

## Patent Foramen Ovale (PFO) Closure

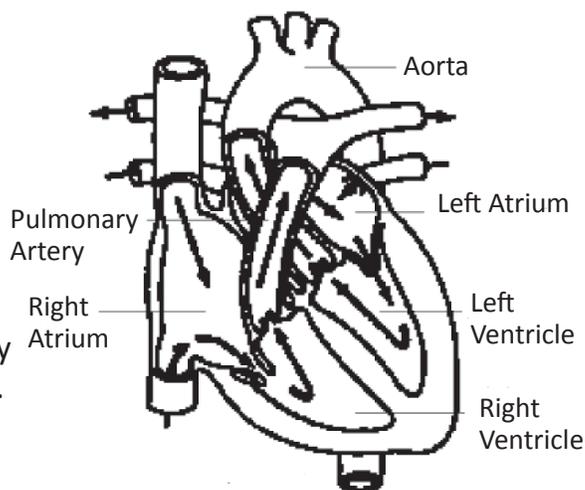
A patent foramen ovale (PFO) closure is done to seal off or close an opening between the upper right and left chambers of the heart. To understand the procedure, it is helpful to know how the heart works.

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).

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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 Lab (CCL) is a less invasive way to treat the condition.

**Figure 1**



During this procedure, a thin catheter (tube) is threaded to the heart through a blood vessel 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 CCL nurse will contact you several days before the procedure. The nurse will answer your questions and review pre-catheterization 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).

You will be asked to start taking a soluble aspirin, 325 mg daily, before the procedure.

The CCL nurse will review your medications with you. Please tell the CCL nurse if you are taking blood thinners or medications for diabetes. These medications will need to be addressed before your procedure.

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.

Check in at the CCL reception desk, Galter Pavilion, 675 North Saint Clair Street, 8th floor, at the time assigned to you by the CCL nurse.

Parking is available for patients and visitors in the garage at 222 East Huron Street, 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; and on the 1st floor of Prentice Women's Hospital (including the Prentice 24-hour desk near the Superior Street entrance).

Be sure to bring:

- A list of all your current medications (prescription, over-the-counter, and herbals)
- Photo ID
- Medical insurance information and card
- 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, start an IV, and draw any blood tests that are needed. The IV is used for fluids and needed medication during the exam. Your groin area will be cleaned and shaved. The femoral vein in the groin is used for the procedure.

Your physician will discuss the procedure with you. After the physician 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 will be asked to empty your bladder just before going into the CCL.

## During the procedure

Once in the CCL, you will be assisted onto a firm, X-ray table. The room has a camera and several TV monitors. Through the IV line, you will be given medicine to relax you. You may feel drowsy, but usually you will be awake and comfortable during the procedure.

The area around the puncture site in your groin will be cleaned with a special soap that may feel cold. An anesthetic (numbing medicine) will be injected into the area. A needle will be inserted into the femoral vein. This is not usually painful. You may feel pressure and mild discomfort at the puncture site. If needed, more numbing medicine can be given.

A catheter (with a tiny ultrasound at the tip) will be inserted through the femoral vein. A device delivery catheter also will be inserted through the femoral vein. Using X-ray and IV contrast (dye), the catheters will be guided to the heart.

A properly sized closure device will be selected and placed on a special delivery catheter. The catheter will be advanced across the PFO. Ultrasound images will determine the size and exact placement of the device. Once the position is confirmed, the device will be released and implanted in your heart.

## After the procedure

You will be on bed rest for at least 4 to 6 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 help you sit up and walk. You may be discharged from the hospital at the end of the day or possibly the following morning. An echocardiogram will be done before 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 81 mg (soluble) once a day
- Plavix® 75 mg once a day for 6 months
- Other \_\_\_\_\_

Both of these medications are blood thinners (anticoagulants) used 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 that you have 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.

### **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 the first 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 (such as 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 will be applied to the wound site. You may remove the dressing the day after the procedure. Do not reapply a new dressing or bandage. Avoid using lotions, ointments or powders on or near the wound site for 1 week.

### **Wound healing**

The healing wound should remain soft and dry. A bruise or a marble-sized lump may be present. Please notify your physician or the CCL physician 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 a marble
- 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

## ***Oozing/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 physician.

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

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

If a problem occurs or if you have any questions, do not hesitate to call the CCL at 312.926.CATH (2284) ext. 3.

## **Follow-up care**

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

## **Northwestern Medicine – Health Information Resources**

For more information, contact Northwestern Memorial Hospital's Alberto Culver Health Learning Center (HLC) at [hlc@nm.org](mailto:hlc@nm.org), or by calling 312.926.5465. Health information professionals can help you find the information you need and provide you with personal support at no charge.

For more information about Northwestern Medicine, please visit our website at [nm.org](http://nm.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 312.926.6363 or the Northwestern Medical Group Patient Representatives Department at 312.695.1100, TDD/TTY 312.926.6363.

Developed by: NMH Cardiac Catheterization Laboratory