

# Pericardial Effusion

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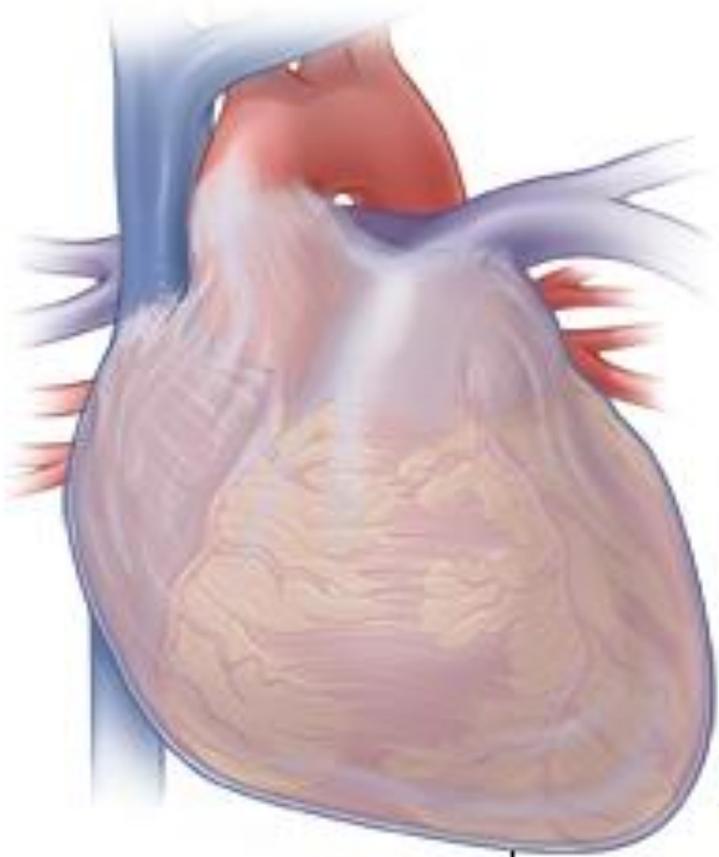
# INTRODUCTION

- Presence of **abnormal amount** and/or abnormal **character** of fluid in the pericardial space
- Can be caused by LOCAL/SYSTEMIC/IDIOPATHIC causes
- Can be ACUTE or CHRONIC (symptoms)
- Treatment directed at **removal of pericardial fluid** and **alleviation of the underlying cause**

# PHYSIOLOGY

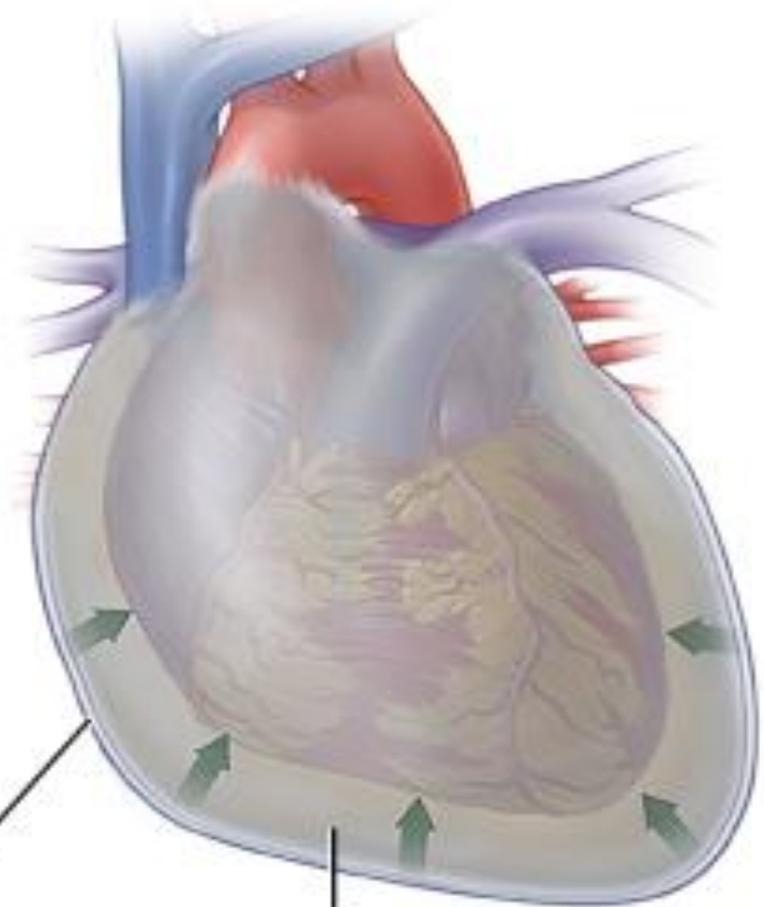
- Volume of fluid: 15-50 ml.
- Essentially and ultrafiltrate of plasma
- Total protein generally low. Albumin conc. HIGH.
- Acute (80ml) vs. Chronic (up to 2lt).
- **Cardiac tamponade** is acute heart failure due to compression of heart by a large or rapidly developing effusion

Normal heart



Pericardium

Pericardial effusion

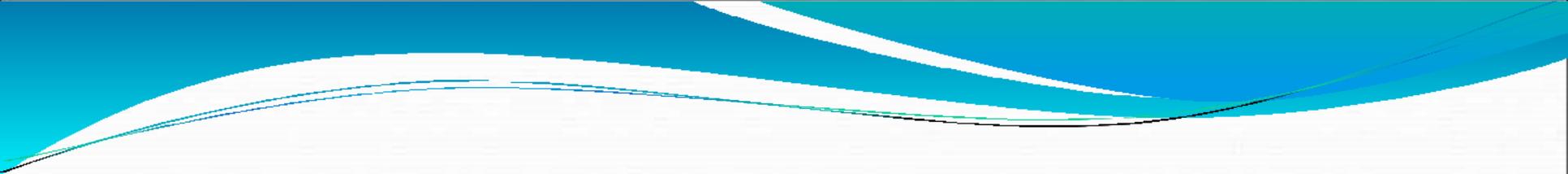


Buildup of fluid

# pathophysiology

Clinical manifestation are highly dependent on the **rate** of accumulation of fluid in the pericardial sac

Pericardial effusion → increased pericardial pressure → overcomes ventricular filling pressure → decreased stroke volume → reduced cardiac output.



Hemodynamic effect of pericardial effusion does not depend on the size of the effusion but on the speed of accumulation of it, so a small quickly accumulating effusion can be worse than a large chronic one.

# ETIOLOGY

- **As a component of any pericardial disorder or 2ry to a systemic disorder:**
- Acute idiopathic or viral pericarditis
- Infectious: Viral, Purulent pericarditis, Tuberculous, HIV
- Post MI/post cardiac surgery
- Malignancy (lung, breast, hodgkin's, mesothelioma)
- Mediastinal radiation
- Autoimmune disease
- Dialysis, Ch. Renal failure
- Hypothyroidism (myxedema), ovarian hyperstimulation synd.
- Drugs: procainamide, isoniazid, hydralazine, anticoagulants.

# ETIOLOGY

- HEMORRHAGIC PERICARDIAL EFFUSION:
- Malignancy (26%)
- Trans-catheter interventions and/or pacemaker insertion (18%)
- Post-pericardiotomy syndrome (13%)
- Complication of MI (free wall rupture, thrombolysis) (11%)
- Idiopathic (10%)
- Uremic (7%)
- Aortic dissection (4%)
- Trauma (3%)

# CLINICAL- SYMPTOMS

- CVS: chest pain, pericardial pain aggravated **by lying supine** (relieved by sitting/leaning forward), light headedness, syncope, palpitations
- RESP: cough, dyspnea, hoarsness
- GI: hiccoughs
- NEUR: anxiety, confusion

# CLINICAL- SIGNS-physical examination

- CVS: **BECK's triad** of tamponade (hypotension, muffled heart sounds, jugular venous distension), **pulsus paradoxus**, **pericardial friction rub**, **tachycardia**, **hepatojugular reflux**.
- RESP: **tachypnea**, decreased breath sounds, **Ewart sign** (**dullness to percussion beneath the angle of left scapula from compression of the left lung by pericardial effusion**)
- GI: **hepato-splenomegaly**
- EXTREMITIES: **weakened peripheral pulses**, **edema**, **cyanosis**.

# DIAGNOSIS

- Suspect when:
- All cases of **acute pericarditis**
- New radiographic **cardiomegaly** without pulmonary Congestion.
- Isolated **left pleural effusion on X-ray**
- **Hemodynamic deterioration** after MI, cardiac surgery, invasive cardiac procedures.



# investigation

**Baseline:** CBC, Electrolytes, Cardiac enzymes, ESR, CRP

**Pericardiocentesis**(diagnostic and therapeutic)  
Pericardial fluid Analysis (mainly if suspected malignancy)

**Thyroid profile**

**Rheumatoid factor, Immunoglobulin complexes, Antinuclear AB test**

**Chest Radiography-** enlarged cardiac silhouette (**water bottle heart**) and pericardial fat strip

**CT scan and MRI**

**Pericardial biopsy if TB suspected**



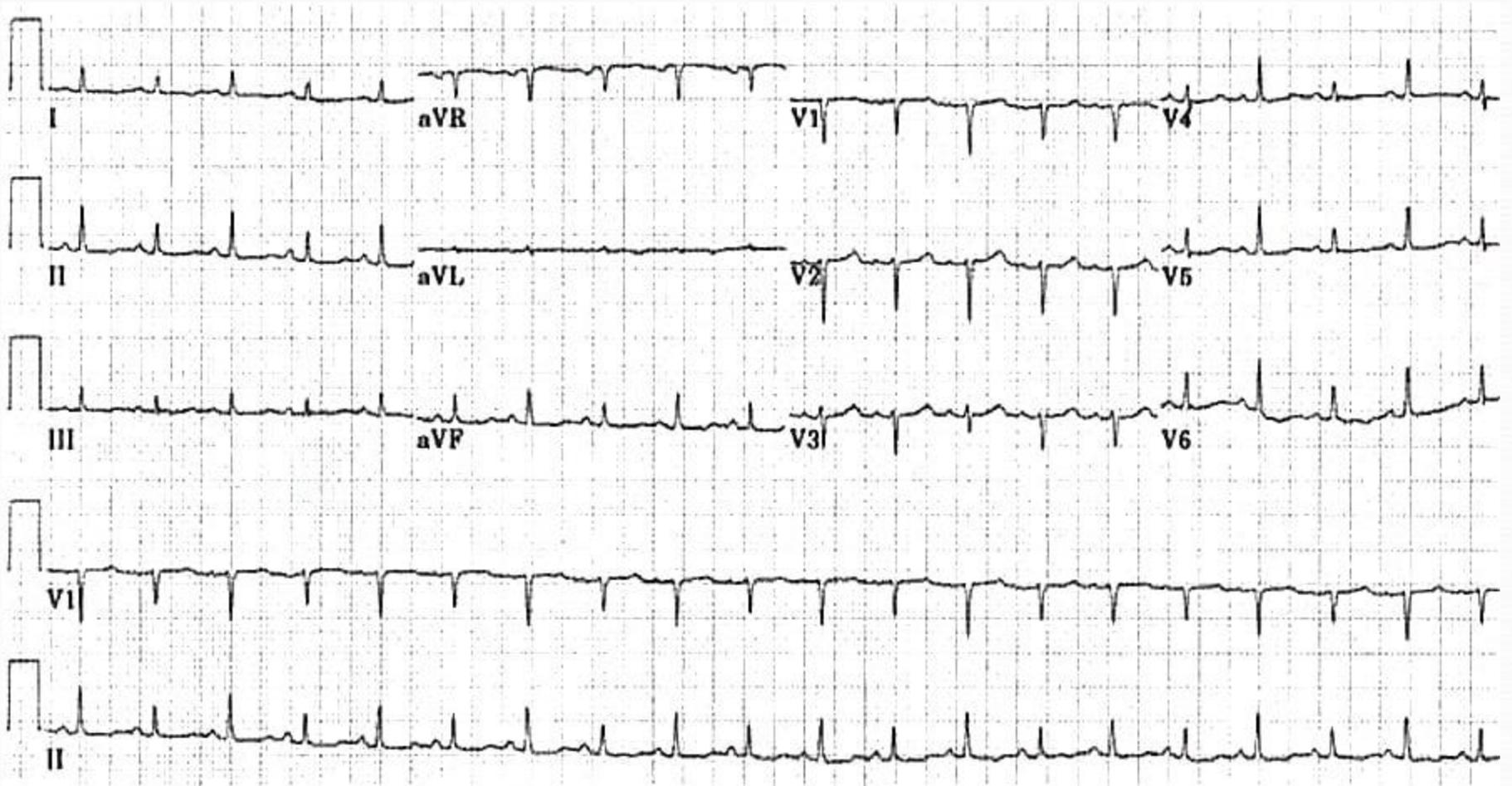
# Echocardiography: diagnostic test

effusion	Echo-free space	location
small	<10mm	posteriorly
moderate	10-20mm	circumferential
Large	>20mm	circumferential

**False positive findings** : due to pleural effusions, pericardial thickening, increased epicardial fat tissue, mediastinal mass

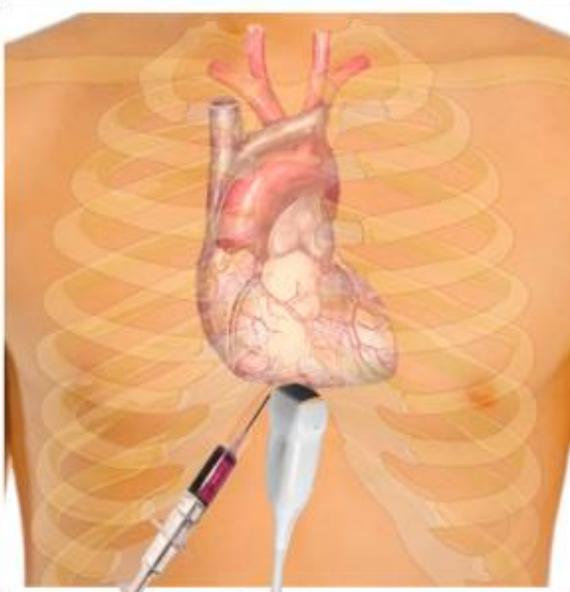
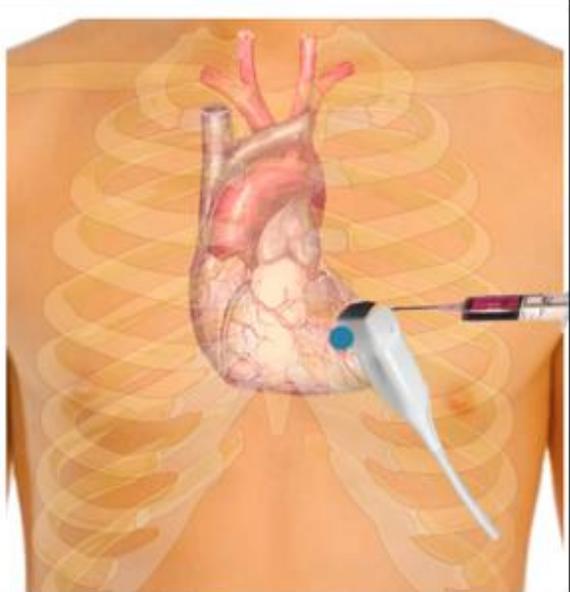
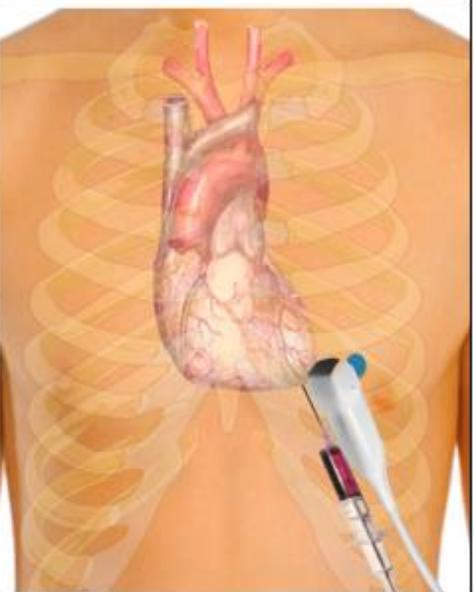
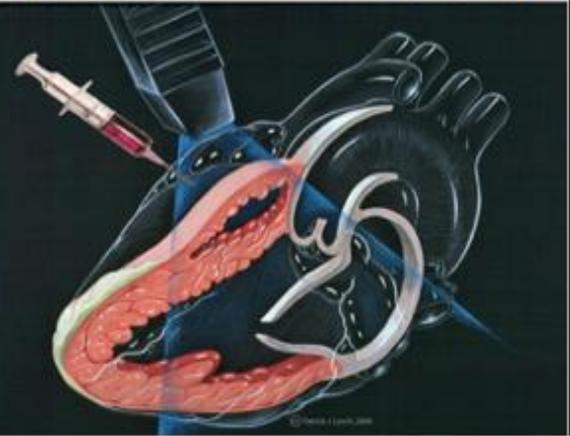
# Electrocardiography

- Low voltage QRS complexes
- Electrical alternans (pathognomonic)



# MANGEMENT

- 1-Oxygen supplementation
- 2-Fluid resuscitations
- 3-Bed rest with leg elevation
- 4-Pericardiocentesis(if pt is unstable)
- 5-Pharmacotherapy:  
(Aspirin/NSAIDS/Colchicine/Steroids)-  
Antibiotics-  
Vancomycin/Ceftriaxone/Ciprofloxacin
- 6-Percutaneous balloon pericardiotomy
- 7-Surgical creation of pericardial window

	SUBXIPHOID	PARASTERNAL	APICAL
APPROACH			
ULTRASOUND			
LANDMARKS	Under the xiphoid process	3rd or 4th ICS to left of sternum Probe marker - patient's right shoulder	Probe marker - patient's left
RISKS	LIVER	LIMA (left internal mammary artery) - runs 1-2 cm lateral to sternum LAD LUNG	LUNG

# Management of recurrent cardiac tamponade or pericardial effusion

**1-pericardial sclerosis:**

tetracycline, doxycycline,  
cisplatin, 5-Fluorouracil

**2-pericardio-peritoneal shunt**

**3-pericardiectomy**

A red pushpin is pinned to the top edge of the yellow sticky note.

THANK  
YOU! 😊