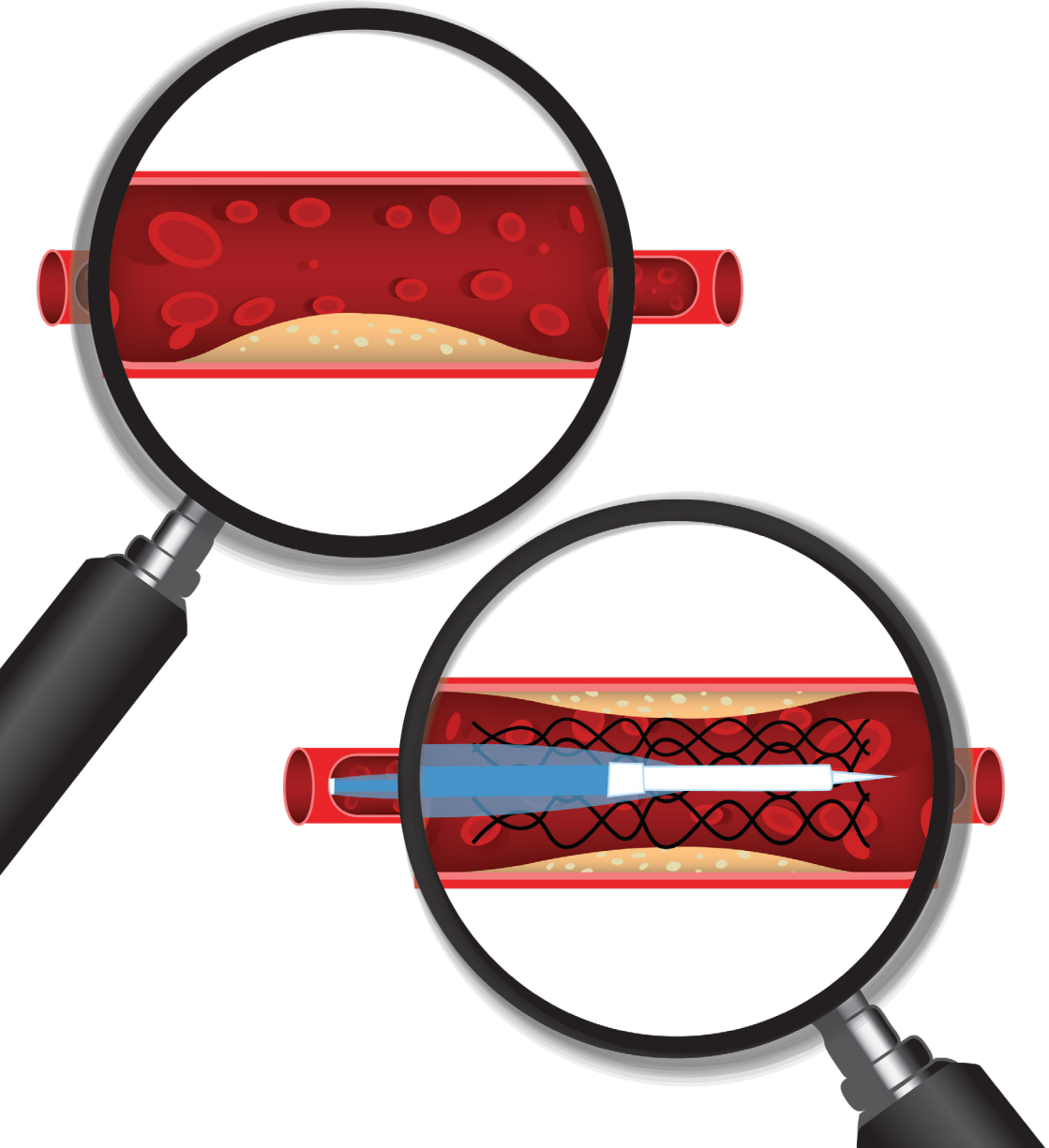
A guide to coronary angiography and angioplasty

Heart Foundation™



Welcome

If you have this booklet then, like many other people in New Zealand, heart disease has touched your life. Whether it is you or a loved one who is looking to find out more about coronary angiography or angioplasty, you are likely to have many questions. We hope the information in this booklet will give you some of the answers, but remember you can talk to your doctor or nurse about any questions or concerns you have as well.

My checklist

After reading through this booklet, you should be able to check off the following statements:

- ☐ I understand the risks and benefits for me to have a coronary angiography and an angioplasty.
- ☐ I have talked to my doctor, nurse and other health professionals about any concerns that I have.
- ☐ I have checked out the Heart Foundation's Heart Help website to find my local cardiac rehabilitation programme.
- ☐ I have emailed hearthelp@heartfoundation.org.nz to sign up to the Heart Foundation's Heart Help e-newsletter.
- ☐ I have a plan for my life-long heart health.

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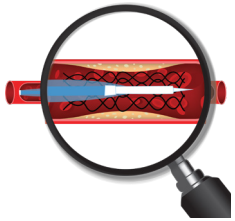
Why have coronary angiography or angioplasty?

Coronary angiography

also called cardiac catheterisation

is a **test** that identifies whether you have narrow or blocked coronary arteries.



Angioplasty

also called percutaneous coronary intervention (PCI)

is a **treatment** used to improve blood flow to heart muscle by opening a narrowed or blocked coronary artery.

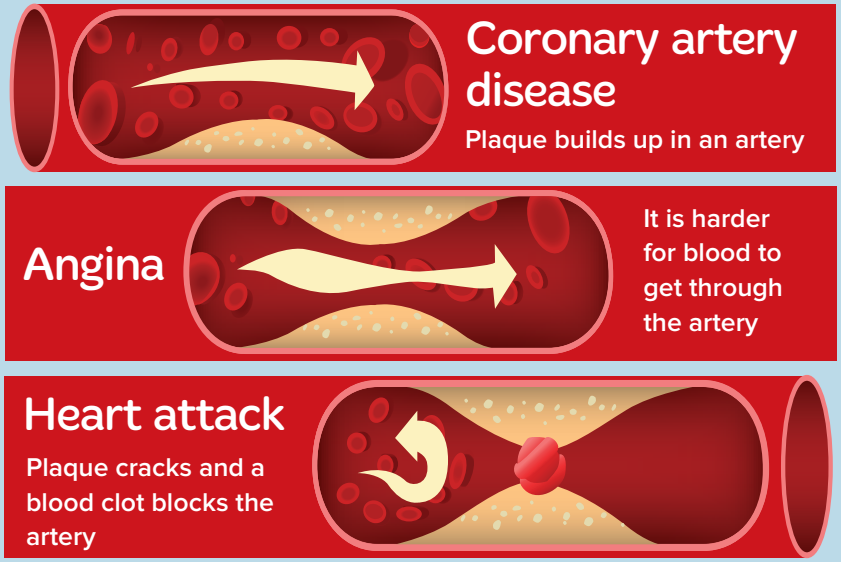
Coronary angiography and angioplasty may be done soon after a heart attack, or if you have angina.

You are likely to have been referred for a coronary angiography to find out more about the severity and extent of your heart disease, and measure how well your heart is working. Knowing this information can help you and your healthcare team to decide what treatment (such as angioplasty, bypass surgery or medications) would be best for you.

While having angiography it is possible that you will go on to have an angioplasty as part of the same procedure. Angioplasty is a treatment where a metal mesh tube (stent) is used to open a narrowed or blocked artery and increase blood flow to the heart muscle. Widening a narrowed artery results in fewer angina symptoms and a better quality of life.

How the heart works

Your heart pumps blood around your body through arteries and other blood vessels, allowing you to walk, talk and think. Coronary artery disease often begins when the coronary arteries that feed blood to your heart start to narrow.



When making a decision about having coronary angiography and / or angioplasty, it is important to talk to your doctor, nurse and other health professionals to get all the information you need.

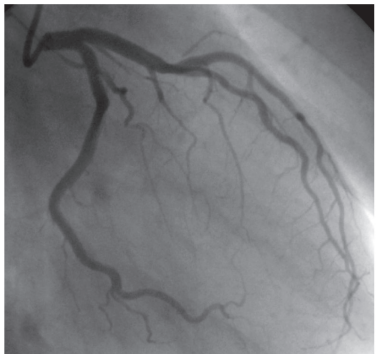
You may like to ask questions such as:

- Why do I need an angiography / angioplasty?
- What other tests and treatments are available?
- What happens if I decide to do nothing?

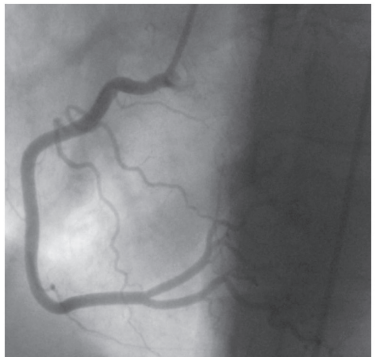
Benefits of coronary angiography

Coronary angiography is used to take x-ray pictures (angiograms) of the coronary arteries. These pictures show the extent and location of any narrowing or blockage that may be stopping blood from flowing easily to your heart muscle.

Depending on what the pictures show, you may need to have treatment with an angioplasty or coronary artery bypass graft surgery.



Normal coronary arteries on the left side of the heart

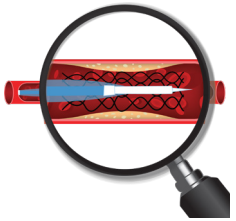


Normal coronary arteries on the right side of the heart

Coronary angiography

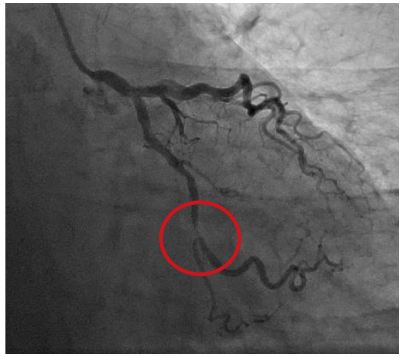
- A test to find narrowing or blockages in your coronary arteries.
- Gives you pictures of your arteries.
- Helps you and your healthcare team gather information to make informed decisions about what your next step may be.

Benefits of angioplasty

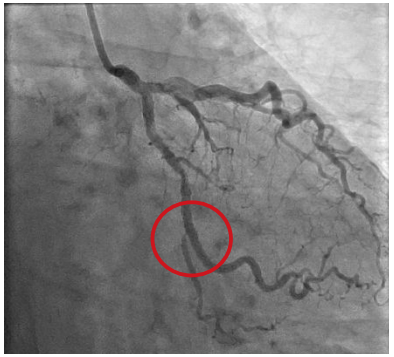


Angioplasty is used to widen a narrowing or open up a blocked coronary artery using a special balloon and a metal mesh tube (stent). In the long term, this should improve blood flow to the heart muscle, resulting in less or no angina.

If needed, an angioplasty will normally be done immediately following an angiography, as part of the same procedure.



Coronary artery – pre-angioplasty



Coronary artery – post-angioplasty

Angioplasty

- The treatment for a narrowed or blocked coronary artery.
- Opens a narrowed artery using a balloon and usually a stent.
- Improves blood flow to your heart, so you may experience fewer or no angina symptoms and enjoy a better quality of life.

What's involved?

Getting ready for hospital

You may have a coronary angiography to check on the health of your heart rather than to immediately fix a problem.

Depending on the urgency of your situation, you may have a coronary angiography and / or angioplasty done while you are in hospital following a heart attack or unstable angina. Otherwise you may have the procedure(s) as an outpatient for more stable symptoms. In this case, you will usually be seen at a pre-admission clinic some days or weeks before the procedure. At the clinic, or when you arrive for the coronary angiography, you may be asked to have heart tests like an electrocardiogram, a chest x-ray, and / or blood tests.

Before going to hospital you should:

- Think about your medical history, allergies and medications. You will be asked about these before your procedure.
- Ask a friend or relative to drive you home and stay with you as you should not be alone on the night following your procedure. You may not be able to drive for several days.
- If you live in another city, you will need to stay overnight near the hospital. Talk to your doctor or nurse about this and arrange any necessary accommodation.
- Talk to your doctor or nurse about whether or not you may need to stop taking any medications before your procedure, especially if you take blood thinners. Also check how long you should stop eating and drinking before the procedure.

In hospital

When you go to hospital the doctor or nurse will explain the procedure, along with the risks, and can answer any questions you and your family / whānau may have.

Occasionally other tests may be done to measure your blood pressure within the heart chambers, check your heart valves are working and make sure your heart is pumping properly.

Before the procedure, you will have an intravenous (IV) cannula placed in a vein on the back of your hand or in your arm (medications are given through this as required). You will be asked to change into a hospital gown, and an area on your arm or groin will be shaved to allow for insertion of the cardiac catheter.

You will be given a sedative, which will help you to relax. This will make you a little drowsy, but you will still be able to follow the doctor's instructions.

Bring all your medications with you to hospital

You may be instructed by your doctor to stop some medications prior to the test.

Tell your doctor or nurse if you have an allergy to contrast fluid (sometimes referred to as dye), iodine or seafood.

It is important to talk about the medications you are taking, including:

- blood thinning medication, e.g. warfarin, clopidogrel, dabigatran, ticagrelor, aspirin
- medication for diabetes, including insulin
- diuretics (water pills)
- supplements and over-the-counter medications.

Coronary angiography

Coronary angiography usually takes about 30 minutes. Your cardiologist and medical team will be monitoring you and the progress of the procedure on a television screen.

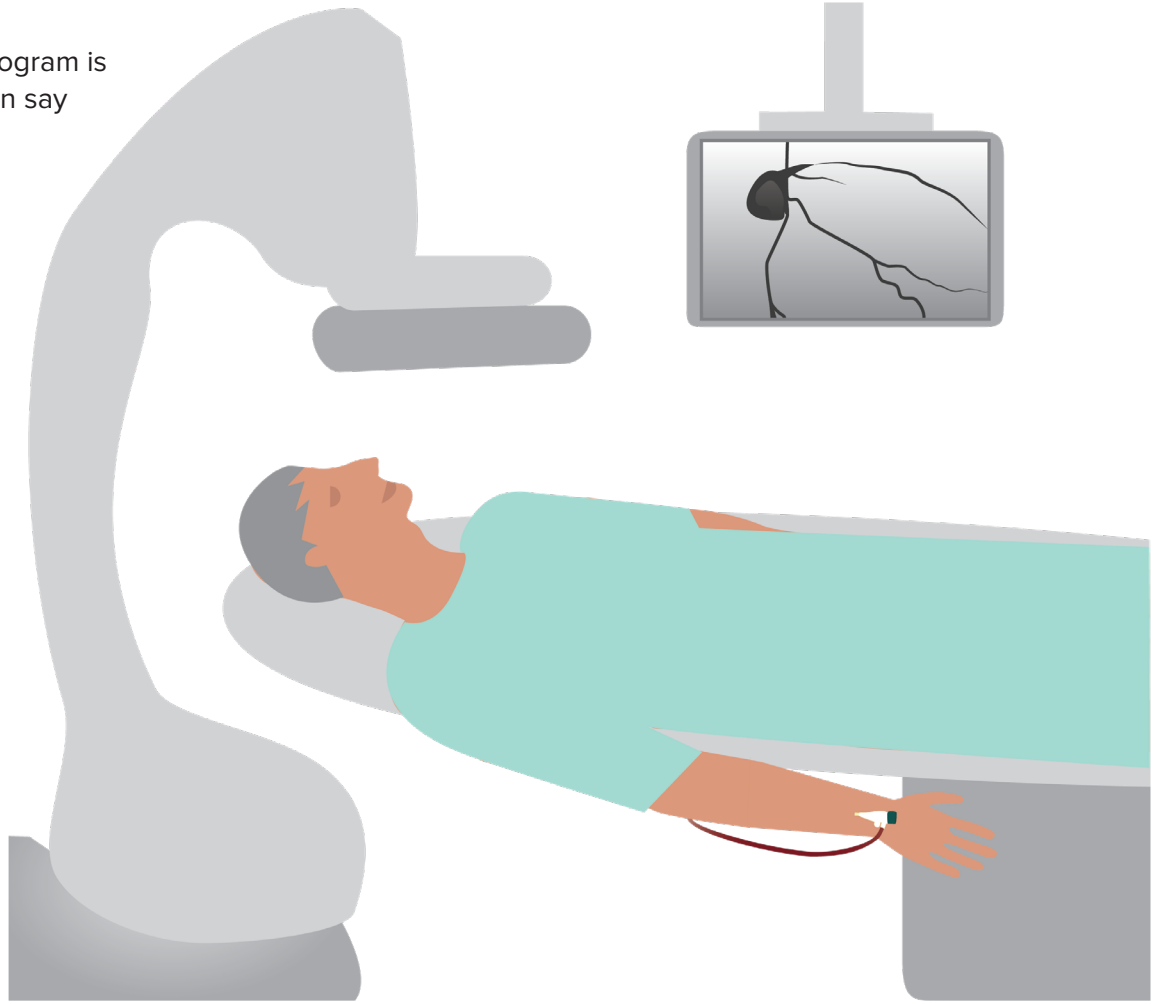
Most people find having an angiogram is easier than they expect and often say they hardly felt anything during the procedure. Any pain or discomfort you may feel will be closely monitored by the clinical team throughout the procedure. It is normal to feel slight pressure as the catheter is inserted into your artery, but not inside your blood vessels.

1. Preparing the injection site

You will lie under an x-ray camera in an angiography theatre (cath lab). The catheter insertion site in your arm or groin will be cleaned and covered in sterile sheets. The doctor will inject local anaesthetic into this area.

2. Inserting the sheath

When this area is numb, a narrow tube (sheath) is inserted into the artery. Sometimes an extra tube may be inserted into a vein in the groin to test the pressure on the right side of the heart.



3. Inserting the catheter

A thin, flexible plastic tube called a cardiac catheter will be threaded through the sheath. The catheter is guided through the artery until it reaches the part of the aorta immediately outside the heart, where the coronary arteries begin.

4. Making coronary arteries visible

A special x-ray contrast fluid is injected through the catheter. Coronary arteries do not show up on normal x-rays, so this contrast fluid is used to highlight the blood flow in your coronary arteries and show any narrowed areas.

5. Taking the x-rays

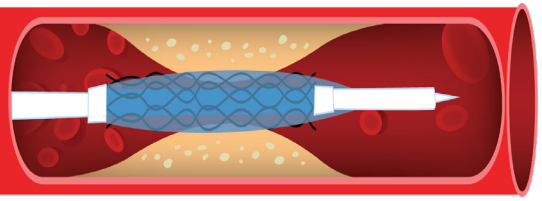
As x-rays are being done, it is important to lie flat and still. You may be asked to hold your breath while x-rays are taken of your heart and coronary arteries.

Angioplasty

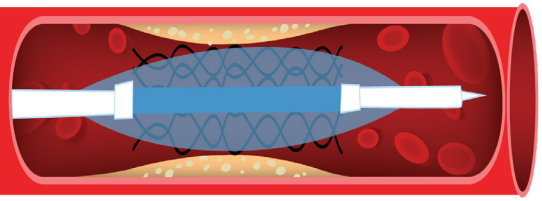
If the pictures from your angiography show a narrowing or blockage that can be treated immediately, your cardiologist may decide to continue and perform an angioplasty at once.

The procedure for an angioplasty is very similar to that for an angiography, with a balloon and stent usually inserted into the same artery.

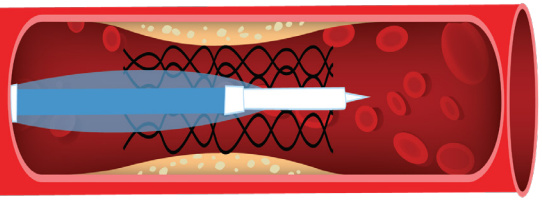
1. The balloon and stent are positioned in the narrowed part of the artery.



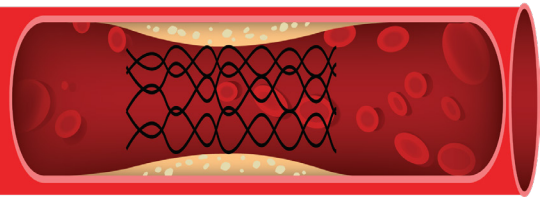
2. The balloon is inflated and the stent expands, pushing the plaque back against the artery wall.



3. The balloon is then deflated and removed, leaving the stent propping open the artery.



4. The widened artery improves blood flow to the heart muscle.



What does a stent do?

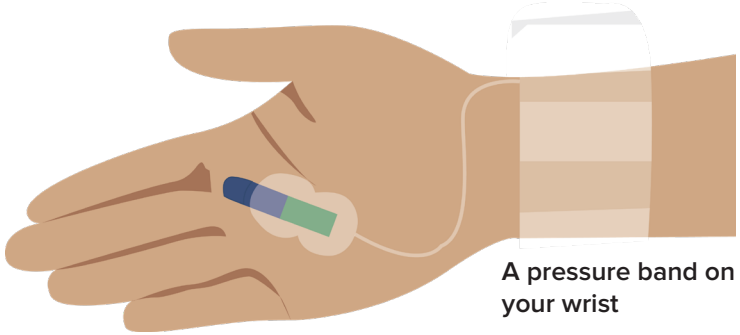
A stent is a metal mesh tube that can be inserted into the narrowed artery.

It acts as an internal support framework to keep the artery open by continuing to press plaque back against the artery wall.

Often the stent is coated with medication which is slowly released into the surrounding area, helping to lower the chance of a clot forming and the artery blocking. This is called a drug eluding stent.

Final steps in coronary angiography and angioplasty

The sheath in your arm or groin will be taken out at the end of the procedure. To stop any bleeding and seal the insertion site, either a tiny plug will be inserted into the artery or pressure will be applied to the area for up to 20 minutes. Often a pressure band is used to seal the radial artery in your arm. A pressure band is like an inflatable bracelet and can be pumped up so that it sits tightly on your arm and applies enough pressure to prevent bleeding.



A pressure band on your wrist

Unless the catheter was inserted in your groin, you should be able to sit up and walk soon after the procedure ends. However, if the groin was used, you will need to lie flat for a few hours. You will either go home that evening or the following day. Arrange for someone to take you home, because you cannot drive yourself.

Before going home, a nurse will teach you how to check the site for bleeding and explain what to do if this happens. If the groin was the site used, you may be asked to avoid heavy lifting and straining for a week. If the wrist was used, avoid pulling and pushing doors and such like for 48 hours.

Risks of angiography and angioplasty

As with all medical procedures, there are both risks and benefits associated with having a coronary angiography and angioplasty.

Minor complications may include:

- Minor oozing from the insertion site – a band aid can be applied. If more obvious bleeding, swelling or pain occurs you must call 111, as this is a serious complication.
- Bruising at the catheter entry point – this is relatively common. You should not be overly concerned unless the area becomes painful, or appears to be getting worse. Bruising discolouration may stay for a few weeks.
- Allergy to the contrast dye used, causing symptoms such as a rash – you should discuss any allergies that you have with your cardiologist before having the procedure.

You are more likely to develop complications based on:

- your age – the older you are, the higher your risk
- if the procedure was planned or is emergency treatment – emergency treatment is always riskier because there is less time to plan it and the patient is unwell to start with
- if you have kidney disease – the dye used during an angiography can occasionally cause further damage to your kidneys
- if you have one or more blocked coronary arteries
- if you have a history of serious heart disease.

More serious complications are uncommon, but may include:

- serious bleeding, needs immediate attention call 111
- damage to the artery in the arm or groin from the catheter, possibly affecting blood supply to the limb
- heart attack
- stroke
- damage to the kidneys caused by the contrast dye
- tissue damage caused by x-ray radiation if the procedure is prolonged
- death.

Talk to your doctor, nurse and other health professional about the risks and benefits for you, and any concerns you may have. Your healthcare team can give you more information about your individual circumstances and level of risk.

Staying well

Getting the most from your angioplasty

An angioplasty is NOT a cure for heart disease.

An angioplasty can help to control your symptoms, but it does not fix the underlying heart disease that caused the symptoms in the first place. To lower your chance of further heart problems, you will need to make and maintain changes to your lifestyle.

Choices you can make to lower your risk of heart attack and stroke

Stop smoking | Take medications | Make heart healthy eating and drinking choices | Move more | Lose weight

After an angioplasty

In a small percentage of cases, the coronary artery may narrow again in the same place and cause angina symptoms. If so, the recurrence will generally happen in the first six months. The coronary artery may also narrow in another location. It is important to take your medication as prescribed and maintain a heart healthy lifestyle to reduce the chance of this occurring.

If you do develop angina or chest pain after an angioplasty, you can follow the angina action plan (see page 22). Make sure that you talk to your doctor within 24 hours of an angina attack, so that you receive appropriate treatment.

Taking medication

Before leaving hospital you may be prescribed medication. Taking your medication is an important part of your treatment. For the medication to be effective you must take it regularly, as recommended by your doctor. If you have had an angioplasty, medication (aspirin, clopidogrel or ticagrelor) will be needed to prevent blood clots forming on the stent and blocking the artery.

If you are taking supplements or over-the-counter medications this needs to be discussed with your doctor, as some can adversely affect your prescribed medication.

Don't stop taking your prescribed medication without talking to your doctor or nurse. Stopping these medications suddenly can make your condition significantly worse.

> Tablets for erectile dysfunction should not be used with GTN spray or nitrate tablets. Taken within 24 hours of each other, this combination of medications can cause a large drop in blood pressure resulting in dizziness, fainting or even a heart attack.

Feeling uncomfortable?

If you have questions or concerns about your medications or unwanted effects of the medications, please talk to your doctor, nurse or pharmacist. There may be other options available so that you can be given medication that suits you better.

Cardiac rehabilitation

Attending cardiac rehabilitation classes will offer you and your family support, and give information about how to live well with heart disease.

Cardiac rehabilitation can help you:

Return to work and other activities sooner

Lower your chances of having chest pain and anxiety

Improve your level of fitness

Talk to your nurse or visit the Heart Foundation's page **heartfoundation.org.nz/cardiac-rehab-and-support** to find cardiac rehabilitation programmes available in your area.

When I go home

After a coronary angiography or angioplasty, most people resume normal everyday activities within one to two days of returning home. Depending on your condition, it may take you more or less time to resume everyday activities. You may like to discuss this with your cardiologist.

Returning to work

Many people can return to work after two to five days, although this may vary depending on the nature of your work and any other heart events. Talk to your cardiologist, nurse or other health professional about what you can expect.

For more Heart Foundation information about heart disease and staying well in the future visit **www.heartfoundation.org.nz/hearthelp**

Getting behind the wheel

The New Zealand Transport Agency (NZTA) guidelines state that you must not drive a car for at least two days after an angioplasty. If you have had an angiography, you should also wait 48 hours after the procedure before driving, to prevent possible bleeding complications.

If you have complications arising from the procedure, or you have had a heart attack resulting in angioplasty, you must not drive until you have been given medical clearance which is generally two weeks for a car licence.

If you hold a vocational licence and, for example, drive passenger vehicles, trucks, fork lifts, courier vans or fly aeroplanes, then different rules apply. Your licence needs to be approved by a cardiologist or specialist who will examine you and make sure it is safe for you to drive. It also pays to check with your insurance company to ensure you are fully covered.

For more information, contact the NZTA, phone 0800 822 422 or visit www.nzta.govt.nz.

Angina action plan

If you have angina symptoms

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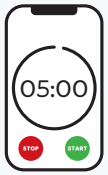
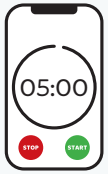
Stop and rest.

Take **1 spray of your GTN** under your tongue.
Tell someone how you feel.



Wait 5 minutes.

If you still have symptoms, take **1 more spray of your GTN** under your tongue.



Wait 5 more minutes.

If you still have symptoms,
call 111. It could be a heart attack.

See a doctor within 24 hours if your angina is happening more often, lasts longer or happens at rest.

Heart attack warning signs

Know these signs and symptoms

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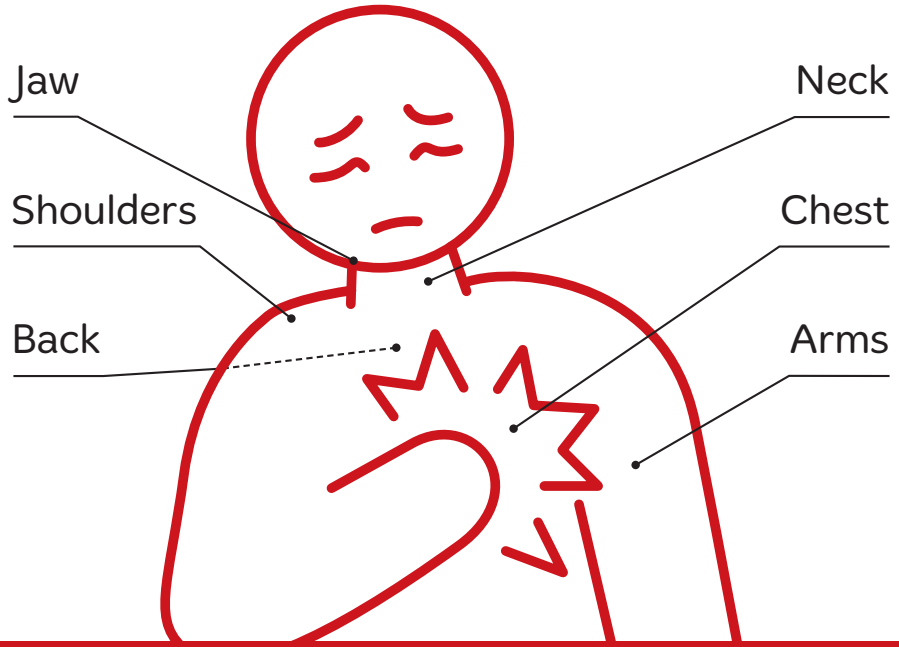
Pain or discomfort in any of these areas:



You may also feel:

Dizzy or lightheaded

Short of breath

Sweaty

Sick

You may be having a heart attack.

Call 111

Hearts fit for life

The Heart Foundation is the charity that works to stop all people in New Zealand dying prematurely from heart disease and enable people with heart disease to live full lives.

Visit our website **heartfoundation.org.nz** to find out how to:

- join information and support sessions
- share your story
- ask questions.

For heart health support and information, call our Heart Line at 0800 863 375.

If you would like to help people living with heart disease, please consider donating.

To donate:

Visit: heartfoundation.org.nz/donate

Phone: 0800 830 100

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