

Patient information from the BMJ Group

High blood pressure

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High blood pressure

If you have high blood pressure you probably won't feel ill. But having high blood pressure increases your chance of having a heart attack or a stroke. It can also lead to kidney disease and heart failure.

We've brought together the best research about high blood pressure 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 high blood pressure?

When doctors take your blood pressure, they're measuring how hard your blood pushes against your arteries and veins as it moves around your body. Your blood pressure may rise and fall slightly throughout the day and the night. But when it stays up, it's called high blood pressure.

If you have high blood pressure you probably won't feel ill or have any symptoms. But high blood pressure increases your chances of having a heart attack or a stroke. It can also lead to **kidney disease** and **heart failure**.

The good news is that there are many things you can do to lower your blood pressure. You can make changes to your lifestyle, for example, or take medicines.

Your doctor may call high blood pressure hypertension.

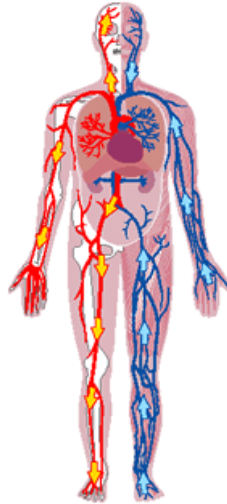
Key messages for people with high blood pressure

- About 1 in 3 men and women in the UK have high blood pressure.^[1]
- Although high blood pressure is common, it doesn't usually cause any symptoms. You can have it without knowing it.
- The only way you can find out if your blood pressure is high is to have it checked.
- Taking medicines or making changes to your lifestyle, such as eating less salt, exercising, and losing weight, can help to keep your blood pressure down.

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- If your doctor says you have high blood pressure, you should have it checked every year. ^[2]

What is blood pressure?



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

To understand why you have high blood pressure and how treatments work, it helps to know a bit about how blood flows through your body and what controls the pressure.

- Your blood is pumped around the body by your heart.
- It travels through blood vessels called arteries and veins.
- Blood leaves the heart through your arteries. This blood carries oxygen and food to all the cells in your body.
- Blood is then carried back to the heart through your veins. On the way it makes a detour through your lungs to pick up oxygen.

You need a certain amount of pressure to keep blood moving through your arteries and veins. When your heart beats it pushes blood out and around your body. This causes the pressure to rise. When the heart relaxes and fills with blood, the pressure drops.

There are two parts to your blood pressure reading:

- The first (higher) number is your systolic pressure. It measures the pressure of the blood when your heart pushes blood out.
- The second (lower) number is your diastolic pressure. This is the pressure measured when your heart relaxes and fills up with blood.

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What controls your blood pressure?

The three main things that help to control your blood pressure are: ^[3]

- How fast and forcefully your heart pumps blood around your body
- How open and flexible your arteries are
- How much blood you have going around your body.

These three things are controlled by: ^[3]

- Nerves going to the heart and arteries
- Muscles around the blood vessels
- Chemicals in the blood itself.

The amount of pressure your blood needs to keep flowing varies slightly from one minute to the next. It depends on how much oxygen and nutrients the various organs in your body need. For example, when you exercise, your muscles need lots of oxygen and your heart has to pump faster, so your blood pressure may rise.

- If your body senses that your pressure is too low, the brain sends messages through nerves to the heart telling it to pump faster and harder. This pushes more blood out and around the body with each beat, and the blood surges through the arteries under higher pressure.
- If your body senses that your pressure is too high, the brain sends messages through another nerve to slow down the heart. Your body also releases chemicals to open up (dilate) the arteries, so blood can flow through easily without putting extra pressure on the walls of your vessels. Your blood pressure then drops.

This system works a bit like a garden hose. If you turn the tap on full, the water shoots out through the narrow hose under high pressure. If you turn the tap down or off, the pressure drops.

Your kidneys

Your **kidneys** control how much fluid is in your blood vessels, so they have a role in controlling blood pressure. For more information, see [How your kidneys help control your blood pressure](#) .

What happens if you have high blood pressure?

It's normal for your blood pressure to rise and fall during the day. But if it stays high for a long time (usually for at least three months) then it's called high blood pressure.

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Usually your GP will say you have high blood pressure if either your higher blood pressure reading has been 140 or higher or your lower blood pressure reading has been 90 or higher over a period of time. ^[2]

See [Understanding your blood pressure reading](#) to find out more.

No one knows exactly what goes on in your body to cause high blood pressure. But researchers think that you get it when the balance of certain chemicals in the blood is upset. These chemicals control how fast your heart beats, how open the arteries are and how much blood there is in your blood vessels.

If the balance of chemicals is upset:

- Your heart may beat too fast
- Your arteries and veins may become narrower, thicker, and less flexible
- The amount of blood in your arteries and veins may go up.

All these things can make your blood pressure rise. ^[3]

High blood pressure: why me?

Your doctor probably won't be able to tell you why you have high blood pressure. More than 9 in 10 people with high blood pressure never know the cause.

Even though there's often no obvious cause of high blood pressure, there are several things that increase the risk. Doctors call these things risk factors. Your high blood pressure may be caused by a combination of these risk factors. We've listed them here.

Getting older

Blood pressure tends to go up as you get older. For example, just under 1 in 10 men aged between 16 and 24 have high blood pressure, compared with 6 in 10 men aged between 65 and 74. ^[1] The same thing happens in women.

Having a relative with high blood pressure

The genes you inherit from your parents can make you more likely to get high blood pressure. So, if other people in your family have it, you may be more likely to get it too.

Being pregnant

Up to 1 in 10 pregnant women get high blood pressure. ^[4]

- This may be due to a condition called [pre-eclampsia](#) .
- Pre-eclampsia can be very dangerous and can cause a woman to go into labour too early.

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- It can also cause other health problems in the mother, and the baby may weigh too little when born.

For these reasons, if you're a pregnant woman, your doctor will keep a close check on your blood pressure and treat it with medicines if necessary.

Your ethnic group

British people of black African or Caribbean origin are more likely than other British people to have high blood pressure.^[4] As many as half of all black Afro-Caribbean people aged over 40 have high blood pressure. And people in this group have a greater chance than other British people of having a stroke and kidney failure. British people of South Asian (Indian, Pakistani, or Bangladeshi) origin are also more likely to have high blood pressure and are more prone to stroke and heart attacks.^[4]

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

Being overweight

If you are overweight you are more likely to have high blood pressure than someone who is of normal weight, especially if you carry this extra weight mainly on your abdomen rather than on your hips and thighs. We don't know why this is the case.

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

- Your **body mass index** (or BMI for short). Your BMI relates your weight to your height. This gives an estimate of your body fat. If your BMI is more than 27, you have a higher risk of getting high blood pressure.^[7] You can [calculate your own BMI](#) .
- If you're a woman and your waist is more than 88 cm (35 inches) you are considered overweight. If you're a man, and your waist is more than 102 cm (40 inches) you are considered overweight.^[8]

Not exercising enough

If you don't get regular exercise, your chances of getting high blood pressure are much higher than someone who is active and fit.^[9]

The British Hypertension Society recommends that:^[4]

- 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 improving muscle tone by weight training)
- Older people should aim to exercise for at least 20 minutes each day, say by walking briskly.

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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 hypertension as someone who doesn't drink. ^[10]
- 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. To find out more about what this number means, see [Understanding your blood pressure reading](#).

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. ^[3] However, if you cope with stress by smoking, drinking alcohol, or eating more, this can have a negative effect on your blood pressure.

What are the symptoms of high blood pressure?

Most people with high blood pressure don't get any symptoms.

You can't feel when your blood pressure goes up, although some people with high blood pressure say they had bad headaches before they were treated. The only way to find out if your blood pressure is high is to have it measured. The test is quick and it doesn't hurt. To learn more, see [The blood pressure test](#).

If your high blood pressure causes other health problems, you may get symptoms. For example, if you get heart failure (when your heart can't pump blood around your body

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as well as it should) you may get out of breath easily, have swollen ankles, or get tired very easily.

Symptoms of severe high blood pressure

In rare cases blood pressure can rise suddenly without any warning and get very high (for example, 220 in the top number and 120 in the bottom number).^[11] This happens to less than 1 in 100 people who have high blood pressure. It is very serious and can lead to death. People with blood pressure this high need treatment straight away.

The symptoms of this type of severe high blood pressure include:

- Having a bad headache
- Feeling confused
- Feeling nauseated (sick)
- Having trouble sleeping
- Feeling very sleepy.

If you have these symptoms, you should see a doctor straight away.

How do doctors diagnose high blood pressure?

You may not get any symptoms with high blood pressure. Some people go to their doctor to get their blood pressure checked when they feel ill. But your doctor will often check your blood pressure whenever you go to see them, as part of a general examination.

Having your blood pressure checked

The only way to know whether you have high blood pressure is to have it measured. You're probably familiar with the simple blood pressure test. To find out more about it, see [The blood pressure test](#) .

Your doctor will first measure your blood pressure in the surgery. You may need it checked in both arms, and more than once. If it seems high, you'll need more checks to see if it is usually high, or if it was just a one-off high reading.

Blood pressure can go up and down, depending on the time of day and what you're doing. For this reason, doctors are now told that the best way to tell if someone has high blood pressure all the time is to monitor their blood pressure at home, for 24 hours.^[2]

This is called **ambulatory blood pressure monitoring** (ABPM for short). You wear a device that makes a series of measurements (at least two every hour) of your blood pressure as you go about your everyday life. 'Ambulatory' means you wear it while moving around, not just in the GP surgery. You wear the monitor for a day, then return it to the

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surgery. Your ambulatory blood pressure reading is the average of all the readings taken during the day.

About 1 in 4 people who have a high blood pressure reading in the GP surgery will have a normal ambulatory blood pressure result. That means they don't really have high blood pressure, and don't need treatment. But they should have their blood pressure checked again in five years.

If your doctor doesn't use ambulatory blood pressure monitoring, he or she should still take several readings before deciding that you have high blood pressure. A single reading is not enough. You may have a series of blood pressure readings taken by a nurse in your home.

But if your blood pressure is dangerously high, the doctor may start you on blood pressure lowering drugs, or send you to see a specialist, straight away.

Finding the cause of high blood pressure

If you have high blood pressure, your doctor may do some other tests to try to find out what's causing it. Your doctor will also want to check whether your high blood pressure has affected your body.

You may have: ^[2]

- A blood test (to look for **diabetes** , check your **cholesterol** , and check how well your **kidneys** are working)
- A urine test (to see how well your kidneys are working)
- An **electrocardiogram** (or ECG, a test to see if your heart is working properly).

Finding out your risk of heart disease

Your doctor may also ask you:

- About your health
- Whether you smoke
- How much alcohol you drink
- Whether anyone else in your family has high blood pressure or heart disease.

These tests and questions help your doctor find out if you have any other risk factors for heart disease besides high blood pressure, such as high cholesterol. (Having a risk factor for a disease increases your chances of getting a certain condition. But it does not guarantee that you will get it.) The results of the tests will also help your doctor decide whether you need treatment.

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Your doctor may also do some special tests to see if you have a disease that has caused the high blood pressure. If your blood pressure is dangerously high, you may need to go to hospital straight away for treatment.

How common is high blood pressure?

High blood pressure is very common and affects an equal number of men and women.

- About 33 in 100 men and women in the United Kingdom have high blood pressure. ^[1]
- About 60 in 100 people with high blood pressure are not being treated. ^[1]
- Out of those who are being treated, 50 in 100 still have high blood pressure. ^[1]
- About 20 in 100 heart attacks are caused by high blood pressure. ^[1]

What treatments work for high blood pressure?

If you have high blood pressure you probably won't feel bad or have any symptoms. But high blood pressure increases your risk of a heart attack or stroke. It can also cause kidney disease and heart failure.

There is a range of treatments for lowering blood pressure. Your doctor may suggest using more than one treatment at once.

Key points about treating high blood pressure

- Not all people with high blood pressure need to be treated with drugs. You may be able to reduce your blood pressure by making changes to your lifestyle. For example, by eating less salt, exercising more, or losing weight.
- If lifestyle changes aren't helping you may need to take medicines, depending on how high your blood pressure is. To learn more, see [Understanding your blood pressure reading](#) . But medicines can have side effects.
- Lowering your blood pressure can reduce your risk of having heart disease , a stroke , or kidney disease and help you live longer.
- It's important to take your blood pressure medicine the way your doctor has prescribed it. Don't stop taking your tablets without talking to your GP.
- Tell your GP if you get side effects. You don't have to put up with them. There are lots of drugs to treat high blood pressure, so if one doesn't suit you, you can switch to another.

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- You will probably need to take more than one drug to control your blood pressure.

Guidelines for doctors on treating high blood pressure

Drugs for blood pressure work differently for different groups of people. Experts from the National Institute for Health and Care Excellence (NICE), which advises the government on which treatments work best, have advised doctors to follow these guidelines. ^[2]

- People with high blood pressure who are aged 55 years old or over, or who are of African or Caribbean descent, should start by taking a drug called a [calcium channel blocker](#) . If they can't take a calcium channel blocker for some reason, they should take a [diuretic](#) .
- People with high blood pressure who are younger than 55 and not of African or Caribbean descent should start by taking a drug called an [ACE inhibitor](#) . If they can't take an ACE inhibitor, for example because it makes them cough, they should take an [angiotensin II receptor blocker \(ARB\)](#) .

If one drug doesn't bring your blood pressure low enough, you may need another drug. So:

- If you're taking a calcium channel blocker or a diuretic and you need another drug, you should also take an ACE inhibitor or an ARB
- If you're taking an ACE inhibitor or an ARB and you need another drug, you should also take a calcium channel blocker or a diuretic.

If you need three drugs to keep your blood pressure low, you should take an ACE inhibitor or an ARB, plus a calcium channel blocker, plus a diuretic. But your doctor should check that you are taking the best doses of two drugs, before adding a third.

Treatments for high blood pressure

Which treatments work best? We've looked at the research and given each treatment a rating according to how well it works.

For help deciding which treatment is best for you, see [How to make the best decisions about treatment](#).

The National Institute for Health and Care Excellence (NICE) is the government body that decides which treatments should be available on the NHS. NICE has written guidelines for doctors on drugs to lower blood pressure. NICE says that different groups of people should start on different types of drugs. To learn more, see [Guidelines for doctors on treating high blood pressure](#) .

Treatment Group 1

Treatments for high blood pressure

Treatments that work

- [Diuretics](#) : These drugs help your body get rid of extra fluid. Some diuretics (and their brand names) are bendroflumethiazide (Aprinox), chlortalidone (Hygroton), and cyclopenthiazine (Navidrex). [More...](#)
- [ACE inhibitors](#) : ACE inhibitors can stop your blood vessels becoming narrower. This allows blood to pass more easily along your blood vessels and lowers your blood pressure. Some common ACE inhibitors (and their brand names) are captopril (Acepril, Capoten, Tensopril), enalapril (Ednyt, Innovacel, Pralenal), ramipril (Tritace), and perindopril (Coversyl). [More...](#)
- [Angiotensin II receptor blockers](#) (ARBs): Angiotensin II receptor blockers can stop your blood vessels narrowing. So, blood can pass more easily along your blood vessels, which lowers your blood pressure. Some common angiotensin II receptor blockers (and their brand names) are candesartan (Amias), losartan (Cozaar), and valsartan (Diovan). [More...](#)
- [Calcium channel blockers](#) : Calcium channel blockers can help keep your blood vessels relaxed and open. This makes it easier for your blood to flow, which lowers your blood pressure. Some common calcium channel blockers (and their brand names) are amlodipine (Istin), diltiazem (Adizem, Angitil), and nifedipine (Cardene). [More...](#)

Treatments that are likely to work

- [Alpha-blockers](#) : These drugs can help keep your blood vessels relaxed and open, making it easier for blood to flow through them. This lowers your blood pressure. Some alpha-blockers (and their brand names) are doxazosin (Cardura), prazosin (Hypovase), and terazosin (Hytrin). [More...](#)
- [Beta-blockers](#) : Beta-blockers work by slowing down your heart beat. This reduces the amount of blood that is pumped with each beat. Some common beta-blockers (and their brand names) are acebutolol (Sectral), atenolol (Tenormin), metoprolol (Lopresor), and propranolol (Inderal). [More...](#)
- [Physical activity](#) : Getting moderate exercise, such as jogging, cycling, or walking, may help bring your blood pressure down. [More...](#)
- [Low fat, high fruit and vegetable diet](#) : This plan is known as the DASH diet. [More...](#)

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- [Drinking less alcohol](#) : This means cutting back to the recommended daily limit of three to four units of alcohol for men, two to three for women. A unit is half a pint of ordinary strength lager or one shot of spirits. [More...](#)
- [Reducing the salt in your diet](#) : This usually requires a big change in the foods you eat. [More...](#)
- [Stopping smoking](#) : You need to stop smoking, not just cut back. [More...](#)
- [Losing weight](#) : If you are overweight, you will need to get your weight down to the recommended limit for your height. [More...](#)
- [Potassium supplements](#) : These comes tablets you can buy from a pharmacy. They are usually called potassium chloride. [More...](#)
- [Fish oil supplements](#) : These are capsules with omega-3 fatty acids that you can buy from a pharmacy or health food shop. [More...](#)
- [Cocoa](#) : Cocoa usually comes as a hot drink made from cocoa powder, or in chocolate. Only chocolate that is high in cocoa (at least 70 percent cocoa) is useful as a treatment for high blood pressure. [More...](#)

Treatments that need further study

- [Calcium supplements](#) : You can buy these as tablets from a pharmacy. [More...](#)
- [Magnesium supplements](#) : You can buy these as tablets from a pharmacy. [More...](#)

Other treatments

We haven't looked at the research on these treatments 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 them or be interested in them.

- [Renin inhibitors](#) : The only renin inhibitor you can get at the moment is called aliskiren (brand name Rasilez). [More...](#)

What will happen to me?

It's hard to say what will happen to you if you have high blood pressure.

A lot of what happens when you have high blood pressure depends on:

- How high your blood pressure is
- How long you've had high blood pressure

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- Whether you have other health problems
- What other risk factors you have for heart disease (such as [high cholesterol](#))
- Whether your high blood pressure is under control.

The risk of health problems

There are some general things we can say about high blood pressure and the health problems it can lead to. The main health problems related to high blood pressure are heart attacks, strokes, heart failure, and kidney failure.

Heart attacks and strokes

High blood pressure can damage the walls of your blood vessels. The damage to the wall makes it easier for fatty material to stick to it. And this can lead to blood clots forming.
[\[3\]](#)

- If a blood clot blocks the flow of blood to your heart it can lead to a heart attack. If a blood clot blocks the flow of blood to your brain it can lead to a stroke.
- The higher your blood pressure and the longer it stays high, the greater your risk of having a [heart attack](#) or a [stroke](#) .
- Not everybody with high blood pressure will get heart disease or have a stroke. Many other things affect your chances of getting heart disease apart from blood pressure. Your personal risk will depend on whether you have other risk factors, such as whether you smoke.
- The people most likely to have a heart attack or a stroke are those who already have signs of heart disease. [\[12\]](#)
- So if you have angina (a type of chest pain that you get especially when you exert yourself) or if you've had a heart attack, your chances of having another heart attack or stroke are higher if your blood pressure is high. And your doctor will pay extra attention to your blood pressure.

To find out more, see our information on [Heart attacks](#) and [Strokes](#) .

Heart failure

If your blood pressure is high, your heart has to work harder to pump blood through your blood vessels. Over time the extra work makes the heart flabby and then it can't do its job properly. Eventually your heart can become so bad at doing its job that you get a condition called heart failure.

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The main symptom of heart failure is being short of breath, even after doing something that shouldn't make you feel so tired (for example, walking up a few stairs). You may also get swollen ankles and feel tired.

See our information on [Heart failure](#) to find out more.

Kidney failure

If the arteries in your **kidneys** become narrow and damaged because of high blood pressure, your kidneys may not work properly. This can lead to **kidney failure**.^[13]

What you can do

The good news is that the effects of high blood pressure don't happen overnight. They usually take many years to develop. And if you control high blood pressure you can reduce the chances that they will ever happen.

If you have high blood pressure, there's a good chance that you will be able to lower it by making changes to your lifestyle, taking medicine, or both.

If you reduce your blood pressure by about 5 (top number) your chances of dying from a stroke drop by about 14 percent and your chances of dying from heart disease drop about by 9 percent.^[14]

Finding out if you need treatment

If you have high blood pressure, you'll need to have some kind of treatment. Most people need drug treatment to get their blood pressure down. Some people may be able to bring down their blood pressure to a normal range by changing what they eat and do. For example, losing weight and exercising can sometimes help to reduce blood pressure.

Your doctor will decide what kind of treatment you need by looking at:^[11]

- Your age
- Your sex
- How high your blood pressure is
- How long it has been high
- Whether you have any other diseases, such as **diabetes**
- Whether you have any other risk factors for heart disease or stroke, such as whether you smoke or have high **cholesterol**
- Whether you have had a heart attack or a stroke before

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- Whether your high blood pressure has already caused damage (for example, to your heart or kidneys).

Questions to ask your doctor

If you've been told you have high blood pressure, you may want to talk to your doctor to find out more.

Here are some questions that you might want to ask:

- What is my blood pressure? What do the numbers mean?
- What blood pressure reading should I aim for?
- Will I have any symptoms from my high blood pressure?
- Do I need any other tests?
- How often should I have my blood pressure checked?
- Do I need treatment?
- If I need treatment, what's the best treatment for me?
- What are the side effects of treatment?
- How long will I need to take this treatment for?
- What should I do if I forget to take a dose of my blood pressure medicine? Should I take two doses the next morning or skip one?
- Will I still need to have treatment once my blood pressure comes down?
- What are the chances that my blood pressure will get lower?
- What will happen if I don't get my blood pressure under control?
- Can I make any changes to my lifestyle to help get my blood pressure down?
- Should I change my diet?
- How will having high blood pressure affect my life?
- Is there anything I should avoid doing?

Treatments:

ACE inhibitors

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

This information is for people who have high blood pressure. It tells you about a group of drugs called ACE inhibitors, a treatment for high blood pressure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you have high blood pressure (also called hypertension), taking an ACE inhibitor can lower it and help keep it down.

There is a strong chance that taking an ACE inhibitor will reduce your chance of having a heart attack or a **stroke**, or of getting **heart failure**.

ACE inhibitors are at least as good at lowering blood pressure as other drugs called [diuretics](#), [beta-blockers](#), and [calcium channel blockers](#).

What are they?

ACE inhibitors help to lower your blood pressure. They are available only on prescription from your doctor.

ACE stands for **angiotensin-converting enzyme**. It's a chemical that's produced naturally by the body. To find out more, see [What's an angiotensin-converting enzyme?](#)

There are lots of different ACE inhibitors. Here are some examples (with their brand names):

- Captopril (Acepril, Capoten, Ecopace, Tensopril)
- Enalapril (Innovace, Enacard, Ednyt, Pralenal)
- Fosinopril (generic)
- Lisinopril (Zestril)
- Moexipril (Perdix)
- Perindopril (Coversyl)
- Ramipril (Tritace)

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- Trandolapril (Gopten, Odrik).

Most ACE inhibitors come as tablets, although ramipril is also available as a liquid.

Once you start taking an ACE inhibitor to control your blood pressure, you'll probably need to stay on it. If you stop taking it, your blood pressure may go up again. If after a year your blood pressure stays low and steady, your doctor may be able to cut down your dose.

ACE inhibitors may be especially useful for people with **diabetes**. This is because they reduce the risk that diabetes will cause problems with your **kidneys**. ^[15]

You may need to take more than one type of medicine to bring your blood pressure down. Most people need at least two drugs. ^[15]

How can they help?

Taking an ACE inhibitor can lower your blood pressure and keep it down. ^{[16] [17]}

Having high blood pressure increases your chance of having a heart attack, heart failure, or a stroke. Treating your high blood pressure with an ACE inhibitor can reduce these risks and lower your chances of dying of these conditions. ^{[16] [17]}

Many other things, besides your high blood pressure, will affect your personal risk of getting heart disease or stroke. So it's hard to say how much your risk will fall by if you take an ACE inhibitor.

ACE inhibitors lower blood pressure just as well as diuretics, beta-blockers, calcium channel blockers and angiotensin II receptor blockers (ARBs). ^{[16] [17] [18] [19] [20]} But they may not offer as much protection as diuretics against heart attacks, strokes, and heart failure. ^{[21] [22]}

How do they work?

Your blood pressure is controlled partly by your kidneys. Your kidneys raise your blood pressure by releasing a chemical called renin. This helps your body produce another chemical called angiotensin I.

Angiotensin I is then converted into a more active chemical called angiotensin II. This conversion happens because of a chemical called angiotensin-converting enzyme. Enzymes are proteins that speed up chemical reactions in your body.

Angiotensin II increases blood pressure. It helps the body save salt and water and makes your blood vessels narrower. This means there is more blood struggling to get through a smaller space, so your blood pressure goes up. This increases the strain on your heart and blood vessels.

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ACE inhibitors stop the angiotensin-converting enzyme turning angiotensin (angiotensin I) into the active form (angiotensin II). This is why they are called ACE inhibitors.

Can they be harmful?

Like many medicines, ACE inhibitors can have side effects. If you feel healthy, you might be reluctant to take tablets every day to prevent a future illness. However, the problems caused by high blood pressure can be serious, such as a heart attack or stroke. You might be reassured to know that, in studies, very few people got side effects bad enough to stop them taking ACE inhibitors. ^[16]

The biggest problem with ACE inhibitors is that they can cause a dry cough in up to a third of people who take them. ^[19] This can last and be annoying. Some people find that sucking sweets reduces the cough.

Other possible side effects are: ^[21]

- Dizziness. Sometimes these drugs can lower your blood pressure too quickly. This can make you feel faint. You're most likely to get dizzy the very first time that you take the drug. Because of this side effect, your GP will increase the dose of drug slowly. Your GP may also suggest taking the tablet at bedtime so you don't feel dizzy
- A high level of potassium in your blood. This can cause abnormal heart rhythms, possibly leading to death. Your GP should keep a close eye on the level of potassium and other salts in your blood
- Kidney problems. Studies show that these drugs might reduce the kidneys' ability to get rid of waste products. Your GP will be monitoring this. But if you already have kidney disease, these drugs may actually reduce the risk of kidney failure .

Other rare side effects include swelling of the lips, eyes, and face; a rash; fever; and changes in the way things taste.

If you are a woman, you shouldn't take ACE inhibitors if you're pregnant or planning to get pregnant. These drugs can harm your baby. ^[23]

How good is the research on ACE inhibitors?

There's good evidence that taking ACE inhibitors lowers blood pressure and reduces the risk of heart attacks and strokes. We know this from two large summaries that looked at lots of smaller, good-quality studies. ^[17] ^[24] These studies looked at more than 45,000 people who took ACE inhibitors (as well as taking other drugs that reduce blood pressure).

Research has also shown that taking ACE inhibitors works at least as well as some other drugs to reduce blood pressure, such as [diuretics](#) , [beta-blockers](#) , [calcium channel](#)

High blood pressure

[blockers](#) , [angiotensin II receptor blockers](#) , and [alpha-blockers](#) .^[25] ^[26] Again, the reviews were large. They looked at many good studies in over 120,000 people.

However, some studies have found that ACE inhibitors might not be as good as diuretics at protecting against heart attacks and strokes.^[25] ^[27] ^[28]

Alpha-blockers

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

This information is for people who have high blood pressure. It tells you about a group of drugs called alpha-blockers, which are used to treat high blood pressure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you have high blood pressure (hypertension), taking an alpha-blocker can lower your blood pressure and keep it down.

Alpha-blockers are as good at lowering blood pressure as other drugs available called [beta-blockers](#) , [diuretics](#) , [ACE inhibitors](#) , and [calcium channel blockers](#) .

But alpha-blockers aren't as good as some other treatments at protecting you against having a heart attack, having a stroke, or getting heart failure. They aren't usually used unless you're already taking other drugs, but your blood pressure is still high.^[2]

What are they?

Alpha-blockers drugs that help lower blood pressure. Some common alpha-blockers (and their brand names) are:

- Doxazosin (Cardura)
- Prazosin (Hypovase)
- Terazosin (Hytrin).

Once you start taking medicine to control your blood pressure, you will probably need to stay on it. If you stop taking it, your blood pressure may go up again.

You may need to take more than one medicine to bring your blood pressure down. Most people need at least two drugs.^[29]

High blood pressure

How can they help?

Taking an alpha-blocker can lower your blood pressure and keep it down.

Alpha-blockers aren't as good at protecting you against heart failure as diuretics. ^[30]

How do they work?

The walls of your veins and arteries include a layer of muscle. Sometimes, this muscle can tighten up, making your blood vessels narrower. Blood can't flow through narrow vessels very easily, so it ends up pushing against the vessel walls more strongly. This means your blood pressure goes up.

The muscles that line your blood vessels have areas called alpha receptors. When these areas are activated, the muscles tighten. Alpha-blockers stop this happening by blocking the receptors. So, your blood vessels stay relaxed and open, making it easier for blood to flow through them. This lowers your blood pressure.

Can they be harmful?

Side effects of alpha-blockers are usually mild. But some people have a fainting spell with the first dose or two. So, doctors may start with a low dose and then gradually increase it over a few weeks.

Other common side effects include a headache and swelling of the ankles. You may also feel dizzy or tired.

How good is the research on alpha-blockers?

Research shows that alpha-blockers help to lower blood pressure just as well as other treatments. ^[31] Studies have included over 120,000 people, although people were often taking several drugs, not just alpha-blockers.

As well as lowering blood pressure, alpha-blockers cut the risk of dying from a stroke or a heart attack, but not as well as some other treatments.

One problem with alpha-blockers is that they aren't as good as diuretics for preventing heart failure. ^[31]

Angiotensin II receptor blockers

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

High blood pressure

This information is for people who have high blood pressure. It tells you about a group of drugs called angiotensin II receptor blockers, a treatment for high blood pressure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you have high blood pressure, taking an angiotensin II receptor blocker (or ARB for short) can lower your blood pressure and keep it down.

There is a strong chance that taking an ARB will lower your risk of getting a heart attack or a [stroke](#) .

What are they?

Angiotensin II receptor blockers are tablets that can lower your blood pressure. Some common names (along with their brand names) are:

- Candesartan (Amias)
- Irbesartan (Aprovel)
- Losartan (Cozaar)
- Olmesartan (Olmotec)
- Telmisartan (Micardis)
- Valsartan (Diovan)
- Azilsartan (Edarbi).

If your doctor prescribes an ARB, you need to take it every day, even after your blood pressure gets better. You may need to take it for the rest of your life. You should not stop taking your blood pressure medicine without talking to your doctor first. If you stop taking your medicine, your blood pressure may get dangerously high.

You may need to take more than one type of medicine to bring your blood pressure down. Most people need at least two drugs. ^[32]

You can get valsartan combined with a drug called amlodipine. Amlodipine is a type of drug called a [calcium channel blocker](#) . The brand name for the combination is Exforge.

How can they help?

ARBs can help lower your blood pressure and keep it down. Lowering your high blood pressure reduces your chances of having a heart attack, a stroke, or heart failure. It also means you are less likely to die from one of these conditions. ^[33]

High blood pressure

ARBs seem to work just as well as other drugs for lowering your blood pressure. ^[33]

How do they work?

ARBs work by blocking the action of a chemical called **angiotensin II** in your body. Angiotensin II makes your blood vessels narrower. This means there is more blood struggling through a smaller space, and your blood pressure goes up.

ARBs work by stopping angiotensin II doing its job. So, ARBs stop the arteries from narrowing. When arteries are wider and more relaxed, the pressure inside the arteries goes down. This means your blood pressure gets lower.

To learn more, see [How do angiotensin II receptor blockers affect your body ?](#)

Can they be harmful?

Like all drugs, ARBs can have side effects. But they are usually mild or they only affect a small number of people. The most common problem is dizziness. ^[34]

For most people, ARBs don't seem to cause the dry cough that can happen with drugs called [ACE inhibitors](#) . So, ARBs may be useful for people who don't want to take an ACE inhibitor because it makes them cough. ^[34]

How good is the research on angiotensin II receptor blockers?

There is quite good evidence that angiotensin II receptor blockers can lower your blood pressure and protect you against heart attacks and **strokes** .

The evidence comes from two large reviews of the research. ^[35] ^[36] Together, these reviews looked at more than 165,000 people. But the studies didn't just look at angiotensin II receptor blockers, they also looked at the effect of other drugs used to lower blood pressure. They found that angiotensin II receptor blockers and other drugs can reduce the risk of stroke and heart attack.

Azilsartan (Edarbi) is a newer angiotensin receptor blocker that you may be offered. It hasn't been studied as much as the older drugs. But the research suggests that it works about as well as the others. ^[37]

Beta-blockers

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

High blood pressure

This information is for people who have high blood pressure. It tells you about a group of drugs called beta-blockers, a treatment for high blood pressure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you have high blood pressure (also called hypertension), taking a beta-blocker can lower it and help keep it down.

Taking a beta-blocker may also reduce your risk of having a heart attack or a **stroke**, or of getting **heart failure**.

Beta-blockers are good at lowering blood pressure. But they don't seem to be as good at reducing the risk of strokes and heart attacks as drugs called [diuretics](#), [ACE inhibitors](#), and [calcium channel blockers](#). And beta-blockers may increase your risk of getting **diabetes** if you take them with a diuretic. Doctors are now told to try other drugs first for most people.

What are they?

Beta-blockers help to lower your blood pressure. Doctors call medicines that lower blood pressure **antihypertensive drugs**.

Some common beta-blockers (and their brand names) are:

- Acebutolol (Sectral)
- Atenolol (Tenormin, Atenix)
- Bisoprolol (Cardicor, Emcor, Vivacor)
- Carvedilol (generic)
- Metoprolol (Lopresor)
- Nadolol (Corgard)
- Propranolol (Angilol, Inderal, Beta Prograne, Bedranol)
- Timolol (Betim).

If your doctor prescribes a beta-blocker, you will need to take it every day. And you will probably need to stay on it for the rest of your life. If you stop taking it your blood pressure may go up again.

If you have had a heart attack, you are more likely to be given a beta-blocker rather than other drugs to lower blood pressure. Beta-blockers can help prevent another heart attack. They can also help with **angina** (chest pain) and heart failure.

High blood pressure

You may need to take more than one medicine to bring your blood pressure down. Most people need at least two drugs. ^[38]

The National Institute for Health and Care Excellence (NICE), which advises the government on which treatments work best, has written guidelines for doctors on drugs to lower blood pressure. To learn more, see [Guidelines for doctors on treating high blood pressure](#) .

How can they help?

Beta-blockers can lower your blood pressure and keep it down.

Studies show that these drugs can reduce the top number of your blood pressure reading (systolic pressure) by around 12 to 16 points, and the bottom number (diastolic pressure) by 5 to 10 points. ^[39]

To learn more about the numbers, see [Understanding your blood pressure reading](#) .

Reducing your blood pressure lowers your chances of having a heart attack, stroke or heart failure and dying from one of these conditions. ^[39] ^[17] ^[40]

You will get the most benefit from beta-blockers if you are at higher risk than normal of developing these conditions in the first place (for example, if you are aged over 70 and have had a heart attack or stroke in the past). ^[17]

Until recently, doctors thought that beta-blockers worked just as well as other drugs that are used to lower blood pressure. These other drugs are called diuretics, ACE inhibitors, angiotensin II receptor blockers (ARBs), and calcium channel blockers. ^[41] ^[42] ^[43]

But a large study, which included almost 10,000 people, showed that beta-blockers don't work as well as the other drugs. ^[44] It also showed that people taking beta-blockers were more likely to have a stroke than people taking calcium channel blockers.

A study that collected together findings from this and other research (a [systematic review](#)) concluded that beta-blockers were not as good as other drugs for treating high blood pressure. ^[45]

Now, doctors are advised to use the other drugs before trying beta-blockers. ^[44] To learn more, see [Guidelines for doctors on treating high blood pressure](#) .

But, some people still need to take beta-blockers for other reasons. Some of the reasons why a beta-blocker might be the best treatment for you are: ^[44]

- You have [angina](#) (chest pains)
- You've had a [heart attack](#) in the past
- You have [heart failure](#)

High blood pressure

- You need more than three drugs to control your blood pressure.

Also, some people need to take beta-blockers because they can't take an ACE inhibitor or an angiotensin II receptor blocker (ARB). That includes women who might become pregnant. ^[44]

If your blood pressure is already well controlled by drugs including a beta-blocker, and you are not getting any side effects, you may not need to change to another drug.

How do they work?

You may have high blood pressure because your heart is beating too fast and too hard. This means there is more blood moving around your body each time your heart beats. So it is forced through small blood vessels under higher pressure.

Beta-blockers work by slowing down your heart beat and reducing the amount of blood that is pumped with each beat. They do this by stopping the work of chemicals that make the heart beat faster and more strongly.

Some beta-blockers also stop a chemical in the **kidneys** from working. Usually this chemical (called renin) controls how much water and salt you have in your body. Beta-blockers can block renin and help the body to get rid of more salt and water. The result is lower blood pressure.

Can they be harmful?

Taking a beta-blocker together with another blood pressure drug, called a diuretic, may increase your chance of getting **diabetes**. This is a condition where you have trouble controlling your blood sugar levels. ^[44]

So doctors are now advised to use other drugs for lowering blood pressure first. But beta-blockers are still useful for other conditions. You shouldn't stop taking your beta-blockers without talking to your doctor first. ^[2] To learn more, see [Guidelines for doctors on treating high blood pressure](#) .

You need to tell your doctor if you have asthma, because beta-blockers can cause breathing problems in people with asthma.

There are some other side effects. Taking a beta-blocker may: ^[40]

- Make you feel tired
- Make your hands and feet cold (beta-blockers can change your circulation so less blood flows to the parts of your body farthest away from your heart)
- Make you feel sick.

High blood pressure

If you want to stop taking beta-blockers or change to another drug, you'll need to plan this with your doctor at your next appointment. ^[2]

How good is the research on beta-blockers?

There is very good evidence that taking beta-blockers helps to reduce blood pressure. This comes from studies involving tens of thousands of people.

There is also evidence that beta-blockers help to prevent heart attacks, strokes, and heart failure. ^{[17] [39] [46]}

But there is good evidence that beta-blockers might not be as good as some of the other drugs for high blood pressure. ^{[17] [47] [48] [49] [50]} Studies have found that:

- Taking beta-blockers may not be as good as taking [calcium channel blockers](#) at preventing strokes ^[47]
- Taking beta-blockers may not be quite as good as taking [diuretics](#) at preventing strokes and heart attacks. ^{[48] [49]}

Calcium channel blockers

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

This information is for people who have high blood pressure. It tells you about a group of drugs called calcium channel blockers, a treatment for high blood pressure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you have high blood pressure (also called hypertension), taking a drug called a calcium channel blocker each day can lower your blood pressure and help keep it down.

Taking these drugs may also cut your chances of having a [heart attack](#) or a [stroke](#), or of getting [heart failure](#).

But they may not be as good at preventing heart attacks and heart failure as other drugs called [diuretics](#) and [ACE inhibitors](#).

What are they?

Calcium channel blockers help to lower your blood pressure. They come as tablets and are available only on prescription from your doctor.

High blood pressure

Some calcium channel blockers (and their brand names) are:

- Amlodipine (Istin)
- Diltiazem (Adizem, Angitil, Calcicard, Dilcardia, Dilzem, Optil, Slozem, Tildiem, Viazem, Zemtard)
- Felodipine (Plendil)
- Nicardipine (Cardene)
- Nifedipine (Adalat, Adipine, Cardilate, Coracten, Fortipine, Hypolar, Nifedipress, Tensipine)
- Verapamil (Cordilox, Univer, Verapress, Vertab).

You can get amlodipine combined with a drug called valsartan. Valsartan is a type of drug called an [angiotensin II receptor blocker](#). The brand name of the combination is Exforge.

If your doctor prescribes a calcium channel blocker, you'll need to take it every day. If you stop taking it, your blood pressure may go up again.

You may need to take more than one type of medicine to bring your blood pressure down. Most people need at least two drugs. ^[4]

How can they help?

Calcium channel blockers can lower your blood pressure and keep it down. ^[17] ^[51]

Treating your high blood pressure with a calcium channel blocker can reduce your risk of having a heart attack or a stroke, and may help you live longer. ^[17] ^[51]

Many other things, besides your high blood pressure, will affect your personal risk of getting heart disease or stroke. So, it's hard to tell how much you can reduce these risks by taking a calcium channel blocker. Things like whether you are overweight, smoke, or have other illnesses need to be taken into account too.

Calcium channel blockers reduce blood pressure at least as well as other drugs, such as diuretics, beta-blockers, ACE inhibitors, alpha-blockers, and angiotensin II receptor blockers. ^[22] ^[52] ^[53] ^[54] But they may be slightly better at protecting people against having a stroke. ^[53]

Calcium channel blockers may be slightly worse at protecting against heart failure than some other drugs. ^[22] ^[52] ^[54]

High blood pressure

How do they work?

Sometimes you get high blood pressure because the muscles in the walls of your arteries tighten up. Arteries are the blood vessels that carry blood from your heart around your body.

When your arteries tighten up, they get narrower, and blood can't flow through easily. So, the blood pushes harder against the artery walls as it goes through. This means your blood pressure is high.

For the muscles lining your arteries to tighten, calcium must flow through tiny channels, called calcium channels, in the walls of the muscle cells. Calcium channel blockers do as their name suggests. They stop the calcium going through these channels, so that the blood vessels tighten less. Because your blood vessels are now relaxed and open, your blood pressure falls.

Can they be harmful?

Like all medicines, calcium channel blockers can have side effects. There are different types of calcium channel blockers, and they work in different ways. This means they have different side effects. One type may suit you better than another. Talk to your GP if you are having side effects.

Higher doses of this medicine can increase your chance of having side effects, so your doctor will start you on a low dose and see how your blood pressure responds.

Here are some of the main side effects of calcium channel blockers:

- You may get headaches
- You may feel dizzy ^[51]
- You may get swollen ankles (this happens if fluid builds up in your legs). One study found that about one-quarter of people taking the calcium channel blockers called felodipine and isradipine had swollen ankles ^[55]
- You may go red in the face ^[51]
- Your heartbeat may be abnormally fast, slow, or uneven
- If you take the drug called verapamil, you may get constipation. ^[55]

Taking calcium channels blockers (except amlodipine) can cause worse symptoms and even death in people who have heart failure after a heart attack. ^[56] ^[57] So, your doctor may recommend avoiding calcium channel blockers if you have heart failure or if you've had a heart attack.

How good is the research on calcium channel blockers?

There is good evidence that taking calcium channel blockers can lower blood pressure. ^[58] ^[59] We also know that calcium channel blockers reduce your risk of getting **heart disease** or having a **stroke**, and may help you live longer. ^[58] ^[59]

Diuretics

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

This information is for people who have high blood pressure. It tells you about a group of drugs called diuretics, a treatment for high blood pressure. It is based on the best and most up-to-date research.

Do they work?

Yes. If you have high blood pressure (also called hypertension), drugs called diuretics can lower your blood pressure and help keep it down.

There is also a strong chance that taking a diuretic will reduce your risk of having a **heart attack** or a **stroke** or getting **heart failure**.

Diuretics are as good at lowering blood pressure as other drugs called [beta-blockers](#), [ACE inhibitors](#), [calcium channel blockers](#), [alpha-blockers](#), and [angiotensin II receptor blockers](#).

What are they?

Diuretics are drugs used to lower blood pressure. They are sometimes called water tablets because they work by flushing excess salt and water from your body in your urine.

A group of diuretics called **thiazides** are usually used to treat high blood pressure. Some of the most common ones (and their brand names) are:

- Bendroflumethiazide (Aprinox, Neo-Naclex)
- Chlortalidone (Hygroton)
- Cyclopenthiazide (Navidrex)
- Indapamide (NatriliX, NatriliX SR)
- Xipamide (Diurexan).

High blood pressure

You may need to take more than one medicine to bring your blood pressure down. Most people need at least two drugs. ^[11]

Diuretics are often used with ACE inhibitors and beta-blockers because they can make these drugs work better. ^[43]

How can they help?

Diuretics can lower your blood pressure and keep it down.

Studies looking at thiazide diuretics showed that they can reduce the top number of your blood pressure reading (systolic pressure) by around 12 to 16 points and the bottom number (diastolic pressure) by 5 to 10 points. ^[39] To find out more about the numbers, see [Understanding your blood pressure reading](#) .

Reducing your blood pressure reduces your risk of having a heart attack, a stroke, or heart failure. It also reduces your risk of dying from one of these conditions. ^{[39] [60] [17]}

Diuretics work just as well as other drugs that lower blood pressure such as beta-blockers, ACE inhibitors, calcium channel blockers, alpha-blockers, and angiotensin II receptor blockers. ^{[48] [49] [61] [62] [63] [64]}

Diuretics may work better than some other drugs at preventing heart failure, although they may not be as good as calcium channel blockers at cutting your risk of a stroke. ^[61]
^[62]

How do they work?

You may have heard diuretics called water tablets. That's because they flush out excess salt and water from your body, in your urine. This takes some of the water out of your blood. As the amount of fluid in your blood vessels falls, so does your blood pressure.

Diuretics also open up the arteries (the blood vessels that carry blood from the heart around the body), making it easier for blood to flow through under less pressure.

Can they be harmful?

Like many medicines, diuretics can have side effects. If you feel healthy, you might be reluctant to take tablets every day to prevent a future illness. However, the problems caused by high blood pressure can be serious, such as a heart attack or stroke. You might be reassured to know that, in studies, very few people got side effects bad enough to stop them taking diuretics. ^[60]

Taking a diuretic may make you: ^{[60] [65]}

- Feel thirstier than usual
- Feel sick

High blood pressure

- Feel dizzy, especially when you stand up
- Need to urinate more often. It's best to take diuretics in the morning so you don't have to get up in the night. This side effect may go away after a few days
- Get gout. If you take diuretics, you may get a build up of a substance called uric acid in your bloodstream and joints. This can lead to attacks of gout, which is painful and can damage your joints
- Have muscle cramps
- Have problems getting an erection (this isn't common, and will go away as soon as you stop treatment)
- Get cold hands and feet. About 1 in 10 people who take a diuretic get this problem.

Some diuretics can make you lose the mineral potassium from your body.^[65] Low levels of potassium can make your heart beat abnormally. Other diuretics have been designed to get round this problem. They're called potassium-sparing diuretics. Unfortunately, these can sometimes raise your levels of potassium too much. Your doctor may suggest checks on the level of potassium in your blood.

How good is the research on diuretics?

There's good evidence that taking diuretics helps to lower blood pressure. These drugs have been around for a long time and lots of good-quality studies have looked at their effects in tens of thousands of people.^[17] ^[66]

The studies show that people who take diuretics are more likely to see their blood pressure fall. If you are taking diuretics, you are also less likely to die from heart disease , a stroke , or heart failure .

We also found lots of studies that compared the different drugs used to treat high blood pressure. The studies involved many thousands of people.^[48] ^[49] ^[67] ^[68] ^[69] ^[70] They show that diuretics work just as well as the other main groups of drugs used to lower blood pressure.

There's also some evidence that taking diuretics might work better at preventing heart failure than taking some other drugs, such as calcium channel blockers, ACE inhibitors, and alpha-blockers.^[67]

Renin inhibitors

In this section

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[How do they work?](#)

[Can they be harmful?](#)

High blood pressure

This information is for people who have high blood pressure. It tells you about a group of drugs called renin inhibitors.

We haven't looked at the research on renin inhibitors in the same detail we have for the other treatments we cover. But we've included some information in case you're interested.

What are they?

Renin inhibitors are a relatively new type of drug for high blood pressure. The only renin inhibitor you can get at the moment is called aliskiren (brand name Rasilez).

How can they help?

Research has shown that aliskiren can help to lower people's blood pressure. ^[71]

How do they work?

Renin inhibitors lower your blood pressure by stopping a chemical called renin from working. Renin is made by your kidneys, and plays a part in raising your blood pressure.

Can they be harmful?

In studies, aliskiren didn't cause many side effects. When people did get side effects, the problems tended to be mild and only last a short time. The most common problem was diarrhoea. ^[72] About 2 in 100 people taking a higher dose of aliskiren got diarrhoea. ^[72]

In rare cases, it's possible to get a reaction to aliskiren that causes swelling in the deep layers of the skin. ^[72] This is called **angio-oedema**. The swelling can also affect your mouth or throat. Angio-oedema can be dangerous if you get swelling in your mouth or throat that makes it hard to breathe. If you notice swelling of your face, lips, or tongue, stop taking aliskiren and see your doctor straight away. If you've had this reaction to aliskiren before, you shouldn't take it again. ^[73]

If you are a woman, you shouldn't take aliskiren if you're pregnant or planning to get pregnant. It could harm your baby. ^[72]

Drinking less alcohol

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[How good is the research on drinking less alcohol?](#)

This information is for people who have high blood pressure. It tells you about how drinking less alcohol can help keep your blood pressure under control. This advice is based on the best and most up-to-date research.

High blood pressure

Does it work?

Probably. Lots of studies show that drinking a lot of alcohol increases your chances of having high blood pressure. So, drinking less alcohol will probably bring down your blood pressure, especially if you're a heavy drinker.

We don't know whether drinking less alcohol can reduce your risk of having a heart attack or a stroke. Some drugs that lower blood pressure ([beta-blockers](#) , [diuretics](#) , [ACE inhibitors](#) , and [calcium channel blockers](#)) can reduce the chances of these things happening.

What is it?

Drinking less alcohol means cutting back to the recommended limit of no more than three to four units of alcohol a day for men, and no more than two to three units a day for women.

- A small glass (125 millilitres) of wine contains one-and-a-half units of alcohol
- Half a pint of ordinary strength lager contains one unit of alcohol
- A single shot (25 millilitres) of a spirit (such as whisky or gin) contains one unit of alcohol.

Bear in mind that different beers and wines contain different amounts of alcohol.

How can it help?

If you have high blood pressure and drink a large amount of alcohol (25 to 50 drinks each week), cutting back may help lower it. ^[74] But we're not completely sure, because the results from research have been mixed.

If you already stay within the recommended limits, we don't know if cutting down further will have any effect on your blood pressure. ^[75]

How does it work?

Studies show that drinking a lot of alcohol is linked to high blood pressure. ^[76]

It's not clear how alcohol works in the body to affect blood pressure. One theory is that the chemicals in alcohol may have an effect on the blood vessels, causing them to tighten and close. This means that blood has to force its way through. And the pressure this puts on the vessel walls will be higher.

Can it be harmful?

Most people won't get any problems from cutting down on alcohol. If you're a very heavy drinker and you stop drinking suddenly, you can get withdrawal symptoms. If you have these symptoms you may need help from a doctor or nurse to deal with them.

How good is the research on drinking less alcohol?

More than 60 studies have shown a link between drinking a lot of alcohol and high blood pressure. ^[75] So, if you're a heavy drinker, cutting back should help lower your blood pressure, although the research doesn't prove this.

We found one large summary of the research (a **systematic review**) of seven studies. ^[74] The studies looked at people with high blood pressure who drank more than the recommended amounts. The results from this research were mixed. The researchers couldn't say for sure whether people with high blood pressure who drink moderate to large amounts of alcohol can lower their blood pressure by cutting back.

Losing weight

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

This information is for people who have high blood pressure. It tells you about how losing weight can help keep your blood pressure under control. This advice is based on the best and most up-to-date research.

Does it work?

If you have high blood pressure and are overweight, losing even four or five pounds (a couple of kilograms) may help to bring your blood pressure down.

If you are being treated for high blood pressure, losing weight may make the treatment work better. And it may reduce how much of the medicine you need.

Having high blood pressure increases your chance of having a **heart attack** or a **stroke**. So far there isn't any evidence that lowering your blood pressure by losing weight will reduce this risk.

There's no advantage to losing weight if you are already at a healthy weight.

For more, see our information on treatments for [obesity](#).

High blood pressure

What is it?

To lose weight, you have to eat fewer **calories** than you burn. Just how many calories you burn depends on things such as your body size and how active you are.

Doctors tend to use two measurements to work out whether you are overweight:

- Your body mass index (BMI). Your BMI relates your weight to your height. This gives an estimate of your body fat. If your BMI is more than 27, you have a higher risk of getting high blood pressure.^[7] You can use our [calculator](#) to work out your BMI.
- Your waist measurement. According to US guidelines, if you're a woman and your waist is more than 88 cm (35 inches) you are considered overweight. If you're a man, and your waist is more than 102 cm (40 inches), you are considered overweight.^[77]

How can it help?

Studies have shown that people who lost 3 percent to 9 percent of their weight reduced their systolic pressure (the top number) and their diastolic pressure (the bottom number) by an average of 3 points more than people who did not lose weight.^[7] ^[77] (To find out more about the numbers, see [Understanding your blood pressure reading](#) .)

If you take tablets for your blood pressure, losing some weight may help them work better. This means you might be able to cut down the dose you need to take or the number of different drugs you need.^[7] ^[77]

How does it work?

Doctors don't know exactly why losing weight helps lower blood pressure.

Can it be harmful?

There is no evidence from the research that losing weight will hurt you.

How good is the research on losing weight?

There is reasonably good evidence that if you're overweight, losing weight can help lower your blood pressure. Overall, the research has found that, with some help, people can lose 3 percent to 9 percent of their weight.^[7] ^[78] ^[79] And losing this much helps to lower blood pressure in most people.

But there isn't any good direct evidence that lowering your blood pressure by losing weight reduces your chances of having a **heart attack** or a **stroke** , or of getting **heart failure** .

High blood pressure

People in the studies followed different programmes for losing weight. Some ate only certain foods. Others were simply given advice on healthy eating and exercise. The research doesn't tell us which diets worked best, but most people lost some weight. ^[78]

Low-fat diet with plenty of fruit and vegetables

In this section

[Does it work?](#)

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[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on a low-fat diet with plenty of fruit and vegetables?](#)

This information is for people who have high blood pressure. It tells you about how a healthy diet can help keep your blood pressure under control. This advice is based on the best and most up-to-date research.

Does it work?

Yes. If you have high blood pressure, eating a diet that is low in fat and includes lots of fruit and vegetables may help lower it.

If you also [cut down on the salt](#) in your diet, you may lower your blood pressure even further.

If you have high blood pressure, you're more likely to get **heart disease** or have a **stroke**. Some research has shown that eating more fruit and vegetables can reduce your risk of having a **heart attack** or a stroke. But it's not clear how much it helps.

Some drugs that lower blood pressure ([beta-blockers](#) , [diuretics](#) , [ACE inhibitors](#) , and [calcium channel blockers](#)) are better at preventing heart problems or a stroke, compared with a healthy diet.

What is it?

A diet called the DASH diet has been shown to lower blood pressure. DASH stands for Dietary Approaches to Stop Hypertension.

On this diet you eat:

- Less saturated fat (which is found in butter, meat, cheese, and cream)
- Less cholesterol (found in saturated fats, eggs, and dairy products)
- Lots of fruit (five servings a day)
- Lots of vegetables (five servings a day)
- Small amounts of dairy products.

High blood pressure

So, you eat wholegrain products (such as brown rice and wholemeal bread), and you also eat fish, poultry, and nuts. You avoid red meat, and sweets and sugary drinks. There are no special foods and no hard-to-follow recipes.

The British Heart Foundation has published a booklet for patients, called *Eating well*. It gives details of how to eat a low-fat diet with plenty of fruit and vegetables. You can get the booklet from its website (<http://www.bhf.org.uk/>).

How can it help?

If you eat a diet with more fruit and vegetables, you may lower your blood pressure more than if you eat the average British diet (which includes high fat foods, sugary drinks, and snacks, and only small amounts of fruit and vegetables).^[80]

One study looked at the blood pressure of people who ate more fruit and vegetables for eight weeks. It found that people's systolic blood pressure (the top number) dropped by an average of 2.8 points, and their diastolic pressure (the bottom number) dropped by an average of 1.1 points.^[80] (To find out more about the numbers, see [Understanding your blood pressure reading](#) .)

You might be able to reduce your blood pressure even more if you:

- Cut down on the amount of fat you eat
- Eat more fruit and vegetables
- Eat a diet high in calcium and protein.

In one study, people who followed this advice lowered their systolic blood pressure (the top number) by an average of 5.5 points and their diastolic pressure (the bottom number) by 3 points.^[80]

How does it work?

It's hard to say why this diet works because we know very little about how food affects blood pressure.

Some research has shown that people whose diets are low in magnesium, potassium, calcium, and protein tend to have higher blood pressure than people who eat foods with high levels of these nutrients. The DASH diet is high in all these nutrients, so this may be the key to its success.

Can it be harmful?

There is no evidence that eating a low-fat diet that includes lots of fruit and vegetables is harmful. But some people may get diarrhoea or feel bloated after eating this diet.

How good is the research on a low-fat diet with plenty of fruit and vegetables?

There haven't been many studies looking at how what you eat affects your blood pressure. We found one study, called the DASH-diet study.^[80] (DASH stands for Dietary Approaches to Stop Hypertension.)

The researchers compared:

- A typical Western diet
- A diet with lots of fruit and vegetables diet
- The DASH diet. This included lots of fruit and vegetables, and low-fat dairy foods. People only ate small amounts of foods that had saturated fat or **cholesterol**.

After eight weeks, more people eating the fruit and vegetable diet or the DASH diet had lower blood pressure, compared with people eating the typical Western diet. The DASH diet was the best.

Physical activity

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

This information is for people who have high blood pressure. It tells you about how exercise can help keep your blood pressure under control. This advice is based on the best and most up-to-date research.

Does it work?

Yes. If you have high blood pressure (hypertension), there's a good chance that taking some exercise at least three times a week will help to lower it.

You need to exercise regularly to keep your blood pressure down. If you stop, it may rise again.

Having high blood pressure increases your risk of getting **heart disease** or having a **stroke**. If you stay physically active, your chance of getting these conditions will be lower than for someone who is not active.

Exercise may not offer as much protection against a **heart attack** or a stroke as some of the drugs that lower blood pressure, such as [beta-blockers](#), [diuretics](#), [ACE inhibitors](#), and [calcium channel blockers](#).

High blood pressure

What is it?

Being physically active means getting a moderate amount of activity regularly. Types of exercise that could help include:

- Walking briskly (4 miles per hour)
- Swimming (with moderate effort)
- Cycling (at a moderate speed of around 10 miles per hour)
- Playing golf (and pulling the cart or carrying clubs)
- Canoeing or rowing at a leisurely speed (about 2 to 4 miles per hour)
- Mowing the lawn (pushing a power mower)
- Housework (for example, cleaning and bed making).

Most of the research has looked at a combination of activities, such as walking, jogging, running, and cycling. People tended to have qualified trainers to help motivate and supervise them.

The British Hypertension Society recommends the following. ^[11]

- Younger, fit people should do three sessions of exercise a week. You should feel your heart beating faster and be out of breath. Improving your fitness, say by jogging, is better for your heart than improving muscle tone by weight training.
- Older people should aim to exercise for 20 minutes each day, say by walking briskly.

You may find it easier to get active if you build exercise into your routine, rather than setting aside exercise time. For example, try taking the stairs rather than the lift, or parking your car at the far end of the car park at work.

How can it help?

Doing at least three, 45-minute to 60-minute sessions of moderate exercise each week can lower your blood pressure.

In studies, people who did this amount of exercise reduced the top number of their blood pressure reading (systolic pressure) by around 4 points. ^[81] They reduced their bottom number (diastolic pressure) by around 3 points. (To find out more about the numbers, see [Understanding your blood pressure reading](#) .)

A study in Taiwan encouraged older people with mild hypertension to walk more. It found that, after six months, people reduced their top number by 15 points. That was 7 points

High blood pressure

more than people who weren't told to walk more. ^[82] A review of studies also found that moderate- to high-intensity walking was most likely to improve people's blood pressure. ^[83]

The higher your blood pressure is to start with, the more effect exercise seems to have on it. ^[81]

How does it work?

When you exercise, your blood pressure rises because your heart beats more strongly to pump blood to your muscles. When you stop exercising, your pressure then returns to your normal level.

It's not clear why regular physical activity can bring down high blood pressure. One theory is that it reduces the amount of a chemical called noradrenaline in your blood. Noradrenaline makes blood vessels narrow. And this makes it difficult for blood to squeeze through.

If there is less noradrenaline around, the blood vessels will be more relaxed. Blood can pass through more easily without increasing the pressure it puts on the vessel walls.

Can it be harmful?

Sprains, strains, and injuries are the most likely downsides of exercising.

Most people don't need to see their GP before they start to exercise at a moderate level. But you should check with your GP first if you've had a heart attack or other serious health problems.

How good is the research on physical activity?

There is good evidence that taking regularly taking some moderately strenuous exercise reduces blood pressure.

We know this from one summary that looked at the results of 54 small studies. ^[84] These studies included more than 2,000 people altogether. In people who exercised:

- Systolic blood pressure readings (the top number) fell by an average of 3.8 points
- Diastolic pressure (the bottom number) fell by an average of 2.6 points.

To find out more about the numbers, see [Understanding your blood pressure reading](#) .

One small study looked at how well regular heavy activity worked for 173 men with high blood pressure. The study found that it helped prevent heart attacks and strokes. But the study didn't say exactly what type of exercise the men did. ^[85]

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Just walking more can also help. One study looked at 200 Taiwanese people aged over 60. It found the people could reduce their systolic blood pressure over six months by walking more. But the study didn't say exactly how much walking they did.^[82] A review of studies also found that walking is most likely to help if you walk at a moderate to intense pace.^[83]

Reducing the salt in your diet

In this section

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[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

[How good is the research on reducing the salt in your diet?](#)

This information is for people who have high blood pressure. It tells you about how eating less salt can help keep your blood pressure under control. This advice is based on the best and most up-to-date research.

Does it work?

Yes. If you have high blood pressure, switching to a low-salt diet can help to lower it, especially if you're over 45.

Having high blood pressure increases your risk of having a heart attack or a stroke. So far, there is no evidence that lowering your blood pressure by cutting down on salt will reduce this risk.

What is it?

Reducing the amount of salt in your diet means changing the types of food you eat, and perhaps using 'low salt' instead of table salt.

Most of us eat more salt than we need. And around three-quarters of this salt comes from processed foods such as ready meals, canned vegetables and soups, preserved meats, hard cheese, and salty snacks.

A low-salt diet means eating less than 6 grams (or 1 teaspoon) of table salt a day.^[4] This is the same as 2.4 grams of sodium.

On average, adults in the UK eat about 7 grams to 10 grams of salt a day. So, cutting down to 6 grams means you might have to cut out a large amount of the salt you eat at the moment. You might find it hard to adjust to your new diet at first, because things may seem tasteless for a few weeks.

Here are some tips on [How to cut down on salt](#).

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How can it help?

If you eat less salt, your blood pressure is likely to fall. ^[87] The less salt you eat, the more your blood pressure is likely to fall. ^[88]

In studies, people who cut their salt intake by about 5 grams (just under a teaspoon) saw their systolic blood pressure (the top number) drop by 5 points. ^[87] Their diastolic pressure (the bottom number) dropped by nearly 3 points. (To find out more about the numbers, see [Understanding your blood pressure reading](#) .)

If you have high blood pressure, you are at higher risk of getting heart disease or having a stroke . But we don't know if cutting down on salt will lower this risk.

How does it work?

We don't know exactly how salt affects your blood pressure. There's some evidence that certain people are salt-sensitive, meaning that salt affects their blood pressure. Other people seem to be able to eat as much or as little salt as they like, without any effect on their blood pressure. They are said to be salt-insensitive.

Can it be harmful?

Reducing the amount of salt you eat probably won't hurt you, as most people eat too much. But studies haven't specifically looked at this.

How good is the research on reducing the salt in your diet?

There's good evidence that cutting back on the amount of salt you eat lowers blood pressure. But we don't know if eating less salt protects you against heart attacks or strokes .

The evidence comes from a big review of the research (a systematic review). ^[89] It looked at 20 studies that included around 800 people. The studies found that eating less salt brings down blood pressure, and that the benefits are likely to increase the longer you keep up a low-salt diet. ^[89] ^[90]

Stopping smoking

In this section

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[How does it work?](#)

[Can it be harmful?](#)

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

This information is for people who have high blood pressure. It tells you about how giving up smoking can help keep your blood pressure under control. This advice is based on the best and most up-to-date research.

Does it work?

There's no evidence that your blood pressure will go down if you stop smoking. But there is evidence that stopping smoking can cut your risk of a heart attack or a stroke.

What is it?

Stopping smoking means giving up cigarettes completely rather than just cutting back.

There are lots of things that can help you quit smoking. You can get nicotine replacement products like patches, sprays, or gum. You can buy these yourself or get them from your GP. Your GP can also prescribe anti-smoking drugs, such as bupropion (brand name Zyban) and varenicline (Champix). He or she might also be able to refer you to a self-help group.

To learn more, see [Stopping smoking](#) .

How can it help?

We don't know if stopping smoking will help lower your blood pressure because it hasn't been studied properly.

But we do know that people who smoke are more likely to have a **heart attack** or a **stroke** than people who don't smoke. ^[91] ^[92] ^[93] ^[94] For example, middle-aged smokers are nearly three times as likely to have a heart attack as middle-aged people who have never smoked. ^[92] ^[93]

If you give up smoking, within two to three years your chances of having a heart attack can drop to the same level as someone who's never smoked. ^[91]

How does it work?

If you have high blood pressure, you are more likely to get **heart disease** or have a stroke. Smoking adds to your risk.

Smoking hardens your arteries (the blood vessels that carry blood from your heart). This makes it difficult for blood to flow through easily, which could lead to your blood pressure going up.

Can it be harmful?

It can be difficult and stressful to give up smoking. But once you do you probably won't regret it. As far as your health's concerned, stopping smoking is one of the best things you can do.

How good is the research on stopping smoking?

There isn't much evidence from studies to prove that stopping smoking will lower your blood pressure. But there is lots of evidence that smokers are much more likely to have a **heart attack** or a **stroke** than people who don't smoke.

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The evidence comes from two large summaries of the research, plus three other studies. [\[93\]](#) [\[94\]](#) [\[95\]](#) [\[92\]](#) [\[96\]](#) All these found that smokers were around three times as likely as non-smokers to have a heart attack or a stroke.

Calcium supplements

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 supplements?](#)

This information is for people who have high blood pressure. It tells you about taking calcium supplements. It is based on the best and most up-to-date research.

Do they work?

We're not certain. There's some evidence that calcium supplements might help to lower your blood pressure a tiny bit. But we need to see the results of more research before we know for certain.

Having high blood pressure increases your chances of having a heart attack or a stroke. We don't know if taking extra calcium will reduce this risk. There's no good research to tell us.

What are they?

Calcium supplements are tablets that you can buy over the counter from a pharmacy or from health food shops. The label might say something like calcium carbonate or calcium citrate.

Calcium is best known as the building block for bones and teeth. It also keeps our hearts pumping and nerves working properly.

How can they help?

Taking calcium supplements (500 milligrams to 2,000 milligrams a day) might help to reduce your blood pressure a tiny bit. ^[97]

A few studies show that taking 500 milligrams to 2,000 milligrams of calcium a day lowered the top number of the blood pressure reading (the systolic pressure) by about 1.4 points on average, and the bottom number (diastolic pressure) by about 0.8 points. ^[97] (To find out more about the numbers, see [Understanding your blood pressure reading](#).)

If you have high blood pressure, you are at risk of having a heart attack or a stroke and getting kidney disease. Studies haven't shown whether these risks are cut in people who take calcium tablets.

High blood pressure

How do they work?

We're not sure how calcium might work in the body to lower blood pressure. But studies have found that people whose diet is low in calcium tend to have higher blood pressure than people whose diets have a lot of calcium.

It's possible that if you don't have enough calcium your blood vessels don't relax properly to let blood through easily. This makes it more difficult for blood to flow through them, so your blood pressure goes up.

Calcium may also help your body get rid of salt. Reducing the amount of salt in your body may lower your blood pressure. ^[98]

Can they be harmful?

Some people who take calcium supplements get mild stomach pain and constipation.

How good is the research on calcium supplements?

There hasn't been much research looking at whether calcium supplements can lower blood pressure. We found one summary of the research that weighed up the results of 42 studies. ^[97]

The studies looked at 4,560 middle aged men and women in total. Some of the people had high blood pressure and some didn't. The studies found that taking calcium supplements lowered blood pressure by a small amount. But most of the studies were very small. This makes it hard to say whether their results are reliable.

Fish oil supplements

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[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on fish oil supplements?](#)

This information is for people who have high blood pressure. It tells you about fish oil supplements. It is based on the best and most up-to-date research.

Do they work?

If you have high blood pressure, taking a fish oil supplement every day may help to lower it.

You will need to take 3 to 4 grams of fish oil every day to have a small effect on blood pressure. ^[99] This is a high dose and you might find it difficult or unpleasant to take this much. Too much fish oil can cause stomach problems and bad breath. It can also make your mouth taste fishy.

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Having high blood pressure increases your chances of having a heart attack or a stroke . We don't know if taking fish oil supplements will reduce this risk.

What are they?

Fish oil supplements are capsules that contain the omega-3 fatty acids called DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid). These are the same as the fatty acids found in oily fish such as trout, mackerel, sardines, and salmon. Omega-3 fatty acids are also called n-3 fatty acids.

How can they help?

Taking about 3 to 4 grams of fish oil supplements every day may lower your blood pressure. Studies show that taking these supplements can lower the top number of your blood pressure (the systolic pressure) by an average of 3.7 points and the bottom number (the diastolic pressure) by 2.5 points.^[99] (To find out more about the numbers, see [Understanding your blood pressure reading](#) .)

Studies don't show whether taking fish oil supplements will reduce your risk of getting heart disease or having a stroke.

The studies used different mixtures of oils. So we can't say for sure if one type of fish oil supplement works better than another.

How do they work?

We're not sure how fish oils work in the body to lower blood pressure. But doctors became interested in fish oils after they noticed that people who eat lots of fish have lower blood pressure and are less likely to have heart disease .

Fish oils may help keep blood vessels stretchy. And this may make it easier for blood to flow through them.

Can they be harmful?

About a third of people taking 3 grams of fish oil a day get stomach pain, wind, bad breath, or an unpleasant fishy taste in their mouth.^[99]

How good is the research on fish oil supplements?

We found one big summary of the research (a systematic review) that looked at 36 studies.^[100] Together, these studies looked at about 1,000 people with high blood pressure. Taking an average of 3.7 grams of fish oil did help to reduce blood pressure. But it might be hard to take this amount of fish oil for a long time.

Magnesium supplements

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High blood pressure

[What are they?](#)

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[How do they work?](#)

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

This information is for people who have high blood pressure. It tells you about taking magnesium supplements. It is based on the best and most up-to-date research.

Do they work?

We're not certain. There's no research so far that shows that taking magnesium supplements can help to reduce your blood pressure. We'll need to see the results of larger studies to know for certain whether magnesium can help.

What are they?

Magnesium supplements are tablets containing the mineral magnesium. You can buy these over the counter from a pharmacy or from health food shops.

Your body needs magnesium to help your nerves and muscles work properly. It is also a key part of the **enzymes** in your body. Enzymes help make lots of proteins and chemicals your body needs.

You get magnesium from green vegetables, such as spinach, and nuts, seeds, and some whole grains.

How can they help?

Some small studies suggest that taking magnesium supplements might help to reduce blood pressure.^[101] But we need to see the results of much bigger studies to be certain.

How do they work?

Several studies have found that people who eat a lot of foods that contain magnesium tend to have lower blood pressure.

It's not clear how magnesium might lower your blood pressure.

- It seems to have a role in helping to keep the small blood vessels open so that blood can flow through easily.
- If these are not open properly then the blood has to squeeze through.
- This puts more strain on the walls of the vessels, so your blood pressure will be higher.^[102]

Can they be harmful?

The studies that we found don't mention any side effects from taking extra magnesium.

How good is the research on magnesium supplements?

There isn't much evidence so far from studies that taking magnesium supplements can reduce blood pressure.^[103] ^[104] We found one summary of the research (a **systematic review**) that looked at 20 studies that included 1,220 people altogether plus one other small study of 36 people with slightly raised blood pressure.^[103] ^[104] There was a suggestion from the summary that taking magnesium may help to reduce blood pressure.^[103] But the small study found that magnesium had no effect.^[104]

We need bigger studies to find out for certain if taking magnesium can help to reduce blood pressure.

Potassium supplements

In this section

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[What are they?](#)

[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

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

This information is for people who have high blood pressure. It tells you about taking potassium supplements. It is based on the best and most up-to-date research.

Do they work?

If you have high blood pressure, taking potassium supplements each day might help to lower it, but only by a small amount.

If you have high blood pressure you are more likely to have a **heart attack** or a **stroke**. But we don't know if taking potassium supplements reduces these risks. We haven't found good studies that have looked at this.

What are they?

Potassium supplements are tablets that you can buy over the counter from a pharmacy or from a health food shop. The label might say potassium chloride.

Your body needs potassium to help balance the amount of water in your blood and body tissues, and to help your nerves and muscles work properly.

Foods high in potassium include bananas, grapefruit, oranges, tomatoes, prune juice, and melons.^[105]

It's important that you don't eat a lot of foods high in potassium if you are taking a potassium supplement. Too much potassium can be dangerous and affect the way your heart works. Talk to your doctor if you're worried about how much of these foods to eat.

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Also, grapefruit and grapefruit juice contain a substance that can slow down the break up of some medicines by the body, including some medicines used to treat high blood pressure. This can increase the amount of the medicine in your blood. Other fruit and juices do not have this effect. Speak to your doctor if you're not sure whether you should be eating grapefruit or drinking grapefruit juice.

How can they help?

Taking a potassium supplement every day may help to lower your blood pressure.

Some studies have shown that taking about 2 to 3 grams of potassium each day can reduce your systolic pressure (the top number in your blood pressure reading) by 2 to 4 points, and your diastolic pressure (the bottom number) by around 2 points.^[106] ^[107] (To find out more about the numbers, see [Understanding your blood pressure reading](#) .)

You need to eat about five bananas a day to get this much potassium.

No studies have shown that taking potassium supplements reduces your risk of getting [heart disease](#) or [kidney disease](#) , or having a [stroke](#) .

How do they work?

People whose diets are low in potassium are more likely to have high blood pressure than people whose diets contain a lot of potassium. This is why doctors have looked at whether taking potassium supplements might help to lower blood pressure.

We don't know for sure how increasing the potassium in your diet might lower your blood pressure.

Can they be harmful?

In some studies about 1 in 50 people who took potassium supplements said they had wind, [diarrhoea](#) , and stomach pains. In other studies about 1 in 10 people had these side effects.^[106]

How good is the research on potassium supplements?

There is some evidence that taking potassium supplements can help lower your blood pressure. But more studies need to be done before we can say for sure whether they will help you.

We found one summary of the research that looked at 21 studies, plus one other study.^[106] ^[108]

The studies in the summary included 1,560 people altogether. The one other study looked at the effects of taking potassium in 150 people. The summary and the separate study both found that taking potassium supplements can help to reduce blood pressure. But they didn't show whether taking supplements will cut your risk of getting [heart disease](#) or having a [stroke](#) .

Cocoa

In this section

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[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

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

This information is for people who have high blood pressure. It tells you about products that contain cocoa. It is based on the best and most up-to-date research.

Does it work?

If you have high blood pressure, eating or drinking cocoa products each day might help to lower it by a small amount. ^[109]

If you have high blood pressure you are more likely to have a **heart attack** or a **stroke**. But we don't know if regularly eating cocoa reduces these risks.

What is it?

Cocoa is made from cacao beans, the fatty seeds of the Theobroma cacao tree. It is what gives chocolate its flavour. People usually get cocoa from eating chocolate or from drinking chocolate drinks that come as a powder, to which you add hot water or milk.

A chocolate product is usually said to be high in cocoa if it contains at least 70 percent cocoa. A chocolate bar with this much cocoa in it is called 'dark' or 'plain' chocolate, rather than the paler-coloured milk chocolate. Milk chocolate is only about 20 to 30 percent cocoa. ^[109]

How can it help?

In studies, consuming cocoa regularly lowered people's systolic blood pressure (the top number) by about 2.7 points and lowered diastolic blood pressure (the bottom number) by about 2.2 points. ^[109] (To find out more about the numbers, see [Understanding your blood pressure reading](#).)

In the studies we found, only cocoa products that were low in sugar helped to lower people's blood pressure. This may be because having a lot of sugar in your blood might affect how well the blood circulates. ^[109] It's a good idea to read the label of any product to check that there is a good amount of cocoa, and not too much sugar. Cocoa and chocolate products that are high in cocoa are less likely to be high in sugar.

If you have high blood pressure, you have a higher chance of getting **heart disease** or having a stroke. But we don't know if consuming more cocoa will lower this risk.

High blood pressure

How does it work?

Cocoa may help lower blood pressure in several ways:

- Cocoa is thought to produce a substance called nitrous oxide in the blood. Nitrous oxide helps open up blood vessels, and so lowers blood pressure.
- Substances called flavonols contained in cocoa work much like blood pressure lowering drugs called [ACE inhibitors](#) in helping to lower blood pressure.

Can it be harmful?

Cocoa is unlikely to be harmful. In the studies we found, about 1 in 100 people had a stomach upset from eating cocoa. About 1 in 200 people had a headache. ^[109]

Some chocolate products contain a lot of sugar. The sugar in these products is more likely than the cocoa to be harmful. Diets high in sugar can lead to weight gain, diabetes, and other health problems. Products that are high in cocoa (at least 70 percent) are less likely to be high in sugar.

How good is the research on cocoa?

The quality of the research about cocoa is still fairly low.

We found one large summary of research (a [systematic review](#)). This review included 20 studies and 856 people altogether. Most of the studies were quite short, lasting only about four weeks. ^[109] We would need longer studies to tell us whether daily cocoa consumption can lower blood pressure over the long term, and whether it can cause long-term problems.

Further informations:

Understanding your blood pressure reading

When your doctor tells you what your blood pressure is, they will give you two numbers. For example, your doctor may say that your blood pressure is '120 over 80'. This would be written as 120/80.

- The first, higher number is called the systolic pressure. It measures the pressure of the blood when your heart pumps blood out.
- The second, lower number is called the diastolic pressure. This is the pressure measured when your heart relaxes and fills up with blood.

High blood pressure

Your GP may say your blood pressure is fine, give you lifestyle advice (on diet, exercise, or stopping smoking) or treat you with drugs to lower your blood pressure, depending on what your numbers are. Here is a guide as to what your GP might do. ^[2] ^[4]

Blood pressure between 130 and 139 (systolic) or 85 and 89 (diastolic)

This is sometimes called 'high-normal' blood pressure. It means you may have a raised risk of developing high blood pressure. ^[5] Your doctor may give you advice on how to reduce your blood pressure by changing what you eat or do.

Blood pressure between 140 and 159 (systolic) or 90 and 99 (diastolic)

This is sometimes called stage 1 hypertension. Your GP will probably offer you drug treatment if your blood pressure is at this level in your first reading, and if you have an ambulatory blood pressure result of 135/85 or more, and a raised risk of cardiovascular disease. If you don't have other risk factors, you may just be given advice on diet and exercise, and have your blood pressure checked more regularly.

Blood pressure between 160 and 179 (systolic) or 100 and 109 (diastolic)

This is sometimes called stage 2 hypertension. If it is still high after ambulatory blood pressure monitoring, your GP will probably offer you drug treatment straight away.

Blood pressure above 180 (systolic) or 110 (diastolic)

This is called severe hypertension. Your GP may offer you drug treatment immediately, without waiting for further tests.

When you are treated for high blood pressure, your doctor will try to reduce your blood pressure to 140 over 90 (140/90) or less. If you have diabetes, problems with your kidneys, or have had a heart attack or a stroke, your doctor will aim to bring your blood pressure down further.

How your kidneys help control your blood pressure

Your kidneys take excess salt and water out of your blood and turn them into urine. They do this to get rid of the salt and water your body doesn't need. It's also one of the ways your body regulates your blood pressure.

If your blood pressure is low, your kidneys make a substance called **renin**. Renin is an enzyme. Enzymes are substances in your body that help chemical changes to happen.

Renin begins a series of chemical reactions in your body that play a part in raising your blood pressure. Renin helps your body to make another chemical, called **angiotensin I**.

High blood pressure

Angiotensin I needs to be changed to another form before it can work. This is done by an enzyme called **angiotensin-converting enzyme (ACE)**. ACE turns angiotensin I into **angiotensin II**. Angiotensin II is the active form that increases your blood pressure.

Angiotensin II raises your blood pressure by stopping your kidneys taking salt and water out of your blood. It also makes your blood vessels narrower. This means there is more blood struggling to get through a smaller space. This causes higher blood pressure. ^[6]

Some medicines for high blood pressure work by interfering with the chemicals in your body that cause your blood pressure to go up.

- Drugs called renin inhibitors stop renin working.
- Some drugs for treating high blood pressure stop the body turning angiotensin I into the active form, angiotensin II. These drugs are called [ACE inhibitors](#) .
- Other drugs for treating high blood pressure block the effects of angiotensin II so it can't make blood vessels narrower. These drugs are called [angiotensin II receptor blockers](#) (or ARBs for short).

The blood pressure test

Doctors usually use a device called a **sphygmomanometer** to take your blood pressure. This measures pressure as millimetres of mercury (mm Hg). Most doctors now use digital sphygmomanometers, which don't actually contain mercury. But the measurement is still given in this way.

This is how your doctor will take your blood pressure. ^[3]

- Your doctor wraps a cuff around your arm above your elbow and pumps air into it. The cuff inflates and stops the blood flow in the main blood vessel in your arm.
- Then, your doctor slowly releases the pressure in the cuff.

If they are using a digital machine, your doctor will check the reading on the side of the machine. It will give both the systolic pressure and the diastolic pressure. Digital machines are more common, but they are not suitable for everyone. People with an irregular pulse may need to be tested with an old-style machine.

If they are using an old-style machine, your doctor will look at a gauge on the sphygmomanometer while they use a stethoscope to listen for the sound of the blood rushing back through.

- The first measurement is taken when your doctor hears the first thumping sound. This is your blood pressure during a heartbeat. It's called the systolic pressure.

High blood pressure

- As the pressure in the cuff drops further, and your blood can flow past more easily, the thumping sound stops. At this point your doctor reads off the second measurement. This is your blood pressure as your heart is relaxing between beats. It's called the diastolic pressure.

What's an angiotensin-converting enzyme?

ACE inhibitors treat high blood pressure by affecting a chemical in your body called angiotensin-converting enzyme (ACE).

Your body makes angiotensin when your heart is pumping less blood. Your blood carries the oxygen and food that all the cells in your body need. Angiotensin has two forms, angiotensin I and angiotensin II.

- Angiotensin I tries to control how much blood is circulating around your body. If less blood is circulating, angiotensin I makes your body save salt and water. It does this to try to increase the amount of fluid circulating through your blood vessels.
- Angiotensin I also makes your blood vessels narrower and raises your blood pressure. Over time, this can make the chamber on the lower left side of your heart (called the left ventricle) flabby. This means that it doesn't pump as well as it should.
- Angiotensin I is changed into a more active chemical called angiotensin II. This chemical makes the heart use more oxygen than usual to pump, which in turn makes your blood pressure go up further.

ACE inhibitors stop the angiotensin-converting enzyme changing angiotensin I into angiotensin II.

How do angiotensin II receptor blockers affect your body?

Angiotensin II receptor blockers (ARBs) are drugs that affect a chemical in your body called angiotensin. Your body makes angiotensin when your heart is pumping less blood around your blood vessels. Your blood carries the oxygen and food that all the cells in your body need.

Angiotensin has two forms, angiotensin I and angiotensin II.

- Angiotensin I tries to control how much blood is circulating around your body. If less blood is circulating, angiotensin I makes your body save salt and water. It does this to try to increase the amount of fluid circulating in your blood vessels.

High blood pressure

- Angiotensin I also makes your blood vessels narrower and raises your blood pressure. Over time, this can make the chamber on the lower left side of your heart (called the left ventricle) flabby. This means that it doesn't pump as well as it should.
- Angiotensin I can be changed into a more active chemical called angiotensin II. This chemical makes the heart use more oxygen than usual to pump, which in turn makes your blood pressure go up.
- Angiotensin II receptor blockers stop angiotensin II from making your blood pressure go up.

Angiotensin II receptor blockers work in a slightly different way to [ACE inhibitors](#). ARBs block the effect of angiotensin II. ACE inhibitors stop angiotensin I being changed into angiotensin II.

How to cut down on salt

Here's some advice from a group called Consensus Action on Salt and Health (CASH).
^[86] The group consists of specialists who are concerned about salt and how it affects health.

- Taste your food before adding salt at the table.
- Choose foods that say 'low salt', if possible. Foods such as cereals, bacon, sausages, and bread are high in salt, so look for ones that have less salt in them.
- Avoid processed foods and ready-made meals as much as possible. Most of the salt we eat (about 75 percent) is hidden in processed foods and you might not even realise it's there. Always check the label.
- Avoid salty snacks, such as crisps and salted nuts.
- Snack on fruit and vegetables instead.

Glossary:

kidney disease

Your kidneys are the organs in your body that make urine. Kidney diseases are diseases in which your kidneys have been damaged. Kidney disease can be caused by several things, including high blood pressure (hypertension).

heart failure

When the heart loses its ability to push enough blood through the blood vessels, it is called heart failure.

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.

High blood pressure

enzymes

Enzymes are chemicals in your body. They have lots of different functions, including playing a part in helping to digest food and starting other chemical reactions that keep the body working.

heart attack

Doctors call a heart attack an acute myocardial infarction (or acute MI). This is the name for the damage that occurs to the heart muscle if it isn't getting enough blood and oxygen because a branch of the coronary arteries is blocked. During a heart attack, you may have pain or heaviness over your chest, and pain, numbness or tingling in your jaw and left arm.

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).

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.

stroke

You have a stroke when the blood supply to a part of your brain is cut off. This damages your brain and can cause symptoms like weakness or numbness on one side of your body. You may also find it hard to speak if you've had a stroke.

kidney failure

Kidney failure is when your kidneys can't make urine properly. Kidney failure happens because of kidney disease. People with kidney failure need to have dialysis, which is a way to get rid of the substances in your blood that normally go in your urine.

cholesterol

Cholesterol is a fat-like substance made by your liver or absorbed from food. It is used by your body to make bile acids (which help your intestines absorb nutrients) and steroid hormones (like testosterone or oestrogen). Cholesterol is also an important part of cell membranes, which are the structures that surround cells. 'Good cholesterol' is called HDL; 'bad cholesterol' is LDL.

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 disease

You get heart disease when your heart isn't able to pump blood as well as it should. This can happen for a variety of reasons.

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.

calories

A calorie is a unit that is used to tell how much energy is found in food. But when we talk about how many calories food contains, we actually mean kilocalories, or kcal, which contain 1,000 'small' calories. When your body stores energy instead of using it, you get heavier. This is why you gain weight if you eat foods that are high in calories and the energy is stored instead of used. If your daily calorie intake is the same as the amount of energy your body uses up, your weight will remain the same. If you consume more calories than your body uses, you put on weight. Foods containing fat are high in calories.

diarrhoea

Diarrhoea is when you have loose, watery stools and you need to go to the toilet far more often than usual. Doctors say you have diarrhoea if you need to go to the toilet more than three times a day.

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