TEST

Venogram

A venogram uses contrast dye and imaging to show blood flow through veins.

WHAT IT MEASURES
Blood flow, narrowing, and blockages in veins

SAMPLE
None

FASTING NEEDED?
Sometimes, if sedation or an intervention is planned

HOW LONG IT TAKES
Usually 30 to 90 minutes

RESULTS IN
Same day to several days; varies by laboratory or imaging service

USED FOR
Diagnosis and treatment planning

MAIN LIMITATION
Contrast filling and technique can hide or mimic blockages

Overview

A venogram is an imaging test that shows veins and how blood moves through them. It may be used to look for a blood clot, narrowing, blockage, abnormal vein, or pressure from a nearby structure.

In a conventional venogram, a healthcare professional injects contrast dye into a vein. X-rays taken in real time, called fluoroscopy, follow the dye as it travels. The contrast makes veins visible because veins do not usually show clearly on standard X-rays.

The word "venogram" may also describe CT venography or MR venography. CT uses X-rays and computer processing. MR uses a strong magnetic field and radio waves. The preparation, risks, and type of contrast differ between these tests.

Ultrasound is usually the first imaging test for a possible clot in an arm or leg. A venogram may provide more detail when ultrasound cannot clearly show the relevant veins, particularly in the pelvis, abdomen, or chest.

Why the test is ordered

A venogram may be ordered to investigate:

Conventional venography may be performed immediately before treatment. For example, the same catheter may sometimes be used to open a narrowed vein, remove or treat a clot, or place a stent. These procedures require separate discussion and consent.

- A possible clot in a deep vein
- Persistent swelling, pain, or skin changes linked to poor venous flow
- A narrowed or completely blocked vein
- Compression of a vein by another structure
- Abnormal connections or patterns of veins
- Problems with a dialysis access, venous stent, or central line
- Vein anatomy before surgery or another procedure

Who should have the test

A venogram is considered when detailed pictures of the veins could change your diagnosis or treatment. It is not a routine screening test for people without symptoms or a specific clinical reason.

The most appropriate type depends on which veins need to be examined. Duplex ultrasound is often suitable for veins in the legs or arms. CT or MR venography may be more useful for deeper veins that ultrasound cannot reach. Catheter venography may be chosen when another scan is unclear or when treatment might be performed at the same appointment.

Tell the imaging team if you are or could be pregnant. Also tell them about kidney disease, previous reactions to contrast, bleeding problems, implanted devices, and medicines that affect blood clotting. These details help the team choose the safest method.

How to prepare

Follow the instructions from your imaging department because preparation differs by venogram type. You may be asked not to eat for several hours if you will receive sedation or if a procedure may follow the imaging. Clear fluids may still be allowed, but confirm this with the department.

You may need a blood test to check kidney function before receiving iodinated contrast for

X-ray or CT venography. Kidney function helps determine how safely your body can clear the contrast and whether precautions or another test are appropriate.

Give the team an up-to-date list of your medicines. Do not stop anticoagulants like warfarin or apixaban , diabetes medicines, or any other prescribed treatment unless the team responsible for the procedure tells you to.

Wear loose clothing and leave jewellery at home. Arrange transport if you expect sedation, since you should not drive afterward.

What happens during the test

For a conventional limb venogram, you lie on an X-ray table. A small intravenous line is placed, often in a vein in the foot, ankle, hand, or arm. The area is cleaned first.

Contrast is injected while X-ray images are taken. You may briefly feel warmth, flushing, or a metallic taste. A band may sometimes be placed around the limb to direct contrast into the deeper veins.

For veins in the pelvis, abdomen, chest, or around a medical device, a thin tube called a catheter may be inserted through a vein in the arm, neck, or groin. Local anaesthetic numbs the skin. You may feel pressure, but you should report pain.

The catheter and intravenous line are removed when imaging is complete. Pressure or a dressing is applied to the access site. You may need brief monitoring, especially after sedation or catheter placement.

CT and MR venography follow different steps. CT is generally faster and uses ionising radiation. MR takes longer, uses no ionising radiation, and requires screening for implants or metal.

Understanding your results

A radiologist reviews the images and reports how contrast moves through the veins. A normal result generally means the examined veins fill as expected without a visible obstruction or important narrowing.

The report may use terms such as:

A finding is interpreted alongside your symptoms, examination, previous imaging, and reason for testing. There is usually no universal numerical reference range for a venogram. Interpretation varies with the imaging technique, laboratory or imaging service, age, sex,

pregnancy status, medicines, and clinical context.

A visible abnormality does not always explain your symptoms. Likewise, an unclear study does not reliably exclude a problem.

- Filling defect: an area where contrast does not fill the vein normally
- Stenosis: narrowing of a vein
- Occlusion: complete blockage
- Collateral veins: alternative veins that enlarge to carry blood around a blockage
- Reflux: backward blood flow, often related to valves that do not close properly
- External compression: pressure on a vein from a nearby structure

What affects the results

Venography has fewer day-to-day biological influences than many blood tests. Technical factors are more likely to affect the pictures.

Movement can blur images. Incorrect timing between the contrast injection and imaging can leave a vein incompletely filled. Slow blood flow or mixing of contrasted and uncontrasted blood can create an apparent filling defect that resembles a clot.

The injection site matters. Contrast entering through one vein may not fully show another vein or a network separated by valves or blockage. Tourniquets and body position can also change which veins fill.

Previous clots, surgery, stents, central lines, or long-standing collateral veins alter the anatomy. These changes may make it harder to distinguish an old problem from a new one without earlier images.

Pregnancy can change blood flow and place pressure on pelvic veins. Anticoagulant medicines can change the appearance of a clot over time, although they do not directly create a false image. Kidney function mainly affects contrast choice and safety rather than whether a blockage is visible.

Eating, coffee, recent exercise, and the time of day usually have little direct effect on vein anatomy. They may still matter if sedation or an additional procedure is planned.

Accuracy and limitations

Conventional catheter venography can provide detailed pictures and has historically been

used as a reference test for venous blockage. However, it is invasive and is not automatically the best test for every vein or every suspected clot.

A venogram can miss a clot or narrowing if the relevant vein does not fill with contrast, imaging is taken at the wrong time, or overlapping structures hide the area. Small abnormalities may also be difficult to see.

It can suggest a blockage when none is present. Vein spasm, slow flow, contrast mixing, external pressure, or incomplete filling may imitate disease. A finding may need confirmation with another view or another imaging method.

Ultrasound is usually better suited to an initial examination of many arm and leg veins because it avoids radiation and injected contrast. CT venography may better show pelvic or abdominal veins but uses radiation and iodinated contrast. MR venography avoids ionising radiation but takes longer and may not be suitable with some implants.

No venogram result should be interpreted in isolation.

Risks and complications

An ordinary intravenous line can cause brief discomfort, bruising, or light bleeding. Some people feel faint during needle placement.

Iodinated contrast may cause warmth, nausea, itching, or a rash. Serious allergic-like reactions are uncommon but require immediate treatment. Contrast can occasionally leak into tissue around the injection site, causing pain and swelling.

Kidney injury from iodinated contrast is a concern mainly in people with significantly reduced kidney function or other relevant risk factors. The team may check kidney function and adjust the plan.

Catheter venography carries additional risks, including bleeding, infection, vein injury, or a clot at the access site. X-ray and CT venography also involve radiation. MR venography does not use radiation, but its contrast and magnetic field have separate safety considerations.

After leaving, seek urgent medical help for increasing bleeding, severe access-site swelling, a newly cold or blue limb, or rapidly worsening limb pain. Call emergency services for difficulty breathing, swelling of the face or throat, collapse, or chest pain. Mild bruising or tenderness at the needle site can usually be discussed during routine follow-up if it does not improve.

What happens next

A radiologist sends the report to the healthcare professional who requested the test. If the result is straightforward, it may be discussed at a routine follow-up appointment.

A normal result may lead to observation, another test, or investigation of a different cause for your symptoms. An unclear result may be followed by ultrasound, CT, MR imaging, or repeat venography using a different approach.

If a clot or important narrowing is found, the next step depends on its location, extent, your symptoms, and your overall health. Treatment is not determined by the image alone. If treatment was performed during the venogram, you will receive specific instructions about the access site, activity, medicines, and follow-up.

Common questions

Can I drink coffee before a venogram?

Usually, unless you have been told to fast. Coffee with milk may count as food, and caffeine may be restricted before sedation. Follow the instructions from your imaging department.

Does the time of day matter?

Usually not. Vein anatomy does not change enough during the day to determine the result, although limb swelling may be more noticeable later in the day.

Can I exercise beforehand?

Ordinary activity generally does not affect the images. Avoid strenuous exercise if it worsens your symptoms or if your procedure instructions ask you to limit activity.

Will I be awake?

Most people remain awake. Local anaesthetic may be used for catheter placement, and some procedures include light sedation. General anaesthesia is not usually needed for diagnostic venography.

Is the contrast dye radioactive?

No. Contrast used for X-ray or CT venography is not radioactive. The radiation comes from the imaging equipment. MR contrast is also not radioactive.

Can I drive home afterward?

You may be able to drive after a simple study without sedation, but not after receiving sedating medicine. Catheter procedures may also require monitoring and transport home.

Sources

- Radiological Society of North America and American College of Radiology. Venography
- American College of Radiology. ACR Appropriateness Criteria: Suspected Lower Extremity Deep Vein Thrombosis
- American College of Radiology. ACR Manual on Contrast Media
- National Institute for Health and Care Excellence. Venous thromboembolic diseases: diagnosis, management and thrombophilia testing (NG158)