

Patient information from the BMJ Group

Heart failure

In this section

[What is it?](#)

[What are the symptoms?](#)

[How is it diagnosed?](#)

[How common is it?](#)

[What treatments work?](#)

[What will happen?](#)

[Questions to ask](#)

Heart failure

Heart failure is serious, but it can be treated. Many people live with it for years.

We've brought together the best research about heart failure and weighed up the evidence about how to treat it. You can use our information to talk to your doctor and decide which treatments are best for you.

What is heart failure?

Heart failure means your heart isn't pumping blood around your body as well as it should. It doesn't mean that your heart is about to stop working. But it does mean that it's not doing its job properly.

If you've been diagnosed with heart failure, you may be worried about how it will affect your life. Heart failure is serious, but it can be treated. And lots of people live with it for many years.

Key points for people with heart failure



Lots of people live with heart failure for years.

- Heart failure is usually caused by an illness that damages your heart, such as a heart attack.

Heart failure

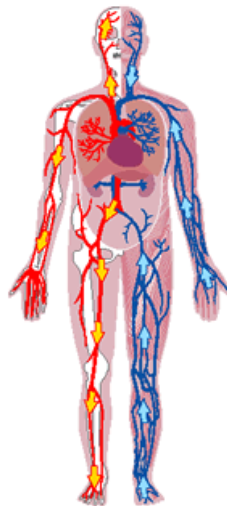
- You get symptoms of heart failure because your heart isn't pumping blood around your body as well as it used to.
- You may feel breathless and tired, even if you don't do very much. You may also cough up frothy pink phlegm and have swollen ankles.
- Treatments for heart failure work well. Drugs called diuretics are one of the main treatments. They help your body get rid of excess fluid.
- Taking some exercise can also help your heart work better. It doesn't have to be strenuous. Walking every day can make a difference.
- If you are having side effects from your tablets, don't just stop taking them. If you don't take your tablets, your heart failure may get suddenly worse and you may need to go to hospital. Talk to your doctor if you want to stop or change your tablets.

Your heart and what it does

The symptoms of heart failure make more sense when you understand how your heart works and how it tries to cope when things go wrong. If you understand why you have symptoms and can tell when they are getting worse, you may stay well longer and avoid having to go to hospital.

Your heart sits in the middle of your chest, under your breastbone. It's a muscle about the size of a fist. Unlike the muscles in your arms and legs, your heart works automatically. You don't have to think about making it beat.

Your heart works like a pump. Every time it beats, it pushes blood around your body. Blood carries oxygen and nutrients, such as sugar, to your cells. The cells in your body will die if they don't get a constant supply of oxygen and nutrients.



Arteries (shown in red) carry blood away from your heart. Veins (in blue) take blood back to your heart.

Heart failure

Two main types of blood vessel work together to carry blood through your body: **veins** and **arteries**.

Veins carry blood back from around your body to your heart. From here, the blood is pumped to your lungs to pick up more oxygen, then back to your heart.

Arteries then carry this blood, with its fresh supply of oxygen, around your body.

To read more, see [What does my heart do?](#)

What goes wrong when you have heart failure?

You get heart failure when your heart can't pump blood around your body properly. This usually happens because your heart has been damaged.

Your heart tries to make up for the damage by:

- Getting bigger, so it can pump more blood each time it beats
- Beating faster
- Getting stronger. If some of your heart muscle has been damaged by a heart attack or another illness, the healthy parts of your heart muscle get stronger.

But your heart can't keep making up for the damage forever. When it stops being able to pump properly, you start to get symptoms of heart failure. ^[1]

Because your body isn't getting as much blood as it used to, it responds as if there's too little blood being pumped round your blood vessels. Your kidneys try to make up for this by increasing the amount of fluid in your blood. They do this by making your body hold on to water and salt. This is called **fluid retention**.

Some of the problems you get with heart failure are because of this extra water in your blood. And some are caused by your body not getting the oxygen and nutrients it needs.

To read more, see [What are the symptoms of heart failure?](#)

Types of heart failure

The symptoms you get can depend on which part of your heart has been damaged. (When we talk about the left or right side of your heart, we mean **your** left and **your** right.)

If you have **left-sided heart failure**, the lower left chamber of your heart (the **left ventricle**) isn't working properly. Your heart can't pump enough blood around your body. And because your heart isn't pumping well enough, blood can get backed up in your lungs. Fluid in your blood seeps from your blood vessels and collects in your lungs. This makes you short of breath.

Heart failure

If you have **right-sided heart failure**, the lower right chamber of your heart (the **right ventricle**) isn't working properly. This means that not enough blood is pumped to your lungs. And blood coming back to your heart from your lungs can build up in your veins. This can make the veins in your neck swollen. The veins in your legs can also swell up, and fluid can leak out of your veins and into your tissues. This fluid collects in your legs, ankles, and feet, and in the organs in your body. All this fluid may make you feel puffed up.

It's possible to have both left- and right-sided heart failure. This is also called **biventricular heart failure**, and is quite common. Biventricular heart failure means that both the left ventricle and the right ventricle are not working properly.

If you get a build-up of fluid, your heart failure is called **congestive heart failure**. You can have congestive heart failure if you have a problem with the right or left side of your heart.

You may also hear doctors describe your heart failure as **systolic** or **diastolic**.

- **Systolic heart failure** means your heart can't pump hard enough. **Systole** is the part of the heartbeat when blood is being pumped out of your heart.
- **Diastolic heart failure** means your heart can't relax enough to allow its chambers to fill up with blood. It pumps without having enough blood in it. **Diastole** is the part of the heartbeat when your heart relaxes between beats.
- It's possible to have both systolic and diastolic heart failure.

Heart failure: why me?

Heart failure is usually caused by an illness that damages your heart. You might have had a heart attack or have high blood pressure.

The most common conditions that lead to heart failure are listed below. Having one of these conditions won't definitely lead to heart failure, but it does increase the risk. It's important to get these conditions treated, as this can reduce your chances of getting heart failure.

- [Coronary artery disease](#) : This causes the arteries that supply your heart with blood to get clogged with fatty deposits. Coronary artery disease is the most common cause of heart failure. **High cholesterol** and smoking can both clog your arteries.
- [High blood pressure](#) : If your arteries are clogged by fatty deposits, your heart has to work harder to pump blood through them.
- [Heart valve disease](#) : If the valves in your heart are damaged, some of the blood leaks backwards instead of being pumped forwards round your body.

Heart failure

- [Abnormal heart rhythms](#) : Sometimes your heart may beat irregularly or beat faster than normal.
- [Heart muscle diseases](#) : If your heart muscle is damaged, it stops pumping as well as it should.

Sometimes doctors can't tell what's caused the damage to your heart. This is the case for about 1 in 7 people with heart failure. ^[2]

How heart failure is classified

Doctors use a scoring system called the New York Heart Association Functional Classification (also called NYHA classification) to find out how much your heart failure affects your life. People with heart failure fall into one of four categories.

If you have heart failure and can walk up one flight of stairs without feeling short of breath, or walk a short distance up a mild-to-moderate slope, you have **class I heart failure**. If either of these activities makes you feel tired or breathless, you have **class II heart failure**.

If walking from the kitchen to the living room makes you feel out of breath or tired, you have **class III heart failure**. If you get symptoms when you are resting or not doing much (getting out of a chair, for example), then you have **class IV heart failure**.

Category	Definition
Class I	No limitation of physical activity. Ordinary activity doesn't cause undue fatigue or breathlessness.
Class II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue or breathlessness.
Class III	Marked limitation of physical activity. Comfortable at rest, but less-than-ordinary activity causes fatigue or breathlessness.
Class IV	Unable to carry out any physical activity without symptoms. Symptoms are present even at rest. If any physical activity is undertaken, symptoms are increased.

What are the symptoms of heart failure?

Lots of the symptoms of heart failure are similar to the symptoms of other illnesses, so heart failure can be difficult to diagnose. ^[21] Feeling short of breath, for example, can be caused by more than 30 different conditions. ^[22]

Common symptoms

The most common symptoms of heart failure are listed below. ^[21] ^[22] ^[3] You get these symptoms when your heart can no longer do its job properly. If you have these symptoms, talk to your doctor as soon as you can. To learn more, see [What is heart failure?](#)

Heart failure

Feeling breathless

You may find it difficult to catch your breath if you have heart failure. It's normal to gasp for breath after exercise, but if you have heart failure, you may feel breathless after everyday activities.

You're also likely to feel breathless when you're lying in bed.^[23] You may find yourself suddenly sitting up in bed and gasping for breath. You may feel as if you are suffocating and need to rush to the window to get some air. Lots of people with heart failure use pillows to prop themselves up at night to help them breathe more easily.

If you wake up suddenly feeling as if you are suffocating, it may be a sign that you have heart failure. If you know you have heart failure and you start waking up at night, it may be a sign that your treatment isn't working as well as it should. Talk to your doctor straight away.

And if you start to feel more and more short of breath, you should see your doctor straight away.

When you have heart failure, the left side of your heart may not be pumping as well as it should. If so, blood stays in the upper left chamber (the **left atrium**) instead of being pumped out around your body. When blood sits in this chamber, pressure builds up in the blood vessels behind it. The extra pressure causes fluid to leak from the vessels into your lungs. This causes shortness of breath.

Coughing up pink phlegm

If you have heart failure, you are likely to cough up pink, frothy phlegm. This doesn't mean that you have an infection or are losing lots of blood. It's a common symptom of heart failure.

It happens because fluid collects in your lungs. This fluid irritates your lungs. By coughing, your lungs try to get rid of the irritation. The fluid you cough up is pink because it has seeped out of your blood vessels.

Swelling in your ankles

Your feet, ankles, and legs may feel puffy and swollen. If you press a finger into your ankles, it may leave a mark that takes a while to go away. You may find that your shoes start feeling too tight and your feet feel uncomfortable. If this happens, it's a good idea to see your doctor.

Your doctor may call this type of swelling **oedema**.

It happens because your body stores extra fluid. Your heart isn't pumping as much blood through your blood vessels as usual. So your body tries to increase the amount of fluid in your blood vessels by holding on to extra fluid.

Heart failure

Your body makes a chemical called **angiotensin** that raises your **blood pressure** and tells your kidneys to store as much salt and water as they can. You may find that you pass less urine.

Because your heart can't pump properly, blood doesn't move around your body as well as it normally would. This causes the extra fluid to leak from your blood vessels. When you stand up or sit up, gravity makes the fluid collect in your ankles and feet.

Feeling tired

Heart failure can make you feel exhausted. You may find you struggle to do even simple things, such as walking up stairs or Hoovering.

Your heart isn't pumping blood around your body as well as it should. To protect itself, your body sends the blood it does get to the most important parts, such as your brain. This means your muscles don't get the food and oxygen they need, so they become weaker. They may even get smaller.

Other symptoms

Putting on weight or feeling bloated

This is caused by your body holding on to extra fluid. When you are treated for heart failure you should lose this weight as you get rid of the excess water in your body.

Your doctor may ask you to weigh yourself every day or every couple of days. This can be a good indication of how well your heart failure is being treated.

If extra fluid collects in and around your abdomen, you might feel bloated.

Losing weight

You may feel sick and lose your appetite if you have heart failure. This is caused by the excess water in your body. You may feel too full to eat. This can cause you to lose weight, especially if you have bad heart failure.

Even if you are eating normally you may notice that you lose weight. This is because your body can't digest your food as well as it normally would. And because your heart and lungs have to work harder when you have heart failure, your body burns more calories. This adds to the weight loss.

It's important to see your doctor if you are losing weight. You may need to take supplements to help your body get the nutrients it needs. ^[24]

How your symptoms affect your life

Your doctor may use a scoring system to find out how much your symptoms affect your life. ^[21] ^[22] To learn more, see [How heart failure is classified](#) .

Heart failure

Your symptoms may change from day to day.^[22] Sometimes they may be easy to cope with, and sometimes they may make your life very difficult. It's possible to have severe symptoms even when your heart failure isn't very bad.^[22]

Your doctor will probably want to see you regularly to make sure that treatment is working well for you. If any of your symptoms suddenly get much worse, let your doctor know straight away.

Feeling depressed

Sometimes people who find out they have heart failure feel depressed or anxious. This is a normal reaction to being told you have a serious illness, but you don't have to feel this way. Sometimes it helps to talk to other people who have heart failure.^[3] Your doctor may have information about local support groups.

To learn more about depression and how it can be treated, see [Depression in adults](#) .

How do doctors diagnose heart failure?

It can be difficult for doctors to tell for sure whether someone has heart failure, especially in people who are elderly or overweight. This is because the symptoms of heart failure are similar to the symptoms of many other illnesses.

Your doctor will probably start by talking to you about your symptoms. You may be asked how long you've had symptoms and how much they affect your life. Your doctor will probably want to know if you feel short of breath when you are sitting still and whether you have pain in your chest when you walk up a flight of stairs.^[21]

Checking how well your heart is working

Your doctor will listen to your heart and lungs, and you will need to have some tests.^[21]
^[3] You will need to go to hospital for some of your tests.

Electrocardiogram (ECG)

An **electrocardiogram** is often called an ECG for short. It measures the electrical activity in your heart and helps your doctor work out whether you have heart failure and what may be causing it.^[21] ^[3]

If your ECG shows something is wrong, your doctor will do extra tests to find out more. If your ECG is normal, you may still have heart failure, so you should also have further tests.^[22]

BNP test

BNP stands for **B-type natriuretic peptide**. It's a **hormone** made by your heart. If the amount of BNP in your blood is higher than normal, it's a sign that you could have heart failure.^[3] Doctors also use this test to see how bad your heart failure is.

Heart failure

If your BNP is very low, you can be pretty sure that you don't have heart failure and don't need further tests. ^[33]

Echocardiogram

An echocardiogram is sometimes called an 'echo' for short. It is an **ultrasound** of your heart. A doctor puts some jelly on your chest and then puts an ultrasound probe on the jelly. By moving the probe over your heart, the doctor can check how well it's pumping blood. This is one of the first tests you'll have if you've recently had a heart attack and your doctor suspects you have heart failure. You'll also have this test if you haven't had a heart attack but the level of BNP in your blood (see above) is higher than normal. ^[3]

Checking how bad your heart failure is

Your doctor will probably use a scoring system to rate your symptoms. This helps them decide whether your heart failure is mild (class I heart failure), severe (class IV), or somewhere in the middle (class II or III). To learn more, see [How heart failure is classified](#).

Your doctor may ask you questions from a test that has been designed to help doctors find out how much heart failure affects their patients' quality of life. If you want to read a version of this test, see the [Quality-of-life test](#). Your doctor may also measure how far you can walk in six minutes. To find out about this test, see the [Six-minute walk test](#).

Checking for other conditions

You may have blood tests to see how well your **liver** and **kidneys** are working and to test whether you have **diabetes** or **high cholesterol**. ^[3]

You may also have a chest **x-ray**. This takes a picture of your lungs and is used to check whether something other than heart failure is causing your symptoms. ^[3]

And you may be asked to blow into a **peak flow meter** or a spirometer to check for lung disease. ^[3]

The results of your tests will help your doctor be certain that your symptoms are caused by heart failure, not another illness. Your doctor may refer you to a specialist, especially if you have other illnesses or you are pregnant.

How common is heart failure?

If you've been told you have heart failure, you're not alone. About 900,000 people in the UK have heart failure. ^[3] Men are slightly more likely to be affected than women. ^[25] ^[26]

Heart failure is far more common among older people. ^[25]

- About 1 in 100 people under 65 have heart failure.
- But this number rises to about 7 in 100 among people aged 75 to 84.

What treatments work for heart failure?

The good news about heart failure is that there are treatments that work. There is a lot of research that shows that medicine can keep your symptoms under control and help you feel better and live longer. But there is no cure for heart failure.

Doctors sometimes describe heart failure as being either **systolic** or **diastolic**. (Systolic means your heart can't pump hard enough. Diastolic means your heart can't relax enough to allow its chambers to fill up with blood.) The treatments we look at here have mainly been studied in people with systolic heart failure.

There hasn't been much research on treatments for diastolic heart failure, although there has been some on drugs called [angiotensin II receptor blockers](#). To learn more, see [Treating diastolic heart failure](#).

To learn more about the different types of heart failure, see [What is heart failure?](#)

Key points about treating heart failure

- Drugs that help your body get rid of extra fluid (called diuretics) are one of the main treatments for heart failure.
- Drugs called ACE inhibitors and beta-blockers can help you stay out of hospital and may help you live longer.
- Your doctor may suggest that you take diuretics, ACE inhibitors, and beta-blockers.
- One of the main reasons that people with heart failure end up in hospital is because they stop taking their tablets or don't take them correctly. You shouldn't stop taking your medicine without talking to your doctor first.
- Taking a moderate amount of exercise can stop your heart failure getting worse and help keep you out of hospital. Talk to your doctor if you are not sure how much exercise to take.
- Getting support and advice from a health professional about the right food to eat and what exercise to take can help keep you out of hospital.
- If you have heart failure, you probably shouldn't take a group of painkillers known as **nonsteroidal anti-inflammatory drugs** (NSAIDs). They can make your heart failure worse. Ibuprofen is the most common NSAID. If you're not certain whether a drug is safe for you to take, ask your doctor or pharmacist.

Which treatments work best? We've carefully weighed up the research and divided the treatments into categories.

For help in deciding which treatment is best for you, see [How to use research to support your treatment decisions](#).

Treatment Group 1

Treatments for heart failure

Usual treatment

- [Diuretics](#) : Your doctor may prescribe a drug called a diuretic to help your body get rid of extra fluid. These drugs have been used to treat heart failure for a long time. Doctors have known for many years that diuretics help symptoms of heart failure, so not many studies have been done. Common diuretics are bendroflumethiazide (brand names are Aprinox and Neo-NaClex), bumetanide (Burinex), and furosemide (Lasix). [More...](#)

Treatments that work

- [ACE inhibitors](#) : These drugs block chemicals that are normally released by your body when you have heart failure. Examples of these drugs (followed by their brand names) are captopril (Capoten) and lisinopril (Zestril). [More...](#)
- [Angiotensin II receptor blockers](#) : These drugs block the effects of chemicals released by your body when you have heart failure. Examples of these drugs include candesartan (Amias), eprosartan (Teveten), and losartan (Cozaar). [More...](#)
- [Beta-blockers](#) : These drugs slow your heart rate, improve the beating of your heart, and stop the lower left chamber of your heart getting flabby. Examples of beta-blockers (with their brand names) include bisoprolol (Cardicor), and metoprolol (Lopressor SR). [More...](#)
- [Digoxin](#) : This drug makes your heart beat more strongly. It is also used to treat abnormal heart rhythms. [More...](#)
- [Being looked after by a team of health professionals](#) : Having a team of doctors and nurses to check on you may mean you're less likely to die of heart failure or need to go to hospital. [More...](#)
- [Having a pacemaker put in:](#) For some people with heart failure, the left and right sides of their heart don't work together as they should. An electrical device that's put in your chest called a pacemaker can help your heart beat properly. [More...](#)

Treatments that are likely to work

- [Aldosterone receptor antagonists](#) : These drugs make you produce more urine, and stop your body holding on to water and salt. Examples are spironolactone (brand name Aldactone) and eplerenone (Inspra). [More...](#)
- [Exercise](#) : It doesn't have to be strenuous. Moderate exercise is fine. [More...](#)

Heart failure

- [Having a defibrillator put in](#) : A small electrical device is implanted in your chest. It gives your heart an electric shock to stop it beating abnormally. [More...](#)
- [Hydralazine](#) : This drug is sometimes taken along with a nitrate drug for heart failure. The brand name is Apresoline. [More...](#)

Treatments that need further study

- [Amiodarone](#) : This drug is used to treat abnormal heart rhythms. Its brand name is Cordarone. [More...](#)
- [Anticoagulants](#) : These drugs make it less likely that a blood clot will form and block the flow of blood to the heart. One of the most common anticoagulants is warfarin. [More...](#)
- [Anti-platelet drugs](#) : These make the blood less sticky so that a blood clot is less likely to form and block blood vessels. Two common anti-platelet drugs are aspirin and clopidogrel (brand name Plavix). [More...](#)

Treatments that are likely to be ineffective or harmful

- [Anti-arrhythmic drugs \(other than amiodarone\)](#) : These drugs are used to treat abnormal heart rhythms. Examples are quinidine, procainamide, and disopyramide. [More...](#)
- [Calcium channel blockers](#) : These drugs stop calcium entering the cells of the heart muscle. This makes your heart beat less strongly. One example is amlodipine (brand name Istin). [More...](#)
- [Positive inotropic drugs \(other than digoxin\)](#) : These drugs make your heart beat more strongly. An example is milrinone. [More...](#)

Other treatments

We haven't looked at the research on this treatment in the same detail we have for most of the treatments we cover. (To read more, see Our method.) But we've included some information because you may have heard of it or be interested in it.

- [Heart surgery](#) : There are several types of surgery. The operation you have will depend on what's causing your heart failure. [More...](#)

What will happen to me?

If you've been told you have heart failure, you may wonder how it will affect your future. You may be worried that heart failure will shorten your life. Or you may prefer not to know about how it's going to affect you.

Heart failure

If you do want to find out what studies show about people with heart failure, read on. But remember that you are not a number. We can tell you what's likely to happen to someone with heart failure, but not what will happen to you. And bear in mind that many people with heart failure are treated successfully and live for many years.

Studies vary in their findings.^[3] Heart failure is a complicated illness and it's often difficult for doctors to predict what will happen to people who have it.

Things that may affect how well you do are your age, how bad your heart failure is, whether you have other health problems, how well your medicine works for you, whether you remember to take your tablets, and whether you make changes in your life that can help you, such as giving up smoking.^[27] ^[28] These things can affect how likely you are to need to go to hospital for treatment.^[29]

When doctors want to know how a condition like heart failure affects people in the long term or whether it shortens lives, they tend to look at how many people with that condition are still alive five years after they were diagnosed.

But we can't be sure how many people with heart failure have died five years after being diagnosed. This is because the figures from studies vary. In these studies, the number of people with heart failure who were still alive after five years ranged from one-quarter to three-quarters.^[12]

Here are some other figures from the research.

- The chance of dying from heart failure is higher if you have bad ([class IV](#)) heart failure.
- Up to half of all deaths from heart failure happen suddenly (within an hour of symptoms starting). The most common cause of death is a type of abnormal heart rhythm called **ventricular arrhythmia**. This causes one-quarter to one-half of all deaths.^[30]
- Women with heart failure tend to do slightly better than men.^[31]
- A study in the UK found that people of South Asian origin are likely to have heart failure at a younger age than white people.^[32] But even though they have heart failure earlier, they tend to live just as long as people who first get heart failure at an older age.

Feeling depressed

Sometimes people who find out they have heart failure feel depressed or anxious.^[3] This is a normal reaction to being told you have a serious illness, but you don't have to feel this way. Sometimes it helps to talk to other people who have heart failure. Your doctor may have information about local support groups.

Heart failure

To learn more about depression and how it can be treated, see [Depression in adults](#) .

Questions to ask your doctor

If you've been told you have heart failure, you may want to talk to your doctor to find out more.

Here are some questions that you might want to ask:

- Why did I get heart failure?
- Will I have a heart attack?
- Will I get better?
- What's the best treatment for me?
- Can I take [beta-blockers](#) ?
- Should I be on an [ACE inhibitor](#) ?
- Will I need to have treatment for the rest of my life?
- What are the side effects of treatment? How can I cope with them?
- Will I need surgery?
- Do I have to stop any activities, such as playing tennis or swimming?
- Can I still have sex?
- Should I change what I eat? If so, how? What should I avoid eating?
- Is it safe for me to drive?

If you smoke, you may want to ask your doctor:

- Will it help if I stop smoking?
- Where can I find someone who can help me stop smoking?
- What treatments are available to help me stop?
- Is there a local support group I can join to help me stop?

Treatments:

Diuretics

In this section

[What are they?](#)

[How can they help?](#)

[Can they be harmful?](#)

This information is for people with heart failure. It tells you about diuretics, a treatment used for heart failure.

What are they?

If your doctor prescribes diuretics, you will probably take them with other drugs, such as [ACE inhibitors](#) , [beta-blockers](#) , or [digoxin](#) .

There are several different types of diuretics. The ones used for heart failure (with their brand names) are:

- bendroflumethiazide (Aprinox, Neo-NaClex)
- bumetanide (Burinex)
- furosemide, which is also called frusemide (Lasix).

How can they help?

When you have heart failure, fluid can collect in your lungs, making you feel short of breath. Or you may have swollen ankles or feet. Diuretics can improve these symptoms by helping your body get rid of extra fluid.^[3] They do this by making you produce more urine. Doctors have known for many years that diuretics help symptoms of heart failure, so there haven't been many good studies of these drugs.

Can they be harmful?

Diuretics are usually safe. However, it can be difficult to regulate how much fluid leaves your body. Some people are bothered by having to urinate more than often. If you lose too much, you may get low blood pressure, develop kidney problems, or become low on potassium, which is an important mineral for your heart and nervous system.^[36] Your doctor will adjust your dose to make sure you're not losing too much or too little fluid.

ACE inhibitors

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

Heart failure

[How good is the research on ACE inhibitors?](#)

This information is for people with heart failure. It tells you about ACE inhibitors, a treatment used for heart failure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you take an ACE inhibitor, you are less likely to have to go to hospital because of heart failure. You are also less likely to die from heart failure, have a heart attack, or have a type of chest pain called **angina**.

If you are at a high risk of getting heart failure, taking an ACE inhibitor can mean it takes longer for you to get heart failure.

What are they?

Angiotensin is a chemical that is made by your body. There may be more of it in the body than normal in people who have heart failure. The action of angiotensin gives you some of the symptoms of heart failure. The **angiotensin-converting enzyme (ACE)** that works with it is important for your body to be able to make angiotensin. ACE inhibitors stop ACE doing its job.

If you want to know more about these chemicals, see [More about angiotensin and ACE](#).

There are many different ACE inhibitors. We've listed the most common ones (and their brand names).

- captopril (Capoten)
- enalapril (Innovace)
- fosinopril (generic)
- lisinopril (Zestril)
- perindopril (Coversyl)
- quinapril (Accupro)
- ramipril (Tritace)

Your doctor will usually start you on a low dose and increase the dose over a few weeks. As the dose is increased, you will be closely supervised by your doctor. You should not change your dose or stop taking your tablets without talking to your doctor first. If you stop taking your treatment, your symptoms may get suddenly worse.

Your doctor may prescribe ACE inhibitors along with other drugs, such as [diuretics](#) or [beta-blockers](#).^[3]

Heart failure

How can they help?

If you have heart failure, taking an ACE inhibitor can: ^[37] ^[38]

- Reduce your chances of dying from heart failure
- Keep you out of hospital
- Reduce your risk of having another heart attack (if you've already had one).

ACE inhibitors work regardless of what is causing your heart failure, how ill your heart failure is making you feel, how old you are, and whether you are a man or a woman. ^[37] These drugs seem to help people with severe heart failure more than people with mild symptoms. ^[37] ^[38]

If you're at risk of getting heart failure (because you have had a heart attack or you have other risk factors for heart failure such as high blood pressure), taking an ACE inhibitor may: ^[39] ^[40] ^[41] ^[42] ^[43]

- Prevent you getting heart failure
- Keep you out of hospital
- Reduce your risk of having a heart attack or a second heart attack
- Reduce your risk of dying from heart failure.

How do they work?

ACE inhibitors stop your body making a chemical called **angiotensin II**. Your body makes this chemical to try to cope with the effects of heart failure, but it actually makes the condition worse.

ACE inhibitors reduce the strain on your heart by lowering your **blood pressure**. By stopping your body making angiotensin II, they stop your blood vessels narrowing and prevent your blood pressure going up. Blood flows more easily through wider blood vessels, and your heart doesn't have to work as hard.

ACE inhibitors also stop your body holding on to too much salt and water. And they stop the left lower chamber of your heart from getting larger and becoming inefficient.

Can they be harmful?

ACE inhibitors have some side effects. If you want to stop taking an ACE inhibitor, you should talk to your doctor first. If you stop taking your treatment, your symptoms may get suddenly worse.

Heart failure

Your doctor will start you on a low dose of an ACE inhibitor and keep a close watch on you to make sure you don't get serious side effects.

The European Medicines Agency, which gives advice about the safety of drugs across Europe, warns that people who have heart failure shouldn't take ACE inhibitors along with another type of heart failure drug, called angiotensin II receptor blockers, unless they are advised to do so by a specialist doctor. This is because taking the two drugs together can increase the risk of side effects affecting the heart, the blood vessels, or the kidneys. ^[44]

We've listed the side effects of ACE inhibitors below. ^[39] ^[45] Dizziness, fainting, and coughing are the most common side effects.

- **Dizziness or fainting:** This happens to about half the people who take ACE inhibitors. But people with heart failure often feel dizzy, even if they don't have treatment. You get this side effect when your blood pressure falls too quickly. It is important for you to tell your doctor if you are taking any type of medicine that makes you produce more urine, such as diuretics. Taking an ACE inhibitor with high doses of some diuretics can cause a sharp fall in your blood pressure. ^[39]
- **Having a dry cough:** About one-third of people who take ACE inhibitors have a cough. This cough can be annoying. If it bothers you, talk to your doctor about it.
- **High levels of potassium in your blood:** This isn't common, but your doctor will keep an eye on your potassium levels. About 6 in 100 people who take an ACE inhibitor get high levels of potassium. Having a lot of potassium in your blood can affect the way your heart works. If you feel sick, have diarrhoea, or feel weak, it could be a sign that you have too much potassium in your blood. If this happens, you should see your doctor.
- **Kidney problems:** About 10 in 100 people taking ACE inhibitors will have kidney problems.
- **Swelling of the lips, face, or eyes:** This happens to about 4 in 100 people who have heart failure, even if they are not taking this medicine. Talk to your doctor if this happens to you.
- **Erection problems:** Men who take ACE inhibitors are more likely to have problems getting an erection.

You shouldn't take ACE inhibitors if you're pregnant or planning to get pregnant. These drugs can harm your unborn baby. ^[46]

How good is the research on ACE inhibitors?

There is good evidence that ACE inhibitors help people with heart failure and people at risk of getting heart failure.

For people who have heart failure

We found two big summaries of the research (known as [systematic reviews](#)). ^[37] ^[38] They found people who have heart failure who took an ACE inhibitor were less likely to die from heart failure, or have another heart attack if they had already had one, than people who took a dummy treatment (a [placebo](#)).

For people at risk of heart failure

A big summary of research looked at more than 30,000 people at risk of heart failure. It showed that people taking an ACE inhibitor were less likely to have a heart attack, die of heart failure, or need to go to hospital. ^[43]

Angiotensin II receptor blockers

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on angiotensin II receptor blockers?](#)

This information is for people with heart failure. It tells you about angiotensin II receptor blockers, a treatment used for heart failure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you take an angiotensin II receptor blocker, it can make you feel less short of breath. This treatment can also make it easier to do everyday things such as carrying shopping or walking up stairs. If you take an angiotensin II receptor blocker, you are also less likely to wake up at night feeling breathless.

It's not clear whether angiotensin II receptor blockers can help if you have a type of heart failure called diastolic heart failure. This is when your heart doesn't fill with blood properly, so there is less blood to pump around your body. To learn more about the different types of heart failure, see [What is heart failure?](#)

What are they?

Angiotensin II receptor blockers stop the actions of some of the chemicals your body makes when it is trying to cope with the effects of heart failure. They work in a similar way to [ACE inhibitors](#). ACE inhibitors stop your body changing angiotensin I to angiotensin II. Angiotensin II receptor blockers allow angiotensin II to be made but stop it having an effect.

Heart failure

To learn more, see [More about angiotensin and ACE](#) .

There are many different angiotensin II receptor blockers. We have listed some of the most common ones (with their brand names) below.

- candesartan (Amias)
- eprosartan (Teveten)
- irbesartan (Aprovel)
- losartan (Cozaar)
- olmesartan (Olmotec)
- telmisartan (Micardis)
- valsartan (Diovan)

Your doctor may suggest you try angiotensin II receptor blockers if you can't take ACE inhibitors for some reason.^[3] For example, you may get a bad cough if you take an ACE inhibitor.

How can they help?

If you take an angiotensin II receptor blocker:^[47]

- You are less likely to have to go to hospital because of heart failure
- You are less likely to die of heart failure.

Angiotensin II receptor blockers seem to work just as well as ACE inhibitors.^{[48] [49]}

Taking one of these drugs together with an ACE inhibitor may work better than taking an ACE inhibitor on its own.^{[47] [48] [50]} You may be less likely to need hospital treatment.

If you have a type of heart failure called diastolic heart failure, angiotensin II receptor blockers may not help you to live longer.^{[51] [52]} However, one study found that angiotensin II receptor blockers might help people with diastolic heart failure stay out of hospital.^[51]

How do they work?

Angiotensin II receptor blockers stop the actions of angiotensin II. Your body makes this chemical to try to cope with the effects of heart failure, but it actually makes the condition worse.

Heart failure

Angiotensin II receptor blockers help your blood vessels to open up. This helps lower your blood pressure and prevent damage to your heart. These drugs also stop your body holding on to salt and water, making it less likely that your feet and ankles will swell up.

Can they be harmful?

Angiotensin II receptor blockers may have fewer side effects than ACE inhibitors. For example, they are less likely to give you a dry cough than ACE inhibitors.

Side effects from angiotensin II receptor blockers are usually mild. The most common side effect is feeling dizzy. This happens because these drugs lower your blood pressure

But your doctor will need to monitor you closely if you have problems with your kidneys .^[53] These drugs can lead to a high level of potassium in your blood. Having a lot of potassium in your blood can affect the way your heart works. If you feel sick, have diarrhoea, or feel weak, it could be a sign that you have too much potassium in your blood. If this happens, you should see your doctor.

The European Medicines Agency, which gives advice about the safety of drugs across Europe, warns that people who have heart failure shouldn't take ACE inhibitors along with another type of heart failure drug, called angiotensin II receptor blockers, unless they are advised to do so by a specialist doctor. This is because taking the two drugs together can increase the risk of side effects affecting the heart, the blood vessels, or the kidneys.^[44]

How good is the research on angiotensin II receptor blockers?

There's good research to show that angiotensin II receptor blockers can help if you have heart failure.

We found a big review of the research (a systematic review) that looked at more than 38,000 people with heart failure.^[54] Researchers kept track of people for between four weeks and two-and-a-half years. During this time, people who took angiotensin II receptor blockers were less likely to die or need treatment in hospital.

The review also compared angiotensin II receptor blockers with other drugs called [ACE inhibitors](#) .^[54] Both treatments seemed to work about as well as each other.

For people with diastolic heart failure

We also found one study that looked at an angiotensin II receptor blocker called candesartan.^[51] The study included more than 3,000 people who had a type of heart failure called diastolic heart failure. (To read more about the different sorts of heart failure, see [What is heart failure?](#))

Over three years, people who took candesartan were less likely to need hospital treatment than people who took a dummy treatment (a placebo).

Beta-blockers

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on beta-blockers?](#)

This information is for people with heart failure. It tells you about beta-blockers, a treatment used for heart failure. It is based on the best and most up-to-date research.

Do they work?

Yes. Beta-blockers help if you have heart failure.

Doctors used to think that beta-blockers made heart failure worse. But the evidence from medical research shows that these drugs, when given with [ACE inhibitors](#), can reduce your risk of dying of heart failure.^[3] They also reduce the risk that you will have to go to hospital because of your heart failure. You should also find that your symptoms improve. For example, you may be able to do more without getting breathless.

What are they?

Beta-blockers stop the action of chemicals called adrenaline and noradrenaline.

Adrenaline and noradrenaline are made whenever your body has to cope with exercise, stress, or anxiety. (They are also produced in your body's response to sudden fear, which is sometimes called the fight-or-flight response. In these situations, your body gets ready to fight the danger or run from it.) Your body makes these chemicals when you have heart failure, because it senses that your heart isn't pumping as well as it should.^[3]

Adrenaline and noradrenaline have important actions on the heart. They:

- Make it beat faster
- Make it beat more strongly.

Beta-blockers stop the action of these chemicals. They:

- Slow your heart down
- Make it beat less strongly
- Reduce the work done by your heart
- Reduce the amount of oxygen your heart uses.

Heart failure

Some commonly used beta-blockers (and their brand names) are: ^[55]

- bisoprolol (Cardicor)
- carvedilol
- metoprolol (Lopresor).

How can they help?

Taking a beta-blocker can reduce your risk of having to go to hospital and your risk of dying from heart failure. ^[55] This is true even if your heart failure is severe ([class III or IV](#)). ^[56] ^[57] Taking a beta-blocker can also mean that you need fewer days in hospital than you would if you didn't take one of these drugs. A big summary of studies (a [systematic review](#)) found the different types of beta-blocker seem to work about as well as each other. ^[58]

The evidence that beta-blockers work has been so good that some studies were stopped early so that the people taking a dummy treatment for comparison (a [placebo](#)) could start taking beta-blockers. ^[57]

There's some evidence that beta-blockers might not work as well in black people as they do in white people. ^[57] Beta-blockers seem to help people who have [diabetes](#) as well as heart failure. But they don't work as well for people with diabetes as they do for people who don't have diabetes. ^[59]

Beta-blockers work as well for older people (over 60) as they do for younger people. ^[60]

Beta-blockers should be taken with a standard treatment for heart failure, such as [ACE inhibitors](#) . They are not usually used to treat heart failure on their own.

How do they work?

Beta-blockers stop the effects of chemicals called adrenaline and noradrenaline. These chemicals can make your heart work too hard.

So if you take beta-blockers, your heart slows down, beats less strongly, and works more efficiently. And your blood pressure will drop. Beta-blockers relieve the strain on your heart. This should make you feel less short of breath and less tired.

Can they be harmful?

Beta-blockers do have side effects but people who take beta-blockers are less likely to stop their treatment because of side effects than people who take a dummy treatment ([placebo](#)). ^[61] This suggests that the side effects of these drugs are usually mild.

If you have side effects, talk to your doctor. Don't stop taking your tablets suddenly.

Heart failure

- Beta-blockers can make your heart beat more slowly. Doctors used to think this might make your heart failure worse, but research shows that this doesn't happen.
- Beta-blockers can lower your [blood pressure](#) . This can make you feel dizzy.
- Beta-blockers can make your hands and feet feel cold.
- If you have a disease that affects your breathing, such as [asthma](#) or [bronchitis](#) , tell your doctor. You shouldn't take beta-blockers if you have this type of condition.
- There are several different beta-blockers. They may have different side effects. And they may affect people in different ways.

When you start taking beta-blockers, you will start with a low dose so you will be less likely to get side effects. If the side effects aren't a problem, your doctor will try a higher dose.

Your doctor will check your condition regularly. You shouldn't stop taking these drugs or change the dose without asking your doctor. Stopping the drug or changing the dose could make you seriously ill.

How good is the research on beta-blockers?

There's good research showing that beta-blockers help people with heart failure.

We found several big summaries of the research (called [systematic reviews](#)). ^[55] ^[56] ^[60] They show that people taking beta-blockers are less likely to have to go to hospital or die of heart failure. Beta-blockers also reduce the amount of time that people have to stay in hospital.

A big summary of 21 studies (a [systematic review](#)) found the different types of beta-blocker seem to work about as well as each other. ^[58]

Digoxin

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on digoxin?](#)

This information is for people with heart failure. It tells you about digoxin, a treatment used for heart failure. It is based on the best and most up-to-date research.

Heart failure

Does it work?

Yes. Taking a combination of digoxin, an [ACE inhibitor](#) , and a [diuretic](#) may mean your heart failure doesn't get worse so quickly. This combination may also make you less likely to need treatment in hospital because of heart failure.

What is it?



Digoxin originally came from foxgloves.

Digoxin was originally made from plants called foxgloves. It makes your heart beat more strongly and efficiently. Digoxin has been used to treat heart failure for two centuries. ^[62] It is also used to treat people who have abnormal heart rhythms, especially if their heart beats in a fast and irregular way.

Digoxin is usually given your heart failure is severe or getting worse despite taking standard treatments for heart failure, such as [ACE inhibitors](#) , [beta-blockers](#) , and [diuretics](#) . ^[3]

There are other drugs that are similar to digoxin. But the other drugs in this group (called [positive inotropic agents](#)) do not seem to help people with heart failure.

How can it help?

If you have heart failure, it is less likely to get worse if you take digoxin, an ACE inhibitor, and a diuretic. ^[63]

One study lasted about three years. ^[64] People who took digoxin were less likely to need to go to hospital because of heart failure.

How does it work?

Digoxin makes your heart muscles contract more strongly. So blood is pushed around your body with more force.

Digoxin also slows your heart rate. This can help your heart work more efficiently.

Can it be harmful?

Digoxin has some unpleasant side effects, so your doctor will check the amount of digoxin in your blood by doing tests. ^[64]

Digoxin can cause:

- Abnormal heart rhythms

Heart failure

- Loss of appetite
- Nausea and vomiting
- Yellow vision (this is when you see things with a yellow tint around them).

Digoxin doesn't affect your stomach or bowels directly. The nausea, vomiting, and loss of appetite happen because of the effects of digoxin on parts of your brain.

How good is the research on digoxin?

Digoxin has been used to treat heart failure for many years. There's good research to show that it can help.

A summary of the research (a [systematic review](#)) looked at nearly 8,000 people with heart failure.^[65] People who took digoxin were less likely to get worse or need to go to hospital than people who took a dummy treatment (a [placebo](#)).

Being looked after by a team of health professionals

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on being looked after by a team of health professionals?](#)

This information is for people with heart failure. It tells you about being looked after by a team of health professionals if you have heart failure. It is based on the best and most up-to-date research.

Does it work?

Yes. Having a team of doctors and nurses to look after you means you're less likely to need to go to hospital because of your heart failure. It can also mean you live longer.

You may also feel more able to cope with your condition and enjoy your life more.

What is it?

A team of health professionals gives you help and advice about taking care of your heart. They may do this in several ways.^[66]

- A specialist heart doctor (a cardiologist) may write a plan of what treatment you should be getting.
- A nurse might phone you every few weeks to see how you're feeling and answer any questions you have. Or you might be given a number you can call if you have a problem.

Heart failure

- You might see a heart nurse at a clinic every few weeks. Or a nurse might visit you at home. He or she could do things like adjusting the dose of your medicine if you're getting side effects.
- You may be given advice about what exercise you can do and what foods you should be eating or not eating.
- You may be given advice by a pharmacist about taking your medicines. In some studies, people were given boxes with compartments for their different tablets. This made it easier for them to take the right dose at the right time.
- You might have regular checks on things like your weight, blood pressure, heart rate, or breathing.
- You might be taught about heart failure and given advice on how to tell if your symptoms are getting worse. You might be encouraged to see your GP if you're having any problems.

So far, most of the studies of this treatment have been done in specialist clinics. Not all hospitals or doctors' surgeries will have the facilities to check on people so closely. But it may be that there is some information or support on offer. Ask your doctor what's available in your area.

Remote monitoring is a newer option for people who don't live close to a clinic or hospital. This can involve having regular phone calls with your health team and using devices to transmit your blood pressure and other information over a phone or computer (called telemonitoring). However, this isn't yet widely available.

How can it help?

If you have heart failure, being looked after by a team of health professionals can:^[67]
[\[68\]](#) [\[69\]](#) [\[70\]](#) [\[71\]](#) [\[72\]](#) [\[73\]](#)

- Help you live longer
- Keep you out of hospital.

One big summary of studies (a **systematic review**) found that people with heart failure who are looked after by a team of specialist healthcare professionals go to hospital less often than people who have usual care. After 12 months of being looked after by a team of healthcare professionals:^[74]

- About 16 in 100 fewer people who were looked after by a specialist team went to hospital.

Heart failure

One study found that people who were looked after by a specialist team were more likely to feel better and enjoy life.^[67] They also felt less anxious and more able to cope with their condition.

Two reviews also looked at working with a team of health providers through remote monitoring, which can involve regularly talking with doctors and nurses over the phone and using devices that transmit blood pressure and other information over a phone or the internet (called **telemonitoring**).^[69] ^[75] People who had remote monitoring were less likely to be hospitalised or die during the study than those who didn't.

How does it work?

If you see a doctor or nurse regularly, they may notice if your heart failure is getting worse or if your treatment needs changing. And if you're given more information about your condition, you may be able to know yourself if it's getting worse. This might mean you get treatment earlier, which could help you live longer and keep you out of hospital.

Getting regular support may also mean you're more likely to remember to take your medicine. This may also help you be healthier and live longer.

The extra help you get from a team of doctors and nurses may also mean that any other health problems you have get picked up and treated more quickly. So you're less likely to have other problems on top of heart failure.^[67]

If you're healthier overall because of the extra care, this may help you be more active and enjoy life more.^[67]

Can it be harmful?

The studies that looked at this treatment didn't talk about side effects. But it's unlikely that having extra care could be harmful.

How good is the research on being looked after by a team of health professionals?

We found several big reviews of the research (systematic reviews).^[68] ^[70] ^[71] ^[72] There's good research to show that being looked after by a team of doctors and nurses can help if you have heart failure. You're likely to live for longer. And you're less likely to need to go to hospital.

But we still need more research to know for certain whether telemonitoring helps or not.

Having a pacemaker put in

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

Heart failure

[How good is the research on having a pacemaker put it?](#)

This information is for people with heart failure. It tells you about pacemakers, which are devices used for heart failure. It is based on the best and most up-to-date research.

Does it work?

Yes. If you have heart failure, you may be able to have a pacemaker fitted to make the left and right sides of your heart beat together. This can help you be more active. It may also help you stay out of hospital and live longer.

What is it?

A pacemaker is an electrical device that's put in your chest. It's used to treat an abnormal heartbeat. You'll have an operation to put the pacemaker under the skin in your chest, just under your collarbone.

The main part of a pacemaker is roughly the size of a pack of cards. It weighs about 25 grams (less than an ounce). It contains a battery and wires that run from the pacemaker to your heart. Electric pulses travel down the wires and make your heart beat in a steady rhythm.

Normally, the left and right sides of your heart beat together. But if you have heart failure, the two sides of your heart may beat a fraction of a second apart.^[76] If this happens, your heart doesn't pump as strongly as it should.

There are different types of pacemakers. They have one, two, or three wires. The wires are attached to different parts of the heart, depending on the type of problem you have.

In this section we deal with a type of pacemaker called a **cardiac resynchronisation therapy pacemaker**. This pacemaker had three wires. Two of the wires run to the upper and lower chamber on the right side of your heart. The third wire runs to the lower chamber on the left side of your heart. The electrical signals from the pacemaker make both sides of your heart beat together.

You may hear this treatment called cardiac resynchronisation therapy, or CRT. The pacemaker itself may be called a CRT device or a cardiac resynchronisation implant.

This type of pacemaker is sometimes combined with a device that can shock your heart into starting again if it stops beating. This is called a defibrillator. To read more, see [Having a defibrillator put in](#). This combination of a pacemaker and defibrillator is sometimes called a CRT-D device.

How can it help?

Having a pacemaker put in to make the two sides of your heart beat together can help you:^[77] ^[78]

- Be able to do more. For example, you may be able to walk further without feeling tired

Heart failure

- Stay out of hospital
- Live longer
- Enjoy life more.

Most of the studies of this treatment looked at people who had severe heart failure. Their condition was rated as class III or class IV on a scale that's used to say how bad heart failure is. (To read more, see [How heart failure is classified](#) .) But we did find studies that showed this treatment also helped people with less severe heart failure. ^[79] ^[80]

How does it work?

The left and right sides of your heart should beat together. To read more, see [What does my heart do?](#) But if you have heart failure, the two sides of your heart may beat at slightly different times. This means your heart doesn't pump as strongly.

A natural electrical pulse in your body tells the left and right sides of your heart to pump. Electrical pulses from the pacemaker can take over from your body's natural signal. The wires from the pacemaker take electrical signals to the left and right sides of your heart at exactly the same time, making them beat together. This means your heart can pump more strongly.

Can it be harmful?

All operations have risks, and having a pacemaker fitted is a complicated operation.

In one big study, the implant worked well for 92 in 100 people. ^[81] But 8 in 100 people had problems and needed another operation. These are some of the problems that have happened in other studies.

- For about 4 in 100 people, there are mechanical problems with the device during the operation. ^[77]
- About 3 in 1,000 people die during the operation. ^[77]
- For almost 7 in 100 people, the wires running from the pacemaker to the heart come loose within 11 months. ^[77] And about 5 in 100 pacemakers stopped working properly within six months. If either of these things happens, you might need another operation to fix the problem.
- Almost 2 in 100 people were hospitalised for an infection in the part of their chest where the pacemaker was put in. ^[77]

Heart failure

- In one study, about 1 in 100 people got air trapped in their chest.^[82] This is called pneumothorax. It can make breathing painful. A doctor can let the air out with a needle.

How good is the research on having a pacemaker put it?

There's good research to show that people with heart failure do better if they're fitted with a type of pacemaker that makes both sides of their heart beat at the same time. Doctors sometimes call these **cardiac resynchronisation therapy pacemakers**.

We found a big summary of the research (a **systematic review**).^[77] It looked at 14 good-quality studies (called **randomised controlled trials**) with more than 4,400 patients to find out how well pacemakers work.

Most of the studies in this summary looked at people who had severe heart failure.^[83] Their condition was rated as class III or class IV on a scale that's used to say how bad heart failure is. (To read more, see [How heart failure is classified](#).) But we also found a more recent summary that looked at people with less severe heart failure (classes I and II). It also found that people who had a pacemaker were less likely to die or need hospital treatment during the studies than those who had drug treatment only.^[80]

Aldosterone receptor antagonists

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on aldosterone receptor antagonists?](#)

This information is for people with heart failure. It tells you about aldosterone receptor antagonists, drugs used for heart failure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you have heart failure, taking a drug called an aldosterone receptor antagonist will probably reduce your risk of dying of heart failure. It may also help to keep you out of hospital.

What are they?

Aldosterone receptor antagonists reduce the amount of fluid in your body by increasing the amount of urine that you produce. If you have heart failure, your body may hold on to too much water. Aldosterone receptor antagonists help to get rid of the extra water.

Aldosterone receptor antagonists are often used with other drugs called **diuretics**, which also help to get rid of extra water in your body.

Heart failure

Examples of aldosterone receptor antagonists are:

- spironolactone (brand name Aldactone)
- eplerenone (brand name Inspra).

In the UK, aldosterone receptor antagonists are usually only used in people with moderate to severe heart failure.^[84] Your doctor may prescribe one of these drugs if you've been taking other drugs for heart failure, such as [ACE inhibitors](#) or [beta-blockers](#), but you still have bad symptoms.^[3]

How can they help?

Taking an aldosterone receptor antagonist can cut your risk of dying of heart failure.^[85]^[86] In a large review of the research looking at people with heart failure:^[85]

- About 14 in 100 people died while taking an aldosterone receptor antagonist
- About 19 in 100 people died while taking a dummy treatment (a [placebo](#)) or another comparison treatment.

Treatment also helped keep people out of hospital.^[85]

However, most of the studies have lasted less than a year, so we can't be sure about the long-term benefits.

Taking an aldosterone receptor antagonist can help you do more physical things.^[87]

How do they work?

Aldosterone receptor antagonists block the action of aldosterone, a chemical that regulates the balance of salt and water in your body. Blocking the action of aldosterone reduces the amount of fluid in your body by increasing the amount of urine you produce. Reducing the fluid in your body should make you more comfortable.

Aldosterone receptor antagonists also block the effects of some other chemicals that are made by your body. One of these, adrenaline, can put your heart under stress by making it beat faster and more strongly.

Can they be harmful?

Aldosterone receptor antagonists can make men's breasts larger and more tender. In studies, this affected 2 in 100 men.^[85] Men often stop taking the tablets when this happens.

Heart failure

Aldosterone receptor antagonists can cause the level of potassium in your body to rise, and this can make you seriously ill. In trials, this happened to 6 in 10 people. ^[85] Your doctor will want to monitor your potassium level with blood tests.

Because high potassium levels are dangerous, it's important that you don't eat a lot of foods high in potassium if you are taking spironolactone. Foods high in potassium include bananas, grapefruit, oranges, tomatoes, prune juice, and melons. Talk to your doctor if you're worried about how much of these foods to eat.

Another problem with aldosterone receptor antagonists is that they can make kidney problems worse. You may need regular blood tests to see how well your kidneys are working.

How good is the research on aldosterone receptor antagonists?

There's some good evidence that aldosterone receptor antagonists can help people with heart failure.

We found one big review of the research looking at nearly 11,000 people with heart failure. ^[85] People who took an aldosterone receptor antagonist were less likely to die than people who took a dummy treatment (a placebo) or other treatments.

We also found a large study of people who took eplerenone for mild symptoms of heart failure. After nearly two years, people who took eplerenone were less likely to have died or needed hospital treatment for heart failure than people who took a placebo.

Exercise

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on exercise?](#)

This information is for people with heart failure. It tells you about taking exercise to improve your heart failure symptoms. It is based on the best and most up-to-date research.

Does it work?



Exercise may make it less likely that your heart failure will get worse.

Heart failure

Yes. Doctors used to think that exercise was dangerous for people with heart failure. In the past, you may have been told to rest as much as possible.

But we know from recent research that exercise is likely to make you feel better and improve the ability of your heart to pump blood around your body. Exercise may also help you live longer.

Exercise will probably make you feel less short of breath and give you more energy. It may also improve your appetite.

What is it?

Exercise programmes vary. The ones in research studies are often run in hospitals, and you may need to be tested and monitored closely before you are allowed to take part.

If you take part in an exercise programme, you may train on an exercise bike for 30 minutes three times a week.^[88] Or your training sessions may involve walking, cycling, or ball games.^[88] Sessions should start with warm-up exercises. Your blood pressure and pulse will be measured before, during, and after you exercise. Trained staff will be monitoring you.

Outside the hospital, your doctor may advise you to keep active by walking. Your doctor can tell you how to increase the distance you walk and how to check your pulse to make sure that you are not overdoing it. If you feel very tired, you may need to cut back the next day.

Try to think of exercise as part of your lifestyle, rather than as something you're going to do for only a couple of months.

How can it help?

Exercise may make it less likely that you will go into hospital or die because of complications from heart failure.^[89] ^[90] It may reduce your risk by as much as 40 percent over 12 months.^[88]

Exercise may improve your quality of life.^[90] ^[91] ^[92] You may feel happier, less anxious and discouraged, and better able to cope. You may also become more independent and confident.

Exercise may make you feel less short of breath.^[93] It may also make you feel less tired and more able to do things like making the bed, chatting, or shopping without having to stop because you are short of breath.

Cycling, walking, or doing other aerobic exercise may help improve the shape of your heart if the lower left part (the left ventricle) has become enlarged. This can help your heart work better.^[94]

How does it work?

- Exercise increases the amount of oxygen going around your body. This is a good thing, because when you have heart failure, your heart is struggling to supply your body with enough oxygen.
- Exercise increases the blood flowing around your heart.
- Exercise makes your muscles stronger so you can do more without getting tired.
- Exercise tends to lower your blood pressure, which is helpful if you have heart failure.

Can it be harmful?

An exercise programme is unlikely to be harmful. People in research studies didn't notice any side effects.

If you feel too short of breath while exercising, you should stop. Moderate exercise is better than strenuous exercise.

How good is the research on exercise?

The research shows that exercise is likely to help if you have heart failure. However, some of the studies looked at only a small number of people, and we don't know which kinds of exercise are best.

One summary of the research (a [meta-analysis](#)) found that adding exercise to people's usual treatments helped people live longer and stay out of hospital.^[88] A second review found that exercise made people fitter and able to do more things.^[95] But a third summary (a [systematic review](#)) didn't find much difference between people who exercised and people who didn't.^[96]

Most studies have looked at doing exercise through a hospital-based programme. However, one review looked at doing exercise at home.^[97] It found that people who exercised at home were fitter than those who didn't exercise.

Having a defibrillator put in

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on having a defibrillator put in?](#)

This information is for people with heart failure. It tells you about having a defibrillator put in your chest. It is based on the best and most up-to-date research.

Does it work?

Probably. Having a defibrillator put in your chest reduces your chances of dying from an abnormal heartbeat if you have heart failure.

What is it?

An **implantable cardiac defibrillator** is a small device that can be put in your body to help correct abnormal heart rhythms.

The device is about the size of a pack of cards. You'll have an operation to put the defibrillator under the skin in the upper part of your chest. The device has a generator and leads. The generator holds the battery and an electric circuit that checks the electrical signals given out by your heart. The leads are connected to your heart.

The leads feed the electrical signals from your heart back to the generator where they are checked. If your heart goes into an abnormal rhythm, the generator uses an electric impulse to shock it back into a normal rhythm.

Implantable cardiac defibrillators were first used in 1980. Each device lasts for about five to seven years. ^[98]

To read more about the operation to put in a defibrillator, see [Having a defibrillator fitted](#) in our section on operations and tests.

Instead of a defibrillator, some people with heart failure have a pacemaker fitted. They're similar, but instead of shocking your heart, a pacemaker gives out a constant signal to keep your heart beating at the right speed. Some pacemakers aim to help the left and right sides of your heart beat together. To read more, see [Having a pacemaker put in](#) .

Some devices combine a pacemaker and a defibrillator.

How can it help?

Having a defibrillator fitted can help you live longer if you're at risk of getting a dangerously fast heartbeat. ^[99] ^[100] You're about half as likely to die suddenly of heart problems if you have a defibrillator put in. ^[99]

How does it work?

If you have a cardiac arrest, you need treatment straight away to restart your heart. If you don't have treatment, you will die.

An electric pulse can shock your heart into beating normally again. You may have seen this in medical dramas on television, with actors using electric paddles to shock someone's heart into beating again.

A defibrillator that's put in your chest works in the same way as the paddles. It shocks your heart into beating normally if you suddenly get an abnormal heartbeat. The idea is that a small shock given early should stop you having a cardiac arrest.

Can it be harmful?

All operations have risks, and some people have problems after they have a defibrillator put in. And the defibrillator itself can break down. Here's what the research found. ^[99]

- Between about 1 in 100 and 12 in 100 people got an infection after the operation to put in a defibrillator.
- Between about 2 in 100 and 14 in 100 people's defibrillators broke down.
- Between 1 in 100 and 6 in 100 people got severe bleeding.
- Less than 1 in 100 people got trapped air in their chest. This is called pneumothorax. It makes breathing painful. A doctor can let the trapped air out using a needle.

If you get severe bleeding or your defibrillator breaks down, you might need another operation to fix the problem.

Some people get a shock from their defibrillator more often than other people. For example, a defibrillator might be faulty and give your heart a shock even when it's not beating too quickly. This can be uncomfortable. ^[99]

How good is the research on having a defibrillator put in?

The research on defibrillators is quite good. We found two summaries of the research that looked at whether they can help people with heart failure (a [systematic review](#) and a [meta analysis](#)). ^[101] ^[102]

The first review looked at nearly 5,000 people. ^[101] People who had a defibrillator fitted were likely to live longer than people who didn't. They were about half as likely to die suddenly of heart problems. Defibrillators helped people who were at risk of getting heart failure as well as people who already had it.

The second review looked at 2,110 people with heart failure. ^[102] Having a defibrillator fitted helped people to live longer.

Hydralazine

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on hydralazine?](#)

This information is for people with heart failure. It tells you about hydralazine, a treatment used for heart failure. It is based on the best and most up-to-date research.

Heart failure

Does it work?

Yes, hydralazine taken with a nitrate drug may help you stay out of hospital and live longer. But it's not often used, because of the risk of side effects. It's usually used only for severe heart failure, or if you can't take an [ACE inhibitor](#) or an [angiotensin II receptor blocker](#).

What is it?

Hydralazine is a drug that's sometimes used to reduce [high blood pressure](#). The brand name is Apresoline. It's not often used alone. For heart failure, it's usually prescribed along with a nitrate drug called isosorbide dinitrate. ^[103]

Hydralazine is not usually tried unless you can't take other drugs, or you've tried other drugs but they haven't worked. Usually, you'll only start this drug while you are in hospital, so your doctors can keep an eye on you in case of side effects.

How can it help?

Hydralazine plus isosorbide dinitrate may: ^[104] ^[105]

- Help you live longer
- Help you stay out of hospital
- Help you feel you are getting more out of life.

How does it work?

Hydralazine relaxes your blood vessels. This lowers your blood pressure, which means there is less strain on your heart.

Can it be harmful?

Yes, there are some important side effects.

These side effects are common. You should talk to your doctor if they continue, or if they are causing you problems: dizziness, headache, loss of appetite, nausea, stuffy nose, vomiting. ^[106]

Taking hydralazine for more than six months can also cause a disease called systemic lupus erythematosus. This can be dangerous. If you get these symptoms, see your doctor straight away: anxiety or depression, blood in your urine (or pinkish urine), chest pain, difficult or painful breathing, a rapid heart beat, palpitations, joint pain, numbness, tingling or pins and needles, sore throat or fever, skin rash, blisters, or itching. ^[106]

How good is the research on hydralazine?

Most of the evidence for hydralazine is quite old. We found two good-quality studies ([randomised controlled trials](#)).

The first study looked at 642 men with heart failure. It found men who took hydralazine plus isosorbide dinitrate were likely to live longer than men taking a dummy treatment (a [placebo](#)). But this study was carried out in 1986, and not all the treatments available today were available then. ^[105]

The second study looked at 1,050 black people with severe heart failure. It found people lived longer if they took hydralazine plus another heart failure medicine called isosorbide dinitrate. It found people who took the combination hydralazine treatment were less likely to need to go to hospital, and were more likely to have a better quality of life. ^[104]

Amiodarone

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on amiodarone?](#)

This information is for people with heart failure. It tells you about amiodarone, a treatment used for heart failure. It is based on the best and most up-to-date research.

Does it work?

We're not sure. There's some evidence that taking amiodarone may reduce your chances of dying from heart failure. But we can't say for certain whether it works, because there haven't been enough good-quality studies.

What is it?

Amiodarone is a drug that affects the electrical activity in the nerves around your heart. It slows the electrical impulses that tell your heart how fast to beat and in what rhythm.

Amiodarone is most commonly used to treat life-threatening abnormal heart rhythms. (To learn more, see [What is heart failure?](#))

The brand name of amiodarone is Cordarone.

You will need to see a specialist before you start taking this treatment. ^[3]

How can it help?

If you have heart failure, and in particular if you have had a heart attack, you are probably less likely to die from an abnormal heart rhythm if you take amiodarone. ^[107] ^[108] But

Heart failure

some of the research is not very good. So we can't say for certain how well this drug works if you have heart failure.

There are other drugs like amiodarone but they don't seem to help people with heart failure. These drugs are called [anti-arrhythmic drugs](#). Amiodarone is the only drug in this group that seems to work well for people with heart failure. Some of the other drugs in this group may be harmful and may increase your risk of dying from heart failure.

How does it work?

Some people with heart failure die because they develop an abnormal heart rhythm. Amiodarone is good at controlling some of the worst abnormal rhythms.

Can it be harmful?

The most common side effect of amiodarone is nausea. Some people taking part in studies noticed several other side effects as well. ^[107] ^[108] If you are taking amiodarone, your doctor will regularly test how well your [thyroid gland](#) and liver are working.

Researchers found that amiodarone made the thyroid less active in about 7 in 100 people. ^[107] ^[108]

- Amiodarone can cause your heart to beat more slowly, so you might feel faint. This happened to about 1 in 50 people in studies. ^[107] ^[108]
- It can cause liver problems, but these are unlikely to be bad enough to stop you taking the tablets. ^[107] ^[108]
- Amiodarone can damage your lungs. This can make you feel short of breath. This happened to about 1 in 100 or 2 in 100 people who took amiodarone for more than a year. ^[107] ^[108]
- Most people who take this drug develop small spots in their eyes. If you drive a car, they can mean that you are dazzled by headlights at night. These spots go away once you stop taking the drug.
- This drug could make you sensitive to sunlight, so you should wear sunscreen most days.

How good is the research on amiodarone?

There's some research that looks at amiodarone, but not enough to say for certain how well it works ^[107] ^[108] for people with heart failure.

We found two summaries of the research ([systematic reviews](#)). ^[107] ^[109] The biggest review looked at 4,766 people. ^[107] But some of the people in this review didn't have

Heart failure

heart failure. They had other conditions, such as an abnormal heart rhythm. So it's not clear how good these drugs are if you have heart failure.

The second review looked at 5,000 people who'd had a heart attack.^[109] Amiodarone seemed to reduce the risk of dying during the studies. But we can't be certain that it helped, because some of the results could have happened by chance.

Anticoagulants

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on anticoagulants?](#)

This information is for people with heart failure. It tells you about anticoagulants, a treatment used for heart failure. It is based on the best and most up-to-date research.

Do they work?

We don't know. The evidence isn't good enough to say whether you should take these drugs for heart failure. But you may need to take them for other reasons.

What are they?

Anticoagulants stop blood clots forming in your blood vessels. The most common anticoagulant is warfarin.

Anticoagulants work by stopping your body from making **fibrin**. Fibrin is a protein that helps your blood clot by sticking small blood cells (platelets) together. Blood clots normally stop the bleeding when you cut yourself. But if a clot forms inside your blood vessels and stops blood flowing to an important part of your body, it can be harmful.

A blood clot in a vein in your leg, for example, can break off and travel to your lungs, blocking the blood vessels in your lungs. This can be life-threatening.

Anticoagulants make your blood thinner. If you take them, you need to have your blood tested regularly to check that it isn't getting too thin.

How can they help?

There isn't enough research to say whether anticoagulants will help if you have heart failure.^[110] But they can be life-saving if you have a blood clot.

How do they work?

When you have heart failure, blood doesn't flow around your body as quickly as it should, because your heart isn't pumping as well as it should. If your blood is flowing more slowly, you may be more likely to get clots in your blood vessels.

Heart failure

More research is needed to find out whether anticoagulants work for treating heart failure.

Can they be harmful?

If you have a high dose of anticoagulants, you may start to bleed for no reason.^[111] These drugs can also cause rashes. We don't know how common these side effects are if you take anticoagulants for heart failure.

How good is the research on anticoagulants?

There's not much research looking at whether anticoagulant drugs help people with heart failure.

One study looked at 279 people with heart failure.^[112] This study may have been too small to find a difference if there was one.

Some studies done in the 1950s suggest warfarin may help people with heart failure live longer.^[113] But these studies weren't done to the same standards as modern research.

In two studies, researchers looked back over the medical records of people with heart failure who had taken warfarin.^{[114] [115]} In one study it seemed to help, and in the other it didn't.

We need more research to know if anticoagulant drugs can help people with heart failure.

Anti-platelet drugs

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on anti-platelet drugs?](#)

This information is for people with heart failure. It tells you about anti-platelet drugs, a treatment used for heart failure. It is based on the best and most up-to-date research.

Do they work?

We don't know. There isn't enough evidence to tell us whether anti-platelet drugs work to treat heart failure. If you are given one of these drugs, you will also need to take other treatments for heart failure.

Anti-platelet drugs aren't used on their own to treat heart failure.

Aspirin is a well-known anti-platelet drug.

What are they?

Platelets are small cells in your blood. They help your blood to clot and stop the bleeding if you cut yourself.

But if a blood clot forms inside a blood vessel, it can stop blood travelling around your body. This is dangerous because all parts of your body need a constant supply of blood.

Anti-platelet drugs stop platelets sticking together. They reduce the risk of blood clots.

Some common anti-platelet drugs are:

- aspirin
- aspirin plus dipyridamole (Asasantin Retard)
- clopidogrel (Plavix).

How can they help?

We don't know if anti-platelet drugs will help if you have heart failure. There isn't enough good research. ^[116] ^[117]

How do they work?

If you have heart failure, your blood is being pumped around your body more slowly than usual. This gives the sticky parts of your blood more time to form clots, which could stop the blood flow to parts of your body. Anti-platelet drugs make it less likely that clots will form. But heart failure may not cause blood clots often enough for anti-platelet drugs like these to make a difference.

Can they be harmful?

The studies we looked at didn't find any serious side effects, but these drugs are likely to make you bleed more if you cut yourself, and they can make you feel sick. ^[116]

Clopidogrel may not work as well if you are taking heartburn drugs called proton pump inhibitors (PPIs). These drugs reduce the amount of acid produced in the stomach and are used to protect against acid reflux ([GORD](#)) and stomach ulcers. Brand names include Nexium, Losec, and Proteum. But research shows these drugs may stop the body from breaking down clopidogrel properly, so it may not work as well. Doctors have been advised to avoid using PPIs along with clopidogrel. ^[118]

How good is the research on anti-platelet drugs?

There's not much research on anti-platelet drugs for people with heart failure.

Heart failure

One summary of the research (called a [systematic review](#)) found only one good-quality study (called a [randomised controlled trial](#)).^[119] Taking aspirin didn't make any difference to how long people lived or how likely they were to have a heart attack or a stroke.^[120]

We also looked at three other studies, but they weren't good enough to tell us whether anti-platelet drugs work as a treatment for heart failure.^{[114] [115] [121]} They looked back at the medical records of people who had taken these drugs. This type of study isn't as good as studies where researchers compare a drug with a dummy treatment (a [placebo](#)).

Anti-arrhythmic drugs (other than amiodarone)

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on anti-arrhythmic drugs \(other than amiodarone\)?](#)

This information is for people with heart failure. It tells you about anti-arrhythmic drugs other than amiodarone. It is based on the best and most up-to-date research.

Do they work?

No. [Amiodarone](#) is the only anti-arrhythmic drug that seems to work in treating heart failure. Other anti-arrhythmic drugs may actually increase your risk of dying of heart failure.

What are they?

Anti-arrhythmic drugs slow the electrical signals that come from the nerves around your heart. These impulses tell your heart how fast to beat and at what rhythm.

Drugs that try to stop your heart from beating abnormally work in different ways. Examples of these drugs are:

- disopyramide
- procainamide.

How can they help?

They can't. Anti-arrhythmic drugs may make it more likely that you will die of heart failure.^{[122] [123]} Amiodarone is the only drug in this group that may be helpful.

How do they work?

Some deaths from heart failure are caused by abnormal heart rhythms. Anti-arrhythmic drugs stop the heart beating abnormally. But the drugs that are used to treat this problem work in different ways. The way most anti-arrhythmic drugs work is unlikely to help if you have heart failure. Only amiodarone may help.

Can they be harmful?

Anti-arrhythmic drugs may increase the risk of dying of heart failure.

How good is the research on anti-arrhythmic drugs (other than amiodarone)?

There's good evidence that anti-arrhythmic drugs (other than amiodarone) are harmful if you take them for heart failure.

One large summary of the research (a [systematic review](#)) looked at more than 23,000 people who'd had a heart attack.^[122] Some of these people might also have had heart failure, because you can get heart failure after a heart attack.

People who took anti-arrhythmic drugs had a higher risk of dying than people who took a dummy treatment (a [placebo](#)).^[122] A good-quality study (a [randomised control trial](#)) also found that people were more likely to die while taking these drugs.^[123]

Calcium channel blockers

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on calcium channel blockers?](#)

This information is for people with heart failure. It tells you about calcium channel blockers. It is based on the best and most up-to-date research.

Do they work?

No. Most people who have heart failure do not seem to be helped by calcium channel blockers. Some of these drugs can be harmful for people with heart failure.

What are they?

Calcium channel blockers are drugs that slow down your heartbeat. They work by changing the electrical signals in your heart.

There are lots of different kinds of calcium channel blockers. They are used for many heart conditions, including [high blood pressure](#).

Heart failure

Two of these drugs are not usually used in people with heart failure, because they can make it worse.^[124] These drugs (and some common brand names) are:

- diltiazem (Adrizem, Angitil, Calcicard)
- verapamil (Cordilox, Univer).

Two other drugs are used with great care in people with heart failure:

- nicardipine (Cardene)
- nifedipine (Adalat, Adipine, Cardilate).

Other calcium channel blockers (and their brand names) include:

- amlodipine (Istin)
- felodipine (Plendil)
- isradipine (Prescal)
- lacidipine (Motens)
- lercadipine (Zanidip)
- nimodipine (Nimotop)
- nisoldipine (Syscor).

These drugs tend not to be used for people with systolic heart failure, because they can make some symptoms worse. But they may help people with diastolic heart failure. Systolic means your heart can't pump hard enough. Diastolic means your heart can't relax enough to allow its chambers to fill up with blood. To learn more, see [What is heart failure?](#)

How can they help?

Calcium channel blockers don't seem to make people with heart failure feel better or help them live longer.^[125] ^[30] ^[126] One study found that people whose heart failure was caused by damage to the heart muscle (cardiomyopathy) could benefit from taking these drugs.^[127] But in other people they could actually make heart failure worse.^[30] ^[126]

How do they work?

Calcium channel blockers help the heart to pump less strongly, so researchers thought they may help with symptoms of heart failure. But this doesn't seem to happen.

Can they be harmful?

Some calcium channel blockers can make your symptoms worse.^[125] ^[30] They can even increase your chance of dying of heart failure if you have just had a heart attack and have a lot of fluid in your lungs. The same risks apply if your heart failure is already bad and you start taking these drugs.

These drugs can also cause milder side effects, such as headaches, dizziness, and nausea. Newer calcium channel blockers (amlodipine, felodipine, isradipine, lacidipine, lercadipine, and nisoldipine) cause less serious side effects.^[125]

How good is the research on calcium channel blockers?

There's good research that shows calcium channel blockers don't help if you have heart failure.

We found two summaries of the research on calcium channel blockers and one other good study (a randomised controlled trial).^[125] ^[30] ^[126]

The first summary looked at more than 3,000 people with heart failure.^[125] Taking calcium channel blockers didn't help people live any longer. The second summary and the other study also found that calcium channel blockers didn't help.^[30] ^[126]

Positive inotropic drugs (other than digoxin)

In this section

[Do they work?](#)

[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on positive inotropic drugs \(other than digoxin\)?](#)

This information is for people with heart failure. It tells you about positive inotropic drugs other than digoxin. It is based on the best and most up-to-date research.

Do they work?

No. [Digoxin](#) is the only drug of this type that works to treat heart failure.

What are they?

Positive inotropic drugs make your heart beat more strongly and efficiently. Some examples (with their brand names) are:

- dobutamine (Posiject)
- dopexamine (Dopacard)
- milrinone (Primacor).

Heart failure

They are given as a drip into a vein (also called an [intravenous infusion](#) or IV).

How can they help?

Apart from digoxin, positive inotropic drugs don't seem to help, and they may even make it more likely that you will die of heart failure. ^[128] ^[129]

How do they work?

Positive inotropic agents make your heart beat more strongly, so blood is pumped around your body more vigorously. But there is no evidence that this helps with symptoms of heart failure. In fact, more evidence suggests that they increase the risk of dying of heart failure.

Can they be harmful?

Studies of positive inotropic drugs have lasted six months to nine months. In this time, these drugs increased the risk of dying from heart failure. ^[128] ^[129]

In one study, 17 in 100 people died while taking positive inotropic drugs, compared with 15 in 100 taking a dummy treatment (a [placebo](#)). ^[129]

How good is the research on positive inotropic drugs (other than digoxin)?

There's good research to show that [positive inotropic drugs](#) (other than [digoxin](#)) don't help with heart failure.

Two reviews of the research compared positive inotropic drugs with a dummy treatment (a [placebo](#)). ^[128] ^[129] More people died while taking positive inotropic drugs.

Heart surgery

In this section
[What is it?](#)

This information is for people with heart failure. It tells you about different types of surgery.

We haven't looked at the research on surgery for heart failure in as much detail as we've looked at the research on most of the treatments we cover. (To read more, see Our method.) But we've included some information because you may have heard of these types of surgery or be interested in them.

What is it?

Some people with heart failure can be helped by surgery. ^[3] Having surgery may prevent further damage to your heart and help it work better.

Heart failure

There are several types of surgery you can have for heart failure. Which operation you have will depend on what is causing your heart failure.

Surgery that widens the blood vessels to the heart

If the blood vessels leading to your heart have become narrow, you can have an operation to widen them. There are two types of surgery used for this: **coronary angioplasty** and **coronary artery bypass**.

Sometimes the blood vessels that take blood to the heart are made narrower by fatty deposits. This means your heart may get too little oxygen to work properly. You might also get a type of chest pain called **angina**. If a blood vessel to your heart gets blocked, it can cause a heart attack. Making the blood vessels wider allows more blood and oxygen to get through to your heart muscle. It can get rid of angina and reduce your risk of having a heart attack.

If you have chest pain (angina), your doctor might recommend you have one of these operations. ^[130] Both types of surgery can help you feel better and live longer. ^[130]

If you don't have angina, it's not clear whether this type of surgery will help you. ^[130] And if your heart failure symptoms are very bad, your risk of dying during coronary bypass is greater than if your symptoms are mild.

Coronary angioplasty

If you have a coronary angioplasty, doctors use a tiny balloon to widen blood vessels. As the balloon inflates, it squeezes the fatty deposits to the sides of blood vessel, giving more room for blood to pass through.

We've prepared some extra information for people thinking of having this operation. To read more, see [Coronary angioplasty](#).

Coronary artery bypass

During coronary artery bypass surgery (called CABG for short), a surgeon takes parts of healthy blood vessels from another part of your body (such as your leg). The surgeon uses these healthy blood vessels to replace the damaged vessels around your heart.

We've prepared some extra information for people thinking of having this operation. To read more, see [Coronary artery bypass](#).

Surgery on valves in your heart

You may have this type of surgery if there is something wrong with one of the valves in your heart. Repairing the valve helps blood flow through your heart and around your body.

If you have heart failure, the lower left part of your heart (the left ventricle) can get bigger. This happens because your heart is trying to pump more strongly to get more

Heart failure

blood around your body. But these changes to the shape of the heart can make the muscles in the heart weaker.

Over time, the valve that separates the lower and upper parts of the left side of the heart (called the mitral valve) can stretch and become slack. When it's working properly, the valve helps blood flow through the heart in the right direction. But when the valve is weak, blood can leak back into the heart instead of being pumped around the body. This reduces the amount of blood that can be pumped around the body and makes your symptoms worse.

If there is something wrong with the mitral valve, surgeons may be able to repair it. Or they may replace it with an artificial valve. Sometimes valves from animal or human hearts are used.

This is a serious operation, and surgeons will need to stop your heart during surgery. While your heart is stopped, surgeons use a machine to get oxygen into your blood and pump it around your body. This is called a **heart-lung bypass machine**.

Surgery to repair the mitral valve can help you feel better. You should be able to do more before getting out of breath or getting chest pain.^[131] ^[132] ^[133] It can also help keep you out of hospital and help you live longer.^[132] However, there hasn't been much research on the long-term effects of valve surgery. And we don't know which patients are most suitable for this type of surgery.

Heart remodelling

This operation is used to make the heart a more normal shape.

In heart failure, your heart gets bigger and out of shape as it tries to pump harder. Sometimes part of the muscle in the lower left part of the heart (the left ventricle) dies or becomes thin and bulges out. If this happens, it won't work properly and may not pump enough blood around the body.

Surgeons can take away the dead part of the muscle and then stitch the heart up again to make it smaller and a more normal shape. Or if there is a weak spot, surgeons can stitch a patch over it to give the heart extra support. The patch is made from a special material or from tissue taken from another part of your body.

This is a serious operation, and surgeons will need to stop your heart during surgery. While your heart is stopped, surgeons use a machine to get oxygen into your blood and pump it around your body. This is called a heart-lung bypass machine.

This operation can help your heart pump more strongly and help symptoms of heart failure.^[134] But it is a new type of surgery and may only be offered in a few specialist centres.

Heart transplant

If your heart failure is bad and drug treatments don't help, your doctor may suggest a heart transplant.

A heart transplant involves replacing your heart with one from a donor. You may also have your lungs transplanted. It is a major operation and you will need to take drugs for the rest of your life to stop your body rejecting your new heart or lungs.

You need to be in quite good health (apart from your heart failure) to have a heart transplant. For example, if you have problems with your **kidneys** or **liver**, or you have been treated for cancer in the last five years, you usually won't be able to have a heart transplant.^[3] There is a shortage of donors and you may have to wait a long time for one that matches you.

The results from a heart transplant can be very good. You will probably see a big improvement in your symptoms and what you can do. About 8 in 10 people who have a heart transplant live for at least five years afterwards.^[135]

Devices to help your heart pump better

Ventricular assist devices help the heart pump better. You have them fitted in your chest.

These devices were originally used as a temporary treatment for people who needed to have a heart transplant. But now doctors are looking to see if they can be used for longer and instead of a heart transplant.

Ventricular assist devices take over the job of the left ventricle, the part of the heart that pumps blood around the body. Tubes from your left ventricle take blood from here to the device. The pump then pushes the blood back into the circulation system to go around the body.

These devices used to be very big and bulky and could only be used in hospital. They had to be connected to an electricity supply, which meant that patients were restricted in what they could do. But smaller devices are now available that can be fitted inside the chest. They run on batteries, which need to be recharged every eight hours or so.

However, ventricular assist devices are still very new. There hasn't been much research on how well they work or whether they are safe when used for a long time. Only a few specialist centres in the UK can put these devices in.

Devices that restore your heartbeat

If you have heart failure, you may also have an operation to fit a device that makes your heart beat properly. You may get an implantable **cardiac defibrillator** or a **pacemaker**.

A pacemaker is an electrical device that's implanted in your chest. It's used to treat an abnormal heartbeat. You'll have an operation to put the pacemaker under the skin in your chest, just under your collarbone.

Heart failure

The main part of a pacemaker is roughly the size of a pack of cards. It weighs about 25 grams (less than an ounce). It contains a battery and the electric circuits it needs to work. Wires run under your skin from the main part of the pacemaker to your heart. Electric pulses travel down the wires and make your heart beat in a steady rhythm.

A type of pacemaker that's used for some kinds of heart failure helps the left and right sides of your heart beat together. To read more, see [Having a pacemaker put in](#) .

A defibrillator is similar to a pacemaker. But instead of pacing your heart all the time, a defibrillator monitors your heartbeat. If your heart beats dangerously fast or stops, a defibrillator can shock it into beating normally again. This can save your life. To learn more, see [Having a defibrillator put in](#) .

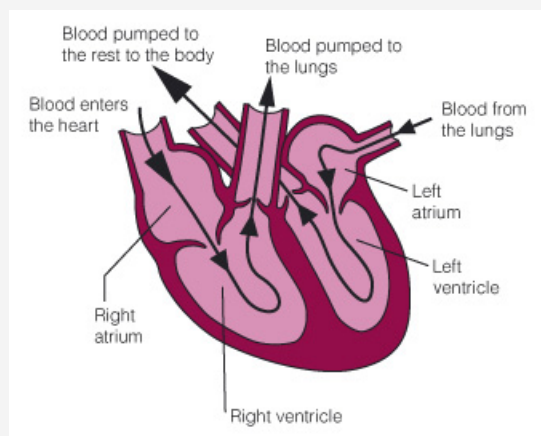
Some devices combine a defibrillator and a pacemaker.

Further informations:

What does my heart do?

Your heart pumps blood around your body. Blood is pumped to your lungs to pick up oxygen, then flows back to your heart. The blood, with its fresh supply of oxygen, is then pumped around your body.

Your heart can pump blood around your lungs and your body at the same time because it is divided into two halves, the left and the right. (When we talk about the left or right side of your heart, we mean your left and your right.) Each half has an upper chamber and a lower chamber.



The parts of your heart.

The two upper chambers of your heart are called **atria**. One of these chambers on its own is called an atrium. You have a left atrium and a right atrium.

The two larger chambers in the lower part of your heart are called your left and right **ventricles**.

Heart failure

Blood enters your heart through veins and leaves it through arteries. Veins and arteries run throughout your body.

How blood moves round your body

Your heart pumps blood through a network of tubes that runs around your body. These tubes are your blood vessels. There are two main types of blood vessel.

- **Arteries** carry blood around your body after it has picked up oxygen from your lungs.
- **Veins** are thinner than arteries. They carry blood back to your heart from around your body after its oxygen has been used.

Blood that has delivered its food and oxygen in your body returns to your heart through two big veins on the right-hand side. The blood enters the upper chamber (the right atrium). From there, it is pumped into the lower chamber (the right ventricle). This chamber pumps the blood to your lungs through a big blood vessel called the **pulmonary artery**. The blood picks up oxygen in your lungs.

Carrying the oxygen, the blood returns to your heart and enters the upper chamber on the left side (the left atrium). From there, it is pumped into the lower chamber (the left ventricle) and then out again around your body.

What happens when my heart beats?

The thump that you feel when you put your hand over the left side of your chest is your heart muscle pumping. Your heart's chambers get bigger to let blood flow into them, then get smaller to pump the blood out.

The two sides of your heart work together. As blood is pushed from the right ventricle to your lungs, the blood from the left ventricle is pumped out around your body.

Your heart beats about 60 to 80 times a minute, but this can rise to 150 times a minute if you are exercising hard.

Coronary artery disease

Coronary artery disease is the most common cause of heart failure.^[3] You get this disease when the arteries that carry blood to your heart get clogged with fatty deposits. Doctors call this atherosclerosis .

The arteries that get clogged aren't the big ones that carry blood away from your heart and around your body. They are the smaller blood vessels on the surface of your heart that deliver oxygen and food to the heart muscle itself. These are called your **coronary arteries**.

Heart failure

If your coronary arteries are narrowed by fatty deposits, they won't be able to take enough blood to your heart. If your heart doesn't get enough blood, it can't work as well as it should. If you have bad coronary artery disease, you could have a heart attack.

What is a heart attack?

A heart attack happens when one of your coronary arteries gets blocked and too little blood reaches your heart. Your heart doesn't get the oxygen and food it needs, and parts of your heart muscle start to die.

A heart attack is painful. It often causes a tight, crushing pain in the centre of your chest. It can also leave a scar on your heart muscle. If enough of your heart is scarred, it can't pump as well as it should.

A large study of people with heart disease found that almost 1 in 5 people who had a heart attack got heart failure in the next five years to six years. ^[4]

Risk factors for coronary artery disease

We don't know exactly why fatty deposits build up in some people's arteries. But we do know that some things make it more likely you'll have coronary artery disease and a heart attack. ^[5] ^[6] Doctors call these things **risk factors**. The more risk factors you have, the more likely you are to have a heart attack.

There are some risk factors you can't do anything about. But by stopping smoking and doing more exercise you can reduce your chances of getting coronary artery disease. Ask your doctor for help.

Smoking

In the UK, about 1 in 8 deaths from heart disease happen because of smoking. ^[7] Researchers don't know exactly how smoking harms your heart, but they do know that nicotine and other chemicals in cigarette smoke damage the lining of your arteries. And these chemicals also make blood stickier and more likely to clot.

Blood clots in the arteries that take blood to your heart (your coronary arteries) can block your heart's blood supply and cause parts of your heart muscle to die.

If you've already been diagnosed with heart failure, smoking is particularly dangerous.

If you stop smoking, you can reduce your risk of getting heart disease or having a heart attack. Things that can help you give up include nicotine gum, a nicotine skin patch, a drug called bupropion (Zyban), and counselling. To learn more, see our information on [Smoking](#) .

Diabetes

Having diabetes increases your risk of getting heart failure. And if you get heart failure, you're more likely to need hospital treatment if you have diabetes. ^[6]

Heart failure

Researchers think that diabetes changes the shape of the muscle that surrounds your heart. This makes it harder for your heart to work normally and increases your chances of getting heart failure.

Having diabetes means you have too much glucose in your blood. Glucose is a kind of sugar that your body uses as a source of energy. It can build up in your bloodstream and it makes you ill.

Diabetes doesn't go away. Untreated, it can lead to serious health problems. But if you make changes to your lifestyle, take medicine, and keep a close watch on your condition, you can keep your glucose levels under control. You should be able to live a long and healthy life.

There are two main types of diabetes: type 1 and type 2. Both types increase your risk of having heart problems. Controlling your blood glucose level can reduce your risk of having a heart attack or dying from heart disease.^[8] How you do this will depend on which type of diabetes you have.

- If you have **type 1 diabetes**, you'll need daily injections of insulin and you'll need to keep a careful watch on the glucose levels in your blood.
- If you have **type 2 diabetes**, you may need to take pills or you may need to take insulin.

Whichever type of diabetes you have, becoming more active and being careful about what you eat can help control your blood glucose levels. To learn more, see our articles on [type 1](#) and [type 2](#) diabetes.

High cholesterol

Cholesterol is a fatty substance in your blood. There two main types of cholesterol: 'bad' cholesterol (low-density lipoprotein cholesterol, or LDL) and 'good' cholesterol (high-density lipoprotein cholesterol, or HDL).

If you have high levels of bad cholesterol in your blood, you have a higher risk of getting heart disease and having a heart attack. Having more good cholesterol lowers your risk of heart disease.

Your cholesterol level is affected by what you eat, how much you exercise, and whether you smoke. It's also affected by your family history. If you have a high level of bad cholesterol, talk to your doctor about how you can lower it. To find out more, see our information on [High cholesterol](#) .

Being overweight

If you're overweight, you probably also have too much 'bad' cholesterol in your blood. This type of cholesterol can clog the blood vessels that take blood to your heart. Being

Heart failure

overweight also increases your chances of having high blood pressure . And carrying too much weight makes your heart work harder. All these things are bad for your heart.

If you want to find out whether you are overweight, you can work out your body mass index (BMI) using our [calculator](#) . Your body mass index compares your height with your weight.

People with a BMI of 25 or more are overweight. People with a BMI of 30 or more are obese. ^[9] .

Not getting enough exercise

There's good evidence that if you do some kind of exercise on most days, you can reduce your chances of getting heart disease. People who don't exercise regularly are two or three times more likely to get heart disease. ^[10] ^[11]

You don't need to do strenuous exercise. Going for a long walk every few days can help. Or you could swim or ride a bike.

Alcohol

Drinking too much alcohol on a regular basis can damage your heart. ^[6]

If your heart failure has been caused by drinking too much, stopping drinking can help your symptoms. ^[6]

High blood pressure and heart failure

Blood pressure is a measure of how hard your blood pushes against the walls of your blood vessels. If your arteries get clogged up with fatty deposits, they become hard and narrow. This is called atherosclerosis . Your blood pressure goes up because your heart has to work harder to pump the blood through these narrower arteries.

The part of your heart that takes most of strain when your arteries get narrower is the left lower chamber (the **left ventricle**). It gets bigger to try to cope with the extra work, just as your other muscles do when you exercise. But there are limits to how big this chamber can get. Eventually it won't be able to work hard enough to make up for the stiffness and narrowness of the blood vessels.

But there is some good news. There are tablets that can help keep high blood pressure under control. They can reduce your chances of getting heart failure by half. ^[12]

Some things increase your chances of getting high blood pressure. Doctors call these things **risk factors**.

You might be able to change some of these and reduce your chances of getting high pressure. Your doctor will be able to help.

Getting older

Blood pressure tends to go up as you get older. For example, just over 1 in 10 men aged between 16 and 24 have high blood pressure, compared with 7 in 10 men aged between 65 and 74.^[13] The same thing happens in women.

Your ethnic group

British people of black African or Caribbean origin are more likely to have high blood pressure.^[14] As many as half of all African-Caribbean people aged over 40 have high blood pressure. And people in this group have a higher risk of stroke and kidney failure than other British people.

British people of South Asian (Indian, Pakistani, or Bangladeshi) origin are also more likely to have high blood pressure and are more prone to strokes and heart attacks.^[14]

We're not sure why there are these differences among ethnic groups.

Being overweight

If you're overweight, you're more likely to have high blood pressure, especially if you carry this extra weight mainly on your stomach area rather than on your hips and thighs.^[15] We don't know why this is.

Doctors tend to use two measurements to work out whether you're overweight.

- Your **body mass index** (BMI). Your BMI relates your weight to your height. It tells you roughly how much body fat you have. If your BMI is more than 27, you have a higher risk of getting high blood pressure.^[16] You can use our [calculator](#) to work out your BMI.
- Your **waist measurement**. If you're a woman and your waist is more than 86 centimetres (34 inches), you are considered overweight. If you're a man and your waist is more than 99 centimetres (39 inches), you are considered overweight.

Exercise

If you don't get regular exercise, your chances of getting high blood pressure are much higher.^[17]

The British Hypertension Society recommends that:^[14]

- Younger, fitter people should do three sessions of exercise a week where they can feel their heart beating faster (that is, exercise where you get out of breath, such as jogging, rather than exercise where you improve muscle tone by weight training)
- Older people should aim to exercise for 20 minutes each day, say by walking briskly.

Heart failure

Eating and drinking the wrong things

Here's what we know about how what you eat and drink is linked to blood pressure.

- A balanced diet that is rich in fruit and vegetables and low in saturated fat is linked with lower blood pressure. (Saturated fats are fats that are usually solid at room temperature. They're mostly found in butter, cream, cheese, meat, and other animal products.)
- If you have more than two alcoholic drinks a day, you are up to twice as likely to get high blood pressure as someone who doesn't drink. ^[18]
- But there is some evidence that drinking one or two alcoholic drinks a day may protect you against heart disease even if you have high blood pressure.
- Eating too much salt is linked to high blood pressure, but the evidence on this is mixed. For some people, salt seems to be more dangerous than for other people. For example, older people and people with high blood pressure or diabetes are more likely to be affected by how much salt they eat.
- Your blood pressure may rise when you drink coffee, but there is no evidence that it has a lasting effect.

Smoking

Smoking can raise your blood pressure by as much as 10 points on the blood pressure scale.

Stress

There is some evidence that being in a very stressful situation can push up your blood pressure for a short time. But doctors aren't sure that feeling stressed has a lasting effect on your blood pressure. ^[19]

Heart valve disease

Valves in your heart keep blood flowing in the right direction. These valves can be damaged by an infection, for example.

If the valves in your heart are damaged, blood can leak backwards into the chamber it came from. This means your heart can't pump as well as it should.

To learn more, see [What does my heart do?](#)

Abnormal heart rhythms

Your heart may beat faster than it should. Or it may beat irregularly.

Having an irregular heartbeat means that instead of beating evenly (thump thump thump) like the ticking of a watch, your heart beats something like this: thump thump thump-thump thump. Abnormal rhythms make it hard for your heart to pump blood as well as it should.

To learn more, see [What does my heart do?](#)

Heart muscle diseases

The medical term for diseases in the heart muscle is **cardiomyopathy**. Some people are born with a disease in their heart muscle. Infections, such as HIV, can also cause damage. So can drinking too much alcohol and taking some drugs, including cocaine.

[20]

Sometimes doctors can't tell what caused the damage.

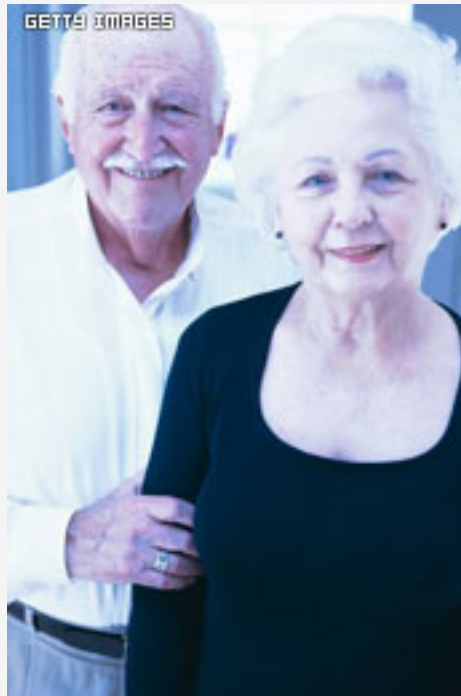
If your heart muscle is damaged, it usually means that the upper and lower chambers don't expand and contract properly as blood enters and leaves them. Your heart muscle gets bigger, but doesn't act as efficiently as a firm, toned muscle would.

To learn more, see [What does my heart do?](#)

Quality-of-life test

This test comes from McMaster University in Canada. It's used by doctors to help them work out how much trouble your heart failure is causing you.

Chronic Heart Failure Questionnaire



Doctors look at your quality of life to help them decide how bad your heart failure is.

Question one

Think of the activities that you have done during the last two weeks that have made you feel short of breath. These should be activities that you do frequently and that are important in your day-to-day life. Please list as many activities as you can that you have done during the last two weeks that have made you feel short of breath.

Question two

Can you think of any other activities you have done during the last two weeks that have made you feel short of breath?

Question three

Here is a list of activities that make some people with lung problems feel short of breath. If you have done any of these activities in the past two weeks, did they make you feel out of breath? The activities are:

- Being angry or upset
- Having a bath or shower
- Bending
- Carrying things, such as shopping

Heart failure

- Dressing
- Eating
- Going for a walk
- Doing your housework
- Hurrying
- Lying flat
- Making a bed
- Mopping or scrubbing the floor
- Moving furniture
- Playing with children or grandchildren
- Playing sport
- Reaching over your head
- Running, such as for a bus
- Shopping
- Talking
- Vacuuming
- Walking around your own home
- Walking uphill
- Walking up stairs
- Walking with others on level ground
- Preparing meals
- Trying to sleep.

Heart failure

If you've selected more than five activities, which five are most important in your day-to-day life?

Question four

How much shortness of breath have you experienced during the last two weeks while doing the five most important activities you have selected? (This counts as questions 4a-4e, as you're answering for each of the five activities.) Please indicate how much shortness of breath you have had during the last two weeks by choosing one of the following options (they all have a score from 1 to 7: lower means worse symptoms):

1. Extremely short of breath
2. Very short of breath
3. Quite a bit short of breath
4. Moderate shortness of breath
5. Some shortness of breath
6. A little shortness of breath
7. Not at all short of breath.

Question five

In general, how much of the time during the last two weeks have you felt frustrated or impatient?

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. Hardly any of the time
7. None of the time

Question six

What about fatigue? How tired have you felt over the last two weeks?

1. Extremely tired
2. Very tired
3. Quite tired

Heart failure

4. Moderately tired
5. Somewhat tired
6. A little tired
7. Not at all tired

Question seven

How often during the last two weeks have you felt inadequate, worthless, or as if you were a burden on others?

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. Hardly any of the time
7. None of the time

Question eight

How much energy have you had in the last two weeks?

1. No energy
2. A little energy
3. Some energy
4. Moderate amount of energy
5. Quite energetic
6. Very energetic
7. Extremely energetic

Question nine

In general, how much of the time did you feel upset, worried, or depressed during the last two weeks?

1. All of the time
2. Most of the time

Heart failure

3. A good bit of the time
4. Some of the time
5. A little of the time
6. Hardly any of the time
7. None of the time

Question ten

How much of the time during the last two weeks did you feel relaxed and free of tension?

1. None of the time
2. Hardly any of the time
3. A little of the time
4. Some of the time
5. A good bit of the time
6. Most of the time
7. All of the time

Question eleven

How often during the last two weeks have you felt low in energy?

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. Hardly any of the time
7. None of the time

Question twelve

In general, how often during the last two weeks have you felt discouraged or depressed?

1. All of the time
2. Most of the time

Heart failure

3. A good bit of the time
4. Some of the time
5. A little of the time
6. Hardly any of the time
7. None of the time

Question thirteen

How often during the last two weeks have you felt worn out or sluggish?

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. Hardly any of the time
7. None of the time

Question fourteen

How happy, satisfied, or pleased have you been with your personal life during the last two weeks?

1. Not at all happy, satisfied, or pleased
2. A little happy, satisfied, or pleased
3. Some happiness, satisfaction, or pleasure
4. Moderately happy, satisfied, or pleased
5. Quite happy, satisfied, or pleased
6. Very happy, satisfied, or pleased
7. Extremely happy, satisfied, or pleased

Question fifteen

In general, how often during the last two weeks have you felt restless or tense?

1. All of the time
2. Most of the time

Heart failure

3. A good bit of the time
4. Some of the time
5. A little of the time
6. Hardly any of the time
7. None of the time

Your score

The questions are divided into three categories:

- Shortness of breath (4a to 4e)
- Fatigue (6, 8, 11, and 13)
- Your emotions (5, 7, 9, 10, 12, 14, and 15).

Each question has a score from 1 to 7, with 1 meaning severe heart failure and 7 less severe heart failure. The scores for the questions in each category are added together. The minimum and maximum scores for each category are:

Category	Minimum score (worst function)	Maximum score (best function)
Shortness of breath	5	35
Fatigue	4	28
Emotional function	7	49

A low score means your heart failure is stopping you doing things, or making you frustrated or unhappy. A higher score means your heart failure doesn't affect your life so much. In some studies on treatments for heart failure, researchers use questionnaires like this to see if a treatment helps people enjoy life more.

Questionnaire adapted from Guyatt, et al., Development and testing of a new measure of health status for clinical trials in heart failure.

The Chronic Heart Failure Questionnaire is a copyrighted work owned by McMaster University, Hamilton, Canada. Any use of the questionnaire requires a licence. Licensing details may be obtained by contacting orcip@mcmaster.ca or by writing to the Office of Research Contracts and Intellectual Property, McMaster University, HSC 3N43, 1200 Main Street West, Hamilton, Ontario, Canada L8N 3Z5.

Heart failure

Six-minute walk test

This test measures how bad your heart failure is by working out how far you can walk in six minutes.

Most people can do this test, although you may need to stop if you become short of breath, get chest pain, or feel tired, dizzy, or light-headed. Usually, the test is done in a corridor along a course that is 30 metres (100 feet) long. The distance is usually marked by a chair at each end.

You walk from one end of the corridor to the other at your own pace, trying to cover as much ground as possible. A nurse usually times the test, calling out the time every two minutes.

The nurse will encourage you to walk as far as you can. You can stop and rest on the way.

After six minutes, you are asked to stop. The distance you walked is measured and any symptoms you had during the test are written down. The test aims to imitate the amount of effort you use in your day-to-day activities.

Treating diastolic heart failure

Doctors can't say for sure which treatments work best for diastolic heart failure.

About 2 in 10 to 4 in 10 people with heart failure have **diastolic heart failure**.^[34] This means that the heart doesn't relax enough to allow it to fill with blood. So when it pumps it doesn't have enough blood in it.

This type of heart failure is most common in older women, especially if they have [high blood pressure](#).^[35] Doctors aren't sure why this is.

There hasn't been much research on treatments for diastolic heart failure. And the studies that have been done have been small, and the results aren't clear.^[34] So doctors can't say for sure which treatments work best for diastolic heart failure.

If you have diastolic heart failure, your doctor will usually treat the problems that caused it. So if you have high blood pressure, you'll have treatment to lower your blood pressure. And if your heart beats too quickly, you'll have treatment to help your heart beat more slowly.

Here we summarise the guidelines from the American Heart Association about treating diastolic heart failure.^[34] (This is different to the NYHA classification.) Treatments for diastolic heart failure depend on how bad the heart failure is.

Heart failure

- **Class I** is the mildest form of heart failure and means you can climb a flight of stairs or walk up a short slope without getting out of breath.
- If you get symptoms with either of these activities then you have **class II** heart failure.
- **Class IIb** is slightly more severe than **class IIa**.

Treatments for class I diastolic heart failure

- If you have high blood pressure, you'll be given drug treatment for this. To learn more, see our articles on [high blood pressure](#).
- You may be given drugs to slow your heartbeat. For example, you may be given a drug called a [beta-blocker](#).
- If your body is holding on to fluid, you may be treated with a [diuretic](#).

Treatments for class IIa diastolic heart failure

If the blood vessels to your heart are narrowed because fatty material has collected in them, and your doctor thinks this is a cause of your heart failure, you may be advised to have an operation to widen these blood vessels. There are two ways of doing this:

- If you have **angioplasty**, doctors use a tiny balloon to push the fatty material to the side of the blood vessels to let the blood flow more easily
- If you have **coronary artery bypass**, doctors take healthy blood vessels from another part of your body (often your leg) and use them to take over the job of the ones in the heart that have become narrowed.

Treatments for class IIb diastolic heart failure

- If the top chambers in your heart quiver instead of beat normally (this is called **atrial fibrillation**), you might be given drug treatment or have a device fitted in your chest (called a pacemaker) to keep your heart beating normally.
- You might be treated with [beta-blockers](#), [ACE inhibitors](#), [angiotensin II receptor blockers](#), or [calcium channel blockers](#) in the same way as people with systolic heart failure.
- You might be treated with a drug called [digoxin](#).

Heart failure

More about angiotensin and ACE

Angiotensin II is a chemical that your body makes when it notices that less blood is being pumped around it. This can happen when you have heart failure.

Your blood carries a mix of food and oxygen that is used to feed the cells in your body. When the amount of blood flowing around your body falls, your cells don't get enough food and oxygen.

Angiotensin II tries to help your body cope with less blood by making your body save salt and water. It does this to try to increase the amount of fluid travelling through your blood vessels. Angiotensin II also makes your heart use more oxygen than usual.

Drugs called [angiotensin II receptor blockers](#) work by stopping the effects of angiotensin.

The chemical angiotensin II is made from another chemical called angiotensin I by using an enzyme called angiotensin-converting enzyme (ACE). Drugs called [ACE inhibitors](#) work by stopping your body from changing angiotensin I into angiotensin II by preventing angiotensin-converting enzyme from working.

Glossary:

high cholesterol

If you've been told that you have high cholesterol it usually means that your total cholesterol level is 5mmol/l or higher. But doctors also look at the amount of good (HDL) and bad (LDL) cholesterol you have in your blood. Having high levels of bad cholesterol can make it more likely that you'll get certain diseases in your heart and arteries.

atherosclerosis

Atherosclerosis is also called 'hardening of the arteries'. It happens when fatty material sticks to the inner wall of your arteries. Over time, cholesterol, fats and other things in your blood stick to the same area and the artery wall becomes thick and narrow, making it progressively more difficult for blood to flow through the affected vessels.

coronary arteries

Coronary arteries are the vessels that supply blood to the heart muscle. If yours are blocked, you may have a pain in your chest (known as angina) or a heart attack because parts of the heart are not getting enough blood and oxygen.

high blood pressure

Your blood pressure is considered to be high when it is above the accepted normal range. The usual limit for normal blood pressure is 140/90. If either the first (systolic) number is above 140 or the lower (diastolic) number is above 90, a person is considered to have high blood pressure. Doctors sometimes call high blood pressure 'hypertension'.

blood pressure

Blood pressure is the amount of force that's exerted by your blood on to your blood vessels. You can think of it like the water pressure in your home: the more pressure you have, the faster and more forcefully the water flows out of the shower. Blood pressure is measured in millimetres of mercury (written as mm Hg). When your blood pressure is taken, the measurement is given as two numbers, for example 120/80 mm Hg. The first, higher, number is called the systolic pressure, and the second, lower, number is the diastolic pressure. The systolic number is the highest pressure that occurs while your heart is pushing blood into your arteries. The diastolic number is the lowest pressure that happens when your heart is relaxing and is not pushing your blood.

diabetes

Diabetes is a condition that causes too much sugar (glucose) to circulate in the blood. It happens when the body stops making a hormone called insulin (type 1 diabetes) or when insulin stops working (type 2 diabetes).

cardiomyopathy

Cardiomyopathy is an illness in which your heart muscle is weakened or inflamed, which makes it unable to work normally.

electrocardiogram

An electrocardiogram is a test that measures the electrical activity in your heart. The test doesn't hurt. It tells doctors how well your heart is working. It is called ECG for short.

Heart failure

hormones

Hormones are chemicals that are made in certain parts of the body. They travel through the bloodstream and have an effect on other parts of the body. For example, the female sex hormone oestrogen is made in a woman's ovaries. Oestrogen has many different effects on a woman's body. It makes the breasts grow at puberty and helps control periods. It is also needed to get pregnant.

ultrasound

Ultrasound is a tool doctors use to create images of the inside of your body. An ultrasound machine sends out high-frequency sound waves, which are directed at an area of your body. The waves reflect off parts of your body to create a picture. Ultrasound is often used to see a developing baby inside a woman's womb.

liver

Your liver is on the right side of your body, just below your ribcage. Your liver does several things in your body, including processing and storing nutrients from food, and breaking down chemicals, such as alcohol.

kidney

Your kidneys are organs that filter your blood to make urine. You have two kidneys, on either side of your body. They are underneath your ribcage, near your back.

X-ray

X-rays are pictures taken of the inside of your body. They are made by passing small amounts of radiation through your body and then onto film.

peak flow meter

A small plastic tube that you blow into to measure the flow of air from your lungs.

NSAIDs

NSAID stands for nonsteroidal anti-inflammatory drug. NSAIDs help with pain, inflammation and fever. They are called 'nonsteroidal' because they don't contain any steroids. Aspirin and ibuprofen are both NSAIDs.

angina

Angina is the name that doctors use for a pain in your chest that you get when your heart muscle isn't getting enough oxygen.

systematic reviews

A systematic review is a thorough look through published research on a particular topic. Only studies that have been carried out to a high standard are included. A systematic review may or may not include a meta-analysis, which is when the results from individual studies are put together.

placebo

A placebo is a 'pretend' or dummy treatment that contains no active substances. A placebo is often given to half the people taking part in medical research trials, for comparison with the 'real' treatment. It is made to look and taste identical to the drug treatment being tested, so that people in the studies do not know if they are getting the placebo or the 'real' treatment. Researchers often talk about the 'placebo effect'. This is where patients feel better after having a placebo treatment because they expect to feel better. Tests may indicate that they actually are better. In the same way, people can also get side effects after having a placebo treatment. Drug treatments can also have a 'placebo effect'. This is why, to get a true picture of how well a drug works, it is important to compare it against a placebo treatment.

low blood pressure

If your blood pressure is about 100/60 or less, your doctor may say that you have low blood pressure. Low blood pressure is usually not a problem unless it becomes too low to push blood to your brain and the rest of the body. If you have low blood pressure, you may sometimes feel dizzy when you stand up.

asthma

Asthma is a disease of the lungs. It makes you wheeze, cough and feel short of breath. Asthma attacks are caused by inflammation and narrowing of your airways, which makes it hard for air to pass in and out of your lungs.

bronchitis

Bronchitis is inflammation of one or both of the major airways (called bronchi) that lead in and out of your lungs.

randomised controlled trials

Randomised controlled trials are medical studies designed to test whether a treatment works. Patients are split into groups. One group is given the treatment being tested (for example, an antidepressant drug) while another group (called the comparison or control group) is given an alternative treatment. This could be a different type of drug or a dummy treatment (a placebo). Researchers then compare the effects of the different treatments.

diuretics

Diuretics are a type of medicine that reduce the amount of fluid in your body. The extra fluid is removed in your urine.

meta-analysis

Heart failure

A meta-analysis puts together the results of a number of studies. A meta-analysis is used if individual studies are too small for any definite conclusions to be drawn about a treatment. Pooling together results from a number of studies may help say for sure what the effects of the treatment are.

thyroid gland

Your thyroid gland is a small organ that sits in your neck, just in front of your windpipe. It sends out a hormone called thyroxine. This acts on receptors within cells. By acting on the receptors it gives the cells a message to speed up their metabolism and work harder.

intravenous infusion

When a medicine or a fluid, such as blood, is fed directly into a vein, it's called an intravenous infusion (or IV). To give you an intravenous infusion, a nurse, technician or a doctor places a narrow plastic tube into a vein (usually in your arm) using a needle. The needle is then removed and the fluid is infused (or dripped) through the tube into the vein.

positive inotropic drugs

Positive inotropic drugs are drugs that make your heart beat more strongly. They are used to treat heart failure. 'Inotropic' means something that affects how a muscle tightens.

Sources for the information on this leaflet:

1. Clark AL, McDonagh T. The origin of symptoms in chronic heart failure. *Heart*. 1997; 78: 429-430.
2. Fox KF, Cowie MR, Wood DA, et al. Coronary artery disease as the cause of incident heart failure in the population. *European Heart Journal*. 2001; 22: 228-236.
3. National Institute for Health and Care Excellence. Chronic heart failure: management of chronic heart failure in adults in primary and secondary care. August 2010. Clinical guideline 108. Available at <http://guidance.nice.org.uk/CG108> (accessed on 15 September 2014).
4. Ho KK, Pinsky JL, Kannel WB, et al. The epidemiology of heart failure: the Framingham Study. *Journal of the American College of Cardiology*. 1993; 22: 6-13.
5. National Heart Lung and Blood Institute. What are coronary heart disease risk factors? September 2011. Available at <http://www.nhlbi.nih.gov/index.htm> (accessed on 15 September 2014).
6. Gibbs CR, Davies MK, Lip GYH. ABC of heart failure. BMJ Books, Birmingham, UK; 2000.
7. American College of Cardiology. Coronary heart disease statistics 2004. Available at <http://www.cardiosmart.org/heartdisease/ctt.aspx?id=790> (accessed on 15 September 2014).
8. Lawson ML, Gerstein HC, Tsui E, et al. Effect of intensive therapy on early macrovascular disease in young individuals with type 1 diabetes: a systematic review and meta-analysis. *Diabetes Care*. 1999; 22 (supplement 2): S35-S39.
9. National Institute for Health and Care Excellence. Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children. December 2006. Clinical guideline 43. Available at <http://www.nice.org.uk/Guidance/CG43> (accessed on 15 September 2014).
10. Batty GD. Physical activity and coronary heart disease in older adults: a systematic review of epidemiological studies. *European Journal of Public Health*. 2002; 12: 171-176.
11. Pate RR, Pratt M, Blair SN, et al. Physical activity and public health: recommendations from the Center for Disease Control and Prevention and the American College of Sports Medicine. *Journal of the American Medical Association*. 1995; 273: 402-407.
12. Cowie MR, Mosterd A, Wood DA, et al. The epidemiology of heart failure. *European Heart Journal*. 1997; 18: 208-225.
13. British Heart Foundation. Blood pressure levels by sex and age, 2003, England (table). Available at <http://www.bhf.org.uk/research/statistics.aspx> (accessed on 15 September 2014).
14. Williams B, Poulter NR, Brown MJ, et al. The BHS Guidelines Working Party guidelines for management of hypertension: report of the fourth working party of the British Hypertension Society. *Journal of Human Hypertension*. 2004; 18: 139-185.
15. National Institute of Health, National Heart, Lung, and Blood Institute (NHLBI). Your guide to lowering high blood pressure. Available at http://www.nhlbi.nih.gov/files/docs/public/heart/hbp_low.pdf (accessed on 15 September 2014).

Heart failure

16. Metz JA, Stern JS, Kris-Etherton P, et al. A randomized trial of improved weight loss with a prepared meal plan in overweight and obese patients: impact on cardiovascular risk reduction. *Archives of Internal Medicine*. 2000; 160: 2150-2158.
17. National Institutes of Health, National Heart, Lung and Blood Institute, National High Blood Pressure Education Program. The Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Archives of Internal Medicine*. 1997; 157: 2413-2446.
18. Fuchs FD, Chambless LE, Whelton PK, et al. Alcohol consumption and the incidence of hypertension. *Hypertension*. 2001; 37: 1242-1250.
19. Beevers G, Lip GYH, O'Brien E (editors). *ABC of hypertension*. 4th edition. BMJ Books, London, UK; 2001.
20. Poole-Wilson PA. History, definition, and classification of heart failure. In: *Heart failure: scientific principles and clinical practice*. Churchill Livingstone, London, UK; 1997.
21. Scottish Intercollegiate Guidelines Network. Management of chronic heart failure. February 2007. Guideline 95. Available at <http://www.sign.ac.uk/pdf/sign95.pdf> (accessed on 15 September 2014).
22. Khunti K, Baker R, Grimshaw G. Diagnosis of patients with chronic heart failure in primary care: usefulness of history, examination, and investigations. *British Journal of General Practice*. 2000; 50: 50-54.
23. British Heart Foundation. Heart failure. Available at <http://www.bhf.org.uk/heart-health/conditions/heart-failure.aspx> (accessed on 15 September 2014).
24. Cowie MR, Kirby M. *Managing heart failure in primary care: a practical guide*. Bladon Medical Publishing, Chipping Norton, UK; 2003.
25. NHS Choices. Heart failure. October 2010. Available at <http://www.nhs.uk> (accessed on 15 September 2014).
26. Department of Health. Coronary heart disease: national service framework for coronary heart disease - modern standards and service models: executive summary. March 2000. Available at http://webarchive.nationalarchives.gov.uk/20080910134953/dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4094275 (accessed on 15 September 2014).
27. Petersen S, Peto V, Rayner M. Coronary heart disease statistics 2004. Available at <http://www.heartstats.org> (accessed on 15 September 2014).
28. Pocock SJ, Ariti CA, McMurray JJ, et al. Predicting survival in heart failure: a risk score based on 39 372 patients from 30 studies. *European Heart Journal*. 2013; 34: 1404-1413.
29. Chaudhry SI, McAvay G, Chen S, et al. Risk factors for hospital admission among older persons with newly diagnosed heart failure: findings from the Cardiovascular Health Study. *Journal of the American College of Cardiology*. 2013; 61: 635-642.
30. Gheorghiade M, Benatar D, Konstam MA, et al. Pharmacotherapy for systolic dysfunction: a review of randomized clinical trials. *American Journal of Cardiology*. 1997; 80: 14-27.
31. Parashar S, Katz R, Smith NL, et al. Race, gender, and mortality in adults ≥ 65 years of age with incident heart failure (from the Cardiovascular Health Study). *American Journal of Cardiology*. 2009; 103: 1120-1127.
32. Blackledge HM, Newton J, Squire IB. Prognosis for South Asian and white patients newly admitted to hospital with heart failure in the United Kingdom: historical cohort study. *BMJ*. 2003; 327: 526-531.
33. Doust JA, Glasziou PP, Pietrzak E, et al. A systematic review of the diagnostic accuracy of natriuretic peptides for heart failure. *Archives of Internal Medicine*. 2004; 164: 1978-1984.
34. Hunt SA, Abraham WT, Chin MH, et al. 2009 focused update incorporated into the ACC/AHA 2005 guidelines for the diagnosis and management of heart failure in adults. *Circulation*. 2009; 119: 391-479.

Heart failure

35. Davie AD, Francis CM, Carvana I, et al. The prevalence of left ventricular diastolic filling abnormalities in patients with suspected heart failure. *European Heart Journal*. 1997; 18: 941-944.
36. American Heart Association. Heart failure medications. June 2011. Available at <http://www.heart.org> (accessed on 15 September 2014).
37. Garg R, Yusuf S. Overview of randomized trials of angiotensin-converting enzyme inhibitors on mortality and morbidity in patients with heart failure. *Journal of the American Medical Association*. 1995; 273: 1450-1456.
38. Flather M, Kober L, Pfeffer MA, et al. Meta-analysis of individual patient data from trials of long-term ACE-inhibitor treatment after acute myocardial infarction (SAVE, AIRE and TRACE studies). *Circulation*. 1997; 96 (supplement 1): S1-S706.
39. The SOLVD Investigators. Effect of enalapril on mortality and the development of heart failure in asymptomatic patients with reduced left ventricular ejection fractions. *New England Journal of Medicine*. 1992; 327: 685-691.
40. Heart Outcomes Prevention Evaluation Study Investigators. Effects of ramipril on cardiovascular and microvascular outcomes in people with diabetes mellitus: results of the HOPE study and MICRO-HOPE substudy. *Lancet*. 2000; 355: 253-259.
41. Rutherford JD, Pfeffer MA, Moye LA, et al. Effects of captopril on ischemic events after myocardial infarction. Results of the Survival and Ventricular Enlargement trial. *Circulation*. 1994; 90: 1731-1738.
42. Jong P, Yusuf S, Rousseau MF, et al. Effect of enalapril on 12-year survival and life. *Lancet*. 2003; 361: 1843-1848.
43. Dagenais GR, Pogue J, Fox K, et al. Angiotensin-converting-enzyme inhibitors in stable vascular disease without left ventricular systolic dysfunction or heart failure: a combined analysis of three trials. *Lancet*. 2006; 368: 581-588.
44. European Medicines Agency. PRAC recommends against combined use of medicines affecting the renin-angiotensin (RAS) system. April 2014. Available at http://www.ema.europa.eu/docs/en_GB/document_library/Press_release/2014/04/WC500165197.pdf (accessed 14 October 2014).
45. Agusti A, Bonet S, Arnau JM, et al. Adverse effects of ACE inhibitors in patients with chronic heart failure and/or ventricular dysfunction: meta-analysis of randomized clinical trials. *Drug Safety*. 2003; 26: 895-908.
46. British National Formulary. Table of drugs to be avoided or used with caution in pregnancy. Appendix 4. British Medical Association and Royal Pharmaceutical Society of Great Britain. Also available at <http://bnf.org> (accessed on 15 September 2014).
47. Lee VC, Rhew DC, Dylan M, et al. Meta-analysis: angiotensin-receptor blockers in chronic heart failure and high risk acute myocardial infarction. *Annals of Internal Medicine*. 2004; 141: 693-704.
48. Shibata MC, Tsuyuki RT, Wiebe N. The effects of angiotensin-receptor blockers on mortality and morbidity in heart failure: a systematic review. *International Journal of Clinical Practice*. 2008; 62: 1397-1402.
49. Phillips CO, Kashani A, Ko DK, et al. Adverse effects of combination angiotensin II receptor blockers plus angiotensin-converting enzyme inhibitors for left ventricular dysfunction: a quantitative review of data from randomized clinical trials. *Archives of Internal Medicine*. 2007; 167: 1930-1936.
50. Dimopoulos K, Sulukhe TV, Coats AJS, et al. Meta-analyses of mortality and morbidity effects of an angiotensin receptor blocker in patients with chronic heart failure already receiving on ACE inhibitor (alone or with a beta-blocker). *International Journal of Cardiology*. 2004; 93: 105-111.
51. Yusuf S, Pfeffer MA, Swedberg K, et al. Effects of candesartan in patients with chronic heart failure and preserved left-ventricular ejection fraction. *Lancet*. 2003; 362: 777-781.
52. Massie BMC, Donovan AS. Irbesartan in patients with heart failure and preserved ejection fraction. *New England Journal of Medicine*. 2008; 359: 2456-2467.
53. British National Formulary. Angiotensin-II receptor antagonists. Section 2.6.2. British Medical Association and Royal Pharmaceutical Society of Great Britain. Also available at <http://www.bnf.org> (accessed on 15 September 2014).

Heart failure

54. Lee VC, Rhew DC, Dylan M, et al. Meta-analysis: angiotensin-receptor blockers in chronic heart failure and high risk acute myocardial infarction. *Annals of Internal Medicine*. 2004; 141: 693-704.
55. Brophy JM, Joseph L, Rouleau JL. Beta-blockers in congestive heart failure: a Bayesian meta-analysis. *Annals of Internal Medicine*. 2001; 134: 550-560.
56. Whorlow SL, Krum H. Meta-analysis of effect of beta-blocker therapy on mortality in patients with New York Heart Association class IV chronic congestive heart failure. *American Journal of Cardiology*. 2000; 86: 886-889.
57. Beta-Blocker Evaluation of Survival Trial Investigators. A trial of the beta-blocker bucindolol in patients with advanced chronic heart failure. *New England Journal of Medicine*. 2001; 344: 1659-1667.
58. Chatterjee S, Biondi-Zoccai G, Abbate A, et al. Benefits of beta-blockers in patients with heart failure and reduced ejection fraction: network meta-analysis. *BMJ*. 2013; 346: f55.
59. Haas SJ, Vos T, Gilbert RE, et al. Are beta-blockers as efficacious in patients with diabetes mellitus as in patients without diabetes mellitus who have chronic heart failure? A meta-analysis of large-scale clinical trials. *American Heart Journal*. 2003; 146: 848-853.
60. Abdulla J, Kober L, Christensen E, et al. Effect of beta-blocker therapy on functional status in patients with heart failure: a meta-analysis. *European Journal of Heart Failure*. 2006; 8: 522-531.
61. Ko DT, Hebert PR, Coffey CS, et al. Adverse effects of beta-blocker therapy for patients with heart failure: a quantitative overview of randomised trials. *Archives of Internal Medicine*. 2004; 164: 1389-1394.
62. Lonn E, McKelvie R. Drug treatment in heart failure. *BMJ*. 2000; 320: 1188-1192.
63. Hood WB, Dans AL, Guyatt GH, et al. Digitalis for treatment of congestive heart failure in patients in sinus rhythm: A systematic review and meta-analysis. *Journal of Cardiac Failure*. 2004; 10: 155-164.
64. The Digitalis Investigation Group. The effect of digoxin on mortality and morbidity in patients with heart failure. *New England Journal of Medicine*. 1997; 336: 525-533.
65. Hood WB, Dans AL, Guyatt GH, et al. Digitalis for treatment of congestive heart failure in patients in sinus rhythm: a systematic review and meta-analysis. *Journal of Cardiac Failure*. 2004; 10: 155-164.
66. Kasper EK, Gerstenblith G, Hefter G, et al. A randomized trial of the efficacy of multidisciplinary care in heart failure outpatients at high risk of hospital readmission. *Journal of the American College of Cardiology*. 2002; 39: 471-480.
67. Atienza F, Anguita M, Martinez-Azamora N, et al. Multicenter randomised trial of a comprehensive hospital discharge and outpatient heart failure management program. *European Journal of Heart Failure*. 2004; 6: 643-652.
68. Gohler A, Januzzi JL, Worrell SS, et al. A systematic meta-analysis of the efficacy and heterogeneity of disease management programs in congestive heart failure. *Journal of Cardiac Failure*. 2006; 12: 554-567.
69. Clark RA, Inglis SC, McAlister FA, et al. Telemonitoring or structured telephone support programmes for patients with chronic heart failure: systematic review and meta-analysis. *BMJ*. 2007; 334: 942.
70. Holland R, Battersby J, Harvey I, et al. Systematic review of multidisciplinary interventions in heart failure (provisional record). *Heart*. 2005; 91: 899-906.
71. Kozak AT, Rucker-Whitaker C, Basu S, et al. Elements of nonpharmacologic interventions that prevent progression of heart failure: a meta-analysis. *Congestive Heart Failure*. 2007; 13: 280-287.
72. Koshman SL, Charrois TL, Simpson SH, et al. Pharmacist care of patients with heart failure: a systematic review of randomized trials. *Archives of Internal Medicine*. 2008; 168: 687-694.
73. Inglis SC, Pearson S, Treen S, et al. Extending the horizon in chronic heart failure: effects of multidisciplinary, home-based intervention relative to usual care. *Circulation*. 2006; 114: 2466-2473.

Heart failure

74. Thomas R, Huntley A, Mann M, et al. Specialist clinics for reducing emergency admissions in patients with heart failure: a systematic review and meta-analysis of randomised controlled trials. *Heart*. 2013; 99: 233-239.
75. Inglis SC, Clark RA, McAlister FA, et al. Structured telephone support or telemonitoring programmes for patients with chronic heart failure. In: *The Cochrane Library*. Chichester, UK: John Wiley & Sons, Ltd.
76. McAlister FA, Ezekowitz JA, Wiebe N, et al. Systematic review: cardiac resynchronization in patients with symptomatic heart failure. *Annals of Internal Medicine*. 2004; 141: 381-390.
77. McAlister FA, Ezekowitz J, Hooton N, et al. Cardiac resynchronization therapy for patients with left ventricular systolic dysfunction: a systematic review. *Journal of the American Medical Association*. 2007; 297: 2502-2514.
78. Freemantle N. Cardiac resynchronisation for patients with heart failure due to left ventricular systolic dysfunction: a systematic review and meta-analysis (Provisional record). *European Journal of Heart Failure*. 2006; 8: 433-440.
79. Linde C, Abraham WT, Gold MR, et al. Randomized trial of cardiac resynchronization in mildly symptomatic heart failure patients and in asymptomatic patients with left ventricular dysfunction and previous heart failure symptoms. *Journal of the American College of Cardiology*. 2008; 52: 1834-1843.
80. Al-Majed NS, McAlister FA, Bakal JA, et al. Meta-analysis: cardiac resynchronization therapy for patients with less symptomatic heart failure. *Annals of Internal Medicine*. 2011; 154: 401-412.
81. Leon AR, Abraham WT, Curtis AB, et al. Safety of transvenous cardiac resynchronization system implantation in patients with chronic heart failure: combined results of over 2,000 patients from a multicenter study program. *Journal of the American College of Cardiology*. 2005; 46: 2348-2356.
82. Cleland JGF, Daubert JC, Erdmann E, et al. The effect of cardiac resynchronization on morbidity and mortality in heart failure. *New England Journal of Medicine*. 2005; 352: 1539-1549.
83. McAlister FA, Ezekowitz JA, Wiebe N, et al. Systematic review: cardiac resynchronization in patients with symptomatic heart failure. *Annals of Internal Medicine*. 2004; 141: 381-390.
84. British National Formulary. Drugs affecting the renin-angiotensin system. Section 2.5.5. British Medical Association and Royal Pharmaceutical Society of Great Britain. Also available at <http://bnf.org> (accessed on 15 September 2014).
85. Ezekowitz JA, McAlister FA. Aldosterone blockade and left ventricular dysfunction: a systematic review of randomized clinical trials. *European Heart Journal*. 2009; 30: 469-477.
86. Zannad F, Kessler M, Leheret P, et al. Prevention of cardiovascular events in end-stage renal disease: Results of a randomized trial of fosinopril and implications for future studies. *Kidney International* 2006; 70: 1318-1324
87. Phelan D, Thavendiranathan P, Collier P, et al. Aldosterone antagonists improve ejection fraction and functional capacity independently of functional class: a meta-analysis of randomised controlled trials. *Heart*. 2012; 98: 1693-1700.
88. ExTraMATCH Collaborative. Exercise training meta-analysis of trials in patients with chronic heart failure. *BMJ*. 2004; 328: 189-192.
89. Dracup K, Evangelista LS, Hamilton MA, et al. Effects of a home-based exercise program on clinical outcomes in heart failure. *American Heart Journal*. 2007; 154: 877-883.
90. Belardinelli R, Georgiou D, Cianci G, et al. 10-year exercise training in chronic heart failure: a randomized controlled trial. *Journal of the American College of Cardiology*. 2012; 60: 1521-1528.
91. Smart N, Marwick TH. Exercise training for patients with heart failure: a systematic review of factors that improve mortality and morbidity. *American Journal of Medicine*. 2004; 116: 693-706.
92. Chen YM, Li Y. Safety and efficacy of exercise training in elderly heart failure patients: a systematic review and meta-analysis. *International Journal of Clinical Practice*. 2013; 67: 1192-1198.

Heart failure

93. Taylor RS, Sagar VA, Davies EJ, et al. Exercise-based rehabilitation for heart failure (Cochrane review). In: The Cochrane Library. Wiley, Chichester, UK.
94. Haykowsky MJ, Liang Y, Pechter D, et al. A meta-analysis of the effect of exercise training on left ventricular remodeling in heart failure patients: the benefit depends on the type of training performed. *Journal of the American College of Cardiology*. 2007; 49: 2329-2336.
95. Rees K, Taylor RS, Singh S, et al. Exercise based rehabilitation for heart failure (Cochrane review). In: The Cochrane Library. Wiley, Chichester, UK.
96. Smart N, Marwick TH. Exercise training for patients with heart failure: a systematic review of factors that improve mortality and morbidity. *American Journal of Medicine*. 2004; 116: 693-706.
97. Chien CL, Lee CM, Wu YW, et al. Home-based exercise increases exercise capacity but not quality of life in people with chronic heart failure: a systematic review. *Australian Journal of Physiotherapy*. 2008; 54: 87-93.
98. The Antiarrhythmic Versus Implantable Defibrillators (AVID) Investigators. A comparison of antiarrhythmic drug therapy with implantable defibrillators in patients resuscitated from near-fatal ventricular arrhythmias. *New England Journal of Medicine*. 1997; 337: 1576-1583.
99. Ezekowitz JA, Armstrong PW, McAlister FA, et al. Implantable cardioverter defibrillators in primary and secondary prevention: a systematic review of randomised, controlled trials. *Annals of Internal Medicine*. 2003; 138: 445-452.
100. Desai AS, Fang JC, Maisel WH, et al. Implantable defibrillators for the prevention of mortality in patients with nonischemic cardiomyopathy: a meta-analysis of randomised controlled trials. *Journal of the American Medical Association*. 2004; 292: 2874-2879.
101. Ezekowitz JA, Armstrong PW, McAlister FA. Implantable cardioverter defibrillators in primary and secondary prevention: a systematic review of randomised, controlled trials. *Annals of Internal Medicine*. 2003; 138: 445-452.
102. Desai AS, Fang JC, Maisel WH, et al. Implantable defibrillators for the prevention of mortality in patients with nonischemic cardiomyopathy: a meta-analysis of randomised controlled trials. *Journal of the American Medical Association*. 2004; 292: 2874-2879.
103. British National Formulary. Vasodilator antihypertensive drugs. Section 2.5.1. British Medical Association and Royal Pharmaceutical Society of Great Britain. Also available at <http://bnf.org> (accessed on 15 September 2014).
104. Taylor AL, Ziesche S, Yancy C, et al. Combination of isosorbide dinitrate and hydralazine in blacks with heart failure. *New England Journal of Medicine*. 2004; 351: 2049-2057.
105. Cohn JN, Archibald DG, Ziesche S, et al. Effect of vasodilator therapy on mortality in chronic congestive heart failure. Results of a Veterans Administration Cooperative Study. *The New England Journal of Medicine*. 1986; 314: 1547-1552.
106. electronic Medicines Compendium. Apresoline Tablets 25 mg. April 2014. Available at <http://www.medicines.org.uk/EMC/medicine/10820/SPC/Apresoline+Tablets+25+mg> (accessed on 15 September 2014).
107. Piepoli M, Villani GQ, Ponikowski P, et al. Overview and meta-analysis of randomised trials of amiodarone in chronic heart failure. *International Journal of Cardiology*. 1998; 66: 1-10.
108. Amiodarone Trials Meta-Analysis Investigators. Effect of prophylactic amiodarone on mortality after acute myocardial infarction and in congestive heart failure: meta-analysis of individual data from 6500 patients in randomised trials. *Lancet*. 1997; 350: 1417-1424.
109. Amiodarone Trials Meta-Analysis Investigators. Effect of prophylactic amiodarone on mortality after acute myocardial infarction and in congestive heart failure: meta-analysis of individual data from 6,500 patients in randomised trials. *Lancet*. 1997; 350: 1417-1424.
110. Lip GY, Shantsila E. Anticoagulation versus placebo for heart failure in sinus rhythm (Cochrane review). In: The Cochrane Library. Wiley, Chichester, UK.
111. Cleland JGF, Findlay I, Jafri S, et al. The Warfarin/Aspirin Study in Heart Failure (WASH): a randomised trial comparing antithrombotic strategies for patients with heart failure. *American Heart Journal*. 2004; 148: 157-164.

Heart failure

112. Cleland JGF, Findlay I, Jafri S, et al. The Warfarin/Aspirin Study in Heart Failure (WASH): A randomised trial comparing antithrombotic strategies for patients with heart failure. *American Heart Journal*. 2004; 148: 157-164.
113. Lip GY, Gibbs CR. Antiplatelet agents versus control or anticoagulation for heart failure in sinus rhythm (Cochrane review). In: *The Cochrane Library*. Update Software, Oxford, UK.
114. Dunkman WB, Johnson GR, Carson PE, et al. Incidence of thromboembolic events in congestive heart failure. (The V-HeFT VA Cooperative Studies Group). *Circulation*. 1993; 87 (supplement): S94-S101.
115. Al-Khadra AS, Salem DN, Rand WM, et al. Antiplatelet agents and survival: a cohort analysis from the Studies of Left Ventricular Dysfunction (SOLVD) trial. *Journal of the American College of Cardiology*. 1998; 31: 419-425.
116. Lip GY, Gibbs CR. Antiplatelet agents versus control or anticoagulation for heart failure in sinus rhythm (Cochrane review). In: *The Cochrane Library*. Update Software, Oxford, UK.
117. Cleland JGF, Findlay I, Jafri S, et al. The Warfarin/Aspirin Study in Heart Failure (WASH): a randomised trial comparing antithrombotic strategies for patients with heart failure. *American Heart Journal*. 2004; 148: 157-164.
118. European Medicines Agency. Public statement on possible interaction between clopidogrel and proton pump inhibitors. May 2009. Available at http://www.ema.europa.eu/docs/en_GB/document_library/Public_statement/2009/11/WC500014409.pdf (accessed on 15 September 2014).
119. Lip GY, Gibbs CR. Anticoagulation for heart failure in sinus rhythm (Cochrane review). In: *The Cochrane Library*. Update Software, Oxford, UK.
120. Cleland JGF, Findlay I, Jafri S, et al. The Warfarin/Aspirin Study in Heart Failure (WASH): a randomised trial comparing antithrombotic strategies for patients with heart failure. *American Heart Journal*. 2004; 148: 157-164.
121. Latini R, Tognoni G, Maggioni AP, et al. Clinical effects of early angiotensin-converting enzyme inhibitor treatment for acute myocardial infarction are similar. *Journal of the American College of Cardiology*. 2001; 35: 1801-1807.
122. Teo KK, Yusuf S, Furberg CD. Effects of prophylactic antiarrhythmic drug therapy in acute myocardial infarction: an overview of results from randomized controlled trials. *Journal of the American Medical Association*. 1993; 270: 1589-1595.
123. Echt DS, Liebson PR, Mitchell LB, et al. Mortality and morbidity in patients receiving encainide, flecainide, or placebo. The Cardiac Arrhythmia Suppression Trial. *New England Journal of Medicine*. 1991; 324: 781-788.
124. British National Formulary. Calcium-channel blockers. Section 2.6.2. British Medical Association and Royal Pharmaceutical Society of Great Britain. Also available at <http://www.bnf.org> (accessed on 15 September 2014).
125. Cleophas TJ, van Marum R. Meta-analysis of efficacy and safety of second-generation dihydropyridine calcium channel blockers in heart failure. *American Journal of Cardiology*. 2001; 87: 7-8, 487-490.
126. Levine TB, Bernink PJ, Caspi A, et al. Effect of mibefradil, a T-type calcium channel blocker, on morbidity and mortality in moderate to severe congestive heart failure: the MACH-1 study. Mortality Assessment in Congestive Heart Failure Trial. *Circulation*. 2000; 101: 758-764.
127. Packer M, O'Connor CM, Ghali JK, et al. Effect of amlodipine on morbidity and mortality in severe chronic heart failure. *New England Journal of Medicine*. 1996; 335: 1107-1114.
128. Thackray S, Easthaugh J, Freemantle N, et al. The effectiveness and relative effectiveness of intravenous inotropic drugs acting through the adrenergic pathway in patients with heart failure: a meta-regression analysis. *European Journal of Heart Failure*. 2002; 4: 515-529.
129. Amsallem E, Kasparian C, Haddour G, et al. Phosphodiesterase III inhibitors for heart failure (Cochrane review). In: *The Cochrane Library*. Wiley, Chichester, UK.

Heart failure

130. National Institute for Health and Care Excellence. Chronic heart failure. August 2010. Clinical guideline 108. Available at <http://guidance.nice.org.uk/CG108> (accessed on 15 September 2014).

131. Bach DS, Bolling SF. Early improvement in congestive heart failure after correction of secondary mitral regurgitation in end-stage cardiomyopathy. *American Heart Journal*. 1995; 129: 1165-1170.

132. Bolling SF, Pagani FD, Deeb GM, et al. Intermediate-term outcome of mitral reconstruction in cardiomyopathy. *Journal of Thoracic and Cardiovascular Surgery*. 1998; 115: 381-386, discussion 387-388.

133. Chen FY, Adams DH, Aranki SF, et al. Mitral valve repair in cardiomyopathy. *Circulation*. 1998; 98 (supplement): S124-S127.

134. Dor V, Saab M, Coste P, et al. Endoventricular patch plasties with septal exclusion for repair of ischemic left ventricle: technique, results and indications from a series of 781 cases. *Japanese Journal of Thoracic and Cardiovascular Surgery*. 1998; 46: 389-398.

135. Stevenson LW. Selection and management of candidates for heart transplantation. *Current Opinion in Cardiology*. 1996; 11: 166-173.

This information is aimed at a UK patient audience. This information however does not replace medical advice. If you have a medical problem please see your doctor. Please see our full [Conditions of Use](#) for this content. For more information about this condition and sources of the information contained in this leaflet please visit the Best Health website, <http://besthealth.bmj.com>. These leaflets are reviewed annually.

