TEST

# CT angiography - arms and legs

CT angiography uses X-rays and contrast dye to show arteries in your arms or legs.

**WHAT IT MEASURES**
Artery narrowing, blockage, widening, injury, and blood flow

**SAMPLE**
None

**FASTING NEEDED?**
Sometimes, for several hours if your imaging service instructs

**HOW LONG IT TAKES**
Usually 20 to 60 minutes

**RESULTS IN**
Often 1-2 days; timing varies by imaging service

**USED FOR**
Diagnosis, treatment planning, and monitoring

**MAIN LIMITATION**
Calcium and movement can make arteries look more narrowed

## Overview

CT angiography, or CTA, creates detailed pictures of the arteries in your arms or legs. It combines a CT scan with an iodine-containing contrast dye injected into a vein.

The contrast makes arteries stand out. A computer produces cross-sectional pictures and three-dimensional views that can show narrowing, blockage, abnormal widening called an aneurysm, or injury. The scan may cover one limb, both limbs, or the arteries from the abdomen to the feet.

CTA shows blood vessel structure but does not always show how much a narrowing affects blood flow during activity.

## Why the test is ordered

CTA may be used to investigate symptoms or plan treatment. Reasons include:

For long-term leg symptoms, an ankle-brachial index or ultrasound is often used first. CTA may provide more detail when treatment is being considered or earlier tests are unclear.

- Pain, cramping, weakness, or tiredness in a limb during activity
- A wound that is not healing
- A limb that suddenly becomes painful, pale, cold, numb, or weak
- A pulse that is difficult to feel
- Suspected artery damage after an injury
- A possible aneurysm, blood clot, or abnormal artery connection
- Planning angioplasty, stent placement, or vascular surgery
- Checking a bypass graft, stent, or artery repair

## Who should have the test

CTA may be suitable when your healthcare professional needs a detailed map of your limb arteries and the findings could change your care. It is not usually a general screening test for people without symptoms or relevant clinical findings.

Tell the imaging team if you are pregnant or could be pregnant. Also tell them about reduced kidney function, recent kidney injury, previous contrast reactions, asthma, thyroid disease, diabetes, or severe heart problems. These conditions do not always prevent CTA, but they may affect how it is planned.

If contrast or radiation is a concern, ultrasound or magnetic resonance angiography may be an alternative.

## How to prepare

Follow your imaging service's instructions. Some centres ask you not to eat for several hours before contrast is given. Clear fluids may be allowed, but local guidance differs.

You may need a recent blood test to check kidney function, especially if you have kidney disease, diabetes, recent serious illness, or other risk factors for kidney injury.

Tell the team about all medicines and supplements you take. Metformin does not affect the images, but instructions may differ if you have acute kidney injury or significantly reduced kidney function. Do not stop taking it unless specifically told to.

Remove jewellery or metal near the area being scanned. Unless you have a fluid restriction, arrive normally hydrated to help with placement of the intravenous line.

## What happens during the test

You lie on a narrow table that moves through a large ring-shaped CT scanner. A healthcare professional places a small intravenous line, usually in your arm or hand.

Contrast is injected, often using an automatic injector. You may briefly feel warm, notice a metallic taste, or feel as though you have passed urine. These sensations usually fade quickly.

The scan is timed for when contrast reaches your arteries. You must keep still and may need to hold your breath briefly. Although scanning is quick, preparation makes the appointment longer. The intravenous line is removed afterward, and most people can leave soon unless observation is needed.

## Understanding your results

A radiologist reviews the scan and sends a report to the healthcare professional who requested it. Terms may include:

The report may describe the location, length, and estimated severity of disease, as well as calcification, clots, stents, or grafts. There is no single numerical range defining a normal CTA; findings are interpreted alongside your symptoms, health, and previous procedures.

- Patent: Open, with blood able to pass through
- Stenosis: Narrowing of an artery
- Occlusion: Complete blockage
- Aneurysm: Abnormal widening of an artery
- Pseudoaneurysm: Blood collecting beside an injured artery
- Dissection: A tear within the artery wall
- Runoff: Blood flow through smaller arteries toward the hand or foot

## What affects the results

Movement can blur small arteries, particularly in the hands, feet, and lower legs. Metal from joint replacements, clips, or other devices can hide nearby vessels.

Heavy calcium deposits may appear larger on CT than they are, making the artery look more narrowed. Poor contrast timing, slow circulation, severe heart problems, intravenous-line position, or severe artery disease can also cause weak or uneven filling.

Body size and scanner settings affect image detail. Very small stents or those that distort images may be difficult to assess. Routine medicines, recent transfusion, and ordinary activity usually have little effect on fixed artery narrowing.

## Accuracy and limitations

CTA is generally good at showing major narrowing and blockages in larger limb arteries. It also shows nearby bones and soft tissues.

It can miss disease in small arteries when images are blurred or contrast filling is poor. Heavy calcification, movement, and metal may make arteries appear more narrowed than they are.

CTA shows anatomy at one point in time and may not establish whether moderate narrowing causes symptoms. Blood-pressure testing, ultrasound, or exercise testing may help.

Ultrasound avoids radiation and contrast but may not show every artery. Magnetic resonance angiography avoids X-rays but has its own contrast and device limitations. Catheter angiography is invasive but can provide more detail and allow treatment during the procedure.

## Risks and complications

CTA uses more radiation than a standard X-ray. The expected benefit is weighed against exposure, particularly during pregnancy and in younger people needing repeated scans.

The intravenous line may cause discomfort, bruising, or bleeding. Contrast can leak into surrounding tissue, causing pain and swelling.

Mild contrast reactions include itching, hives, nausea, or sneezing. Serious reactions affecting breathing or blood pressure are uncommon but need immediate treatment.

Contrast-associated kidney injury is mainly a concern for people with acute kidney injury or significantly reduced kidney function. The team uses your kidney results and health history to decide whether precautions or another test are needed.

## What happens next

You can usually resume normal activities after CTA. Follow instructions about fluids, medicines, and the injection site.

Results may be discussed at an appointment, by telephone, or through an electronic health record. Next steps can include risk-factor management, ultrasound, specialist review, or

planning a procedure.

Seek urgent medical advice if increasing pain, redness, swelling, blistering, or numbness develops around the injection site.

Call emergency services for difficulty breathing, swelling of the face or throat, collapse, or a rapidly worsening contrast reaction. A limb that suddenly becomes very painful, pale, cold, numb, or weak is also an emergency; do not wait for a routine appointment or result.

## Common questions

Can I drink coffee before the scan?

Often, unless you have been told to fast. Milk may count as food, so follow your imaging service's instructions.

Can I eat before CT angiography?

Some centres allow normal eating; others ask you to avoid food for several hours. Follow your local instructions.

Does the time of day matter?

Usually not. Contrast timing during the scan matters, but morning and afternoon scans should produce similar images.

Can I exercise beforehand?

Ordinary activity is usually fine. Avoid unusually strenuous exercise if it leaves you dehydrated, uncomfortable, or unable to lie still.

Can I drive home afterward?

Most people can drive after routine CTA without sedation. Arrange transport if you receive a sedative, have a reaction, or are told not to drive.

How much water should I drink afterward?

Drink normally unless advised otherwise. Do not force extra fluids if you have heart failure, kidney disease, or a prescribed fluid restriction.

## Sources

- American College of Radiology. ACR Manual on Contrast Media . Guidance on contrast reactions, kidney risk, metformin, and contrast leakage.

- American College of Radiology. ACR Appropriateness Criteria: Lower Extremity Arterial Claudication-Imaging Assessment for Revascularization .
- National Institute for Health and Care Excellence. Peripheral arterial disease: diagnosis and management (CG147) .
- European Society of Urogenital Radiology, Contrast Media Safety Committee. ESUR Guidelines on Contrast Agents, version 10.0 .
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- Met R, Bipat S, Legemate DA, Reekers JA, Koelemay MJW. "Diagnostic performance of computed tomography angiography in peripheral arterial disease: a systematic review and meta-analysis." JAMA . 2009;301(4):415-424.