CONDITION

Myocarditis

Myocarditis is inflammation of the heart muscle that can affect its pumping or electrical rhythm.

WHAT IT IS
Inflammation of the heart muscle

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Chest pain, breathlessness, palpitations, fatigue

WHAT CAUSES IT
Usually infection or immune reactions; sometimes unknown

HOW IT IS DIAGNOSED
Cardiac MRI; heart biopsy in selected cases

MAIN TREATMENT
Rest, monitoring, and treatment of heart complications

CAN IT BE CURED?
Sometimes - many recover, some retain heart damage

IS IT AN EMERGENCY?
Sometimes - chest pain, fainting, or severe breathlessness

LONG-TERM OUTLOOK
Many recover; some develop chronic heart weakness

Overview

Myocarditis is inflammation of the myocardium, the muscular middle layer of the heart. The inflammation can injure heart muscle cells and affect how well the heart pumps. It may also disturb the heart's electrical system, causing an abnormal rhythm.

The condition ranges from mild to severe. Some people have few symptoms and recover without lasting heart damage. Others develop heart failure, serious rhythm problems, or a rapid loss of heart function known as fulminant myocarditis.

Myocarditis can occur on its own or together with pericarditis, which is inflammation of the thin sac around the heart. When both are present, the condition may be called myopericarditis or perimyocarditis.

Chest pain and breathlessness have many possible causes. Symptoms alone cannot confirm myocarditis, so medical assessment and heart tests are important.

Symptoms

Symptoms may begin suddenly or develop over several days or weeks. Some people first have symptoms of an infection, such as fever, sore throat, cough, vomiting, or diarrhoea. Heart symptoms may appear during the infection or after it seems to have passed.

Possible symptoms include:

Chest pain from associated pericarditis may feel sharp, become worse with a deep breath or when lying flat, and improve when sitting forward. However, pain patterns are not reliable enough to identify the cause at home.

Children may have less specific symptoms, including poor feeding, rapid breathing, unusual sleepiness, abdominal pain, or reduced activity. Teenagers may have symptoms similar to adults.

- Chest pain, pressure, or discomfort
- Shortness of breath during activity or while resting
- A rapid, pounding, fluttering, or irregular heartbeat
- Unusual tiredness or reduced ability to exercise
- Light-headedness or fainting
- Swelling of the ankles, feet, legs, or abdomen

Causes and risk factors

Myocarditis often results from an immune response to an infection. Viruses are common triggers, including viruses that cause respiratory or stomach infections. SARS-CoV-2, the virus that causes COVID-19, can also be associated with myocarditis.

Less commonly, myocarditis may be linked to:

A small number of myocarditis cases have occurred after COVID-19 vaccination, most often in adolescent and young adult males. This reaction is rare, and cases have often improved with care. Myocarditis is also a recognized complication of COVID-19 infection.

In many people, testing does not identify one definite cause. This does not mean that the symptoms or inflammation are unexplained in a broader sense; it means the specific trigger

could not be confirmed.

- Bacterial, fungal, or parasitic infections
- Autoimmune conditions, in which the immune system attacks healthy tissue
- Reactions to certain medicines
- Cancer treatments that activate the immune system
- Exposure to some toxins or recreational drugs
- Inflammatory conditions such as cardiac sarcoidosis
- Rare forms such as giant-cell or eosinophilic myocarditis

Diagnosis

Diagnosis begins with a medical history, physical examination, and tests of heart function. A clinician may ask about recent infections, new medicines, vaccinations, immune conditions, substance exposure, and the timing of symptoms.

Initial tests may include:

Abnormal troponin or ECG results support concern about heart injury, but they do not confirm myocarditis by themselves. Similar findings can occur with a heart attack and other heart conditions.

Cardiac magnetic resonance imaging, usually called cardiac MRI, can show swelling, inflammation, or scar tissue in the heart muscle. It is an important non-invasive test for diagnosing myocarditis.

In selected cases, a small heart-muscle sample may be removed through a catheter and examined under a microscope. This is called an endomyocardial biopsy. Because it is invasive and can miss patchy inflammation, it is generally reserved for situations in which the result could change urgent or specialized treatment.

Tests may also be needed to rule out blocked coronary arteries, blood clots in the lungs, stress cardiomyopathy, and other causes of similar symptoms.

- An electrocardiogram, or ECG, which records the heart's electrical activity
- Blood tests for troponin, a protein released when heart muscle is injured
- Blood tests for inflammation and signs of strain on the heart
- An echocardiogram, which uses ultrasound to examine pumping and heart structure

- A chest X-ray to look for heart enlargement or fluid in the lungs

Treatment and management

Treatment is based on the severity, cause, and effects of the inflammation. People with significant chest pain, abnormal heart rhythms, elevated troponin, or reduced heart function may need hospital monitoring.

Rest is an important part of early recovery. Strenuous exercise can place extra demand on an inflamed heart and may increase the risk of rhythm problems. A gradual return to activity is usually guided by symptoms and repeat heart tests rather than by how fit someone feels.

If myocarditis has weakened the heart, treatment may include the same categories of medicine used for heart failure. These medicines can reduce strain on the heart, control fluid buildup, and support recovery. Rhythm problems may need monitoring, medication, or a procedure.

Treatment directed at the cause is used when appropriate. For example, a suspected medicine trigger may need to be stopped under medical supervision. Medicines that suppress the immune system are used for certain immune-related or biopsy-confirmed forms of myocarditis, but they are not routine treatment for every case.

Severe myocarditis can cause cardiogenic shock, meaning the heart cannot pump enough blood to the body. Intensive care may include temporary mechanical support for the circulation. Heart transplantation is considered only when severe heart failure does not recover despite other treatment.

Follow-up commonly includes an ECG, echocardiogram, cardiac MRI, exercise testing, or heart-rhythm monitoring. The choice and timing depend on the original severity and how recovery is progressing.

Complications

Most complications result from reduced pumping strength or an unstable electrical rhythm.

Possible complications include:

Scar tissue can remain after the active inflammation settles. In some people, this scar increases the long-term risk of rhythm problems even when pumping function has improved.

Complications are not inevitable. Risk is higher when heart function is severely reduced, dangerous rhythms occur, or inflammation continues.

- Heart failure, causing breathlessness, fatigue, and fluid retention
- Dilated cardiomyopathy, in which the heart becomes enlarged and weak
- Atrial or ventricular arrhythmias, meaning abnormal heart rhythms
- Blood clots caused by poor blood flow through a weakened heart
- Stroke if a clot travels to the brain
- Cardiogenic shock
- Sudden cardiac arrest

Prevention

Myocarditis cannot always be prevented. Many infections are common, and it is not possible to predict whose immune system will react by inflaming the heart.

Reducing exposure to infections may lower some risk. Useful measures include washing your hands, avoiding close contact with people who are acutely unwell when practical, and following recommended vaccination advice.

Use prescribed and non-prescribed medicines as directed, and avoid recreational drugs or toxins that can injure the heart. If a medicine has previously caused myocarditis, make sure this reaction is recorded in your medical history.

General heart-healthy habits support recovery and long-term cardiovascular health, but they cannot guarantee that myocarditis will not occur.

Living with it and what to expect

Recovery can take weeks or months. Tiredness and reduced exercise capacity may continue after chest pain or infection symptoms have improved. Trying to return immediately to intense exercise can delay a safe recovery plan.

Many people regain normal heart function. Some are left with scar tissue or persistent weakness of the heart muscle and need longer-term monitoring and treatment. A smaller group develops chronic inflammatory cardiomyopathy or ongoing heart failure.

Repeat testing helps show whether inflammation has settled, pumping function has recovered, and exercise is safe. Keep follow-up appointments even if you feel well, because electrical or structural changes may not cause obvious symptoms.

Your care team may advise temporary limits on strenuous exercise, competitive sport, alcohol,

or other activities that stress the heart. Return to demanding activity should be gradual and based on reassessment.

Myocarditis can occasionally return, especially when it is linked to an ongoing immune or inflammatory condition. New chest pain, breathlessness, fainting, or persistent palpitations should not be assumed to be part of normal recovery.

When to get medical help

Call emergency services for:

These symptoms can occur with myocarditis, a heart attack, a dangerous rhythm, or another serious condition. Do not drive yourself if you feel faint or severely unwell.

Seek prompt medical advice if you have ongoing chest discomfort, unexplained breathlessness, repeated palpitations, or a marked loss of exercise capacity, particularly during or after an infection.

If you have already been diagnosed, contact your care team about increasing ankle swelling, rapid weight gain over several days, worsening fatigue, new palpitations, or breathlessness that is becoming more noticeable. These changes need review but are not always an emergency.

- New or severe chest pain, pressure, or tightness
- Severe difficulty breathing or breathlessness at rest
- Fainting, collapse, confusion, or difficulty staying awake
- A rapid or irregular heartbeat with chest pain, weakness, or light-headedness
- Blue or grey lips, or cold and clammy skin

Common questions

Is myocarditis the same as a heart attack?

No. A heart attack is usually caused by a blocked coronary artery. Myocarditis is inflammation of the heart muscle. Both can cause chest pain, ECG changes, and raised troponin, so testing is needed to tell them apart.

Can myocarditis go away completely?

Yes, it can. Many people recover with normal heart function. Others have lasting scar tissue, reduced pumping strength, or rhythm problems. The initial severity and findings on follow-up

tests help show how recovery is progressing.

How long does myocarditis last?

Active inflammation may settle over weeks, but strength and exercise tolerance can take months to return. Some people develop longer-lasting heart weakness. There is no single recovery timetable that applies to everyone.

Can I exercise after myocarditis?

Strenuous exercise is usually avoided while the heart is inflamed. Returning too soon may increase strain and the risk of an abnormal rhythm. A safe return is normally based on follow-up assessment, heart function, rhythm testing, and symptoms.

Is myocarditis contagious?

Myocarditis itself is not contagious. An infection that triggered it may be contagious, such as a respiratory or stomach virus. Most people who catch those infections do not develop myocarditis.

Can a vaccine cause myocarditis?

Rare cases have occurred after COVID-19 vaccination, particularly in adolescent and young adult males. Symptoms often begin within several days. Chest pain, breathlessness, or palpitations after vaccination should be medically assessed. COVID-19 infection itself can also cause myocarditis and other heart complications.

Sources

- American College of Cardiology. 2024 ACC Expert Consensus Decision Pathway on Strategies and Criteria for the Diagnosis and Management of Myocarditis . 2024.
- Ammirati E, Frigerio M, Adler ED, and colleagues. Management of Acute Myocarditis and Chronic Inflammatory Cardiomyopathy: An Expert Consensus Document . Circulation: Heart Failure. 2020;13:e007405.
- Caforio ALP, Pankuweit S, Arbustini E, and colleagues. Current State of Knowledge on Aetiology, Diagnosis, Management, and Therapy of Myocarditis . European Heart Journal. 2013;34:2636-2648.
- Ferreira VM, Schulz-Menger J, Holmvang G, and colleagues. Cardiovascular Magnetic Resonance in Nonischemic Myocardial Inflammation: Expert Recommendations . Journal of the American College of Cardiology. 2018;72:3158-3176.

- National Heart, Lung, and Blood Institute. Heart Inflammation: Myocarditis . US National Institutes of Health.
- Centers for Disease Control and Prevention. Clinical Considerations: Myocarditis and Pericarditis after Receipt of COVID-19 Vaccines . Reviewed October 2024.