

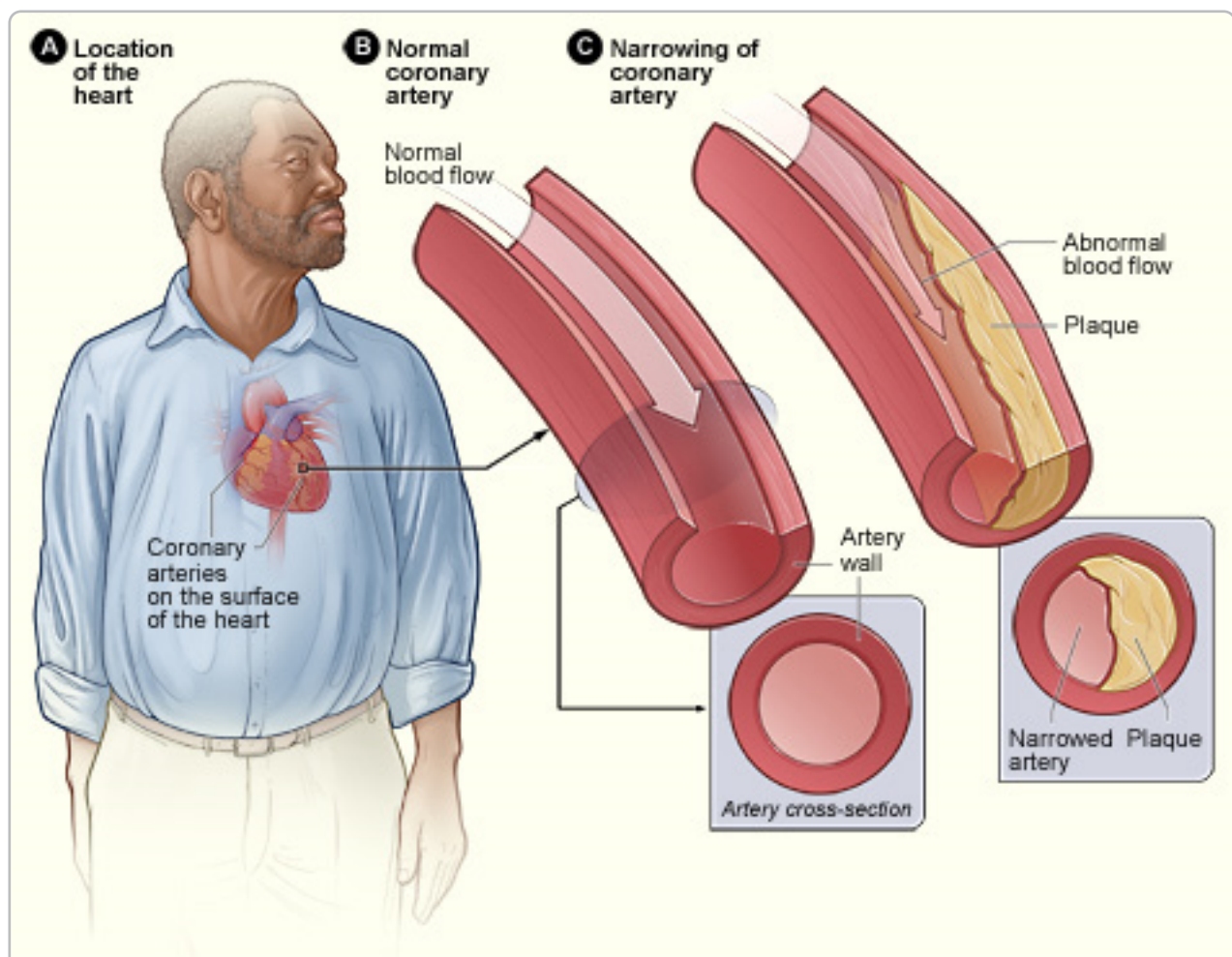
# Cardiac Catheterization/Coronary Angiogram

## Your Procedure and Treatment Options

### What is a cardiac catheterization/coronary angiogram?

A **cardiac catheterization** (also called a coronary angiogram) is a procedure that looks at the coronary arteries (the blood vessels that supply the heart muscles) and the heart valves.

The doctor performs this procedure to look for narrowing or blockage in the blood vessels that supply the heart (see Figure 1).



**Figure 1.** "A" shows the location of the heart in the body. "B" shows a normal coronary artery with normal blood flow. The inset image shows a cross-section of a normal coronary artery. "C" shows a coronary artery narrowed by plaque. The buildup of plaque limits the flow of oxygen-rich blood through the artery. The inset image shows a cross-section of the plaque-narrowed artery.

Source: National Heart, Lung, and Blood Institute, National Institutes of Health.

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## Why do I need this procedure?

You will need this procedure to help the doctor diagnose heart disease and decide on treatment. This procedure will find out if there are any blockages in your heart's blood supply. It will also help to identify any problems with your heart valves and functioning of your heart muscle.

## How do I prepare for the procedure?

- While you are at Humber River Health, we will discuss the procedure with you and the possible treatments that you may have based on the results of the procedure. Please ask us any questions you may have about this procedure.



You can also view the video "Coronary Angiography" on the bedside terminal to help you understand what to expect during the procedure.

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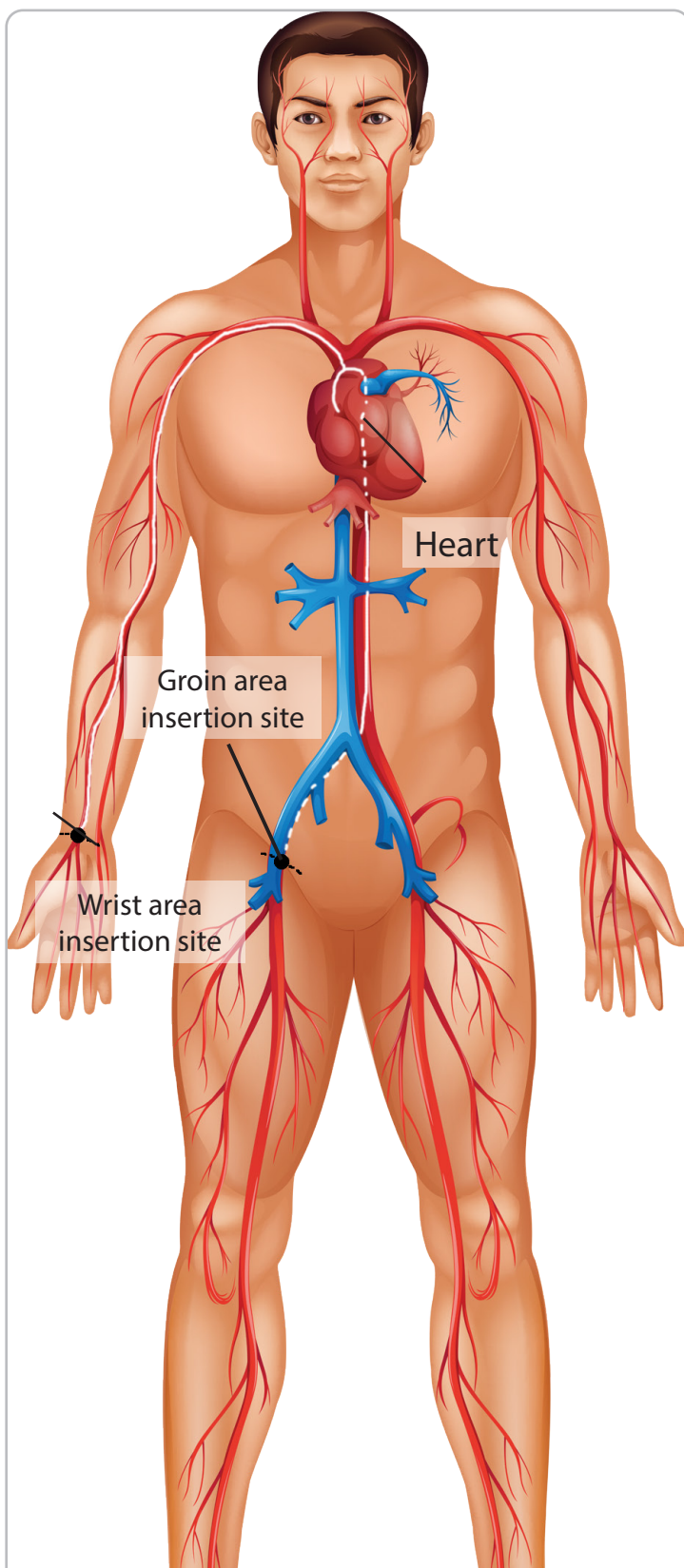
During the procedure, we may give you sedation (a medicine to help you relax).

Please **do not eat or drink anything after midnight**, the night before the procedure.

Sometimes, if your procedure is later in the day, we will give you a light breakfast to eat.

## What can I expect on the day of the procedure?

- Humber River Health does not perform this procedure. Instead, we will send you to another hospital to have this procedure done. It is a good idea to have someone go with you.
  - We will arrange for an ambulance to pick you up and take you to the hospital performing the procedure.
  - We will prepare all of the paper work you will need for the other hospital.
- In most cases, you will return to Humber River Health after the procedure, but we ask that you prepare an overnight bag in case you need to stay at the other hospital.
  - Take only a few items for personal care.
  - Have a family member or friend take home the rest of your personal belongings.



**Figure 2.** The 2 dots show the two locations where a catheter may be inserted. *Source: iPhotos.com*

## What will I experience during the procedure?

- The preparation, procedure and recovery time takes about 5 to 6 hours.
- You will be awake during the procedure but the doctor will give you sedation to help relax you if needed.
- The room you will be in is kept cool for the computers. You will have covers over you, but if you are still cold, please ask for more blankets.
- The doctor will insert the catheter in either your wrist or groin area (see Figure 2). The doctor will use a freezing agent to numb the area of your skin first. You will feel a little pressure as the doctor finds your blood vessel. If you feel any discomfort, tell the doctor and he will use more freezing.
- The doctor will thread the thin tube up inside your chest area into your heart.
- The doctor then injects a dye to highlight the blood flow through in your heart. The doctor uses the dye and an x-ray machine to pinpoint any narrowing or blockage in the blood vessel and decide on treatment.

## Is the procedure painful?

You may feel:

- A little pressure once the doctor inserts the flexible tube in the groin or wrist area.
- Some back discomfort from lying still.
- Some discomfort at the procedure site once the procedure is completed.

**IF YOU HAVE ANY CHEST PAIN OR DISCOMFORT DURING THE PROCEDURE, LET THE DOCTOR KNOW.**

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## What can I expect after the procedure?

After your cardiac catheterization/angiogram:

- The staff will bring you to another room where the nurse will watch you closely. They will check your breathing, blood pressure, pulse, and the area the doctor punctured (either your groin or wrist area).
- The doctor will put on a clamp to apply pressure to the puncture site. This will prevent bleeding in your groin or wrist area.
- The doctor will talk with you about the results of the procedure.
- In most cases, you will return to Humber River Health by ambulance after the procedure.

## What are my treatment options if the procedure shows I have blocked or narrowed blood vessels?

There are 2 options:

1. Angioplasty with stent insertion, or
2. Coronary artery bypass graft

## TREATMENT OPTION 1: ANGIOPLASTY WITH STENT INSERTION (PERCUTANEOUS CORONARY INTERVENTION (PCI))

If your doctor finds blocked or narrowed blood vessels, your doctor may perform an angioplasty with stent insertion (also known as “Percutaneous Coronary Intervention (PCI)”). If your doctor determines this is the best treatment, he will perform this non-surgical procedure at the time of the cardiac catheterization/coronary angiogram procedure.

### To do the PCI (see Figure 3):

1. The doctor inserts a thin tube containing a balloon and a stent (a mesh tube) and threads it up to where the blockage is located.
2. Once at the blocked or narrowed site, the doctor inflates the balloon. This pushes the blockage against the artery wall and widens the artery, which helps restore blood flow. The fully extended balloon also expands the stent, pushing it into place in the artery.
3. The doctor then deflates the balloon and pulls it out along with the thin tube. The stent stays in your artery.

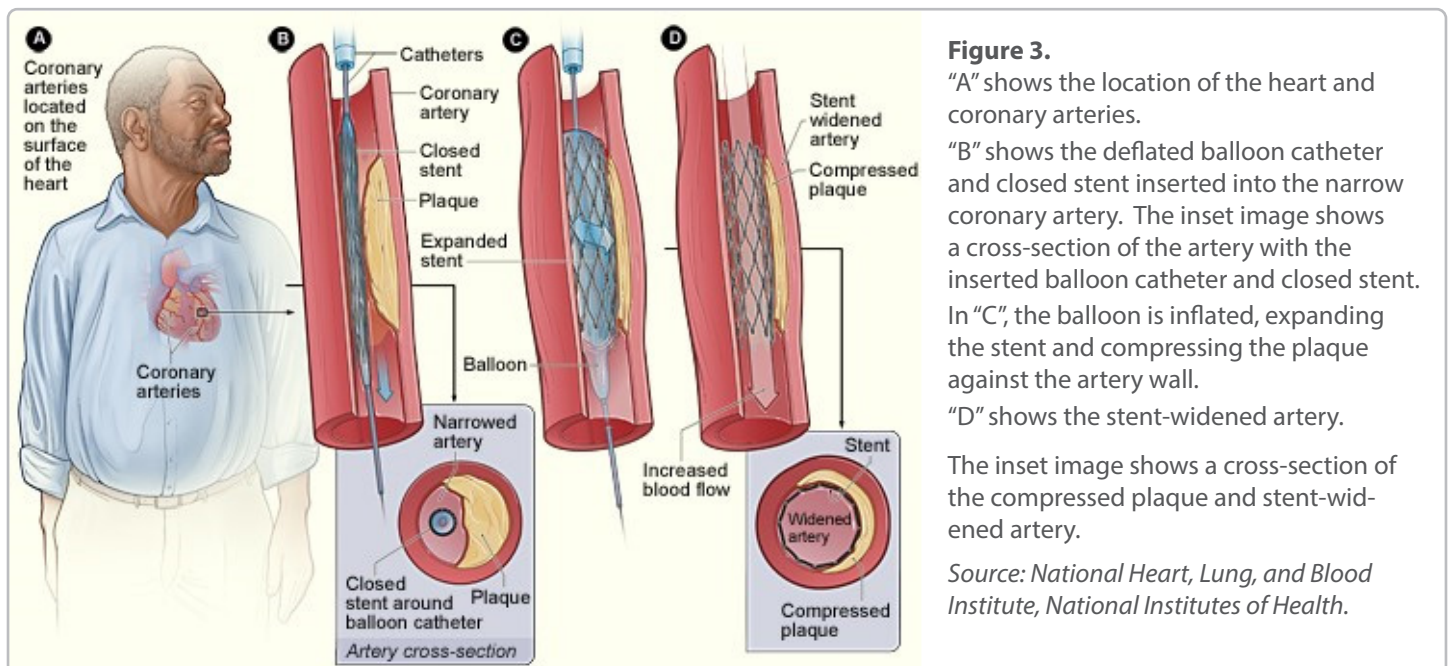
The doctor can insert multiple stents, if needed. Over time, the cells in your artery will grow to cover the mesh of the stent. They create an inner layer that looks like the inside of a normal blood vessel.

If your doctor inserts a stent during your cardiac catheterization/angiogram:

- He will prescribe medicines such as ticagrelor (Brilinta®) or clopidogrel (Plavix®) and acetylsalicylic acid (Aspirin®). Taking these medicines will prevent the risk of a clot forming on the stent and causing another heart attack.



To learn more about what to expect during angioplasty, you can view the video “Angioplasty” on the bedside terminal.



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## TREATMENT OPTION 2: CORONARY ARTERY BYPASS GRAFT (*OPEN HEART SURGERY*)

If your doctor determines that he cannot open the blockage by inserting a stent, the other option is coronary artery bypass graft surgery. Sometimes, this common surgery is a better choice than the stent. Your doctor will not do this surgery at the same time as your cardiac catheterization/coronary angiogram procedure.

Your doctor will finish the cardiac catheterization/coronary angiogram procedure and will send you back to Humber River Health. You will have to go back to the same hospital that performed your procedure to have this surgery done.

### **To do this surgery (see Figures 4, 5, and 6):**

1. The surgeon takes a healthy blood vessel from your arm or leg (called a graft).
2. The surgeon places the graft around the blockage to create a new pathway, restoring blood flow to the heart muscle. The surgeon can place up to 4 to 5 grafts during this surgery.

If your doctor determines you need a coronary artery bypass graft:

- The hospital that performed the procedure will send you back to Humber River Health by ambulance.
- At Humber River Health, we may discharge you home to wait for the surgery or we may ask you to wait in hospital. If you are waiting in hospital:
  - The wait can be up to 1 week, or more if further you need further testing.
  - The day before your surgery, we will transfer you back to the hospital performing the surgery. Please make sure to take all your belongings home or with you.
  - You will stay at the hospital during your recovery. You will not have to return to Humber River Health.

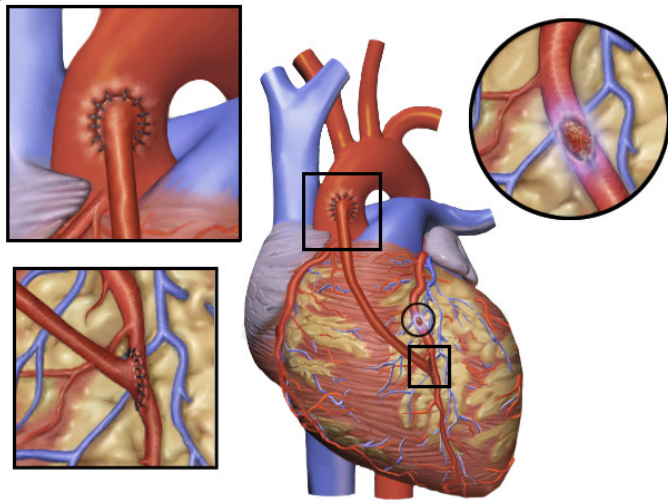
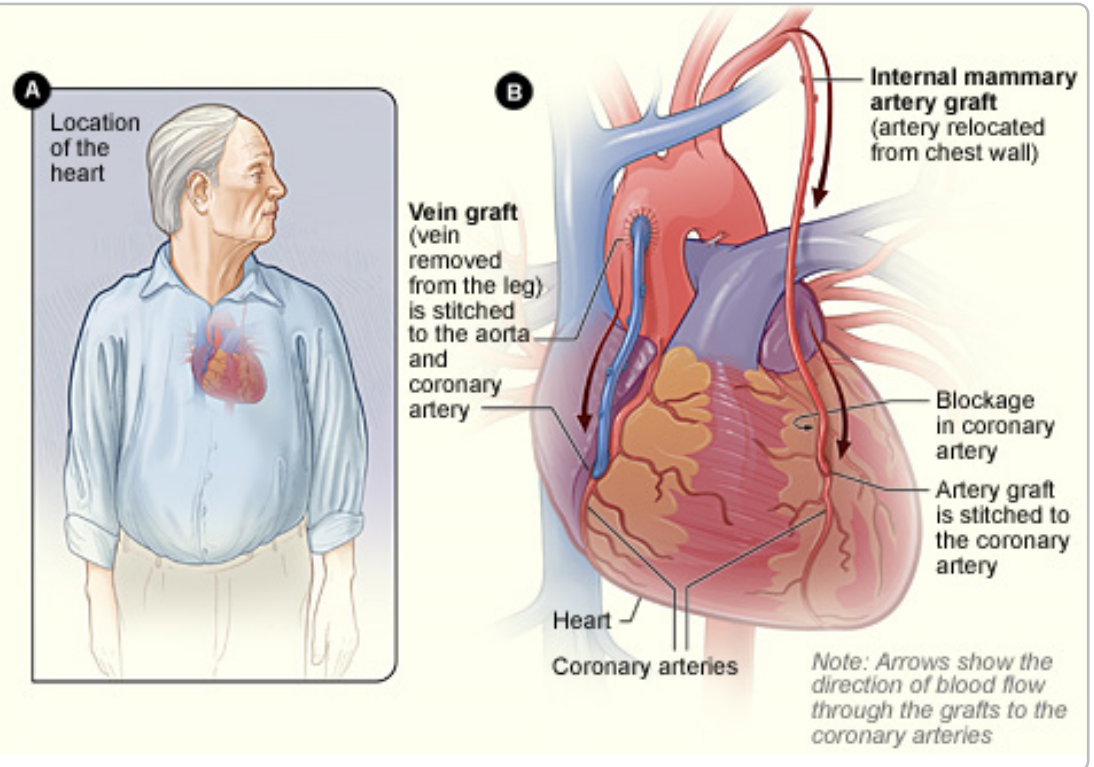


To learn more about what to expect during this surgery, you can view the video “Coronary Artery Bypass Graft” on the bedside terminal.

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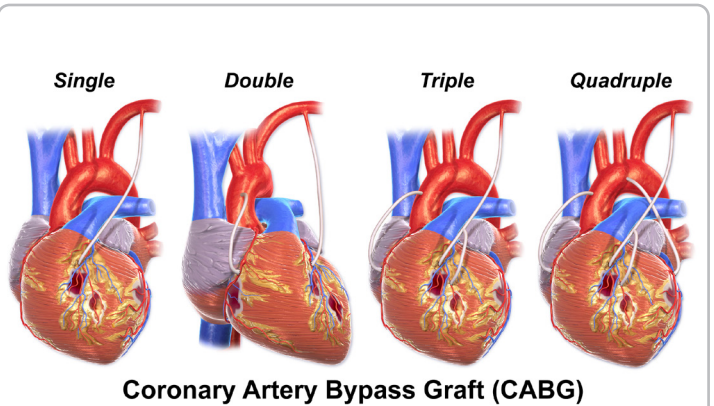
**Figure 4.** "A" shows the location of the heart. "B" shows how vein and artery bypass grafts are attached to the heart.

Source: National Heart, Lung, and Blood Institute, National Institutes of Health.



**Figure 5.** A coronary artery bypass graft.

Source: BruceBlas (Own work) [CC BY-SA 4.0 (<http://creativecommons.org/licenses/by-sa/4.0/>)], via Wikimedia Commons



**Figure 6.** Coronary artery bypass graft - single bypass, double bypass, triple bypass and quadruple bypass.

Source: Blausen.com staff. "Blausen gallery 2014". Wikiversity Journal of Medicine. DOI:10.15347/wjm/2014.010. ISSN 20018762.

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## Resources and Support

For more information on your heart health:

### HUMBER RIVER HEALTH PATIENT AND FAMILY RESOURCE CENTRE

Staff from the centre will assist you in finding health information and community resources.

1235 Wilson Ave., Toronto, Ont., M3M 0B2

Tel: (416) 242-1000 ext. 81200

Fax: (416) 242-1047

E-mail: [pfrc@hrh.ca](mailto:pfrc@hrh.ca)

Hours: Monday to Friday, 9:00 a.m. to 4:00 p.m.

### HEART AND STROKE FOUNDATION

Find information on the internet about your heart health.

Tel: (416) 489-7111 (Toronto office)

Web: [www.heartandstroke.on.ca](http://www.heartandstroke.on.ca)

### CARDIAC CARE NETWORK OF ONTARIO

Learn more about procedures related to your heart.

Web: [www.ccn.on.ca](http://www.ccn.on.ca)

### SMOKERS HELPLINE

This program offers support and information about quitting smoking and tobacco use.

Toll-free: 1 (877) 513-5333

Web: [smokershelpline.ca](http://smokershelpline.ca)

### COMMUNITY CARE ACCESS CENTRE (CCAC)

Connects you to care at home and in your community.

Toll-free: 1 (866) 243-0061

Web: [www.ccac-ont.ca](http://www.ccac-ont.ca)

## My Questions

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Please feel free to speak with your nurse, cardiac nurse clinician or doctor if you have any questions or concerns about this procedure.

