CONDITION

Heart block

Heart block is a delay or interruption in the electrical signals that control your heartbeat.

WHAT IT IS
Delayed or interrupted electrical signals within the heart

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Dizziness, fainting, tiredness, shortness of breath

WHAT CAUSES IT
Heart disease, medicines, procedures, or inherited changes

HOW IT IS DIAGNOSED
Electrocardiogram and often longer heart rhythm monitoring

MAIN TREATMENT
Monitoring, cause-specific care, or a pacemaker

CAN IT BE CURED?
Sometimes - reversible causes can be treated

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

LONG-TERM OUTLOOK
Often good with monitoring or pacing when needed

Overview

Heart block is a problem with the heart's electrical signalling system. These signals tell the upper and lower chambers when to contract and pump blood.

A normal heartbeat usually begins in the sinus node, the heart's natural pacemaker. The signal travels through the upper chambers to the atrioventricular, or AV, node. It then passes into the lower pumping chambers, called the ventricles.

In heart block, that signal is delayed or does not pass through normally. This can make the heart beat too slowly, pause, or lose coordination between its upper and lower chambers. Heart block is not the same as a blocked heart artery.

There are several degrees of AV heart block:

Second-degree block includes Mobitz type I, also called Wenckebach, and Mobitz type II.

Mobitz I is often less serious, although its meaning depends on your symptoms and other heart findings. Mobitz II can progress to complete heart block and usually needs closer assessment.

Some people have no symptoms and only need monitoring. Others need treatment, often with a pacemaker. The importance of heart block depends on its type, cause, symptoms, and effect on the heart rate.

- First-degree heart block: every signal reaches the ventricles, but more slowly than usual
- Second-degree heart block: some signals fail to reach the ventricles
- Third-degree, or complete, heart block: no signals pass normally from the upper to the lower chambers

Symptoms

Heart block does not always cause symptoms. First-degree block and some forms of second-degree block may be found during an electrocardiogram, or ECG, performed for another reason.

When symptoms occur, they may include:

Symptoms may be brief if the block comes and goes. They may also resemble symptoms caused by other heart, lung, or neurological conditions. An ECG is needed to identify whether heart block is responsible.

Babies born with complete heart block may have a persistently slow heart rate. Some have no early symptoms, while others may feed poorly, tire easily, or show signs that the heart is struggling to pump enough blood.

- Dizziness or feeling light-headed
- Fainting or nearly fainting
- Unusual tiredness or weakness
- Shortness of breath, especially during activity
- Reduced ability to exercise
- Awareness of a slow, irregular, or paused heartbeat
- Chest discomfort
- Confusion, particularly in an older adult with a very slow heart rate

Causes and risk factors

Heart block can develop when the AV node or the electrical pathways below it are damaged or affected by disease. In many adults, it results from gradual scarring of the heart's conduction tissue with age.

Possible causes include:

Some medicines can slow conduction through the AV node. These include certain beta blockers like metoprolol or propranolol , calcium channel blockers like amlodipine or diltiazem , digoxin, and medicines used to control abnormal heart rhythms. A medicine-related block may improve after the medicine is adjusted, but you should not stop a prescribed medicine without medical advice.

A mild conduction delay can sometimes appear during sleep or in highly trained athletes because of strong activity from the vagus nerve, which naturally slows the heart. This is not always harmful, but the ECG pattern and symptoms still need to be interpreted in context.

Congenital complete heart block may occur when antibodies from a pregnant parent's autoimmune condition cross the placenta and affect the developing heart. It can also occur alongside structural heart differences or, less commonly, without a clear cause.

- Coronary artery disease or a heart attack
- Heart muscle inflammation, called myocarditis
- Heart failure or disease of the heart muscle
- Previous heart surgery or certain catheter procedures
- Inflammatory conditions such as cardiac sarcoidosis
- Infections that affect the heart, including Lyme disease
- Abnormal levels of potassium or other body salts
- Reduced thyroid activity in some cases
- Changes present from birth, called congenital heart block

Diagnosis

An ECG is the main test used to confirm heart block. It records the heart's electrical activity through small sticky sensors placed on your skin. The pattern shows whether signals are delayed, occasionally blocked, or completely disconnected from the ventricles.

Because heart block can come and go, a short ECG may not capture it. Longer monitoring may

include a portable Holter monitor worn for a day or more, an event monitor used over several weeks, or a small implanted monitor used for infrequent symptoms.

Your assessment may also include:

Some people need an electrophysiology study. During this procedure, thin wires passed into the heart measure its electrical signals more directly. This is reserved for situations where the cause or level of the block remains uncertain and the result may affect treatment.

- A review of fainting, dizziness, exercise tolerance, and medicines
- A physical examination and pulse check
- Blood tests for body salts, thyroid function, infection, or other causes
- An echocardiogram, which uses ultrasound to examine heart structure and pumping
- An exercise ECG to see how conduction changes with activity

Treatment and management

Treatment is based on the type of block, whether you have symptoms, and whether the cause can be reversed.

First-degree heart block often needs no direct treatment. Follow-up may include repeat ECGs and a review of medicines or underlying heart conditions. Some people with Mobitz I block also need monitoring rather than a procedure, particularly when they have no symptoms and the block is confined to the AV node.

A reversible cause is treated when possible. This may involve correcting an abnormal body salt level, treating an infection or inflammation, or reviewing a medicine that slows the heart. Medicine changes should be supervised because suddenly stopping some heart medicines can be harmful.

If severe heart block causes an unstable heart rate, hospital treatment may include medicines that temporarily raise the heart rate or temporary electrical pacing. These measures support the circulation while the cause is assessed or a longer-term plan is made.

A permanent pacemaker is the main treatment for persistent complete heart block and many cases of Mobitz II or high-grade block. It is a small device placed under the skin, usually near the collarbone. One or more leads connect it to the heart. The pacemaker monitors your rhythm and sends a small electrical impulse when the heart does not produce or conduct a beat as expected.

A pacemaker manages the slow rhythm but does not remove scarring in the heart's electrical

pathways. The device needs regular checks, and its battery is replaced when it becomes low. Battery life commonly extends for years, but the exact time depends on the device and how often it provides pacing.

Complications

Significant heart block can reduce the amount of blood reaching the brain and other organs. This may lead to falls, fainting, injury, worsening heart failure, or reduced ability to be active.

Complete or advanced heart block can occasionally lead to a dangerously slow rhythm or cardiac arrest if there is no reliable backup heartbeat. Timely assessment and pacing greatly reduce this risk when a pacemaker is indicated.

Complications can also come from the condition causing the block, such as a heart attack, inflammation, or structural heart disease. A pacemaker has its own possible complications, including infection, bleeding, a collapsed lung, or movement of a lead, although many people have the procedure without a major problem.

Prevention

Many cases of heart block cannot be prevented. Age-related scarring and congenital heart block are not caused by something you did.

Reducing the risk of coronary artery disease may lower the chance of some acquired conduction problems. This includes not smoking, staying active within your abilities, and managing blood pressure, cholesterol, and diabetes.

Use prescribed medicines only as directed, and make sure each healthcare professional involved in your care knows what you take. Do not stop a medicine because you are worried about heart block. A clinician can check your pulse, ECG, and medicines and decide whether changes are appropriate.

Prompt treatment of conditions such as Lyme disease or heart inflammation may help when these are the cause, but it cannot prevent every lasting conduction problem.

Living with it and what to expect

Some mild forms of heart block remain stable for years and never cause symptoms. Others can progress, particularly when the block is located in the electrical pathways below the AV

node. Follow-up is used to check for new symptoms or ECG changes rather than to assume that progression will occur.

If you have a pacemaker, you can usually return gradually to everyday activities after the implant site heals. You will receive advice about wound care, arm movement, driving, work, and exercise. Most household equipment is safe, but strong magnets and certain industrial electrical sources may interfere with some devices. Tell healthcare and security staff that you have a pacemaker.

Pacemaker checks confirm that the leads and battery are working. Some checks can be completed remotely from home. You should continue follow-up even when you feel well.

Your ability to exercise, work, travel, or become pregnant depends more on your symptoms, underlying heart health, and treatment than on the term "heart block" alone. Many people lead active lives with monitoring or a pacemaker. Some need continuing care for another heart condition that caused the block.

When to get medical help

Call emergency services if you or someone else has:

If someone is unresponsive and not breathing normally, begin cardiopulmonary resuscitation if you know how and use an automated external defibrillator if one is available.

Seek prompt medical assessment if you have new fainting, repeated near-fainting, unexplained dizziness, or a slow pulse with weakness or breathlessness. Do not drive yourself if you feel likely to faint.

Arrange routine follow-up if previously mild symptoms become more frequent, your exercise tolerance falls, or a home monitor repeatedly reports an unusually slow rate. If you have a pacemaker, contact your device clinic about redness, swelling, drainage, or increasing pain around the implant site, or if you receive a device alert.

- Fainted and is not recovering normally
- Chest pain, severe shortness of breath, or sudden confusion
- Collapse with no normal breathing
- A very slow heartbeat with severe weakness, grey or blue skin, or difficulty staying awake

Common questions

Is heart block the same as a blocked artery?

No. Heart block affects the electrical signals that coordinate your heartbeat. A blocked coronary artery restricts blood flow to the heart muscle. A heart attack can sometimes damage electrical tissue and cause heart block, so the two problems can occur together.

Can heart block go away?

Sometimes. Heart block caused by a medicine, infection, inflammation, or abnormal body salt level may improve when the cause is corrected. Block caused by permanent scarring or congenital changes is less likely to resolve. A pacemaker controls the slow rhythm but does not cure damaged conduction tissue.

Does everyone with heart block need a pacemaker?

No. Many people with first-degree block or symptom-free Mobitz I block are monitored. A pacemaker is more often recommended for Mobitz II, high-grade, or complete heart block when there is no reversible cause. Symptoms and other heart findings also guide the decision.

Can I exercise with heart block?

Many people can exercise, but the safe level depends on the type of block, symptoms, and other heart conditions. Stop and seek assessment if activity causes faintness, chest discomfort, or unusual breathlessness. After pacemaker implantation, temporary limits may apply while the wound and leads settle.

Can anxiety cause heart block?

Anxiety can cause a racing heart, skipped-beat sensations, dizziness, or increased awareness of your heartbeat. It does not usually cause AV heart block. New fainting or persistent slow-heart-rate symptoms should not be assumed to be anxiety without an appropriate assessment.

Can heart block be inherited?

Most adult heart block is not directly inherited. Rare genetic conditions can affect the heart's electrical system, and some people are born with congenital heart block. A family history of conduction disease, pacemakers at a young age, or sudden unexplained death may lead to further assessment.

Sources

- Kusumoto FM, Schoenfeld MH, Barrett C, et al. 2018 ACC/AHA/HRS Guideline on the Evaluation and Management of Patients With Bradycardia and Cardiac Conduction Delay . Circulation. 2019;140:e382-e482.
- Glikson M, Nielsen JC, Kronborg MB, et al. 2021 ESC Guidelines on Cardiac Pacing and Cardiac Resynchronization Therapy . European Heart Journal. 2021;42:3427-3520.
- National Health Service. Heart block . NHS patient information.
- American Heart Association. Heart Block . Patient information on conduction disorders, symptoms, diagnosis, and treatment.
- Merck Manual Professional Edition. Atrioventricular Block . Overview of AV block classification, causes, diagnosis, and management.