



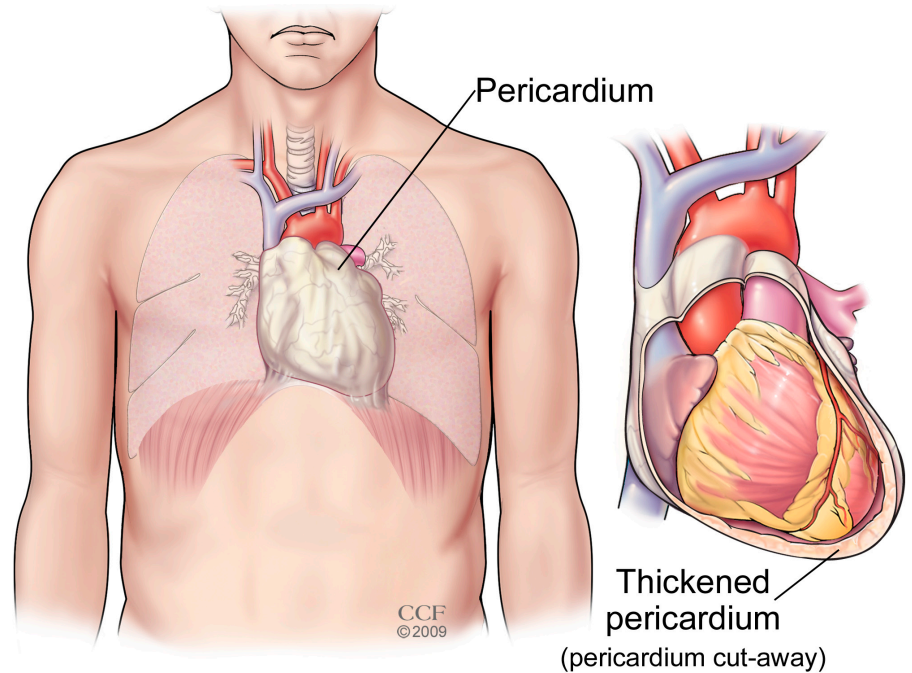
Pericarditis Guide



PERICARDITIS GUIDE

The Pericardium

The pericardium is a thin, two-layered, fluid-filled sac that covers the outer surface of the heart. It shields the heart from infection or malignancy and contains the heart in the chest wall. It also prevents the heart from over-expanding when blood volume increases, which keeps the heart functioning efficiently.



What is pericarditis?

Pericarditis is an inflammation of the pericardium. Pericarditis is usually acute – it develops suddenly and may last up to several months. If you could see and touch it, the membrane around the heart would look red and swollen, like the skin around a cut that becomes inflamed. Sometimes excess fluid develops in the space between the pericardial layers and causes a **pericardial effusion** (buildup of excess fluid around the heart).

What are the symptoms of pericarditis?

Chest pain symptoms associated with pericarditis can be described as:

- Sharp and stabbing (caused by the heart rubbing against the pericardium)
- May increase with coughing, swallowing, deep breathing or lying flat
- Can be relieved by sitting up and leaning forward

You also may feel the need to bend over or hold your chest to breathe more comfortably.

Other symptoms include:

- Pain in the back, neck or left shoulder
- Difficulty breathing when lying down
- A dry cough
- Anxiety or fatigue

Symptoms of pericarditis (continued)

In some people, pericarditis can cause swelling of the feet, legs or ankles. This swelling may be a symptom of **constrictive pericarditis**, a serious type of pericarditis. In constrictive pericarditis, the patient's pericardium hardens and/or thickens, preventing the heart muscle from expanding and affecting the function of the heart. The heart may be compressed by the constrictive process, which may cause blood to back up into the lungs, abdomen and legs, as well as cause the swelling.

If you have any symptoms of acute pericarditis, it is important to call your doctor right away.

If you feel your symptoms are a medical emergency, do not wait for an appointment. Call 911 immediately and ask to be transported to the nearest hospital.

Who gets pericarditis?

Most cases of pericarditis occur in men aged 20 to 50, although pericarditis also can occur in women.

What causes pericarditis?

There are many causes of pericarditis, but it is often a complication of a viral infection (viral pericarditis) – usually a gastrointestinal virus, or rarely the flu virus or AIDS. It may also be caused by a bacterial infection (bacterial pericarditis), fungal infection (fungal pericarditis) or parasitic infection (parasitic pericarditis).

Certain autoimmune diseases, such as lupus, rheumatoid arthritis and scleroderma, also can cause pericarditis. Additional causes of pericarditis include injury to the chest such as after a car accident (traumatic pericarditis), other health problems such as kidney failure (uremic pericarditis), tumors, genetic diseases such as Familial Mediterranean Fever (FMF), or rarely, medications that suppress the immune system.

The risk of pericarditis is greater after a heart attack or after heart surgery (Dressler's syndrome), radiation therapy or a percutaneous treatment, such as cardiac catheterization or radiofrequency ablation (RFA).

Glossary of Pericarditis Terms

Acute pericarditis: Inflammation of the pericardium that develops suddenly and is accompanied by the sudden onset of symptoms.

Cardiac tamponade: A severe compression of the heart that impairs its ability to function. Cardiac tamponade is a medical emergency that requires prompt diagnosis and treatment.

Chronic pericarditis: Inflammation of the pericardium that lasts for three months or longer after the initial acute attack.

Constrictive pericarditis: A severe form of pericarditis in which the inflamed layers of the pericardium stiffen, develop scar tissue, thicken and stick together. Constrictive pericarditis interferes with the normal function of the heart.

Infectious pericarditis: Pericarditis that develops as the result of a viral, bacterial, fungal or parasitic infection.

Idiopathic pericarditis: Pericarditis that does not have a known cause.

Pericardium: The thin, two-layered, fluid-filled sac that covers the outer surface of the heart.

Pericardial effusion: Excess fluid build-up in the pericardium.

Pericardial window: A minimally invasive surgical procedure performed to drain fluid that has accumulated in the pericardium. This surgical procedure involves a small chest incision through which an opening is made in the pericardium.

Pericardiectomy: Surgical treatment of pericarditis that involves the removal of a portion of the pericardium.

Pericardiocentesis: A procedure performed to drain excess fluid from the pericardium with a catheter.

Traumatic pericarditis: Pericarditis that develops as the result of injury to the chest, such as after a car accident.

Uremic pericarditis: Pericarditis that develops as the result of kidney failure.

Causes of pericarditis (continued)

In these cases, many experts believe that pericarditis is the result of the body mistakenly producing an inflammatory response to the pericardium. After bypass surgery, symptoms of pericarditis may not occur until several weeks after surgery.

In many cases of pericarditis, the cause is unknown. Pericarditis with an unknown cause is referred to as **idiopathic pericarditis**.

Pericarditis often becomes recurrent after the initial episode and attacks can last over many years.

When should I see my doctor?

If you have any of the symptoms of acute pericarditis, you should schedule an exam with your doctor immediately. Left untreated, pericarditis can become a life-threatening condition because pericardial effusion can develop and possibly lead to **cardiac tamponade** (a severe compression of the heart that impairs its ability to function).

Symptoms of cardiac tamponade include chest pain, difficulty breathing, fainting, light-headedness, palpitations or rapid breathing. These symptoms require emergent treatment; **call 911** if you experience any of these symptoms.

If you develop symptoms of constrictive pericarditis, including shortness of breath, swelling of the legs and feet, water retention, heart palpitations, and severe swelling of the abdomen, you should make an appointment with your cardiologist for an evaluation.

How is pericarditis diagnosed?

Your doctor will start with an evaluation of your symptoms: the sharp pain in the chest and back of the shoulders, and difficulty breathing are two major clues that you may have pericarditis rather than a heart attack. Your doctor also will ask you about your medical history, such as whether you have had a recent viral illness. He or she should already know about any previous heart surgery or current diseases, such as lupus or kidney failure, that may increase your risk of pericarditis.



During a physical exam, the doctor will listen to your heart with a stethoscope. Pericarditis may cause a rubbing or creaking sound, called the “pericardial rub,” that is produced by the rubbing of the inflamed lining of the pericardium. This is best heard when the patient leans forward while holding his or her breath, and when breathing out. Depending on how severe the inflammation is, your doctor may also hear crackles in the lungs, signs of fluid in the space around the lungs, or excess fluid in the pericardium.

Cleveland Clinic imaging specialists in the Center for the Diagnosis and Treatment of Pericardial Diseases often use a multi-modality approach to diagnose pericarditis and to detect any complications, such as pericardial effusion or constrictive pericarditis. Diagnostic tests may include:

- **Chest X-ray:** Shows evidence of enlargement of the heart and congestion of the lungs.
- **Electrocardiogram (ECG or EKG):** Shows changes in your normal heart rhythm that may indicate you have pericarditis. In about half of the patients with pericarditis, the heart rhythm goes through a sequence of four distinct patterns, but all patients with pericarditis will have some of the changes.
- **Echocardiogram (echo):** Shows the heart function and may show evidence of fluid or pericardial effusion around the heart. It will also show the classic signs of constrictive pericarditis when present (including stiffening or thickening of the pericardium that constricts the heart’s normal movement).

How pericarditis is diagnosed (continued)

- **Cardiac MRI and CT scan:** Show excess fluid in the pericardium or signs of pericardial inflammation using a special imaging agent called gadolinium. These tests may also show a thickened pericardium or compression of the heart from the thickened pericardium.
- **Cardiac catheterization:** Provides hemodynamic information about the filling pressures within the heart in order to confirm a diagnosis of constrictive pericarditis.
- **Laboratory (blood) tests:** Can be used to make sure you are not having a heart attack, to evaluate the heart's function, test the fluid in the pericardium and determine the underlying cause of the pericarditis. Often, the sedimentation rate (ESR) or C reactive protein levels (markers of inflammation) are elevated. Other laboratory tests may include evaluation for autoimmune diseases.

How is pericarditis treated?

Treatment for acute pericarditis (sudden onset) may include medication for pain and inflammation, such as nonsteroidal anti-inflammatory drugs, including ibuprofen in large doses. Depending on the cause of your pericarditis, your doctor may prescribe an antibiotic (for bacterial pericarditis) or an antifungal medication (for fungal pericarditis).



If your symptoms last longer than two weeks or recur over subsequent months, your doctor may prescribe an anti-inflammatory drug called colchicine in combination with the ibuprofen. Colchicine is an older and well-established anti-inflammatory drug that can help control

the inflammation and prevent pericarditis from recurring weeks or even months later.

When high doses of ibuprofen are prescribed, your doctor may prescribe medications to offset gastrointestinal symptoms. If you are taking high doses of nonsteroidal anti-inflammatory drugs, you should be monitored with frequent follow-up appointments to evaluate changes in kidney or liver function.

A small number of patients will develop **chronic pericarditis**, a condition that persists despite treatment, or that comes back (recurrent pericarditis). These patients may need to take nonsteroidal anti-inflammatory drugs or colchicine for several years, even when they are feeling well.

Previous treatment included the use of steroids, such as prednisone; however, this has been found in many cases to cause dependency on the medication to prevent a return of symptoms. In addition, steroids can reactivate the original viral infection. Furthermore, some patients can become dependent on narcotics for pain control.

Are procedures needed to treat pericarditis?

For most people with pericarditis, treatment with medications is all that is needed to clear up the inflammation and surgery is not usually necessary.

Sometimes fluid builds up in the pericardium, causing the heart to be compressed. If this occurs, you may need to undergo **pericardiocentesis** – a procedure to drain the excess fluid with a catheter. The doctor will use echocardiography to safely guide the placement of a large needle and catheter into the pericardium to remove excess fluid. If the fluid cannot be drained with a needle, then a surgical procedure called a **pericardial window** is performed.

Surgery may be needed for some patients with constrictive pericarditis. **Pericardiectomy** is the surgical treatment of pericarditis that involves the removal of a portion of the pericardium. Surgery is rarely done for pain control of recurrent pericarditis.

Possible Complications of Pericarditis

Constrictive Pericarditis

Constrictive pericarditis is a severe form of chronic pericarditis in which the inflamed layers of the pericardium stiffen, develop scar tissue, thicken and stick together. The thick, rigid pericardium constricts the heart's normal movement so that it cannot expand normally as it fills with blood. As a result, the heart chambers don't fill up with enough blood. The blood then backs up behind the heart, causing symptoms of heart failure, including shortness of breath, swelling of the legs and feet, water retention and disturbances in the heart's normal rhythm. These symptoms should improve when the constrictive pericarditis is treated.

Constrictive pericarditis often can be treated with a diuretic, such as furosemide, to treat the fluid retention. If you develop a heart rhythm problem, you may need to take a medication to treat the irregular rhythm for as long as the constrictive pericarditis lasts or until your heart rhythm returns to normal. When none of these treatments is effective, pericardiectomy may be needed to surgically remove the stiffened pericardium.

Pericardial Effusion

When an excess of fluid builds up in the space between the pericardium, it can cause a condition known as pericardial effusion. Rapid fluid accumulation in the pericardium can cause cardiac tamponade, a severe compression of the heart that impairs its ability to function. Cardiac tamponade resulting from a pericardial effusion can be life-threatening and is a medical emergency requiring emergent drainage of the fluid with a catheter.

What is the outlook after pericarditis?

In most people, pericarditis persists for up to three months then goes away and does not come back.

After you recover from the illness, you should be able to return to your normal activities without any reason for concern. Your doctor will talk to you about what you can expect and any activity limitations depending on your age, health, activity level and the cause of your pericarditis.

Sometimes the attacks recur every few months and anti-inflammatory medications are needed for years to manage symptoms.

How do I find a doctor who can diagnose and treat my condition?

The **Center for the Diagnosis and Treatment of Pericardial Diseases** in the Sydell and Arnold Miller Family Heart & Vascular Institute is a specialized center involving a multi-disciplinary group of specialists, including cardiologists, cardiac surgeons and nurses who provide a comprehensive approach to diagnosing and treating pericarditis. Specialists from other disciplines, such as rheumatologists and infectious disease physicians, may also participate in the diagnosis and treatment of pericarditis.

For more information

Resource Nurses are able to answer your questions about pericarditis in adults and help you arrange an appointment with a specialist in the Center for the Diagnosis and Treatment of Pericardial Diseases. You can talk with a Resource Nurse Monday through Friday, 8:30 am to 4:30 pm by calling **866.289.6911**.

You can also participate in a live online chat with a nurse or send an e-mail by visiting our website at **www.clevelandclinic.org/heart**.

References

Troughton RW, Asher CR and Klein AL. Pericarditis, *Lancet* 2004;363:717-27.

Maisch B, Seferović PM, Ristić AD, et al. Guidelines on the diagnosis and management of pericardial diseases executive summary; The Task Force on the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology. *European Heart Journal* 2004;25:587-610.

