

## Patent Foramen Ovale (PFO) Closure

A patent foramen ovale (PFO) closure is done to seal off or close an opening between the upper right and left chambers of the heart. To understand the procedure, it is helpful to know how the heart works.

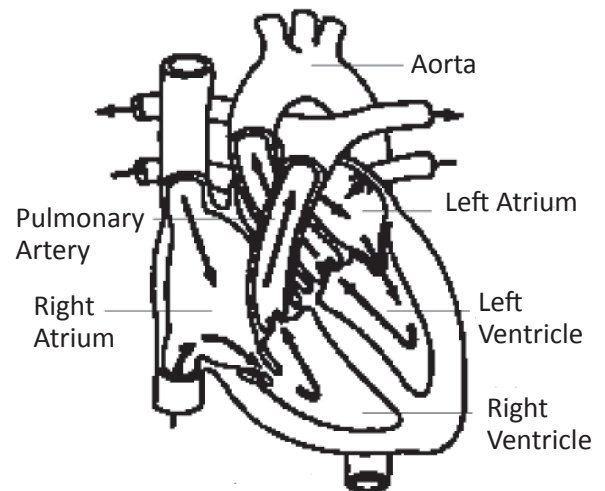
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The heart is about the size of a closed fist. It delivers blood to the lungs and to all the body tissues. The heart has 4 chambers. The right atrium receives blood from the body and pumps it to the right ventricle. The right ventricle then pumps blood to the lungs, where it picks up oxygen. The left atrium receives oxygen-rich blood from the lungs and sends it to the left ventricle. From there, it pumps blood to the body (see Figure 1).

Before birth, each fetus has a small opening between the upper left and right chambers (atria) of the heart. This opening is called a foramen ovale.

In most cases, this closes naturally soon after birth. If it remains open (patent), blood may leak between the 2 atria. In the past, the foramen ovale could be closed only during open heart surgery. A PFO closure done in the Cardiac Catheterization (Cath) Lab offers a less invasive option.

**Figure 1**



During this procedure, a thin catheter (tube) is threaded to the heart from the blood vessels in the groin area. The catheter, guided by X-ray, allows a special device to be put in place to close the patent foramen ovale. The procedure lasts about 1 to 2 hours. An overnight hospital stay may be needed.

## Before the Procedure

### *At Home*

The Cardiac Cath Lab nurse will contact you several days before the exam. The nurse will answer your questions and review pre-cath guidelines. Please tell the nurse about any allergies or if you have ever had an unusual reaction to iodine or a test using contrast media (dye).

Stop taking warfarin (Coumadin®) at least 3 days before the procedure. If you are not taking aspirin, you will be asked to start taking a soluble aspirin, 325 mg daily, before the procedure.

If you are a diabetic taking metformin (Glucophage®, Glucophage XR®, Glucovance®), talk with the doctor who manages your diabetes. The contrast given during the procedure may affect the way metformin works. You may not take metformin for at least 48 hours after the procedure. Contact your doctor to develop a short-term plan for controlling your blood sugar (diet, other medications or checking blood sugar levels).

The night before the exam, do not eat or drink anything after midnight.

## Day of the Procedure

On the day of the procedure, take only the medicines the nurse has instructed you to take. Medication should be taken with small sips of water. Do not take metformin (Glucophage®, Glucophage XR®, Glucovance®) on the morning of your procedure.

Check-in at the Cardiac Cath Lab reception desk, Galter Pavilion, 675 North Saint Clair Street, 8th floor, between 6:00 a.m. and 6:30 a.m. unless told otherwise.

Parking is available for patients and visitors in the garage at 222 E. Huron, across from the Feinberg and Galter pavilions. For discounted rates, please bring your parking ticket with you. Tickets can be validated at the Customer Services Desks on the 1st, 2nd, and 8th floors of the Feinberg and Galter pavilions; 1st floor of Prentice (including the Prentice 24-hour desk near the Superior entrance).

Be sure to bring:

- Your doctor's written order for the test.
- A list of allergies.
- A list of all your current medications (prescription, over-the-counter, and herbals).
- Photo ID.
- Medical insurance information.
- Medicare card (Medicare patients only).

Plan to have a responsible adult take you home.

For their own safety, children under 16 may not visit in the testing area. They may stay in the waiting room with a responsible adult.

You will be assigned a room for both your pre- and post-procedure care. After you change into a hospital gown, the nurse will review your health history and take your blood pressure and pulse. Blood tests, including a blood creatinine test, are done as needed. An IV (into the vein) line will be inserted into your arm or hand. The IV is used for fluids and needed medication during the exam. Your groin area is cleaned and shaved. The femoral vein in the groin is used for the procedure.

The doctor will discuss the procedure with you. After the doctor has answered your questions, you will be asked to give your written consent.

You may wear your watch, glasses, dentures (or bridgework), jewelry and hairpieces. You are asked to empty your bladder just before going into the Cath Lab.

### **During the Procedure**

Once in the Cath Lab, you will be assisted onto an X-ray table. The room has a camera and several television monitors. Medicine to relax you is given into the IV. You may feel drowsy, but usually you will be awake and comfortable during the procedure. The area around the puncture site is cleaned with a special soap that may feel cold. An anesthetic (numbing medicine) is injected into the area. A needle is inserted into the femoral vein. This is usually not painful. You may feel pressure and mild discomfort at the puncture site. If needed, added numbing medicine is given.

A catheter will be inserted through the femoral vein. Using X-ray and IV contrast (dye), the catheter will be guided to the heart. Your PFO is measured.

A properly sized closure device is selected. It is placed on a special delivery catheter and advanced across the PFO. After the device is carefully placed in the PFO, it is released and implanted in your heart.

### **After the Procedure**

You will be on bed rest for at least 4 to 8 hours to allow the vein to seal. It is important to keep the affected leg(s) straight at all times. The nurses will be in often to check your:

- Blood pressure.
- Heart rate.
- Groin site(s) for any bleeding or swelling.

Once your bed rest is over, the nurses will assist you to sit up and walk. You may be discharged from the hospital at the end of the day or possibly the following morning. A chest X-ray and/or an echocardiogram may be done prior to the time you leave.

## Discharge Instructions

At home, follow these guidelines to assist your recovery.

### **Medications and Device ID**

After your procedure, you will need to take:

- Aspirin, 325 mg (soluble) once a day, for 6 months.
- Plavix<sup>®</sup>, 75 mg once a day, for 3 months.

Both of these medications are blood thinners (anticoagulants) to help prevent blood clots. Your cardiologist will decide if any anticoagulants are needed beyond 6 months.

A closure device ID card will be mailed to your home after your procedure. Carry it with you at all times. It is important that all healthcare providers are aware of this device.

For 6 months after a PFO closure, you will need to take antibiotics before medical or dental procedures. This helps prevent the risk of infection to the device. Always inform your other healthcare providers that you have this device before having medical or dental procedures.

### **Diabetics**

If you are taking metformin, the nurse will give you an order for a blood creatinine test. This blood test should be done within 48 hours after your procedure. Do not take metformin until the doctor or Cath Lab nurse tells you to resume it. Most patients may begin metformin 48 hours after the procedure. Follow your doctor's advice about caring for your diabetes (diet, other medications and monitoring your blood sugar levels). Contact the doctor who manages your diabetes if there are any changes in your diabetes control.

### **Activity**

While the wound is healing, bleeding or swelling can occur as a result of stress or strain to the groin and abdominal muscles. Carefully follow these guidelines:

- On the day of discharge, limit your activities.
- Do not drive for 24 hours.
- You may shower after 24 hours, but no tub baths are allowed for 1 week.
- Climb stairs with a slow, steady pace for 2 days after the procedure.

You may resume your usual activities the day after your discharge, including normal social activities, except:

- No heavy lifting of objects greater than 10 lbs. for the next 3 days.
- No strenuous physical exercise for 1 week (i.e., tennis, running, swimming, golfing, weightlifting or bicycling).
- No sexual activity for 1 week.
- No contact sports for 4 weeks.

### ***Wound Care***

After the procedure, a small dressing is applied to the wound site. You may remove the dressing the day after the procedure. Do not reapply a new dressing or bandage. Avoid lotions, ointments or powders at the wound site for 1 week.

### ***Wound Healing***

The healing wound should remain soft and dry. A bruise or a marble-size lump may be present. Please notify your doctor or the Cardiac Cath Lab doctor if any of the following signs appear:

- Redness around the wound.
- Drainage from the wound.
- A lump at the puncture site that enlarges or is larger than marble size.
- Pain at the puncture site that makes walking difficult.
- Numbness or tingling in the thigh or leg.
- Calf tenderness or pain.
- Swelling of the ankle or foot.
- Increased area of bruising with discoloration extending into the thigh, over the buttock or into the groin.
- Discoloration or coolness of the leg or foot.

### ***Bleeding***

If you notice bleeding from the puncture site, please do the following:

- Immediately lie flat.
- Apply firm pressure just above the puncture site and hold firm pressure for 15 minutes. You may use a clean cloth or tissue to apply pressure. If possible, have another person apply the pressure.
- After 15 minutes, remove pressure. The wound should be dry and flat, without bleeding. You should continue to lie flat for about 1 hour before getting up and walking.
- Cover the wound with a bandage.
- Notify your doctor.

**If bleeding persists for more than 15 minutes, or swelling occurs and appears to be increasing, you should be taken to the nearest Emergency Room for evaluation of the groin site.**

Notify the doctor right away if you have any chest pain or shortness of breath.

## Follow-up Care

You should arrange for follow-up appointments as instructed by your cardiologist. You will need to have an outpatient chest X-ray and a transthoracic echocardiogram (TTE) test 1 week, 1 month, 6 months, and 1 year after a PFO closure. Please talk with your doctor about scheduling these exams.

If a problem occurs or you have any questions, do not hesitate to call the Cath Lab at 312-926-5135.

## Health Information Resources

For more information, visit Northwestern Memorial Hospital's Alberto Culver Health Learning Center. This state-of-the-art health library is located on the 3rd floor of the Galter Pavilion. Health information professionals are available to help you find the information you need and provide you with personalized support at no charge. You may contact the Health Learning Center by calling 312-926-LINK (5465) or by sending an e-mail to [hlc@nmh.org](mailto:hlc@nmh.org).

*Para asistencia en español, por favor llamar al Departamento de Representantes para Pacientes al 312-926-3112.*

The entities that come together as Northwestern Medicine are committed to representing the communities we serve, fostering a culture of inclusion, delivering culturally competent care, providing access to treatment and programs in a nondiscriminatory manner and eliminating healthcare disparities. For questions, please call either Northwestern Memorial Hospital's Patient Representatives Department at 312-926-3112, TDD/TTY 312-944-2358 and/or the Northwestern Medical Group Patient Representatives Department at 312-926-1920, TDD/TTY 312-695-3661.

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