

What are angioplasty and stenting?

Angioplasty and stenting are procedures used to open narrowed or blocked kidney arteries, restoring blood flow to the kidneys. 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 it is in place, a balloon is inflated, pushing the blockage back 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.

In addition to [kidney artery disease](#), angioplasty and stenting can be used to treat artery disease in many other parts of the body, including [PAD in the legs](#),
,
[carotid artery disease](#),
, and
[coronary artery disease](#).

Who might benefit from angioplasty and stenting to treat kidney artery disease?

For many women, lifestyle changes and medications may be enough to prevent kidney artery disease from getting worse. However, if your kidney artery disease is causing damage to the kidneys or other organs, or has not responded to medication, you may benefit from a procedure to open the blocked artery. You should consider angioplasty and stenting if:¹

- You have kidney artery disease that is causing chronic kidney disease, damage to other organs (such as [heart failure](#)), or buildup of fluid in the lungs (*pulmonary edema*)
- You have kidney artery disease that is causing [high blood pressure](#) that has not responded to [high blood pressure medication](#)

The use of angioplasty and stenting for women who have kidney artery disease that is not causing other problems is controversial. It is not clear if these procedures are any better than medication alone at lowering blood pressure and preventing kidney damage. Despite the lack of clear evidence, you and your doctor may want to consider an angioplasty and stent procedure if:

- Both kidney arteries (or one, if it is your only working kidney) are blocked by 50% or more and reducing blood flow to the kidneys
- Both kidney arteries (or one, if it is your only working kidney) are blocked by 70% or more

Is angioplasty better than medication to treat kidney artery disease?

Both medication and angioplasty and stent procedures can lower blood pressure in women with kidney artery disease. However, for women with kidney artery disease that is not causing other problems, it is not clear which treatment is best at lowering blood pressure and preventing kidney damage.¹

Studies so far have found no long-term differences in blood pressure or kidney function in patients who have angioplasty and stenting compared with those who only take medication.² Patients often need to take fewer blood pressure medications after a procedure, and about one in ten are able to stop medication altogether.^{3,4} However, this benefit is offset by the risks of the procedure, which can cause complications such as death or worsening kidney disease (see [What are the risks?](#)).

For now, the decision about whether to treat your kidney artery disease with medication or a procedure must be made on an individual basis after you and your doctor discuss the risks and benefits of each treatment.¹ A large clinical trial is currently underway to find out which patients benefit from angioplasty and stenting compared with medication alone.

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How do doctors decide which procedure is right for me?

If you need to have a procedure to open the blocked vessel, the main choices are balloon angioplasty alone, and angioplasty combined with stent placement, in which a tiny wire-mesh tube is left in place to prop the artery open.

Which procedure is best for you depends on what caused your kidney artery disease. For 9 out of 10 women, kidney artery disease is caused by [atherosclerosis](#) —the gradual buildup of fatty deposits on the walls of the arteries that occurs over a lifetime.

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In these women, the arteries are very likely to re-narrow after they are opened with a balloon, so a stent is usually left in place to prop the artery open and preserve long-term blood flow to the kidneys.

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If your kidney artery disease is causing kidney damage, a stent procedure may improve your kidney function and stop your kidneys from shrinking.

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For about 1 in 10 women, kidney artery disease is caused by *fibromuscular dysplasia* (FMD), a genetic disease that makes cells in the artery walls grow abnormally.

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This type of kidney artery disease has a characteristic appearance on imaging tests, with the arteries looking like a "string of beads." Because the arteries are unlikely to re-narrow over time, women with FMD usually do well with balloon angioplasty alone, and do not need a stent to hold the arteries open.

What are the risks of the procedure?

As with all medical procedures, angioplasty and stent procedures do carry some risks. Between 1% and 2% of patients die within 30 days of the procedure, often from blood clots that broke loose and caused a heart attack or stroke.³ However, we do not know how this compares to patients who only take medication.

Other possible complications include bruising, bleeding, and infection of the incision where the catheter was inserted. The catheter can also damage the arteries, and rarely the procedure can make your kidney function worse. The arteries re-narrow after the procedure in about 1 in 7 patients, requiring additional treatment to restore blood flow.³

How is the procedure performed?

During angioplasty and stenting, an incision is made in the groin and a long, thin tube called a catheter is guided up through your arteries to the kidney artery. Balloon angioplasty uses a tiny balloon on the end of the catheter to push the artery blockage back against the walls and restore blood flow. In women with FMD, this also smoothes out the "string of beads" pattern of the artery walls, providing a straighter path for blood to flow to the kidneys.

If you are having a stent procedure, after the artery is opened with the balloon a tiny wire mesh tube called a stent will be expanded and pressed against the walls of the artery to prop them open.

Angioplasty and stent procedures are performed in the same way whether they are used to treat kidney artery disease or artery disease in other parts of the body. [Click here](#) to learn more about what happens before, during, and after the procedure.

Are there any alternatives to angioplasty and stenting for kidney artery disease?

For most women, angioplasty (with or without stent placement) can successfully open blocked kidney arteries, restoring blood flow and preventing damage to the kidneys and other organs. However, not all kidney artery disease can be treated with angioplasty and stents. For some women, surgery to restore blood flow to the kidneys may be the only option.

You may need surgery to treat kidney artery disease if:

- You have had an angioplasty or stent procedure that failed to open the artery
 - Your kidney arteries are bent or abnormally shaped
 - A kidney artery is completely blocked, and [clot-busting drugs](#) were not able to open it
 - You are planning to have [aneurysm repair surgery](#) to treat an [aortic aneurysm](#) – your kidney arteries can be repaired during the same procedure
- The wall of one of your kidney arteries is bulging out (*renal artery aneurysm*) or the artery has split open

The most common types of surgery used to treat kidney artery disease are:

- **Renal artery bypass surgery** - a procedure to treat narrowed or blocked kidney arteries that uses a blood vessel from another part of your body to re-route blood flow around the blockage
- **Vascular reconstruction surgery** – a procedure to treat renal artery aneurysms or abnormally shaped kidney arteries. The kidney arteries are cut open and reinforced or sewn back together in a different shape.

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