Intermountain® Healthcare

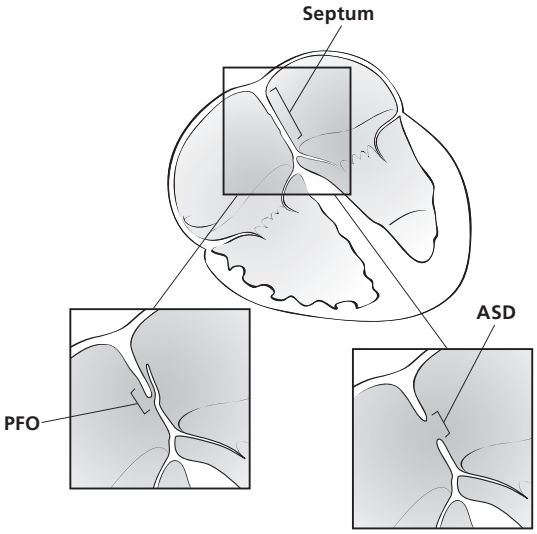
PFO and ASD Closure in the Cath Lab

What is it?

PFO or ASD closure is a procedure to repair a small opening in the wall between the upper chambers of your heart. There are two kinds of openings: a **patent foramen ovale (PFO)** and **an atrial septal defect (ASD)**.

What is a patent foramen ovale (PFO)? Fetuses in the womb have a normal opening between the heart's upper chambers. This opening usually closes soon after birth. But for about 1 in 5 people, it doesn't close completely. A PFO allows tiny amounts of oxygen-rich blood and oxygen-poor blood to mix, almost like a "leaky tunnel" between the two heart chambers. For many patients, a PFO does not cause significant health problems, but in some patients a PFO can increase the risk of stroke.

What is an atrial septal defect (ASD)? Less than 1% of the time, a baby is born with a hole between the upper chambers of the heart. This birth defect does not heal. Compared with a PFO, an ASD usually allows more oxygen-rich blood and oxygen-poor blood to mix. An ASD can cause congestive heart failure or heart rhythm problems, and can allow blood clots to travel through the heart and increase your risk of stroke.



How are PFOs and ASDs closed? A PFO or ASD can be closed in surgery, or in many cases can be closed in a cardiac cath lab procedure. A doctor will thread a **catheter** (a narrow tube) through a blood vessel to your heart, and then to the PFO or ASD. The catheter is fitted with a **closure device** that generally works like a tiny umbrella. When it's closed, it's small enough to travel through your blood vessel. When it opens, it expands to close the hole.

Talking with your doctor

The table below lists the most common potential benefits, risks, and alternatives for PFO closure. Other benefits and risks may apply in your unique medical situation. Talking with your healthcare provider is the most important part of learning about these risks and benefits. If you have questions, be sure to ask them.

Potential benefits	Risks and potential complications	Alternatives
• Lower risk of stroke in the future • More oxygen in your blood • Lower risk of complications than with open heart surgery	There are risks with any kind of procedure, including ASD or PFO closure. But **serious complications are rare.** Your doctor and the cath lab staff take every precaution to prevent them. Risks include: • Temporary leg numbness or weakness in the first few hours afterward (rare) • Bruising, bleeding, infection, or blood vessel damage where catheter(s) were inserted • Damage to the heart muscle that may require open heart surgery • Abnormal heart rhythm • Blood clots • Heart attack or stroke • Negative reaction to anesthetic or dye • Unforeseen complications	Alternatives to PFO closure include: • Anticoagulant medication (blood thinners, aspirin) Alternatives to PFO or ASD closure include: • Open heart surgery • Watching and waiting

Why might I need it?

An ASD can cause heart rhythm problems or symptoms of congestive heart failure such as fatigue and shortness of breath. Your doctor may recommend ASD closure if you're having these symptoms, or to reduce your risk of stroke.

Your doctor may recommend PFO closure if you've had a stroke that seems to be related to the PFO, or to reduce your risk of stroke.

How do I prepare for the procedure?

Follow these steps to make your procedure go better:

- **Avoid having any dental work done for 30 days before the procedure.** Dental work can put you at risk for **endocarditis**, an infection in the heart's inner lining.
- **Follow your doctor's instructions about medications.** You may be asked to stop or start taking certain medications before the procedure. Always check with your doctor before stopping any medications.
- **Ask about what you can eat and drink.** Your doctor may give you special instructions on what you can eat or drink before the procedure.
- **Tell your doctor about allergies.** Your doctor needs to know if you are allergic to any medication, dyes, or to latex or rubber products (such as rubber gloves or balloons).
- **Bring a list of all your current medications.** Be sure to include everything, including over-the-counter medications, herbal supplements, and vitamins.
- **Plan to spend the night.** You may or may not return home the day of your procedure. Bring items with you (such as a robe, slippers, and a toothbrush) that will make you more comfortable if you need to spend the night in the hospital.
- **Arrange for a ride.** Ask someone to drive you home from the hospital or clinic.

What happens before?

When you arrive at the hospital or clinic, here is what will happen:

- You will fill out some paperwork, including a consent form.
- You'll change into a hospital gown. A nurse will prepare the patch of skin where the catheter will be inserted.
- An IV (intravenous line) will be placed in your arm so you can receive medications or fluids during the procedure.
- You'll be moved to the cardiac cath lab. The room may feel cool, but you will be covered with sterile drapes. You can also ask for a blanket.
- You may have a sedative to help you relax during the procedure.

What happens during?

This procedure usually takes about 1 to 2 hours. Here's what will happen:

- **Monitoring.**
  - Electrodes (small, sticky patches) will be placed on your chest. These are attached to a monitor to measure your heart's electrical activity.
  - Your heart will also be monitored with an echocardiogram (heart ultrasound), sometimes by passing a probe down your esophagus, or from your blood vessel into your heart.
- **Local anesthetic.** The doctor will use a local anesthetic to numb the site where the catheter will be inserted.
- **Inserting the catheter.** Your doctor will first insert a sheath (a short plastic sleeve) into a blood vessel. The catheter will be inserted through the sheath and advanced through the blood vessel to your heart.
- **Assessing the PFO or ASD.** When the catheter is in place, the doctor may inject a small amount of X-ray contrast dye through the catheter. You may feel hot or flushed for a few seconds at first. The contrast dye shows up on an X-ray monitor, to help the doctor see the hole and measure its size.

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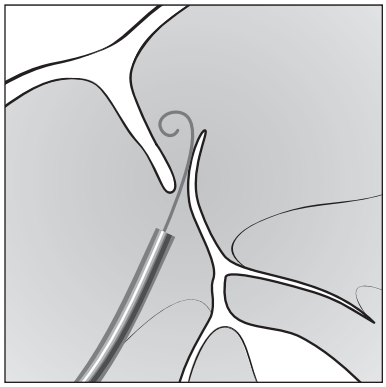

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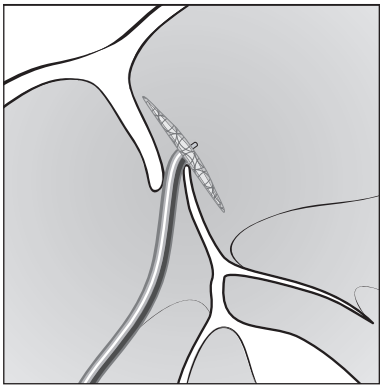

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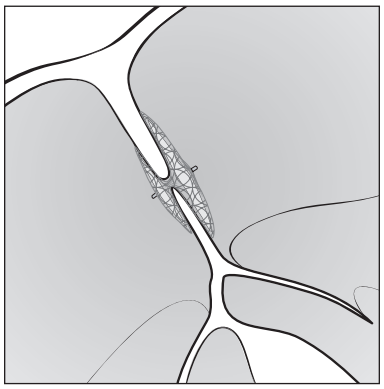

- **Placing a guidewire and catheter.** A small guidewire and/or catheter will be delivered through the hole, to guide your doctor in placing the closure device.
- **Inserting the closure device.** The doctor will attach a special closure device to the catheter, and thread it through the blood vessel to the heart. Two general types of closure devices can be used:
  - The first device is like two wire mesh discs that cover each side of the hole like a sandwich.
  - The second device works like a tiny double umbrella. When it's in place, the umbrella springs open and covers each side of the hole.

  (Your doctor may not decide which type of device to use until your ASD or PFO is assessed during the procedure.)
- **Closing the hole.** Once the catheter is correctly positioned in your heart, the device will be expanded to close the hole.
- **Removing the catheter.** The catheter will be removed from your heart, and the closure device will remain in place. Eventually your body will cover the device with its own tissue.
- **Ending the procedure.** The catheter will be removed from your body. The site where the catheter was inserted might be closed with a stitch or other closure device. A doctor or nurse will apply pressure to the site to prevent bleeding.

What happens after the procedure?

After the procedure, you'll move to a **recovery unit**.

- A nurse will check on you often to make sure the catheter insertion site is not bleeding. The nurse will also monitor your heart activity.
- You will need to lie flat for several hours to prevent bleeding.
- In case you have temporary numbness or weakness in your leg, special steps will be taken to make sure you're safe when you first get up. If you need to urinate and your leg is numb, it may not be safe to walk to the bathroom. You will use a urinal or bedpan instead.
- Some patients can go home at the end of the day, while other patients will need to stay overnight. Your doctor will decide when you are ready to leave the hospital. You'll need to have someone drive you home.

What happens when I go home?

- **The first 48 hours:** You'll need to take care of yourself and watch for symptoms.
  - **What you'll feel:** You might feel sore from several hours of lying flat — this will go away in a day or so. The catheter site will be bruised, but this should go away in a week or so. You might have a sore throat if a tube was placed down your throat to take ultrasound images of your heart.
  - **What to watch for:** Watch for swelling, bleeding, or signs of infection at the catheter site. If you notice these symptoms or have any chest discomfort, call the doctor or hospital. See "When should I call my doctor" on the last page.
  - **Taking care of yourself:** Avoid bending or squatting. Avoid intense activity such as climbing stairs, running, or lifting anything over 10 pounds. Take short walks of 5 to 10 minutes, several times a day. Use a stool softener if necessary to relieve constipation.

- **Care for the catheter site:** Avoid hot baths, hot tubs, or swimming pools for the first 5 days or until the wound is closed. Showers are okay after 24 hours, but don't let the spray hit the site. If the site is sealed with a special closure device, ask your doctor about the device and what you should watch for.
- **Returning to work:** When you go back to work depends on your physical condition and the nature of your job. Many people can go back to work within a week. Check with your doctor.

When should I call my doctor?

Call your doctor if you experience any of these:

- A fever over 101° F.
- Bruising at the catheter site that gets worse, rather than going away
- Redness, swelling or drainage at the catheter site that is severe or gets worse over time
- Bleeding or severe pain near the catheter site
- Coldness or numbness in your arm or leg

Call 911 if you have chest discomfort that lasts more than a few minutes or goes away and comes back, especially if you also have shortness of breath or discomfort in other areas of your upper body.

What should I do long-term?

Your doctor will give you specific information about what to do, but here are some tips:

- **Avoid dental work for 6 months.** Dental work — including having your teeth cleaned — creates a risk of bacterial infection in your heart. If you need emergency dental treatment, talk to your doctor and/or your dentist about taking preventive antibiotics beforehand.
- **Follow your medication plan.** You will probably need to take medication for several months after the procedure to prevent blood clots.
- **Keep follow-up appointments.** Your doctor will ask you to schedule follow-up appointments to check on the closure device as your body heals. Make sure you keep these.

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