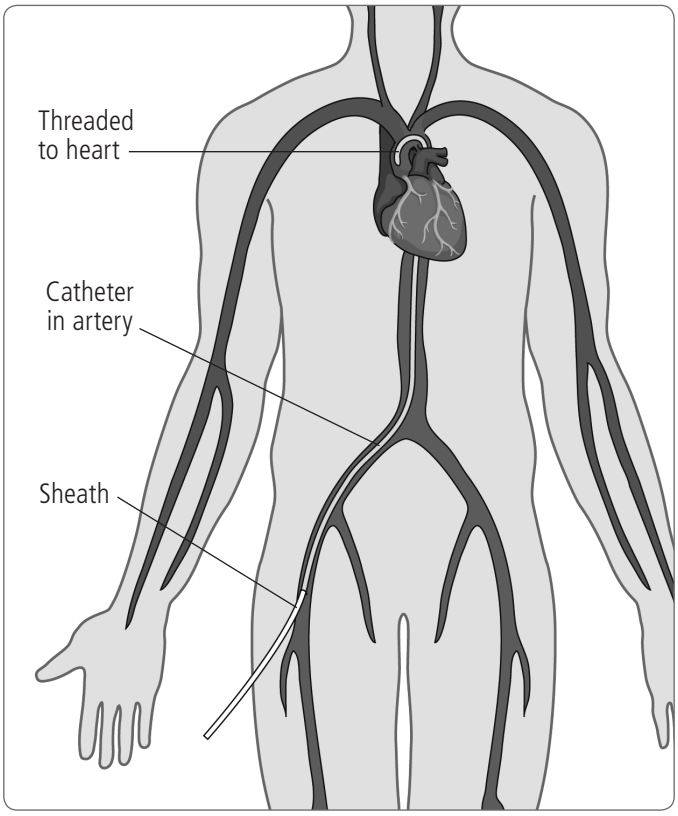
Intermountain® Healthcare

Coronary Angioplasty and Stent

What is it?

Angioplasty and stents are used to treat coronary artery disease (CAD) — a narrowing of the arteries that supply blood and oxygen to the heart. Arteries (blood vessels) can be blocked by **plaque**, a material containing fat, cholesterol, and other substances. In an angioplasty, your doctor compresses the plaque by inflating a tiny balloon at the end of a **catheter** (a long, flexible tube). This opens up the artery so that blood flows more freely. Your doctor might also insert a **stent**, a tube made of wire mesh. The stent will stay in the artery to hold it open.



Why do I need it?

When plaque builds up in the arteries that feed the heart, the heart can't get enough oxygen. This can cause shortness of breath or angina (chest discomfort), especially when you exercise. Other people don't have symptoms.

Eventually, the arteries can become completely blocked, which can cause a heart attack. If this happens, you might have angioplasty as an emergency procedure.

How do I prepare for the procedure?

These are things you can do to make your procedure go better:

- **Follow your doctor's directions about medications.**
  - You may be asked to stop taking certain blood thinners, such as Plavix (clopidogrel bisulfate) or Coumadin (warfarin), before the procedure. Always check with your doctor before stopping any medications.
  - If you take metformin (Glucophage), you'll need to stop taking it the day of the procedure and wait to restart it until at least 2 days after. (You'll need blood tests before starting it again.) Monitor your blood glucose during this time, and call your doctor if it's higher than 300 mg/dL.
- **Arrange for a ride.** Ask someone to drive you to and from the hospital.
- **Fast the night before.** If directed by your doctor or the cath lab, don't eat or drink anything after midnight the night before the procedure.
- **Tell your doctor if you are ill.** If you have a cold, flu, or other illness the day of the procedure, tell your doctor.
- **Bring a list of all your current medications.** Be sure to include everything, including over-the-counter medications, herbal supplements, and vitamins.
- **Tell your doctor about allergies.** Your doctor needs to know if you are allergic to any medications, iodine, or dyes.

What happens before the procedure?

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. and may draw blood for lab work.
- An IV (intravenous) line will be placed in your arm or hand to give you fluids. You'll be given medication through the IV to make you feel relaxed and drowsy.
- 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 if you want.

What happens during the procedure?

This procedure usually takes about an hour. You'll be relaxed but awake, because the doctor might ask you to breathe deeply or cough at certain points. Here is what will happen:

- **Monitoring.** You will have monitoring devices attached to you to check your heart rate and breathing.
- **Local anesthetic.** The doctor will inject numbing medication in the site where the catheter will be inserted. The site is usually in your groin, but is sometimes in your arm or wrist. The injection usually feels like a pinprick with some burning, and only lasts a few seconds.
- **Inserting the catheter.** Your doctor will first insert a **sheath** (a short plastic sleeve) into a blood vessel. You'll feel some pressure at first. The catheter will be put into the sheath and threaded through the blood vessel to your heart. You won't feel this.
- **Locating the problem.** The doctor will use x-ray guidance to pinpoint the blockage or narrowed section. (See the page at right for more details.)
- **Compressing the plaque.** Your doctor will insert a catheter with a balloon attached to the end. The balloon will compress the plaque against the artery walls. (See the next page.)
- **Inserting a stent.** Your doctor may also place a stent in the artery. The stent, a tiny tube of wire mesh, will hold the artery open. (See the next page.)
- **Removing the catheter.** The catheter will be slowly withdrawn first, and then the sheath will be removed. The insertion site may be closed with a stitch, plug, or pressure device.

What happens after the procedure?

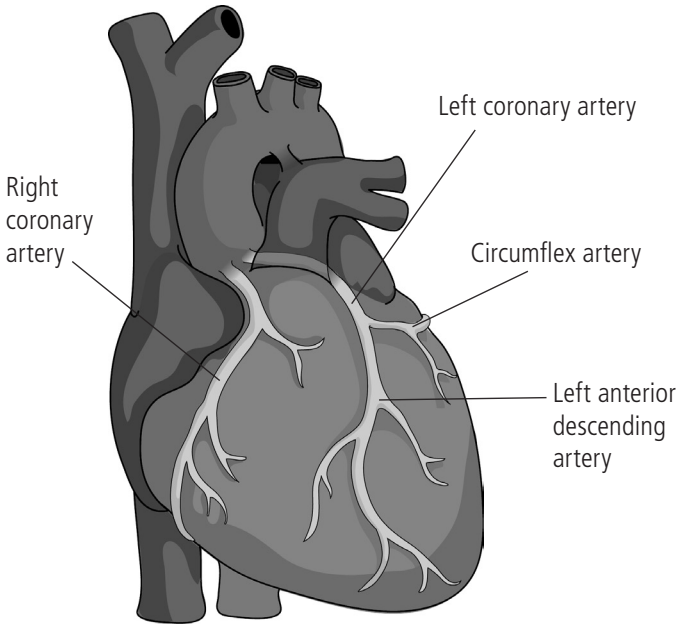
- You'll be moved to a recovery unit. Nurses will monitor your heart rhythm and blood pressure. You may need to lie flat for up to 4 to 8 hours.
- The insertion site may be held under pressure to prevent bleeding.
- In case you have temporary numbness or weakness in your leg, special steps will be taken to make sure you're safe when you 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.
- In the first few hours, you may want to drink plenty of fluids to flush the X-ray contrast dye out of your body.
- The puncture in your artery might be sealed with a closure device, such as a protein (collagen) plug or dressing. Ask your doctor about whether a device will be used, and how you should care for it.

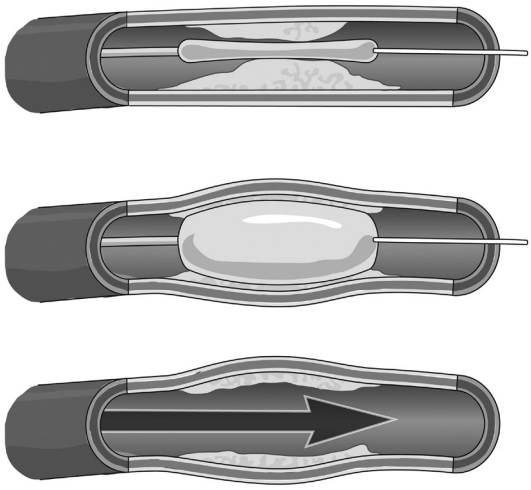
What happens next?

- **The first 24 hours:** You might return home the same day, or you might stay in the hospital overnight. If the catheter was inserted in your groin, try to keep that leg straight. Avoid sitting so the leg is bent at the groin.
- **The next 48 hours:** Avoid intense activity or exercise such as climbing stairs, running, biking, heavy lifting, or heavy housework. Take short walks (5 to 10 minutes) four or five times a day. Avoid bending or squatting. If you're constipated, use an over-the-counter stool softener.
- **Returning to work:** When you go back to work depends on your physical condition and the nature of your job. Check with your doctor.

Locating the problem

- The doctor will inject contrast dye through the catheter. For a few seconds, you'll feel a warm sensation.
- The contrast dye will appear on x-ray images.
- The doctor will use the x-ray guidance to move the catheter to the artery that needs treatment.





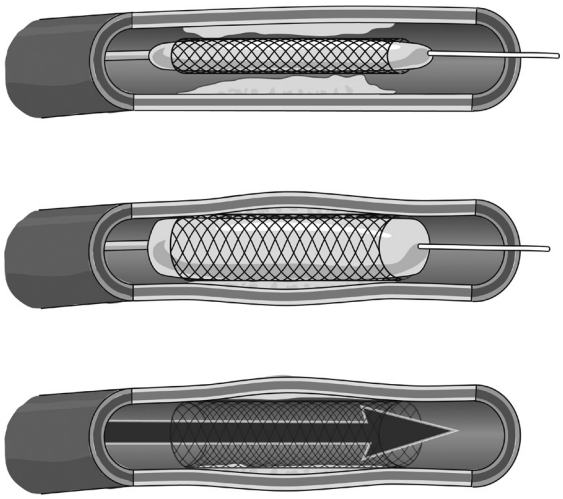
Compressing the plaque

- Your doctor will insert a balloon catheter.
- The balloon will be inflated and deflated several times. This compresses the plaque and stretches the artery open.
- The balloon will be removed, and blood will flow more freely through the artery.

Inserting a stent

Your doctor may place a stent in the artery.

- The stent will be attached to a catheter with a balloon.
- Once the catheter is in the correct place, the balloon will inflate to expand the stent.
- The balloon will deflate and the catheter will be removed.
- The stent will remain in place to hold the artery open.



How do I care for the puncture site?

- For the first few days, watch for swelling or bleeding. The site will probably be bruised, but this should go away within a week or so.
- 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 water spray hit the site.
- If the site was sealed with a closure device, you might feel a lump. Also, you might need to watch for specific problems or follow steps to take care of the site. Ask your doctor about how the site was closed and what you should do.

When to call the doctor

Contact your doctor if you experience any of these:

- The arm or leg where the catheter was inserted feels cold or numb.
- Bruising, redness, or swelling at the insertion site gets worse, rather than going away.
- There is bleeding or severe pain at the site.
- You have a fever over 100° F.
- You have chest pain or discomfort. If it is severe or it is not relieved by prescription medication for chest pain, **call 911.**

What should I do long-term?

Your doctor will give you specific information about what to do, but here are a couple of general tips:

- **Follow your medication plan.** You will probably need to take medication to avoid blood clots for at least 6 to 12 months after the procedure.
- **Reduce your risk factors.** Some risk factors for cardiovascular disease can be avoided by changing your activity level, adopting a heart-healthy diet, and treating high blood pressure or diabetes. See Intermountain's *Heart Care Handbook* for more information.

Talking with your doctor about benefits, risks, and alternatives

The table below lists the most common potential benefits, risks, and alternatives for this procedure. Other benefits and risks may apply in your unique medical situation. The conversation you have with your healthcare provider is the most important part of learning about these risks and benefits. Don't be afraid to ask questions. It's important to have all your questions answered before you agree to a recommended procedure.

Potential benefits	Potential risks and complications	Alternatives
• **Relief of symptoms,** such as chest discomfort or shortness of breath. • **Restoration of blood supply to the heart muscle.** This can prevent a heart attack or stop heart damage if you've had a heart attack. • **Faster recovery than with surgery.** The procedure doesn't require a major cut or general anesthesia. • **Lower risk and cost when compared to surgery.**	**General risks** include: • Leg numbness or weakness for a few hours after (rare) • Bleeding or infection where the catheter was inserted (rare) • Leaking of the contrast dye into tissues (rare and temporary) • Allergic reaction to the contrast dye (very rare) • Reduced kidney function (kidney failure in rare cases) — tell your doctor or the imaging technician if you have kidney disease or diabetes • Damage to the artery or heart muscle (extremely rare) • Heart attack or stroke (extremely rare, and not typically caused by the procedure itself) • Radiation exposure from the X-rays, which can slightly increase your lifetime cancer risk (for more information, see Intermountain's *Guide to Understanding Radiation*) • Unforeseen complications **Risks of angioplasty** include plaque quickly re-narrowing arteries (restenosis) — a stent may reduce this risk **Risks of stent placement** include blood clots in the stent — you'll need to take medication to prevent clots for at least 6 to 12 months afterward	• Medication • Healthy lifestyle changes • Surgery to bypass blocked arteries

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