CONDITION

Thyroid cancer

Thyroid cancer is abnormal cell growth that begins in the thyroid gland in the neck.

WHAT IT IS
Cancer beginning in the thyroid gland

BODY SYSTEM
Hormone system

MAIN SYMPTOMS
Neck lump, hoarseness, swallowing difficulty, swollen neck glands

WHAT CAUSES IT
DNA changes, usually from unknown causes

HOW IT IS DIAGNOSED
Thyroid ultrasound and needle biopsy

MAIN TREATMENT
Surgery, sometimes radioactive iodine, radiotherapy, or targeted medicines

CAN IT BE CURED?
Sometimes - early differentiated cancers are often curable

IS IT AN EMERGENCY?
Sometimes - severe breathing difficulty needs emergency care

LONG-TERM OUTLOOK
Often excellent, but poorer for aggressive or advanced types

Overview

Thyroid cancer begins in the thyroid, a small butterfly-shaped gland at the front of your neck. The thyroid makes hormones that help control how your body uses energy.

A thyroid nodule is a lump within the gland. Thyroid nodules are common, and most are not cancer. A nodule needs assessment when its size, appearance, growth, or associated symptoms suggest that testing would be helpful.

There are several types of thyroid cancer:

Papillary and follicular cancers are called differentiated thyroid cancers because their cells still resemble normal thyroid cells. They usually have a better outlook than anaplastic cancer.

The likely course depends on the cancer type, its size, whether it has spread, your age and general health, and how it responds to treatment. Many people with an early differentiated

cancer are treated successfully and continue their usual activities.

- Papillary thyroid cancer is the most common type and usually grows slowly.
- Follicular thyroid cancer also begins in cells that make thyroid hormones.
- Medullary thyroid cancer starts in cells that make calcitonin, another thyroid hormone. Some cases are inherited.
- Anaplastic thyroid cancer is uncommon but grows quickly and needs urgent specialist care.
- Other rare cancers, including lymphoma, can also begin in the thyroid.

Symptoms

Thyroid cancer may not cause symptoms at first. It is sometimes found during a neck examination or imaging performed for another reason.

Possible symptoms include:

These symptoms have many possible causes. For example, benign thyroid nodules, thyroid inflammation, infections, and other neck conditions can cause similar changes. Having one does not mean you have cancer.

Most thyroid cancers do not change thyroid hormone levels. Symptoms such as tiredness, weight change, or feeling unusually hot or cold are therefore not reliable signs of thyroid cancer.

- A new lump or swelling at the front or side of the neck
- A thyroid lump that is getting larger
- Swollen lymph nodes, sometimes called glands, in the neck
- Persistent hoarseness or another unexplained voice change
- Difficulty or discomfort when swallowing
- Pressure in the neck or trouble breathing
- Ongoing pain in the front of the neck, sometimes reaching the ears

Causes and risk factors

Thyroid cancer develops when genetic material inside thyroid cells changes. These changes allow cells to grow and survive when they normally would not. In most people, it is not possible

to identify one clear cause.

Factors associated with a higher risk include:

Inherited changes in the RET gene can cause familial medullary thyroid cancer. They can also cause multiple endocrine neoplasia type 2, known as MEN2. This condition can affect the thyroid and other hormone-producing glands.

Having a risk factor does not mean you will develop thyroid cancer. Many people diagnosed with it have no known risk factors.

- Previous exposure of the head or neck to significant ionising radiation, especially during childhood
- A close relative with thyroid cancer
- Certain inherited gene changes or syndromes
- A personal history of an enlarged thyroid or thyroid nodules
- Increasing age, although thyroid cancer can occur in younger people
- Being female, for most thyroid cancer types

Diagnosis

Assessment usually begins with questions about the lump, your symptoms, previous radiation exposure, and family history. A healthcare professional may examine your thyroid and the lymph nodes in your neck.

A thyroid ultrasound uses sound waves to show the nodule's size and structure. It can identify features that help determine whether a biopsy is appropriate. Ultrasound can also examine nearby lymph nodes.

A fine-needle aspiration biopsy removes cells through a thin needle, usually guided by ultrasound. A laboratory specialist examines the cells under a microscope. This is the main test used to diagnose many thyroid cancers.

Biopsy results can sometimes be uncertain. Molecular tests may look for gene changes that make cancer more or less likely. In other cases, surgery to remove part of the thyroid is needed before the diagnosis can be confirmed.

Blood tests commonly measure thyroid-stimulating hormone, or TSH, and thyroid hormone levels. These tests show how the gland is working, but normal results do not rule out thyroid cancer. Calcitonin and related tests may be used when medullary cancer is suspected.

If cancer is found, further tests may show its extent. These can include another ultrasound, CT

or MRI scans, radioactive iodine imaging, or other scans. Staging describes the cancer's size and whether it has reached lymph nodes or distant organs.

Genetic counselling and a blood test for inherited RET changes are important for people with medullary thyroid cancer. Results may also have implications for close relatives.

Treatment and management

Treatment is planned according to the cancer type, size, location, spread, genetic features, and your preferences. Care often involves thyroid surgeons, hormone specialists, cancer specialists, radiologists, and specialist nurses.

Surgery is the main treatment for many thyroid cancers. A surgeon may remove one thyroid lobe or the whole gland. Nearby lymph nodes may also be removed if cancer is present or strongly suspected there.

A carefully monitored active surveillance approach may be an option for some very small, low-risk papillary cancers. This means regular ultrasound and review rather than immediate surgery. It is not suitable for every tumour.

Radioactive iodine can destroy thyroid cells by using a form of iodine that gives off radiation. It may be offered after complete thyroid removal for selected differentiated cancers. Not everyone benefits from it, and it does not treat medullary or anaplastic cancer.

After the whole thyroid is removed, you need lifelong levothyroxine to replace thyroid hormone. In differentiated cancer, the dose may also be managed to keep TSH at a chosen level because TSH can stimulate thyroid cells. The target is adjusted over time rather than being the same for everyone.

Other treatments may include:

Medullary thyroid cancer is mainly treated with surgery when possible. Radioactive iodine is not useful because medullary cells do not absorb iodine. Targeted medicines may be used when the cancer is advanced.

Anaplastic thyroid cancer needs rapid assessment. Treatment may involve surgery, radiotherapy, targeted treatment, chemotherapy, and support for breathing or swallowing. Testing the tumour for gene changes can help identify treatment options.

- External-beam radiotherapy directed at a specific area
- Targeted medicines that block particular cancer growth signals
- Chemotherapy, mainly in selected aggressive or advanced cancers

- Treatments aimed at easing symptoms and protecting quality of life

Complications

Thyroid cancer can return in the thyroid area, lymph nodes, or other organs. Recurrence may happen years after initial treatment, which is why follow-up can continue long term.

A large or rapidly growing tumour may press on the windpipe, food pipe, nerves, or blood vessels. Cancer that spreads can cause symptoms related to the affected area, such as bone pain or breathing problems.

Possible effects of treatment include:

Surgical complications are not inevitable. Your team should explain the likely benefits and risks of the treatment being considered.

- An underactive thyroid requiring hormone replacement
- Low calcium if the nearby parathyroid glands are affected by surgery
- Temporary or lasting voice changes from injury or irritation to a nerve
- Neck stiffness, scarring, or swallowing discomfort
- Dry mouth, taste changes, or salivary gland problems after radioactive iodine
- Tiredness or other effects from radiotherapy or cancer medicines

Prevention

Most thyroid cancers cannot be prevented because their cause is unknown.

Avoiding unnecessary radiation exposure, particularly during childhood, may reduce avoidable risk. However, medically necessary imaging and radiotherapy can have important benefits. Imaging teams use methods intended to limit exposure.

If your family has an inherited RET gene change or MEN2, genetic counselling can clarify your risk. People who carry certain RET changes may be offered thyroid surgery before cancer develops. The timing is based on the particular gene change and specialist assessment.

There is no established routine screening programme for people at average risk who have no symptoms. Regularly pressing or scanning the thyroid without a medical reason can find harmless nodules and may lead to unnecessary procedures.

Living with it and what to expect

Many people with differentiated thyroid cancer complete treatment and live for many years without the cancer returning. Follow-up remains important because recurrence can occur even after a long period.

Appointments may include a neck examination, ultrasound, and blood tests. After treatment for differentiated cancer, thyroglobulin can act as a marker of remaining thyroid cells. Thyroglobulin antibodies are often checked because they can affect the result. Calcitonin and carcinoembryonic antigen, or CEA, may be followed after medullary cancer.

Your levothyroxine needs may change. Blood tests help keep thyroid hormone and TSH within the planned range. Tell your healthcare team about palpitations, tremor, unusual tiredness, heat or cold intolerance, or major weight changes, as these may suggest that the dose needs review.

Recovery from surgery often takes weeks, although the exact course differs. A scar may remain visible at first and usually becomes less noticeable over time. Voice or swallowing problems should be reassessed if they persist.

Advanced disease may be controlled for months or years with targeted medicines or other treatments, but the course is less predictable. Anaplastic cancer usually progresses much more quickly and has a poor outlook. Supportive and palliative care can be provided alongside cancer treatment to manage symptoms and support you and your family.

Thyroid cancer and repeated tests can cause worry, including fear that the cancer will return. A specialist nurse, counsellor, support group, or cancer charity may help you deal with uncertainty and practical concerns.

When to get medical help

Arrange a routine medical appointment if you notice a new or persistent neck lump, an enlarging thyroid nodule, unexplained hoarseness, swollen neck glands, or ongoing difficulty swallowing. These symptoms are usually caused by something other than cancer, but they should be assessed.

If you have been treated for thyroid cancer, contact your follow-up team if you develop a new neck lump, a lasting voice change, increasing swallowing difficulty, unexplained bone pain, or other new symptoms that do not settle.

Seek urgent same-day help for a neck swelling that is enlarging quickly, new noisy breathing, or rapidly worsening swallowing problems.

Call emergency services if you have severe difficulty breathing, feel that your airway is closing, cannot speak because of breathlessness, or develop blue or grey lips or skin.

Common questions

Is thyroid cancer curable?

Many early papillary and follicular thyroid cancers can be cured. Cure is less likely when cancer has spread widely or is an aggressive type. Medullary cancer can sometimes be cured with surgery when found before it spreads. Anaplastic cancer is rarely curable.

Is a lump in my thyroid usually cancer?

No. Most thyroid nodules are benign, meaning they are not cancer. Ultrasound findings, the nodule's size, your history, and sometimes a needle biopsy help determine whether it needs further investigation.

Will I need my whole thyroid removed?

Not always. Some people need only one thyroid lobe removed, while others need the whole gland removed. Selected very small papillary cancers may be monitored. The choice is based on the cancer's features and your preferences.

Will I need thyroid tablets for life?

You will need lifelong thyroid hormone replacement if your whole thyroid is removed. If only one lobe is removed, the remaining lobe may make enough hormone, but blood tests are needed to check.

Can thyroid cancer come back?

Yes, although many people never have a recurrence. It can return in the neck, lymph nodes, or elsewhere, sometimes years later. Follow-up tests are designed to find meaningful changes early.

Can thyroid cancer spread to other parts of the body?

It can. Papillary cancer often spreads first to neck lymph nodes and may still respond well to treatment. Follicular cancer can spread through the blood, including to bones or lungs. The pattern differs for medullary and anaplastic cancers.

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