TEST

Knee CT scan

A knee CT scan uses X-rays to create detailed images of the knee

WHAT IT MEASURES
Detailed X-ray images of knee bones and nearby structures

SAMPLE
None

FASTING NEEDED?
Usually no; sometimes before contrast or sedation

HOW LONG IT TAKES
About 10 to 30 minutes

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

USED FOR
Diagnosis, treatment planning, and monitoring

MAIN LIMITATION
Less detail than MRI for ligaments, cartilage, and menisci

Overview

A knee CT scan is a computed tomography scan of your knee. It uses X-rays and computer processing to create thin, cross-sectional images. These can also be combined into three-dimensional views.

CT shows bone in greater detail than a standard X-ray. It can help identify complex fractures, assess the position of bones, and show surgical implants such as screws or a knee replacement.

A standard knee CT does not usually require contrast dye. In some cases, contrast is injected into a vein or directly into the knee joint to make certain structures easier to see.

Why the test is ordered

A knee CT may be ordered when an X-ray does not provide enough detail or when precise information is needed for treatment planning.

Common reasons include:

For many knee injuries, an X-ray is the first imaging test. MRI is often better when the main concern involves ligaments, tendons, cartilage, bone marrow, or the menisci-the shock-absorbing pads inside the knee.

- Looking for a fracture that is difficult to see on an X-ray
- Showing the size, position, or number of fracture fragments
- Assessing bone alignment or kneecap position
- Planning surgery or checking healing after surgery
- Examining a knee replacement or other metal hardware
- Investigating a bone growth, infection, or other abnormal area
- Performing CT arthrography to examine the joint after contrast injection

Who should have the test

You may be offered a knee CT if detailed bone images could affect your care. It is often useful after a significant injury, before surgery, or when metal implants make another type of imaging less helpful.

CT is not automatically the best test for every knee problem. Your symptoms, examination, previous images, age, and treatment history help determine whether an X-ray, CT, MRI, or ultrasound is more suitable.

Tell the imaging team if you are or might be pregnant. A knee scan exposes the pelvis to much less radiation than an abdominal CT, but the team still needs this information to choose the safest appropriate test.

Children can have CT when it is needed. The imaging service can adjust the scan settings to the child's size and the clinical question.

How to prepare

Most knee CT scans need little preparation. You can usually eat, drink, and take your regular medicines normally.

Wear comfortable clothing without metal around the knee if possible. You may be asked to remove jewellery, a belt, clothing fasteners, or other objects that could interfere with the images.

Before the appointment, tell the imaging team if:

If intravenous contrast, an injection into the joint, or sedation is planned, you may receive separate instructions about food, drink, medicines, and transport home. Follow those instructions rather than stopping any medicine yourself.

- You might be pregnant
- You have previously reacted to CT contrast
- You have kidney disease or reduced kidney function
- You take medicines for diabetes or blood thinning
- You have a knee replacement, screws, plates, or other implants
- You have difficulty lying still or keeping your knee in one position

What happens during the test

You will lie on a narrow table, usually on your back. A radiographer will position your leg and may use cushions or supports to help keep it still.

The table moves through the CT scanner, which looks like a large ring rather than a tunnel. The scanner takes many X-ray images as it rotates around your knee. You will need to stay still, but you can communicate with the radiographer throughout.

The scan itself may take only a few minutes. Positioning and preparation can make the full appointment about 10 to 30 minutes.

If intravenous contrast is used, it is given through a small tube in a vein. You may briefly feel warm or notice a metallic taste.

For CT arthrography, a clinician first places contrast directly into the knee joint, usually using local anaesthetic and imaging guidance. The CT images are then taken while the contrast outlines the inside of the joint.

Understanding your results

A radiologist, a doctor trained to interpret medical images, reviews the scan and writes a report. The report is sent to the clinician who requested the test.

A knee CT report may describe:

Knee CT does not use a universal numerical reference range. Interpretation depends on your age, anatomy, previous injuries, surgery, symptoms, and reason for testing. Sex, pregnancy status, and medicines usually do not alter the visible knee structures, although they may affect

whether contrast, sedation, or radiation is appropriate.

A finding on the report does not always explain your symptoms. Imaging results need to be considered alongside your examination and medical history.

- Fractures and the position of bone fragments
- Joint alignment or kneecap tracking
- Bone loss, extra bone growth, or areas of damage
- The position and condition of surgical hardware
- Joint swelling or collections of fluid
- Signs that may need assessment with another test

What affects the results

Knee CT has relatively few biological factors that make the result misleading. Eating, coffee, exercise, medicines, kidney function, and the time of day do not usually change a non-contrast image of the bones.

Technical and anatomical factors matter more:

Kidney function does not affect a standard non-contrast scan. It matters when intravenous iodine-based contrast is being considered. Pregnancy does not usually change the knee image, but it affects decisions about radiation exposure.

Recent exercise may increase knee fluid or make an injury feel worse, but it does not usually create a false bone finding. A recent blood transfusion does not affect knee CT results.

- Movement: Even small movements can blur fine detail
- Metal: A knee replacement, screws, or plates can create streaks that hide nearby tissue
- Positioning: Pain or stiffness may prevent the knee from being placed in the ideal position
- Scan protocol: Slice thickness and the area scanned affect what can be assessed
- Contrast timing: Poor timing can limit a contrast-enhanced study
- Previous surgery or injury: Scar tissue and altered anatomy can make interpretation harder

Accuracy and limitations

CT is very good at showing cortical bone, the hard outer layer of bone. It can reveal small

fracture lines and complex fracture patterns that are unclear on standard X-rays.

No scan finds every problem. A very subtle fracture can be missed because of movement, metal streaks, unusual anatomy, or the way the scan was performed. Normal structures, old injuries, or image artefacts can sometimes look abnormal and lead to further testing even when no new problem is present.

CT provides less detail than MRI for meniscus tears, ligament injuries, tendon damage, cartilage loss, and changes inside the bone marrow. MRI is often the better test when one of these is the main concern.

CT arthrography can provide more information about cartilage and the inside of the joint. It may be considered when MRI cannot be performed or when metal affects MRI quality, but it requires an injection into the joint.

Accuracy also depends on the question being asked. A scan designed to assess a fracture may not be the right study for blood vessels, a suspected infection, or a soft-tissue mass.

Risks and complications

A knee CT uses ionising radiation. The amount is limited to the area being examined, and imaging teams aim to use the lowest exposure that provides useful images. Radiation carries a small long-term risk, which is weighed against the expected benefit of the scan.

A standard scan without contrast is painless and has no recovery period. Holding an injured knee still may be uncomfortable.

Intravenous contrast can cause temporary warmth, nausea, or a metallic taste. Allergic-like reactions are uncommon but can occur. Contrast may also leak under the skin at the injection site, and kidney problems are more relevant in people with significantly reduced kidney function.

After joint contrast injection, temporary soreness or swelling can occur. Infection and bleeding are uncommon complications.

Seek emergency help after contrast if you develop trouble breathing, swelling of your face or throat, fainting, or a severe widespread reaction. Contact the imaging service or seek urgent medical advice after a joint injection if pain, redness, swelling, or fever is worsening rather than settling.

What happens next

If the scan identifies an urgent injury, the result may be discussed with you during an emergency visit. Routine outpatient reports may take from the same day to several days, depending on the imaging service and the urgency of the request.

Your next step may be routine follow-up, treatment for an injury, an orthopaedic assessment, or another imaging test such as MRI. Sometimes no further imaging is needed.

Contact the clinician who arranged the scan if you have not received the result within the timeframe you were given. Do not assume that no news means the scan was normal.

Common questions

Can I eat or drink before a knee CT scan?

Usually, yes. Fasting is not normally needed for a scan without contrast. If contrast or sedation is planned, follow the specific instructions from the imaging service.

Can I drink coffee first?

Coffee does not affect standard knee CT images. Avoid it only if your appointment instructions require fasting or if caffeine makes it difficult for you to remain still.

Does the time of day matter?

No. Knee CT findings are not usually affected by the time of day. Choose an appointment time that allows you to arrive and position your knee comfortably.

Can I exercise beforehand?

Light activity does not usually affect the scan. Avoid exercise that noticeably increases your pain or swelling, and follow any restrictions given for a recent injury or operation.

Do I need contrast dye?

Most knee CT scans do not need contrast. It may be used to assess blood vessels, infection, a mass, or the inside of the joint. Your appointment information should state whether contrast is planned.

Can I drive after the scan?

You can usually drive after a standard knee CT. You may need someone to take you home if you receive sedation or if pain, injury, or a joint injection makes driving unsafe.

Sources

- American College of Radiology Appropriateness Criteria: Acute Trauma to the Knee
- American College of Radiology Appropriateness Criteria: Chronic Knee Pain
- American College of Radiology: Manual on Contrast Media
- RadiologyInfo.org: CT of the Extremities
- US Food and Drug Administration: Medical X-ray Imaging
- NHS: CT scan