**Pericarditis**

**Description/Etiology**

Pericarditis is an inflammation of the pericardium, a fibrous sac that envelopes, supports, and protects the heart. Pericarditis is characterized by chest pain, fever, and an audible pericardial friction rub (i.e., an abnormal heart sound, usually scratchy or raspy, best heard at the left sternal border during forced expiration or when the patient leans forward). It occurs in both acute and chronic forms. The acute form can be fibrinous or effusive and is characterized by serous purulent, serous, or hemorrhagic exudates. The chronic form (also called chronic constrictive pericarditis) is characterized by dense fibrous pericardial thickening.

Pericarditis may be idiopathic or caused by viral, bacterial, amebic, or fungal infections; inflammatory disorders (e.g., rheumatic fever, systemic lupus erythematosus [SLE], rheumatoid arthritis [RA], sarcoidosis); metabolic disorders (e.g., chronic kidney failure, hypothyroidism, hypercholesterolemia); myocardial infarction (MI); chest trauma due to penetrating injury by a sharp object or improper use of a cardiac catheter; inflammation related to cardiothoracic surgery that requires cutting through the pericardial sac to expose the heart; cancer metastasis to the pericardium; adverse effects of medications (e.g., penicillin, cromolyn sodium, anthracyclines); or radiation therapy of the chest or upper torso. Pericarditis ranges in severity from mild (in which most cases resolve spontaneously) to life-threatening (e.g., characterized by pericardial tamponade, a life-threatening condition in which fluid rapidly accumulates under pressure in the pericardial sac, causing impaired filling of the cardiac chambers and decreased cardiac output). Potential complications include recurrent pericarditis, noncompressive effusion, chronic constrictive pericarditis, pericardial effusion (i.e., increased accumulation of fluid in the space between the myocardium and the pericardium), and pericardial tamponade.

Emergency care focuses on prompt diagnosis, assessing for the underlying cause, and rapid treatment of potentially life-threatening complications. Diagnosis is based on physical, laboratory, and imaging findings. The differential diagnosis includes angina pectoris, acute MI, pneumonia with pleurisy, pulmonary infarction, aortic dissection, pneumothorax, hepatitis, cholecystitis, mediastinal emphysema, and gastrointestinal (GI) abnormalities. The treatment approach depends on the etiology and severity. Bacterial pericarditis is usually severe, may occur as a complication of thoracic surgery or secondary to another infection, and is associated with a high mortality. Uncomplicated idiopathic and viral cases of pericarditis may be treated with aspirin and/or colchicine. In severe cases, treatment may include surgical drainage of the pericardium, pericardiocentesis, partial pericardiectomy (for recurrent pericarditis), and total pericardiectomy (for constrictive pericarditis). Prognosis depends upon the underlying cause and most patients recover within 3 weeks to several months and require no additional treatment.

**Facts and Figures**

Pericarditis occurs more frequently in males than in females and more common in adults than in children. Pericarditis accounts for an estimated 0.1% of hospitalizations, 1% of emergency department visits, and 5% of emergency department visits for nonischemic chest pain. Between 80% and 90% of cases of acute pericarditis are idiopathic or viral in origin. Pericarditis develops in up to 7% of patients with MI. Cardiac tamponade occurs in 15% of patients with idiopathic pericarditis and up to 60% of those with neoplastic, tuberculous, or
purulent pericarditis. The mortality rate is nearly 100% in patients with untreated purulent pericarditis and 12–40% of those who receive treatment. Between 10% and 15% of patients experience a recurrence within 12 months of an initial episode of pericarditis; the recurrence rate increases to 50% after a first recurrence.

Risk Factors
Risk for pericarditis increases with certain recent illness (e.g., MI, viral illness, rheumatic fever). Tuberculosis may cause pericarditis in immunosuppressed individuals.

Signs and Symptoms/Clinical Presentation
Signs and symptoms include sharp and often sudden substernal chest pain that may radiate to the neck, shoulders, back, or arms. This pain varies with respiration, is worse when lying down, and is relieved by sitting up and leaning forward. Other presenting symptoms may include fever, cough, dyspnea, palpitations, low-grade intermittent fever, night sweats, weight loss, and dysphagia.

Assessment
› Physical Findings of Particular Interest
  • Pericardial friction rub, diminished apical impulse, fluid retention, ascites, and hepatomegaly may be present
  • Tachycardia may indicate pericardial effusion. In cases of cardiac tamponade, physical findings may include pallor, clammy skin, hypotension, pulsus paradoxus, jugular venous distension, and dyspnea
› Laboratory Tests That Can Be Ordered
  • CBC can reveal ↑ WBC and erythrocyte sedimentation rate (ESR) in infectious pericarditis. Serum chemistry studies may indicate ↑ BUN and slightly ↑ creatinine phosphokinase-MB fraction, particularly in cases of associated myocarditis. Other serum lab studies that may be performed to assess for underlying causes of pericarditis include antinuclear antibody to assess for SLE and rheumatoid factor and antistreptolysin O titers to evaluate for rheumatic fever. Purified protein derivative (PPD) skin test may be ordered to assess for tuberculosis
  • Cultures of pericardial fluid obtained by open surgical drainage or by cardiocentesis may reveal the causative infectious organism
  • Serum high sensitivity C-reactive protein (hs-CRP) will be elevated due to inflammation of the pericardium; markers of a myocardial lesion (e.g., creatinine kinase, troponin) may also be elevated
› Other Diagnostic/Imaging Studies
  • Cardiac catheterization is the gold standard diagnostic test in patients with constrictive pericarditis in combination with other cardiac diseases
  • Chest X-ray can show small pulmonary effusions or infiltrates; it may also show the image of a “water bottle” silhouette associated with pericardial effusion. High-resolution CT or MRI may show increased pericardial thickening. Echocardiography may show pericardial effusions or right atrial or right ventricular collapse
  • EKG can show ST segment elevation in acute pericarditis and atrial ectopic rhythms (e.g., atrial fibrillation) and diminished QRS complexes in pericardial effusion. EKG also may show electrical alternans (characterized by alternating amplitude and vector of the P wave, QRS complex, and T wave), which is considered pathognomonic (i.e., definitively diagnostic) of cardiac tamponade
  • Echocardiography may be ordered to look for pericardial effusion and cardiac wall motion abnormalities

Treatment Goals
› Provide Emergency Nursing Care and Promote Optimal Physiologic Function
  • Place the patient in an upright position to relieve dyspnea and chest pain. Place the patient on cardiac monitor and administer oxygen, as ordered
  • Assess pain in relation to respiration and body position to distinguish pericardial pain from myocardial ischemic pain; administer symptomatic relief, as ordered
    – As ordered, administer aspirin or other nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen or indomethacin for pain/inflammation for acute idiopathic pericarditis, post-MI pericarditis, or post-thoracotomy pericarditis; colchicine in NSAID-intolerant patients or in combination with aspirin or other NSAIDs; corticosteroids (e.g., predniSONE) for severe pericarditis; antibiotics for bacterial infection; amphotericin B for fungal infection; antitubercular drugs for tuberculous pericarditis; and oxygen for shortness of breath
• Closely monitor vital signs; fluid, nutritional, respiratory, and hemodynamic status; and for complications, particularly hypotension, increased central venous pressure, paradoxical pulse, cardiac compression, and cardiac tamponade
• Assess for and provide prescribed treatment for identified causal/underlying conditions
• Follow facility pre- and postsurgical protocols if patient becomes a surgical candidate; reinforce pre- and postsurgical education and verify completion of informed consent documents

Provide Supportive Care, Reduce Risk of Complications, and Educate
• Assist with activities of daily living (ADLs); complete bed rest may be necessary for as long as the fever and pain persist. Assess anxiety level and coping ability; provide emotional support, educate, and encourage discussion about pericarditis, its complications, treatment risks and benefits, and prognosis; reassure patients with acute pericarditis that the condition is treatable and usually temporary

Food for Thought
› The addition of colchicine to conventional anti-inflammatory therapy (i.e., aspirin or ibuprofen) appears to be associated with reduced risk of pericarditis recurrence, including in patients who have already experienced multiple recurrences
• Researchers in a randomized study of 240 adults with a first episode of acute pericarditis found that risk of incessant pericarditis (defined as persistent pericarditis or symptom-free interval < 6 weeks) or recurrent pericarditis was 44% lower in patients who were treated with aspirin or an NSAID plus colchicine, compared with those treated with aspirin or an NSAID alone (Imazio et al., 2013)
• In a study of 240 patients with 2 or more recurrences of pericarditis, investigators reported that patients randomized to colchicine in addition to conventional anti-inflammatory therapy were 51% less likely to experience an additional recurrence, compared with those randomized to conventional anti-inflammatory therapy plus placebo (Imazio et al., 2014)
› Authors of a study concluded that in patients with idiopathic recurrent pericarditis, the use of immunotherapy as an adjunct therapy (i.e., IV immunoglobulin & anakinra) is beneficial in preventing pericarditis recurrence and long-term corticosteroid use (Schweir et al., 2017)

Red Flags
› Have a pericardiocentesis set readily available when pericardial effusion is suspected
› Because acute pericarditis typically presents as chest pain with ST-segment elevation and elevated cardiac biomarkers, the condition may be misinterpreted as evolving MI; it is important to consider the possibility of pericarditis or myopericarditis (a severe form of pericarditis with myocardial involvement that may progress to constrictive pericarditis and heart failure) in patients with chest pain

What Do I Need to Tell the Patient/Patient’s Family?
› Advise patient to seek immediate medical attention for fever, restlessness, and/or pain not controlled by prescribed analgesia (e.g., NSAIDs, acetaminophen), new shortness of breath with rapid heartbeat, unexplained weight loss, unexplained symptoms, and/or medication side effects
› Explain that home care is usually sufficient unless there are complications. A heating pad or warm compress may be applied to the chest area to relieve pain