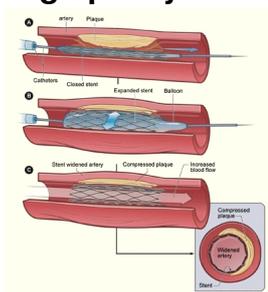


What is balloon angioplasty and stent placement?

Angioplasty and stenting are procedures used to treat PAD by opening narrowed or blocked arteries, restoring normal blood flow. These procedures are called *endovascular* ("inside the blood vessels") procedures because they are performed through a small cut in an artery, instead of a large incision as with surgical procedures.

During balloon angioplasty, a long, thin tube called a catheter is inserted into an artery (usually in the groin) and guided to the blocked artery. Once in place, a balloon is inflated, pushing the blockage against the artery wall and restoring blood flow. In some cases, a tiny wire mesh tube called a stent is left in place to prop the artery open.

Angioplasty and Stent Placement



- A.** Balloon carrying stent is moved into place in blocked artery.
- B.** Balloon is inflated, opening artery and expanding stent.
- C.** Balloon is removed, leaving stent in place to prop artery open.

Angioplasty and stenting can be used to treat artery blockages in many different parts of the body, including [PAD in the legs](#) , [kidney artery disease](#) , and [carotid artery disease](#) .

This section deals with angioplasty and stenting for PAD in the legs. To learn about how these procedures are used in women with carotid (neck) artery disease to prevent a stroke, see [Carotid Stenting](#)

. To learn about procedures to treat kidney artery disease, [click here](#)

See also: [Angioplasty & Stenting for Coronary Artery Disease](#)

Who might have an angioplasty and stenting procedure?

For many women, lifestyle changes, medications, and exercise therapy are enough to get PAD symptoms under control. However, women with PAD symptoms that have not responded to other treatments may need a procedure to open the blocked artery. You may benefit from angioplasty and stenting if you have PAD in the legs and:

- Your [PAD symptoms](#) are limiting your ability to work or perform daily tasks
- [Medication](#) and [exercise therapy](#) have failed to control your symptoms
- A narrowing or blockage in your leg arteries is limiting blood flow to your legs
- The location and size of the narrowing or blockage are suitable for treatment, with low risk and a high chance of success

Who should not have the procedure?

If your PAD is not yet causing symptoms, you should not have an angioplasty or stent procedure to prevent future problems.¹ For these women, the risks of the procedure outweigh the benefits.

Not all blockages, even if they are large, need to be treated. Some arteries can be blocked by 50% or more without significantly reducing overall blood flow to the legs, and a procedure to treat this kind of blockage is probably not worth the risk.¹

Even if you have severe PAD caused by blockages that can be treated, you may decide not to have the procedure if you have other conditions, such as chest pain (*angina*) or lung disease, that would prevent you from exercising even if your PAD symptoms improved.

What are the benefits of angioplasty and stenting in women with PAD?

In women with PAD that has not responded to other treatments, angioplasty and stenting can be very effective at opening blocked arteries, with 1-year success rates of around 80%.²⁻⁴ Women who undergo these procedures to treat leg pain symptoms benefit from increased blood flow to the legs (measured by

[ankle-brachial index](#)

),
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better walking ability, and less severe leg pain symptoms.

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However, the arteries may close up again in the future.

Is angioplasty with a stent better than balloon angioplasty alone?

For certain types of PAD, balloon angioplasty alone is effective at opening the arteries. In certain situations, doctors will also implant a small wire mesh tube called a stent to prevent re-narrowing after the artery has been opened with a balloon. In deciding whether a stent is needed, doctors will consider the location and size of your artery narrowing or blockages, and how likely they are to re-narrow in the future.

If you have PAD in your thigh arteries or further down in your legs, balloon angioplasty alone is often enough to restore blood flow and relieve your PAD symptoms. In most cases, stents will only be used to treat these arteries if angioplasty failed to open the artery completely, or if the arteries have re-narrowed after an earlier treatment.

If you have blockages in the *iliac arteries*, large arteries in the lower abdomen that carry blood to each leg, you will probably have a stent implanted after angioplasty is performed (during the same procedure).

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Should I have angioplasty and stenting or surgery to treat PAD?

The main alternative to angioplasty and stenting for PAD in the legs is [peripheral artery bypass surgery](#). In this surgical procedure, a healthy vessel from elsewhere in the body is removed and re-attached to direct blood flow around the blockage. Bypass surgery was once the standard procedure to treat PAD, but today angioplasty is much more common.

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Before you have a procedure, tests such as [ultrasound](#), [MR angiography](#), [CT angiography](#), or a [contrast angiogram](#)

will be performed to examine your artery blockages and decide on the best treatment. For most women, endovascular treatments are the first choice because they are as effective as surgery for many blockages, with fewer risks and a shorter recovery time.

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Some blockages are too long or in a difficult location to treat with endovascular techniques, in which case bypass surgery may be your best option. Surgery may also be required if you already had angioplasty or a stent procedure that failed to restore blood flow and improve your PAD symptoms. Peripheral artery bypass surgery may be necessary if you have severe PAD that is causing tissue in your legs to die (*critical limb ischemia*), risking amputation if blood flow is not restored.

How do I prepare for the procedure?

Be sure your doctor knows about all medications you are taking, including prescription medication, over-the-counter drugs, and any dietary or herbal supplements. Some medications, such as the anti-clotting drug [warfarin](#) (Coumadin), can increase your risk of bleeding, and you may be instructed to stop taking it for a few days before the procedure.

Women with diabetes should discuss with their doctor how to maintain blood sugar control

before and after the procedure. In addition, some diabetes medications can interact with the dye used to view the arteries during the procedure, so you may be instructed to stop taking your medications until the dye is cleared from your system in a day or two.

To prevent clots from forming during and after the procedure, you may need to take blood-thinning medication, such as [aspirin](#) and [clopidogrel](#), in the days leading up to the procedure.

You should not eat or drink anything after midnight the night before your procedure. Tell the nurse or doctor if you have ever had an allergic reaction to the dye used during a contrast angiogram, or if you are allergic to shellfish, iodine, or strawberries (the dye may contain similar compounds).

What happens during the procedure?

The day of the procedure you will be taken to a special operating room called the catheterization lab. The nurse will insert an intravenous (IV) line into your arm so that drugs to prevent blood clots and other medication can be given. Small sticky patches attached to wires will be taped to your body to monitor your heart rhythm using an ECG, and your blood pressure and oxygen levels will be monitored.

You will be awake during the procedure, but you may be given a mild sedative to help you relax. The area where the catheter is inserted (usually in your groin, but sometimes in your arm) will be cleaned, shaved, disinfected, and numbed with a local anesthetic.

A small puncture (that you will not feel) will be made in the artery, and a long, thin tube called a catheter will be inserted and guided through your arteries to the location of the blockage. An X-ray dye will be injected as part of a [contrast angiogram](#) to view the narrowed artery. There may be mild discomfort as the catheter moves through your arteries, but let the nurse or doctor know if you feel any pain.

Once the catheter is in place, a balloon is used to open the artery, and a stent may be left in

place to prop the artery open. Another angiogram will be performed to make sure blood is flowing smoothly, and then the catheter will be removed and the incision will be sewn closed.

The angioplasty procedure can last anywhere from 1 to 3 hours, depending on how severe your blockages are and how many different areas need to be treated.

What happens after the procedure?

After the procedure is finished, you will be transferred to a recovery room. You may feel groggy if you have received any sedation, and the catheter insertion site may be bruised and sore. If the groin was used as the point of catheter insertion, you will be instructed to lie in bed with your legs out straight.

As you recover in the hospital, the place where the catheter was inserted will be checked for bleeding, swelling, or inflammation and your vital signs will be continuously monitored. You should drink plenty of fluids to flush out the dye used in the procedure.

Some women can go home the same day as the procedure, but you may be asked to stay overnight for observation. Most patients can safely walk around within 6 hours after the procedure, and return to normal activities within a week. You should avoid strenuous physical activity or heavy lifting for the first few days. Your doctor or nurse may give you other special instructions.

If you had a stent implanted, you will need to take the blood-thinning drug [clopidogrel](#) for at least 30 days to prevent clots, and you may need to take daily aspirin for the rest of your life. In about a month, you may need to return for tests (such as an [ankle-brachial index](#)) to make sure the procedure was successful.

What are the risks of the procedure?

Angioplasty and stenting for PAD are relatively safe, but as with any procedure, there are risks. Serious complications occur in about 1 in 25 patients, and may include [heart attack](#), [stroke](#), or kidney damage.

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The risk of dying during the procedure is less than 1%.

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The most common complications are requiring an additional procedure immediately (7.6% of patients) and excessive bleeding related to the blood-thinning drugs you were given (less than 5% of patients).⁹ Other rare complications include blood vessel damage and infections at the catheter insertion site.

Contact your doctor immediately if you have swelling, pain, or bleeding at the insertion site, or if you develop a fever, dizziness or faintness, or feel chest pain or shortness of breath.

References

1. Hirsch AT, Haskal ZJ, Hertzler NR, et al. ACC/AHA 2005 Practice Guidelines for the management of patients with peripheral arterial disease (lower extremity, renal, mesenteric, and abdominal aortic): a collaborative report from the American Association for Vascular Surgery/Society for Vascular Surgery, Society for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology, Society of Interventional Radiology, and the ACC/AHA Task Force on Practice Guidelines (Writing Committee to Develop Guidelines for the Management of Patients With Peripheral Arterial Disease): endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation; National Heart, Lung, and Blood Institute; Society for Vascular Nursing; TransAtlantic Inter-Society Consensus; and Vascular Disease Foundation. *Circulation*. Mar 21 2006;113(11):e463-654.
2. Kalbaugh CA, Taylor SM, Blackhurst DW, Dellinger MB, Trent EA, Youkey JR. One-year prospective quality-of-life outcomes in patients treated with angioplasty for symptomatic peripheral arterial disease. *J Vasc Surg*. Aug 2006;44(2):296-302; discussion 302-293.
3. Trocciola SM, Chaer R, Dayal R, et al. Comparison of results in endovascular interventions for infrainguinal lesions: claudication versus critical limb ischemia. *Am Surg*. Jun 2005;71(6):474-479; discussion 479-480.
4. DeRubertis BG, Faries PL, McKinsey JF, et al. Shifting paradigms in the treatment of lower extremity vascular disease: a report of 1000 percutaneous interventions. *Ann Surg*. Sep 2007;246(3):415-422; discussion 422-414.
5. Feiring AJ, Wesolowski AA, Lade S. Primary stent-supported angioplasty for treatment of

below-knee critical limb ischemia and severe claudication: early and one-year outcomes.

J Am Coll Cardiol

. Dec 21 2004;44(12):2307-2314.

6. Feinglass J, McCarthy WJ, Slavensky R, Manheim LM, Martin GJ. Functional status and walking ability after lower extremity bypass grafting or angioplasty for intermittent claudication: results from a prospective outcomes study. *J Vasc Surg*. Jan 2000;31(1 Pt 1):93-103.

7. Goodney PP, Beck AW, Nagle J, Welch HG, Zwolak RM. National trends in lower extremity bypass surgery, endovascular interventions, and major amputations. *J Vasc Surg*. Jul 2009;50(1):54-60.

8. Axisa B, Fishwick G, Bolia A, et al. Complications following peripheral angioplasty. *Ann R Coll Surg Engl*

. Jan 2002;84(1):39-42.

9. Shammass NW, Lemke JH, Dippel EJ, et al. In-hospital complications of peripheral vascular interventions using unfractionated heparin as the primary anticoagulant. *J Invasive Cardiol*

. May 2003;15(5):242-246.

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