TREATMENT UPDATE:

Thyroid Cancer

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Treatment Update: Thyroid Cancer

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Each year in the United States, approximately 44,000 people are diagnosed with thyroid cancer. It is diagnosed at a younger age than most cancers, and is much more likely to develop in women than in men.

The thyroid is a butterfly-shaped gland that sits along the front of the windpipe. It absorbs a mineral called iodine from the bloodstream to produce hormones that help regulate metabolism and keep the brain, heart and other organs working as they should. Thyroid cancer starts when healthy cells in the thyroid grow out of control, causing a tumor to develop.

Thyroid cancer doesn't always have symptoms, especially early in the disease. Symptoms, when they occur, can include:

- A lump on the neck which can be felt through the skin
- Changes to the voice, including hoarseness
- Difficulty swallowing
- Pain in the neck and throat
- Swollen lymph nodes in the neck

Diagnosis of thyroid cancer is usually made through a combination of physical exam, blood tests, imaging tests and biopsy. In a biopsy, a sample of thyroid tissue is removed using a long, thin needle and examined in a laboratory to look for cancer cells.

The American Joint Committee on Cancer has created a system that's used to describe the stages of thyroid cancer. Called the "TNM" system, it focuses on three things:

- **T (tumor):** How big is the main tumor, and has it spread to other areas of the body?
- **N (nodes):** Has the cancer spread to nearby lymph nodes? (Lymph nodes are bean-shaped cells that help fight infection.)
- **M (metastasized):** Has the cancer metastasized (spread) to other areas of the body or organs, such as the lungs, liver or bones?

Types of Thyroid Cancer

Papillary thyroid cancer is the most common type of thyroid cancer, accounting for approximately 85 percent of cases. It arises from follicular cells, which produce and store thyroid hormones. Papillary and follicular thyroid cancer are sometimes referred to together as differentiated thyroid cancer. Other types, which are much more rare, are anaplastic thyroid cancer and medullary thyroid cancer.

Treatment Options

Treatment approaches for thyroid cancer depend on the type and stage of the cancer and the individual's overall health.

Tumors that are very small and have a low risk of metastasizing might not need immediate treatment. Instead, doctors may suggest "active surveillance" in which the cancer is frequently monitored through blood tests and ultrasound imaging tests.

Surgery

Most treatment approaches include surgery to remove all or part of the thyroid. The type of surgery depends on the cancer's type, size and whether it has spread beyond the thyroid.

Surgical options include:

- **Thyroidectomy,** the removal of the entire thyroid (total thyroidectomy) or most of the thyroid (near-total thyroidectomy).
- **Thyroid lobectomy,** in which a portion of the thyroid is removed. This option may be used when there is a slow-growing tumor in only one part of the thyroid.
- **Lymph node dissection,** in which lymph nodes in the neck are removed at the time of thyroidectomy or lobectomy. The lymph nodes can then be examined for signs of cancer.

Radiation therapy

Radiation therapy is often given after surgery to destroy any remaining cancer cells.

Intraoperative radiation therapy (IORT) directs radiation to the tumor while sparing the healthy surrounding tissue. Another type of radiation therapy, called internal radiation therapy, uses a radioactive substance sealed in needles, seeds, wires or catheters placed directly into or near the tumor.

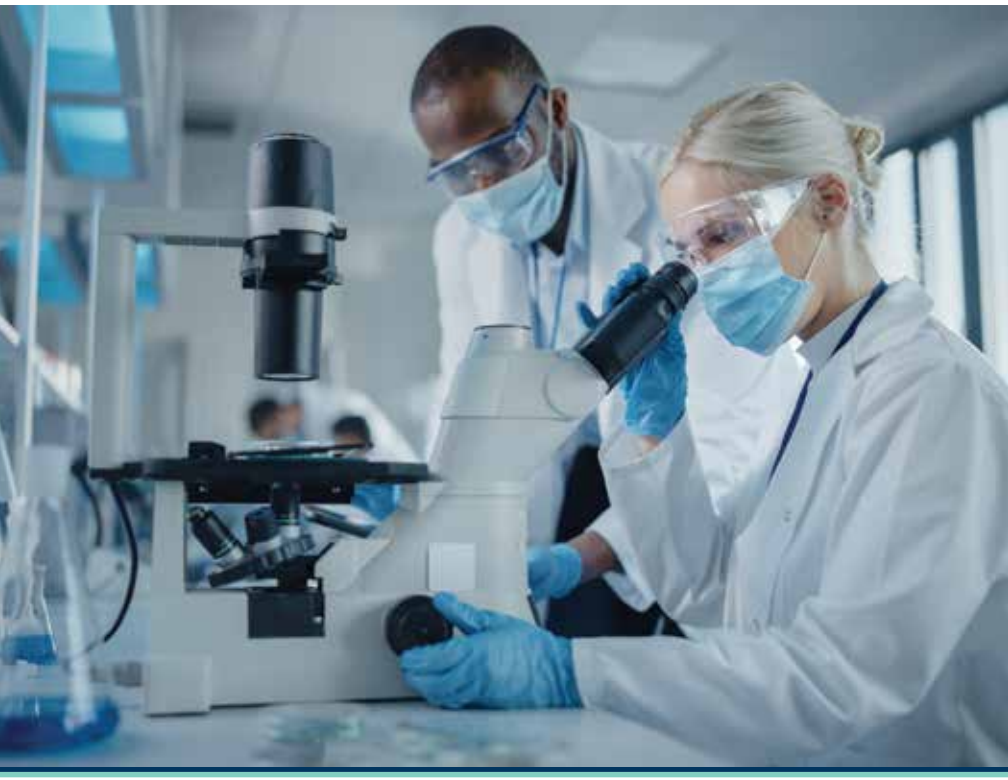
The administration of radioactive iodine (RAI) after surgery is standard practice in cases of papillary or follicular thyroid cancer (differentiated thyroid cancer) that has spread to the neck or other parts of the body. Given in capsule form, RAI ablates (destroys) any thyroid cancer cells not removed in surgery without harming healthy tissue.

Thyroid hormone therapy

The medication levothyroxine (Synthroid, Levoxyl) is taken for life after surgery. It supplies the levels of hormone the thyroid would normally produce. Levothyroxine also suppresses the production of thyroid-stimulating hormone (TSH). High TSH levels can stimulate the growth of any remaining cancer cells.

Targeted therapy

Targeted therapies focus on specific molecules and cell mechanisms thought to be important for cancer cell survival and growth, taking advantage of what researchers have learned in recent years about how tumors grow.



Targeted therapy in the treatment of papillary or follicular thyroid cancer (differentiated thyroid cancer)

Most cases of differentiated thyroid cancer (DTC) can be successfully treated by surgery and radioactive iodine therapy. Targeted therapy may be used if those approaches aren't effective.

- **Multikinase inhibitors.** Lenvatinib (Lenvima) and sorafenib (Nexavar) inhibit (block) tumors from forming new blood vessels, which tumors need to grow. These drugs also inhibit the production of proteins that help cancer cells grow.
- **RET inhibitor.** Some differentiated thyroid cancers exhibit changes in the RET gene that cause the production of an abnormal form of the RET kinase protein, leading to the growth of cancer cells. Selpercatinib (Retevmo) targets (attacks) the abnormal RET protein.
- **NTRK inhibitors.** Changes in one of the NTRK genes can help cancer cells grow. Larotrectinib (Vitrakvi) and entrectinib (Rozlytrek) target and disable the abnormal proteins made by NTRK genes.
- **Tyrosine kinase inhibitor.** Cabozantinib (Cometriq, Cabometyx) works by blocking the action of an abnormal protein that signals cancer cells to multiply. It is approved by the U.S. Food and Drug Administration (FDA) for the treatment of DTC that has progressed after treatment with a multikinase inhibitor.

Targeted therapy in the treatment of medullary thyroid cancer

Targeted therapy is of particular value in the treatment of medullary thyroid cancer, because thyroid hormone-based treatments (including radioactive iodine therapy) are not effective against this type of cancer.

- **Multikinase inhibitors.** Vandetanib (Caprelsa) and cabozantinib (Cometriq) stop cancer cells from growing by inhibiting proteins and stopping the growth of new blood vessels (which tumors need to grow).
- **RET inhibitors.** As with differentiated thyroid cancer, some medullary thyroid cancers exhibit changes in the RET gene that cause the production of an abnormal form of the RET kinase protein. Selpercatinib (Retevmo) and pralsetinib (Gavreto) attack the abnormal RET protein.

Targeted therapy in the treatment of anaplastic thyroid cancer

Because most other therapies are not very effective against anaplastic thyroid cancer, targeted therapies are of significant interest in the treatment of this type of cancer.

- **BRAF and MEK inhibitors.** Some anaplastic thyroid cancers exhibit changes in the BRAF gene, causing the creation of proteins that help cancer cells grow. Dabrafenib (Tafinlar) inhibits the BRAF protein and trametinib (Mekinist) inhibits a related protein called MEK.
- **RET inhibitors.** As in differentiated thyroid cancer and medullary thyroid cancer, some anaplastic thyroid cancers exhibit changes in the RET gene that cause the production of an abnormal form of the RET kinase protein. Selpercatinib (Retevmo) attacks the abnormal RET protein.

- **NTRK inhibitors.** A small number of anaplastic thyroid cancers exhibit changes in one of the NTRK genes that can help cancer cells grow. As in differentiated thyroid cancer, larotrectinib (Vitrakvi) and entrectinib (Rozlytrek) target and disable the abnormal proteins made by NTRK genes.

Chemotherapy

Chemotherapy, the use of drugs to destroy cancer cells by stopping the ability of the cells to grow and divide, isn't commonly used in the treatment of thyroid cancer. It is sometimes recommended for people with anaplastic thyroid cancer, often in combination with radiation therapy.

The Importance of Clinical Trials

Clinical trials are the standard by which we measure the worth of new treatments and the quality of life of patients as they receive those treatments. For this reason, doctors and researchers urge people with cancer to take part in clinical trials.

Your doctor can guide you in making a decision about whether a clinical trial is right for you. Here are a few things that you should know:

- Often, people who take part in clinical trials gain access to and benefit from new valuable treatments.
- Before you participate in a clinical trial, you will be fully informed as to the risks and benefits of the trial, including any possible side effects.
- Most clinical trials are designed to test a new treatment against a standard treatment to find out whether the new treatment has any added benefit.
- You can stop taking part in a clinical trial at any time for any reason.

Treatment Side Effects

All cancer treatments can cause side effects. It's important that you report any side effects that you experience to your health care team so they can help you manage them. Report them right away—don't wait for your next appointment. Doing so will improve your quality of life and allow you to stick with your treatment plan. It's important to remember that not all people experience all side effects, and people may experience side effects not listed here.

Side Effects of Radiation Therapy

Fatigue is the most common side effect of intraoperative radiation therapy (IORT). Additionally, changes to the skin can frequently occur. The changes can include dryness, swelling, peeling, redness and (rarely) blistering. If a reaction occurs, contact your health care team so the appropriate treatment can be prescribed. It's especially important to contact your health care team if there is any open skin or painful area, as this could indicate an infection. Infections can be treated with an oral antibiotic or topical antibiotic cream.

Radioactive iodine (RAI) may cause temporary side effects, including neck tenderness and swelling, swollen salivary glands, loss of taste or changes in taste, dry eyes and dry mouth.

Side Effects of Targeted Therapy

Targeted therapy doesn't have the same effect on the body as do chemotherapy drugs, but it can still cause side effects. Side effects of targeted therapies can include diarrhea, liver problems (such as hepatitis and elevated liver enzymes), nerve damage, high blood pressure and problems with blood clotting and wound healing.

Side Effects of Chemotherapy

The side effects of chemotherapy depend on the type and dose of drugs given and the length of time they are used, and can include:

- Hair loss
- Increased risk of infection (from having too few white blood cells)
- Easy bruising or bleeding
- Changes in memory or thinking
- Peripheral neuropathy (numbness or tingling in hands and feet)

General Side Effects

Some side effects may occur across treatment approaches. This section provides tips and guidance on how to manage these side effects should they occur.

Managing Digestive Tract Symptoms

Nausea and vomiting

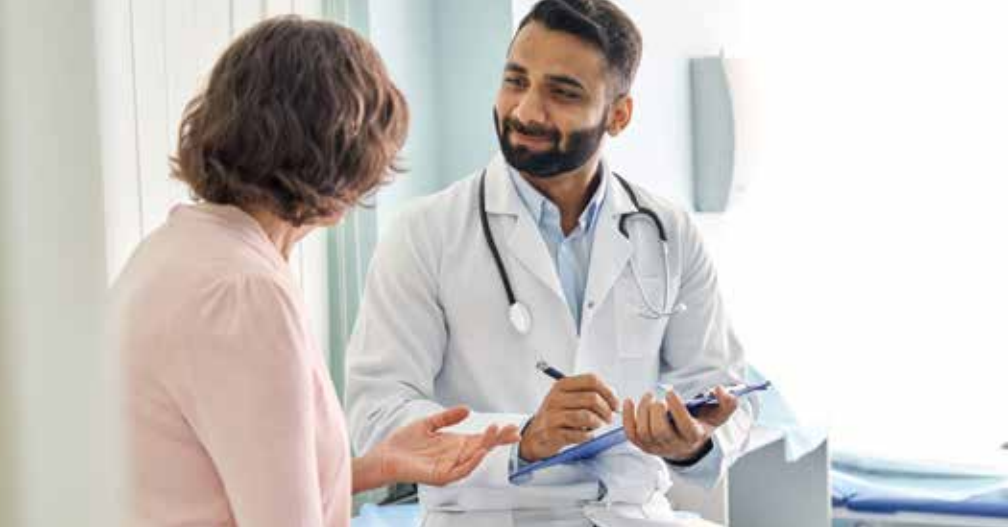
- Avoid food with strong odors, as well as overly sweet, greasy, fried or highly seasoned food.
- Eat meals that are chilled, which often makes food more easily tolerated.
- Nibble on dry crackers or toast. These bland foods are easy on the stomach.
- Having something in your stomach when you take medication may help ease nausea.

Diarrhea

- Drink plenty of water. Ask your doctor about using drinks such as Gatorade which provide electrolytes. Electrolytes are body salts that must stay in balance for cells to work properly.
- Over-the-counter medicines such as loperamide (Imodium A-D and others) and prescription drugs are available for diarrhea but should be used only if necessary. If the diarrhea is bad enough that you need medicine, discuss it with your doctor or nurse.
- Choose fiber-dense foods such as whole grains, fruits and vegetables, all of which help form stools.
- Avoid food high in refined sugar and those sweetened with sugar alcohols such as sorbitol and mannitol.

Managing loss of appetite

- Eating small meals throughout the day is an easy way to take in more protein and calories, which will help maintain your weight. Try to include protein in every meal.
- To keep from feeling full early, avoid liquids with meals or take only small sips (unless you need liquids to help swallow). Drink most of your liquids between meals.
- Keep high-calorie, high-protein snacks on hand such as hard-boiled eggs, peanut butter, cheese, ice cream, granola bars, liquid nutritional supplements, puddings, nuts, canned tuna or trail mix.
- If you are struggling to maintain your appetite, talk to your health care team about whether appetite-building medication could be right for you.



Managing Fatigue

Fatigue (extreme tiredness not helped by sleep) is one of the most common side effects of many cancer treatments. If you are taking a medication, your doctor may lower the dose of the drug, as long as it does not make the treatment less effective. If you are experiencing fatigue, talk to your doctor about whether taking a smaller dose is right for you.

There are a number of other tips for reducing fatigue:

- Take several short naps or breaks during the day.
- Take short walks or do some light exercise, if possible.
- Try easier or shorter versions of the activities you enjoy.
- Ask your family or friends to help you with tasks you find difficult or tiring.
- Save your energy for things you find most important.

Fatigue can be a symptom of other illnesses, such as anemia, diabetes, heart disease, rheumatoid arthritis and depression. So be sure to ask your doctor if they think any of these conditions may be contributing to your fatigue.

Managing Pain

To help your doctor prescribe the best medication, it's useful to give an accurate report of your pain. Keep a journal that includes information on:

- Where the pain occurs
- When the pain occurs
- How long it lasts
- How strong it is on a scale of 1 to 10, with 1 being the least amount of pain and 10 the most intense
- What makes the pain feel better and what makes it feel more intense

There are a number of options for pain relief, including prescription and over-the-counter medications. It's important to talk to a member of your health care team before taking any over-the-counter medication to determine if they are safe and will not interfere with your treatments.

Physical therapy, acupuncture and massage may also be of help in managing your pain. Consult with a member of your health care team before beginning any of these activities.

Communicating With Your Health Care Team

As you manage your thyroid cancer, it's important to remember that you are a consumer of health care. The best way to make decisions about health care is to educate yourself about your diagnosis and get to know the members of your health care team, including doctors, nurse practitioners, physician assistants, nurses, dietitians, social workers and patient navigators.

Here are some tips for improving communication with your health care team:

Start a health care journal. Having a health care journal or notebook (either on paper or in a digital format) will allow you to keep all of your health information in one place. You may want to write down the names and contact information of the members of your health care team, as well as any questions for your doctor.

Prepare a list of questions. Before your next medical appointment, write down your questions and concerns. Because your doctor may have limited time, ask your most important questions first and be as specific as possible.

Bring someone with you to your appointments or have them be present during telehealth sessions. Even if you have a journal and a prepared list of questions or concerns, it's always helpful to have support when you go to your appointments. The person you bring may also think of questions to ask your doctor or remember details about your symptoms or treatment that you may have forgotten.

Write down your doctor's answers. Taking notes will help you remember your doctor's responses, advice and instructions. You can also ask the person who accompanies you to take notes for you. If you have a mobile device, ask if you can use it to take notes. Keeping notes will help you review the information later.

Record your visit if your doctor allows it. Recording the conversation with your doctor gives you a chance to hear specific information again or share it with family members or friends.

Incorporate other health care professionals into your team. Your oncologist is an essential member of your health care team, but there are other health care professionals who can help you manage your diagnosis and treatment:

- Your primary care physician should be kept updated about your thyroid cancer treatment and any test results.
- Your local pharmacist is a great source of knowledge about the medications you are taking. Have all of your prescriptions filled at the same pharmacy to avoid the possibility of harmful drug interactions.
- Make sure your oncologist knows of any other medical conditions you have or any pain you are experiencing so that they can consult with you primary care physician or specialists as needed.

Remember, there is no such thing as over-communication.

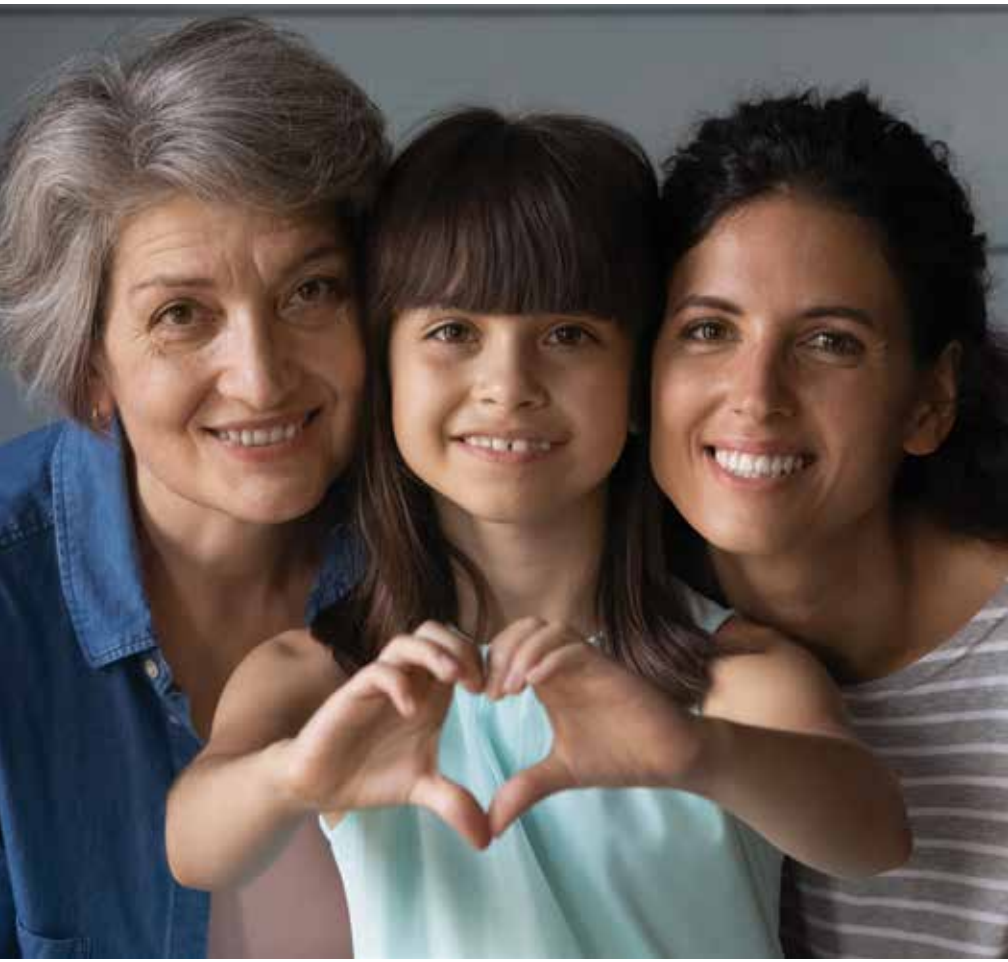
Cancer*Care*'s Free Support Services and Programs

It can be very difficult to receive a diagnosis of thyroid cancer, and adjusting to the necessary changes in your life can be challenging.

Cancer*Care*® can help. We are a national nonprofit organization providing free, professional services to anyone affected by cancer. Our licensed oncology social workers can provide support and education, help in navigating the complicated health care system and offer information on support groups and other resources.

To learn more about how Cancer*Care* helps, call us at 800-813-HOPE (4673) or visit www.cancercare.org.

You will likely also build your own personal support network composed of family and friends. In doing so, it's best to take some time to think about the people in your life and how they are best suited to help. Match the task to their strengths—ask a family member who loves to shop to pick up something for you at the store, or ask a friend who's a good listener to come over for a chat.



Frequently Asked Questions

Q: Are there risk factors for developing thyroid cancer?

A: Although it's not clear what causes thyroid cancer, there are factors that increase the risk of it developing:

- **Gender.** Thyroid cancer occurs approximately three times more frequently in women than in men.
- **Exposure to radiation.** Previous radiation therapy treatments to the head and neck increase the risk of thyroid cancer.
- **Genetic syndromes.** Inherited genetic syndromes that increase the risk of thyroid cancer include familial medullary thyroid cancer, multiple endocrine neoplasia, Cowden's syndrome and familial adenomatous polyposis.

Based on your family history, genetic testing may be recommended to look for genes that increase your risk of developing thyroid cancer.

Q: Is immunotherapy used as a treatment approach for thyroid cancer?

A: Our immune system is constantly working to keep us healthy. It recognizes and fights against danger, such as infections, viruses and growing cancer cells. In general terms, immunotherapy uses our own immune system as a treatment against cancer. Immunotherapy is currently being studied in clinical trials as a treatment approach for thyroid cancer.

Q: What is a treatment summary and why is it important?

A: Keeping your own records up-to-date in the form of a treatment summary can be helpful, as it allows you and your family members to have instant access to the specifics of your thyroid cancer diagnosis and treatment. A treatment summary should include:

- Your name and date of birth
- Date of diagnosis
- Prescribed therapy/therapies, including dates started and stopped and dosages when appropriate
- Dates and types of baseline and post-diagnosis testing and the results of these tests
- Other medications and supplements you are taking
- Names, affiliations and contact information of all members of your health care team

Ask the members of your health care team what they suggest be included. Take your personal record with you when you visit any doctor, not just your oncologist.

Resources

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800-813-HOPE (800-813-4673)
www.cancercare.org

American Cancer Society
800-227-2345
www.cancer.org

Cancer.Net
Patient information from the American Society of Clinical Oncology
888-651-3038
www.cancer.net

National Cancer Institute
800-422-6237
www.cancer.gov

Cancer Support Community
888-793-9355
www.cancersupportcommunity.org

National Coalition for Cancer Survivorship
877-622-7937
www.canceradvocacy.org

American Thyroid Association
www.thyroid.org

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

Medicine Assistance Tool
www.medicineassistancetool.org

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