

Ultrasound

Ultrasound is an imaging technique that uses sound waves to study the internal parts of the body. The technical term for ultrasound testing and recording is sonography. Ultrasound has been adapted to perform ophthalmic examinations.

High-frequency sound waves (which are beyond the range of normal hearing) transmitted to the eye are reflected at interfaces of differing tissue densities, the reflected waves are recorded, and the images are formed and analyzed to give information about the ocular structures and their function.

The two most common types of ultrasound used in ophthalmology are:

- A-scans - a one-dimensional display of sound waves to perform linear measurements of the eye structures e.g., measure the eye length to determine the appropriate intraocular lens for cataract surgery.
- B-scans – creates a two-dimensional, cross-section view of the eye to perform a detailed examination and measurements of eye's structures.
- Doppler imaging – used to detect the movement of blood inside the blood vessels in the eye.

Ophthalmic ultrasound is capable of acquiring both real-time video and static images of the eye.

Why it is performed

Ophthalmic ultrasound is used to:

- Examine the internal eye structures, such as cornea, lens, vitreous, retina, or choroids to detect abnormalities, such as vitreous haemorrhages or tumours.
- Examine the orbital areas to identify and determine the extent of various conditions such as infections, inflammatory diseases, or traumatic disorders in the soft tissues surrounding the eye.
- Examine the function of the eye structures to determine the causes of various visual defects.
- Perform measurements of the eye structures (such as corneal thickness, anterior chamber depth and angle, lens thickness, and scleral thickness) to determine specific causes of various eye disorders.

Ultrasound examination complements other diagnostic procedures (such as ophthalmoscope or slit lamp examination) and is especially useful these procedures cannot show the delicate eye structures (such as the retina or optic nerve) because the inside of the eye is cloudy or something is blocking the line of sight. It is also used to study the function of the eye and its parts.

How to prepare

No special preparation is required for the eye ultrasound examination.

How it is performed

Before the ultrasound examination is performed, anaesthetic drops are applied to the eye. Subsequently, a small probe – transceiver - that emits and receives the sound waves, is gently placed against the closed eyelid.



The emitted sound waves are reflected back to the probe from various tissue surfaces within the eye and/or soft tissues surrounding the eye, and appear on the screen of the ultrasound instrument. The resultant images are referred to as echograms.

The eye care professional carefully observes the echograms and takes photographs of the images.

Results

The results vary significantly depending on the condition being studied and the patient.

How it feels

Although ultrasound examination is considered painless, some people may feel a little discomfort associated with this procedure, ultrasound examination is considered.

What the risks are

Ultrasound examination is a non-invasive procedure and can be repeated as and when required.

However, some people have adverse reactions to anaesthetic drops. Side effects are rare, but could include an increased intraocular pressure or increased blood pressure.