TEST

Thyroid ultrasound

A thyroid ultrasound uses sound waves to create images of the thyroid and nearby tissues.

WHAT IT MEASURES
Thyroid size, structure, blood flow, and nodule features

SAMPLE
None; imaging uses sound waves

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually 20 to 30 minutes

RESULTS IN
Usually several days; timing varies by imaging service

USED FOR
Diagnosis, biopsy guidance, and monitoring

MAIN LIMITATION
Cannot reliably show whether a thyroid nodule is cancerous

Overview

A thyroid ultrasound creates pictures of your thyroid using high-frequency sound waves. The thyroid is a small gland at the front of your neck. It makes hormones that help control energy use, body temperature, heart rate, and other body functions.

The test can show the thyroid's size, shape, and internal structure. It can also detect nodules, which are lumps within the gland, and examine nearby lymph nodes. Doppler ultrasound may be used to assess blood flow.

Ultrasound does not use X-rays or ionizing radiation. It shows the thyroid's structure, but it does not directly show how well the gland is working. Thyroid blood tests are usually better for assessing hormone function.

An ultrasound may identify features that make a nodule more or less concerning. However, the image alone usually cannot confirm whether a nodule is cancerous.

Why the test is ordered

A thyroid ultrasound may be ordered to investigate:

It may also help assess thyroid inflammation or changes after surgery or other treatment.

An abnormal thyroid blood test does not automatically mean that you need an ultrasound. Blood tests measure thyroid function, while ultrasound examines structure. The reason for the blood test result, your symptoms, and findings from a neck examination all matter.

Ultrasound is not generally used by itself to screen everyone who has no thyroid symptoms or examination findings. It can find very small nodules that may never cause harm but could lead to further tests.

- A lump or swelling in the neck
- A thyroid nodule found during an examination
- A nodule noticed on a CT, MRI, or other imaging test
- An enlarged thyroid, sometimes called a goitre
- Changes in a previously identified nodule
- Nearby lymph nodes that feel or look unusual
- The position of a needle during a thyroid biopsy

Who should have the test

You may be offered an ultrasound if a clinician feels a thyroid lump, sees neck swelling, or finds a nodule on another scan. It may also be appropriate if you have a known nodule that needs monitoring.

Your personal history can affect the decision. Relevant details may include previous thyroid treatment, neck surgery, radiation treatment involving the neck, or a family history of certain thyroid cancers.

Symptoms such as ongoing hoarseness, difficulty swallowing, or pressure in the neck may lead to imaging, although these symptoms can have many causes. Ultrasound is not always the best first test because it cannot see every part of the throat, chest, or airway.

How to prepare

You can usually eat and drink normally before a thyroid ultrasound. Coffee does not affect the images, and fasting is not needed.

Take your usual medicines unless your healthcare service has given you different instructions.

Do not stop thyroid medicine based only on an upcoming ultrasound.

Wear clothing that leaves the front of your neck easy to reach. You may need to remove necklaces, scarves, or other items around your neck.

Tell the imaging service if extending your neck is painful or difficult. A pillow or a different position may make the test more comfortable. Ultrasound is considered suitable during pregnancy because it does not use ionizing radiation.

If a needle biopsy is planned for the same appointment, follow the separate preparation instructions provided for that procedure.

What happens during the test

You will usually lie on your back with your neck slightly extended. A cushion may be placed under your shoulders.

The sonographer or radiologist will apply water-based gel to your neck. A small handheld device called a transducer is then moved over the skin. It sends out sound waves and receives the echoes that return from the tissues.

You may feel gentle pressure, especially if the area is tender. The test should not be painful. You may be asked to turn your head or swallow so that different areas can be seen.

The thyroid and surrounding tissues are examined from several angles. The person performing the test may take measurements and save still images or short video clips. The appointment usually takes about 20 to 30 minutes.

The gel is wiped away afterward, and you can normally return to your usual activities immediately.

Understanding your results

A radiologist or another qualified professional reviews the images and prepares a report. The report may describe:

Some reports use a system such as ACR TI-RADS to group nodules by their ultrasound features. A higher category means that the appearance deserves closer assessment. It does not mean that cancer has been diagnosed.

Fluid-filled cysts often have a reassuring appearance. A solid nodule is not automatically cancerous. Size is also only one part of the assessment.

Measurements may differ slightly between scans because the nodule can be measured from a

different angle. A small change does not always represent true growth. Comparing the actual images, rather than only the written measurements, can be helpful.

There is no single universal normal thyroid size for everyone. Interpretation can vary with the imaging service, age, sex, pregnancy status, medicines, previous treatment, and clinical context. Laboratory reference ranges mainly apply when the ultrasound is considered alongside thyroid blood tests.

- The size and shape of each thyroid lobe
- Whether the thyroid tissue looks even or uneven
- The number, position, and size of any nodules
- Whether a nodule is solid, fluid-filled, or mixed
- Its borders, shape, brightness, and internal calcium deposits
- Blood-flow patterns
- The appearance of nearby lymph nodes

What affects the results

Ultrasound depends partly on the equipment and the skill and experience of the person performing and interpreting the examination. Different operators may select slightly different measurement points.

Your position and the angle of the transducer can change a measurement by a small amount. Firm pressure may also change the shape of a soft or fluid-filled nodule.

Other factors that can affect the images include:

Food, coffee, time of day, and routine exercise do not usually change the structural findings. Iodinated contrast from a recent CT scan does not spoil an ultrasound, although it can affect some thyroid nuclear medicine tests.

Long-term thyroid medicine can change gland size or appearance by treating the underlying condition. This is different from a dose taken on the morning of the scan, which does not distort the images.

- A very large thyroid extending behind the breastbone
- Deep nodules or a body shape that limits the sound-wave view
- Thyroid inflammation, which can make the gland look uneven
- Previous surgery, ablation, or radiation treatment

- Bleeding into a nodule after a recent biopsy
- Recent drainage of a thyroid cyst
- Pregnancy-related changes in thyroid size and blood flow

Accuracy and limitations

Ultrasound is very good at finding thyroid nodules, including small ones that cannot be felt. It is less reliable at determining exactly what a nodule is.

Some benign nodules, inflammation, and scar tissue can look suspicious. This can produce a concerning result when no cancer is present. Conversely, some cancers have few suspicious ultrasound features and may appear relatively ordinary. Results also differ according to the equipment, operator, reporting system, and types of nodules being examined, so one accuracy percentage does not apply to every setting.

Ultrasound cannot measure thyroid hormone production. Blood tests are better for that purpose. If the thyroid-stimulating hormone level is low, a nuclear medicine thyroid scan may sometimes be used to show whether a nodule is producing excess hormone.

When tissue is needed, an ultrasound-guided fine-needle aspiration may be the better test. It removes a small sample of cells for laboratory examination. Even a biopsy can occasionally be unclear or miss the relevant area.

Ultrasound also has difficulty seeing tissue behind bone or deep inside the chest. CT or MRI may provide more information when a large thyroid extends behind the breastbone or affects nearby structures.

Risks and complications

A thyroid ultrasound has no known complications when diagnostic ultrasound is used appropriately. It does not expose you to ionizing radiation.

The gel may feel cold, and pressure from the transducer can be uncomfortable over a tender area. A needle biopsy has separate risks and should not be confused with the ultrasound itself.

What happens next

If the scan is reassuring, you may not need another ultrasound. In other cases, a repeat scan may be suggested to check for meaningful change over time.

A nodule with uncertain or concerning features may lead to thyroid blood tests, a fine-needle aspiration, another imaging test, or review by a thyroid specialist. The plan is based on the nodule's appearance and size, your symptoms, previous results, and personal history.

Arrange routine follow-up if you notice gradual enlargement, persistent hoarseness, neck discomfort, or increasing difficulty swallowing.

Seek urgent medical help for rapidly increasing neck swelling or new trouble breathing. If severe breathing difficulty develops, especially after a biopsy or neck procedure, seek emergency care.

Common questions

Can I drink coffee before a thyroid ultrasound?

Yes. Coffee does not affect the ultrasound images, and you do not need to fast.

Does the time of day matter?

No. Thyroid structure does not usually change enough during the day to affect the test.

Can I exercise beforehand?

Yes. Routine exercise does not usually affect thyroid ultrasound findings. Follow separate instructions if you are also having a biopsy or another procedure.

Do I need to stop my thyroid medicine?

Usually not. Take it as prescribed unless the healthcare service arranging the test specifically tells you otherwise.

Is thyroid ultrasound safe during pregnancy?

Yes. It uses sound waves rather than ionizing radiation. Pregnancy can affect thyroid size and blood flow, so it should be considered when the images are interpreted.

Will the ultrasound tell me whether a nodule is cancerous?

Not by itself. It can identify features linked with a higher or lower chance of cancer, but some nodules require a fine-needle aspiration for a clearer answer.

Sources

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