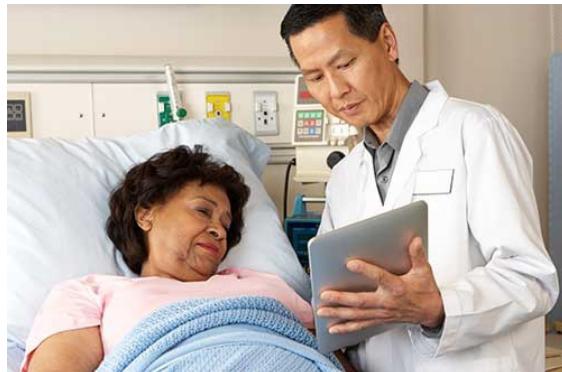


Renal Artery Stenosis

Renal artery stenosis is a narrowing of one or more arteries that carry blood to your kidneys. Left untreated, it can lead to high blood pressure and kidney damage.

Your doctor may use ultrasound, CT angiography (CTA), magnetic resonance angiography (MRA), or catheter angiography to evaluate the narrowing. Treatment often focuses on lifestyle changes like regular exercise and improvements in diet. In more severe cases, treatment to improve or restore blood flow may include procedures to open the narrowing using balloons and stents.



What is renal artery stenosis?

Renal artery stenosis is narrowing of one or more arteries that carry blood to your kidneys.

The narrowing usually results from atherosclerosis (<http://www.radiologyinfo.org>). Reduced blood flow to your kidneys may injure kidney tissue. Renal artery stenosis can increase blood pressure throughout your body. This is called renovascular hypertension (RVH).

Risk factors for renal artery stenosis include:

- age
- smoking and other tobacco use
- high blood pressure
- high cholesterol
- diabetes
- obesity
- inactive lifestyle.

Renal artery stenosis often does not cause any signs or symptoms. When there are signs, they often involve high blood pressure that begins suddenly or worsens without explanation. High blood pressure that begins before age 30 or after age 50 is another common sign.

Doctors may discover the condition during testing for something else.

The most common cause of renal artery stenosis is atherosclerosis. As these plaque deposits get larger, they can narrow the artery.

A less common cause is fibromuscular dysplasia. This condition happens when the muscle in the artery wall doesn't grow as it should. It often begins in childhood and can lead to high blood pressure at a young age. The cause is unknown.

In rare cases, renal artery stenosis results from other conditions such as inflammation of the blood vessels. It can also develop due to a growth in the abdomen that presses on the renal arteries.

Possible complications of renal artery stenosis include:

- kidney failure
- fluid retention in your legs that causes swollen ankles or feet
- shortness of breath due to a sudden buildup of fluid in the lungs.

How is renal artery stenosis diagnosed and evaluated?

Renal artery stenosis sometimes causes an abnormal sound, or bruit, in the artery. Your doctor can hear this sound with a stethoscope placed on the front or the side of the abdomen. Renal artery stenosis may still be present even in the absence of this sound.

In some cases, doctors will find renal artery stenosis during a test for another reason. For example, the doctor may detect renal stenosis during cardiac screening (<https://www.radiologyinfo.org/en/info/screening-cardiac>).

The following imaging tests are used to diagnose renal artery stenosis:

Catheter angiography (<https://www.radiologyinfo.org/en/info/angiocath>) : This procedure uses a catheter, x-ray imaging guidance and an injection of contrast material to check the renal arteries for narrowing. The use of a catheter makes it possible to combine diagnosis and treatment in a single procedure.

Abdominal ultrasound (<https://www.radiologyinfo.org/en/info/abdominus>) : Ultrasound imaging of the abdomen uses sound waves to produce pictures of the structures within the upper abdomen. Ultrasound is safe, noninvasive and does not use ionizing radiation.

Your doctor will use a method called duplex ultrasound to assess renal artery stenosis. This combines traditional and Doppler ultrasound (<http://www.radiologyinfo.org>) to measure the speed of blood flow. It allows the doctor to estimate the diameter of a blood vessel and the degree of blockage.

CT angiography (CTA) (<https://www.radiologyinfo.org/en/info/angiocat>) : CTA uses an injection of contrast material into your blood vessels and CT scanning to evaluate the renal arteries.

Magnetic resonance angiography (MRA) (<https://www.radiologyinfo.org/en/info/angiomr>) : MRA uses a powerful magnetic field, radio waves and a computer to evaluate blood vessels and identify abnormalities. This exam does not use radiation. It may require an injection of contrast material. The contrast material in MRA is less likely to cause an allergic reaction than the contrast material in CTA.

In most cases, an MRI exam is safe for patients with metal implants. There are some exceptions, however. See the MRI Safety page (<https://www.radiologyinfo.org/en/info/safety-mr>) for more details.

How is renal artery stenosis treated?

Renal artery stenosis that has not led to RVH or caused a significant blockage of the artery may not need treatment.

If blockage is mild to moderate, your doctor may recommend lifestyle modifications, including:

- quitting smoking
- losing weight
- exercising regularly
- dietary changes to include healthy foods and reduced salt intake.

Your doctor may prescribe medications to control blood pressure or lower cholesterol.

If the blockage is severe, your doctor may recommend a procedure to treat the narrowing. These options include:

- **Angioplasty and stenting** (<https://www.radiologyinfo.org/en/info/angioplasty>) : Angioplasty uses a balloon-tipped catheter to open a blocked blood vessel and improve blood flow. The doctor may place a metal mesh tube called a stent inside the blood vessel to help keep it open. This is the most common procedure if treatment is indicated.
- **Endarterectomy:** In this procedure, the surgeon removes the plaque directly from the artery. This procedure is less common.
- **Bypass surgery:** To create a bypass, the surgeon grafts a vein or synthetic tube from the kidney to the aorta. This enables to flow around the blocked renal artery into the kidney. This procedure is less common.

Disclaimer

This information is copied from the RadiologyInfo Web site (<http://www.radiologyinfo.org>) which is dedicated to providing the highest quality information. To ensure that, each section is reviewed by a physician with expertise in the area presented. All information contained in the Web site is further reviewed by an ACR (American College of Radiology) - RSNA (Radiological Society of North America) committee, comprising physicians with expertise in several radiologic areas.

However, it is not possible to assure that this Web site contains complete, up-to-date information on any particular subject. Therefore, ACR and RSNA make no representations or warranties about the suitability of this information for use for any particular purpose. All information is provided "as is" without express or implied warranty.

Please visit the RadiologyInfo Web site at <http://www.radiologyinfo.org> to view or download the latest information.

Note: Images may be shown for illustrative purposes. Do not attempt to draw conclusions or make diagnoses by comparing these images to other medical images, particularly your own. Only qualified physicians should interpret images; the radiologist is the physician expert trained in medical imaging.

Copyright

This material is copyrighted by either the Radiological Society of North America (RSNA), 820 Jorie Boulevard, Oak Brook, IL 60523-2251 or the American College of Radiology (ACR), 1891 Preston White Drive, Reston, VA 20191-4397. Commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is prohibited.

Copyright ® 2026 Radiological Society of North America, Inc.