



Patient Education

# **Getting ready for Cardiac Catheterization and/or Angioplasty**

We understand having a cardiac catheterization, angioplasty or both can be stressful. You may have many questions about your care. This booklet will help to answer some of those questions. If you have additional questions, please phone our Coordinator for Cardiac Catheterization and Angioplasty by calling 905-527-4322, ext. 46674.

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## How does your heart work?

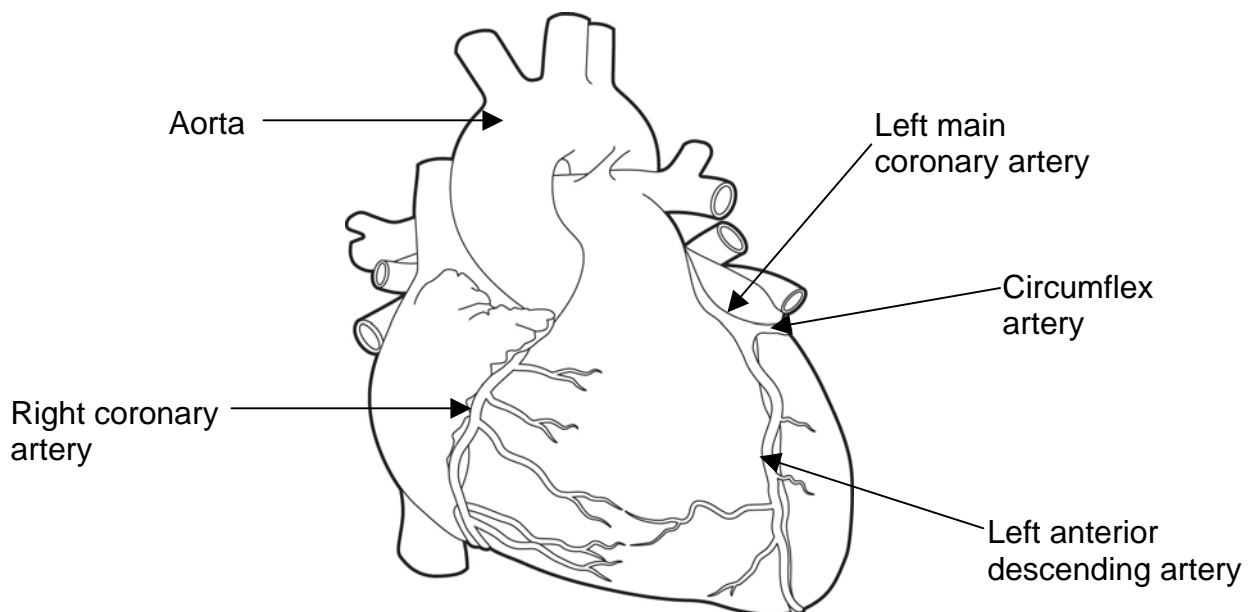
The heart is a muscle that pumps blood throughout your body. Blood contains oxygen and nutrients that your body needs.

The arteries that bring blood to your heart muscle are called the coronary arteries. Your heart has 2 main coronary arteries:

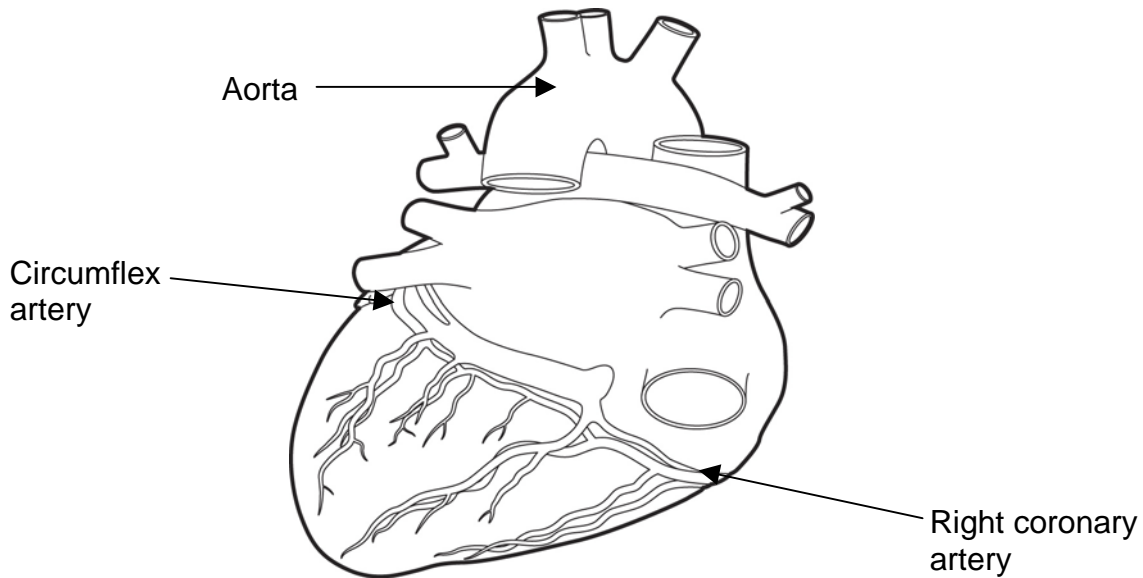
- **right coronary artery.** This artery supplies blood to the right side and back of the heart.
- **left main coronary artery.** This divides into 2 large branches called the circumflex and the left anterior descending artery. The circumflex artery supplies blood to the left side and back of the heart. The left anterior descending artery supplies blood to the front of the heart.

The 2 main coronary arteries branch-out into many smaller arteries. These arteries spread over the outside of the heart and then enter the heart muscle. They give the heart oxygen rich blood.

### Front view of heart



## Back view of heart



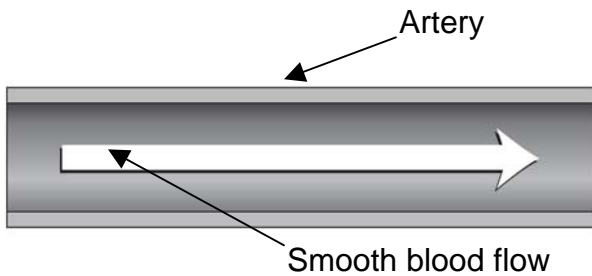
## What is coronary artery disease?

Coronary artery disease is a build up of fat and other materials including cholesterol and calcium inside the arteries called atherosclerotic plaque.

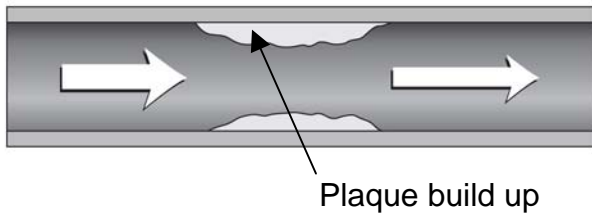
The artery walls become thick, narrowing the blood flow. Blood carrying oxygen to the heart cannot flow through these arteries well.

Coronary artery disease is also called hardening of the arteries or atherosclerosis.

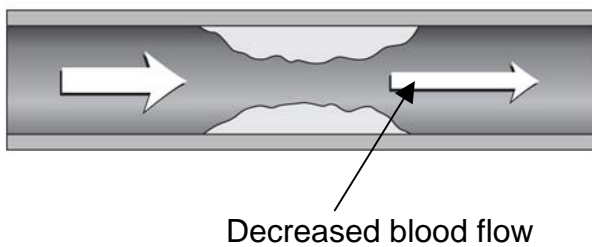
## Progress of coronary artery disease



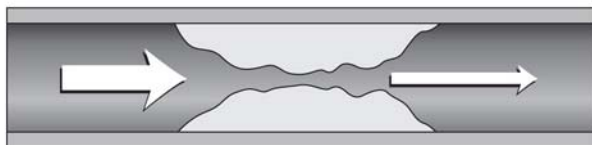
**Normal Artery** – The blood flows through easily.



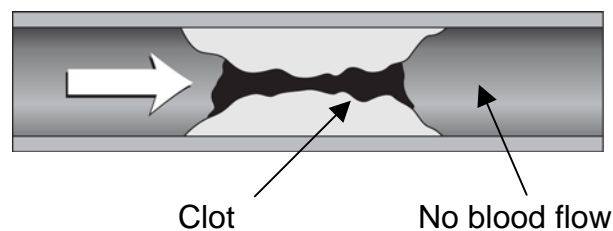
**Damaged Artery** – Plaque starts to build up and narrow artery.



**Narrowed Artery** – Blood flow becomes partially blocked because of build up of plaque. This decreases the amount of oxygen your heart gets during exercise. You may have symptoms of angina or chest pain.



**Worsening Narrowed Artery** – The build up of plaque continues to slow the blood flow even more.



**Blocked Artery** – Over time, the flow of blood becomes sluggish and causes blood clots to form which block the artery. A heart attack happens when oxygen cannot reach your heart due to a blocked artery.

Your arteries change over time for many reasons.

The main reasons are:

- smoking
- having high blood pressure
- having diabetes or high blood sugar
- being overweight
- having high cholesterol or high triglycerides
- not doing enough exercise
- having constant tension or stress
- having a family history of heart disease
- age

Most of these reasons you can control but some you cannot.

## **Why do I need to have a cardiac catheterization?**

A cardiac catheterization is usually done when your doctor has reason to believe that there may be a blockage in one or more of your coronary arteries.

A cardiac catheterization can help your doctor see if you need treatment such as medications, coronary angioplasty or coronary bypass surgery.

## **What is a cardiac catheterization?**

This is a test where the doctor injects a special dye into your arteries. An x-ray camera takes moving pictures that show your heart and the arteries that supply blood to the heart muscle. By filling the chambers with dye, the x-ray pictures can also show the structure and function of your heart valves and chambers of the heart.

A cardiac catheterization is able to show:

- any blockages or narrowing in the coronary arteries
- the function of the heart valves
- how well the heart pumps blood to the rest of the body
- any abnormalities in the heart
- the pressures inside the heart

A cardiac catheterization is also called a:

- coronary angiogram
- heart catheterization
- cardiac cath

## **What are the risks?**

The risks vary with each person and are related to your health condition.

Your doctor will explain your risks to you before the test.



**Possible risks for cardiac catheterization and angioplasty include:**

- bleeding from the artery or the vein at the puncture site
- with a cardiac catheterization, there is a 1 in 1000 chance of having a stroke, heart attack needing emergency open heart surgery or death
- with an angioplasty, there is a 1 in 100 chance of having a stroke, heart attack needing emergency open heart surgery or death
- infection at the puncture site
- arrhythmias or irregular heartbeats
- worsening kidney function, which is a concern mainly for people who already have kidney disease
- in very rare cases, allergic reaction to dye – this is usually treated successfully

## Where will I have my test?

Your test will be done in the Heart Investigation Unit, also called the HIU, at the Hamilton General Hospital. It will be done by a specially trained doctor, called a cardiologist.



Your referring doctor will send a referral form to the Regional Coordinator for Cardiac Catheterization and Angioplasty at the Hamilton General Hospital. The Coordinator will answer your questions and provide you and your family with support until you have your test. You can reach the Coordinator by calling 905-527-4322 extension 46674.

You can also get information about cardiac catheterization from the Cardiac Care Network of Ontario internet website at [www.ccn.on.ca](http://www.ccn.on.ca).

## How do I get ready for my cardiac catheterization?

### Up to 2 weeks before your test:

You will be contacted to arrange an appointment in the pre-HIU clinic, located on the main floor in the Outpatient Department at the Hamilton General Hospital. This appointment will take place within 2 weeks of cardiac catheterization. If you can, please bring a friend or family member with you to this visit.

### At this visit:

- **bring all of your current medications in their original containers.**
- you will have a blood test and an electrocardiogram (ECG) done – you will not have to fast for this visit.
- you will watch a short video about the test.
- a nurse clinician will review your information, health history, and do a physical examination and **ask you about any allergies.**
- you will be given instructions on how to prepare for your cardiac catheterization and your questions will be answered.
- you will be given special instructions regarding your medications including medications for diabetes, blood thinners and water pills.

If you are taking warfarin, also called Coumadin<sup>®</sup>, you will be contacted by a nurse from the Thrombosis Clinic to make arrangements to stop this medication a few days before the test. During this time, you may be changed to another medication. If you have not heard from the Thrombosis Clinic one week before your test, please call us at 905-527-4322, ext. 46674.

### **The night before your test:**

Do not eat or drink anything for 6 hours before your test.

- If your test is in the morning, do not eat or drink after midnight.
- If your test is after 12:00 noon, you may have a light breakfast such as tea or coffee and toast up to 6 hours before your test.

### **The morning of your test:**

- Take all of your usual medications as prescribed including aspirin (ASA) with a sip of water.
- Follow the specific instructions given to you by your doctor on how to take your medication for diabetes, blood thinners and water pills.

## What do I bring to the hospital?

- Bring all of your medications in their original containers.**
- Bring your Ontario Health Card.
- Wear your glasses, dentures and/or hearing aid(s).
- Bring medical alert and allergy bracelets.
- Bring a cane or walker, if you use one.
- Leave all other valuables such as money, jewellery and credit cards at home.
- Bring your personal care items, such as a toothbrush, toothpaste, shampoo, soap, lotion, deodorant, housecoat and slippers in case you stay overnight.

## Where do I go when I arrive at the hospital?

Go directly to the Heart Investigation Unit or HIU on the 3<sup>rd</sup> floor.

**The HIU is a Regional Cardiac Care Centre for Central South Ontario. It responds to emergency cases on a daily basis. Please be aware that this may delay or change the time of your test.**

## What can I expect in the HIU?

You will receive care in 2 areas of the HIU:

- HIU Reception and Recovery
- HIU Lab

## **HIU Reception and Recovery**

The purpose for the HIU Reception and Recovery area is to prepare you for the cardiac catheterization. You will also be taken there after your cardiac catheterization. There will be nurses in this area to care for you before and after your test.

We encourage you to bring 1 to 2 family members or friends to be with you before and after the test.

If you are not able to speak or understand English, please bring an interpreter with you.

### **Before your test:**

- you will meet the doctor who will do the test. The doctor will explain the test, answer your questions and ask you to sign a consent form.
- you will change into a hospital gown.
- an intravenous (IV) line will be started in your arm.
- your hair will be removed at the access site of your test.
- you will be asked to empty your bladder in the bathroom just before the test.
- you may wear your glasses, hearing aid(s) and dentures.

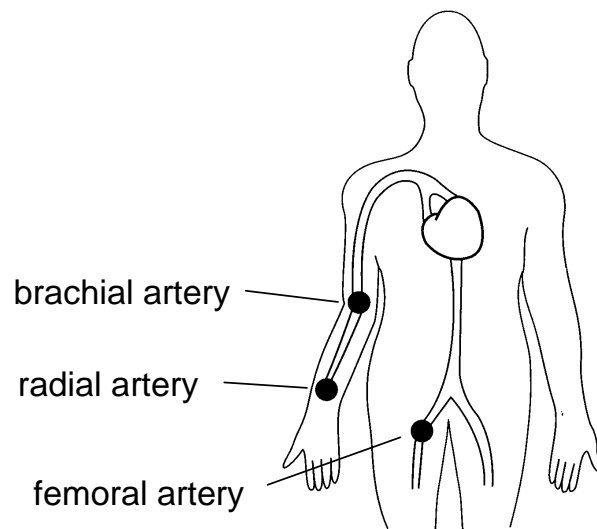
## **HIU Lab**

Your test will be done in the HIU Lab area. A team of doctors, nurses and technologists will greet you. They will be wearing operating room clothes.

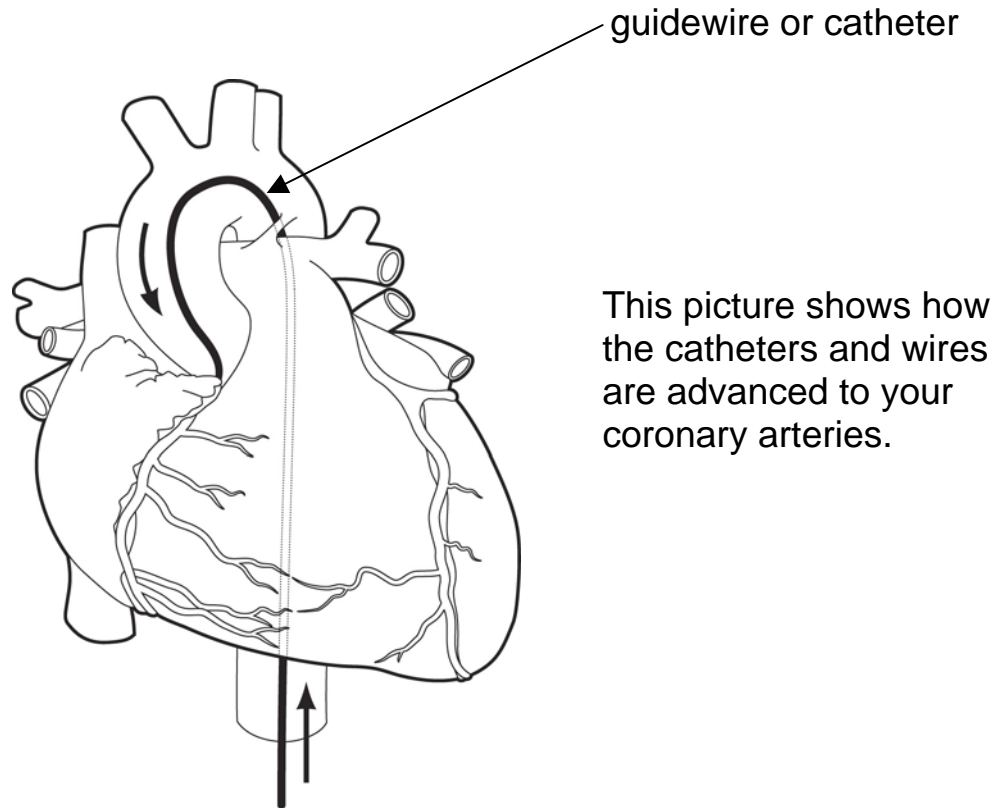
This room is cool to protect the computers and special equipment. You will be given medication to relax you through your IV line. A nurse will be with you the whole time and will take you back to the Reception and Recovery area on a stretcher once the test is over.

## How is a cardiac catheterization done?

- During the test, you will be awake but drowsy after receiving medication to relax you.
- You will lie on a hard narrow table.
- The access site will be cleaned with antiseptic.
- Sterile sheets will be placed over you. The staff will provide you with as much privacy as they can.
- The site will be injected with a local anesthetic or “freezing”. This will sting for a few moments and then the area will become numb. You will feel pressure and movement at the site during the test, but should not feel pain.
- A small thin hollow tube called a sheath is inserted through the skin into an artery. Your doctor will decide before the test whether it will be done through the:
  - femoral artery in your groin
  - radial artery in your wrist
  - brachial artery in your elbow



- Guidewires and smaller catheters are then inserted through the sheath into the coronary arteries.



- A small amount of dye is injected into each coronary artery. This dye makes the arteries easy to see on x-ray. When the dye is injected, you may:
  - have a metallic taste in your mouth
  - feel a warm flush sensation like you have wet the bed

These are both normal and last only seconds.

- Dye may also be injected into the chambers of your heart.
- You can watch the test on a television monitor while it is being done.
- If you have angina or chest pain during the test, tell the doctor or nurse and it will be treated right away.

## **What will the results of the cardiac catheterization tell me?**

The pictures from this test are saved. The doctor will look at them closely and depending on what your cardiac catheterization shows, one of these treatment options may be recommended:

- nothing further needed at this time
- medication to control your symptoms
- coronary angioplasty with or without stent
- open heart surgery

If your doctor feels you need to have an angioplasty, this test may be done at the same time as the cardiac catheterization. See page 15 to learn about angioplasty. Open heart surgery is not done at this time.

## **After your cardiac catheterization**

You will be taken back to the HIU Reception and Recovery area where your sheath will be removed.

You will be given something to eat and drink. You will be encouraged to drink lots of fluid to help flush the dye through your kidneys. This may cause you to pass more urine than usual.

You will need to rest in bed for at least 2 hours. Your nurse will tell you how long you will have to rest in bed.



For your comfort, you may:

- turn from side-to-side with help
- wiggle your toes
- bend your arms and legs not used for the test
- raise the head of the bed slightly
- have pain medication as you need it

**Call your nurse for help with any changes in your position.**

Frequent checks will be made of your:

- blood pressure, heart rate and breathing
- arm or leg for bleeding, swelling, pain and blood flow

**Tell your nurse right away if you notice:**

- warmth or dampness around the bandage
- coldness, numbness or pain in your leg, arm or hand
- discomfort in your chest, jaw or arms
- lightheadedness
- back pain

You may be able to go home 4 to 6 hours after your test.

## **What is a coronary angioplasty?**

Coronary angioplasty is a procedure used to open up a narrowing in your artery. You may have a narrowing in one or more arteries that supply blood and oxygen to your heart. Lack of oxygen causes angina pain and sometimes, heart attacks.

This procedure is also called:

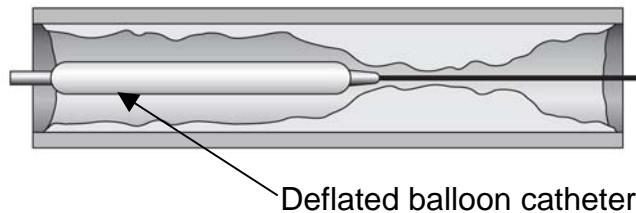
- percutaneous transluminal coronary angioplasty (PTCA)
- percutaneous coronary intervention (PCI)
- balloon angioplasty
- balloon procedure

## **What are the risks?**

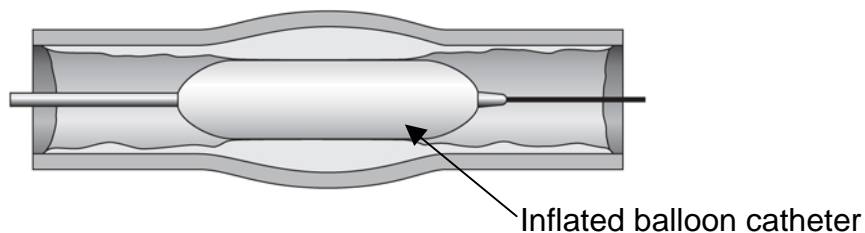
- See page 6 to learn about the risks for this procedure.

## How is an angioplasty done?

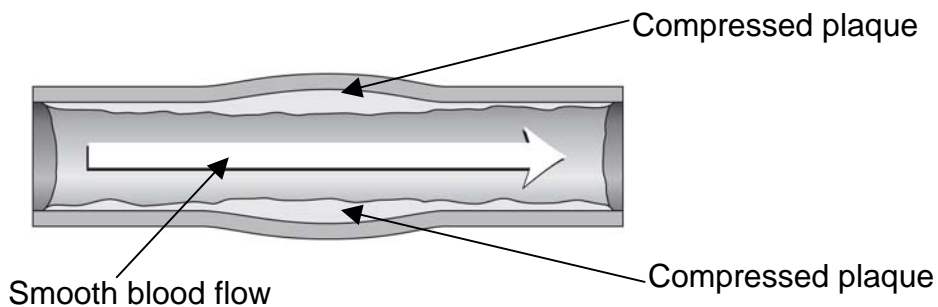
After your cardiac catheterization, a small catheter with a tiny deflated balloon at its tip is inserted through the sheath. It is advanced into the narrowed part of an artery.



The balloon is then inflated for up to several minutes. This balloon presses the plaque against the artery walls so that blood will flow more easily through the centre of the artery.



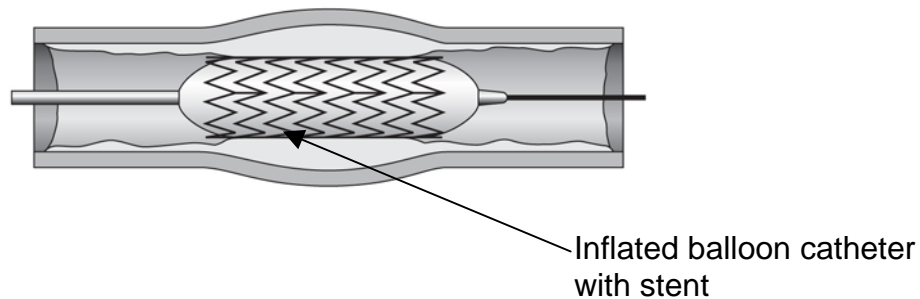
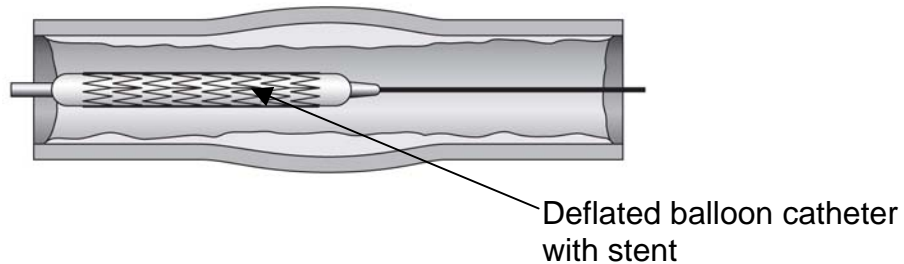
Blood thinners are given during the procedure to prevent blood clots from forming. Then the balloon is deflated and removed.



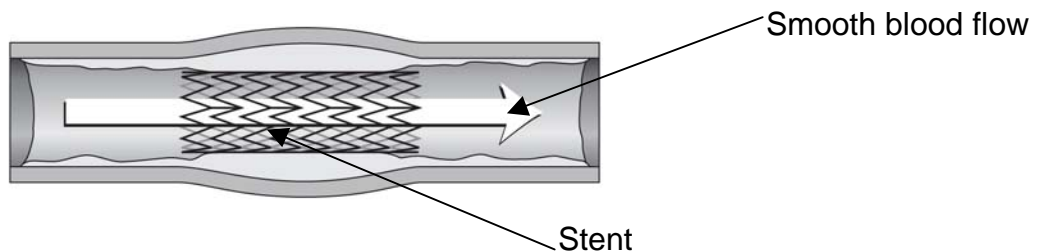
If you have pain or discomfort in your chest or have trouble breathing, tell your doctor or nurse. In most cases balloon angioplasty is followed by the placement of a stent. See the next page.

## What is a stent?

A stent is a wire mesh tube used to help support the open artery after angioplasty.



The stent remains in the artery after the balloon is deflated and the catheter is removed.



The stent acts to help keep the artery open and prevent re-narrowing, also called a stenosis. Some stents are coated with medications which are released slowly over time into the artery and help prevent re-narrowing. Your doctor will insert which stent is best for you.

## **After your coronary angioplasty**

You will be taken back to the HIU Reception and Recovery area.

If the sheath is in your groin, it will be left in your artery for up to 4 hours after the procedure. You will need to keep your leg straight and still until it is removed. This will prevent bleeding around the tube.

After the sheath is removed from your artery, pressure will be applied for 15 to 30 minutes to stop the bleeding. A dressing will be applied and you will need to keep your arm or leg straight and still for another 4 hours. Therefore, you may have a total of up to 8 hours of bed rest.

For your comfort, you may:

- turn from side-to-side with help
- wiggle your toes
- bend your arms and legs not used for this procedure
- raise the head of the bed slightly
- ask for pain medication

**Call your nurse for help with any changes in your position.**

You will need to stay in bed for 4 more hours **after** the sheath is removed.

Frequent checks will be made of your:

- blood pressure, heart rate and breathing
- arm or leg for bleeding, swelling, pain and blood flow

**Tell your nurse right away if you notice:**

- warmth or dampness around the bandage
- coldness, numbness or pain in your leg, arm or hand
- discomfort in your chest, jaw or arms
- lightheadedness
- severe back pain

You may need to stay in HIU Reception and Recovery overnight.

You will need to arrange a ride home for 6:30 am the next day so that you can be discharged by 7:00 am.

Please make these arrangements before you come to the hospital.

## What medications will I need to take?

After angioplasty, you will be given a prescription for **2 medications**, ASA (Aspirin<sup>®</sup>) and clopidogrel (Plavix<sup>®</sup>).

**When taken together** these medications will help prevent clots from forming inside the stent. You will need to be on low dose ASA (Aspirin<sup>®</sup>) 81 mg and clopidogrel (Plavix<sup>®</sup>) 75 mg for **up to one year**.

It is important that you take these medications as directed and **do not stop** without speaking to your cardiologist or family doctor first.

**It is very important that you do not miss any doses of ASA (Aspirin<sup>®</sup>) or clopidogrel (Plavix<sup>®</sup>). Missed doses could cause you to have a heart attack or increase your chance of dying.**

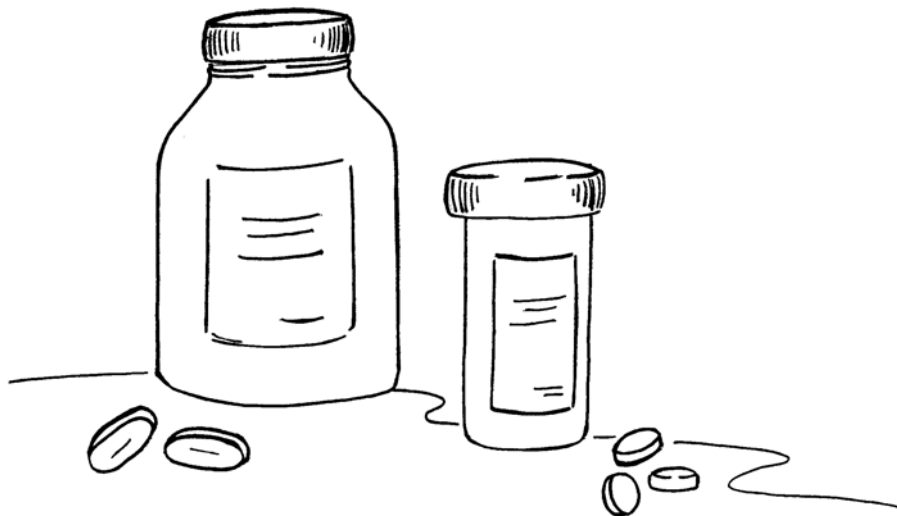
If your doctor prescribes these medications for you, you will be asked to watch for more bleeding than normal, such as from cuts or scratches, or for blood in your urine or stools.

## What about my other heart medications?

The chart on the next page lists the common heart medications. It shows how they work and the reason for taking them.

The chart does not list all of the medications currently available on the market. It only gives examples of medications in each group. You may be on a similar medication that is not listed in the chart. If you have questions, please talk to your doctor, nurse or pharmacist.

To lower your chance of having more heart problems, you need to stay on your prescribed medication. It is important that you do not stop any of your medications without first discussing it with your cardiologist or family doctor.





Getting ready for Cardiac Catheterization and Angioplasty

<b>Medication</b>	<b>How it works</b>	<b>Protects the heart</b>	<b>Reduces symptoms</b>
<b>Anti-Platelet Agent:</b> – acetylsalicylic acid (aspirin) – clopidogrel	<ul style="list-style-type: none"> <li>• thins your blood to lower the risk of heart disease</li> <li>• aspirin and clopidogrel work together to prevent further heart problems</li> </ul>	✓	
<b>Angiotensin-Converting Enzyme (ACE) Inhibitors:</b> – enalapril – lisinopril – perindopril – ramipril – trandolapril	<ul style="list-style-type: none"> <li>• lowers blood pressure</li> <li>• relaxes the blood vessels</li> <li>• strengthens the heart muscle</li> </ul>	✓	
<b>Beta Blockers:</b> – atenolol – bisoprolol – metoprolol	<ul style="list-style-type: none"> <li>• decreases the work of the heart</li> <li>• lowers blood pressure and heart rate</li> </ul>	✓	✓
<b>Calcium Channel Blockers:</b> – diltiazem – verapamil – amlodipine – felodipine	<ul style="list-style-type: none"> <li>• decreases the work of the heart</li> <li>• lowers blood pressure</li> </ul>		✓
<b>Cholesterol and Lipid Lowering:</b> – atorvastatin – pravastatin – simvastatin	<ul style="list-style-type: none"> <li>• reduces the amount of cholesterol in your blood</li> <li>• prevents further heart disease</li> </ul>	✓	
<b>Nitroglycerin:</b> – patch – spray	<ul style="list-style-type: none"> <li>• improves blood flow to the heart by relaxing the blood vessels – this reduces angina or chest pain</li> </ul>		✓

## **Going home after cardiac catheterization or angioplasty**

### **Can I drive myself home after the procedure?**

No. Arrange to have someone drive you home. The medications you will be given will affect your ability to drive. You may not drive for up to 48 hours. Your nurse or doctor will tell you when you can drive.

### **What do I need to know about my care when I get home?**

Generally:

- You may have a shower the morning after the procedure.
- You may have a tub-bath after the puncture site is healed. Healing is when the site is dry with no open areas and no drainage. This is usually within 72 hours.
- Change the bandage over the puncture site daily until the site is healed over. You will be given bandages and instructions on how to care for your site.
- Avoid lifting anything greater than 4 kilograms or 10 pounds for 72 hours.

## Medications

- Ask your doctor, nurse or pharmacist about changes to your medications.
- You will be given prescriptions for any new medication.
- Continue your medication as directed.

**If you have had an angioplasty, do not stop your ASA (Aspirin®) or clopidogrel (Plavix®) until your cardiologist or family doctor tells you when you can.**

## What about my follow-up appointments?

- Before you leave the hospital, ask your doctor when you can return to normal physical activities.
- Before you leave the hospital, ask your doctor when you can return to work. The type of work you do will determine when you can return.
- You will need to make follow-up appointments with your referring cardiologist within 4 to 6 weeks and your family doctor within 1 week.
- If you have had an angioplasty, do not stop your Plavix® until your cardiologist or family doctor tells you when you can.

**If you notice bright red blood at the site, apply pressure and call 911 or your local emergency number right away.**

**Call your family doctor if you notice:**

- bruising or swelling that increases from when you left the hospital
- signs of infection such as redness, warmth to touch or pus draining from the puncture site
- numbness, pain or coldness in your arm or leg
- fever or chills

## **How will I feel after the angioplasty?**

For most people, an angioplasty will relieve or improve their angina.

If you have symptoms, do not ignore them. If you feel pain, pressure or tightness in your chest, jaw or arms, or any other symptoms like your previous angina, treat it as before and contact your doctor right away.

## What to do when you have angina

1	<b>Rest</b>	Stop what you are doing right away. Sit or lie down. This will decrease the work of the heart.
2	<b>Relax</b>	Take slow, deep breaths.
3	<b>Take nitroglycerin</b>	Take your nitroglycerin as prescribed: <ul style="list-style-type: none"><li>• take your 1<sup>st</sup> dose of nitroglycerin. Spray or place tablet under your tongue.</li><li>• if the chest pain does not go away after 5 minutes, take a 2<sup>nd</sup> dose.</li><li>• if the chest pain is still there after 5 or more minutes (now a total of 10 minutes), take a 3<sup>rd</sup> dose.</li></ul>
4	<b>Get help</b>	If you still have chest pain or discomfort after taking 3 nitroglycerins at 5 minute intervals: <ul style="list-style-type: none"><li>• chew a non-enteric coated aspirin, unless you are allergic to it.</li><li>• have someone call 911 or the operator for an ambulance right away.</li><li>• do not drive yourself to the hospital.</li></ul>

## Am I cured after an angioplasty?

An angioplasty will help to reduce or eliminate angina and may help to reduce your chance of having a heart attack.

However, an angioplasty is not a cure for coronary artery disease. You cannot reverse the disease in your arteries. Your goal is to stop or slow down the disease process.

Ask your doctor, nurse, pharmacist or dietitian how you can help yourself by choosing healthy lifestyle habits, such as:

- ♥ being smoke-free
- ♥ following a heart healthy diet that includes reduced saturated fat, trans fat and salt
- ♥ reaching and keeping a healthy weight
- ♥ exercising regularly
- ♥ controlling high blood pressure
- ♥ controlling diabetes
- ♥ taking your medication as directed
- ♥ having regular check-ups
- ♥ asking your doctor to refer you to a cardiac rehabilitation program near you

It may take a little work but your heart will love you for it.

