

Complex Percutaneous Coronary Intervention (PCI)

Treatment for blocked heart arteries

This handout explains complex percutaneous intervention (PCI) treatment of a coronary artery. It includes how complex coronary disease is diagnosed and evaluated, and treatment options at UW Medical Center.

What are coronary arteries?

The main blood vessels of the heart are called the *coronary arteries*. As the heart pumps, it sends blood through these arteries to supply the heart with blood and oxygen. If an artery is blocked, it can restrict blood flow to your heart.

How do heart arteries become blocked?

Heart arteries can be blocked by *arteriosclerosis*, a buildup of plaque inside an artery. This plaque can block normal blood flow to the heart. This may result in chest pain called *angina*. When an artery is fully blocked, the heart may be damaged.

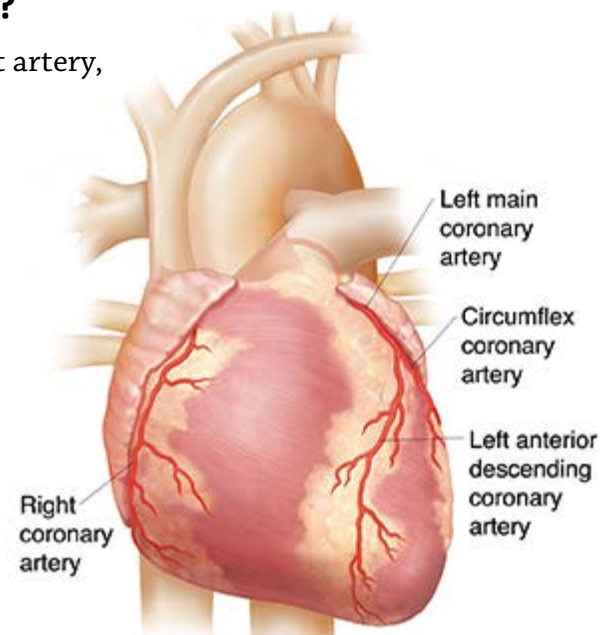
What are the symptoms?

If you have a block in your heart artery, you may have:

- Chest pain or pressure
- Shortness of breath
- Fatigue (feeling very tired)

How is this problem diagnosed?

A procedure called a *heart catheterization* is often used to diagnose blocked heart arteries. In this procedure, a long, thin tube called a *catheter* is inserted into an artery in your groin or arm.



The coronary arteries

The catheter is then moved through your blood vessels to your heart. *Contrast* (X-ray dye) is injected into the tube. Contrast helps the blood vessels show more clearly on X-ray images.

X-rays are then taken. The images show how blood flows through your arteries and if there are blocks or restricted areas.

How are heart blockages treated?

Your treatment depends on your symptoms and if the block is severe. Treatment may include:

- Medical therapy
- *Bypass* surgery
- *Percutaneous coronary intervention* (PCI)

What is percutaneous coronary intervention?

Percutaneous coronary intervention (PCI) is a nonsurgical treatment to open blocked arteries in the heart. In PCI, a *stent* (tube) is placed into your blocked artery. To do this:

- A catheter is inserted through your skin and into your *femoral* (groin) artery or *radial* (wrist) artery, or both. The stent is at the leading tip of this catheter.
- The catheter and stent are then moved through your blood vessels and up to your heart artery.
- The catheter is removed, but the stent is left inside the artery to keep it open. This allows blood flow to reach your heart.

What is complex PCI?

Sometimes, we must place more than one stent. This is called *complex* PCI. You may need complex PCI if:

- You have blocks in more than one artery.
- Calcium in your arteries must be broken up before we can place the stent.
- Your heart muscle is weak, so that we must use a special pump during the procedure to support your heart.
- Your artery is fully blocked (called a chronic total occlusion, or CTO), and your doctor must use special methods to open it.

Is PCI right for me?

To find out if a PCI is the best treatment for you, we need to know if your heart arteries are blocked and how severe the block is. To do this, we will review your records and check the results of these tests:

- **Coronary angiogram.** In this test, we inject contrast into the blood vessels of your heart. We then take a series of detailed X-rays of the inside of your blood vessels.
- **Nuclear stress test.** This test measures blood flow to your heart. There are 2 parts to the test. First, we take images of your heart when you are at rest. Then we take images of your heart when it is working harder after you exercise or take a medicine.
- **Cardiac viability study.** This test helps us decide which heart arteries to open, if you have many blocks.

We will also assess:

- The medicines you take. We may adjust your medicines or your doses to help manage the symptoms caused by your blocked artery.
- How severe your lack of blood flow (*ischemia*) is.
- Your *myocardial viability*. This tells us if the cells around your coronary artery are alive or dead. It also tells us if you will benefit from opening the blocked artery.
- Where your heart arteries are blocked.

Based on all these findings, your doctors will decide whether a complex PCI may help treat your heart artery blockages.

Why do I need this treatment?

By treating your heart artery blockages, we can:

- Ease your symptoms and improve your quality of life
- Improve your ability to exercise
- Improve your heart function
- Reduce your need for bypass surgery or improve your survival rate after surgery

Your Assessment at UWMC

Your primary care provider (PCP) or your *cardiologist* (heart doctor) will refer you to UWMC. Our Complex Coronary Team will work with your doctors to coordinate your care and treatment plan.

The team will review your medical records, angiograms, and other test results that you or your PCP sent us. We will then set up a time for you to meet with a member of the team. At this meeting, called a *consult*, we will talk about your options, risks, and benefits of having a PCI or other procedure.

What are the risks of a PCI?

The greatest risks of a PCI include:

- Kidney damage from the contrast
- Bleeding where the catheter entered the artery in your groin or arm

Other risks are:

- Bleeding or damage to the blood vessel where the catheter entered your skin
- Your coronary artery may suddenly close
- Small tear in the inner lining of your artery
- Heart attack or stroke
- Stroke
- Death

How do I prepare for my PCI?

- Write down all the medicines you are now taking. Bring this list with you to your clinic visit. We will review them and tell you which ones to take and not take on the day of your procedure.
- At your clinic visit, be sure to ask any questions or share any concerns you have about your procedure.
- If you have family with you and you are from out of town, be sure they arrange to stay overnight in the Seattle area. Our Patient Care Coordinator can help you find options for you and your family.
- **If you are taking blood-thinning medicines:** Right before their treatment, most patients need to hold their morning or evening dose of these medicines. If you are taking warfarin (Coumadin) or another blood-thinning medicine, get details from our clinic, your anticoagulation clinic, or your cardiologist about holding your medicine before your procedure.
- **If you are taking diuretics, insulin, or oral diabetes medicine:** Get detailed instructions from one of our team members about if and when to stop taking these medicines.

- **Arrange for someone to drive you home from the hospital and stay with you for 6 hours or longer.** Most patients must stay overnight in the hospital. But, if you leave the hospital the same day as your procedure, you **must** have a responsible adult take you home and stay with you for at least 6 hours. This person must be with you in the Cardiac Procedures Unit **before** you can leave the area.
- **If you have children or pets:** Make plans for someone to take care of them while you are away from home. You will stay 1 night in the hospital after your treatment so that we can monitor you. You will be able to go home the next morning.
- If you have not received detailed instructions within 1 week of your procedure, or if you have any other questions or concerns, please call our Complex Coronary Nurse at 206.598.0906.

Day Before Your Procedure

- For 24 hours before your treatment, do **not** eat or drink anything that contains caffeine. This includes coffee, tea, energy drinks, chocolate, and some supplements.
- Pack an overnight bag.
- Do **not** eat or drink anything after midnight.
- If you need to take medicines, take them with **only** a small sip of water.

Procedure Day

At Home

- You may take your usual medicines with small sips of water unless you have been told otherwise.
- If you use a CPAP machine for sleep apnea or breathing problems, bring it with you to the hospital.
- Bring with you a list of medicines you are now taking. This includes vitamins and herbal supplements.

At the Hospital

- Use the **main hospital entrance** on Pacific Street. When you enter, you will be in the lobby on the 3rd floor of the hospital. You will see the Information Desk in the lobby.

- **Check in at the Admitting Reception window.** This office is down the hall to the right of the Information Desk. Tell them that you are checking in for your heart catheterization. If needed, their phone number is 206.598.4310.
- Do **NOT** go to Cardiac Procedures until after you have checked in at Admitting.

After you check in, go to Cardiac Procedures on the 2nd floor:

- From Admitting, go out to the lobby and turn left. Go along the main hallway to the Pacific elevators. Take an elevator to the 2nd floor.
- As you step off the elevator, you will see a phone on the wall to your right. Pick up the handset and press **Key 1, Cardiac Procedures Visitors**. A nurse will answer and tell you what to do next.

Preparing for the Procedure

While you are in our pre-procedure area:

- We will ask you to change into a hospital gown.
- We will take your blood pressure and temperature.
- A nurse will ask you questions about your medical history.
- We will do an *electrocardiogram* (EKG). This painless test measures the electrical activity of your heartbeats. It shows whether parts of your heart are too large or are working too hard.
- We will place an *intravenous* (IV) line into a vein in your arm.
- Your groin and/or arm will be scrubbed with antiseptic solution and shaved. We do this to help prevent infection.
- We will ask you to read and sign consent forms for your procedure.
 - The procedure has some risks. Some patients have side effects from the contrast or medicines that are used. These side effects are not common, but you should know about them. Your provider will talk with you about these risks and side effects before asking for your consent to do the procedure.
 - Please ask any questions you have before signing the consent forms.
 - You can also decide not to sign the forms. We will not do the procedure if you do not give your consent by signing the forms.

After you sign the consent forms, we will take you to the Cardiac Catheterization Lab. During your procedure, your family may wait in the

waiting room. Staff will show them where to wait and how to get updates on how you are doing.

What can I expect after my procedure?

After the catheterization, you will be taken back to Cardiac Procedures Recovery Unit where you will begin to recover. Expect to stay in Cardiac Procedures Recovery Unit at least 1 to 2 hours after your procedure.

During recovery:

- You must lie flat. Your nurse will help you stay comfortable. You may be given pain medicines if you have any discomfort from lying flat.
- We will check your pulse, blood pressure, and dressing often during the first 3 to 4 hours after your procedure.
- You will be able to eat as usual.
- You may have to stay overnight. If you do, you will be moved to a room on the 4-Southeast unit so that our nurses can monitor you closely.

Discharge

Before you leave (are discharged from) the hospital:

- A doctor or nurse practitioner will check your insertion site. They will also talk with you about the results of your procedure.
- If needed, your medicines or diet will be adjusted. Your nurse will teach you about these changes and talk with you about your follow-up care.
- Ask questions if you do not understand something your nurse or doctor tells you.

If you are going home the same day and you had ANY sedation:

Sedation can make you sleepy, and make it hard for you to think clearly. Because of this:

- **A responsible adult must take you home after your procedure.** You may not take a bus, shuttle, taxi, or any other transportation by yourself.
- For the next 24 hours:
 - Do **NOT** drive.
 - Make sure you have a responsible adult who can help you if needed during this time.

- Do **NOT** be responsible for children, pets, or an adult who needs care.
- Do **NOT** drink alcohol, or take drugs other than the ones your doctors prescribed or suggested.
- Do **NOT** make important decisions or sign legal papers.

When You Get Home

Activity

Some activity restrictions depend on whether the catheter was inserted in your groin or in your arm:

If the catheter was inserted in your groin:

- Starting **24 hours** after you are discharged, you may:
 - Shower
 - Return to light activity
 - Drive
- For **48 hours** after your procedure:
 - Do **not** do anything that puts stress on your puncture site. This includes housework, gardening, and many self-care tasks. Ask for help with any tasks that need to be done during this time.
 - You may go up and down stairs, but limit how much you do this.
- For **7 days** after your procedure:
 - Do **NOT** lift more than 10 pounds (4.54 kilograms). This includes pets, groceries, children, trash, and laundry. (A gallon of milk weighs almost 9 pounds.)
 - Do **NOT** hold your breath or bear down when having a bowel movement.
 - Do **NOT** allow the puncture site to be covered by water. This means do not take a bath, sit in a hot tub, or go swimming.

If the catheter was inserted in your arm:

- For **48 hours** after your procedure:
 - **AVOID** lifting, pushing, or pulling with the affected arm
 - **AVOID** bending, turning, or twisting your wrist on the affected arm
 - Do **NOT** have your blood pressure taken on the affected arm
- For **5 days** after your procedure:
 - **AVOID** vigorous exercise that uses the affected arm.
 - Do **NOT** lift more than 5 pounds with the affected arm. (A 2-liter bottle of soda weighs more than 4 pounds.)
- You may shower the day after your procedure, but do **not** take a bath, sit in a hot tub, or go swimming for **5 days**.
- It is normal to have a small bruise or lump at the insertion site.

Diet

You may return to eating as usual, unless your doctor or nurse advised you to change your diet. If you have questions about these changes, ask your primary care provider (PCP) for a referral to a dietitian. The dietitian can help you plan meals and snacks for your new dietary plan.

Pain Control

- You will most likely be sore for 1 to 2 days at the site where the catheter was inserted.
- You may take acetaminophen (Tylenol) to ease pain. Follow the instructions on the package.
- For **5 days** after your procedure, do **not** take ibuprofen (Advil, Motrin), naproxen (Aleve, Naprosyn), or other anti-inflammatories. They may cause bleeding.
- If your doctor prescribed aspirin for your heart, you may take it as usual. But do **not** take extra aspirin for pain control.

Site Care

- Keep the area clean and dry.
- You may remove the dressing (bandage) 24 hours after your procedure.

- For the next 3 days, watch for signs of infection. Call the cardiologist who did your procedure if you have:
 - Redness around the site
 - Fever higher than 101.5°F (38.6°C)
 - Drainage at the site
- After you remove the dressing:
 - Gently clean the site with mild soap and water.
 - Do **not** scrub or rub the area.
 - Lightly pat dry with a clean towel.
- You may have a bruise where the catheter was inserted. If the procedure was done through your groin, the bruise may spread down your leg. It may take 2 to 3 weeks for the bruise to go away

When to Call

If you have sudden, heavy bleeding or a lot of swelling that you cannot control, apply firm pressure to the site and call 911.

Call 206.598.6190 and ask to page the Cardiology I Fellow on call if you have:

- **Drainage** from the site
- **A** lot of **redness** around the site

Bleeding

If you have light or moderate bleeding or swelling at the site, use clean fingers to apply pressure on it for 10 minutes.

- If bleeding does not stop or swelling does not go down in 10 minutes, **call 911 right away**. Keep applying pressure until help arrives.
- **If your catheter was placed in your arm:** If the bleeding stops or the swelling goes down, sit quietly for 2 hours. Do **not** bend the affected wrist. Call the cardiologist who did your procedure as soon as you can.

Other Concerns

Also call the cardiologist who did your procedure if you have:

- Any of these signs of infection:
 - Redness or drainage at the puncture site
 - Fever higher than 101.5°F (38.6°C)
 - Change in the bruise or lump at the puncture site
- **Severe pain** that is not eased by acetaminophen (Tylenol)
- **Numbness** in your arm or wrist

Medicines

After your procedure, you will:

- Keep taking your prescribed medicines, unless your doctor tells you not to.
- Take aspirin to prevent blood clots in the artery where the stent was placed.
- Take another blood-thinning medicine, such as clopidogrel (Plavix) to help prevent blood clots.
- Resume all heart medicines you were taking before your procedure. Your primary cardiologist will review your medicines at your follow-up visit within 2 to 4 weeks after your procedure.
- For minor pain, you may take acetaminophen (Tylenol), either regular (325 mg) or extra strength (500 mg). Do **not** take more than 4 gm (4,000 mg) in a 24-hour period.
- Carry a list of your medicines with you at all times. Bring all your medicines, vitamins, and herbal supplements with you whenever you see your doctor.

Follow-up Care

- We will update your primary cardiologist about your procedure and the outcome. You will need to follow up with your primary cardiologist within 2 to 4 weeks after your procedure.
- A follow-up visit will be scheduled with your referring care provider within 2 weeks after your procedure.

- Your providers will also advise you to take steps to reduce your risk for heart problems. These include:
 - Managing diabetes
 - Managing lipids
 - Managing your blood pressure
 - Quitting smoking
 - Keeping your weight at a healthy level
 - Getting regular exercise
 - Making sure you are taking the medicines you need, in the right doses
- After your procedure, the artery in your heart can become blocked again. Always watch for the same symptoms that you had before the procedure. **Call your doctor right away if your symptoms return.**

Questions?

Your questions are important. Call your doctor or healthcare provider if you have questions or concerns.

- **For general questions** weekdays from 8 a.m. to 5 p.m., call 206.598.0906 and ask to speak with the Complex Coronary Nurse.
- **For questions related to your procedure** weekdays from 6:30 a.m. to 8 p.m., call Cardiac Procedures at 206.598.7146. Ask to talk with a nurse.
- **For urgent concerns related to your procedure**, or if it is after hours or on a weekend or holiday, call 206.598.6190 and ask to page the Cardiology I Fellow on call.