

# Tests for heart conditions

Heart Information Series Number 9



**British Heart  
Foundation**

This is one of the booklets in the *Heart Information Series*. For a complete list of booklets, see page 45.

We welcome your comments on this booklet.  
Please fill in the feedback form on page 57.

We update this booklet regularly. However, you may find more recent information on our website  
**bhf.org.uk**

## Contents

About this booklet	4
Having tests	5
The electrocardiogram (ECG)	6
Exercise ECG	8
24-hour ECG recording	12
Cardiac event recorders	15
Chest X-ray	18
24-hour blood pressure recording	20
Echocardiogram	22
Radionuclide tests	26
Electrophysiological testing	29
Magnetic Resonance Imaging (MRI)	31
Cardiac enzyme tests	33
Coronary angiogram	35
What next?	41
For more information	44
About the British Heart Foundation	48
Technical terms	51
Index	55
Your comments please	57

## About this booklet

This booklet describes the special tests that are often used to help diagnose heart disease. Some of the tests are also used to assess the current condition of people who have been diagnosed with heart disease.

This booklet is not a substitute for the advice your doctor or cardiologist (heart specialist) may give you based on his or her knowledge of your condition.

## Having tests

You may be reading this booklet because your doctor has just advised you to have some tests to find out if you have heart disease. Or you may already know that you have heart disease and need tests to find out more about your condition.

It can be worrying to be referred for these tests, and it's natural to feel a bit anxious. All sorts of fears may be running through your mind.

If you feel anxious, ask if your partner or a relative or friend can go along with you. For some tests they can sit with you. With others they may be able to sit outside or wait in the hospital so that they're close at hand when the test is over. They may also be able to talk to the doctor or technician with you afterwards.

Some of the tests involve high-tech equipment with lots of machines, wires and computer screens, which can make it feel very lonely and impersonal. This booklet explains what all the equipment is for and what the tests can show. If you still feel uneasy, remember that it often helps to get fears out into the open, so tell the doctor or technician how you feel. They can then explain things to you and reassure you.

## The electrocardiogram (ECG)

An electrocardiogram, or ECG, records the rhythm and electrical activity of your heart. If your GP (family doctor) thinks that you may have heart disease or a heart problem, he or she may refer you to a local hospital for an electrocardiogram. Some GPs may do the test in their surgery. People usually have an ECG before having an operation. Others have one as part of a routine health check-up, even if there is no suspicion of heart disease.

### What happens?

Several small sticky patches are put on your arms, legs and chest. The patches, called 'electrodes', are connected to wires which lead to a recording machine. The recording machine picks up the electrical signals produced by each heartbeat. It records a few beats from each set of electrodes onto paper.

The ECG machine only records signals from your body. It does not give electric shocks and does not affect your heart in any way. The whole test takes about five minutes and will not be uncomfortable at all.

## What can the test show?

An ECG can detect problems with your heart rhythm. It can sometimes show if a person has had a heart attack, either recently or some time ago. And sometimes it can show if the heart may be working under strain.

The ECG is a simple and useful test but it has some limitations. An abnormal reading does not always mean that there is something wrong. On the other hand, some people may have a normal ECG recording even though they do have heart disease. This is why you may need to have one or more other tests as well as the ECG.

## Exercise ECG

Also known as an **exercise electrocardiogram**, **exercise electrocardiography**, **exercise stress testing** or **exercise treadmill test**.

An exercise ECG is an electrocardiogram that is recorded while you are exercising on a treadmill (a running machine) or on an exercise bike. If you get a chest pain or feel uncomfortable when you are being physically active, this test can help to tell if your symptoms are caused by angina, a type of pain that is usually due to coronary heart disease.

If you already know you have coronary heart disease, an exercise ECG can give more information about how severe your condition is, as it lets doctors see the changes to your ECG 'wave form' while you are doing exercise. (The ECG wave form is the pattern of the rhythm of your heart.) It can also help doctors plan your treatment.

If you have recently had heart surgery, an exercise ECG can help doctors decide what level of exercise you should do as part of your cardiac rehabilitation programme.

## Getting ready for the test

Wear light, comfortable clothes and shoes. Don't have a heavy meal before you have your ECG.

Exercise raises your pulse rate. However, this effect shows up less in people who are taking beta-blockers (a type of medicine for the heart). If you take beta-blockers, the doctor may advise you to stop taking them for one or two days before the test.

## What happens?

Several small sticky patches are put on your chest and connected to an ECG recorder to monitor your heartbeat, in the same way as for the ECG described on page 6. You will then be asked to exercise, either on a treadmill (a running machine) or on an exercise bike.

The test starts off at a very easy rate and is gradually made harder either by increasing the speed and slope of the treadmill or by putting a brake onto the bike. A doctor or specially trained technician will carefully check your ECG reading, blood pressure and pulse. The staff will tell you when to stop – usually when they have the measurements they need. They may also tell you to stop if you start getting chest pains, or if you get

tired or very short of breath. Let them know if you get any of these symptoms. You can also tell the staff if you cannot carry on with the test. They will take more ECG readings after you have stopped exercising.

The exercise test usually lasts between a few minutes and 15 minutes. It can be hard work, but should not be too much for you. Many people are pleasantly surprised by how much they can achieve. The value of the test is much greater if you try to work as hard as you can.

If you cannot do the exercise test because you have another physical condition, such as severe arthritis or lung disease, the doctor may recommend a radionuclide test (see page 26) or a stress echocardiogram (see page 24) instead.

### **What can the test show?**

The exercise ECG shows doctors the pattern of your heart activity during exercise. The doctors also need to know how much exercise you can do. If you feel pain and if there are changes on the ECG when you exercise, this could mean that the pain comes from your heart. This may be more serious if it happens during mild physical activity than if it happens during strenuous exercise.

After the test, you may be told that you have had a 'positive' or a 'negative' exercise ECG.

- **A positive exercise ECG** is when significant changes are seen on the ECG during exercise.
- **A negative exercise ECG** means there are no unusual or obvious changes shown on the ECG during the test.

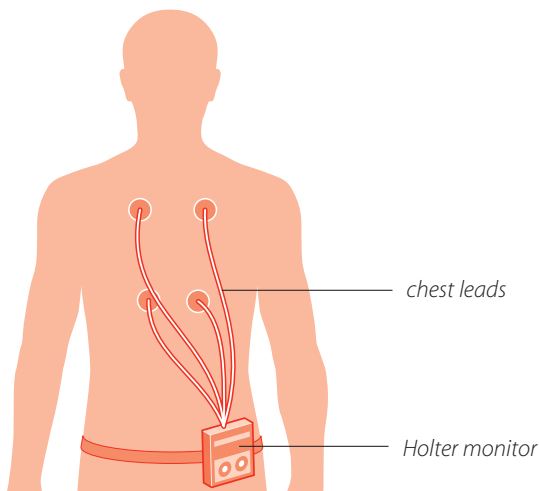
The exercise ECG is a very useful test, but it is still not 100% accurate. Sometimes people with a normal heart have an exercise ECG that shows changes. (For some unknown reason this often happens with young women.) Sometimes the test may show changes even though the person has very few symptoms. On the other hand, people who do have coronary heart disease may have a normal exercise ECG.

If you have had a heart attack, exercise testing can help doctors find out more about the condition of your heart and plan your rehabilitation. If you have an exercise ECG shortly after a heart attack, the exercise test will be less strenuous. If you have a negative exercise ECG after a heart attack, your risk of having further heart problems is low. It is also reassuring for you to know that you can gradually build up to doing quite vigorous exercise safely.

## 24-hour ECG recording

Also known as ***Holter monitoring*** or ***ambulatory ECG monitoring***.

This technique involves continuously recording an electrocardiogram (ECG) over 24 hours. It is usually done as an outpatient. The test is safe and painless. It can help to diagnose symptoms such as palpitations, which don't happen very often and which rarely happen in the doctor's surgery!



***Holter monitor***

## What happens?

You'll need to make two visits to the hospital – once to have the recorder fitted and once to return it.

Small sticky patches are put on your chest. Wires are attached to these and are taped down. The wires lead to a small portable tape recorder, similar to a personal stereo, which you wear on a belt round your waist. The whole system is very comfortable and quiet so you should hardly be aware of it. You can do everything you normally do, except have a bath or shower. It is best to wear loose clothing.

The doctor will ask you to spend a normal day and do any activity which might bring on your symptoms. You will also need to keep a simple 'diary', writing down what activities you do and when, and making a note of any times when you have symptoms such as palpitations or dizzy spells. When you write down the times, remember to say whether you mean morning or afternoon, day or night. When the ECG is analysed later, the doctors will pay special attention to the recordings at these times. That is why it is important to fill in your diary accurately. Often the doctor will arrange for

24-hour recordings to be made for two or three days in a row.

When the test is finished you will need to return the monitor to the hospital. You will get the results of the monitoring a few days later.

### **What can the test show?**

A 24-hour ECG recording can give a lot of useful information. In particular it may show a fast or slow heart rhythm that may need treatment. It can also reassure you if you think you have palpitations but are in fact just 'over-aware' of your normal heartbeat.

## Cardiac event recorders

If you have symptoms that do not happen frequently, your doctor may suggest that you use a cardiac event recorder, to record the heart's activity over a longer period of time. These recorders are not available for everyone. They are mostly used for people who have abnormal heart rhythms that are hard to diagnose.

There are several different types of event recorders that are used to make an ECG recording of the activity of your heart at particular times. Some are portable devices that you hold to your chest (portable event recorders). There is also a device called an implantable loop recorder which can be implanted under the skin.

### Portable event recorder

If you have infrequent episodes of palpitations – say, less than once a week – you may be given a small electrical recording device to keep with you. Then, the next time you have the palpitations, you just need to place the device on your chest and press a button on it so that it can record an ECG during your symptoms. You can then send the recording to the technicians in the hospital, by holding the device to the mouthpiece of your

phone. The technician or doctor can receive the recording through their phone and then analyse the ECG. If there is no significant abnormality, they will be able to reassure you. Or, if there is an abnormal rhythm, they can tell you if it needs to be followed up.

## Implantable loop recorder

*Also known as **ILR**.*

The implantable loop recorder (ILR) is a device for finding out what is causing symptoms that don't happen very often, such as dizzy spells or blackouts. Doctors may use an ILR if 24-hour ECG recordings have failed to reveal an underlying problem.

The ILR is a small, slim device, about 6 centimetres (cm) by 2cm by 0.8cm (2 inches by 1 inch by  $\frac{1}{3}$  inch). Putting the ILR in is a very simple and quick procedure. You will have a local anaesthetic on the front of your chest and the device is put just under your skin. The ILR continuously monitors your heartbeat for up to 14 months, and can record any abnormal events that it is programmed to detect. When you get your typical symptoms such as dizziness or a blackout, you (or a family member or friend) can activate a recording of the period

before, during and after the symptoms started, by holding a small hand-held device over the ILR and pressing the button. Later, the doctor analyses the stored information, and this may help him or her to diagnose the problem and to decide on any treatment you may need.

The ILR helps doctors to diagnose whether blackouts are due to very fast or very slow heart rhythms.

## Chest X-ray

Your doctor may ask you to have a chest X-ray. If you are pregnant, make sure you tell your doctor or radiographer as they may suggest that you avoid having a chest X-ray early on in your pregnancy.

### What happens?

To have a chest X-ray, most people usually stand with their chest pressed to a photographic plate, with their hands on hips and elbows pointing outwards. The radiographer will ask you to stay still and to take a deep breath and hold it. While you are doing this, he or she will switch the equipment on which sends a beam of X-rays from the X-ray source to the photographic plate. (Holding your breath improves the quality of the X-ray image.) They may want to take X-rays from several different angles. The radiographer will ask you to wait until he or she checks the images and makes sure that there are pictures of the whole chest.

Having an X-ray is painless. The main discomfort may be because the recording plate is cold.

### What the test can tell

A chest X-ray allows doctors to examine the heart, lungs and chest wall. If you have symptoms such

as shortness of breath, a chest X-ray can help doctors find out whether it is caused by a heart or lung condition, or whether it might be caused by something else. If the doctor thinks you might have a heart condition, he or she will probably arrange for you to have other tests.

## 24-hour blood pressure recording

Also known as **ambulatory blood pressure monitoring**.

Your doctor may want to record your blood pressure at regular intervals over a 24-hour period. This can be done by using a special recording device.

### What happens?

On a belt around your waist, you wear a portable recorder, which looks similar to a personal stereo. This is attached, through tubes under your clothes, to a cuff which is wrapped around your arm. You carry on with your normal daily activities and, every hour or so, the cuff automatically inflates and measures your blood pressure. The recorder keeps a record of each blood pressure measurement and the time that it was taken. The next day, when you go back to hospital, the device is taken off. It then prints out a record of all the blood pressure measurements made during the previous 24 hours.

## What can the test show?

This test can give an overview of all the blood pressure readings throughout the 24 hours. It is particularly useful if your doctor thinks that your blood pressure is unusually high when you have it measured in the surgery or at hospital appointments.

## Echocardiogram

This test is safe and easy and doesn't hurt.

Bats can fly in the dark by sending out pulses of sound and listening for echoes reflected from objects around them. A similar idea is used when you have an echocardiogram.

### What happens?

A recorder (probe) is placed on your chest and a pulse of high-frequency sound is passed through the skin of your chest. Lubricating jelly is rubbed on your chest first, to help make a good contact with the probe. The probe then picks up the echoes reflected from various parts of the heart and shows them as an echocardiogram – a picture on a screen. You can see different parts of the heart as the probe is moved around on your chest. Recording these images is a skilful job and can take up to an hour.

### What can the test show?

The echocardiogram can give accurate information about the pumping action of the heart, and about the structure of the heart and its valves. It is a useful test if you have recently had a heart attack or if you have heart failure. It is also used routinely to

assess people with valvular heart disease (disease of the heart valves). It is especially useful for diagnosing heart disease in newborn babies and infants, because it doesn't hurt and it is easy to do. It usually avoids the need for the child to have more complicated, and possibly more traumatic, tests. Echocardiograms are also used to diagnose certain heart defects before a child is born (foetal echocardiograms).

## Other forms of echocardiography

### Transoesophageal echocardiography

With this procedure, detailed pictures of the heart are taken from the gullet (oesophagus) which lies behind the heart. You 'swallow' a small probe which is mounted at the end of a flexible tube. To help you, an anaesthetic will be sprayed on the back of your throat. While the probe is in your gullet it takes 'pictures' of your heart. The pictures are taken quite quickly and the tube and probe are then gently withdrawn. You may have a light sedative first, just to help you relax.

This test is particularly useful when doctors need a closer and more defined image of the heart valves and the areas around them.

## **Stress echocardiogram**

Occasionally, an echocardiogram is done after the heart has been put under stress – either with exercise or with a drug. This test can help to diagnose coronary heart disease. If parts of the heart are damaged, they will contract less effectively and this shows up on the echocardiogram. This test is useful if the results of other tests are not clear, and in some hospitals it is used instead of radionuclide tests (see page 26).

## **IVUS**

IVUS stands for ‘intravascular ultrasound’. This is a technique for taking ultrasound pictures of the wall of an artery from inside the artery itself. It shows the thickness of the artery wall and any narrowings of the artery.

The pictures are taken using a fine ultrasound probe attached to the tip of the same type of catheter used for doing a coronary angiogram (see page 35). The catheter is passed into an artery in the groin, in the same way as for the angiogram (see page 37). The probe works in the same way as the probe used for doing an echocardiogram (see page 22). The pictures of the arteries are displayed on a television screen.

IVUS pictures are usually taken at the same time as doing a coronary angiogram (see page 35). Taking IVUS pictures does not widen any narrowed parts of the arteries; it just provides pictures of any narrowings which may be there.

## Radionuclide tests

Medical staff may use the following names when telling you about radionuclide tests. **Radioisotope scan, myocardial perfusion scan (MPS), SPECT** (single photon emission computed tomography), **technetium scan, thallium scan, MIBI scan, or MUGA scan** (multiple-gated acquisition scan).

Radionuclide tests are used for investigating coronary heart disease. They are less common than electrocardiograms or echocardiograms.

### What happens?

A doctor will inject a small amount of radioactive substance (isotope) into the blood, often while you are exercising on an exercise bike or treadmill (a running machine). You may be given a drug which stimulates your heart to beat faster and harder. This is particularly useful if you cannot do much exercise.

A large 'camera', positioned close to the chest, picks up the gamma rays sent out by the isotope as it passes through the heart. The camera can take different types of pictures of the heart depending on what sort of isotope is used. Different isotopes are used for different tests. These include

technetium, tetrofosmin and thallium. In all these tests you get only a small dose of radioactivity.

### What can the test show?

Depending on what sort of isotope is used, the camera can take pictures to:

- look at how strongly your heart pumps (usually a MUGA scan)
- look at the flow of blood to the muscular walls of the heart, or
- help diagnose coronary heart disease (usually a technetium or thallium scan).

Radionuclide tests give more detailed information than the exercise ECG test.

Radionuclide tests are safe and can give a lot of information about your heart, but only some hospitals in the UK have the equipment and skilled staff to carry them out.

## **PET (positron emission tomography) scan**

PET stands for 'positron emission tomography'. This test involves having an injection of a small amount of radioactive material and then lying on a couch under a scanning device. You may need to lie still for up to two and a half hours. This test allows doctors to examine the flow of blood and see how your heart muscle is working. PET scans are useful in people who have complicated medical problems and who are being considered for surgery or angioplasty.

## Electrophysiological testing

Electrophysiological testing has revolutionised the way we understand and treat fast, abnormal heart rhythms. However, at the moment it is only available at specialist hospitals.

### What happens?

A doctor will place flexible tubes, called electrodes or catheters, into a vein, usually in the groin, but sometimes in the arm or neck or under the collarbone. They are then gently moved into position in the heart, where they stimulate the heart and record its electrical activity. This may make you feel as if you are having palpitations.

Before having this test, most people need only a local anaesthetic (an injection which numbs the area where the catheters are put in). Afterwards the catheters are taken out and the nurse or doctor will press on the punctured area for about 15 minutes to make sure there is no bleeding. You will be asked to lie quietly for a few hours. The doctor will talk to you about the results. You may need to stay in hospital overnight, but you can get back to your normal activities in a few days.

## What can the test show?

Continuous monitoring with an ECG during electrophysiological testing helps to diagnose abnormal heart rhythms and identify which area of the heart is affected. It can also show whether the abnormal rhythm is being controlled effectively with certain medicines. In some cases this test can identify the abnormal heart rhythm that is causing the palpitation and this can be stopped by an external pacemaker (a device which helps restore a normal heart rate).

If the doctors find the cause of your abnormal heart rhythm, they may be able to treat the problem at the same time as the test, using radio-frequency electrical energy to destroy the areas inside the heart which are causing the abnormal rhythm. This treatment is called 'radio frequency ablation'.

## Is there any risk?

This procedure does involve some risks. In very rare cases the atrio-ventricular node (the heart's natural 'electrical wiring system') may be accidentally damaged. If this happens, the person may need to have an artificial pacemaker fitted. There may also be damage to the blood vessels, causing some loss of blood.

## Magnetic Resonance Imaging (MRI)

Also known as an **MRI scan**.

Magnetic Resonance Imaging (MRI) is a technique which produces extremely detailed pictures of your internal organs. MRI is only available in a few specialised units in the UK. Researchers are trying to find out which patients could benefit most from this new technology. MRI is not suitable if you have a pacemaker, because it can interfere with the way the pacemaker works.

### What happens?

An MRI is not uncomfortable. You lie in a short 'tunnel', around which there is a large magnet. Short bursts of magnetic fields and radio waves from the MRI scanner allow images to be created, processed and analysed. You must lie still while the scan is done. The whole test takes about an hour.

### What can the test show?

MRI is very good at showing the structure of your heart and blood vessels. It can also measure the flow of blood through the heart and some of the major arteries. It can show where the heart is working abnormally in disorders such as

cardiomyopathy (a disease of the muscle of the heart) and coronary heart disease. And it can identify defects in the structure of the heart.

## Cardiac enzyme tests

Cardiac enzyme tests can tell whether or not you have had damage to the heart muscle. The most common cause of this damage is a heart attack.

Enzymes are proteins that help with chemical actions in the body. When the heart muscle is damaged after a heart attack, it releases certain enzymes into the blood. These enzymes are normally already in the blood but at a low level. The more severely the heart is damaged during a heart attack, the more enzymes are released and the higher the levels of enzymes in the blood will be. The levels can be measured from a series of blood samples taken over a few days.

The most commonly measured enzymes are called CPK and CKMB. The levels of these enzymes reach a peak between 12 and 24 hours after a heart attack. However, often it is not possible to say for sure whether there has been a heart attack until the enzyme levels have been measured for several days. Other enzymes can also be measured in this way.

Another test measures the level of troponins in the blood. Troponins are another type of protein. They are normally found in the heart muscle but not in

the blood. If the heart is damaged – for example, by a heart attack – troponins leak into the blood where they can be detected, within 12 hours, by a simple blood test. Troponin tests can tell whether or not a heart attack is taking place, and they are now often used instead of cardiac enzyme tests. Often if you are admitted to hospital with chest pains, the troponin test can help doctors to decide whether you have had a heart attack.

## Coronary angiogram

Also known as **cardiac catheterisation** or a **catheter test**.

The tests described on pages 6 to 34 can give a lot of valuable information about the heart. However, sometimes it is not possible to make important decisions about a patient's treatment unless a test called a 'coronary angiogram' is done. This is especially true if you have angina and your doctor wants to find out if a further procedure such as coronary angioplasty or coronary bypass surgery will help you.

### What can the test show?

A coronary angiogram gives vital information about the blood pressure inside your heart, and how well the pumping chambers and valves are working. Most importantly, it can also show where any narrowings in the coronary arteries are and how severe they are.

### What happens?

The test is done in an X-ray room and takes between 20 minutes and an hour. A team of people – including a doctor, nurse, technician, and radiographer – does this test. The test is done as a

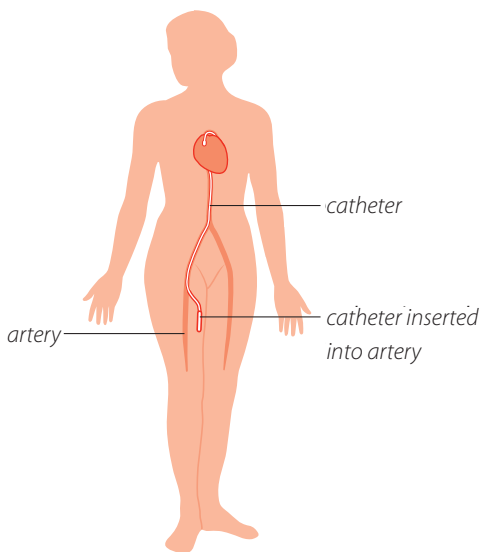
day case. Or, you may have an angiogram if you have been admitted to hospital with chest pain that has been diagnosed as unstable angina or a heart attack.

A catheter is a long, flexible, hollow plastic tube, about the width of the lead in a pencil. It is passed into a vein or artery either in the groin or, less commonly, the arm. You will have a local anaesthetic to numb the area where the catheter is put in, so it should not be painful.

The catheter is put in the artery through a special fine tube called a sheath. The sheath can be put into the artery in your groin or your arm. The operator then uses X-ray screening to help direct the catheter through the blood vessels and into the correct position in the heart. You will not feel the catheter moving around inside your chest, but you may be aware of the occasional 'missed' heartbeat or 'extra' beat. You can watch the procedure on the video screen if you want to.

While you are having the angiogram, you will be linked to an ECG recorder which records your heart rate and rhythm. This will be checked continuously. The blood pressure at the tip of the catheter will also be checked.

X-ray films are taken by putting a dye down the catheter and taking a series of pictures. The dye sometimes causes a hot, flushing sensation which lasts a few seconds. You will be warned when to expect this. You may notice a warm feeling in your



### **Coronary angiogram**

groin and may think you have wet yourself, even though you have not. People occasionally feel a short, mild angina pain during the test. This does not necessarily mean anything is going wrong, but you should tell the doctor about the pain.

When the test is over, the catheter is removed. If the catheter was inserted in your groin, a nurse or doctor will either press on your groin for at least 10 minutes or put in a plug called an angioseal, in order to stop any bleeding. If the sheath was put into your arm, a tight dressing will be applied there for two or three hours. Some people feel a bit 'washed out' for a few hours after the test. A nurse will examine your groin or arm several times after the test, to check for any possible bleeding.

The place where the catheter was inserted will be tender for a few days. Most people get back to normal after a day or two, but this varies from one person to another.

### **Is there any risk?**

The first doctor to perform a coronary angiogram did it on himself. Since then, many hundreds of thousands of these tests have been done.

It is very rare for anyone to have a reaction to the

dye, apart from the brief hot, flushing sensation it can cause, as described above. The staff are well prepared to deal with a reaction if there is one.

Sometimes there may be a small amount of bleeding when the catheter is removed, and a small lump may form around the area. This should go down after a few days, but if you have any concerns, contact your doctor. A common after-effect is for a bruise to form in the groin or arm. This is not serious, but it may be inconvenient for a few days.

Serious complications are very rare, but it would be wrong to give the impression that investigations such as this can be carried out on patients, some of whom may have serious heart disease, without any risk at all. A coronary angiogram is a relatively safe test. The risk of having a serious complication during the test – such as a heart attack, stroke or death – is estimated at about 1 or 2 in every 1,000 people. However, the level of risk varies depending on your overall health and your individual heart condition. So, your doctor will not recommend that you have a coronary angiogram unless he or she feels that the benefits outweigh this small risk. You will be asked to sign a consent form before having the angiogram. You should discuss the benefits

and possible risks of having this test, and any other worries, with your doctor before you sign the form.

### **Coronary angiograms for children**

Angiograms can be carried out on children and even on newborn babies. Some sedation, or a general anaesthetic (in which the child is completely asleep), will be needed.

### **Catheter treatments**

Your cardiologist will usually speak to you about the results of your angiogram. The cardiac catheterisation technique used for doing the angiogram can be used for certain forms of treatment too, such as coronary angioplasty. For more information see our booklet *Coronary angioplasty and coronary bypass surgery*.

## What next?

Depending on the results of your tests, you may be advised to take medicines, to have 'angioplasty with a stent', or to have heart surgery. You will be able to discuss this with your cardiologist or doctor.

If it is the first time you have been diagnosed with coronary heart disease, it may come as a shock to you. Or, you might suddenly be faced with the prospect of major heart surgery. Sometimes it takes a long time for the news to sink in. At times you may feel afraid, angry or depressed. It is natural to feel anxious about what the news means for you, your family life and your work.

Information can be a great help. It's important to ask questions and to make sure you get explanations in language you understand. When you go to see your doctor or cardiologist you may find it helpful to take in a list of questions you want to ask. It may help if someone goes with you so that they can make a note of what your doctor tells you. If an answer isn't clear, it's OK to say: "I don't understand that. Could you explain it again please?" Before you leave, make sure that you know the answers to all your questions. Ask what you can do if you think of any more

questions afterwards. Is there a doctor or nurse you could phone?

See also *For more information* on page 44.

*For your own notes:*

## For more information

### British Heart Foundation website

**bhf.org.uk**

For up-to-date information on the BHF and its services.

### Heart Information Line 08450 70 80 70

A helpline service for the public and health professionals, providing information on a wide range of issues relating to heart conditions.

### Publications and videos

The British Heart Foundation produces a range of publications and videos. You can order these through our website. The address is **bhf.org.uk**

For a complete publications list and order form, please contact:

British Heart Foundation

PO Box 138

Northampton NN3 6WB.

Phone: 01604 640016

E-mail: [ds-bhf@mail.dataforce.co.uk](mailto:ds-bhf@mail.dataforce.co.uk)

Our publications are free of charge, but we would welcome a donation.

## Heart Information Series

This booklet is one of the booklets in the *Heart Information Series*. The other titles in the series are as follows.

- 1 Physical activity and your heart
- 2 Smoking and your heart
- 3 Reducing your blood cholesterol
- 4 Blood pressure
- 5 Eating for your heart
- 6 Angina
- 7 Heart attack and rehabilitation
- 8 Living with heart failure
- 9 Tests for heart conditions
- 10 Coronary angioplasty and coronary bypass surgery
- 11 Valvular heart disease
- 12 Having heart surgery
- 13 Heart transplantation
- 14 Palpitations
- 15 Pacemakers
- 16 Peripheral arterial disease
- 17 Medicines for the heart
- 18 The heart – technical terms explained
- 19 Implantable cardioverter defibrillators (ICDs)
- 20 Caring for someone with a heart problem

## *Heart health magazine*

*Heart health* is a free magazine, produced by the British Heart Foundation especially for people with heart conditions. The magazine, which comes out four times a year, includes updates on treatment, medicines and research and looks at issues related to living with heart conditions, like healthy eating and physical activity. It also features articles on topics such as travel, insurance and benefits. To subscribe to this **free** magazine, call **01604 640 016**.

## **Heartstart UK**

For information about a free, two-hour course in emergency life-support skills, contact Heartstart UK at the British Heart Foundation. The course teaches you to:

- recognise the warning signs of a heart attack
- help someone who is choking or bleeding
- deal with someone who is unconscious
- know what to do if someone collapses, and
- perform cardiopulmonary resuscitation (CPR) if someone has stopped breathing and his or her heart has stopped beating.

## Heart support groups

You may find it helpful to join a ‘heart support group’. A heart support group gives you, your partner and family the chance to meet and talk to people who have gone through similar experiences. Groups vary. They may meet once a week, once a fortnight or once a month. Some hold exercise classes or invite speakers to talk on medical as well as general topics. To find out where your nearest heart support group is call the British Heart Foundation on 020 7487 7110.

### For more information on statistics quoted in this booklet

Statement	Where you can find out more about this
<p><b>Page 39</b> The risk of having a serious complication during the [coronary angiogram] test – such as a heart attack, stroke or death – is estimated at about 1 or 2 in every 1,000 people.</p>	<p>From: ‘American College of Cardiology/Society for Cardiac Angiography and Interventions Clinical Expert Consensus Document on Cardiac Catheterization Laboratory Standards’, by TM Bashore et al. Published in 2001, in the <i>Journal of the American College of Cardiology</i>, volume 37, 8, pages 2170-2214.</p>

## About the British Heart Foundation

The British Heart Foundation (BHF) is the leading national charity fighting heart and circulatory disease – the UK's biggest killer. The BHF funds research, education and life-saving equipment, and helps heart patients return to a full and active way of life.

We rely on donations to continue our vital work. If you would like to make a donation, please ring our **credit card hotline on 0870 606 3399**. Or fill in the form opposite.





**Please send me information about the following.**

- BHF publications**
- Giving regular donations**  
*Regular donations through a standing order give us the long-term support we need. Just tick for information on how to set up a standing order.*
- Remembering us in your Will**  
*Many people choose to leave a gift to their favourite charities in their Will. We can send you a useful information pack to tell you how to go about it.*
- Local fundraising activities and sponsored events**
- Payroll giving**  
*How you and your work colleagues can donate from your salaries before tax.*
- Buying BHF Christmas cards and gifts**
- Becoming a volunteer in a British Heart Foundation shop**

**Please send your form to the British Heart Foundation. The address is over the page.**

## Technical terms

<b>ambulatory blood pressure monitoring</b>	Recording blood pressure at regular intervals over a 24-hour period, while you carry on with your everyday activities
<b>angiogram</b>	See 'coronary angiogram'.
<b>angiography</b>	See 'coronary angiography'.
<b>arteries</b>	Vessels which carry blood from the heart to other parts of the body.
<b>atheroma</b>	Fatty material that can build up within the walls of the arteries.
<b>cardiac</b>	To do with the heart.
<b>cardiac catheterisation</b>	A test to find out about the condition of the heart.
<b>cardiologist</b>	A doctor specialising in heart disease.
<b>catheterisation</b>	See 'cardiac catheterisation'.
<b>coronary angiogram</b>	A picture which shows where the coronary arteries are narrowed and how narrow they have become.
<b>coronary angiography</b>	A test to show where the coronary arteries are narrowed and how narrow they have become.
<b>coronary heart disease</b>	When atheroma builds up in the inside walls of the coronary arteries.
<b>ECG</b>	See 'electrocardiogram'.

<b>echocardiogram</b>	An ultrasound picture of the heart which shows the structure of the heart and how it is working.
<b>electrocardiogram</b>	A test to record the rhythm and electrical activity of the heart. Also called an ECG.
<b>electrophysiological testing</b>	A technique for detecting and giving information about abnormal heart rhythms.
<b>enzymes</b>	Proteins that help stimulate chemical actions in the body.
<b>event recorder</b>	A device which can be activated to record the heart's rhythm and electrical activity.
<b>exercise ECG</b>	See 'exercise electrocardiogram'.
<b>exercise electrocardiogram</b>	A test to record the rhythm and electrical activity of the heart, carried out while the person is taking exercise.
<b>Holter monitoring</b>	A 24-hour recording of an electrocardiogram (ECG).
<b>implantable loop recorder</b>	A recording device used for finding out about the cause of infrequent symptoms such as dizzy spells or blackouts.
<b>intravascular ultrasound</b>	A technique for taking ultrasound pictures of the wall of an artery, from inside the artery itself. Also called IVUS.
<b>IVUS</b>	See 'intravascular ultrasound'.

<b>Magnetic Resonance Imaging</b>	A technique which produces detailed pictures of internal organs of the body by exposing them to a strong magnetic field. Also called MRI.
<b>MRI</b>	See 'Magnetic Resonance Imaging'.
<b>PET scan</b>	A test to examine the flow of blood and see how the heart muscle is working. PET stands for positron emission tomography.
<b>radionuclide test</b>	A test which provides pictures of the heart.
<b>stress echocardiogram</b>	An echocardiogram which is done after the heart has been put under stress – either with exercise or with a drug.
<b>technetium scan</b>	A type of radionuclide test.
<b>thallium scan</b>	A type of radionuclide test.
<b>transoesophageal</b>	Across the oesophagus (gullet).



## Index

24-hour blood pressure recording .....	20
24-hour ECG recording .....	12
ambulatory blood pressure monitoring .....	20
ambulatory ECG monitoring .....	12
angiogram .....	35
angiography .....	35
blood pressure recording .....	20
cardiac catheterisation .....	35
cardiac enzyme tests .....	33
cardiac event recorder .....	15
catheter test .....	35
catheter treatment .....	40
chest X-ray .....	18
children .....	23,41
coronary angiogram .....	35
ECG .....	6
echocardiogram .....	22
electrocardiogram .....	6
electrophysiological testing .....	29
enzymes .....	33
event recorders .....	15
exercise ECG .....	8
exercise electrocardiogram .....	8
exercise electrocardiography .....	8
exercise stress testing .....	8
exercise treadmill test .....	8
foetal echocardiogram .....	23
Holter monitoring .....	12
ILR .....	16
implantable loop recorder .....	16
intravascular ultrasound .....	24

IVUS .....	24
Magnetic Resonance Imaging .....	31
MIBI scan .....	26
MPS .....	26
MRI .....	31
MUGA scan .....	26
myocardial perfusion scan .....	26
negative exercise ECG .....	11
PET scan.....	28
portable event recorders.....	15
positive exercise ECG .....	11
radio frequency ablation.....	30
radioisotope scan.....	26
radionuclide tests .....	26
SPECT .....	26
stress echocardiogram.....	24
technetium.....	26
tetrofosmin.....	27
thallium .....	26
transoesophageal echocardiography .....	23
troponins.....	33
X-ray (chest X-ray) .....	18

## Your comments please

We would be very interested to hear your views about this booklet.  
Please fill in this form and send it to:

### British Heart Foundation

FREEPOST WD513

14 Fitzhardinge Street

London W1E 1JZ.

#### 1 How did you get this booklet?

I got it directly from the British Heart Foundation.

My GP or practice nurse gave it to me.

I got it from a display at my GP's surgery or health centre.

A nurse or doctor at the hospital gave it to me.

I got it from a display in a hospital.

A friend or relative gave it to me.

Other (Please give details.) \_\_\_\_\_

#### 2 Do you find this booklet...

very helpful?

helpful?

not very helpful?

not at all helpful?

#### 3 Do you find this booklet ...

very easy to understand?

easy to understand?

not very easy to understand?

#### 4 What do you think of the design of the booklet (how it looks, the size of the text, the front cover, the size)?

Very good

Good

Not very good

Poor



5 Are there any issues that you need to know about that are not covered in this booklet? If so, what are they?

---

---

---

---

---

---

---

---

---

6 Do you have any other suggestions for how we could improve this booklet?

---

---

---

---

---

---

---

---

---

## **Acknowledgements**

The British Heart Foundation would like to thank all the GPs, cardiologists and nurses who helped to develop the booklets in the *Heart Information Series* and to all the patients who commented on the text and design.

Particular thanks for his work on this booklet are due to Dr Nick Curzen

Edited by Wordworks.





*Heart health* is a free magazine produced by the British Heart Foundation especially for people with heart conditions. See page 46 for more information.

### **British Heart Foundation**

14 Fitzhardinge Street, London W1H 6DH

**Phone:** 020 7935 0185

**Website:** [bhf.org.uk](http://bhf.org.uk)

### **Heart Information Line • 08450 70 80 70**

*(A local rate number.)*

A helpline service for the public and health professionals, providing information on a wide range of issues relating to heart conditions.