TEST

Renal arteriography

Renal arteriography uses contrast dye and X-rays to examine arteries supplying the kidneys.

WHAT IT MEASURES
Blood flow and narrowing in the kidney arteries

SAMPLE
None; X-ray imaging with artery-injected contrast dye

FASTING NEEDED?
Sometimes, before sedation as instructed by the imaging team

HOW LONG IT TAKES
About one to three hours, plus recovery if needed

RESULTS IN
Same day; final report timing varies by imaging service

USED FOR
Diagnosing artery problems and planning or guiding treatment

MAIN LIMITATION
Motion, vessel overlap, or poor contrast timing can obscure narrowing

Overview

Renal arteriography is an imaging test that shows the arteries carrying blood to your kidneys. It uses X-rays and an iodine-containing contrast dye, which makes the arteries visible on the images.

A clinician called an interventional radiologist usually performs the test. A thin, flexible tube called a catheter is placed into an artery, most often through the groin or wrist. The catheter is guided toward the kidney arteries before contrast dye is injected.

This is an invasive test because the catheter enters an artery. Ultrasound, CT angiography, or MR angiography may be used first because they do not require an arterial catheter. Renal arteriography is often chosen when other imaging is unclear, detailed artery images are needed, or treatment may be performed during the same procedure.

Why the test is ordered

Renal arteriography may be used to investigate a suspected problem with one or more kidney arteries. Reasons include:

Angioplasty widens a narrowed artery using a small balloon. Embolization blocks a selected blood vessel to control bleeding or treat an abnormal vessel. These procedures are not automatically part of every renal arteriography appointment. Your consent discussion should explain whether treatment might be performed.

The test does not directly measure how well your kidneys filter blood. Blood tests and urine tests are used for that purpose.

- Narrowing or blockage of a kidney artery
- An aneurysm, which is a weakened, widened area of an artery
- An abnormal connection between an artery and vein
- Bleeding after trauma, surgery, biopsy, or another procedure
- Blood vessel problems affecting a transplanted kidney
- Planning or guiding treatment such as angioplasty, stenting, or embolization

Who should have the test

Renal arteriography is not a routine screening test for people without a specific concern. It may be appropriate when symptoms, blood pressure patterns, kidney test results, or earlier scans suggest a kidney artery problem that could affect care.

It may also be used when a procedure is being considered to open or close a blood vessel. The expected benefit is weighed against the risks of arterial catheterization, contrast dye, and radiation.

Tell the imaging team if you are pregnant or could be pregnant. The test may still be performed when medically necessary, but the team will consider whether another test could provide the needed information without ionizing radiation.

How to prepare

Follow the instructions from your imaging department. Preparation can differ according to whether sedation is planned and whether treatment might be performed.

You may be asked not to eat for several hours. Instructions about clear fluids are not the same at every centre, so use the specific times provided to you. Do not assume that fasting means

you should avoid all water.

Tell the team about:

Do not stop a medicine unless the clinician arranging the test tells you to. Decisions about blood thinners and metformin depend on the procedure, kidney function, and local policy.

Blood tests may be arranged to check kidney function, blood cell counts, and clotting. If sedation is planned, arrange transport home and follow the instructions about driving, work, and staying with another adult afterward.

- Previous reactions to X-ray contrast dye
- Kidney disease, diabetes, asthma, or bleeding problems
- Pregnancy or possible pregnancy
- All prescribed medicines, non-prescription medicines, and supplements
- Blood thinners like warfarin or apixaban , antiplatelet medicines, or metformin
- Recent illness, dehydration, surgery, or contrast imaging

What happens during the test

You will change into a gown and lie on an X-ray table. An intravenous line may be placed in your arm for fluids or sedation. Monitoring equipment checks your heart rate, blood pressure, and oxygen level.

The skin over the access site is cleaned and covered with sterile drapes. Local anaesthetic numbs the area. You may feel brief stinging from the injection, followed by pressure as the catheter is inserted. Many people remain awake, although medicine may help them relax.

Using moving X-ray images, the interventional radiologist guides the catheter to the kidney arteries. Contrast dye is injected while images are taken. You may notice warmth, flushing, or a metallic taste for a short time. You may be asked to hold your breath or remain very still.

If a planned treatment is needed and you have consented, it may be performed through the same catheter. Afterward, the catheter is removed. Pressure or a closure device is used to seal the artery.

You will be monitored for bleeding and other immediate problems. If the groin was used, you may need to keep your leg straight for a period. Recovery takes longer when sedation or treatment is involved.

Understanding your results

The images show whether contrast flows through each kidney artery and its branches. A report may describe:

There is no single universal numerical reference range for this test. An artery can look narrowed without that narrowing meaningfully reducing blood flow. Sometimes pressure measurements across the narrowed area or results from other tests help determine its importance.

Interpretation depends on your anatomy, age, sex, pregnancy status, kidney function, medicines, previous procedures, and the reason for testing. Any accompanying blood-test ranges also vary by laboratory and clinical context.

- Normal, narrowed, or blocked arteries
- The location and appearance of a narrowing
- An aneurysm or abnormal artery-to-vein connection
- Active bleeding or an injured blood vessel
- Blood flow before and after treatment

What affects the results

Movement or breathing can blur the images. Overlapping arteries may hide a short narrowing unless images are taken from another angle.

The timing and position of the contrast injection matter. If the catheter is not ideally positioned or the artery does not fill fully, part of a vessel may be difficult to assess.

Temporary artery spasm caused by the catheter can look like true narrowing. Blood pressure and medicines that tighten or relax blood vessels can also change artery size during the procedure.

Previous stents, surgery, or unusual vessel anatomy may make images harder to interpret. Very small artery branches may not be shown clearly.

Kidney function does not usually change the appearance of a narrowed artery, but it affects the safety planning for contrast dye. Dehydration, recent contrast exposure, and medicines that influence kidney function are therefore important even when the images themselves are technically clear.

Accuracy and limitations

Renal arteriography provides highly detailed images of the inside channel of the kidney arteries. It can identify narrowing that is unclear on ultrasound, CT, or MRI, and it allows treatment during the same session.

However, it can miss a problem if motion, vessel overlap, incomplete contrast filling, or limited viewing angles hide the affected area. Disease in very small branches may also be difficult to see.

The test can suggest narrowing when there is no fixed blockage. Catheter-related spasm and certain viewing angles can make an artery appear tighter than it is. Repeating an image, changing the angle, or giving medicine to relax a spasm may clarify the finding.

Arteriography mainly shows the space through which blood flows. It does not fully show the artery wall, explain every cause of high blood pressure, or prove that opening a narrowing will improve kidney function. Ultrasound can assess blood-flow speed, while CT or MR angiography can show surrounding structures and may be better when a catheter procedure is not needed.

Risks and complications

Bruising, tenderness, and a small amount of bleeding at the catheter site are common short-term effects. Some people feel faint during needle or catheter procedures.

Less common complications include a larger collection of blood under the skin, damage or blockage of an artery, infection, or reduced blood flow to the arm or leg used for access. A closure device can also fail to seal the artery completely.

Iodinated contrast can cause an allergic-like reaction. Most reactions are mild, but serious reactions can occur. Contrast may also contribute to a decline in kidney function, particularly when kidney function is already reduced or other risk factors are present.

The procedure uses ionizing radiation. The team limits exposure while obtaining the images needed. Sedation has separate risks, including slowed breathing, and requires monitoring.

After discharge, contact the procedure team promptly for increasing bruising, persistent pain, redness, drainage, or a new lump at the access site.

Seek emergency help for uncontrolled bleeding, rapidly increasing swelling, fainting, severe breathing difficulty, or swelling of the face or throat. A cold, pale, numb, weak, or severely painful arm or leg below the access site also needs emergency assessment.

What happens next

The interventional radiologist may discuss an initial finding soon after the procedure. A final report is sent to the clinician who arranged the test. If treatment was performed, you should receive separate instructions about medicines, activity, wound care, and follow-up.

Routine recovery advice commonly includes protecting the access site, avoiding strenuous activity for the period specified by the team, and drinking fluids if this is safe for you. Follow the personalised instructions you receive, especially if you have heart failure, reduced kidney function, or fluid restrictions.

Follow-up may include blood pressure checks, kidney blood tests, or another imaging test. These are routine unless the team identifies a concern needing earlier assessment.

Common questions

Can I drink coffee before renal arteriography?

Not unless your preparation instructions allow it. Coffee may count as a non-clear fluid, especially with milk or cream, and fasting rules differ when sedation is planned.

Does the time of day matter?

The images are not normally affected by morning or afternoon timing. Appointment time matters mainly for fasting, medicine schedules, recovery, and transport home.

Can I exercise beforehand?

Light normal activity is unlikely to affect the images. Avoid strenuous exercise if your team has told you to rest, or if exercise worsens the condition being investigated.

Will I be awake?

Many people are awake with local anaesthetic and light sedation. Deeper sedation or general anaesthesia is less common and is based on the planned procedure and your needs.

Does it hurt?

The numbing injection may sting. You may then feel pressure at the catheter site and brief warmth when contrast is injected, but you should tell the team about significant pain.

Can I drive home afterward?

Do not drive if you received sedation. Even without sedation, the access site and procedure plan may make driving unsafe, so arrange transport according to your discharge instructions.

Sources

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