
ECG test

Summary

- An electrocardiogram (ECG) is a medical test that detects heart problems by measuring the electrical activity generated by the heart as it contracts.
 - ECGs from healthy hearts have a characteristic shape. If the ECG shows a different shape it could suggest a heart problem.
 - A doctor may recommend an ECG for people who may be at risk of heart disease because there is a family history of heart disease, or because they smoke, are overweight, have diabetes, high cholesterol or high blood pressure.
 - A doctor may also recommend an ECG for people who are displaying symptoms such as chest pain, breathlessness, dizziness, fainting or fast or irregular heartbeats.
 - The ECG is a safe and non-invasive procedure with no known risks.
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An electrocardiogram (ECG) is a medical test that detects cardiac (heart) abnormalities by measuring the electrical activity generated by the heart as it contracts. The machine that records the patient's ECG is called an electrocardiograph.

The electrocardiograph records the electrical activity of the heart muscle and displays this data as a trace on a screen or on paper. This data is then interpreted by a medical practitioner.

ECGs from normal, healthy hearts have a characteristic shape. Any irregularity in the heart rhythm or damage to the heart muscle can change the electrical activity of the heart so that the shape of the ECG is changed.

A doctor may recommend an ECG for people who may be at risk of heart disease because there is a family history of heart disease, or because they smoke, are overweight, or have diabetes, high cholesterol or high blood pressure.

They may also recommend an ECG if a person is experiencing symptoms such as:

- chest pain
- shortness of breath
- dizziness
- fainting, or
- fast or irregular heartbeats (palpitations).

ECGs are often performed to monitor the health of people who have been diagnosed with heart problems, to help assess artificial cardiac pacemakers or to monitor the effects of certain medications on the heart.

The ECG procedure

There is no need to restrict food or drink before having an ECG test. Always let your doctor know what medications you are taking before you have an ECG, and if you have any allergies to adhesive tapes that may be used to attach electrodes.

When you go for an ECG test, you will need to remove your upper clothing so that electrodes can be attached to your chest and limbs. (For women, wearing a separate top with trousers or a skirt can allow easy access to the chest.) The selected sites are shaved, if necessary.

Electrodes (sensors) are attached to the chest, arms and legs with suction cups or sticky gel. These electrodes detect the electrical currents generated by the heart – these are measured and recorded by the electrocardiograph.

The three major types of ECG are:

- **resting ECG** – the person lies down. No movement is allowed during the test, as electrical impulses generated by other muscles may interfere with those generated by the heart. This type of ECG usually takes 5 to 10 minutes
- **ambulatory ECG** – an ambulatory or Holter ECG is performed using a portable recording device that is worn for at least 24 hours. The person is free to move around normally while the monitor is attached. This type of ECG is used for patients whose symptoms are intermittent (stop-start) and may not show up on a resting ECG. People recovering from heart attack may be monitored in this way to ensure proper heart function. The person usually records symptoms in a diary, noting when they occur so that their own experience can be compared with the ECG
- **cardiac stress test** – this test is used to record a person's ECG while they ride on an exercise bike or walk on a treadmill. This type of ECG takes about 15 to 30 minutes to complete.

Immediately after an ECG procedure

When the procedure is completed, the electrodes are removed. An ECG is completely painless and non-invasive, as the skin is not penetrated.

The doctor can interpret the results of your ECG straight away based on your medical history, symptoms and clinical examination.

Possible complications of an ECG

The ECG is a safe procedure with no known risks. It does not send electric current to the body. On occasion the person may be allergic or sensitive to the electrodes, causing local skin reddening.

Taking care of yourself at home after an ECG

After an ECG you can resume normal activities immediately. The ECG is non-invasive and doesn't involve medications (such as anaesthetics) or require recovery time.

Long-term outlook - heart problems diagnosed by ECG

The results of your ECG will determine what treatment you need, if any.

Some of the various heart problems that can be diagnosed by ECG include:

- enlargement of the heart
- congenital heart defects involving the conducting (electrical) system
- abnormal rhythm (arrhythmia) – rapid, slow or irregular heart beats
- damage to the heart such as when one of the heart's arteries is blocked (coronary occlusion)
- poor blood supply to the heart
- abnormal position of the heart
- heart inflammation – pericarditis or myocarditis
- cardiac arrest during emergency room or intensive care monitoring
- disturbances of the heart's conducting system
- imbalances in the blood chemicals (electrolytes) that control heart activity.

A person with heart disease may have a normal ECG result if the condition does not cause a disturbance in the electrical activity of the heart. Other diagnostic methods may be recommended if heart disease is suspected.

Treatment for a heart condition depends on the diagnosed condition but may include:

- medication
- surgery
- dietary changes
- quitting smoking

- regular exercise.

For example, the following conditions diagnosed by ECG may require the treatment specified:

- arrhythmias – medication or surgery (such as installing an artificial pacemaker)
- coronary artery disease or heart attack – medications including beta-blockers, quitting cigarettes, dietary changes and coronary artery bypass surgery
- high blood pressure – dietary changes, regular exercise and medications.

Other tests for heart problems

Other tests that help diagnose heart problems include:

- physical examination
- chest x-rays
- echocardiogram (ultrasound of the heart)
- magnetic resonance imaging (MRI) or computerised tomography (CT) scans of the chest
- blood tests
- cardiac catheterisation (insertion of a catheter through the blood vessels of the groin into the heart).

Where to get help

- Your doctor
- In an emergency, call triple zero (000) for an ambulance

This page has been produced in consultation with and approved by:

Heart Foundation

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