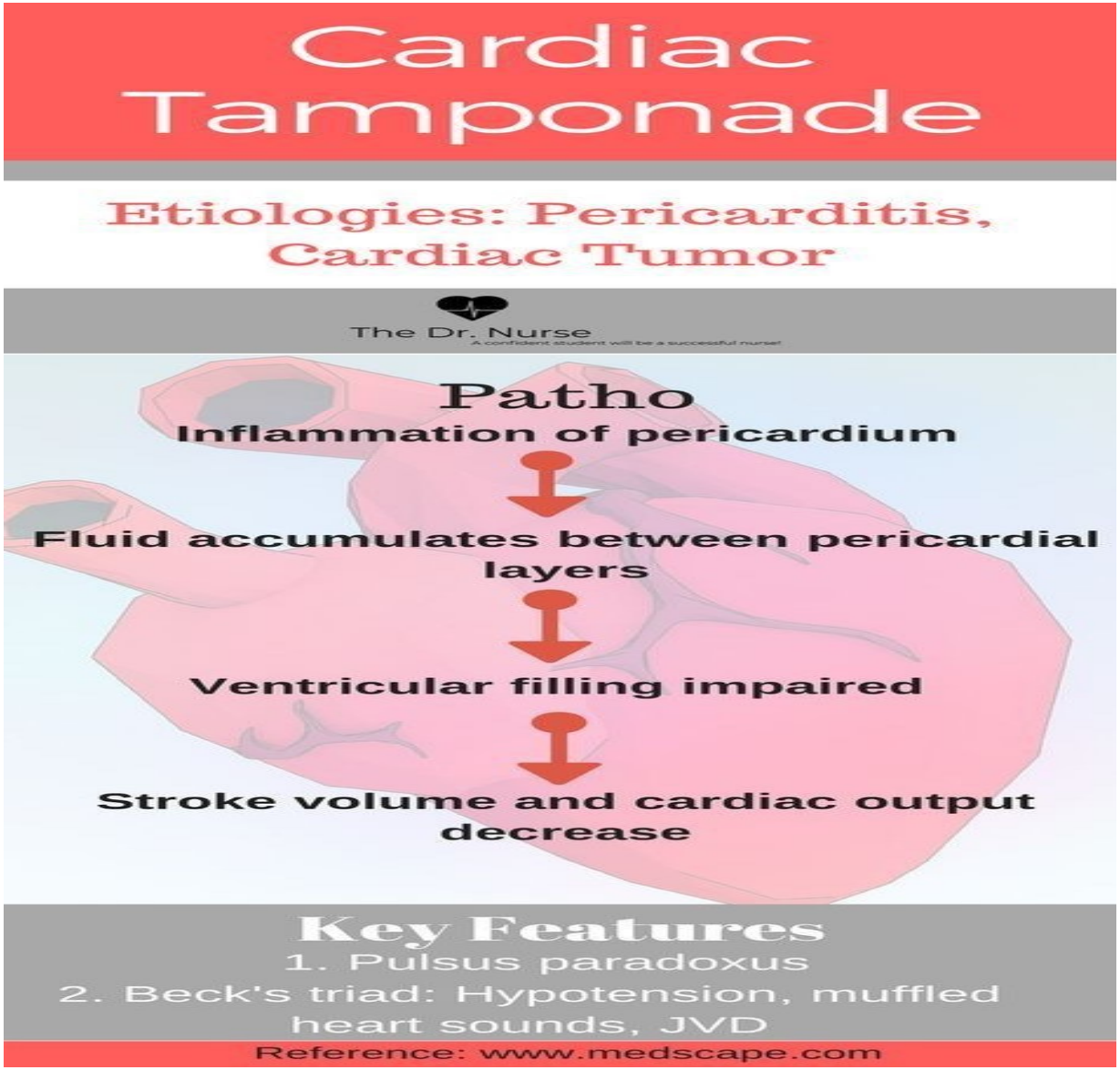
Etiology

- Hypothyroidism
- Physical trauma
- Pericarditis (bact/TB/HIV)
- Myocardial rupture
- After heart surgery
- Aortic dissection
- Neoplastic
- Myocardial Infarction
- Renal failure



- Leukemia's
- Placement of central lines
- Radiation therapy to chest

PATHOPHYSIOLOGY



Pathophysiology

Increased pericardial fluid

↓

Pressure on the right side increased

↓

Pooling of blood in pulmonary capillary

↓

Decreased venous return

↓

Decreased stroke volume and cardiac output

↓

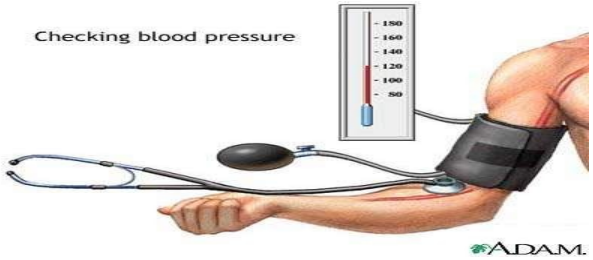
Cardiac arrest

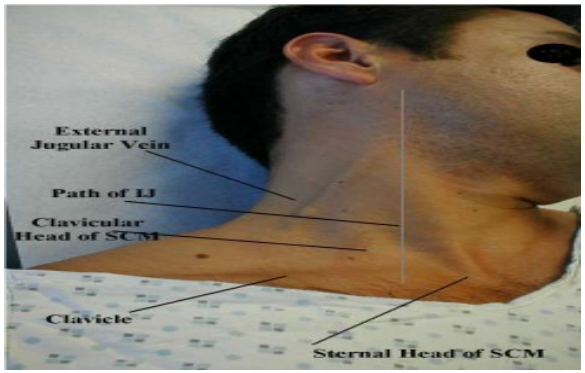
CLINICAL MANIFESTATIONS

- Breathlessness
- Chest pain
- Abdominal pain
- Fatigue
- Fever
- Cough
- Palpitation

Physical Examination Findings

- Tachycardia
- Distant or muffled heart sounds
- Jugular vein distension
- Hypotension
- Paradoxical pulse (a drop in inspiratory BP by greater than 10 mmHg).
- Diaphoresis
- Cyanosis of lips and the nails





Physical Examination Findings Contd…

Beck's triad.(rapid accumulation of pericardial fluid)

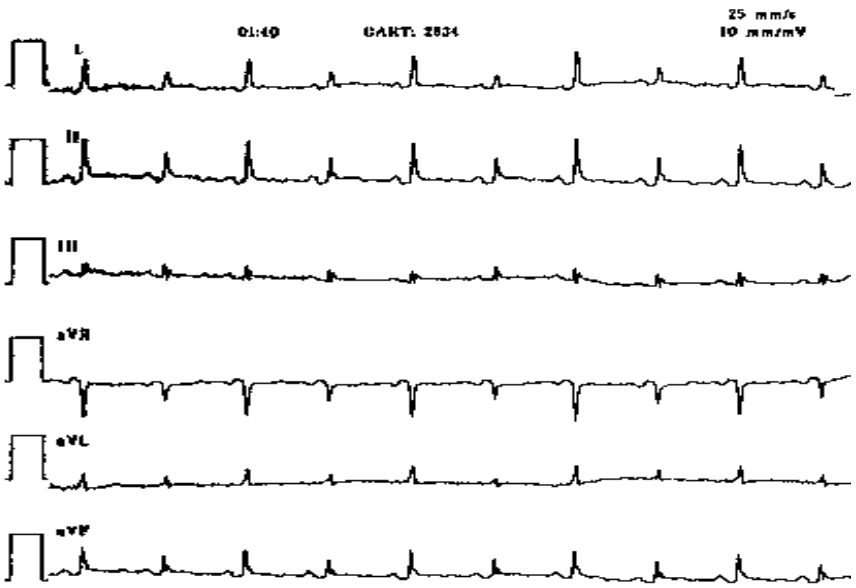
1. **Hypotension** occurs because of decreased stroke volume
2. **Jugular-venous distension** due to impaired venous return to the heart
3. **Muffled heart sounds** due to fluid inside the pericardium

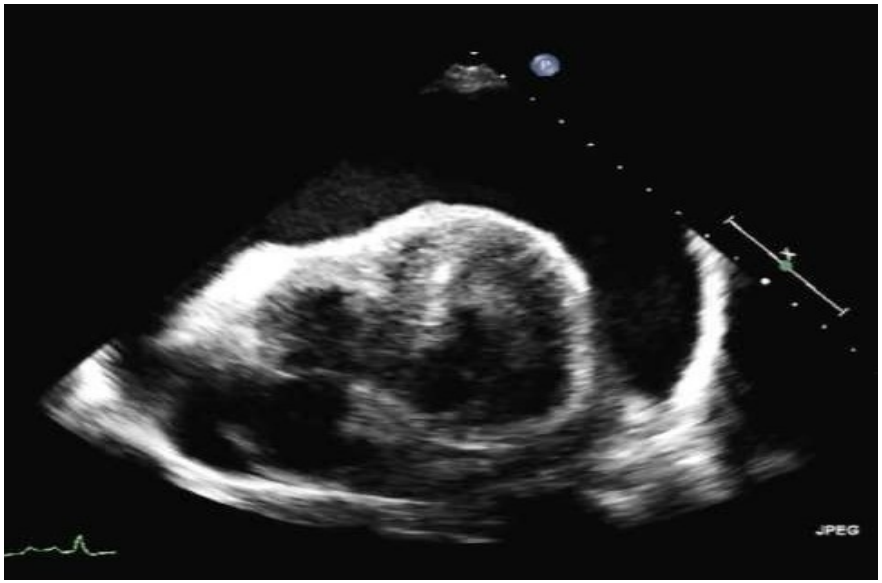
Investigations

- Complete blood count
- Renal function test, liver function test
- PT, INR
- CKMB, TROP – T
- ANA assay
- ESR
- RH factors
- HIV testing
- Mantoux test
- Pericardial fluid

ECG

- Sinus tachycardia ,low voltage QRS complexes ,
- Electrical alterans,



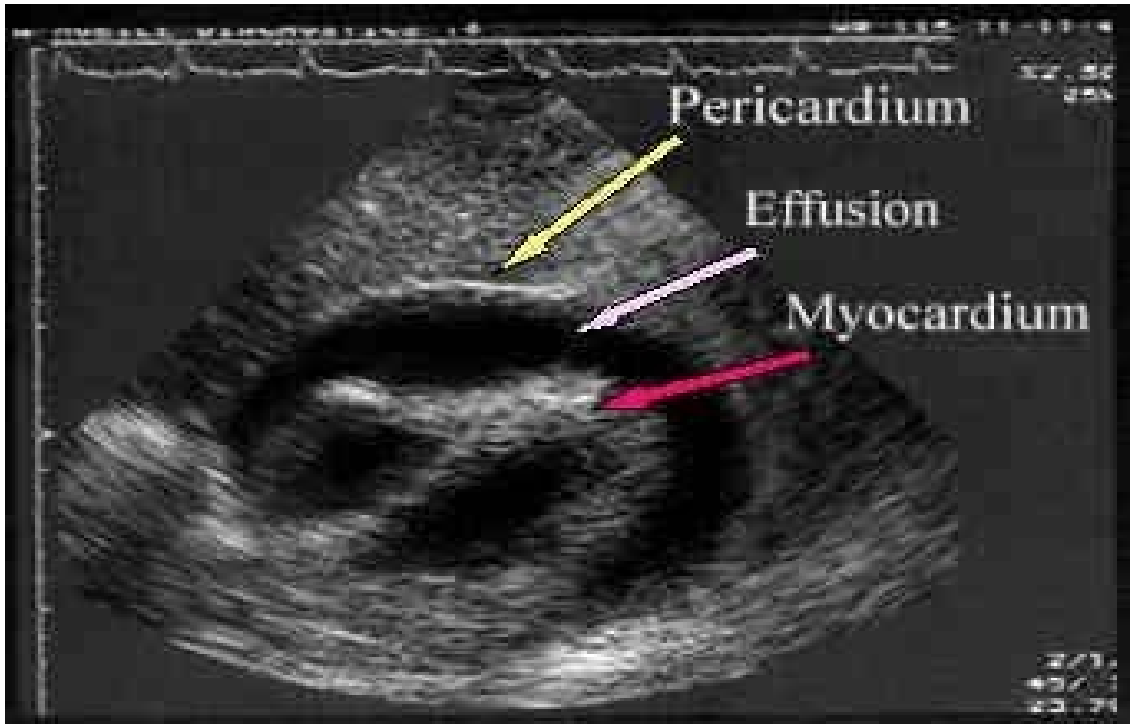


CHEST X RAY

- large, globular heart, enlarge cardiac
- silhouette, water bottle shaped heart

ECHO

- Diagnostic test of choice



Treatment: Pericardial Effusion

Medications

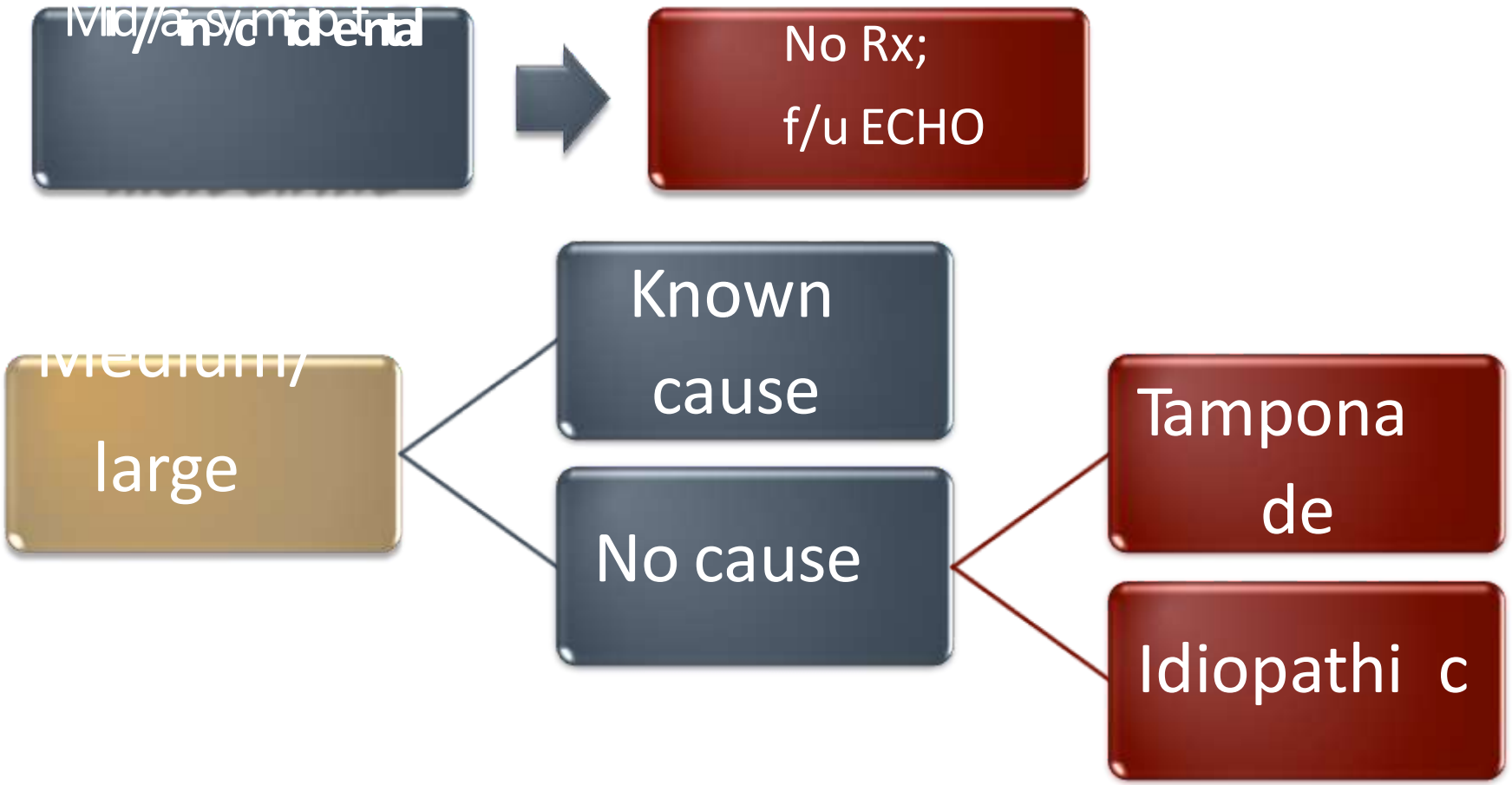
- ☐ NSAIDS
- ☐ Colchicine -COPE Trial
- ☐ Systemic steroids
- ☐ Hemodynamic support – IVF, ionotropes
- ☐ Drainage of pus if exists and start – IV antibiotics
- ☐ TB – ATT + I. V prednisolone 1 -2 mg per kg for 7 days
- ☐ Antineoplastic therapy

Treatment

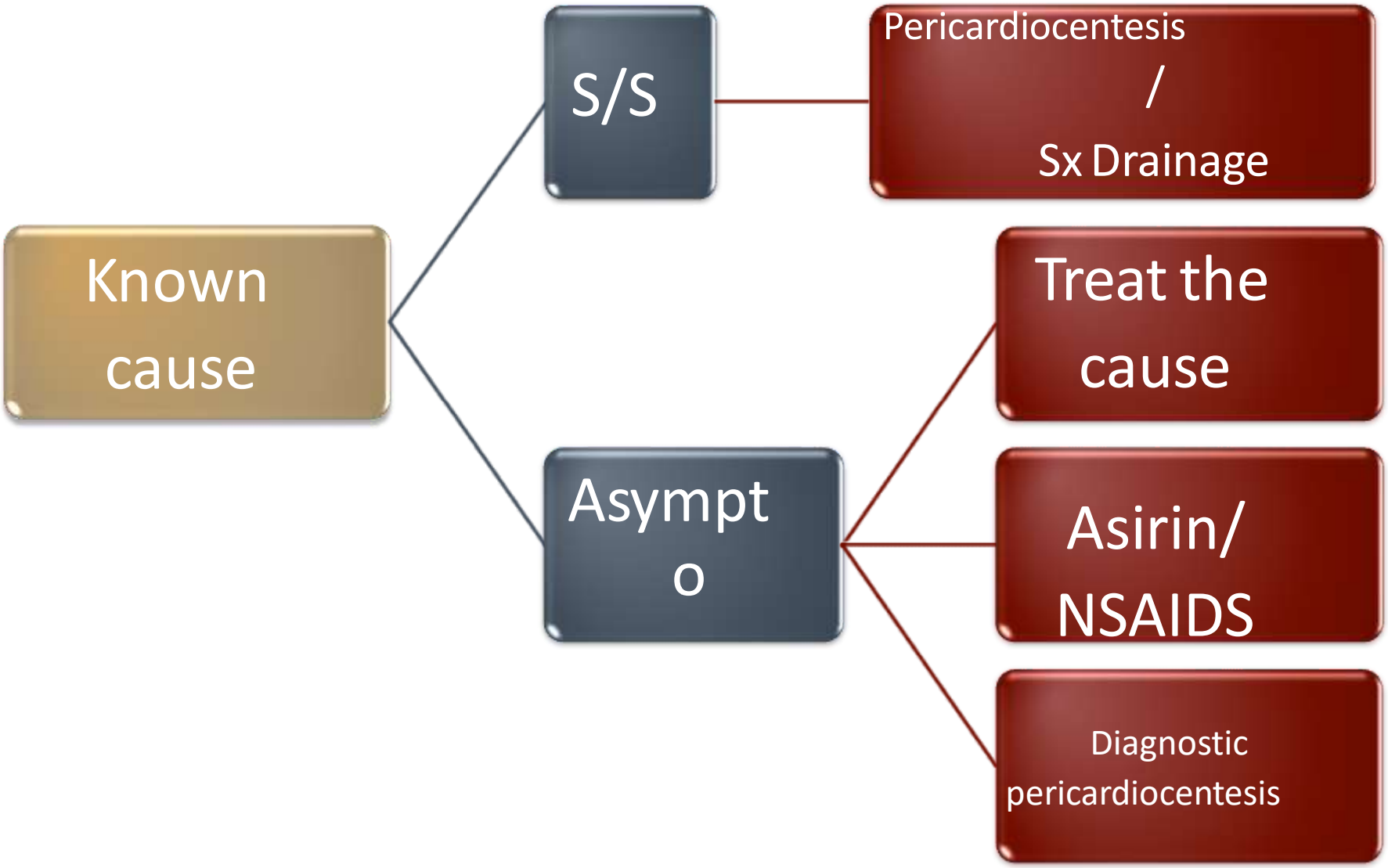
Surgery (if S/S persist)

- ☐ Pericardial sclerosis 9 tetra, doxy, cisplastin, 5 α fluorouracil)
- ☐ Sub xiphoid pericardial window with pericardosis
- ☐ Thorocotomy (pleuro pericardial window)
- ☐ Video assisted thoracic surgery

Treatment: Pericardial Effusion

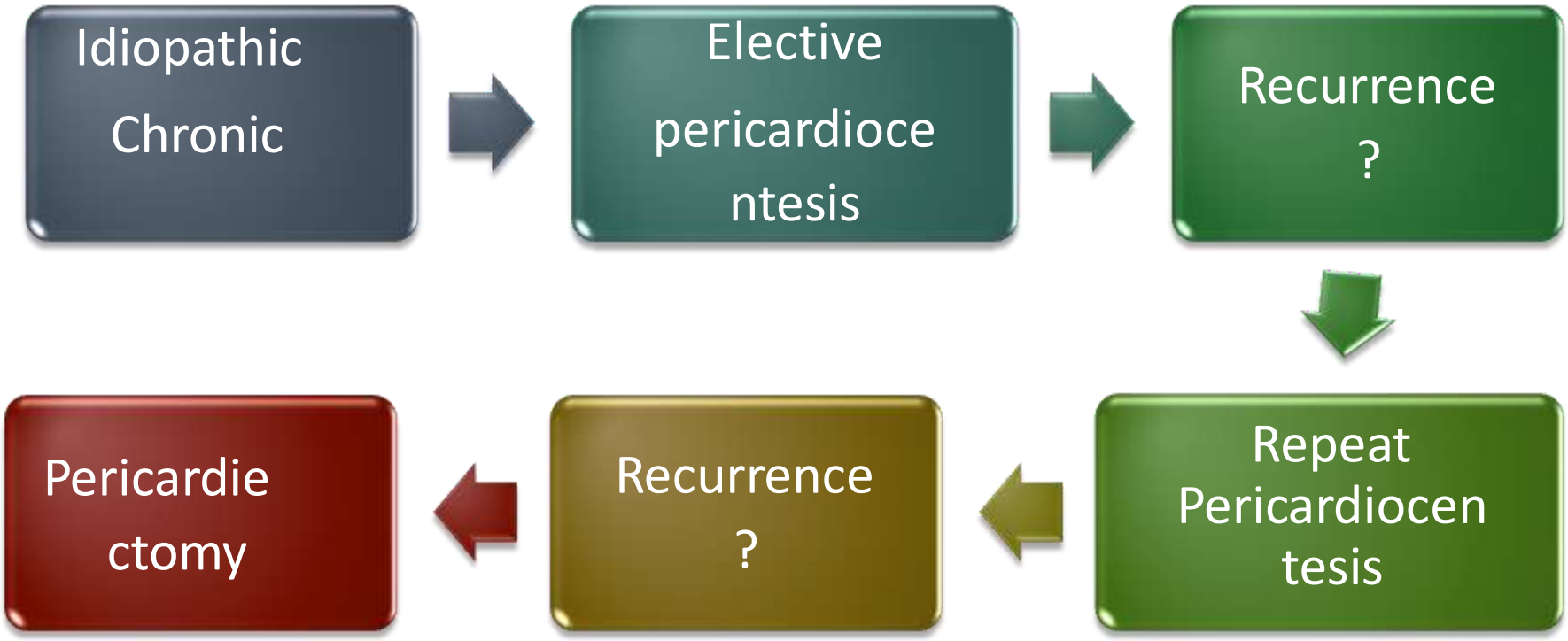


Treatment: Pericardial Effusion



Treatment: Pericardial Effusion

Large effusion



Treatment: Cardiac Tamponade

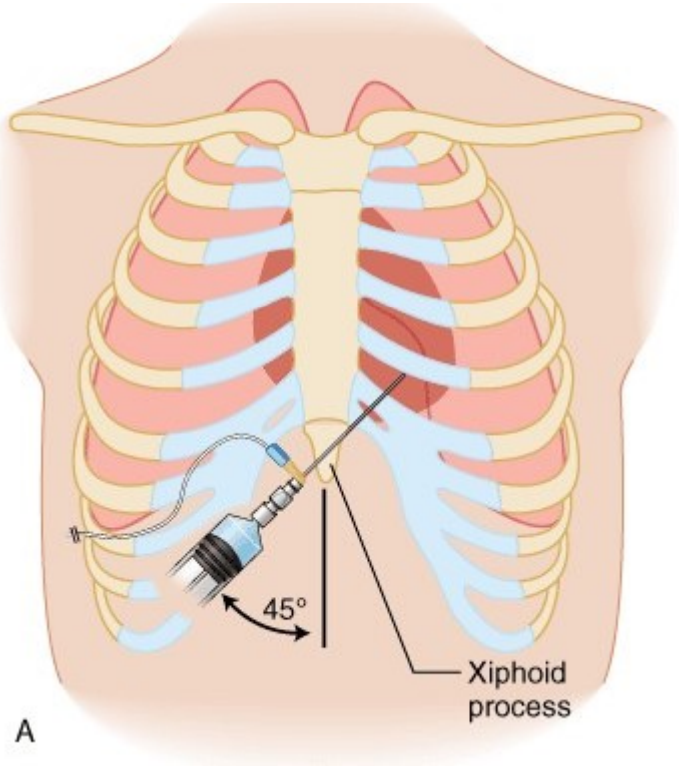
Cardiac temponade is medical emergency. If Untreated rapidly and universally fatal.

- Prompt diagnosis and treatment is the key
- Oxygen administration, Volume expansion
- Inotropic drugs
- Positive-pressure mechanical ventilation should be avoided
- Pericardiocentesis
- A Swan-Ganz catheter can be left in place for continuous monitoring of hemodynamics

Pericardiocentesis

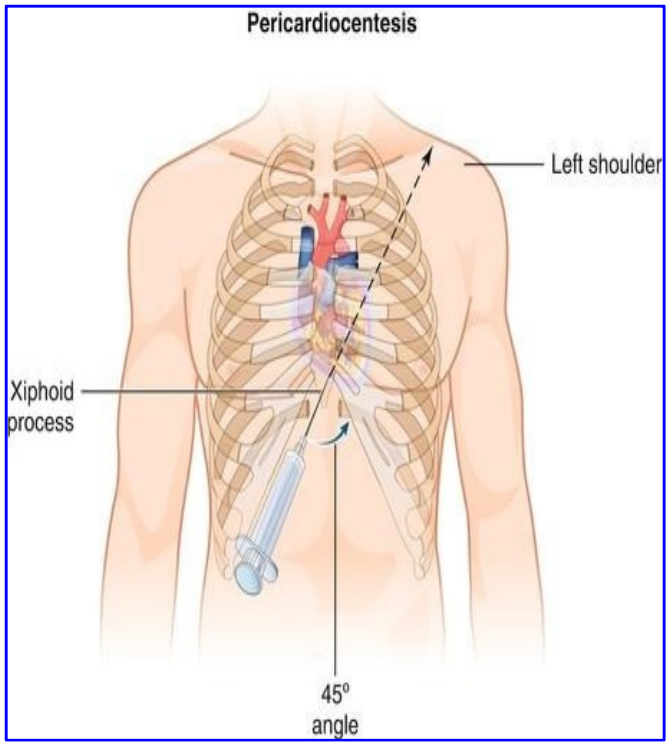
Equipment

1. Bed side ECHO
2. ECG
3. 18 gauge spinal needle
4. 3 way
5. 20 cc syringe
6. A wire with alligator clips



Pericardiocentesis Preparation:

1. Surface landmarks
2. Clean
3. Drape
4. La
5. Raise the head of the bed



Pericardiocentesis After Care

1. Monitor vitals
2. Look out for complications
3. Repeat ECHO & CXR
4. If Pt still symptomatic then may require placement of catheter in the pericardial space or surgical creation of a pericardial window

Pericardiocentesis Complications

1. Cardiac arrhythmia
2. Pneumothorax
3. Pleural effusion
4. Myocardial injury
5. Peritoneal injury
6. Liver/stomach injury
7. Internal mammary artery injury
8. Diaphragmatic injury

Recurrent Tamponade

- Pericardial window
- Sclerosing the pericardium
- Pericardio-peritoneal shunt
- Pericardiectomy

Nursing Management

1. **NURSING DIAGNOSIS:** Ineffective Breathing Pattern related to: hyperventilation

INTERVENTIONS:

1. Monitor strictly vital signs, especially respiratory frequency.
2. Monitor the contents breathing, chest expansion, regularity of breathing, mouth breathing
3. Maintain the semi-Fowler position if not contraindicated to facilitates lung expansion
4. Teach clients about the deep breathing exercise to increase oxygen intake.

Nursing Management-contd

1. Administer oxygen as indicated to avoid the risk of tissue damage.
2. Administer medication as indicated.
3. Monitor for pulsus paradoxus via arterial tracing or during manual BP reading.
4. Monitor urine output hourly; a drop in urine output may indicate decreased renal perfusion as a result of decreased stroke volume secondary to cardiac compression.

Nursing management contd…

2. Nursing diagnosis: Decreased cardiac output related to reduced ventricular filling secondary to increased intra pericardial pressure.

INTERVENTIONS:

1. Continuously monitor ECG for dysrhythmia myocardial ischemia secondary to epicardial coronary artery compression.
2. Monitor the BP every 5 to 15 minutes during the acute phase

Nursing Management-contd

1. Auscultate the breath sounds and heart sounds to note any murmurs
2. Strict bed rest with a comfortable position during the acute period.
3. Provide adequate rest periods / adequate. Assess the form of self-care activities, if indicated

Nursing management contd…

- Nursing diagnosis: Activity intolerance related to restlessness, fatigue
- **Interventions:**

1. Assess the ability of client to perform activities of
2. Assess patient's need for assistive devices.
3. Assess the degree of ability performed by client
4. Assess the degree of ability performed by client
5. Help the people closest to identify the risk of hazards that may arise.
6. Minimize the sources of the hazards in the environment.

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