CONDITION

Thyroid nodule

A thyroid nodule is a distinct lump of solid or fluid-filled tissue within the thyroid gland.

WHAT IT IS
A distinct lump within the thyroid gland

BODY SYSTEM
Hormone system

MAIN SYMPTOMS
Often none, neck lump, pressure, swallowing difficulty

WHAT CAUSES IT
Usually unknown; sometimes cysts, inflammation, or thyroid overgrowth

HOW IT IS DIAGNOSED
Ultrasound, thyroid blood tests, and sometimes needle biopsy

MAIN TREATMENT
Monitoring, surgery, radioiodine, or image-guided ablation

CAN IT BE CURED?
Sometimes - treatment can eliminate the nodule

IS IT AN EMERGENCY?
Sometimes - breathing trouble needs emergency care

LONG-TERM OUTLOOK
Most stay benign and cause few problems

Overview

A thyroid nodule is a lump within the thyroid gland. The thyroid is a small, butterfly-shaped gland at the front of your neck. It makes hormones that help control energy use, body temperature, heart rate, and other body functions.

A nodule may be solid, filled with fluid, or a mixture of both. You may have one nodule or several. Multiple nodules can make the thyroid larger, which is called a multinodular goitre.

Most thyroid nodules are benign, meaning they are not cancer. Many are found by chance during a scan performed for another reason. However, each nodule needs an appropriate assessment because appearance and symptoms alone cannot reliably show what caused it.

Assessment usually checks two separate issues: whether the nodule could be cancerous and whether it is making too much thyroid hormone. The results guide whether you need

monitoring, a biopsy, or treatment.

Symptoms

Most thyroid nodules do not cause symptoms. Thyroid hormone levels are often normal, and the nodule may be too small to see or feel.

When symptoms occur, you may notice:

Some nodules make excess thyroid hormone. This can cause symptoms of an overactive thyroid, such as a fast or irregular heartbeat, shaking, heat intolerance, sweating, anxiety, muscle weakness, or unexplained weight loss.

A nodule usually does not cause an underactive thyroid by itself. However, nodules can occur alongside thyroid conditions that cause tiredness, feeling cold, dry skin, constipation, or weight gain.

- A lump or swelling at the front or lower part of your neck
- Pressure, tightness, or discomfort in your neck
- Difficulty swallowing, especially with solid food
- A persistent change in your voice
- Shortness of breath if a large nodule presses on your windpipe

Causes and risk factors

The cause of a thyroid nodule often remains unknown. Common non-cancerous causes include overgrowth of normal thyroid cells, fluid-filled cysts, and changes within a multinodular goitre.

Thyroid inflammation can also create a lump or an uneven appearance. Hashimoto's thyroiditis, an immune condition in which the body attacks the thyroid, may produce nodules or areas that resemble nodules on a scan.

A small proportion of nodules are thyroid cancer. Factors that can increase concern include:

These features do not prove that a nodule is cancerous. Many people with one or more risk factors still have a benign nodule.

Low iodine intake can contribute to thyroid enlargement and nodules in populations where iodine deficiency is common. Taking extra iodine is not a general treatment, however, and excessive iodine can disturb thyroid function.

- Radiation treatment to the head or neck, especially during childhood
- A close relative with thyroid cancer or certain inherited syndromes
- A firm nodule that appears fixed in place
- Enlarged lymph nodes in the neck
- Persistent hoarseness or rapid enlargement

Diagnosis

An assessment begins with your health history and an examination of your neck. You may be asked about changes in the lump, swallowing or breathing problems, radiation exposure, thyroid conditions, and family history.

A blood test usually measures thyroid-stimulating hormone, or TSH. TSH helps control how much hormone the thyroid makes. Other thyroid blood tests may be added if the TSH result is abnormal. Normal blood tests do not show whether a nodule is benign or cancerous.

Ultrasound is the main imaging test. It uses sound waves to show the nodule's size, location, internal structure, borders, and blood flow. It also checks the rest of the thyroid and nearby lymph nodes. Ultrasound findings help estimate the level of concern, but they do not always provide a final answer.

If TSH is low, a radionuclide thyroid scan may be used. This shows whether the nodule is making more hormone than the surrounding thyroid. Such a nodule is sometimes called "hot" or overactive. This scan is not the same as an ultrasound and is not needed for every nodule.

A fine-needle aspiration biopsy may be recommended based on the ultrasound appearance, size, lymph-node findings, and your risk factors. During this procedure, a thin needle removes cells for examination in a laboratory. It is usually guided by ultrasound and does not require an operation.

Biopsy results may be benign, cancerous, suspicious, indeterminate, or insufficient. "Indeterminate" means the cells do not clearly fit into a benign or cancerous category. Depending on the result, options may include another biopsy, molecular testing, surgery, or ultrasound follow-up.

Treatment and management

Treatment is based on the nodule's cause, ultrasound and biopsy results, thyroid function, growth, and symptoms.

A benign nodule that is not causing problems often needs monitoring rather than immediate treatment. Monitoring may include neck examinations and repeat ultrasound. The timing is based on the nodule's appearance and previous test results.

Routine treatment with high doses of thyroid hormone to shrink a benign nodule is generally avoided because it may cause an overly fast heartbeat, abnormal heart rhythm, or bone loss. Thyroid hormone may still be needed if you also have an underactive thyroid.

A nodule that makes too much thyroid hormone can be treated with radioiodine or surgery. Medicines may be used to control excess thyroid hormone or related symptoms, but they do not usually remove the nodule itself.

Surgery may be considered when a nodule:

The operation may remove one thyroid lobe or the whole gland. If the whole thyroid is removed, lifelong thyroid hormone replacement is needed. Some people also need it after one lobe is removed.

Selected benign nodules can be treated with image-guided procedures. Ethanol injection may be used for recurring fluid-filled cysts. Thermal ablation uses heat to shrink certain solid nodules. Availability and suitability depend on local expertise and confirmed benign test results.

- Is cancerous or has concerning biopsy findings
- Causes pressure, swallowing problems, or breathing difficulty
- Continues to enlarge
- Produces excess thyroid hormone
- Cannot be classified adequately after further testing

Complications

A growing nodule can press on the swallowing tube, windpipe, or nearby nerves. This may lead to swallowing difficulty, breathlessness, or voice changes.

An overactive nodule can cause ongoing hyperthyroidism. If untreated, excess thyroid hormone can affect the heart and bones.

Some thyroid nodules are cancerous. The outlook and treatment depend on the exact cancer type and whether it has spread. Many common thyroid cancers can be treated successfully, but an individual outcome cannot be predicted from the presence of a nodule alone.

Biopsy and treatment also have risks. A biopsy may cause temporary soreness or bruising.

Surgery can affect the voice, calcium control, or thyroid hormone levels, although the specific risks differ according to the operation.

Prevention

Most thyroid nodules cannot be prevented. They often arise from cell changes, cyst formation, inflammation, or inherited risks that are outside your control.

A normal dietary intake of iodine supports thyroid health. In places where salt is iodised, most people do not need iodine supplements. Taking high-dose iodine without medical advice can worsen some thyroid conditions.

Avoiding unnecessary radiation exposure is sensible, but medically needed imaging and treatment should not be skipped because of concern about thyroid nodules. Imaging professionals use measures intended to limit exposure.

If you have a strong family history of thyroid cancer or an inherited cancer syndrome, planned medical follow-up may help find thyroid changes earlier. It cannot guarantee that nodules will be prevented.

Living with it and what to expect

Many benign thyroid nodules stay stable or change only slowly over months and years. Some shrink, especially if fluid drains from a cyst, while others grow. Growth does not automatically mean cancer, but it may lead to another ultrasound or biopsy.

Follow-up is tailored to the ultrasound pattern, biopsy result, symptoms, and changes over time. A clearly benign nodule may need less monitoring than one with uncertain features. Keep scheduled appointments even if the lump feels unchanged, because small changes are easier to assess on ultrasound than by touch.

If treatment removes or shrinks the nodule, pressure symptoms may improve. Further monitoring may still be needed, particularly when other nodules remain.

After thyroid surgery, blood tests check whether your body is receiving enough thyroid hormone. People who need thyroid hormone replacement can usually continue their usual activities once the dose is stable.

When to get medical help

Arrange a routine medical appointment if you discover a new neck lump or notice that a known thyroid nodule is growing. Also seek assessment for persistent hoarseness, repeated difficulty swallowing, unexplained symptoms of an overactive thyroid, or enlarged lymph nodes in your neck.

Contact your healthcare service promptly if a nodule enlarges quickly, becomes painful, or is accompanied by fever. Sudden swelling can sometimes result from bleeding into a cyst and should be assessed, particularly if you take medicines that affect blood clotting.

Seek emergency care if you have:

These symptoms are uncommon, but they require urgent assessment rather than waiting for a routine thyroid appointment.

- New or worsening difficulty breathing
- Noisy, high-pitched breathing
- Rapid neck swelling that is affecting your airway
- Inability to swallow saliva
- Chest pain, fainting, or a severe sustained rapid heartbeat

Common questions

Is a thyroid nodule cancer?

Most thyroid nodules are not cancer. The chance cannot be judged by touch or size alone. Ultrasound features, personal risk factors, lymph-node findings, and sometimes a fine-needle biopsy are used to assess it.

Can a thyroid nodule go away on its own?

Some cystic nodules shrink or disappear, while solid nodules often remain. A nodule may also refill after fluid is drained. Whether treatment is useful depends more on symptoms, hormone production, and test findings than on whether the lump disappears.

What size thyroid nodule needs a biopsy?

There is no single size that applies to every nodule. Ultrasound appearance is important: a smaller nodule with concerning features may need biopsy, while a larger nodule with reassuring features may be monitored. Your history and nearby lymph nodes also affect the decision.

Can a thyroid nodule cause weight gain?

Most nodules do not change thyroid hormone levels and therefore do not cause weight gain.

Weight gain may occur if you have an underactive thyroid condition at the same time. Blood tests can check thyroid function.

Should I avoid iodine or certain foods?

A balanced diet is usually appropriate, and there is no standard "thyroid nodule diet." Do not start high-dose iodine, kelp, or "thyroid support" supplements without medical advice. These products may contain unpredictable amounts of iodine or thyroid-related ingredients.

Does a growing thyroid nodule mean cancer?

Not necessarily. Benign nodules can enlarge because of cell growth, fluid accumulation, or bleeding into a cyst. Growth should still be reported because repeat imaging or biopsy may be appropriate.

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