TEST

Ultrasound

An ultrasound uses sound waves to create images of organs, tissues, blood flow, or a pregnancy.

WHAT IT MEASURES
Sound-wave images of organs, tissues, blood flow, and pregnancy

SAMPLE
None

FASTING NEEDED?
Sometimes, especially before abdominal or gallbladder imaging

HOW LONG IT TAKES
Usually 15 to 45 minutes

RESULTS IN
Same day to several days; laboratory turnaround varies

USED FOR
Screening, diagnosis, procedure guidance, and monitoring

MAIN LIMITATION
Image quality varies with operator, body size, gas, and bone

Overview

Ultrasound, also called sonography, is an imaging test. It uses high-frequency sound waves to create pictures of structures inside your body. It does not use X-rays or other ionising radiation.

A handheld device called a transducer sends sound waves into the body and receives their echoes. A computer turns those echoes into moving images. Doppler ultrasound is a related method that shows the direction and speed of blood flow.

Most ultrasounds are performed through the skin. Some examinations use a small internal transducer, such as a transvaginal ultrasound to examine pelvic organs or a transrectal ultrasound to examine nearby structures.

Ultrasound can also guide procedures such as a needle biopsy, fluid drainage, or an injection. The ultrasound itself is the imaging part; the guided procedure may have separate preparation and risks.

Why the test is ordered

Ultrasound can examine many parts of the body. The reason for ordering it determines which area is scanned and how you prepare.

It may be used to:

Ultrasound is sometimes used as a first imaging test because it is quick and does not involve radiation. It may not provide all the information needed, so another type of imaging can still be necessary.

- Examine pain, swelling, a lump, bleeding, or abnormal blood test results
- View organs such as the liver, gallbladder, kidneys, thyroid, or ovaries
- Assess blood flow or look for a blood clot
- Monitor a pregnancy or investigate pregnancy-related concerns
- Examine the heart through an ultrasound called an echocardiogram
- Guide a biopsy, drainage procedure, or other treatment
- Follow a previously identified cyst, nodule, stone, or other finding

Who should have the test

You may be offered an ultrasound when its images could help answer a specific health question. It is used in adults, children, and during pregnancy.

Whether it is the appropriate test depends on the body area, your symptoms, previous results, and the detail required. For example, ultrasound is useful for gallstones and many pelvic conditions, but air-filled lungs and structures hidden by bone are usually better assessed another way.

Screening recommendations are specific to the condition and your risk factors. Ultrasound is not a general whole-body screening test. A healthcare professional can explain why a particular scan is being suggested and what question it is intended to answer.

How to prepare

Follow the instructions from the imaging service, because preparation differs by scan.

For an abdominal or gallbladder ultrasound, you may need to avoid food for several hours. Eating causes the gallbladder to contract and can increase bowel gas, making some structures

harder to see.

For a pelvic or early-pregnancy ultrasound through the abdomen, you may be asked to arrive with a full bladder. Fluid in the bladder helps sound waves travel and can move bowel out of the way. A transvaginal scan is usually performed after you empty your bladder.

Take your usual medicines unless you have been given different instructions. Tell the service if you may be pregnant, have dressings or open wounds near the area, need mobility support, or feel uncomfortable with an internal examination.

Wear loose clothing that allows access to the area being scanned. For a procedure guided by ultrasound, you may receive additional instructions about eating, medicines, transport, and consent.

What happens during the test

For an external ultrasound, you usually lie or sit on an examination couch. The sonographer applies water-based gel to your skin. The gel removes air between the transducer and your body so sound waves can pass clearly.

The sonographer moves the transducer over the area and may apply gentle pressure. You might be asked to change position, hold your breath, or remain still. The room may be dim so the images are easier to view.

An internal ultrasound uses a narrow, covered transducer. It is inserted gently into the vagina or rectum after the procedure has been explained and you have agreed. You can ask the person performing the scan to stop at any time.

A routine scan often takes 15 to 45 minutes. More detailed scans, Doppler studies, or ultrasound-guided procedures may take longer.

Understanding your results

A specialist reviews the images and produces a report. In some services, the person performing the scan may discuss the findings immediately. In others, the report is sent to the healthcare professional who requested it.

The report may describe an organ's size, shape, appearance, and blood flow. "Unremarkable" usually means that no important abnormality was seen. A "limited" examination means that part of the area could not be assessed clearly.

Ultrasound can show whether a finding is fluid-filled, solid, or mixed. However, appearance

alone does not always show exactly what a finding is. A follow-up scan, another type of imaging, blood tests, or a biopsy may be needed.

Measurements and their interpretation vary by imaging service or laboratory, age, sex, pregnancy status, medicines, and clinical context. A result is best understood alongside the reason for the scan and any previous images.

What affects the results

An ultrasound image can be unclear even when the equipment is working correctly. Important influences include:

Timing also matters. Pregnancy findings change with gestational age, and pelvic structures may look different across the menstrual cycle. Blood flow and some organ measurements can be affected by body position, hydration, heart function, or recent activity.

Medicines usually do not directly interfere with the sound waves. However, they may change the condition being examined, such as blood flow or bladder filling. Tell the imaging service about relevant treatments and recent procedures.

- Bowel gas, because sound waves do not travel well through air
- Bone, which can block structures lying behind it
- Body size and the depth of the organ being examined
- Movement, breathing, or difficulty holding the required position
- An empty bladder when a full one was requested
- Recent food intake before gallbladder or some abdominal scans
- Dressings, wounds, tenderness, or medical devices over the area
- The operator's experience and the equipment or settings used

Accuracy and limitations

Accuracy depends on the organ, the condition being investigated, image quality, and the skill of the person performing and interpreting the scan.

Ultrasound may miss a small or deeply located abnormality, particularly when bowel gas, bone, body size, or movement blocks the view. A normal scan therefore does not always rule out every possible condition.

It can also show harmless changes that resemble disease or reveal an unrelated finding. This may lead to repeat imaging or another test even though the finding later proves not to be concerning.

Ultrasound often cannot reliably determine whether a solid lump is cancerous. Mammography, CT, MRI, endoscopy, or biopsy may provide a better answer, depending on the body area and clinical question. CT or MRI is also usually better for structures hidden by bone or gas and for mapping complex injuries.

Risks and complications

Routine diagnostic ultrasound has no known risks from ionising radiation because it does not use radiation. The gel may feel cold, and pressure from the transducer can be uncomfortable over a tender area.

An internal scan can cause temporary discomfort and occasionally light spotting. Tell the sonographer if you have pain or want the examination paused.

If ultrasound guides a biopsy, injection, or drainage procedure, the needle-based procedure has separate risks, such as bleeding, infection, or injury to a nearby structure. These should be explained before you consent.

What happens next

Routine results may be discussed at a planned follow-up appointment, by telephone, or through an electronic record. The next step may be no further testing, treatment for the identified problem, a repeat ultrasound, or a different test.

An unclear scan does not necessarily mean something is wrong. It may simply mean that the target could not be seen well enough.

If the scan identifies a finding needing prompt attention, the imaging team may contact the referring service before the formal report is completed. This is different from routine follow-up.

Do not wait for an outpatient ultrasound result if you develop emergency symptoms such as severe trouble breathing, signs of a stroke, heavy uncontrolled bleeding, fainting with severe pain, or severe pain during pregnancy. Seek emergency medical help.

Common questions

Can I drink coffee before an ultrasound?

If fasting is required, coffee may not be allowed, even without milk. It can affect the gallbladder and digestive system. Follow the instructions from your imaging service; water is often permitted, but not always.

Does the time of day matter?

Usually not. An early appointment may be easier if you need to fast. Timing can matter for some pregnancy, fertility, or menstrual-cycle assessments.

Can I exercise beforehand?

Gentle activity usually does not affect a routine scan. Avoid strenuous exercise if your instructions say to rest or if blood flow is being assessed, because recent activity can temporarily change circulation.

Can I take my medicines?

Usually, yes. Take them with a small amount of water unless you have been told otherwise. Ultrasound-guided procedures may require separate instructions, especially for medicines that affect bleeding.

Can I have an ultrasound while pregnant?

Diagnostic ultrasound is commonly used during pregnancy and does not use ionising radiation. It should be performed for a medical reason by appropriately trained staff, using the lowest exposure needed to obtain useful images.

Will I get the results immediately?

Sometimes. The sonographer may need a radiologist or another specialist to review the images first. Results are often available the same day or within several days, depending on the service and urgency.

Sources

- NHS - Ultrasound scan
- US Food and Drug Administration - Ultrasound Imaging
- RadiologyInfo.org - General Ultrasound
- American Institute of Ultrasound in Medicine - Official Statements and Practice Parameters



- American College of Obstetricians and Gynecologists - Ultrasound Exams
- British Medical Ultrasound Society - Guidelines for Professional Ultrasound Practice