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Hello - this information booklet has been designed to let you know what will occur during your stay in hospital, while you are undergoing cardiac catheterisation. Important information is highlighted with the following symbol:

The booklet begins with information on how your heart works, followed by an explanation of the procedure. The booklet also describes what you can do to manage your recovery.

Following the procedure you may be told by your Doctor if you have disease in your coronary arteries (coronary artery disease). On page 17 you will find a list of cardiac services you can contact should you have need for support or general (non-urgent) enquires.

This booklet is reviewed regularly. Please check with your Nurse or Doctor if you have any concerns or questions about the content.

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**Acknowledgments**

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## DEFINITION OF MEDICAL TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td><strong>Angina</strong></td>
<td>The feeling of pain related to an insufficient supply of blood and oxygen to heart tissue. Usually occurs when plaque narrows the coronary arteries. Stable angina occurs on exertion only, while unstable angina also occurs at rest.</td>
</tr>
<tr>
<td><strong>Aorta</strong></td>
<td>The main blood vessel that delivers blood and oxygen to the body via arteries branching from it. The aorta originates from the opening of the left ventricle and finally divides into two in the abdomen.</td>
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<tr>
<td><strong>Artery</strong></td>
<td>A blood vessel carrying oxygen-rich blood to organs and tissues.</td>
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<tr>
<td><strong>Atherosclerosis</strong></td>
<td>A disorder of the arteries which is characterised by yellowish plaque (cholesterol, lipids and cell debris) in the inner layers of the walls of large and medium sized arteries.</td>
</tr>
<tr>
<td><strong>Cardiac Catheterisation or Angiogram</strong></td>
<td>A procedure (performed in the Cath Lab) where a small catheter (thin flexible tube) is inserted via an artery in the groin or arm. This catheter travels up to the coronary arteries (via the aorta) where dye is injected to visualise the coronary arteries on x-ray.</td>
</tr>
<tr>
<td><strong>Contrast</strong></td>
<td>The dye used during the Cardiac Catheterisation to see the arteries on x-ray.</td>
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</tbody>
</table>
| **Coronary Arteries** | Arteries carry blood and oxygen to the heart muscle. There are 3 main coronary arteries:
- **right** coronary artery (RCA)
- **left** anterior descending (LAD)
- **circumflex** (Cx) coronary artery |
| **Myocardial Infarction** | Also know as an “MI” or “heart attack”. Usually occurs when the plaque ruptures causing a clot, which prevents blood and oxygen flow to the heart muscle, causing damage to heart muscle fed by that artery. |
| **Plaque (coronary)** | A patch of atherosclerosis on the inner wall of the coronary artery. It is made up of cholesterol, lipids and cell debris. Plaque is able to restrict the blood flow or it may rupture (forming a clot), which leads to a ‘heart attack’. |
HOW YOUR HEART WORKS

Your heart is a muscle that pumps blood to all parts of your body. The blood provides your body with the oxygen and nourishment it needs to carry out its work:

- The normal heart is about the size of your fist and has two sides – left and right, separated by a muscular wall.
- There is an upper and lower chamber on each side connected by valves which direct the flow of blood.
- The smaller upper chambers are known as the atria and the larger lower chambers are the ventricles.
- The right side of the heart pumps the blood to the lungs where it receives oxygen.
- Blood then enters the left side of the heart from the lungs and the heart pumps the oxygen-rich blood around the body (to organs and tissues).

Figure 1 - Structural diagram of the heart

= Inward arrows = blood without oxygen going in
= Outward arrows = blood with oxygen going out
There are three main coronary arteries.

The left coronary artery (LCA) divides into three:

- **Left anterior descending (LAD)**
- **Circumflex (Cx)**
- **Right coronary artery (RCA)**

These arteries have the important job of delivering blood and oxygen to the heart as its “fuel supply” to

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**Figure 2. Diagram of the Coronary Arteries**
WHAT IS CORONARY ARTERY DISEASE?

Coronary artery disease occurs when fatty deposits, called plaque, build up inside the arteries and narrow them. This is referred to as ‘clogging’, which reduces and blocks the flow of blood through these vessels. This clogging on the inside wall of the arteries occurs in patches and is called atherosclerosis. This happens over many years and there may be no symptoms until angina or a heart attack occurs. The angiogram procedure is used to find out if you have plaque or artherosclerosis in your coronary arteries.

Diseased coronary artery

Cardiac catheterisation involves inserting a catheter (thin flexible tube) through an artery in the groin (or the arm) and guiding it into the heart. It is also known as an angiogram, however in this booklet we will refer to it as cardiac catheterisation.

A contrast or dye is injected into the catheter that is placed in your groin or arm. As the contrast fluid flows through the heart and coronary arteries, digital x-ray images are obtained with a special camera (image intensifier).

Cardiac catheterisation is performed or supervised by a Cardiologist and is a common procedure to diagnose heart disease. Information from this test will help your Doctor treat and manage your condition.

Cardiac catheterisation is performed in a special theatre called the Catheter Laboratory (or Cath Lab) at Sir Charles Gairdner Hospital. It is located in the Department of Cardiovascular Medicine on the 4th floor in G Block.

An angiogram is a type of x-ray test that can show if you have any blockages in your coronary arteries.
PREPARING FOR CARDIAC CATHETERISATION

What to expect before the Cardiac Catheterisation

- Chest x-ray
- Electrocardiogram (ECG)
- Blood Tests
- Explanation of the procedure and after-care
- Signed consent form
- The Doctor needs to know if you have any allergies or if you cannot lie flat

On the day of the cardiac catheterisation

- All medications are to continue except the following:
  - Diuretic (“fluid”) tablets
  - Anticoagulants (Warfarin)
  - Diabetic medications (the Doctor may also ask you to stop taking Metformin on the day of, and 2 days following the cardiac catheterisation).
- Your groin or arm hair will be shaved (depending on where the test will be)
- You will need to fast at least 6 hours (food) and 2 hours (fluid) before the procedure.

Your Doctor will give you specific instructions regarding stopping and restarting any of your medications.

- Shower with special soap and change into a hospital gown and disposable pants
- You may be given a pre-procedure sedative (usually a tablet)
- An intravenous (IV) line may be inserted into your arm
- There is no need to remove glasses or dentures
- Jewellery should be sent home, a wedding band may be worn
- Just before leaving the ward, you will be asked to empty your bladder
- You will usually be taken to the Cath Lab on your bed or in a wheelchair

Your test will usually take place as scheduled however occasionally emergency patients may need to be taken first or other patients’ procedures may run longer/shorter than anticipated. Whatever the situation you will be informed if changes occur.
THE CARDIAC CATHETERISATION PROCEDURE

The ‘Cath Lab’

The Cath Lab resembles a small operating theatre. To the side there is a glass panel where Cardiac Technicians and Radiographers monitor your progress and record the results during the test. The Cath Lab will be cool however staff will ensure you are covered by a blanket to keep you warm.

Four or more staff (Nurses, Doctors and Technicians) will be present. Strict sterile conditions are maintained and the staff will be dressed in theatre scrubs. They will wear gloves, a headscarf or hat and lead aprons (to shield them from x-rays).

You will be connected to an ECG machine and your heart rhythm and blood pressure will be monitored. To prevent infection, your groin or arm will be cleansed with a cool antiseptic solution, usually iodine. If you are allergic to iodine another antiseptic will be used.

Your whole body, except your head, will be covered with a blue sterile sheet that has a circular adhesive patch that sticks around the puncture site (groin or arm).

It is important for you not to move or touch the top of these sheets once you are covered.

You will be asked to keep your arms by your side. If you need to move or you feel uncomfortable for any reason, tell one of the Nursing staff immediately. They will do their best to keep you comfortable.
The Doctor will inject some local anaesthetic into the groin or arm and you will experience a slight stinging or burning sensation, closely followed by a feeling of numbness in that area.

After the anaesthetic has taken effect, you may feel a sensation of pressure, however you should not feel any discomfort. If you do, please let staff know and additional local anaesthetic can be given.

An introducer sheath, (a short tube) will be inserted into the artery in your groin. A long flexible catheter is then passed through this and advanced up into the aorta and the coronary arteries. You will not feel the movement of this catheter.

If the catheter is inserted in your arm a small incision may be required to access the artery.

As the catheter moves through the arteries to your heart, both the catheter and heart movement are observed under x-ray. The x-ray will produce black and white pictures on a screen. To ensure the pictures are easy to see, the main lights in the room will be turned on and off intermittently. The camera that takes these pictures is positioned above your chest.

The Doctor will need YOUR help during the cardiac catheterisation.

From time to time you will be asked to breathe in slowly and deeply, and to hold your breath for several seconds.

The Doctor will then instruct you to “breathe away” when he/she is ready for you to stop holding your breath.

This helps to get a clear picture.

You may be able to see the television monitor from time to time, however DO NOT strain or move in an attempt to watch it.
The contrast (dye) is then injected via the catheter into the left and right coronary arteries. As the contrast fluid flows through these vessels, the coronary arterial system becomes visible under x-ray. During this procedure the narrowing/s or blockage/s in the coronary arteries can be determined.

Occasionally a flushing sensation is felt after injection of the dye.

Once the coronary arteries have been seen, the Doctor looks at the main pumping chamber of the heart – the left ventricle. The size, shape and movement of the chamber is observed and its pumping ability is assessed. During this stage, a few quick beats or palpitations may occur but are no cause for alarm. You will notice a feeling of warmth or a “hot flush” which travels from head to toe at this time. You may also feel like you have emptied your bladder, but there is no need to be concerned, as this is only a sensation.

All of these feelings are normal and will subside in a few seconds.

For accurate diagnosis, the heart and coronary arteries must be filmed from several angles. You will be secure, however the x-ray table on which you are lying may be shifted backwards and forwards and the camera will move around you. You may have some discomfort from lying still for long periods.

If at any time during the procedure you feel ANY angina or other discomfort, it is important that you tell the Doctor promptly and if asked, try to grade how severe it is on a scale of “0” (no discomfort) to “10” (severe pain).

You should report discomfort of any sort, in any place. You may be given medication under the tongue, intravenously or directly through the catheter to control the pain.
Immediately Following the Cardiac Catheterisation

At the completion of the procedure, the sheath is removed. If your groin has been used, a clamp or manual digital pressure will be placed over the artery to stop any bleeding. It is applied with firm pressure for 5 minutes and then slowly the pressure is released for up to 20 minutes or more until the bleeding has stopped. A Nurse will stay with you during this procedure and once the clamp, or manual pressure, is removed a clear dressing will be applied. No stitches are required. You will then be transferred back to the ward where frequent observations will be carried out on your puncture site (groin or arm).

If your wrist has been used the sheath will be removed as above, and a dressing placed over your wrist before you return to the ward. Stitches are not required.

Sometimes, instead of the clamp, a closure device is used to seal the puncture site in your groin. This may be a collagen plug, a stitch or a ‘patch’ that is applied to the artery or puncture site. The use of these closure devices will depend on your Doctor’s preference. You will be given information about this device and “take home” instructions as appropriate.

Usually the results of the procedure will be discussed with you by the Doctor, if you are an inpatient (staying overnight), once you have returned to the ward / unit.

If you are a day case patient (admitted and discharged on the day of your procedure) your Doctor will discuss the results with you at your next appointment.
DIAGRAM OF WHAT YOUR CORONARY ARTERIES LOOK LIKE UNDER XRAY

Remember this …

NB. The images look slightly different to the diagram but both are correct.
Approach to your heart via your groin (femoral approach)
If your groin has been used, your Nurse can elevate the head of your bed up to only 40 degrees. You are required to rest in bed for 3 hours from the time the clamp has been removed. If further bleeding or bruising occurs, the rest time may be extended.

Your blood pressure, heart rate, pulse, colour, warmth, movement and feeling in either your leg or arm, and the wound site will be checked regularly.

As the local anaesthetic wears off, it is normal to have some discomfort in the affected area. If you need pain relief just ask your Nurse.

You can eat and drink as you wish after you leave the Cath Lab.

Approach to your heart via your wrist (radial approach)
Following your procedure you are not to place any weight on your hand where the procedure occurred (using your hand to position yourself when moving forward/backward, standing up, sitting down etc).

You are not to participate in any strenuous activities for the first 4 days after discharge (sports, gardening and housework, lifting or carrying).

Observe your wrist for any signs of pain, lumps/swelling, redness and bleeding or bruising. If you notice any of these call for a Nurse immediately.

Leave the dressing on the wound for 24hrs. The dressing is waterproof and normal shower/washing activities are allowed.
Your usual medications will be continued, sometimes with an adjustment in dose and occasionally a new one may be added. The Doctor and Nurse will discuss this, individually, with you.

You should report immediately if any of the following occurs:

- Fresh bleeding (may feel wet & warm) from the wound site.
- Swelling, numbness or pain at wound site or of affected limb (e.g. leg or arm/hand)
- Difficulty in breathing
- Chest discomfort or angina
- Palpitations or irregular heart beat
- Feeling unwell in any way

Ring for the Nurse immediately with 3 short rings on your buzzer and PRESS FIRMLY on your groin or arm if bleeding occurs.
AT HOME

Once you have been discharged (groin approach)

♥ For the next 24 hrs you should avoid straining, lifting and carrying objects weighing more than about 4kgs, driving, exercise and sexual activity. If you have had a wrist approach do not carrying any heavy objects with the affected arm for 24 hours. If you have any queries please speak with your Doctor.

♥ Observe wound site for:

⇒ Fresh bleeding or sudden large swelling.

*If this occurs lie down and apply firm pressure with 2 fingers just above the wound site for at least 15 minutes (if you are with a friend/relative get them to do this). Call an ambulance and come to the Emergency Department IMMEDIATELY.*

♥ Observe affected leg / arm for:

⇒ Changes in colour, numbness, pain or significant discomfort.

*If you are unable to see your GP immediately please come to the Emergency Department.*

♥ Expect some slight bruising at the wound site for up to 7 days.

♥ Normal showering activities are allowed. Do not have a bath or swim for 5 days after the procedure.

♥ Continue medications until advised otherwise.

♥ Usually the groin dressing can be removed the next day in the shower. Your Nurse will advise you prior to discharge if this changes.

♥ Do not apply any dressings, lotion, creams or ointment to the wound site.

♥ Allow one week from date of procedure before undertaking strenuous exercise or heavy lifting.

♥ Contact your Cardiologist or General Practitioner if there are any complications or concerns with your recovery and to discuss when you can return to work.

♥ Prior to leaving hospital you will be given instructions on making your follow-up appointment with your Cardiologist. In some cases the appointment will be made and given to you before discharge. Your Nurse or Doctor will inform you of this.
AT HOME

Once you have been discharged (wrist approach)

♥ Do not weight bear on your hand where the procedure has occurred (standing up, sitting down, pulling or pushing).

♥ Do not participate in any strenuous activities for the first 4 days after discharge (sports, gardening, housework, lifting, carrying or sexual activity).

♥ Observe your wrist for any signs of pain, lumps/swelling, redness and bleeding or bruising. Bruising may become more evident in the first week following the procedure, however extensive bruising should be assessed by a GP.

♥ If bleeding occurs from your wrist wound you should apply firm pressure to that area for 15 minutes and lie down. If bleeding continues, phone an ambulance immediately.

♥ If a small lump or swelling occurs at the wrist site, apply pressure. If the lump or swelling does not respond to this pressure, seek medical advice from GP or hospital.

♥ Alteration in sensation of the palm is normal in the first week. If it continues or you are concerned seek medical advice immediately from GP or hospital.

♥ Leave the dressing that you have been discharged with on the wound for 24 hours. It is waterproof so normal showering activities are allowed.

♥ Observe wrist wound site for:

➡ Fresh bleeding or sudden large swelling.

If this occurs lie down and apply firm pressure with 2 fingers just above the wound site for at least 15 minutes (if you are with a friend/relative get them to do this). If bleeding continues call an ambulance and come to the Emergency Department IMMEDIATELY.

♥ Observe affected wrist/arm for:

➡ Changes in colour, numbness, pain or significant discomfort.

If you are unable to see your GP immediately please come to the Emergency Department.
WHAT ARE THE RISKS WITH THE CARDIAC CATHETERISATION PROCEDURE?

The cardiac catheterisation procedure can be associated with the following risks including, but not limited to:

- Coronary artery injury resulting in perforation or dissection (split) and flap formation of the artery wall
- Clot formation and abrupt artery occlusion (closure)
- Angina
- Serious heart rhythm disturbances
- Heart Attack
- Blood loss, requiring transfusion
- Infection or blood vessel damage at the catheter insertion site
- Reaction to dye
- Arterial spasm
- Stroke
- Death
- There is also a small possibility that special vascular surgery may be required to repair the arm or groin artery where the catheter was inserted.

Serious complications occur in less than 1% of patients.

Please speak with your Doctor if you have any questions about risks of having a cardiac catheterisation.
You will receive the results of your Cardiac Catheterisation either prior to leaving hospital or during your follow-up appointment with your Cardiologist.

If you are told you have CORONARY ARTERY DISEASE / ANGINA / UNSTABLE ANGINA or that you have had a HEART ATTACK please read the following information.

If you are told by your Doctor you have CORONARY ARTERY DISEASE it is important you learn what coronary artery disease is and what you can do to reduce your risk factors that have caused the progress of this disease.

Your Cardiologist will discuss your risk factors with you, and information is also easily obtained both in Sir Charles Gairdner Hospital and in the community.

The CARDIAC REHABILITATION CO-ORDINATOR can provide you with the information you require, including a copy of our cardiac education manual – MY HEART MY LIFE.

You can contact the Cardiac Rehabilitation Co-ordinator on 9346 3333 page 4840, directly on 9346 4302 or email: SCGH.cardiorehab@health.wa.gov.au

The NATIONAL HEART FOUNDATION provides a variety of information about heart disease and stroke. The HEARTLINE number is 1300 36 27 87 and the website address: www.heartfoundation.com.au