TEST

Orbit CT scan

An orbit CT scan uses X-rays to create detailed images of the eye sockets and nearby structures.

WHAT IT MEASURES
Detailed X-ray images of eye sockets and nearby structures

SAMPLE
None

FASTING NEEDED?
Sometimes before IV contrast, following imaging centre instructions

HOW LONG IT TAKES
Usually 15 to 30 minutes

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

USED FOR
Diagnosis and treatment planning

MAIN LIMITATION
Less soft-tissue detail than MRI

Overview

An orbit CT scan is a computed tomography scan focused on the eye sockets, also called the orbits. It uses X-rays and computer processing to produce cross-sectional images.

The scan can show the eyeballs, eye muscles, tear glands, surrounding fat, sinuses and the bones around the eyes. It is particularly useful for finding fractures, bleeding, calcium deposits and many foreign objects after an injury.

Some scans use an iodine-based contrast dye through a vein. Contrast makes blood vessels and areas of inflammation or abnormal tissue easier to see. Whether you need it depends on the reason for the scan.

CT is quick, which is useful in an emergency. However, MRI often provides more detail of the optic nerves, brain and other soft tissues. The optic nerves carry visual information from the eyes to the brain.

Why the test is ordered

An orbit CT may be ordered to investigate:

The images may also help plan surgery, a biopsy or other treatment. CT is not normally used to screen people who have no relevant symptoms or examination findings.

- An injury around the eye or a possible orbital fracture
- A suspected object in or around the eye
- Swelling, pain, redness or a bulging eye
- Possible infection or an abscess, which is a pocket of infected fluid
- Sudden or unexplained changes in vision or eye movement
- A suspected growth or mass
- Changes caused by thyroid eye disease
- Problems involving the nearby sinuses or tear glands
- The position of an eye implant or other postoperative changes

Who should have the test

You may need an orbit CT if your symptoms, examination or another test suggests a problem that CT can assess well. The decision should account for whether CT, MRI, ultrasound or a specialist eye examination is most likely to answer the clinical question.

CT is often preferred for urgent injuries because it is fast and shows bone clearly. It can also detect most metallic foreign objects. MRI is generally avoided until a metallic object in the eye has been ruled out.

Children can have an orbit CT when it is needed, but the imaging team should use a technique suited to the child's size and the clinical question. This helps limit radiation exposure.

Tell the imaging team if you are or might be pregnant. An orbit CT does not directly expose the abdomen, but the expected benefit and radiation exposure should still be considered.

How to prepare

Follow the instructions from the imaging centre because preparation differs according to the scan and local policy.

For a CT without contrast, you can usually eat and drink normally. If IV contrast or sedation is

planned, you may be asked not to eat for a set period beforehand. Do not fast unless you have been instructed to do so.

Before contrast is given, tell the team if you have:

Do not stop a prescribed medicine unless the imaging service or the clinician responsible for it gives you specific instructions.

You may need to remove glasses, contact lenses, hearing aids, hair clips, facial jewellery or removable dental items. Eye makeup can contain metallic particles and may need to be removed if it could interfere with the images.

- Had a previous reaction to CT contrast
- Kidney disease, reduced kidney function or a kidney transplant
- Asthma or serious allergies
- Diabetes or take metformin
- A current pregnancy or possibility of pregnancy

What happens during the test

You will lie on a narrow table, usually on your back. Your head may be supported with cushions or straps to help you keep still.

The table moves through the scanner, which is shaped like a large ring rather than a long tunnel. The scanner does not touch you. You may hear humming or clicking, but the test should not be painful.

You will need to keep your head still and may be asked to look in a particular direction. The scanning itself often takes only a few minutes, although positioning, safety checks and contrast can make the appointment longer.

If contrast is needed, a small plastic tube called a cannula is placed into a vein, usually in your arm. You may briefly feel warm, notice a metallic taste or feel as though you are passing urine. These sensations usually pass quickly.

Sedation is not routinely needed. It may occasionally be used for a young child or someone who cannot remain still.

Understanding your results

A radiologist, a doctor trained to interpret medical images, reviews the scan. The report

describes what is visible and relates it to the reason for the test.

Results might describe the bones, eyeballs, eye muscles, optic nerves, sinuses and tissue behind the eyes. The report may mention swelling, bleeding, a fracture, a foreign object, infection, a mass or no significant abnormality.

CT results are not expressed as one number, so there is no universal reference range. Interpretation varies with age, sex, pregnancy status, medicines, previous surgery, the scan method and the wider clinical context.

Terms such as "incidental" or "chronic" do not necessarily indicate an urgent problem. An incidental finding is something seen unexpectedly. A chronic finding appears longstanding rather than new. The images still need to be considered alongside your symptoms and eye examination.

What affects the results

An orbit CT has relatively few day-to-day biological influences. Eating, exercise and the time of day usually do not change the images.

Several practical and clinical factors can make the scan less clear or change how it is interpreted:

Tell the imaging team about previous eye procedures, injuries and earlier scans. Comparing current and older images can prevent stable findings from being mistaken for new changes.

- Movement: Even small head or eye movements can blur fine structures.
- Metal: Dental work, jewellery, implants or metallic foreign objects can create streaks that hide nearby tissue.
- Contrast timing: Images taken too early or late may show blood vessels or inflamed tissue less clearly.
- Scan technique: Slice thickness, radiation dose and whether contrast is used affect what can be seen.
- Previous surgery or injury: Scar tissue, implants and old fractures can resemble active disease without the relevant history.
- Recent treatment: Antibiotics like amoxicillin or doxycycline , corticosteroids or surgery may reduce or alter visible inflammation.
- Kidney function: This does not usually change the images, but it can affect whether IV contrast is appropriate.

- Pregnancy: Pregnancy does not usually distort the result, but it affects the decision about using radiation.

Accuracy and limitations

An orbit CT is good at showing fractures, bone damage, bleeding, calcium and many foreign objects. It is fast and is less affected by movement than MRI.

However, no scan finds every problem. CT can miss very small abnormalities or subtle damage to the optic nerve and other soft tissues. Wood, plastic and some other non-metallic foreign materials may be difficult to identify, especially when small.

Movement or metal streaks can hide a genuine finding. CT can also suggest an abnormality that is not actually active disease. For example, old fractures, normal bone channels, postoperative changes and inflammation can sometimes resemble a new injury or mass.

MRI is often the better test for the optic nerves, the junction where the optic nerves cross, the brain and detailed soft-tissue assessment. Ultrasound may help examine the eyeball or superficial structures, but it may be unsuitable if a ruptured eyeball is suspected.

Imaging alone may not reliably distinguish infection, non-infectious inflammation and a tumour. An eye examination, blood tests, MRI, follow-up imaging or a tissue sample may be needed.

Risks and complications

CT uses ionising radiation. The amount is kept as low as reasonably achievable while still producing useful images, but the scan should be performed only when its expected benefit outweighs the exposure.

An IV cannula can cause brief discomfort, bruising or occasional light-headedness. Contrast may leak into the surrounding tissue, causing pain or swelling at the injection site.

Allergic-like reactions to iodine-based contrast can occur. Most are mild, such as itching or hives, while serious reactions are uncommon. Contrast may also require extra consideration if kidney function is severely reduced or changing rapidly.

Tell staff immediately if you develop breathing difficulty, facial or throat swelling, widespread hives, severe dizziness, or increasing pain and swelling around the cannula.

What happens next

For a routine outpatient scan, the report is usually sent to the clinician who requested it. They may review it with you at a planned appointment or contact you sooner if another test or treatment is needed.

Urgent findings are normally communicated more quickly. Do not wait for the written report if you develop sudden loss of vision, rapidly worsening eye pain or swelling, new difficulty moving the eye, severe headache with vomiting, or vision changes after an injury. Seek urgent medical assessment.

Call emergency services for severe breathing difficulty, collapse, or swelling of the mouth or throat after contrast.

Common questions

Can I drink coffee before an orbit CT?

Usually yes for a scan without contrast. If contrast or sedation is planned, follow the imaging centre's instructions about drinks, milk and fasting.

Does the time of day matter?

Usually not. The appointment time does not normally change the appearance of the orbits.

Can I exercise beforehand?

Yes, unless pain, injury or other symptoms make exercise unsafe. Exercise does not usually affect orbit CT results.

Will I need contrast dye?

Not always. Trauma and suspected fractures may be assessed without contrast, while infection, inflammation, blood vessels or a mass may be clearer with contrast.

Can I drive home afterward?

Most people can drive after a routine CT, including one with IV contrast. You will need another plan if you receive sedation or are told not to drive for another reason.

Can I wear contact lenses or eye makeup?

You may be asked to remove contact lenses and eye makeup. Some cosmetics contain metallic particles that can interfere with the images.

Sources

- American College of Radiology. ACR Appropriateness Criteria: Orbits, Vision, and Visual Loss
- American College of Radiology. ACR Manual on Contrast Media
- Radiological Society of North America and American College of Radiology. Computed Tomography of the Head
- US Food and Drug Administration. Medical X-ray Imaging
- European Society of Urogenital Radiology. ESUR Guidelines on Contrast Agents
- NHS. CT scan