

Patient information from BMJ

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Coronary artery bypass surgery

This information is about coronary artery bypass surgery. It explains how the operation is done, how it can help, what the risks are, and what to expect afterwards.

It's important to remember that different hospitals sometimes have slightly different methods and procedures. You can use our information to talk with your doctor about the treatment you will have.

What is a coronary artery bypass?

A coronary artery bypass is an operation to improve the blood flow to your heart.

Your heart is a muscle about the size of a fist. It has its own blood vessels called coronary arteries. These arteries bring the heart muscle the oxygen it needs to keep pumping blood around your body.

Heart disease can cause these arteries to become too narrow for blood to flow properly. If this happens, your heart doesn't get enough oxygen. This can cause chest pain.

In a bypass operation, a surgeon takes sections of healthy blood vessels from another part of your body (such as your leg) and uses them to replace the narrowed sections of the arteries in your heart.

The full name for this operation is a **coronary artery bypass graft**, or **CABG**(pronounced 'cabbage').

Why might I need a coronary artery bypass?

If you have heart disease it can cause problems, including chest pain called angina. Angina can be treated with medications. But if they don't help, your doctor might suggest surgery.

Your doctor might suggest that you have bypass surgery if:

- you still get chest pain even if you are taking pills to treat angina
- tests show narrowing in the arteries in your heart. Your doctor is more likely to suggest an operation if several of your heart's arteries have narrowed, or if the narrowing is close to the body's main artery, called the **aorta**

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- the left side of your heart isn't working as well as it should
- you get chest pain whenever you do anything that needs physical effort
- you have a narrowed artery that can't be widened by a simpler operation called **coronary angioplasty**.

What will happen?

Bypass surgery usually takes between three and six hours. You'll be given a general anaesthetic, so you'll be asleep during the operation.

At the start of the operation, the surgeon takes some healthy blood vessels from another part of your body.

These will be attached (**grafted**) onto the arteries in your heart. The healthy blood vessels will then be able to carry blood around (**bypass**) the narrow parts of the arteries in your heart.

Healthy blood vessels can be taken from your leg, chest, or arm. Your blood will still be able to flow normally in these areas, as other blood vessels will take over.

The number of blood vessels the surgeon needs to remove will depend on how many parts of your coronary arteries the surgeon needs to bypass. Some people only need one or two grafts, but most need three or four.

This is what happens during the bypass operation:

- The surgeon will usually make a cut down the middle of your breastbone and gently pull your ribs apart so your heart can be seen.
- The surgeon might need to stop your heart so that it doesn't keep beating while he or she is trying to sew the new blood vessels in place. While your heart is stopped, a heart-lung machine is used to pump blood around your body.

These days, more surgeons can do the operation without stopping your heart. This is called **off-pump coronary artery bypass surgery** (or **OPCAB**). But the machine is always there in case you need it.

- The surgeon will then sew the new blood vessel (the graft) to your coronary artery, bypassing the narrow part. One end of the healthy vessel will be sewn above the blockage, and the other end below.
- After the surgeon has stitched all the grafts in place, the heart-lung machine will be switched off and your heart will start beating again.
- The cut along your breastbone is then stitched up.

After the operation, you'll be taken to intensive care or a cardiac recovery ward, where nurses will keep a close eye on you overnight.

Sometimes there is fluid left in your chest after the operation, and you'll have a tube put in your chest to drain it. The tube is usually taken out the next day. In one or two days you should be well enough to walk.

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How might it help?

If you have angina, having bypass surgery can help you in several ways. For example, it can:

- reduce your chances of having a heart attack
- reduce chest pain and breathlessness. Most people who have bypass surgery find that they have no pain after their operation. Many people have no symptoms for many years afterwards
- reduce the amount of medication you need to take for angina
- improve your quality of life and generally make you feel better and healthier. You should find it easier to go out and see family and friends, and to enjoy the things you like to do.

If you have had a heart attack, bypass surgery can help you live longer, compared with drug treatment alone.

But bypass surgery can't cure your heart disease. Your arteries can become narrow again in new places. You can reduce the chances of this happening by:

- stopping smoking (if you smoke)
- taking the medications you need, and
- exercising regularly.

What are the risks?

All operations have risks, and your surgeon should discuss them with you before your surgery.

The list of possible problems below might look long and frightening. But remember, these are just things that might happen, not things that will definitely happen. Many people have only minor problems or none at all.

One common cause of side effects is the **anaesthetic** you will have before your operation, which can make some people feel nauseous.

Anaesthetics can also cause more serious problems, such as allergic reactions, breathing problems, and heart problems. These are serious but rare. If you have any allergies, it's important that you tell your doctor before you have surgery.

Other **short-term problems** that can happen include:

- pain in your chest. It takes months for the breastbone to heal, and you might need to take painkillers for a few weeks. If you are in pain, tell a doctor or nurse straight away. Don't put up with pain while you wait for your next scheduled dose of painkillers
- pain where the surgeon removed a blood vessel. If a vein was removed from your leg, you might have swelling there for a while
- an irregular heartbeat. It might feel as though your heart misses a beat, or beats too quickly. This should settle down after a few days, but you might need medication to help your heart beat regularly again

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- needing a blood transfusion. This is fairly common after bypass surgery, and it's usually not serious. But some people need to have surgery to stop any excess bleeding
- breathing problems. Some people need to be put on a ventilator for a short time to help them breathe properly. Most people can breathe normally again within a day or two
- a heart attack. It is rare, but some people have a heart attack during or just after the operation. If this happens you will have emergency treatment
- a stroke. Some people have a stroke during or just after the operation. Again, if this happens you will need emergency treatment.

Longer-term problems that can happen include:

- infection. This is a risk with every kind of surgery. There's a small chance that the wound in your chest or around where your arteries were grafted will become infected and that you'll need to stay in hospital for a few extra days and have antibiotics
- problems with your memory. You might not feel as sharp mentally after the operation. But this usually clears up within a few months
- a heart attack or a stroke. As well as sometimes happening during the operation, these can also sometimes happen in the weeks after your surgery
- kidney problems. These usually get better over time, and serious problems are rare. But some people will need to have dialysis
- dying in the weeks after your operation. About 3 in every 100 people die within 30 days of having bypass surgery.

What can I expect afterwards?

Most people recover quickly and are walking again after two days, and at home within 10 days.

If you have high blood pressure or high cholesterol as well as angina, you'll need to keep taking medications for these conditions even after your bypass operation.

If you're overweight, you might need to lose weight. If you smoke, you should do everything you can to stop. Smoking makes any treatment less likely to work.

Going home

A coronary artery bypass is a major operation and it can take months to recover fully. Don't expect too much of yourself too soon. You might feel more tired than you used to, but you'll slowly get your strength back.

You shouldn't drive for four to six weeks after your operation. If you have a commercial licence (to drive a lorry, for example) you will need to tell your local driving authority about your operation. For example, in the UK, it's the DVLA.

You might feel anxious or depressed when you get home. It's normal to feel like this for a while after the stress your body has been under. Try not to worry about these feelings. If they last for more than a few weeks, ask your doctor for advice.

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You might be invited to take part in a **cardiac rehabilitation programme** run by your local hospital. This usually starts about six weeks after your operation and includes exercise classes and advice on what you can do to keep your heart healthy.

Programmes usually last about six weeks. Afterwards, you might want to think about joining a heart support group. Ask your doctor or nurse for information about groups in your area.

You can have sex again after your operation as soon as you feel able to, but you might want to wait for a few weeks. You should be careful not to put too much pressure on your breast bone, as it will still be healing.

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