National Comprehensive Cancer Network®

2026

NCCN Guidelines for Patients®

Cancer care recommendations from leading experts at the National Comprehensive Cancer Network® (NCCN®)

Thyroid Cancer



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Available online at NCCN.org/patientguidelines



NCCN Guidelines for Patients®

The essential guide for people facing cancer.

Based on care recommendations from leading cancer experts.

Explains high-quality cancer care provided at state-of-the-art cancer centers.

Reviewed and revised every year.

Did you know that top cancer centers across the United States work together to improve cancer care? This alliance of leading cancer centers is called the National Comprehensive Cancer Network® (NCCN®).

Because cancer care is always evolving, NCCN develops and frequently updates evidence-based cancer care recommendations used by health care providers worldwide. These recommendations are known as the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®).

The NCCN Guidelines for Patients plainly explain these expert recommendations, so you can talk with your care team about the best care for you.

These NCCN Guidelines for Patients are based on the NCCN Guidelines® for Thyroid Carcinoma, Version 2.2026 – June 2, 2026.

View the NCCN Guidelines for Patients free online: NCCN.org/patientguidelines

Find an NCCN Cancer Center near you: NCCN.org/cancercenters

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The way forward starts here.

National Comprehensive Cancer Network® Foundation

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NCCN Foundation seeks to support the millions of patients and their families affected by a cancer diagnosis by funding and distributing NCCN Guidelines for Patients. NCCN Foundation is also committed to advancing cancer treatment by funding the nation's promising doctors at the center of innovation in cancer research. For more details and the full library of patient and caregiver resources, visit NCCN.org/patients.

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About thyroid cancer

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7 How can I get the best care?

There are different types of thyroid cancer. Most are curable with the right treatment. Surgery is recommended for most thyroid cancers.

What is thyroid cancer?

Thyroid cancer is a disease that forms in the thyroid—a butterfly-shaped gland in the front of the neck. It has 2 lobes, a right and a left. A thin piece of tissue called the isthmus connects the lobes.

The thyroid makes substances called hormones. Hormones circulate in your blood and help regulate body temperature, blood pressure, heart rate, weight, and metabolism (how fast food becomes fuel for your body).

The main hormone made by the thyroid is thyroxine (T4), along with a small amount of triiodothyronine (T3). The thyroid uses a mineral (iodine) found in certain foods and iodized salt to make these hormones.

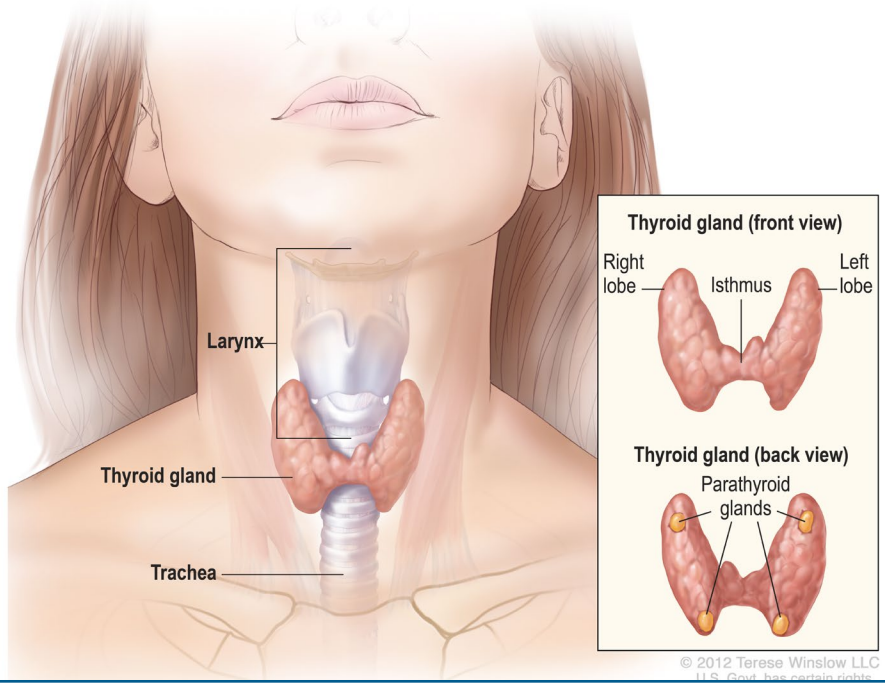
There are 4 pea-sized glands on the back of the thyroid, called parathyroid glands. These glands control the amount of calcium in your bloodstream.

Thyroid nodules

Thyroid nodules are small, often round areas of abnormal growth in the thyroid gland. Very small nodules usually can't be seen or felt. Your provider may be able to see or feel a large nodule while examining your lower neck.

Thyroid gland

The thyroid is a butterfly-shaped gland in the lower front part of the neck. It makes hormones that control blood pressure, metabolism, and other body functions.



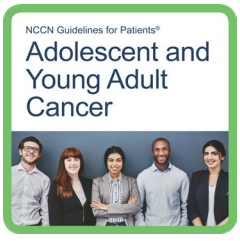
Most thyroid nodules aren't cancerous and don't cause symptoms. Many are found on imaging tests done for a different reason. Symptoms of a larger nodule could include:

- A visible lump in the neck
- Neck pain
- Voice changes
- Trouble breathing
- Problems swallowing

Who is at risk for thyroid cancer?

People assigned female at birth are 3 times more likely to be diagnosed with thyroid cancer than those assigned male at birth.

Compared to other cancers, thyroid cancer is often diagnosed earlier in adulthood. It's the most common cancer in adults aged 18 to 33 years. For more information on cancer in this group, see *NCCN Guidelines for Patients: Adolescent and Young Adult Cancer* at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.



Anything that increases the chances of developing a disease is called a risk factor. The most well-known risk factors for thyroid cancer are described next. However, most people with thyroid cancer have no known risk factors.

Radiation exposure

Anyone who has had radiation treatment to the head or neck in the past (to treat a childhood cancer, for example) is at increased risk of thyroid cancer.

Exposure to large amounts of radiation in the environment (from a nuclear reactor meltdown, for example) also increases the risk of developing a thyroid cancer.

Family history

Most thyroid cancers are sporadic, meaning there is no clear cause or risk factor. Only a small number are the result of inherited gene differences (hereditary).

A personal or family history of thyroid cancer or a related syndrome may increase risk. Syndromes related to thyroid cancer include familial adenomatous polyposis (FAP), Carney complex, Cowden syndrome, and multiple endocrine neoplasia (MEN).

Cowden syndrome is also known as *PTEN* hamartoma tumor syndrome (PHTS). This inherited syndrome can cause follicular thyroid cancer as well as other cancers and health problems. Tell your provider if you have a personal or family history of breast, endometrial, or colorectal cancer.

How is thyroid cancer treated?

Surgery is the most effective treatment for most thyroid cancers. Surgery may involve removing the whole thyroid gland (a total thyroidectomy), or just the lobe that contains cancer (a thyroid lobectomy). For some small and slow-growing cancers, surgery may not be needed unless the nodule grows or spreads.

For differentiated cancers at high risk of returning after total thyroidectomy, radioactive iodine (RAI) therapy may be given to kill microscopic cancer cells in cancers that take up iodine.

After a total thyroidectomy, a medicine called levothyroxine is used to replace the hormones no longer being supplied by the thyroid. This is called thyroid hormone replacement therapy. It's needed lifelong for everyone who has had total a thyroidectomy. After a lobectomy, about 1 in 5 people need thyroid hormone replacement therapy.

How can I get the best care?

Advocate for yourself. You have an important role to play in your care. Many people feel more satisfied when they actively take part in planning their cancer care.

The NCCN Guidelines for Patients will help you play a larger role in your care. Discuss the recommendations in this guide with your care team. Ask questions about your options and share your goals and concerns.

Don't know what to ask? You're not alone. That's why we include suggested questions to ask at the end of chapters. Keep reading to find the best care for you.

How this guide can help you

Making decisions about cancer care is stressful. There's a lot to learn, and you don't know what the future holds.

Use this guide to get the information and support you need.

Patients, doctors, and other health care professionals trust the NCCN Guidelines for Patients. This guide uses clear, everyday language to explain current cancer care recommendations made by respected experts in the field. Their recommendations are based on the latest research and practices at leading cancer centers.

Your health is unique to you, so your cancer care should be, too. As you read this guide, you'll learn which treatments are likely to provide the best results for you. And you'll be better prepared to talk with your care team.

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Testing for thyroid cancer

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If your doctor finds or suspects you have a thyroid nodule, they will order a thyroid-stimulating hormone (TSH) blood test and an ultrasound of your neck and thyroid. Your doctor will use these results to decide whether a biopsy is needed.

TSH testing

Thyroid-stimulating hormone (TSH) is made by the pituitary gland, located near the base of the brain. TSH controls the hormones made by the thyroid.

A TSH blood test can't diagnose thyroid cancer. The level is checked to learn if the nodule is producing thyroid hormone. Nodules that produce thyroid hormone (about 1 in 20) are rarely cancerous.

A high TSH level usually means that the thyroid hormone levels are low. A low TSH level usually means that the thyroid hormone levels are high. This is called hyperthyroidism or overactive thyroid.

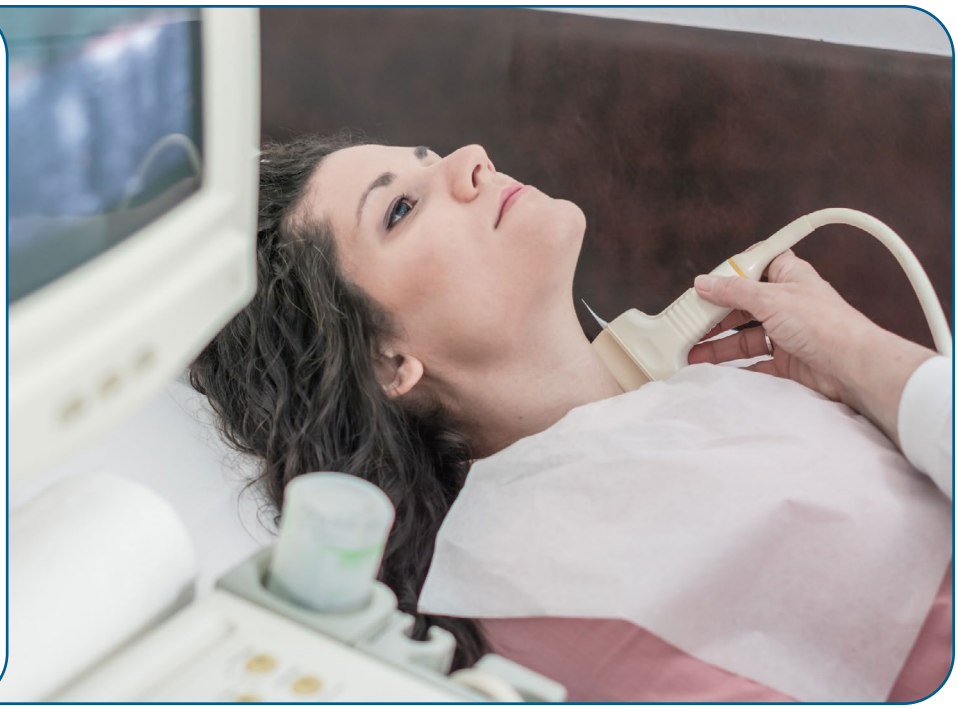
Thyroid and neck ultrasound

Ultrasound is the most common imaging technique used to look for thyroid cancer. It uses sound waves to form images showing the size, shape, and location of a thyroid nodule.

Ultrasound of the thyroid and neck is brief and painless. It's usually done lying down. After applying a gel to the skin, your endocrinologist will glide a handheld device called a probe back and forth over the thyroid area.

Ultrasound

An ultrasound of the thyroid and neck is one of the first tests ordered if a thyroid nodule is known or suspected.



Needle biopsy

Your endocrinologist will consider the nodule size and other features seen on the ultrasound to determine whether to remove samples of the nodule for testing (a biopsy).

If a biopsy is needed, fine-needle aspiration (also called needle biopsy or FNA) is recommended. This method uses a thin needle to take small samples of suspicious thyroid nodules. Ultrasound is usually done at the same time to help pinpoint the suspicious areas.

In certain types of lesions, such as follicular and oncocytic tumors, fine-needle biopsy can identify the nature of the cells but can't determine if the nodule is cancerous. For these lesions, surgery is often needed to make a final diagnosis.

Pathology review

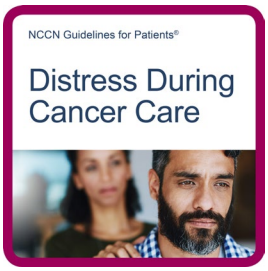
The biopsy samples are sent to a pathologist. Pathologists are physicians with expertise in examining tissues and cells to diagnose disease. By examining the sample under a microscope, the pathologist is able to determine whether the nodule is cancerous and, if so, the cancer type.

Papillary, follicular, and oncocytic carcinomas are known as differentiated thyroid cancers. These cancers usually grow and spread slowly. Treatment for these types is the focus of Chapter 4.

A rare type called medullary thyroid cancer starts in a different type of cell than differentiated cancers. While not typical, medullary thyroid cancer can be inherited. This type is the focus of Chapter 5.

Anaplastic thyroid cancer is the most aggressive type of thyroid cancer. It's rare and most often affects older adults. This type is the focus of Chapter 6.

The cancer type and other features of biopsied lesions are recorded in a pathology report. Ask for a copy of the report for your records. Your care team uses it to plan the next steps of care.



It's okay to ask for help

Ask for help if you are feeling sad, scared, helpless, angry, anxious, or any emotions that can come with a cancer diagnosis. Your care team should ask about these symptoms of emotional distress and others. It's a recommended part of cancer care. If they don't, speak up.

For more information about cancer and distress, see *NCCN Guidelines for Patients: Distress and Cancer Care* at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.



Key points

- Although most nodules aren't cancerous, thyroid-stimulating hormone (TSH) testing and ultrasound are recommended if a thyroid nodule is known or suspected.
- Your provider will use the ultrasound results to determine whether a needle biopsy is needed.
- Biopsy samples are sent to a pathologist. The pathologist determines whether the nodule is cancerous and, if so, the cancer type.

Questions to ask

- Is the nodule cancerous? If so, what type of cancer is it?
- Did the ultrasound find any suspicious lymph nodes?
- Can you give me a copy of my pathology report?

3
Types of treatment

13 Total thyroidectomy

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Surgery is the most effective and commonly used treatment for thyroid cancer. This chapter describes the 2 main types of surgery and the other types of treatment you may receive for thyroid cancer.

Total thyroidectomy

A total thyroidectomy is surgery to remove the entire thyroid gland. Your surgeon will also remove any nearby lymph nodes that are known or suspected to contain cancer cells. This is called a therapeutic neck dissection.

Total thyroidectomy is performed while you are under general anesthesia. Ask your surgeon if you can go home the same day or if you need to stay overnight. After being discharged, be sure to follow the instructions for at-home care. Contact your care team about any new or worsening side effects.

Possible long-term side effects of removing the thyroid include:

- Low levels of calcium in the blood (hypoparathyroidism)
- Damage to the nerves that control your voice and swallowing

Thyroid hormone replacement

After a total thyroidectomy, medicine is used to replace the hormones no longer being supplied by the thyroid. This is called thyroid hormone replacement therapy. It's needed lifelong for everyone who has had total thyroidectomy.

Levothyroxine (for example, Levoxyl, Synthroid) is the most commonly used thyroid hormone replacement therapy. The goal for most people is to keep the level of thyroid-stimulating hormone (TSH) in the **normal** range.

For some differentiated thyroid cancers, the TSH level is kept lower than the normal range (**suppressed**). Suppression helps prevent thyroid cancer cells from growing or returning. For some higher risk thyroid cancers, suppression is an important part of cancer care.

Levothyroxine is taken as a pill once a day. It's generally best to take it on an empty stomach, at least 30 minutes prior to eating a meal. Otherwise, it may not be adequately absorbed into the blood. Try to avoid taking vitamins within 4 hours of levothyroxine.

Your doctor can find the right dose of thyroid hormone for you by checking the TSH level and adjusting the dose as needed. Symptoms that mean your dose is too high include:

- Feeling nervous or anxious
- Trouble sleeping
- Fast heartbeat or pounding heart
- Sweating
- Weight loss

Too much levothyroxine can cause health problems, including:

- Weakened bones (osteoporosis)
- Heart rhythm problems
- Having too much thyroid hormone (thyrotoxicosis)
- High blood pressure

Calcium and vitamin D

Your provider may recommend taking calcium and vitamin D supplements to help strengthen your bones.

Thyroid lobectomy

A lobectomy removes the lobe (half) of the thyroid that contains the cancerous nodule. The tissue connecting the two lobes (the isthmus) is also removed.

As explained later in this guide, lobectomy is preferred over total thyroidectomy for some small and low-risk differentiated thyroid cancers.

Lobectomy is performed while you are under general anesthesia. The surgeon makes a small incision in the front of the neck to remove the cancerous lobe and the isthmus.

Do I need to take levothyroxine?

Because the thyroid continues to make hormones after a lobectomy, you may not need to replace thyroid hormone. About 1 in 5 people need levothyroxine after lobectomy.

Getting your dose right

Your endocrinologist uses the TSH level to determine the right dose of levothyroxine for you. If your dose isn't optimal, you may experience anxiety, trouble sleeping, sweating, and a racing heart. Tell your care team if you have any of these symptoms.



Radioactive iodine

Radioactive iodine (RAI) therapy uses a form of radioactive iodine (iodine-131) to selectively kill thyroid cancer cells that take up (“eat”) iodine.

RAI therapy may be used in the following situations:

- Shortly after thyroidectomy for lower risk cancers, using lower dose iodine-131 (also known as remnant ablation)
- To lower the chances that a high-risk cancer will return after treatment
- To treat thyroid cancer that has spread within the body

RAI therapy is typically only considered for papillary and follicular thyroid cancers that take up iodine. It isn't effective against medullary or anaplastic thyroid cancer.

How is it given?

RAI therapy comes in liquid or pill form and is taken by mouth. You may be asked to eat a diet low in iodine for 1 to 2 weeks before starting this treatment.

You need a high level of TSH for RAI therapy. To allow the TSH to rise appropriately, thyroid hormone replacement (levothyroxine) may be stopped for 4 to 6 weeks.

If stopping levothyroxine isn’t recommended for you, hormone injections of thyrotropin alfa (Thyrogen) can be used to increase the TSH level. Thyrotropin alfa activates iodine uptake so that hormone replacement can be continued.

Possible side effects of RAI therapy include:

- Neck pain or swelling in glands near the jaw
- Nausea and vomiting
- Dry mouth or eyes
- Watery eyes
- Change in taste or smell

The dose of RAI therapy is often adjusted for children with thyroid cancer and people on dialysis for kidney disease. If any cancer can be removed by surgery, this will be considered before RAI therapy is started.

Safety measures

The radiation will exit your body through urine and other body fluids. This means that your body will give off small amounts of radiation after treatment. For a short time, you will need to take safety measures around others, especially children and pregnant people.

Whole body RAI scan

After RAI therapy, a whole body radioiodine scan is performed to look for remaining thyroid tissue and hidden areas of thyroid cancer in the body. At some treatment centers, a whole body scan is also done before RAI therapy.

This imaging can be done using small doses of iodine-131 or a similar form of radioactive iodine called iodine-123.

Radiation therapy

Radiation therapy is the use of high-energy radiation from x-rays, gamma rays, protons, and other sources to kill cancer cells and shrink tumors. When radiation is given using a large machine outside the body, it's called external beam radiation therapy (EBRT).

EBRT is rarely used to treat common types of thyroid cancer. Treatment for anaplastic thyroid cancer, in contrast, often involves EBRT.

Radiation therapy can also relieve symptoms caused by cancer spread, such as difficulty or painful swallowing, loss of your voice, and neck pain or stiffness.

If the cancer has metastasized to the bones, brain, or other organs, radiation therapy can help stop or control cancer growth in those areas.

You will first have a planning session called a simulation. You will be placed in the treatment position, and a CT scan or other type of scan will be done. The images will be used to make a radiation plan tailored to your body and cancer.

During radiation treatment, you will lie on a table in the same position as during the simulation. A technician will operate the machine from a nearby room but will be able to see, hear, and speak with you at all times. You won't feel anything while the radiation is being delivered. One treatment session can take 30 to 60 minutes. It's common to have 5 sessions per week.



Care team

Treating thyroid cancer takes a team of experts. Your care team may include an endocrinologist, radiologist, nuclear medicine specialist, surgeon, radiation oncologist, and medical oncologist.

You and your team will decide on a treatment plan that's best for you. This written course of action covers every phase of the treatment process.

Systemic therapy

Systemic therapy is treatment with substances that travel in the bloodstream, reaching and affecting cells throughout the body.

While most thyroid cancers don't need systemic therapy, the following information can be helpful if systemic therapy is planned.

Targeted therapy

Targeted therapies are medicines that can target and attack specific types of cancer cells. The type most often used for thyroid cancer are called **kinase inhibitors**. Most are capsules that you swallow.

Targeted therapy is generally only used for thyroid cancers that:

- Can't be treated with surgery or RAI therapy
- Have returned after treatment
- Have spread to areas far from the neck (metastasized) and continue to grow

Possible side effects of kinase inhibitor therapy include fatigue, body aches, rash, high blood pressure, diarrhea, and abnormal bleeding.

Some targeted therapies have serious side effects that can affect your heart, skin, and digestive system. If systemic therapy is planned, ask your care team for a complete list of potential side effects.

Chemotherapy

Chemotherapy doesn't work well against most thyroid cancers. It may be used for cancer that isn't responding to other treatment, or that has spread to distant areas of the body.

It's most often used in combination with radiation therapy for the least common and most aggressive type of thyroid cancer—anaplastic.

Most chemotherapy medicines are put directly into the bloodstream through a vein. Common side effects include fatigue, nausea and vomiting, hair loss, mouth sores, and loss of appetite. If chemotherapy is planned, ask your care team about the possible short- and long-term side effects.

Immunotherapy

Immunotherapy with an immune checkpoint inhibitor increases the activity of parts of your immune system. This helps your body find and destroy cancer cells.

Immune checkpoint inhibitors have unique side effects. Unlike other cancer treatments, the side effects of immunotherapy occur because the immune system is attacking healthy cells.

Learning about possible side effects can help you notice reactions early and report them to your care team. More information on the side effects of immune checkpoint inhibitors is available at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.



Clinical trials

A clinical trial is a type of medical research study. After being developed and tested in a lab, potential new ways of fighting cancer need to be studied in people.

If found to be safe and effective in a clinical trial, a drug, device, or treatment approach may be approved by the U.S. FDA.

Everyone with cancer should carefully consider all of the treatment options available for their cancer type, including standard treatments and clinical trials. Talk to your doctor about whether a clinical trial may make sense for you.

Phases

Most cancer clinical trials focus on treatment and are done in phases.

- **Phase 1** trials study the safety and side effects of an investigational drug or treatment approach.
- **Phase 2** trials study how well the drug or approach works against a specific type of cancer.
- **Phase 3** trials test the drug or approach against a standard treatment. If the results are good, it may be approved by the FDA.
- **Phase 4** trials study the safety and benefit of an FDA-approved treatment.

Who can enroll?

It depends on the clinical trial's rules, called eligibility criteria. The rules may be about age, cancer type and stage, treatment history, or general health. They ensure that participants are alike in specific ways and that the trial is as safe as possible for the participants.



Finding a clinical trial

In the United States

NCCN Cancer Centers

NCCN.org/cancercenters

The National Cancer Institute (NCI)

cancer.gov/about-cancer/treatment/clinical-trials/search

Worldwide

The U.S. National Library of Medicine (NLM)

clinicaltrials.gov

Need help finding a clinical trial?

NCI's Cancer Information Service (CIS)

1.800.4.CANCER (1.800.422.6237)

cancer.gov/contact

Informed consent

Clinical trials are managed by a research team. This group of experts will review the study with you in detail, including its purpose and the risks and benefits of joining. All of this information is also provided in an informed

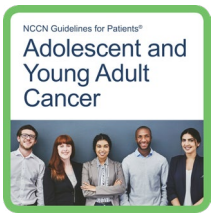
consent form. Read the form carefully and ask questions before signing it. Take time to discuss it with people you trust. Keep in mind that you can leave and seek treatment outside of the clinical trial at any time.

Will I get a placebo?

Placebos (inactive versions of real medicines) are almost never used alone in cancer clinical trials. It is common to receive either a placebo with a standard treatment, or a new drug with a standard treatment. You will be informed, verbally and in writing, if a placebo is part of a clinical trial before you enroll.

Are clinical trials free?

There is no fee to enroll in a clinical trial. The study sponsor pays for research-related costs, including the study drug. But you may need to pay for other services, like transportation or childcare, due to extra appointments. During the trial, you will continue to receive standard cancer care. This care is often covered by insurance.



Fertility and family planning

If you want the option of having children after treatment or are unsure, ask your care team about any fertility-related risks of your treatment plan. They can also refer you to a fertility specialist.

For more information on fertility and family planning, see *NCCN Guidelines for Patients: Adolescent and Young Adult Cancer* at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.

Key points

- Your treatment team may include an endocrinologist, radiologist, nuclear medicine doctor, surgeon, radiation oncologist, and medical oncologist.
- Surgery is the main treatment for most thyroid cancers. Radioactive iodine (RAI) therapy may be used after total thyroidectomy to kill any remaining cancer cells.
- Thyroid hormone replacement therapy with levothyroxine is needed lifelong after total thyroidectomy. About 1 in 5 people need hormone replacement after lobectomy.
- External beam radiation therapy (EBRT) is used for more aggressive, recurrent, or metastatic cancers that can't be removed surgically.
- Targeted therapy may be an option for thyroid cancers that don't respond to other treatments, or that have metastasized and continue to grow.
- Clinical trials provide access to investigational treatments that may, in time, be approved by the U.S. FDA.

Questions to ask

- Can I go home the same day after total thyroidectomy?
- What are the side effects of thyroidectomy?
- Should I take calcium and vitamin D supplements after surgery?



Take our survey and help make the NCCN Guidelines for Patients better for everyone!

NCCN.org/patients/comments

4

Papillary, follicular, and oncocytic carcinoma

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Papillary, follicular, and oncocytic carcinoma are known as differentiated thyroid cancers. These types usually grow slowly and have good treatment outcomes. Differentiated thyroid cancers are treated with surgery to remove all or part of the thyroid. Active surveillance may be an option for some very low-risk cancers. This involves closely monitoring the cancer instead of performing surgery first.

For many years, all thyroid cancers were treated by removing the entire thyroid (a total thyroidectomy). However, removing only the half that contains cancer (a thyroid lobectomy) is just as effective for treating many low-risk cancers that haven't grown or spread beyond the thyroid.

A potential benefit of lobectomy is that you may not need any thyroid hormone replacement therapy, or you may be prescribed a lower dose.

Another potential benefit is that there are typically fewer complications (such as voice changes) after lobectomy than after total thyroidectomy.

Talk to your care team about which procedure they recommend for you (thyroidectomy or lobectomy) and why.

Papillary thyroid cancer

Papillary thyroid carcinoma (PTC) is the most common of all the thyroid cancers. The most common subtype of PTC is **classic type**. Other subtypes that may grow and spread more quickly include:

- Tall cell
- Columnar cell
- Hobnail
- Diffuse sclerosing

Is surgery always needed?

No. Some tiny, low-risk papillary nodules can be safely monitored without surgery. This approach is called **active surveillance**.

Active surveillance isn't typically recommended for nodules larger than 1 centimeter (cm) (about the size of a single pea) or for fast-growing nodules. Eligible cancers haven't grown or spread at all beyond the thyroid.

If this approach is planned, a neck ultrasound is recommended every 6 months for 1 to 2 years, and then yearly after that. If—at any point during surveillance—there are changes in test results that show the cancer is getting worse, surgery is recommended.

If active surveillance is an option for you, consider this commitment and discuss it with your care team.

Total thyroidectomy

When it can be performed safely, total thyroidectomy is a treatment option for most papillary thyroid cancers. However, depending on the size and other features

of the nodule, removing only the lobe with cancer (lobectomy) may be preferred.

Thyroid cancer is considered **invasive** if it has grown outside the thyroid gland. Total thyroidectomy is recommended for all invasive papillary cancers, and for many tumors larger than 4 cm (about the size of a walnut). There are other reasons your doctor may recommend total thyroidectomy.

If your surgeon successfully removes all visible cancer, radioactive iodine (RAI) therapy might be used to kill cancer cells left in the body. RAI therapy is generally only recommended for cancers at higher risk of coming back. See page 15 for more information on RAI therapy.

On the other hand, if a concerning amount of cancer remains after surgery, the next step may be another surgery (if possible) to remove the remaining thyroid. Other options for treatment may include a combination of the following:

- RAI therapy (preferred for cancers that take up iodine)
- External radiation therapy (rarely)
- Systemic therapy
- Monitoring

After treatment with 1 or more of the above, thyroid hormone replacement therapy with levothyroxine is started. This keeps the thyroid-stimulating hormone (TSH) level low or normal.

See page 26 for information on follow-up testing and surveillance after total thyroidectomy.

Differentiated thyroid cancers

Papillary, follicular, and oncocytic carcinoma are known as differentiated thyroid cancers. These types usually grow slowly and have good treatment outcomes. Differentiated thyroid cancers are treated with surgery to remove all or part of the thyroid.



Thyroid lobectomy

If the tumor is small (less than 4 cm in size) and hasn't grown or spread beyond the thyroid (noninvasive), lobectomy is often preferred over total thyroidectomy.

The extent of the cancer can't be fully known until the surgeon sees the thyroid, tumor, and surrounding areas firsthand, as well as the results of the pathology exam of the removed tissues. If the cancer is larger or more invasive than expected during lobectomy, the surgeon will usually decide during surgery to remove the entire thyroid.

After lobectomy, an expert called a pathologist will examine the tumor and other tissues removed during surgery. If the results of surgery and the pathology exam are very good and no high-risk features are found, more surgery isn't needed.

If the pathologist finds certain concerning or high-risk features, another surgery to remove the rest of the thyroid (completion thyroidectomy) is recommended. The surgeon will remove any remaining lymph nodes near the thyroid that are known to have cancer.

Your doctor might recommend thyroid hormone replacement therapy with levothyroxine to keep the TSH level in the normal range. Because the thyroid continues to make hormones after a lobectomy, only about 1 in 5 people need hormone replacement therapy.

See page 26 for information on follow-up testing and surveillance.

NIFTP

The pathology exam after surgery may find that the tumor is a noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP). An NIFTP is a low-risk, noninvasive thyroid tumor.

NIFTP was previously known as the encapsulated follicular variant of papillary thyroid cancer. No further treatment is needed after an NIFTP is surgically removed.

Follicular and oncocytic carcinoma

Follicular thyroid carcinoma (FTC) is the second most common type of thyroid cancer. Unlike papillary cancers, FTC spreads mainly through the bloodstream rather than through the lymphatic system.

Oncocytic thyroid carcinoma (OTC) is an uncommon differentiated cancer that tends to have spread by the time it is diagnosed. This type was formerly known as Hürthle cell carcinoma (HCC).

These differentiated thyroid cancers can't be diagnosed with needle biopsy alone. To be diagnosed as follicular or oncocytic cancer, the cancer must have grown into veins or arteries in and around the thyroid, or into the outer layer of the tumor. This means that surgery is necessary, because a pathologist has to examine the entire tumor in order to make the diagnosis.

Total thyroidectomy

Thyroid cancer is considered invasive if it has grown beyond the thyroid. Total thyroidectomy is recommended for an invasive tumor suspected to be follicular or oncocytic. The surgeon will also remove any nearby

lymph nodes known to have cancer. Total thyroidectomy is also often recommended for tumors larger than 4 cm.

After surgery, everything that was removed or sampled (biopsied) is examined by a pathologist. They may find that the tumor is benign (not cancer). In this case, no more cancer treatment is needed. Lifelong thyroid hormone replacement therapy is needed, however.

If the pathology exam confirms follicular or oncocytic thyroid cancer, further treatment depends on the results of surgery. If the surgeon is able to remove all visible cancer, RAI therapy will be considered for follicular thyroid cancers.

Or, if a concerning amount of cancer remains after surgery, your treatment options may include:

- Another surgery (preferred, if possible)
- RAI therapy (rarely used for oncocytic thyroid cancer)
- Radiation therapy
- Systemic therapy
- Monitoring of residual cancer

After treatment with one or more of the above, thyroid hormone replacement therapy with levothyroxine is started. It keeps the TSH level low or normal.

See the next page for information on follow-up testing and surveillance after total thyroidectomy.

Lobectomy

If the cancer is minimally invasive (hasn’t spread beyond the thyroid), lobectomy may be a treatment option instead of thyroidectomy.

The extent of the cancer can't be fully known until the surgeon sees the thyroid, tumor, and surrounding areas firsthand, as well as the results of the pathology exam of the removed tissues. If the cancer is more invasive than expected during a lobectomy, the decision is usually made during surgery to remove the entire thyroid.

Depending on the extent of cancer observed during surgery and the results of the pathology exam, you may have more surgery to remove the rest of the thyroid. If the cancer is invasive, removing the rest of the thyroid is recommended.

For less invasive or minimally invasive cancer, one option is a watch-and-wait approach to monitor the cancer. If this option is planned, you may receive levothyroxine to keep your TSH level normal. Because the thyroid continues to make hormones after a lobectomy, you may not need any thyroid hormone replacement.

If the nodule removed during lobectomy is benign, monitoring is recommended. In some cases, you may receive levothyroxine to keep your TSH level normal.

See page 26 for information on follow-up testing and surveillance after lobectomy.

Follow-up testing and surveillance

In addition to the surveillance testing described next, a range of other care is important for thyroid cancer survivors. See *Chapter 7: Survivorship* for more information.

Surveillance after total thyroidectomy

Short-term follow-up after total thyroidectomy involves a physical exam and blood tests. A neck ultrasound is recommended 6 to 12 months after surgery.

If you had RAI after surgery, you may have whole body RAI imaging to look for cancer after treatment. It may be helpful for cancers that had high-risk features, for metastatic tumors that took up iodine, or if you have abnormal blood or ultrasound results.

Blood testing will measure the levels of the following:

- Thyroid-stimulating hormone (TSH)
- Thyroglobulin (Tg)
- Anti-thyroglobulin antibodies (Tg ab)

Thyroglobulin (Tg) is only made by thyroid tissue. After the thyroid is removed, there should be a low level of Tg in the blood. If the Tg level rises, it could be a sign that further testing is needed to check for thyroid cancer recurrence.

Some people with thyroid cancer make antibodies in response to Tg. These antibodies can make it hard to get an accurate measurement of the Tg level. If the level of these antibodies goes down, it may be a sign that treatment is working. If the level goes up, further testing should be done to check for cancer recurrence.

Neck ultrasound

Neck ultrasound is used to monitor for the return of thyroid cancer. Talk to your care team about how often you need ultrasounds.



Long-term monitoring

If follow-up test results are normal, it's considered complete remission. Longer-term surveillance during complete remission includes physical exams, blood tests (TSH, Tg, and Tg ab), and periodic neck ultrasound.

Neck ultrasound is recommended every 1 to 3 years for 5 to 8 years. After that, ultrasounds are no longer needed.

If you have no evidence of disease (NED) for 10 to 15 years, you meet the criteria for complete remission. No further surveillance for thyroid cancer is needed.

Surveillance after lobectomy

Short-term follow-up after lobectomy involves a physical exam and TSH blood test. A neck ultrasound is recommended 6 to 12 months after surgery.

Because the remaining lobe of the thyroid continues to make thyroglobulin, monitoring the thyroglobulin level to predict recurrence generally isn't helpful after lobectomy. But your doctor may order a one-time check of your thyroglobulin and thyroglobulin antibody levels.

Long-term monitoring

If there is no evidence of disease, longer-term surveillance includes physical exams and neck ultrasounds as needed. Talk to your care team about how often you need ultrasounds.

After 10 to 15 years of no recurrence for people at low risk, no further surveillance for thyroid cancer is needed.

Recurrence

Although the thyroid has been removed, cancer can return to the neck or to areas far from the neck. The return of cancer after treatment is called recurrence.

The risk of recurrence is highest in the 5 years after thyroid surgery, and then decreases over time.

Biomarker testing

Biomarkers are targetable features of a cancer. Many are mutations (changes) in the DNA of the cancer cells. For thyroid cancers with 1 or more specific biomarkers, targeted therapy or immunotherapy may be a treatment option if needed.

Biomarker testing involves analyzing a piece of tumor tissue in a lab or testing a sample of blood. Testing for the following biomarkers is recommended for recurrent, advanced, or metastatic cancers that can't be treated with RAI therapy:

- *BRAF* gene mutations
- *ALK* gene fusions
- *NTRK1/2/3* gene fusions
- *RET* gene fusions (found in some medullary thyroid cancers)

Sometimes testing for additional biomarkers, including mismatch repair deficiency (dMMR), microsatellite instability (MSI-H), and high tumor mutational burden (TMB-H), may be performed.

Cancer that returns to the neck

If the cancer can be removed based on its size and location, surgery is the preferred treatment. If an updated whole body scan shows that the cancer takes up iodine, RAI therapy may be a treatment option.

But treatment isn't always needed. If the cancer isn't getting worse and isn't close to any critical structures, your provider may recommend close monitoring instead of treatment.

If the cancer can't be removed with surgery, doesn’t take up iodine, and is getting worse (progressing), treatment with radiation therapy, targeted therapy, or both may be an option.

See **Guide 1** for preferred systemic therapies. If these preferred therapies aren’t available or appropriate for you, there are other recommended options for systemic therapy.

Metastatic cancer

Thyroid cancer that spreads to areas far from the neck is known as metastatic. Metastatic tumors can form anywhere but are most common in the lungs, liver, muscles, bones, brain, and spinal cord.

If the cancer takes up iodine, RAI therapy is recommended to treat metastatic papillary or follicular thyroid cancers. Local therapies, such as radiation therapy, may also be used to treat areas of cancer directly.

If RAI therapy isn’t an option

If the cancer doesn't take up iodine and the metastatic tumors are growing slowly (or not at all) and aren't causing symptoms, it can be safe to monitor the cancer. Some people live with thyroid cancer for years without needing treatment. You will continue to take levothyroxine to keep your TSH level down.

However, if treatment is needed and surgery and RAI therapy aren’t options, systemic

Guide 1
Preferred systemic therapies for differentiated thyroid cancers, if needed

A preferred therapy for all differentiated cancers	Lenvatinib (Lenvima)
Preferred therapies for *NTRK1/2/3* gene fusion-positive tumors	• Entrectinib (Rozlytrek) • Larotrectinib (Vitrakvi) • Repotrectinib (Augtyro)
Preferred therapies for *RET* gene fusion-positive tumors	• Pralsetinib (Gavreto) • Selpercatinib (Retevmo)

therapy is recommended. Kinase inhibitor therapy is preferred. Options are listed in **Guide 1**.

If these preferred therapies aren't available or appropriate for you, there are other recommended options for systemic therapy. See below to learn what makes a therapy preferred.

Levels of preference

All treatments listed in this guide are recommended and appropriate. When helpful, NCCN experts also assign a level of preference to their recommendations for systemic therapies:

- **Preferred therapies** havethe most evidence they may work better and be safer than other therapies.
- **Other recommended therapies** can provide effective results but may have less evidence, more side effects, or may not work quite as well as preferred therapies.
- **Therapies used in certain cases** work best for individuals with specific cancer features or health circumstances.

Local therapies

Small tumors can be treated directly using 1 or more types of local therapy. If the cancer has only spread to a limited number of sites, or has spread to bone and/or is causing symptoms, it may be possible to remove or destroy the metastases with surgery or radiation therapy.

Ablation is another method used to treat small tumors. Stereotactic body radiation therapy (SBRT) is a special ablative radiation technique that delivers high doses of radiation to precise areas to kill cancer cells.

In ethanol ablation, a concentrated alcohol solution is injected into the neck to kill cancer cells. Cryoablation involves applying an extremely cold wand directly into the tumor.

Radiofrequency ablation uses radiofrequency waves that generate heat to kill cancer cells. If the cancer has spread to the brain or spinal cord, treatment options may include surgery to remove the metastases.

Stereotactic radiosurgery (SRS) is a non-surgical and highly precise type of radiation therapy that can be used to treat small brain or spine tumors. Whole brain radiation therapy (WBRT) is another type of EBRT used to treat the whole brain for cancer.

If the cancer has spread to your bones, your provider may recommend intravenous bisphosphonate or denosumab. These are bone-strengthening medications that can slow damage caused by bone tumors and help relieve symptoms.

Supportive care

Supportive care is essential for people with metastatic thyroid cancer. In addition to providing relief from symptoms, supportive care can provide emotional, spiritual, and social assistance.

Key points

- Differentiated thyroid cancers (papillary, follicular, and oncocytic carcinoma) usually grow slowly and respond well to treatment.
- Total thyroidectomy is recommended for differentiated cancers that have grown or spread beyond the thyroid. Lobectomy is preferred over total thyroidectomy for small and low-risk differentiated cancers.
- Active surveillance may be an option for very low-risk differentiated cancers.
- Radioactive iodine (RAI) therapy may be used after total thyroidectomy for papillary and follicular cancers that take up iodine. It's generally only recommended for cancers at higher risk of coming back.
- After a total thyroidectomy, thyroid hormone replacement therapy will be needed for the rest of your life. About 1 in 5 people need to replace thyroid hormone after lobectomy.
- Recurrences are usually diagnosed using lab tests and imaging studies. Treatment is individualized and often involves some combination of surgery, RAI, external beam radiation therapy (EBRT), or systemic therapy.

Questions to ask

- Am I a candidate for lobectomy?
- Do I need RAI therapy?
- How likely is the cancer to return?
- Am I a candidate for local therapy to ablate all my metastases?
- Should I consider joining a clinical trial?



Let us know what you think!

Please take a moment to complete an online survey about the NCCN Guidelines for Patients.

NCCN.org/patients/response

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Medullary thyroid cancer

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33 Staging

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Medullary thyroid carcinoma (MTC) starts in cells that make a hormone called calcitonin. MTC behaves differently from more common thyroid cancers. About 1 in 4 medullary thyroid cancers is hereditary.

Medullary thyroid cancer is associated with the *RET* gene. Most medullary thyroid cancers are sporadic. Sporadic MTC develops randomly due to changes in the *RET* gene that occur during your lifetime. Genetic changes found only in the tumor are called **somatic** or **acquired mutations**.

Differences in the *RET* gene can also be passed from parent to child (inherited). About 1 in 4 medullary thyroid cancers is hereditary. Gene differences you are born with are called **germline variants**. Variants that increase your risk of cancer are described as pathogenic or likely pathogenic.

Testing for medullary thyroid cancer

After diagnosis by fine-needle aspiration (FNA), you'll have additional testing to gather important information about the cancer.

Testing includes blood tests to measure the levels of calcitonin, calcium, and carcinoembryonic antigen (CEA) in your blood. If not already performed, you'll have an ultrasound of your neck and thyroid.

You'll also have genetic testing of your blood or saliva for germline (inherited) *RET* variants. If results are positive, see "Hereditary MTC" on the next page for treatment information.

Your care provider will also screen for pheochromocytoma—a type of adrenal tumor that can affect people with hereditary MTC.

Hereditary MTC

About 1 in 4 medullary thyroid cancers is caused by an inherited difference in the *RET* gene. The hereditary form is called MEN2 (multiple endocrine neoplasia type 2).

Hereditary MTC tends to spread to lymph nodes or distant organs earlier and more often than non-hereditary MTC.



If you have voice changes, your doctor will check the mobility of your vocal cords using ultrasound or laryngoscopy.

If your doctor suspects the cancer has spread to areas far from the thyroid, they may recommend additional imaging with CT, MRI, PET, or all of these.

Staging

The results of testing are used to determine the spread of cancer in the body, also known as the cancer stage. While the stage of medullary thyroid cancer provides helpful information about the extent and outlook of the cancer, it doesn't guide your treatment. This is because surgery is recommended for all MTCs.

In the early stages of medullary thyroid cancer, the tumor hasn't spread beyond the thyroid. A tumor that is 2 centimeters (cm) or smaller (about the size of a peanut) is stage 1.

In stage 2 MTC, the tumor is larger than 2 cm. It may have grown into muscles next to the thyroid. In stage 3, cancer has spread to nearby lymph nodes. The tumor itself may be small or large.

There are 3 categories of stage 4 medullary thyroid cancer. Stage 4A is moderately advanced disease. The tumor has grown extensively into the neck, or has spread to lymph nodes far from the thyroid.

Stage 4B is considered very advanced disease. Although there is no cancer in nearby lymph nodes, the tumor has invaded critical areas or structures, such as the spine, large blood vessels, or the carotid artery.

Stage 4C is the most advanced stage—metastatic. The cancer has spread to areas of the body far from the thyroid.

Sporadic MTC

Total thyroidectomy is recommended for most sporadic (non-hereditary) medullary thyroid cancers. Sometimes lobectomy is an option for sporadic MTC, but is only considered if there are no nodules in the opposite lobe.

During total thyroidectomy, in addition to the thyroid the surgeon will remove the lymph nodes closest to the thyroid and any others nearby known or suspected to contain cancer. This is called a neck dissection.

Two to 3 months after surgery, you'll have your first follow-up blood test. See "First blood test after surgery and ongoing surveillance" on the next page for more information.

Thyroid hormone replacement

Levothyroxine is given after surgery to replace the hormones no longer being supplied by the thyroid. Hormone replacement therapy is generally needed lifelong after a thyroidectomy. See the next page for information on what to expect after surgery.

Hereditary MTC

Hereditary MTC is known as multiple endocrine neoplasia type 2 (MEN2). In addition to thyroid cancer, people with MEN2 are at increased risk of pheochromocytomas (adrenal gland tumors) and hyperparathyroidism (overactive parathyroid glands).

Hereditary MTC is caused by inherited differences in the *RET* gene. Some *RET* variants are more likely to cause thyroid cancer than others. Some are also associated with more aggressive thyroid cancer. The specific *RET* variant can affect:

- The risk of developing thyroid cancer
- When thyroid cancer starts
- How aggressive/fast growing the thyroid cancer will be

MEN2 is divided into 3 subtypes: 2A, 2B, and familial medullary thyroid carcinoma (FMTC).

MEN2A, which includes familial medullary thyroid carcinoma (FMTC), is generally considered moderate (medium) risk. MEN2B is caused by higher risk variants of the *RET* gene.

Recommended care for MEN2A and MEN2B is explained on the next page.

Guide 2
Managing risk of medullary thyroid cancer in people with MEN2A

Variant	Managing risk of MTC
M918T (highest-risk) **C634R (high-risk)** **A883F (high-risk)**	Total thyroidectomy is recommended before age 5, based on serum calcitonin levels.
Medium-risk variants	It's safe to delay removing the thyroid as long as yearly calcitonin checks and ultrasounds are normal and there is no family history of aggressive MTC.
V804M (low-risk)	This variant doesn't cause MTC in most people who carry it. For this reason, surveillance may be all that's needed if you don't have a strong family history of MTC.

MEN2A

Depending on the specific *RET* variant, surgery (total thyroidectomy and lymph node dissection) may be recommended for people with MEN2A or familial medullary thyroid carcinoma (FMTC). See **Guide 2**.

Will my parathyroid glands be removed?

In people with MEN2A, the parathyroid glands can make too much parathyroid hormone (hyperparathyroidism).

To lower the amount of parathyroid hormone being made, your surgeon will likely remove some parathyroid tissue, while leaving enough for normal parathyroid and calcium levels in the body.

Thyroid hormone replacement therapy

Levothyroxine is given after surgery to replace the hormones no longer being supplied by the thyroid. Hormone replacement therapy is generally needed lifelong after a thyroidectomy.

MEN2B

In infants and children known to have MEN2B, thyroidectomy is recommended at an early age. The precise age depends on the specific cancer-causing *RET* variant. See **Guide 3**.

In addition to the thyroid gland, any neck lymph nodes known or suspected to have cancer will be removed. Lymph nodes without cancer may also be removed to prevent cancer cells from spreading to them.

Thyroid hormone replacement therapy

Levothyroxine is given after surgery to replace the hormones no longer being supplied by the thyroid. Hormone replacement therapy is generally needed lifelong after a thyroidectomy.

Guide 3
Timing of total thyroidectomy in infants and children with MEN2B

Variant	Timing of total thyroidectomy
M918T (highest-risk)	Before age 1
A883F (high-risk)	Before age 5

First blood test after surgery and ongoing surveillance

After a thyroidectomy, you'll have blood tests on a regular basis to check the levels of calcitonin and CEA. If these tumor markers start to go up, it could be a sign that medullary thyroid cancer has returned.

You will have the first blood test 2 to 3 months after surgery. This allows time for the calcitonin level to drop after the thyroid is removed. This first check of calcitonin after surgery is particularly important. The lower the calcitonin level, the better.



When surgery is planned in a child, thyroidectomy should be performed by a surgeon and a team experienced in performing pediatric thyroid surgery.

Normal blood test results

If the first blood test after surgery doesn't detect calcitonin and CEA is within the normal range, the cancer is likely cured. Going forward, calcitonin and CEA levels should be measured every year. If either level starts to rise, additional testing is needed to check for cancer recurrence.

If you have an inherited medullary thyroid cancer (MEN2A or MEN2B), yearly testing for pheochromocytoma is recommended (in addition to calcitonin and CEA testing). If you have MEN2A, your parathyroid hormone levels should also be checked every year.

Abnormal blood test results

If the first blood test after surgery finds calcitonin or if the CEA level is high, the cancer may not have been completely removed during surgery. Or it may have returned or spread.

Your provider may order imaging tests of your neck, liver, chest, and bones. If imaging results show cancer, or if you have symptoms, see the next page.

If the imaging tests don't find anything concerning and you aren't having symptoms, you'll be closely monitored. Blood tests to measure calcitonin and CEA are recommended every 6 to 12 months.

Depending on how quickly the levels are rising, imaging or more frequent testing may be needed. Sometimes another surgery is considered to remove remaining cancer.

If cancer returns to the neck

In people without an inherited *RET* variant (or if this is unknown), testing the tumor for somatic (acquired) *RET* mutations is recommended.

Surgery is the preferred treatment for medullary thyroid cancer that returns to the neck area. If the cancer can't be removed using surgery and is causing symptoms or getting worse, targeted therapy is often a treatment option. Options for targeted therapy are listed in **Guide 4**.

If treatment with surgery or systemic therapy isn't possible, external beam radiation therapy (EBRT) may be used instead.

Taking a watch-and-wait approach by monitoring the cancer can also be an appropriate option for some recurrent medullary thyroid cancers.

Metastatic cancer

If the cancer is stable and isn't causing symptoms, treatment isn't always needed for metastatic MTC. Your doctor will consider surgically removing the new cancer growth, if possible.

If the cancer worsens and begins causing symptoms, systemic therapy is often a treatment option. Recommended options are listed in **Guide 4**.

Radiation therapy may be used to help with symptoms, or as an ablative treatment in some cases. Surgery, ablation, or other techniques may be used to treat metastases in order to relieve symptoms.

If cancer has spread to bone, intravenous bisphosphonates or denosumab are recommended. These are bone-strengthening

Guide 4
Targeted therapies for recurrent MTC that can't be removed with surgery

Preferred therapy	**For *RET*-mutated cancers:** Selpercatinib (Retevmo)
Other recommended therapies	• Cabozantinib (Cabometyx) • Vandetanib (Caprelsa) Recurrent or persistent distant metastases (symptomatic or progression): • Other small-molecule kinase inhibitors • Dacarbazine-based chemotherapy
Useful in certain circumstances	• **For somatostatin receptor-positive tumors:** Lutetium dotatate (Lutathera) • **For *RET*-mutated cancers:** Pralsetinib (Gavreto)

medications that can help relieve symptoms and slow damage caused by bone metastases.

Joining a clinical trial is strongly encouraged for everyone with metastatic thyroid cancer. Ask your treatment team if there is an open clinical trial you might be eligible for.

Supportive care

Supportive care plays an essential role in the care of people with metastatic thyroid cancer. In addition to providing relief from symptoms caused by cancer and its treatment, supportive care can provide emotional, spiritual, and social support.

Key points

- Medullary thyroid cancer (MTC) starts in the C cells of the thyroid. The C cells make a hormone called calcitonin.
- Everyone diagnosed with MTC using needle biopsy should be tested for germline (inherited) cancer-causing *RET* variants and offered genetic counseling. All MTCs are treated with total thyroidectomy.
- About 1 in 4 MTCs is inherited. Hereditary medullary thyroid cancer is known as multiple endocrine neoplasia type 2 (MEN2). It's caused by inherited differences in the *RET* gene.
- Blood tests to measure carcinoembryonic antigen (CEA) and calcitonin are recommended to monitor for the return of MTC.
- Surgery is the preferred treatment for cancer that returns to the neck. Other options may include radiation therapy, monitoring (no treatment), and targeted therapy.
- Surgery, radiation therapy, or other techniques may be used to remove or destroy metastases and relieve symptoms.
- Supportive care can help relieve symptoms caused by medullary thyroid cancer and its treatment.

Questions to ask

- Do I have sporadic or hereditary MTC?
- Has the cancer spread beyond the thyroid?
- What is my prognosis?
- What are the chances that the cancer will return?

6
Anaplastic thyroid cancer

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Anaplastic carcinoma is the least common and most aggressive type of thyroid cancer. About half of people with this type have (or had) a more common type of thyroid cancer. Anaplastic thyroid cancer generally can't be cured. Supportive care is essential throughout the treatment process.

Testing and staging

If a needle biopsy suggests anaplastic thyroid carcinoma (ATC), more testing is needed to confirm the diagnosis and learn the extent of the cancer.

In addition to blood tests, testing typically includes imaging (scans) of your head and brain, neck, chest, abdomen, pelvis, voice box (larynx), and airway (trachea).

Biomarker testing

Testing the tumor for unique features, called biomarkers, is recommended for all anaplastic thyroid cancers. Testing helps determine whether you are eligible for treatment with targeted therapy or immunotherapy. Testing should include the biomarkers listed below.

- *BRAF* gene mutations
- *NTRK1/2/3* gene fusions
- *ALK* gene fusions
- *RET* gene fusions

Staging

The results of imaging are used to determine the spread of cancer in the body, also known as the cancer stage.

All anaplastic thyroid cancers are stage 4. The letters A, B, and C are used to describe how far the cancer has spread at the time it's found.

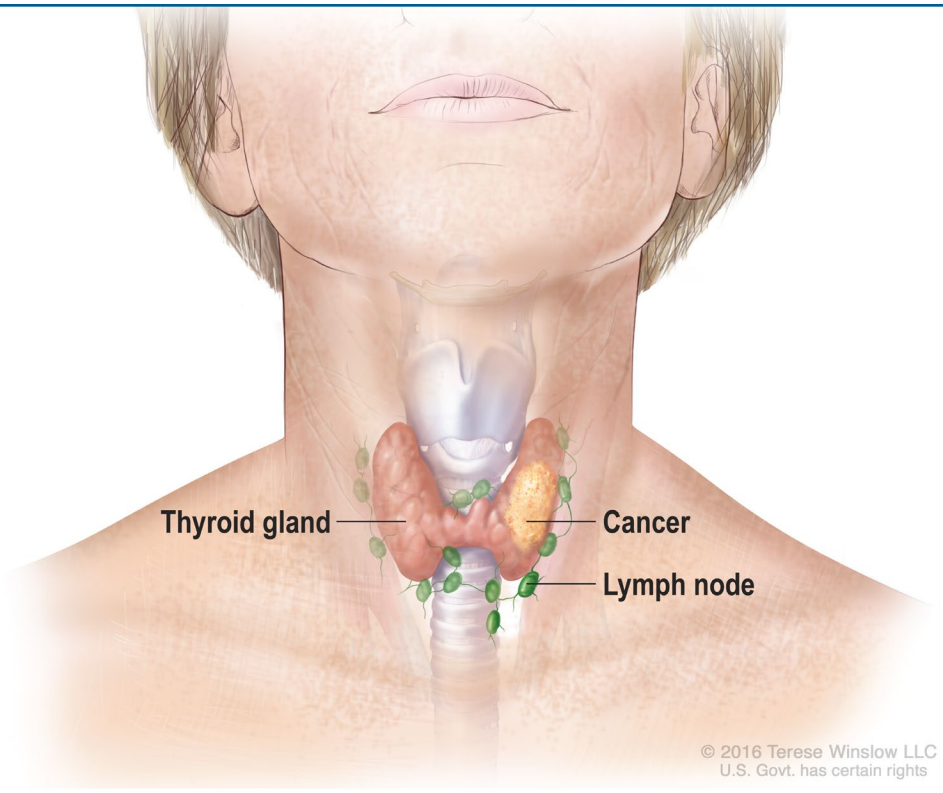
Stages 4A and 4B are non-metastatic. If the cancer is only in the thyroid, it's stage 4A. If the cancer has grown into the neck or spread to nearby lymph nodes, it's stage 4B.

Stage 4C is metastatic disease. The cancer has spread to areas of the body far from the thyroid, such as the lungs or bone.

"Tell your doctor if you're having any unusual feelings of sadness, loss of interest in activities, anxiety, or sleep problems. Many people experience these feelings, and they should not go untreated."

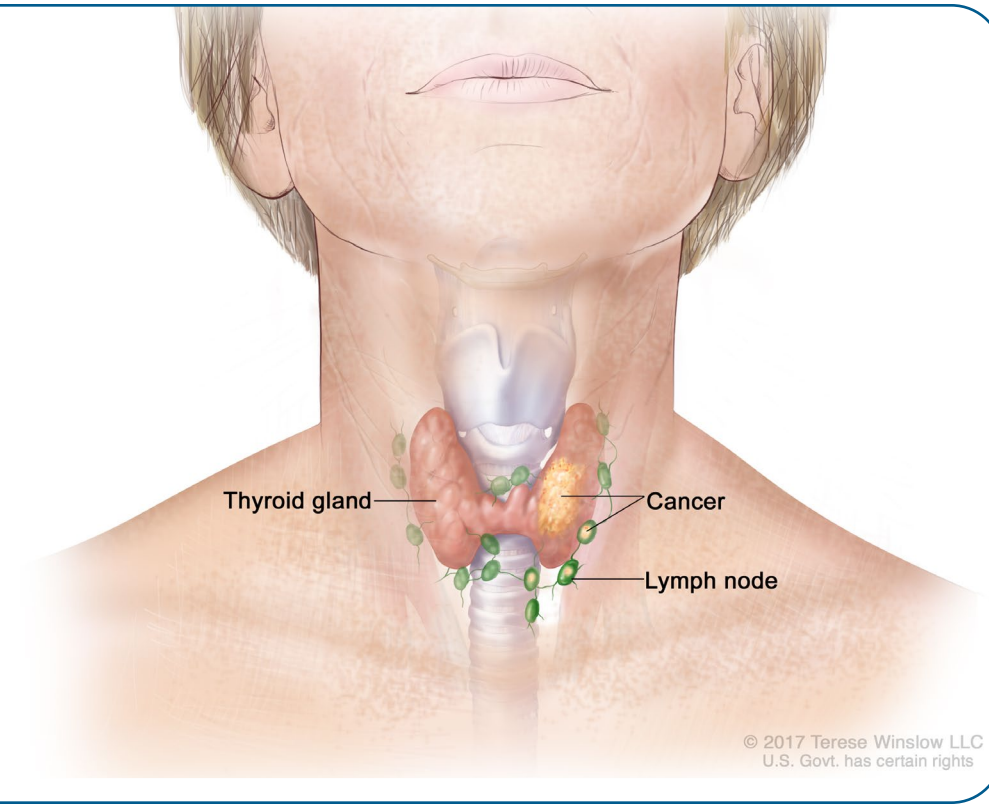
Stage 4A

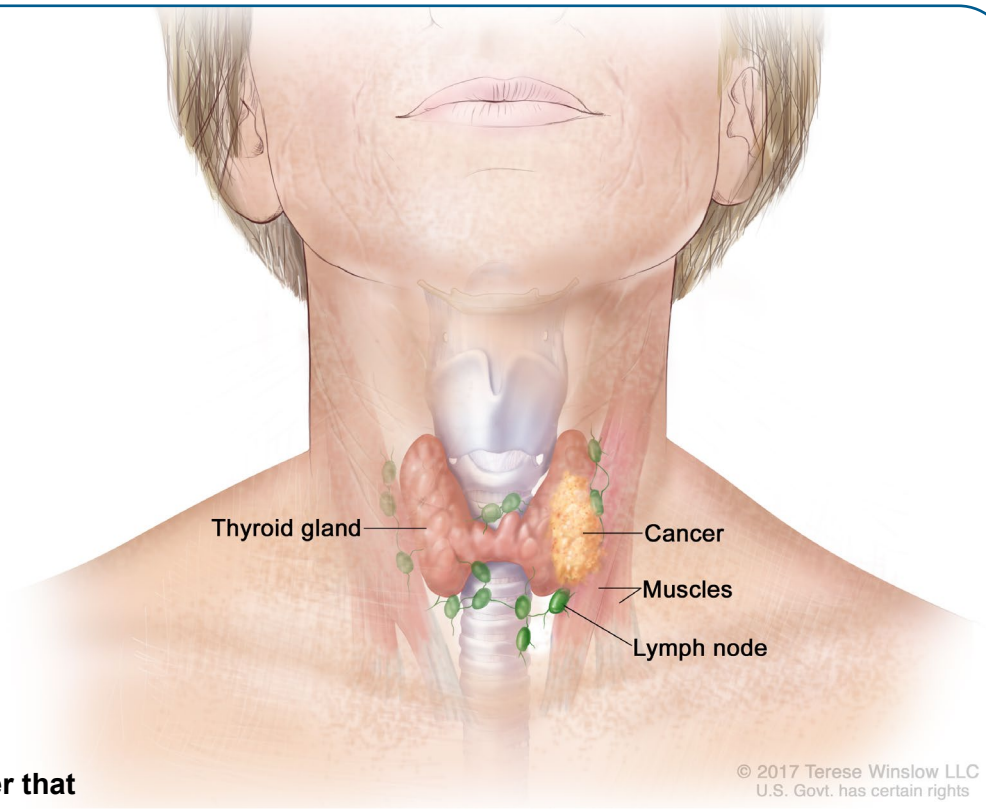
In stage 4A anaplastic thyroid cancer, the cancer hasn't grown or spread beyond the thyroid. The tumor may be small or large.



Stage 4B

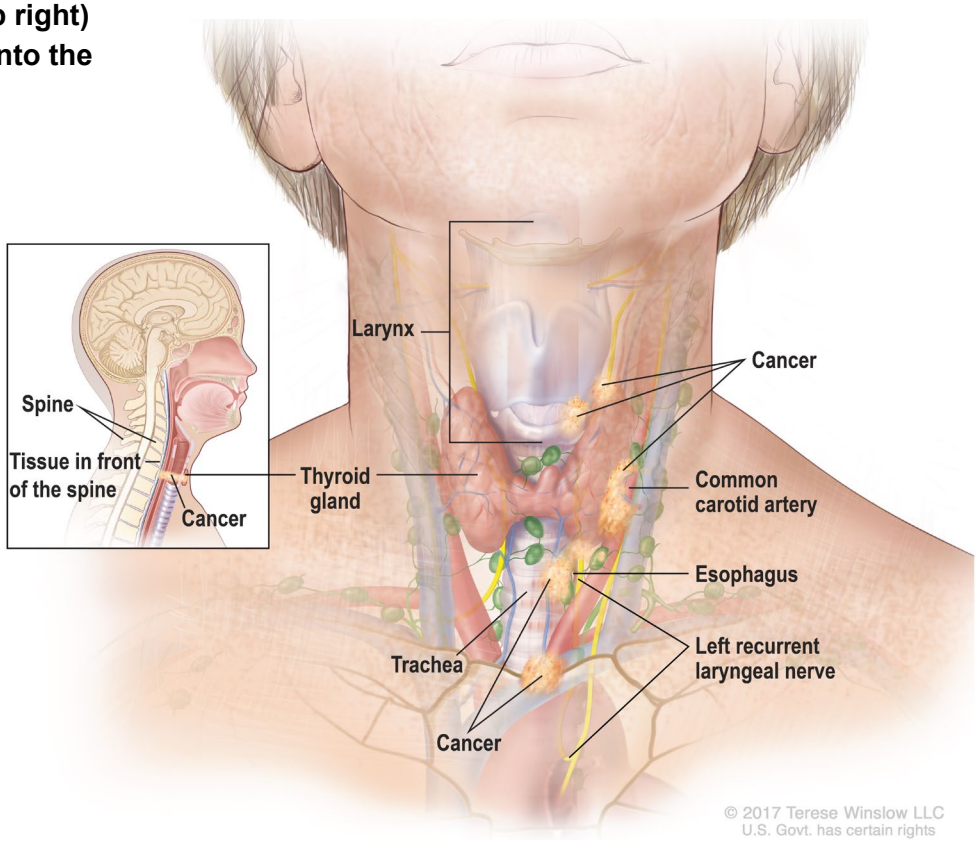
In stage 4B anaplastic thyroid cancer, the cancer may have spread only to nearby lymph nodes, as shown here.





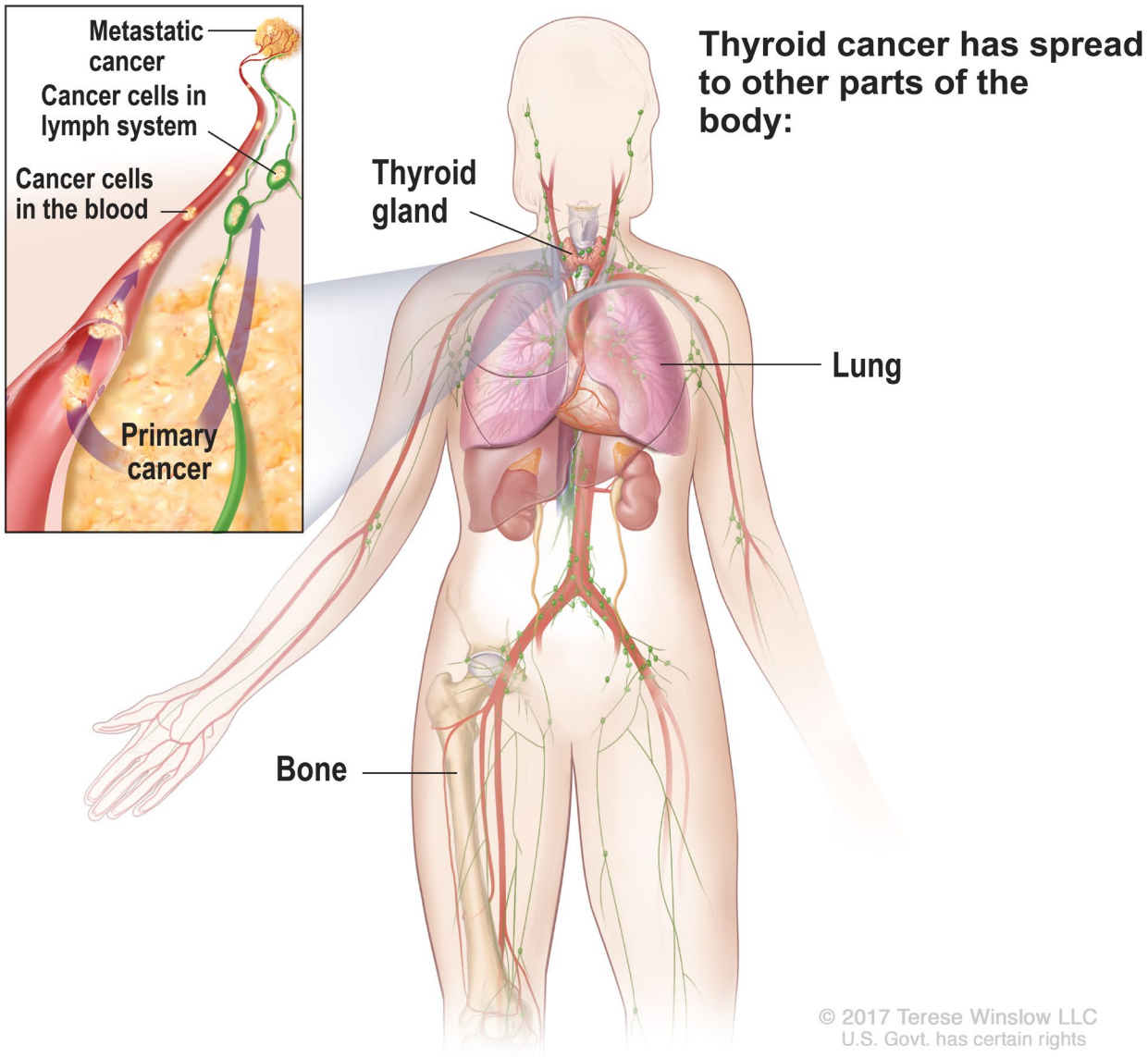
Stage 4B (cont.)

Stage 4B also describes anaplastic thyroid cancer that has grown into neck muscles next to the thyroid (top right) or grown extensively into the neck (bottom right).



Stage 4C

Stage 4C is metastatic disease. The cancer has spread to areas of the body far from the thyroid.



Non-metastatic ATC

Stages 4A and 4B are non-metastatic. Treatment depends on whether the tumor can safely be removed using surgery. If it can, the entire thyroid is removed (total thyroidectomy). Nearby lymph nodes known or suspected to have cancer are also removed.

For cancers with a mutation in the *BRAF* V600E gene, targeted therapy may be given first to shrink the cancer before surgery. The recommended regimen is dabrafenib (Tafinlar) with trametinib (Mekinist).

If all (or almost all) of the cancer is removed during surgery, external beam radiation therapy (EBRT) is next. EBRT kills microscopic leftover cancer cells in and around the cancer site. Chemotherapy may be given during the same time period in a strategy called chemoradiation. The chemotherapy makes it easier for the radiation to kill cancer cells.

After surgery, a 2- to 3-week recovery period is recommended before EBRT (and chemotherapy, if planned) is started.

If surgery isn't an option

If the cancer can't be safely removed using surgery, EBRT (with or without chemotherapy) is recommended. Chemotherapy may be given in addition to radiation therapy.

If the cancer is borderline resectable, it means that you can't have surgery first due to the size and location of the tumor, but surgery may become possible. In this case, you may be eligible for targeted therapy, if the cancer has any of the biomarkers listed in **Guide 5**.

After treatment with EBRT or targeted therapy, surgery may become an option. This depends on the size of the tumor after treatment and other factors.

Guide 5
Targeted therapies for borderline resectable stage 4A and 4B cancers

Biomarker	Options for targeted therapy
***BRAF* V600E mutation**	Dabrafenib (Tafinlar) and Trametinib (Mekinist)
***RET* gene fusion**	• Selpercatinib (Retevmo) • Pralsetinib (Gavreto)
***NTRK* gene fusion**	• Larotrectinib (Vitrakvi) • Entrectinib (Rozlytrek) • Repotrectinib (Augtyro)

Metastatic ATC

If anaplastic thyroid cancer spreads to distant areas of the body, there may be more than one approach to treatment. Some people choose to treat the cancer aggressively. Others choose to maximize their quality of life. Together with your care team, decide on a strategy that aligns with your health and personal preferences. See the next page for more information on these approaches to care.

Anaplastic thyroid cancer grows quickly and can become quite large. Over time, the tumor may block the airway or cause other airway-related problems. Hoarseness, noisy breathing (stridor), and shortness of breath are possible signs of a blocked airway.

Will I need a tracheostomy?

Whether you choose to treat the cancer aggressively or maximize quality of life, your doctor may suggest tracheostomy.

Tracheostomy is surgery to create an opening (called a stoma) in the windpipe. This surgery is typically done in an operating room under general anesthesia.

The surgeon makes an incision into your trachea (windpipe) and places a curved tube into the opening (stoma) . This tracheostomy tube provides an airway used for breathing.

The decision to have a tracheostomy, and when, can be a difficult one for people with ATC and their caregivers. Your care team can provide information on the benefits and risks of tracheostomy for you, taking into consideration your cancer and goals.

Consider a clinical trial

Participation in clinical trials is strongly recommended for everyone diagnosed with anaplastic thyroid cancer. Ask your care team if you are eligible for any current or planned trials.



Option: Aggressive treatment

In this approach, all of the following treatments may be used together to fight the cancer:

- Total thyroidectomy and lymph node dissection
- Radiation therapy
- Systemic therapy with or without radiation therapy (see **Guide 6**)

Receiving treatment as part of a clinical trial is strongly encouraged for everyone with metastatic anaplastic thyroid cancer. Ask your care team about trials you may be eligible for.

Option: Maximize quality of life

Aggressive treatment isn't an option for everyone with metastatic anaplastic thyroid cancer. It may not be recommended for health reasons, or it may not align with your preferences. Everyone's cancer and priorities are different. For some, living as comfortably as possible for as long as possible is preferred to undergoing treatments that may change your quality of life.

In this approach, the thyroid isn't removed. Areas of cancer are removed or destroyed to relieve symptoms caused by cancer in the neck or distant areas. Surgery, radiation

Guide 6
Systemic therapy for metastatic (stage 4C) anaplastic thyroid cancer

Preferred therapies for cancers with certain biomarkers	**Kinase inhibitor therapy for *BRAF* V600E-mutated cancers:** • Dabrafenib (Tafinlar) and Trametinib (Mekinist) • Binimetinib (Mektovi) and Encorafenib (Braftovi) **Kinase inhibitor therapy for *RET* gene fusion-positive cancers:** • Selpercatinib (Retevmo) • Pralsetinib (Gavreto)
Recommended therapies for cancers without above biomarkers	**Immunotherapy:** • Ipilimumab (Yervoy) and Nivolumab (Opdivo) for tumors without *RAS* mutations **Combined kinase inhibitor therapy and immunotherapy:** • Lenvatinib (Lenvima) and Pembrolizumab (Keytruda)
May be recommended in certain situations	• Chemotherapy • Immunotherapy with nivolumab or pembrolizumab • Kinase inhibitor therapy for *NTRK1/2/3* gene fusion-positive tumors

therapy, or both are used to control cancer growth throughout the body.

If anaplastic thyroid cancer has spread to bones, denosumab (Prolia) or medications called bisphosphonates may be given to help strengthen your bones, slow bone damage, and relieve symptoms caused by the tumors.

Supportive care

Supportive care plays an essential role in the care of patients with anaplastic thyroid cancer. The goal is to improve your quality of life during and after cancer treatment. Supportive care is for everyone with anaplastic thyroid cancer and their families, not just for those at the end of life.

Supportive care includes a wide range of services. Supportive care prevents or manages the symptoms of cancer and the side effects of cancer treatment, like pain and cancer-related fatigue. It also addresses the mental, social, emotional, and spiritual concerns faced by people with cancer.

Supportive care provides help with additional needs, such as:

- Making treatment decisions
- Coordinating your care
- Paying for care
- Planning for advance care and end of life

Some health care professionals refer to palliative care as supportive care. They think these types of care are alike or overlap. Others think there are important differences, but both help people with cancer to live as well as they can. Your cancer center may have palliative care specialists, who can give you additional support and help coordinate your supportive care needs.

Your doctor may suggest hospice care. Hospice care can help with the physical and emotional needs of anaplastic thyroid cancer.

Read more about the types of support you may receive in *NCCN Guidelines for Patients: Palliative Care*, available at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.



Important conversations

Important, often difficult, discussions are needed after a diagnosis of anaplastic thyroid cancer. These discussions can help you make decisions about treatment and other care.

Prognosis

Prognosis refers to the expected outcome or course of an individual cancer. The prognosis for most anaplastic thyroid cancers is poor, meaning that good outcomes are unlikely.

Discussing prognosis is an important part of care planning for anaplastic thyroid cancer. Your prognosis can affect the type and number of treatments that you may be willing, or able, to receive.

Weigh treatment options

Consider and discuss the goals of treatment with your care team. Care to improve quality of life may be more helpful than cancer treatment. Talk to your doctor about your treatment options. For example, controlling the tumor growth may be preferred to aggressive treatment.

Participation in clinical trials is strongly recommended for everyone diagnosed with anaplastic thyroid cancer. Talk to your care team about clinical trials you may be eligible for.

Surveillance

Imaging procedures (CT or MRI) of the brain, neck, chest, abdomen, and pelvis are needed on a regular basis for metastatic anaplastic thyroid cancer.

There isn't a one-size-fits-all schedule for these scans. Talk to your care team about how often you need imaging. A combined PET/CT scan may be ordered 3 to 6 months after treatment of metastatic disease to determine the extent of the cancer.

If surveillance testing continues to find no evidence of disease (NED), monitoring will continue. Surgery, radiation therapy, or both are used to control cancer growth throughout the body.

If the cancer returns or gets worse (progresses), trying a different systemic therapy may be an option. Joining a clinical trial is strongly encouraged if one is available to you.

Survivorship

In addition to surveillance testing, a range of other care is important for cancer survivors. See *Chapter 7: Survivorship* for more information.

Key points

- Anaplastic thyroid carcinoma (ATC) is the least common and most aggressive type of thyroid cancer.
- All ATCs are stage 4. Stages 4A and 4B are non-metastatic, meaning they have not spread to distant sites. Stage 4C is metastatic.
- If surgery is possible, non-metastatic ATC is treated with total thyroidectomy and lymph node dissection. Radiation therapy, and sometimes also chemotherapy, is used to kill cancer cells remaining after surgery.
- If surgery isn't an option, treatment with radiation therapy (and possibly chemotherapy) is recommended. If the cancer has biomarkers, treatment with targeted therapy may be an option instead of radiation therapy.
- For borderline resectable cancers, shrinking the tumor with targeted therapy or possibly immunotherapy may be an option. If treatment with radiation therapy or targeted therapy works well, surgery may become possible.
- Treatment of metastatic ATC may focus on maximizing quality of life rather than treating the cancer. Aggressive therapy includes total thyroidectomy, radiation therapy, and systemic therapy.
- Supportive care is essential for everyone with ATC. It can help relieve the side effects of cancer and its treatment. It can also provide mental, social, and spiritual care and support.

Questions to ask

- Is the cancer metastatic? What does this mean for my care?
- Am I a candidate for surgery?
- Does my cancer have any biomarkers?
- What are the most common side effects of kinase inhibitors?

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Survivorship

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Survivorship focuses on the physical, emotional, and financial issues faced by cancer survivors. Managing the long-term side effects of cancer and its treatment, staying connected with your primary care provider, and living a healthy lifestyle are important parts of survivorship.

Your primary care provider

After finishing cancer treatment, your endocrinologist or oncologist and primary care provider should work together to make sure you get needed follow-up care.

Ask your endocrinologist or oncologist for a survivorship care plan that includes:

- A summary of your cancer treatment history
- A description of possible late- and long-term side effects
- Recommendations for monitoring for the return of cancer
- Clear roles and responsibilities for your providers
- Recommendations for your overall health and well-being

Survivorship

Staying active is an important part of survivorship. Try to exercise for at least 150 minutes per week. This will help you achieve or stay within a weight range recommended for your height and sex assigned at birth.



Paying for care

Cancer survivors face a unique financial burden. Paying for doctor visits, tests, and treatments can become unmanageable, especially for those with little or no health insurance. You may also have costs not directly related to treatment, such as travel expenses and the cost of childcare or missed work.

The term financial toxicity is used to describe the problems patients face related to the cost of medical care. Financial toxicity can affect your quality of life and access to needed health care. If you need help paying for your cancer care, financial assistance may be available. Talk with a patient navigator, your treatment team's social worker, and your hospital's financial services department.

Anxiety and depression

Many people with cancer have symptoms of distress, such as anxiety and depression. You may feel anxious during testing, or you may experience depression during a hard part of treatment. Tell your treatment team so you can get help.

Help can include support groups, talk therapy, or medication. Cancer navigators, social workers, and other experts at your cancer center can help. Some people also feel better by exercising, talking with friends or loved ones, or relaxing.

Distress thermometer

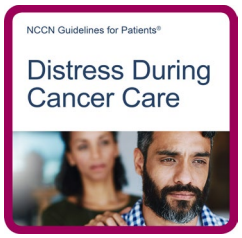
NCCN has a quick-and-easy tool that helps people with cancer tell their care team about their concerns. This screening tool is called the NCCN Distress Thermometer and Problem List. The Problem List includes many areas of

"Find a support network that understands your cancer type and the journey you are taking. Learning from others and having a safe place to ask questions is a huge benefit."



concern, including social and practical ones, that you can check off.

The NCCN Distress Thermometer and Problem List can be found in *NCCN Guidelines for Patients: Distress During Cancer Care*, available at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.



Support groups

Many people diagnosed with cancer find support groups to be helpful. Support groups often include people at different stages of treatment. Some people may be newly diagnosed, while others may be finished with treatment.

Social and practical concerns

Your health can be affected by where you live and work, your income, and your responsibilities, just to name a few social factors. Getting help for social needs can lead to a longer life and better quality of life.

Resources and referrals

Your provider or a patient navigator can put you in touch with local resources. You may need help with practical concerns, such as housing and food.

You may need help from a specialist. Specialists include chaplains, social workers, counselors, psychologists, psychiatrists, and advanced practice clinicians.

- Chaplains can help you with religious or spiritual concerns.
- Social workers and counselors can help with practical and psychosocial issues.
- Mental health providers can diagnose and provide treatment for mental disorders.
- Addiction medicine specialists treat misuse of alcohol and drugs.

Healthy habits

It's important to keep up with other aspects of your health after cancer treatment. Steps you can take to help prevent other health problems and to improve your quality of life are described next.

Cancer screening

Get screened for other types of cancer, such as breast, colorectal, and skin cancer. Your primary care provider can tell you what cancer screening tests you should have based on your age and risk level.

Other health care

Get other recommended health care for your age, such as blood pressure screening, hepatitis C screening, and immunizations (like the flu shot).

Diet and exercise

Try to exercise for at least 150 minutes per week. This will help you stay at a healthy body weight.

Alcohol may increase the risk of certain cancers. Drink little to no alcohol. Eat a diet rich in plant-based foods.

Quit smoking

If you smoke or vape, tell your care team. They can help you find a way to quit that works for you.



Complementary and alternative therapies

Complementary and alternative therapies may help with side effects and improve comfort and well-being during and after cancer treatment. Examples include:

Acupuncture

Dietary supplements

Eastern medicine

Medical marijuana

Herbal teas and preparations

Homeopathy

Hypnosis

Meditation

Reiki

Yoga

Massage therapy

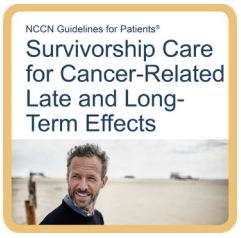
If you want to learn more about complementary therapies, tell your care team. Many cancer centers have integrative oncology programs. An integrative approach to cancer care combines conventional (standard) cancer treatment with complementary and alternative therapies.

More information

For more information on cancer survivorship, the following are available at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app:

- *Survivorship Care for Healthy Living*
- *Survivorship Care for Cancer-Related Late and Long-Term Effects*





Key points

- Survivorship focuses on the physical, emotional, and financial issues unique to cancer survivors.
- Your endocrinologist or oncologist and primary care doctor should work together to make sure you get the follow-up care you need.
- A survivorship care plan is helpful in transitioning your care to your primary care doctor.
- Healthy habits, including exercising and eating nutritious foods, play an important role in helping to prevent other diseases and second cancers.

Questions to ask

- Can you give me a survivorship care plan? How will you provide it?
- Does this treatment center have a survivorship care program?
- What can I expect during a survivorship care visit?

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Other resources

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Want to learn more? Here's how you can get additional help.

What else to know

This guide helps you know your options so you can make informed decisions and improve your cancer care. But it's not the only resource that you have.

Ask for as much information and help as you need. Many people are interested in learning more about:

- The details of their treatment and its side effects
- Being a part of a care team
- Getting financial help
- Finding a cancer care professional who's an expert in their field
- Coping with other health problems

What else to do

Your health care center can help you with next steps. It often has on-site resources to help meet your needs and find answers to your questions. Health care centers can also inform you of resources in your community.

In addition to help from your providers, the resources listed in the next section provide support for many people like yourself.

Where to get help

Look through the list below and visit the provided websites to learn more about these organizations.

AnCan
ancan.org

Bone Marrow & Cancer Foundation
bonemarrow.org

Cancer*Care*
cancercare.org

Cancer Hope Network
cancerhopenetwork.org

GRACE
cancergrace.org

Imerman Angels
imermanangels.org

My Faulty Gene
myfaultygene.org

Stupid Cancer
stupidcancer.org

THANC Foundation
thancfoundation.org

ThyCa: Thyroid Cancer Survivors' Association, Inc.
thyca.org

Triage Cancer
triagecancer.org

Questions to ask

- Who can I talk to about help with housing, food, and other basic needs?
- What help is available for transportation, childcare, and home care?
- Are there other services available to me and my caregivers?



We want your feedback!

Our goal is to provide helpful and easy-to-understand information on cancer.

Take our survey to let us know what we got right and what we could do better.

NCCN.org/patients/feedback



Words to know

anaplastic thyroid cancer
A rare and aggressive type of thyroid cancer. Anaplastic cells look very different from normal thyroid cells. Also called anaplastic thyroid carcinoma (ATC).

biomarkers
A feature of a cancer that may be targetable. Many are mutations (changes) in the DNA of the cancer cells.

biopsy
Removal of small amounts of tissue or fluid to be tested for disease.

calcitonin
A hormone made by the C cells of the thyroid gland. It helps control the calcium level in the blood.

C cells
Cells in the thyroid that make calcitonin. These cells are also called parafollicular cells.

chemotherapy
Drugs that work throughout the body to kill cancer cells.

clinical trial
Research on an investigational test or treatment to assess its safety or how well it works.

computed tomography (CT)
A test that uses x-rays to view body parts.

follicular thyroid cancer
The second most common type of thyroid cancer. Starts in follicular cells and invades blood vessels in and around the thyroid. Also called follicular thyroid carcinoma (FTC).

magnetic resonance imaging (MRI)
A test that uses radio waves and powerful magnets to make pictures of the insides of the body.

medullary thyroid cancer
A type of thyroid cancer that starts in the C cells that make calcitonin. About 1 out of 4 is caused by inherited differences in the *RET* gene. Also called medullary thyroid carcinoma (MTC).

metastasis
The spread of cancer cells from the first tumor to another body part.

neck dissection
Removal of the lymph nodes and other tissue in the neck area.

nodule
A small mass of abnormal tissue.

noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP)
A low-risk, noninvasive thyroid tumor. Formerly known as encapsulated follicular variant of papillary thyroid cancer.

observation
A period of scheduled follow-up testing to watch for signs of cancer spread (metastasis) or return (recurrence).

oncocytic thyroid cancer
An uncommon and often more aggressive type of differentiated thyroid cancer. This type used to be called Hürthle cell carcinoma (HCC).

papillary thyroid cancer
The most common type of thyroid cancer. Starts in follicular cells. Also called papillary thyroid carcinoma (PTC).

parathyroid gland
One of 4 small glands near the thyroid that make parathyroid hormone.

pathogenic/likely pathogenic (P/LP) variant
A variant (difference) in a gene that increases the risk of developing 1 or more cancers.

pathologist
An expert in examining cells and tissues to diagnose disease.

pathology report
A document with information about cells and tissues removed from the body and examined with a microscope for disease.

pituitary gland
A gland found near the base of the brain. It makes hormones that control how other glands in the body work or make hormones.

positron emission tomography (PET)
A test that uses radioactive material to see the shape and function of body parts.

***PTEN* hamartoma tumor syndrome (PHTS)**
An inherited syndrome that can cause follicular thyroid cancer and other cancers and health problems. Also called Cowden syndrome.

somatic mutation
A non-hereditary change in your DNA that occurred sometime after you were conceived. Also called acquired mutation or tumor mutation.

stereotactic radiosurgery (SRS)
A non-surgical and highly precise type of radiation therapy that can be used to treat small brain or spine tumors.

stereotactic body radiation therapy (SBRT)
A special ablative radiation technique that delivers high doses of radiation to precise areas to kill cancer cells.

supportive care
Care given to improve the quality of life of patients who have a serious or life-threatening disease. Also called palliative care.

Thyrotropin alfa (Thyrogen)
A form of thyroid-stimulating hormone (TSH) made in a lab. It's used to test for remaining or recurring cancer cells in patients who have been treated for thyroid cancer.

thyroid
A gland located beneath the larynx (voice box) that makes thyroid hormone and calcitonin. The thyroid gland helps regulate growth and metabolism.

thyroid hormone
Refers to the hormones made by the thyroid–thyroxine (T4) and triiodothyronine (T3). The thyroid uses a mineral from your diet called iodine to produce these hormones.

variant
A difference in a gene that may be helpful, harmful, or have no (known) effect on your health. Variants you are born with are called germline variants.

whole brain radiation therapy (WBRT)
A type of external radiation therapy used to treat cancer in the brain.

NCCN Contributors

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San Francisco, California

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