TEST

Eye and orbit ultrasound

An eye and orbit ultrasound uses sound waves to create images of the eye and surrounding socket.

WHAT IT MEASURES
Eye structures, movement, size, and tissue echoes

SAMPLE
None; imaging with sound waves

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually 15 to 30 minutes

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

USED FOR
Diagnosis, measurement, and treatment planning

MAIN LIMITATION
Image quality and interpretation rely heavily on operator skill

Overview

An eye and orbit ultrasound uses high-frequency sound waves to create images of the eye and tissues inside the eye socket, called the orbit. It does not use ionising radiation.

It is particularly useful when blood, a cloudy lens, or another obstruction prevents a clinician from seeing the back of the eye directly. It can also help assess an injury, foreign object, lump, or retinal problem.

Techniques include:

Most scans use gel and a probe over the closed eyelid. Some specialised measurements require a probe near or against the numbed surface of the eye.

- B-scan ultrasound , which produces moving, two-dimensional images
- A-scan ultrasound , which measures distances within the eye, often before cataract surgery

- Ultrasound biomicroscopy , which provides detailed images of structures at the front of the eye

Why the test is ordered

An eye specialist may order ultrasound when an examination does not provide enough information, such as when a cataract or bleeding blocks the view of the retina.

The test may help investigate:

Ultrasound can show an abnormality's position and movement and may help distinguish fluid-filled areas from solid tissue. Another scan or biopsy may still be needed.

- Retinal detachment
- Bleeding into the vitreous gel inside the eye
- A lump, cyst, or other abnormal tissue
- Swollen or thickened eye muscles
- An injury or possible foreign object
- Changes affecting the optic nerve
- The eye's size and shape before treatment

Who should have the test

Eye and orbit ultrasound is not generally used for routine screening in people without symptoms or abnormal examination findings.

You may be offered it if part of the eye cannot be examined clearly, a structural problem is suspected, or precise measurements are needed before treatment.

Ultrasound may be inappropriate if a penetrating injury or rupture of the eyeball is suspected because probe pressure could worsen the injury. The clinical team may use careful examination or another imaging method first.

Children can have the test. Extra support or sedation may be considered depending on their age, ability to remain still, and the type of scan.

How to prepare

You can usually eat and drink normally, including coffee. Continue your usual medicines unless your clinical team tells you otherwise.

You may need to remove contact lenses and eye makeup. Bring glasses to use after removing your lenses.

Tell the person performing the scan about:

Numbing drops are normally used if the probe will touch the eye. Arrange transport if you will also receive pupil-dilating drops, which can temporarily blur vision and increase sensitivity to light.

- Recent eye surgery or injections
- A gas bubble or silicone oil inside the eye
- A recent injury or possible metal fragment
- Pain when the eyelid or eye is touched
- Allergies to eye drops, latex, or probe-cover materials

What happens during the test

For a standard B-scan, you sit in a reclining chair or lie down. You close your eye while the examiner applies gel and moves a handheld probe gently across the eyelid.

You may be asked to look in different directions behind the closed lid so the examiner can view different areas and assess movement.

For some A-scans or ultrasound biomicroscopy, numbing drops are applied before a small probe or fluid-filled cup touches the eye's surface. You may feel light pressure, but the examination should not be painful.

The scan usually takes 15 to 30 minutes. Detailed examinations of both eyes or the orbit may take longer.

Understanding your results

The report may describe the retina, vitreous gel, lens, eye wall, optic nerve, eye muscles, and other orbital tissues. It may also include measurements.

A normal result means the scan did not show evidence of the suspected problem, but very small, early, or poorly positioned abnormalities can be missed.

An abnormal result describes what appeared on the images rather than always confirming a

diagnosis. The report might mention a membrane, fluid collection, thickened muscle, or mass. Your symptoms, eye examination, medical history, and other tests determine what the finding means.

There is no universal reference range for every eye measurement. Interpretation varies with the imaging service, equipment, age, and clinical circumstances.

What affects the results

Eye ultrasound depends heavily on technique and examiner experience. Probe angle, machine settings, pressure, and the areas examined can affect the images.

Movement may blur the scan or make complete views difficult. Recent surgery, gas bubbles, silicone oil, artificial lenses, implants, and scarring can produce reflections or distort sound waves. Air and calcium may block views of deeper tissues.

Marked eyelid swelling can limit probe positioning. Probe pressure may temporarily alter the eye's shape, which matters for precise measurements.

Food, coffee, exercise, medicines, and time of day usually have little effect on the scan.

Accuracy and limitations

Accuracy varies with the condition, equipment, and examiner's training. A small retinal tear may be missed, especially if the retina has not detached. Blood, scar tissue, normal membranes, or the back surface of the vitreous can sometimes resemble a retinal detachment.

Ultrasound does not replace a full eye examination when the retina can be seen clearly. A dilated examination may be better for detecting small tears or subtle surface changes.

CT is often more useful for fractures and suspected metallic foreign objects. MRI may show some orbital tissues more clearly but is generally avoided until a metal fragment has been excluded. Optical coherence tomography, photographs, blood tests, or biopsy may answer other questions.

Risks and complications

Scanning through the closed eyelid is non-invasive and is not known to cause harm at diagnostic energy levels. The gel may feel cold or briefly irritate sensitive skin.

If a probe touches the numbed eye, there is a small risk of irritation, corneal scratching, or infection. Careful cleaning, minimal pressure, and proper technique reduce these risks.

Ultrasound is usually avoided or performed only with specialist precautions if a ruptured eyeball is suspected.

What happens next

A clinician may discuss the images immediately, or a specialist may review them and issue a report later. Results are usually available the same day or within several days.

A normal or stable result may lead to observation, routine follow-up, or no further imaging. An uncertain finding may require repeat ultrasound, a dilated examination, CT, MRI, or another specialised test.

Seek urgent eye care for sudden vision loss, a new curtain or shadow across your sight, many new flashes or floaters, severe eye pain, or worsening symptoms after an injury. After a chemical splash, rinse the eye immediately with clean water and seek emergency help. Do not wait for a scheduled ultrasound appointment.

Common questions

Can I drink coffee before an eye ultrasound?

Yes. Coffee and other usual drinks do not normally affect the images, and fasting is not usually required.

Does the time of day matter?

Usually not, unless the scan is being coordinated with another examination, procedure, or treatment.

Can I exercise beforehand?

Yes. Ordinary exercise does not usually affect the result. After recent eye surgery or injury, follow your eye-care team's activity instructions.

Do I need to remove my contact lenses?

Often, especially if the eye will be examined directly or numbing drops will be used. Bring a lens case and glasses.

Can I have this scan during pregnancy?

Ultrasound does not use ionising radiation and can generally be performed during pregnancy

when medically needed. Tell the imaging team if you are pregnant, particularly if other tests or medicines are being considered.

Can I drive home afterwards?

The ultrasound itself does not usually affect driving. Do not drive if dilating drops leave your vision blurred or sensitive to light.

Sources

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