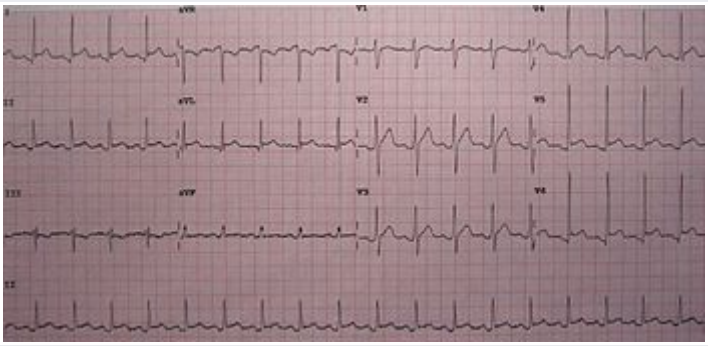
Pericarditis

Pericarditis is inflammation of the pericardium (the fibrous sac surrounding the heart).[8] Symptoms typically include sudden onset of sharp chest pain.[1] The pain may also be felt in the shoulders, neck, or back.[1] It is typically better sitting up and worse when lying down or breathing deeply.[1] Other symptoms may include fever, weakness, palpitations, and shortness of breath.[1] Occasionally onset of symptoms is gradual.[8]

The cause of pericarditis is believed to be most often due to a viral infection.[4] Other causes include bacterial infections such as tuberculosis, uremic pericarditis, following a heart attack, cancer, autoimmune disorders, and chest trauma.[4][5] The cause often remains unknown.[4][8] Diagnosis is based on the chest pain, a pericardial rub, specific electrocardiogram (ECG) changes, and fluid around the heart.[6] Other conditions that may produce similar symptoms include a heart attack.[1]

Treatment in most cases is with NSAIDs and possibly colchicine.[6] Steroids may be used if those are not appropriate.[6] Typically symptoms improve in a few days to weeks but can occasionally last months.[3] Complications can include cardiac tamponade, myocarditis, and constrictive pericarditis.[1][2] It is a less common cause of chest pain.[9] About 3 per 10,000 people are affected per year.[2] Those most commonly affected are males between the ages of 20 and 50.[10] Up to 30% of those affected have more than one episode.[10]

Pericarditis



An ECG showing pericarditis. Note the ST elevation in multiple leads with slight reciprocal ST depression in aVR.

Specialty	Cardiology
Symptoms	Sharp chest pain, better sitting up and worse with lying down, fever[1]
Complications	Cardiac tamponade, myocarditis, constrictive pericarditis[1][2]
Usual onset	Typically sudden[1]
Duration	Few days to weeks[3]
Causes	Viral infection, tuberculosis, uremic pericarditis, following a heart attack, cancer, autoimmune disorders, chest trauma[4][5]
Diagnostic method	Based on symptoms, electrocardiogram, fluid around the heart[6]
Differential diagnosis	Heart attack[1]
Treatment	NSAIDs, colchicine, corticosteroids[6]
Prognosis	Usually good[6][7]
Frequency	3 per 10,000 per year[2]

Contents

Signs and symptoms

Substernal or left precordial pleuritic chest pain with radiation to the trapezius ridge (the bottom portion of scapula on the back) is the characteristic pain of pericarditis. The pain is usually relieved by sitting up or bending forward, and worsened by lying down (both recumbent and supine positions) or by inspiration (taking a breath in).[11] The pain may resemble that of angina but differs in that pericarditis pain changes with body position, where heart attack pain is generally constant and pressure-like. Other symptoms of pericarditis may include dry cough, fever, fatigue, and anxiety.

Due to its similarity to the pain of myocardial infarction (heart attack), pericarditis can be misdiagnosed as a heart attack. Acute myocardial infarction can also cause pericarditis, but the presenting symptoms often differ enough to warrant diagnosis. The following table organizes the clinical presentation of pericarditis differential to myocardial infarction:[11]

Characteristic	Pericarditis	Myocardial infarction
Pain description	Sharp, pleuritic, retro-sternal (under the sternum) or left precordial (left chest) pain	Crushing, pressure-like, heavy pain. Described as "elephant on the chest."
Radiation	Pain radiates to the trapezius ridge (to the lowest portion of the scapula on the back) or no radiation.	Pain radiates to the jaw or left arm, or does not radiate.
Exertion	Does not change the pain	Can increase the pain
Position	Pain is worse in the supine position or upon inspiration (breathing in)	Not positional
Onset/duration	Sudden pain, that lasts for hours or sometimes days before a person comes to the ER	Sudden or chronically worsening pain that can come and go in paroxysms or it can last for hours before the person decides to come to the ER

Physical examinations

The classic sign of pericarditis is a friction rub heard with a stethoscope on the cardiovascular examination, usually on the lower left sternal border.[11] Other physical signs include a person in distress, positional chest pain, diaphoresis (excessive sweating); possibility of heart failure in form of pericardial

tamponade causing pulsus paradoxus, and the Beck's triad of low blood pressure (due to decreased cardiac output), distant (muffled) heart sounds, and distension of the jugular vein (JVD).

Complications

Pericarditis can progress to pericardial effusion and eventually cardiac tamponade. This can be seen in people who are experiencing the classic signs of pericarditis but then show signs of relief, and progress to show signs of cardiac tamponade which include decreased alertness and lethargy, pulsus paradoxus (decrease of at least 10 mmHg of the systolic blood pressure upon inspiration), low blood pressure (due to decreased cardiac index), (jugular vein distention from right sided heart failure and fluid overload), distant heart sounds on auscultation, and equilibration of all the diastolic blood pressures on cardiac catheterization due to the constriction of the pericardium by the fluid.

In such cases of cardiac tamponade, EKG or Holter monitor will then depict electrical alternans indicating wobbling of the heart in the fluid filled pericardium, and the capillary refill might decrease, as well as severe vascular collapse and altered mental status due to hypoperfusion of body organs by a heart that can not pump out blood effectively.

The diagnosis of tamponade can be confirmed with trans-thoracic echocardiography (TTE), which should show a large pericardial effusion and diastolic collapse of the right ventricle and right atrium. Chest X-ray usually shows an enlarged cardiac silhouette ("water bottle" appearance) and clear lungs. Pulmonary congestion is typically not seen because equalization of diastolic pressures constrains the pulmonary capillary wedge pressure to the intra-pericardial pressure (and all other diastolic pressures).

Causes

Infectious

Pericarditis may be caused by viral, bacterial, or fungal infection.

In the developed world, viruses are believed to be the cause of about 85% of cases.[6] In the developing world tuberculosis is a common cause but it is rare in the developed world.[6] Viral causes include coxsackievirus, herpesvirus, mumps virus, and HIV among others.[4]

Pneumococcus or tuberculous pericarditis are the most common bacterial forms. Anaerobic bacteria can also be a rare cause.[13] Fungal pericarditis is usually due to histoplasmosis, or in immunocompromised hosts Aspergillus, Candida, and Coccidioides. The most common cause of pericarditis worldwide is infectious pericarditis with tuberculosis.

Other

- Idiopathic: No identifiable cause found after routine testing.[4]
- Autoimmune disease: systemic lupus erythematosus, rheumatic fever,[4] IgG4-related disease[14][15]
- Myocardial infarction (Dressler's syndrome)[4]
- Trauma to the heart[4]
- Uremia (uremic pericarditis)[4]

- Cancer[4]
- Side effect of some medications, e.g. isoniazid, cyclosporine, hydralazine, warfarin, and heparin
- Radiation induced[4]
- Aortic dissection[4]
- Postpericardiotomy syndrome—such as after CABG surgery[4]

Diagnosis

Laboratory test

Laboratory values can show increased urea (BUN), or increased blood creatinine in cases of uremic pericarditis. Generally however, laboratory values are normal, but if there is a concurrent myocardial infarction (heart attack) or great stress to the heart, laboratory values may show increased cardiac markers like Troponin (I, T), CK-MB, Myoglobin, and LDH1 (lactase dehydrogenase isotype 1).

The preferred initial diagnostic testing is the ECG, which may demonstrate a 12-lead electrocardiogram with diffuse, non-specific, concave ("saddle-shaped"), ST-segment elevations in all leads except aVR and V1[11] and PR-segment depression possible in any lead *except aVR*;[11] sinus tachycardia, and low-voltage QRS complexes can also be seen if there is subsymptomatic levels of pericardial effusion. The PR depression is often seen early in the process as the thin atria are affected more easily than the ventricles by the inflammatory process of the pericardium.

Since the mid-19th Century, retrospective diagnosis of pericarditis has been made upon the finding of adhesions of the pericardium.[16]

When pericarditis is diagnosed clinically, the underlying cause is often never known; it may be discovered in only 16–22 percent of people with acute pericarditis.

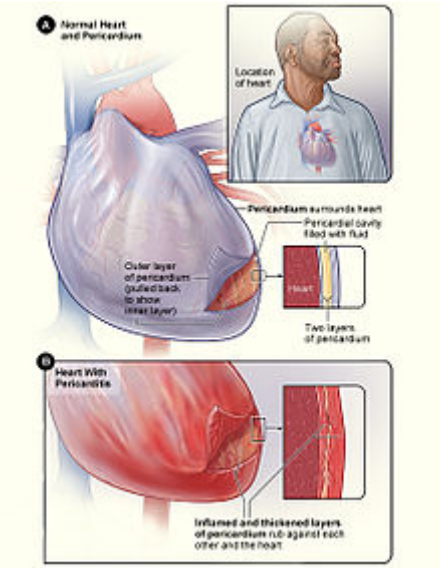
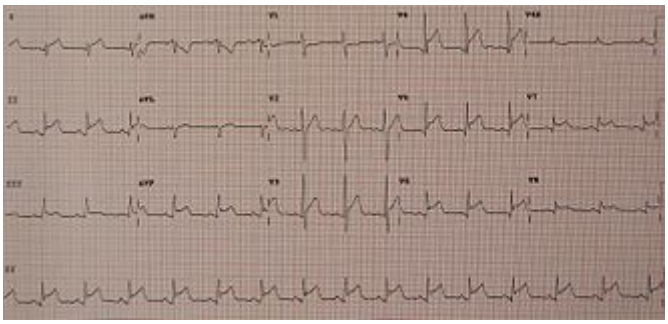


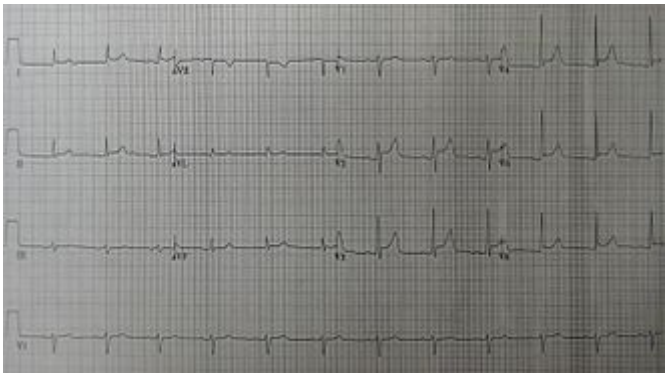
Figure A shows the location of the heart and a normal heart and pericardium (the sac surrounding the heart). The inset image is an enlarged cross-section of the pericardium that shows its two layers of tissue and the fluid between the layers.
Figure B shows the heart with pericarditis. The inset image is an enlarged cross-section that shows the inflamed and thickened layers of the pericardium.[12]



Diffuse ST elevation in a young male due to myocarditis / pericarditis

Imaging

Ultrasounds showing a pericardial effusion in someone with pericarditis



An ECG showing pericarditis. Note the ST elevation in multiple leads with slight reciprocal ST depression in aVR.

A pericardial effusion as seen on CXR in someone with pericarditis

Classification

Pericarditis can be classified according to the composition of the fluid that accumulates around the heart.[17]

Types of pericarditis include the following:

- serous
- purulent
- fibrinous
- caseous
- hemorrhagic

Acute vs. chronic

Depending on the time of presentation and duration, pericarditis is divided into "acute" and "chronic" forms. Acute pericarditis is more common than chronic pericarditis, and can occur as a complication of infections, immunologic conditions, or even as a result of a heart attack (myocardial infarction), as Dressler's syndrome. Chronic pericarditis however is less common, a form of which is constrictive pericarditis. The following is the clinical classification of acute vs. chronic:

- *Clinically*: Acute (<6 weeks), Subacute (6 weeks to 6 months) and Chronic (>6 months)

Treatment

The treatment in viral or idiopathic pericarditis is with aspirin,[11] or non-steroidal anti-inflammatory drugs (NSAIDs such as ibuprofen).[4] Colchicine may be added to the above as it decreases the risk of further episodes of pericarditis.[4][18]

Severe cases may require one or more of the following:

- pericardiocentesis to treat pericardial effusion/tamponade
- antibiotics to treat tuberculosis or other bacterial causes.
- steroids are used in acute pericarditis but are not favored because they increase the chance of recurrent pericarditis.
- in rare cases, surgery
- in cases of constrictive pericarditis, pericardiectomy

Epidemiology

About 30% of people with viral pericarditis or pericarditis of an unknown cause have one or several recurrent episodes.[6]

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External links

- Pericarditis — Cleveland Clinic (http://my.clevelandclinic.org/heart/disorders/other/pericarditis.aspx)
- Pericarditis — National Library of Medicine (https://www.nlm.nih.gov/medlineplus/ency/article/000182.htm)

Classification	**ICD-10**: I01.0 (http://apps.who.int/classifications/icd10/browse/2016/en#/I01.0), I09.2 (http://app

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