TEST

CT angiography - abdomen and pelvis

CT angiography uses X-rays and injected contrast to create detailed images of abdominal and pelvic blood vessels.

WHAT IT MEASURES
Blood flow and structure of abdominal and pelvic arteries

SAMPLE
None, because this is an imaging test

FASTING NEEDED?
Sometimes, usually several hours before contrast imaging

HOW LONG IT TAKES
Usually 20 to 40 minutes

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

USED FOR
Diagnosis, treatment planning, and monitoring

MAIN LIMITATION
Contrast timing or movement can hide or mimic artery problems

Overview

CT angiography, or CTA, uses X-rays and computer processing to create detailed images of blood vessels in the abdomen and pelvis.

An iodine-based contrast liquid is usually injected into a vein in your arm. As it travels through the bloodstream, it makes arteries clearer on the scan. Images can be viewed from different directions or reconstructed in three dimensions.

CTA can examine the aorta and arteries supplying the kidneys, bowel, liver, spleen, pelvis, and legs. It can show narrowing, blockage, abnormal widening, a tear in an artery wall, or contrast leaking from active bleeding.

Why the test is ordered

CTA may be used to investigate symptoms, clarify another scan, plan treatment, or monitor a known blood vessel condition.

Common reasons include looking for:

Specialists may use CTA before surgery or a minimally invasive procedure and afterward to check the repair. Ultrasound is usually preferred for routine abdominal aortic aneurysm screening because it does not use radiation or injected contrast.

- An aneurysm, or abnormal widening of an artery
- A dissection, or tear between layers of an artery wall
- Narrowed or blocked arteries
- Reduced blood supply to the bowel or kidneys
- Active internal bleeding
- Blood vessel injury
- Abnormal blood vessel connections
- Problems involving a stent, graft, or previous repair

Who should have the test

You may be offered CTA when detailed artery images could change your care. Whether it is suitable depends on the clinical question and whether ultrasound, MRI, or another test could provide the needed information.

Tell the imaging team if you:

A previous contrast reaction does not always prevent CTA. The team may take precautions, change the procedure, or recommend another test depending on the reaction's severity.

- Are pregnant or could be pregnant
- Have kidney disease or a recent kidney injury
- Previously reacted to CT contrast
- Have asthma or several serious allergies
- Take metformin or other regular medicines
- Have recently had reduced kidney function
- Cannot lie flat or remain still

How to prepare

Follow your imaging centre's instructions, as preparation varies. You may be asked not to eat for several hours. Clear fluids may be allowed, but confirm this with the centre. Stay hydrated unless you have been told to restrict fluids because of a heart, kidney, or other condition.

Take medicines as instructed. Do not stop metformin or any other medicine on your own. Whether metformin needs to be paused depends on kidney function, recent kidney injury, and local policy.

Before the injection, tell staff about possible pregnancy and previous contrast reactions. You may need a recent creatinine blood test to estimate kidney function. Wear comfortable clothing, remove metal objects from the area, and change into a gown if asked.

What happens during the test

A radiographer positions you on a narrow table and places a small plastic tube called a cannula into a vein, usually in your arm. The table moves through a short, wide, ring-shaped CT scanner. Staff can see, hear, and speak with you.

Contrast is injected through the cannula. It may briefly cause warmth, a metallic taste, or the sensation of passing urine. These feelings usually fade quickly.

You must remain still and may need to hold your breath for several seconds. Precise timing allows the scanner to capture contrast passing through the arteries. After the brief scan, staff may observe you before removing the cannula.

Understanding your results

A radiologist reviews the images and reports whether arteries are open, narrowed, blocked, enlarged, torn, or leaking blood. The report may describe aneurysm size and location, the severity of narrowing, blood clots, calcium deposits, stents, grafts, and blood supply to organs.

CTA also shows other tissues, so it may identify an unrelated finding. Some need no action; others require follow-up or another test.

There is no single normal range. Findings must be interpreted alongside your symptoms, previous images, and reason for testing.

What affects the results

Contrast timing is especially important. Images taken too early or late may not show an artery

clearly. Reduced heart output can slow contrast movement.

Movement and breathing can blur small vessels. Metal implants, surgical clips, stents, and dense calcium can create artefacts or hide part of an artery. Other limitations include:

Kidney function may affect whether and how contrast is used, while pregnancy changes the balance between benefit and radiation exposure.

- Vessels below the scanner's useful resolution
- Bleeding that is temporary or too slow to detect
- Altered blood flow from another severe blockage
- Differences between scanners and processing methods
- Body size and previous surgery

Accuracy and limitations

CTA usually provides detailed views of large and medium-sized arteries and nearby tissues. However, it can miss very small abnormalities or bleeding that is not active during the scan. Calcium, movement, metal, or poor contrast timing can also make arteries appear narrower or more abnormal than they are.

Ultrasound avoids radiation and may be better for repeated monitoring, but bowel gas and body shape can limit the view. Magnetic resonance angiography may be useful when iodine contrast or radiation is undesirable, although it takes longer and is not suitable for everyone.

Catheter angiography is more invasive but can provide detailed images and allow treatment at the same time. It may be used when CTA is unclear or a procedure is planned.

Risks and complications

The cannula may cause bruising, soreness, brief bleeding, or faintness. CTA uses ionising radiation, so the expected benefit is weighed against exposure, particularly during pregnancy or repeated scanning.

Mild contrast reactions include itching, hives, nausea, or sneezing. Serious allergic-like reactions are uncommon but need immediate treatment. Tell staff at once if you develop breathing difficulty, throat tightness, facial swelling, or suddenly feel very unwell.

Contrast can leak into tissue around the vein. Report increasing pain, tightness, swelling, numbness, or skin changes near the injection site.

Kidney problems after modern intravenous contrast are unusual for most people, but risk is greater with severely reduced kidney function or acute kidney injury. The team may check kidney function, modify the scan, or choose another method.

What happens next

You can usually resume normal activities and eating unless you received a sedative or were given other instructions. Follow advice about fluids and medicines.

The radiologist sends the report to the clinician who requested the test. Results may be discussed at an appointment, by telephone, or through a patient portal. If urgent treatment is needed, the imaging team will contact the relevant clinical team without waiting for routine follow-up.

After leaving, seek emergency help for difficulty breathing, facial or throat swelling, collapse, or rapidly worsening symptoms. Contact the imaging centre promptly for increasing injection-site pain, swelling, blistering, numbness, or colour change. A small, stable bruise can usually be monitored at home.

Common questions

Can I drink coffee before the scan?

Follow your appointment instructions. If fasting is required, only water or clear fluids may be permitted.

Does the time of day matter?

Usually not. Timing of the contrast injection matters more. A morning appointment may be easier if you must fast.

Can I exercise beforehand?

Ordinary activity usually does not affect the scan. Avoid activity that makes it hard to lie still or hold your breath, and follow the centre's instructions.

Can I drive home afterward?

Most people can drive after standard CTA. Do not drive if you received a sedative, feel unwell, or were told to arrange transport.

Can I breastfeed after receiving contrast?

Current radiology guidance generally does not require interrupting breastfeeding after

iodine-based contrast. Discuss concerns with the imaging team.

Will I feel enclosed in the scanner?

The scanner is a short, wide ring rather than a long tunnel. Your head may remain outside it for much of the scan.

Sources

- American College of Radiology. ACR Manual on Contrast Media , 2024
- Radiological Society of North America and American College of Radiology. CT Angiography (CTA) , RadiologyInfo.org
- Davenport MS, Perazella MA, Yee J, et al. Use of Intravenous Iodinated Contrast Media in Patients With Kidney Disease: Consensus Statements from the ACR and National Kidney Foundation. Kidney Medicine . 2020;2(1):85-93
- European Society of Urogenital Radiology. ESUR Guidelines on Contrast Agents , version 10.0
- US Food and Drug Administration. What Are the Radiation Risks from CT?
- American College of Radiology and Radiological Society of North America. Iodinated Contrast Material , RadiologyInfo.org