newer treatments. They are also the best way for doctors to learn better methods to treat cancer.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- Clinical Trials

Considering complementary and alternative methods

You may hear about alternative or complementary methods to relieve symptoms or treat your cancer that your doctors haven't mentioned. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods are treatments that are used **along with** your regular medical care. **Alternative** treatments are used **instead of** standard medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision.

- Complementary and Integrative Medicine

Help getting through cancer treatment

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and they can be an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services - including rides to treatment, lodging, and more - to help you get through treatment. Call our Cancer Knowledge Hub at 1-800-227-2345 and speak with one of our caring, trained cancer helpline specialists. Or, if you prefer, you can use our chat feature on cancer.org to connect with one of our specialists.

- Palliative Care
- Programs & Services

Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors as you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- If Cancer Treatments Stop Working

The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask your cancer care team any questions you may have about your treatment options.

Surgery for Thyroid Cancer

Surgery is part of the treatment for nearly all thyroid cancers, except for some anaplastic thyroid cancers. If thyroid cancer is diagnosed by a fine needle aspiration (FNA) biopsy[1], surgery to remove the tumor and all or part of the remaining thyroid

gland is usually recommended.

Different types of thyroid surgery might be done, depending on the situation.

Most often, thyroid surgery is done while you are under general anesthesia (in a deep sleep). The operation is done through an incision (cut) a few inches long across the front of the neck. You will have a small scar across the front of your neck after surgery, but this should become less noticeable over time.

Thyroidectomy

Thyroidectomy is surgery to remove the thyroid gland. This is the most common surgery for thyroid cancer, especially for larger tumors or for cancers with higher-risk features.

If the entire thyroid gland is removed, this is called a **total thyroidectomy**. Sometimes the surgeon may not be able to remove the entire thyroid. If nearly all of the gland is removed, it is called a **near-total thyroidectomy**.

After a near-total or total thyroidectomy, you will need to take daily thyroid hormone[2] (levothyroxine) pills to replace the hormones your thyroid was making.

One advantage of this surgery over a lobectomy is that your doctor will be able to check for recurrence (cancer coming back) afterward using radioiodine scans and thyroglobulin blood tests. (See Tests for Thyroid Cancer[3].)

Lobectomy

In a lobectomy, the surgeon only removes the lobe of the thyroid (left or right) that contains the cancer. The isthmus is usually also removed during this surgery. (The isthmus is the small piece of the gland that acts as a bridge between the lobes.)

Lobectomy is sometimes used to treat differentiated (papillary or follicular) thyroid cancers that are small and show no signs of spread beyond the thyroid gland. It is also sometimes used to diagnose thyroid cancer if an FNA biopsy result doesn't provide a

clear diagnosis.

An advantage of this surgery is that you might not need to take thyroid hormone pills afterward because part of the gland is left behind. But having some thyroid left can interfere with certain tests that look for cancer recurrence after treatment, such as radioiodine scans and thyroglobulin blood tests.

Lymph node removal

When thyroid cancer spreads, most often it goes first to nearby lymph nodes in the neck. If thyroid cancer appears to have spread to these lymph nodes, the nodes will be removed. This is often done at the same time surgery is done on the thyroid, although it might also be done as a separate operation.

In some situations, lymph nodes in the neck might be removed even if it's not clear that the cancer has spread to them. This is especially important for larger thyroid tumors or for those that have grown outside the thyroid, as well as for medullary thyroid cancer or anaplastic thyroid cancer (when surgery is an option), because these cancers are more likely to have spread.

Usually, several lymph nodes in the middle of the neck near the thyroid are removed. This is called a **central neck dissection**. Removal of even more lymph nodes, including nodes on the side of the neck, is called a **modified radical neck dissection**.

Risks and side effects of thyroid surgery

The short-term risks of any type of surgery include reactions to anesthesia, bleeding (which might require blood transfusions), blood clots, and infections. Most people will have at least some pain after the operation. This can usually be helped with pain medicines, if needed.

Potential complications of thyroid surgery in particular can include:

- **Temporary or permanent hoarseness or loss of voice.** This can happen if your larynx (voice box) or windpipe is irritated by the breathing tube that was used during surgery. It can also happen if the nerves to the larynx (or vocal cords) are damaged during surgery. The doctor will examine your vocal cords before surgery to see if they move normally. (See Tests for Thyroid Cancer[4].)
- **Damage to the parathyroid glands.** The parathyroid glands are small glands behind the thyroid that help regulate calcium levels. Damage to these glands can

lead to low blood calcium levels, causing muscle spasms and feelings of numbness and tingling in different parts of the body.

Complications are less likely to happen when your operation is done by an experienced thyroid surgeon. People who have thyroid surgery are often ready to leave the hospital within a day after the operation.

As noted above, removing the entire thyroid gland (or nearly all of it) means your body will no longer be able to make thyroid hormones, so you'll need to take thyroid hormone pills for the rest of your life.

More information about Surgery

For more general information about surgery as a treatment for cancer, see Cancer Surgery[5].

To learn about some of the side effects listed here and how to manage them, see Managing Cancer-related Side Effects[6].

Hyperlinks

1. www.cancer.orgamericancancer.sharepoint.com/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests/biopsy-types.html
2. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/thyroid-hormone-therapy.html
3. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/detection-diagnosis-staging/how-diagnosed.html
4. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/detection-diagnosis-staging/how-diagnosed.html
5. www.cancer.org/cancer/managing-cancer/treatment-types/surgery.html
6. www.cancer.org/cancer/managing-cancer/side-effects.html

References

American Thyroid Association Guidelines Task Force, Kloos RT, Eng C, Evans DB, et al. Medullary thyroid cancer: Management guidelines of the American Thyroid Association. *Thyroid*. 2015 25;19:567-610.

American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2016; 26:1-133.

Asban A, Patel AJ, Reddy S, Wang T, Balentine CJ, Chen H. Chapter 68: Cancer of the Endocrine System. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa. Elsevier: 2020.

Bible KC, Kebebew E, Brierley J, et al. 2021 American Thyroid Association Guidelines for Management of Patients with Anaplastic Thyroid Cancer. *Thyroid*. 2021;31(3):337-386.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Thyroid Carcinoma. V.2.2024. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/thyroid.pdf on April 8, 2024.

Sippel RS. Neck dissection for differentiated thyroid cancer. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/neck-dissection-for-differentiated-thyroid-cancer on April 5, 2024.

Tuttle RM. Differentiated thyroid cancer: Surgical treatment. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/differentiated-thyroid-cancer-surgical-treatment on April 8, 2024.

Wang TS, Lyden ML, Sosa JA. Thyroidectomy. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/thyroidectomy on April 5, 2024.

Last Revised: August 24, 2024

Radioactive Iodine (Radioiodine) Therapy for Thyroid Cancer

Your thyroid gland absorbs nearly all the iodine that enters your body. Because of this, **radioactive iodine** (RAI, also called iodine-131 or I-131) can be used to treat some types of thyroid cancer.

What is radioactive iodine therapy?

During this treatment, radioactive iodine is put into your body by taking a pill, drinking a liquid, or getting a shot in your vein.

When RAI is put into the body, it collects mainly in thyroid cells. The radiation from this treatment can destroy the thyroid gland and any other thyroid cells that take up iodine (including cancer cells). Because most of the RAI collects in thyroid cells, the radiation has less effect on the rest of your body.

The radiation dose used in radioactive iodine therapy is much stronger than the doses used in radioiodine scans, which are described in Tests for Thyroid Cancer[1].

You might need to be in the hospital for a few days after treatment, staying in a special isolation room to prevent others from being exposed to radiation. This will depend on the dose you're given and where you get your treatment.

Once you are allowed to go home, you will be told how to protect others from radiation exposure and how long you need to take these precautions. Be sure you understand the instructions before you leave the hospital or clinic.

If you go home the same day as your treatment: You should not use public transportation (taxis, rideshares, buses, or trains). If possible, drive yourself. If this isn't possible, try to sit as far away from the driver as possible. Do not have anyone who is pregnant or trying to get pregnant drive you home.

Levels of radiation in your urine: I-131 leaves the body through your urine, so you will likely be told to drink lots of fluids for the first few days after treatment, and to wipe down any surfaces the urine touches.

Questions to ask your health care team

Here are some questions you may want to ask your care team before going home.

Risks and side effects of RAI

Short-term side effects of RAI treatment may include:

- Neck tenderness and swelling
- Nausea and vomiting[4]
- Swelling and tenderness of the salivary glands
- Dry mouth[5]
- Taste changes[6]

Chewing gum or sucking on hard candy may help with dry mouth and other salivary gland problems.

Problems with tears: Radioiodine treatment can affect the amount of tears some people make. Some people might notice dry eyes, while others might have excessive tears. If you wear contact lenses, ask your doctor how long you should keep them out.

Fertility issues for men: Men who receive large total doses of radiation because of many treatments with RAI may have lower sperm counts or, rarely, become infertile.

Fertility issues for women: Radioactive iodine may affect a woman's ovaries, and some women may have irregular periods for up to a year after treatment. Although no ill effects have been noted in children born to parents who received RAI, many doctors recommend women avoid becoming pregnant for at least 6 months after treatment.

Second cancers: People who have had RAI therapy may have a slightly increased risk of developing some types of cancer in the future. This includes leukemia, stomach cancer, and salivary gland cancer. Doctors aren't sure exactly how much this risk is increased, but most large studies have found that this is a very rare complication.

Talk to your health care team if you have any questions about the possible risks and benefits of your treatment.

Hyperlinks

1. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/detection-diagnosis-staging/how-diagnosed.html

2. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/surgery.html
3. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/treatment-types/radiation/safety.html
4. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/side-effects/eating-problems/nausea-and-vomiting.html
5. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/side-effects/eating-problems/dry-mouth.html
6. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/side-effects/eating-problems/taste-smell-changes.html

References

Asban A, Patel AJ, Reddy S, Wang T, Balentine CJ, Chen H. Chapter 68: Cancer of the Endocrine System. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa. Elsevier: 2020.

American Thyroid Association Guidelines Task Force, Kloos RT, Eng C, Evans DB, et al. Medullary thyroid cancer: Management guidelines of the American Thyroid Association. *Thyroid*. 2015 25;19:567-610.

American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2016; 26:1-133.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Thyroid Carcinoma. V.2.2024. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/thyroid.pdf on April 15, 2024.

Tuttle RM. Differentiated thyroid cancer: Radioiodine treatment. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/differentiated-thyroid-cancer-radioiodine-treatment on April 8, 2024.

Last Revised: August 23, 2024

Thyroid Hormone Therapy

If your thyroid has been removed (during a thyroidectomy[1]), your body can no longer make the thyroid hormone it needs. You will need to take thyroid hormone (levothyroxine) pills to replace the natural hormone. This can help maintain your normal metabolism and possibly lower your risk of the cancer coming back.

How thyroid hormone therapy can help

Normal thyroid function is regulated by the pituitary gland. The pituitary makes **thyroid stimulating hormone (TSH)**. TSH causes the thyroid gland to make thyroid hormone for the body. It also promotes the growth of the thyroid gland, and probably of thyroid cancer cells as well.

In turn, the level of TSH is regulated by how much thyroid hormone is in the blood. If the level of thyroid hormone in the blood is low, the pituitary makes more TSH. If the level of thyroid hormone is high, not as much TSH is needed, so the pituitary makes less of it.

Doctors have learned that by giving higher than normal doses of thyroid hormone, TSH levels can be kept very low. (This is known as **thyroid hormone suppression therapy**.) This may slow the growth of any remaining thyroid cancer cells and lower the chance of some thyroid cancers (especially high-risk cancers) coming back.

Possible side effects of thyroid hormone therapy

Taking higher than normal levels of thyroid hormone seems to have few short-term side effects, but some doctors have expressed concerns about taking them for long periods of time.

- High levels of thyroid hormone can lead to problems with a rapid or irregular heartbeat.
- Over time, high doses of thyroid hormone can also lead to weak bones (osteoporosis).

Because of this, your doctor might avoid giving you high doses of thyroid hormone unless you have had a differentiated (papillary or follicular) thyroid cancer that has a

high risk of coming back.

Hyperlinks

1. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/surgery.html

References

Asban A, Patel AJ, Reddy S, Wang T, Balentine CJ, Chen H. Chapter 68: Cancer of the Endocrine System. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa. Elsevier: 2020.

American Thyroid Association Guidelines Task Force, Kloos RT, Eng C, Evans DB, et al. Medullary thyroid cancer: Management guidelines of the American Thyroid Association. *Thyroid*. 2015 25;19:567-610.

American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2016; 26:1-133.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Thyroid Carcinoma. V.2.2024. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/thyroid.pdf on April 15, 2024.

Tuttle RM. Differentiated thyroid cancer: Overview of management. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/differentiated-thyroid-cancer-overview-of-management on April 16, 2024.

Last Revised: August 24, 2024

External Radiation Therapy for Thyroid

Cancer

The main drawback of this treatment is that the radiation can damage nearby healthy tissue along with the cancer cells. Possible side effects include:

- Skin changes (similar to a sunburn) in the area being treated
- Trouble swallowing
- Dry mouth
- Hoarseness
- Feeling very tired

To reduce the risk of side effects, doctors carefully figure out the exact dose needed and aim the beam as accurately as they can to hit the target. This is often done with an advanced type of treatment known as **intensity-modulated radiation therapy (IMRT)**.

More information about radiation therapy

To learn more about how radiation is used to treat cancer, see Radiation Therapy[2].

To learn about some of the side effects listed here and how to manage them, see Managing Cancer-related Side Effects[3].

Hyperlinks

1. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/radioactive-iodine.html
2. www.cancer.org/cancer/managing-cancer/treatment-types/radiation.html
3. www.cancer.org/cancer/managing-cancer/side-effects.html

References

Asban A, Patel AJ, Reddy S, Wang T, Balentine CJ, Chen H. Chapter 68: Cancer of the Endocrine System. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa. Elsevier: 2020.

American Thyroid Association Guidelines Task Force, Kloos RT, Eng C, Evans DB, et al. Medullary thyroid cancer: Management guidelines of the American Thyroid Association. *Thyroid*. 2015 25;19:567-610.

American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and

Differentiated Thyroid Cancer. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2016; 26:1-133.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Thyroid Carcinoma. V.2.2024. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/thyroid.pdf on April 15, 2024.

Tuttle RM. Medullary thyroid cancer: Surgical treatment and prognosis. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/medullary-thyroid-cancer-surgical-treatment-and-prognosis on April 17, 2024.

Tuttle RM, Lee NY. Differentiated thyroid cancer: External beam radiotherapy. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/differentiated-thyroid-cancer-external-beam-radiotherapy on April 17, 2024.

Tuttle RM, Sherman EJ. Anaplastic thyroid cancer. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/anaplastic-thyroid-cancer on April 17, 2024.

Last Revised: August 23, 2024

Targeted Drug Therapy for Thyroid Cancer

In recent years,meructors48ws Cabegun using newer, tgeted Drdg Ts toreatmehyroid cancer.

Standard chemo drugs work by attacking rapidly growing cells, including cancer cells. But targeted drugs attack specific gene and protein changes inside thyroid cancer cells. These gene and protein changes are what make the cancer cells different from normal cells.

The types of targeted drugs used to treat thyroid cancer are known as **kinase inhibitors**. Kinases are proteins inside cells that normally relay signals (such as telling the cell to grow). Blocking certain kinases can help treat some cancers.

Targeted drugs for papillary or follicular thyroid cancer

Most of these cancers can be treated with surgery[2] and radioactive iodine therapy[3]. But when those treatments aren't effective, targeted drugs can often be helpful.

Multikinase inhibitors

Lenvatinib (Lenvima), **sorafenib (Nexavar)**, and **cabozantinib (Cabometyx)** are targeted drugs known as *multikinase inhibitors*, because they block several different kinase proteins. These drugs work in 2 main ways:

- They help block tumors from forming new blood vessels, which the tumors need to grow.
- They target some of the proteins made by cancer cells that normally help them grow.

Lenvatinib and sorafenib can often help stop cancer growth for a time in people with papillary or follicular thyroid cancer whose radioactive iodine treatment is no longer working. If these drugs are no longer helpful, cabozantinib may be an option.

All of these drugs are taken by mouth.

Common **side effects** can include fatigue, rash, loss of appetite, diarrhea, nausea, high blood pressure, and hand foot syndrome (redness, pain, swelling, or blisters on the palms of the hands or soles of the feet). Other more serious side effects, such as severe bleeding and holes in the intestine, can also occur.

Ask your health care team what to expect.

RET inhibitors

In some papillary and follicular thyroid cancers, the cells have certain changes in the *RET* gene that cause them to make an abnormal from of the RET kinase protein. This abnormal protein helps the cells grow.

Selpercatinib (Retevmo) and **pralsetinib (Gavreto)** are drugs known as *RET inhibitors*. They work by attacking the RET protein. These drugs can be used to treat advanced papillary or follicular thyroid cancer if the cancer cells have certain types of *RET* gene changes, and radioactive iodine therapy is not a good option.

These drugs are taken by mouth as capsules or pills, typically once or twice a day.

Common **side effects** can include dry mouth, diarrhea, constipation, high blood pressure, feeling tired, swelling in the hands or feet, skin rash, high blood sugar levels, low white blood cell or blood platelet counts, and changes in certain other blood tests.

Less common but more serious side effects can include liver damage, allergic reactions, changes in heart rhythm, bleeding easily, and problems with wound healing.

TRK inhibitors

A small number of thyroid cancers have changes in one of the *NTRK* genes. These genes make TRK proteins, which can help cancer cells grow.

Larotrectinib (Vitrakvi), and **entrectinib (Rozlytrek)**, and **repotrectinib (Augtyro)** target and disable the abnormal TRK proteins made by the *NTRK* genes. Any of these drugs can be used in people with advanced thyroid cancer that has an *NTRK* gene

Vandetanib (Caprelsa) and **cabozantinib (Cometriq)** are multikinase inhibitors (drugs that target several different kinase proteins). They can affect both cancer cells themselves and the growth of new blood vessels (which tumors need to grow). These drugs can be used to treat advanced MTC.

These drugs are taken as pills, typically once a day.

Common **side effects** of vandetanib include diarrhea, rash, nausea, high blood pressure, headache, fatigue, decreased appetite, and belly (abdominal) pain. Rarely, it can also cause serious or even life-threatening heart rhythm problems or infections. Because of its potential side effects, doctors must get special training before they are allowed to prescribe this drug.

Common **side effects** of cabozantinib include diarrhea, constipation, belly pain, mouth sores, decreased appetite, nausea, weight loss, fatigue, high blood pressure, loss of hair color, and hand-foot syndrome (redness, pain, and swelling of the hands and feet). Rarely, this drug can also cause serious side effects such as severe bleeding and holes in the intestine.

RET inhibitors

In some medullary thyroid cancers, the cells have certain changes in the *RET* gene that cause them to make an abnormal form of the RET kinase protein. This abnormal protein helps the cells grow.

Selpercatinib (Retevmo) is a type of drug known as a *RET inhibitor*. It works by attacking the RET protein. This drug can be used to treat advanced MTC if the cancer cells have certain types of *RET* gene changes.

This drug is taken by mouth as capsules or pills, typically twice a day.

Common **side effects** of selpercatinib can include dry mouth, diarrhea, constipation, high blood pressure, feeling tired, swelling in the hands or feet, skin rash, high blood sugar levels, low white blood cell or blood platelet counts, and changes in certain other blood tests.

Less common but more serious side effects can include liver damage, allergic reactions, changes in heart rhythm, bleeding easily, and problems with wound healing.

For anaplastic thyroid cancer

Anaplastic thyroid cancers are often hard to treat. If surgery can't be done to remove the cancer, targeted drugs are often the preferred treatment if the cancer cells have certain gene changes. In some instances, giving a targeted drug first might shrink a tumor enough so that surgery can then be done.

BRAF and MEK inhibitors

Some anaplastic thyroid cancers have changes in the *BRAF* gene, which causes them to make certain proteins that can help them grow.

Dabrafenib (Tafinlar) and **trametinib (Mekinist)** are drugs that target some of these proteins. (Dabrafenib affects the BRAF protein, while trametinib targets the related MEK protein.) These drugs can be used together to treat anaplastic thyroid cancers that have a certain type of *BRAF* gene change and that can't be removed completely with surgery.

These drugs are taken as pills or capsules each day.

Common **side effects** can include skin changes, rash, itching, sensitivity to the sun, headache, fever, chills, joint or muscle pain, fatigue, cough, hair loss, nausea, diarrhea, and high blood pressure.

Less common but serious side effects can include bleeding, heart rhythm problems, liver or kidney problems, lung problems, severe allergic reactions, severe skin or eye problems, and increased blood sugar levels.

Some people treated with these drugs develop skin cancers, especially squamous cell skin cancers[5]. Your cancer care team will want to check your skin often during treatment. You should also let them know right away if you notice any new growths or abnormal areas on your skin.

RET inhibitors

In some anaplastic thyroid cancers, the cells have certain changes in the *RET* gene that cause them to make an abnormal from of the RET kinase protein. This abnormal protein helps the cells grow.

Selpercatinib (Retevmo) and **pralsetinib (Gavreto)** are drugs known as *RET* inhibitors. They work by attacking the RET protein. These drugs can be used to treat advanced anaplastic thyroid cancer if the cancer cells have certain types of *RET* gene changes.

These drugs are taken by mouth as capsules or pills, typically once or twice a day.

Common **side effects** can include dry mouth, diarrhea, constipation, high blood pressure, feeling tired, swelling in the hands or feet, skin rash, high blood sugar levels, low white blood cell or blood platelet counts, and changes in certain other blood tests.

Less common but more serious side effects can include liver damage, allergic reactions, changes in heart rhythm, bleeding easily, and problems with wound healing.

TRK inhibitors

A small number of anaplastic thyroid cancers have changes in one of the *NTRK* genes. These genes make TRK proteins, which can help cancer cells grow.

Larotrectinib (Vitrakvi), **entrectinib (Rozlytrek)**, and **repotrectinib (Augtyro)** target and disable the abnormal TRK proteins made by the *NTRK* genes. Any of these drugs can be used in people with anaplastic thyroid cancer that has an *NTRK* gene change and is still growing despite other treatments.

These drugs are taken as pills or capsules, once or twice a day.

Common **side effects** of these drugs can include dizziness, fatigue, nausea, vomiting, side e rg /GM gaiinf 0 0384.Tm 0 S928 g70. 0 gapyTj 0 g /F2 12 Tf (Tj 0 g /F2 12 Tf (Tj 0 g /capQ q

cancer/treating/surgery.html
3. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/radioactive-iodine.html
4. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/radioactive-iodine.html
5. www.cancer.orgamericancancer.sharepoint.com/cancer/types/basal-and-squamous-cell-skin-cancer.html
6. www.cancer.org/cancer/managing-cancer/treatment-types/targeted-therapy.html
7. www.cancer.org/cancer/managing-cancer/side-effects.html

References

American Thyroid Association Guidelines Task Force, Kloos RT, Eng C, Evans DB, et al. Medullary thyroid cancer: Management guidelines of the American Thyroid Association. *Thyroid*. 2015 25;19:567-610.

American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2016; 26:1-133.

Asban A, Patel AJ, Reddy S, Wang T, Balentine CJ, Chen H. Chapter 68: Cancer of the

immunotherapy on April 17, 2024.

Tuttle RM, Sherman EJ. Anaplastic thyroid cancer. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/anaplastic-thyroid-cancer on April 17, 2024.

Last Revised: August 23, 2024

Chemotherapy for Thyroid Cancer

Chemotherapy (chemo) is the use of anti-cancer drugs that are injected into a vein or are taken by mouth. Chemo drugs enter the bloodstream and travel throughout the body to reach and destroy cancer cells.

Chemotherapy is seldom helpful for most types of thyroid cancer, but fortunately it isn't needed in most cases.

When might chemotherapy be used for thyroid cancer?

For **anaplastic thyroid cancer**, chemotherapy is often combined with external beam radiation therapy[1]. It's also sometimes used for other types of thyroid cancer, when the cancer has spread and surgery and radiation therapy aren't options. However, targeted drugs[2] are usually tried first, as they are more likely to be helpful.

Which chemo drugs are used to treat thyroid cancer?

Doctors give chemo in cycles, with each period of treatment followed by a rest period to allow the body time to recover. Chemo cycles generally last a few weeks.

The chemo drugs most often used to treat thyroid cancer include:

- Dacarbazine

- Vincristine
- Cyclophosphamide
- Doxorubicin
- Streptozocin
- 5-Fluorouracil
- Paclitaxel
- Docetaxel
- Cisplatin
- Carboplatin

Depending on the type of thyroid cancer and other factors, 2 chemo drugs are sometimes combined.

Most of these drugs are given as an infusion into a vein (IV), although some can be taken as pills.

Possible side effects of chemo for thyroid cancer

Chemo drugs can also affect other cells in the body, which can lead to side effects.

The side effects of chemo depend on which drugs are given, the doses used, and the length of treatment. Common side effects of chemo include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea or constipation
- Increased chance of infections (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Fatigue (from having too few red blood cells)

These side effects usually go away after treatment is finished. There are often ways to lessen them. For example, drugs can be given to help prevent or reduce nausea and vomiting.

Some chemo drugs may have other side effects. For example:

- Doxorubicin (one of the most common chemo drugs for thyroid cancer) can affect heart function. If you are getting doxorubicin, your doctor will check your heart regularly using tests such as echocardiograms.
- Drugs like cisplatin, carboplatin, and paclitaxel can damage nerves. This sometimes leads to symptoms (mainly in the hands and feet) such as pain, burning or tingling, sensitivity to cold or heat, or weakness. This is called **peripheral neuropathy**.

Ask your cancer care team about the side effects your chemo drugs may cause.

More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer, see Chemotherapy[3].

To learn about some of the side effects listed here and how to manage them, see Managing Cancer-related Side Effects[4].

Hyperlinks

1. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/external-beam-radiation.html
2. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/targeted-therapy.html
3. www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy.html
4. www.cancer.org/cancer/managing-cancer/side-effects.html

References

Asban A, Patel AJ, Reddy S, Wang T, Balentine CJ, Chen H. Chapter 68: Cancer of the Endocrine System. In: Niederhuber JE, Armitage JO, Doroshow JH, Kast ces

American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2016; 26:1-133.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Thyroid Carcinoma. V.2.2024. Accessed at https://www.nccn.org/professionals/physician_gls/pdf/thyroid.pdf on April 15, 2024.

Sherman SI, Gianoukakis AG. Differentiated thyroid cancer refractory to standard treatment: Systemic therapy. UpToDate. 20204. Accessed at https://www.uptodate.com/contents/differentiated-thyroid-cancer-refractory-to-standard-treatment-systemic-therapy on April 17, 2024.

Sherman SI, Gianoukakis AG. Medullary thyroid cancer: Systemic therapy and immunotherapy. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/medullary-thyroid-cancer-systemic-therapy-and-immunotherapy on April 17, 2024.

Tuttle RM, Sherman EJ. Anaplastic thyroid cancer. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/anaplastic-thyroid-cancer on April 17, 2024.

Last Revised: August 23, 2024

Treatment of Thyroid Cancer, by Type and Stage

The type of treatment your cancer care team recommends will depend on the type[1] and stage[2] of your thyroid cancer, your overall health, and your personal preferences. Talk to your doctor if you have any questions about the treatment plan they recommend for you.

Treating papillary thyroid cancer and its variants

Most papillary thyroid cancers are treated with surgery[3]. This is most often a **total thyroidectomy** (in which the entire thyroid is removed), although some small tumors can be treated with a **lobectomy** (just removing the side of the thyroid containing the tumor).

In some cases, people with very small thyroid cancers may choose to have the cancer watched closely with regular ultrasounds, rather than having surgery right away. This is known as **active surveillance**. If anything changes (such as if the tumor grows larger), surgery can be done at that point.

For people who do have surgery, if the nearby lymph nodes are enlarged or show signs of cancer spread, they will also be removed.

Even if the lymph nodes aren't enlarged, some doctors might recommend a central compartment neck dissection (removal of lymph nodes in the middle of the neck next to the thyroid), especially if the cancer is larger or has other concerning features. This might lower the risk of cancer coming back in the neck area.

Because removing the lymph nodes allows them to be checked for cancer, this surgery also makes it easier to accurately stag[4]e[5] the cancer.

If cancer has spread to other neck lymph nodes, a **modified radical neck dissection** is often done. This involves removing even more lymph nodes, including nodes on the side of the neck.

Treatment after surgery depends on the risk of the cancer coming back (which is based on the stage of the cancer and other factors).

For cancers with a lower risk of coming back, no further treatment is usually needed.

For cancers with a higher risk of coming back (or cancers that are not removed completely with surgery), radioactive iodine (RAI) treatment[6] is often given several weeks after thyroidectomy. The goal is to destroy any remaining thyroid tissue and to try to treat any cancer remaining in the body.

Most often, it's not clear that a thyroid tumor is a follicular cancer based on the results of an FNA biopsy[17] alone. If this is the case, "follicular neoplasm" might be listed as the diagnosis.

growing, although other factors can be important as well.

If cancer comes back in the neck and if the tumor appears to be resectable (removable), surgery is often done.

If the cancer shows up on a radioiodine scan (meaning the cancer cells are taking up iodine), radioactive iodine (RAI) therapy may be used, either alone or with surgery.

If the cancer does **not**

medicines before and during surgery to make the operation safe.

Treating stages I and II MTC

Total thyroidectomy[31] (removing the entire thyroid gland) is the main treatment for stage I or stage II MTC, and it can often cure these cancers. Nearby lymph nodes in the neck are usually removed as well.

Because the thyroid gland is removed, you will need thyroid hormone therapy[32] to keep you healthy, although it doesn't reduce the risk that the cancer will come back.

Because MTC cells don't take up radioactive iodine, radioactive iodine (RAI) therapy isn't helpful in treating MTC.

Treating stages III and IV MTC

Surgery for these cancers is the same as for stage I and II cancers (usually after screening for MEN2 syndrome and pheochromocytoma). Thyroid hormone therapy is needed afterward.

If the tumor is extensive and invades many nearby tissues, or if it can't be removed completely, external beam radiation therapy[33] may be given after surgery to try to reduce the chance of the cancer coming back in the neck.

If you are told that you have MTC, talk to your doctor about genetic counseling and testing. This is important even if you are the first person in your family to be diagnosed with the disease. Genetic testing can check your cells for mutations in the *RET* gene. These mutations are seen in people with the MEN2 syndromes, including familial MTC.

If you have one of these mutations, it's important that close family members (children, siblings, and parents) are tested as well.

Almost all children and adults with mutations in this gene will develop MTC at some point. Because of this, most doctors agree that anyone who has a *RET* gene mutation should have their thyroid removed to prevent MTC. This surgery should be done soon after getting the test results. This includes children, since some hereditary forms of MTC can affect children.

A total thyroidectomy can prevent this cancer in people with *RET* mutations who have not yet developed it. If this is done, lifelong thyroid hormone replacement will be needed.

Treating anaplastic thyroid cancer

Surgery is often not as helpful for anaplastic thyroid cancer as it is for other types of thyroid cancer.

If the cancer is confined to the area around the thyroid, which is rare, the entire thyroid and nearby lymph nodes may be removed. The goal of this surgery is to remove as much cancer in the neck area as possible, ideally leaving no cancer behind. But because of the way anaplastic cancer spreads, this is often very difficult.

Because anaplastic thyroid cancer cells don't take up radioactive iodine, radioactive iodine (RAI) therapy isn't helpful in treating this type of cancer.

External beam radiation therapy[38] may be used alone or combined with chemotherapy[39]:

- To try to **shrink the cancer** before surgery, increasing the chance of removing it completely
- After surgery, to try to **control any cancer that remains** in the neck
- When the tumor is too large or widespread to be treated with surgery

If your cancer is causing you to have trouble breathing (or if this may eventually happen), a surgery called a **tracheostomy** might be done. During a tracheostomy, the

surgeon creates a hole in the front of your neck and into your windpipe to bypass the tumor and allow you to breathe more comfortably.

For cancers that have spread, chemotherapy alone can be used. If the cancer cells have changes in certain genes, treatment with targeted drugs[40] might be helpful. For example:

cancer/detection-diagnosis-staging/how-diagnosed.html#imaging-tests
26. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/targeted-therapy.html
27. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/treatment-types/immunotherapy/immune-checkpoint-inhibitors.html
28. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/chemotherapy.html
29. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
30. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/causes-risks-prevention/risk-factors.html
31. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/surgery.html
32. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/thyroid-hormone-therapy.html
33. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/external-beam-radiation.html
34. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/targeted-therapy.html
35. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/chemotherapy.html
36. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
37. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
38. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/external-beam-radiation.html
39. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/chemotherapy.html
40. www.cancer.orgamericancancer.sharepoint.com/cancer/types/thyroid-cancer/treating/targeted-therapy.html
41. www.cancer.orgamericancancer.sharepoint.com/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html

References

American Thyroid Association Guidelines Task Force, Kloos RT, Eng C, Evans DB, et al. Medullary thyroid cancer: Management guidelines of the American Thyroid Association. *Thyroid*

cancer-including-oncocytic-carcinoma-of-the-thyroid on April 25, 2024.

Tuttle RM. Medullary thyroid cancer: Surgical treatment and prognosis. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/medullary-thyroid-cancer-surgical-treatment-and-prognosis on April 27, 2024.

Tuttle RM, Sherman EJ. Anaplastic thyroid cancer. UpToDate. 2024. Accessed at https://www.uptodate.com/contents/anaplastic-thyroid-cancer on April 27, 2024.

Last Revised: August 23, 2024

Written by

The American Cancer Society medical and editorial content team (https://www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as editors and translators with extensive experience in medical writing.