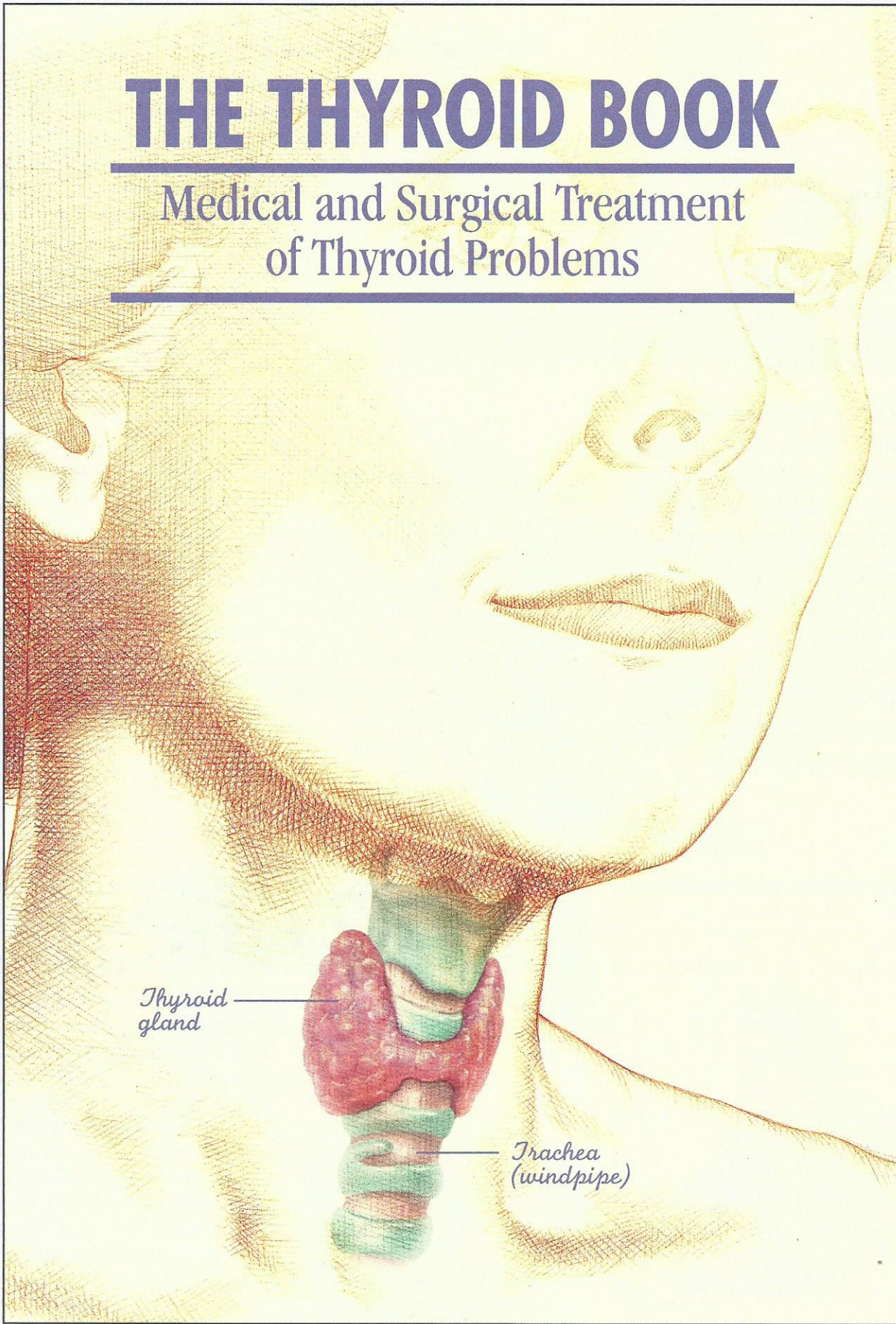


THE THYROID BOOK

Medical and Surgical Treatment
of Thyroid Problems

*Thyroid
gland*

*Trachea
(windpipe)*



Your Thyroid Gland

It doesn't look like much — a small, butterfly-shaped gland, just below your Adam's apple. But your thyroid gland has a big effect on the way your body works. The thyroid controls your body's energy level, and problems with your thyroid gland can interfere with your life. However, these problems *can* be treated. You and your doctor can discuss how best to handle your thyroid problem.

Problems with Your Thyroid

You may not hear much about thyroid problems, but they're common and affect many people. Having a thyroid problem may mean that your thyroid gland is underactive and doesn't work hard enough. Or, it may mean that your gland is overactive and works too hard. Your thyroid gland may also grow larger or develop lumps.

An Underactive Thyroid

When the thyroid doesn't work hard enough, it's called **hypothyroidism**. If you have hypothyroidism, your body runs more slowly and you have less energy. You may notice one or more of these symptoms:

- Feeling sluggish and tired
- Getting cold easily
- Gaining weight more easily



This booklet is not intended as a substitute for professional medical care. Only your doctor can diagnose and treat a medical problem.

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An Overactive Thyroid

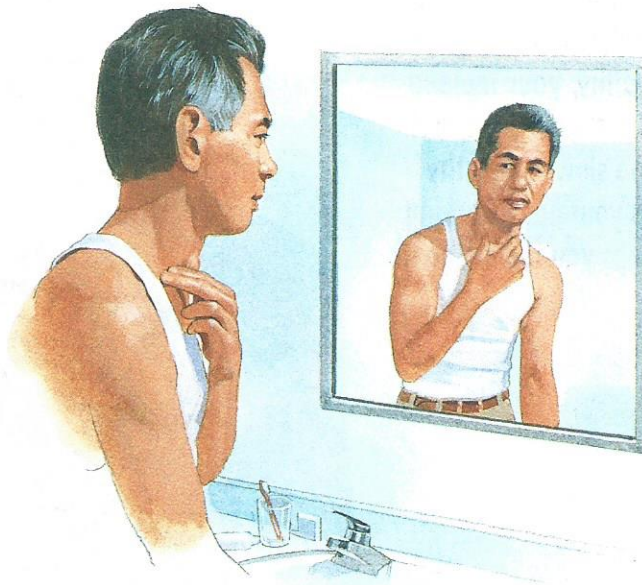
When the thyroid works too hard, it's called **hyperthyroidism**. If you have hyperthyroidism, your body runs faster. You may notice one or more of these symptoms:

- Getting hot easily
- Feeling wired and jittery, but also burned out and tired
- Losing weight without dieting



Thyroid Nodules

Your thyroid gland may develop one or more small lumps. These lumps are called **nodules**. If you have nodules, your thyroid usually continues to work at the right pace. As a result, you may not notice any symptoms, although you may be able to feel the nodule in your neck. Nodules are usually harmless, but occasionally they may be a sign of thyroid cancer.



Thyroid Problems Can Be Treated

Problems with the thyroid gland are often easy to treat. Even most forms of thyroid cancer are treatable, and the treatment often has a good outcome. Your doctor will evaluate your problem and discuss your treatment options with you. Depending on your type of problem, possible treatments include medications, thyroid hormone pills, surgery, and other procedures.

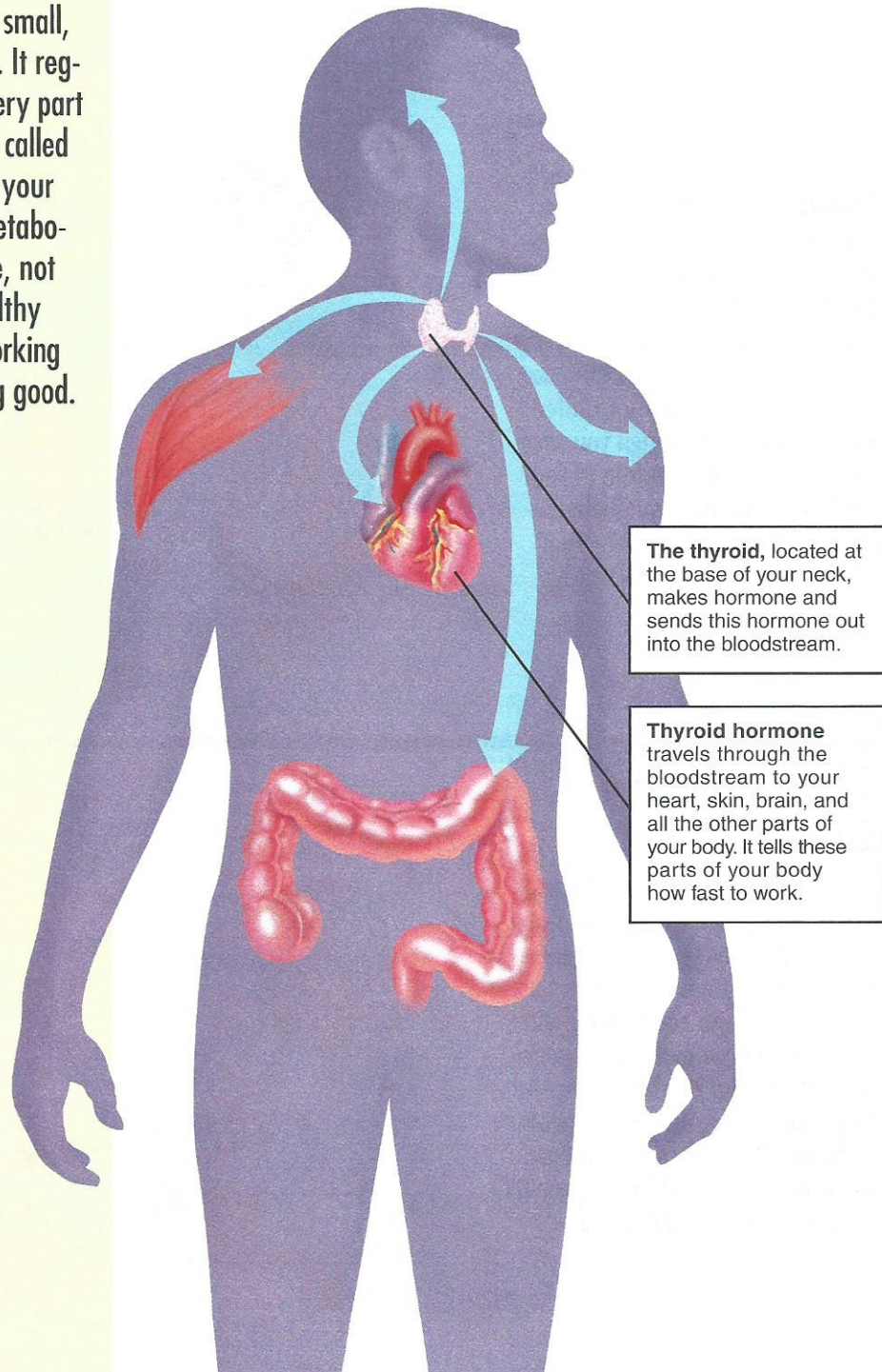


The Healthy Thyroid

Your thyroid gland may be small, but it has an important job. It regulates the rate at which every part of your body works. This is called your **metabolism**. When your thyroid is healthy, your metabolism stays at a steady pace, not too fast or too slow. A healthy thyroid keeps your body working right and keeps you feeling good.

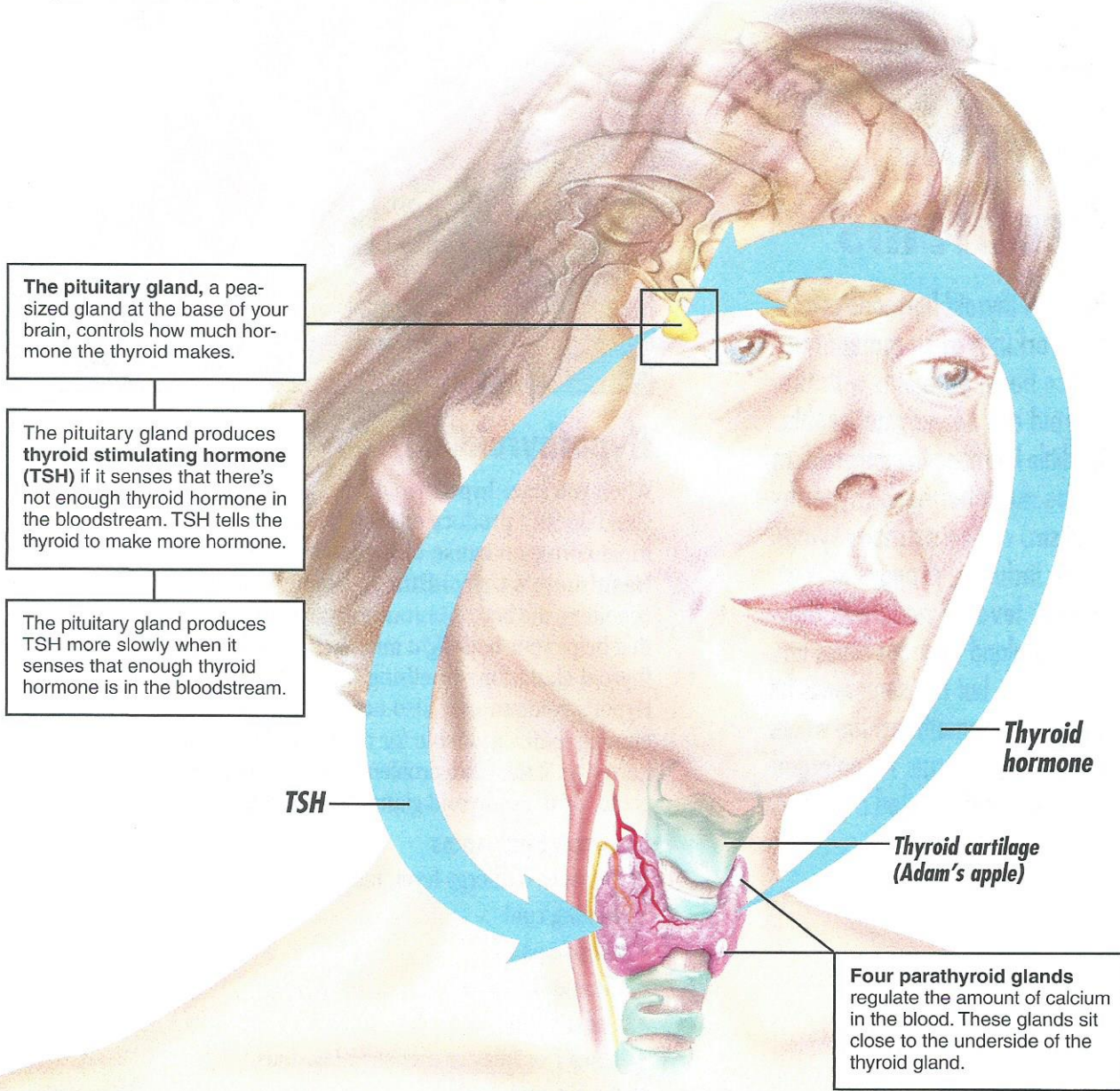
Keeping Your Body Working Right

By controlling your metabolism, your thyroid helps keep your body working right. The speed of your metabolism affects the workings of your organs, such as your heart and brain. Your metabolism acts on your digestive system to control how efficiently you burn calories. It keeps your skin, hair, and nails healthy and your muscles and nerves in good condition. It can even influence how you think and feel. Your thyroid gland regulates your metabolism by making **thyroid hormone**—a chemical that carries messages from the thyroid to the rest of the body through the bloodstream.



Thyroid Hormone: The Thyroid's Messenger

Your thyroid gland makes thyroid hormone from iodine, which is absorbed from the food you eat. When a large amount of thyroid hormone is produced, the cells work faster. When less thyroid hormone is produced, the cells work slower. To control the amount of thyroid hormone that's produced, the pituitary gland monitors the level of thyroid hormone in your blood and tells the thyroid when it needs to make more.



The **pituitary gland**, a pea-sized gland at the base of your brain, controls how much hormone the thyroid makes.

The pituitary gland produces **thyroid stimulating hormone (TSH)** if it senses that there's not enough thyroid hormone in the bloodstream. TSH tells the thyroid to make more hormone.

The pituitary gland produces TSH more slowly when it senses that enough thyroid hormone is in the bloodstream.

Four parathyroid glands regulate the amount of calcium in the blood. These glands sit close to the underside of the thyroid gland.

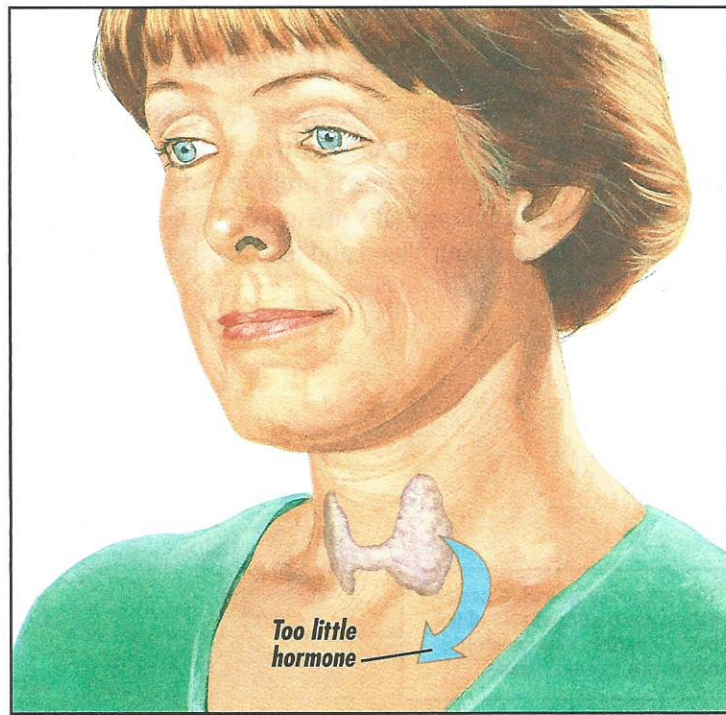
Thyroid Hormone and TSH

In general, levels of thyroid stimulating hormone (TSH) in the bloodstream go up when there's less thyroid hormone and down when there's more thyroid hormone.

- With hypothyroidism, the thyroid produces less thyroid hormone than normal. This prompts the pituitary to send extra TSH into the bloodstream to try to get the thyroid to make more hormone.
- With hyperthyroidism, the thyroid produces more thyroid hormone than normal. The pituitary then cuts back on the amount of TSH it sends into the bloodstream.

Three Common Thyroid Problems

Because thyroid hormone affects the workings of so many areas of the body, problems with the thyroid can be very noticeable. Too little hormone (hypothyroidism) or too much hormone (hyperthyroidism) can cause many symptoms, including changes in your energy level. A nodule in the thyroid gland may not cause any symptoms, but can sometimes be cancerous. Sometimes, the whole gland may enlarge. An enlarged thyroid gland is called a **goiter**.

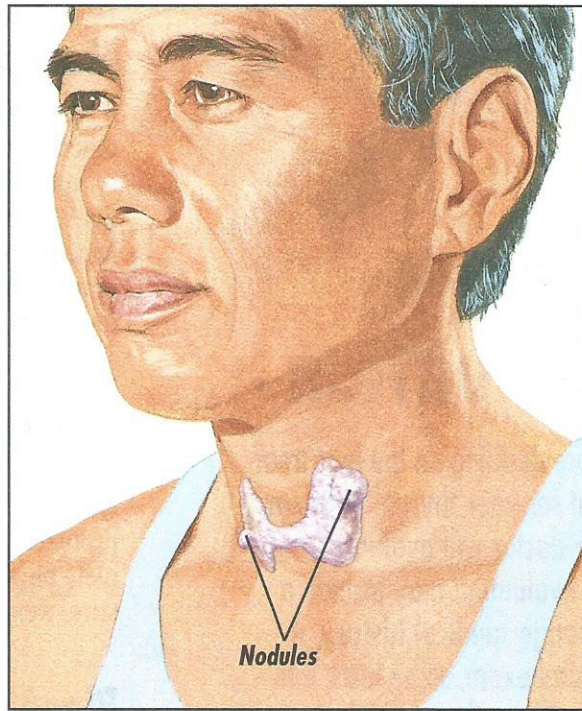
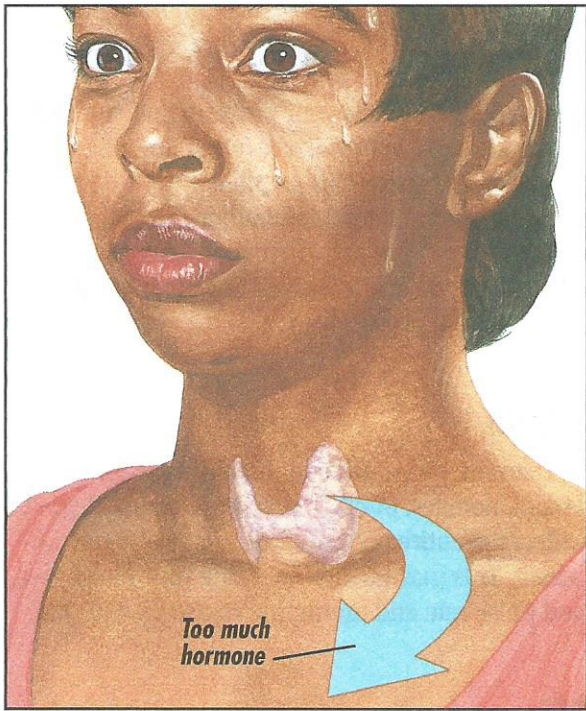


Hypothyroidism

When you have hypothyroidism, your thyroid gland doesn't produce enough hormone. The most common cause of hypothyroidism is **Hashimoto's thyroiditis**. In people with this condition, the body's immune system (the system that helps your body fight infection) mistakes the thyroid gland for something it needs to attack. Hypothyroidism may also occur if there's not enough iodine available for the thyroid to make hormone, if there are problems with the pituitary gland, or if the thyroid gland is removed.

Common Symptoms

- Decreased energy level, fatigue
- Feeling cold
- Muscle pain
- Slowed thinking
- Constipation
- Longer or heavier menstrual periods
- Weight gain
- Dry and brittle skin, hair, and nails
- Feeling down or depressed



Hyperthyroidism

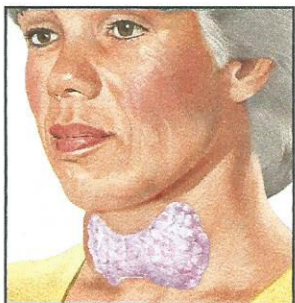
With hyperthyroidism, the thyroid gland produces too much hormone. The most common cause of hyperthyroidism is **Graves' disease**, a problem where the body's immune system overstimulates the thyroid. Graves' disease sometimes causes eye problems that make the eyes look like they're bulging (**exophthalmos**). A nodule in your thyroid gland can cause hyperthyroidism if the cells in the nodule produce more hormone than the rest of the gland.

Common Symptoms

- Shaking, nervousness, jitters, irritability
- Feeling hot
- A rapid, irregular heartbeat
- Muscle weakness, fatigue
- More frequent bowel movements
- Shorter or lighter menstrual periods
- Weight loss
- Hair loss

Nodules

Nodules are lumps of tissue in the thyroid gland. The gland may develop one nodule or many nodules. Usually, the cause of nodules can't be pinpointed, but they may be more common in people who've had therapeutic radiation to the head or neck in childhood for problems such as acne or swollen tonsils. Most of the time, nodules don't affect the production of thyroid hormone and usually cause no symptoms, although sometimes they can be felt from the outside of the neck. Most nodules are **benign** (noncancerous), but occasionally a nodule may be cancerous.



What Is a Goiter?

A goiter is the enlargement of the thyroid gland. When the gland enlarges, you may see or feel a swelling on one or both sides of your neck or notice that your collars or necklaces have become tighter. A goiter may develop in a person with hypothyroidism because the thyroid gets bigger in an attempt to produce more hormone. In hyperthyroidism, the thyroid cells may multiply too fast and cause the thyroid to grow. Multiple nodules can also make the thyroid larger.

Your Evaluation

Before deciding on the best treatment for your thyroid problem, your doctor will evaluate you. This evaluation may include a thorough medical history, a physical exam, some tests, and sometimes other special procedures. These tests and procedures can help your doctor determine what type of thyroid problem you have and its cause.

Medical History

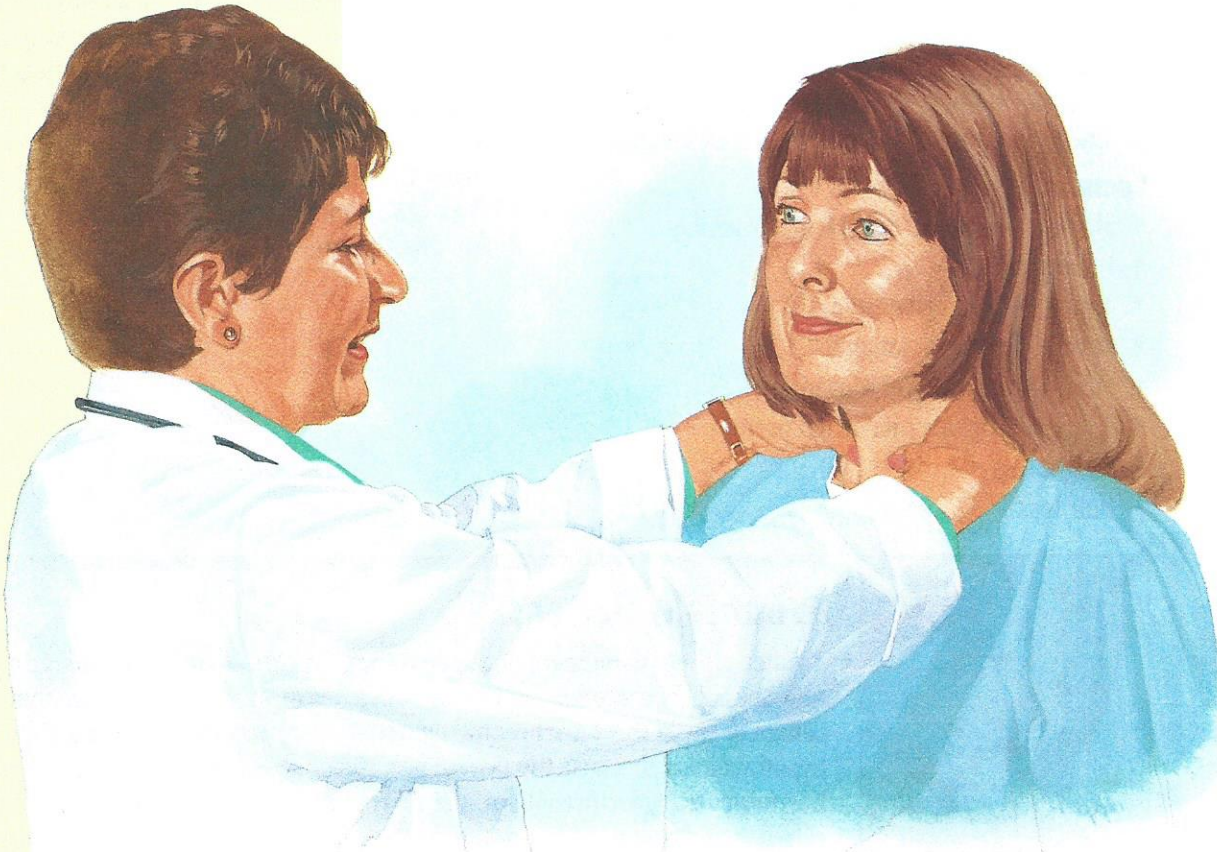
A history helps your doctor identify your problem and rule out other medical causes. Your doctor will ask you to describe your symptoms. Be as clear and specific as possible in your description. Your doctor may want to know about other medical problems you've had in the past. Because thyroid problems run in families, your doctor may also ask whether any other family members have had thyroid problems.

Physical Exam

Your doctor will examine your neck and thyroid gland and feel for any enlargement, nodules, or other changes. Because thyroid problems can affect the entire body, your doctor may do a complete physical exam. This may include checking your blood pressure, weight, and pulse rate and examining your eyes and skin.

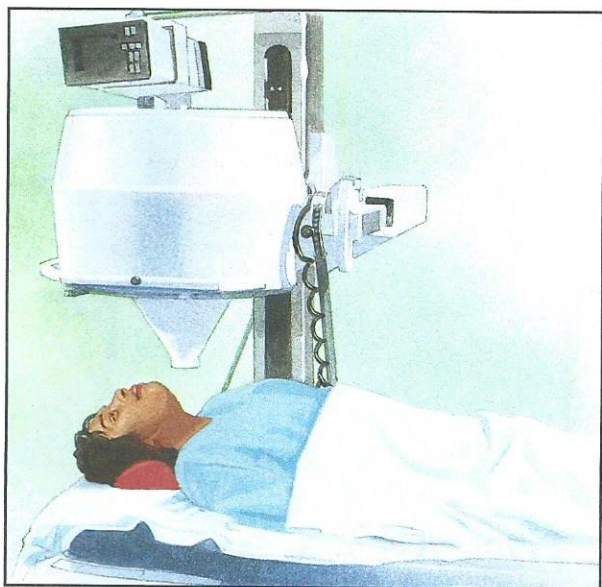
Blood Tests

Blood tests that measure levels of thyroid hormone and TSH in your blood can help confirm whether your thyroid gland is making too much or too little hormone. Tests that check for immune system problems may also be done. These tests can help your doctor diagnose Hashimoto's thyroiditis or Graves' disease.

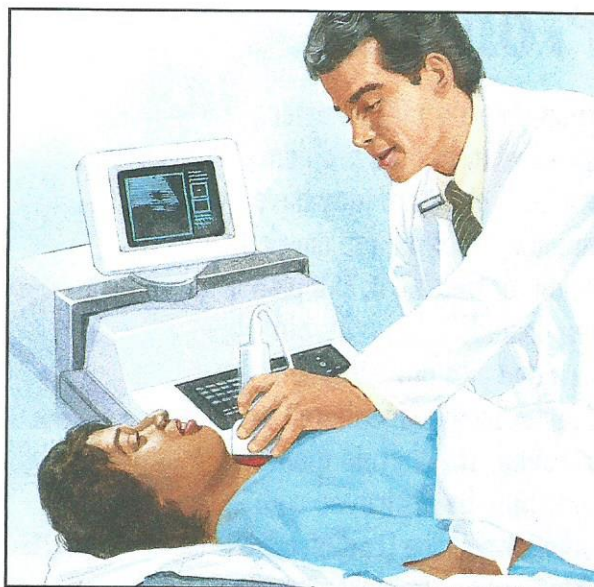


Getting a Closer Look

To get a closer look at your thyroid, your doctor may order certain tests. A **radioiodine uptake test** measures how well your thyroid absorbs iodine. You're asked to take a capsule or drink a cup of liquid containing a small amount of mildly radioactive iodine. Several hours later, and again the next day, a machine similar to an x-ray machine is used to measure the level of radioactive iodine in your thyroid. Two other tests, a **thyroid scan** and an **ultrasound exam**, create pictures of your thyroid gland that help your doctor evaluate nodules. The thyroid scan shows which areas of the thyroid absorb the most iodine. The ultrasound exam can show how many nodules you have, how large they are, and whether they're filled with fluid (**cystic**) or are solid.



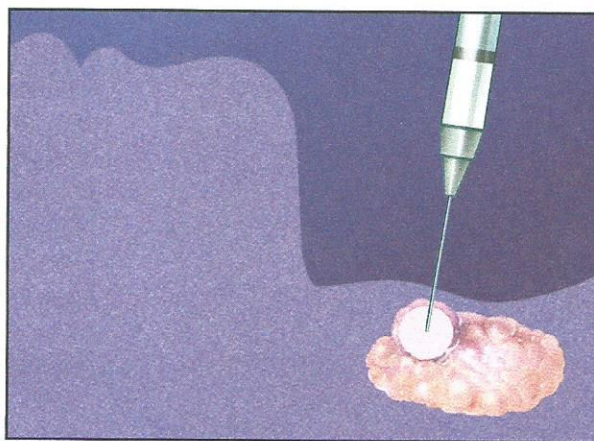
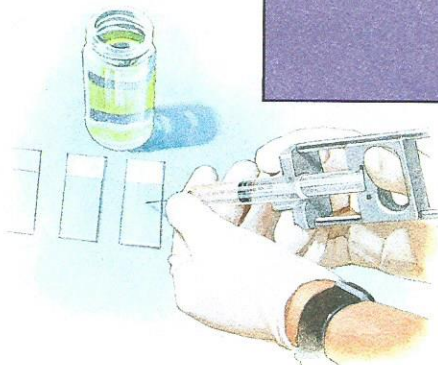
The **thyroid scan**, which creates a picture of the thyroid gland, uses radioactive iodine and is often done at the same time as the uptake test.



The **ultrasound exam** uses harmless sound waves to create a picture of your thyroid gland.

Fine-Needle Aspiration Biopsy

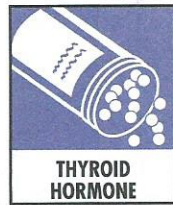
Fine-needle aspiration biopsy can indicate that a thyroid nodule may be cancerous. It's a quick and simple test that can be done in the doctor's office. Your doctor may numb the area around your thyroid gland. Then, a fine needle is passed into the nodule. Using the needle, the doctor collects some cells from your thyroid gland. Later on, these cells are examined under a microscope.



A **fine needle** is used to remove cells from the thyroid gland. The cells are then placed on slides and examined under a microscope.

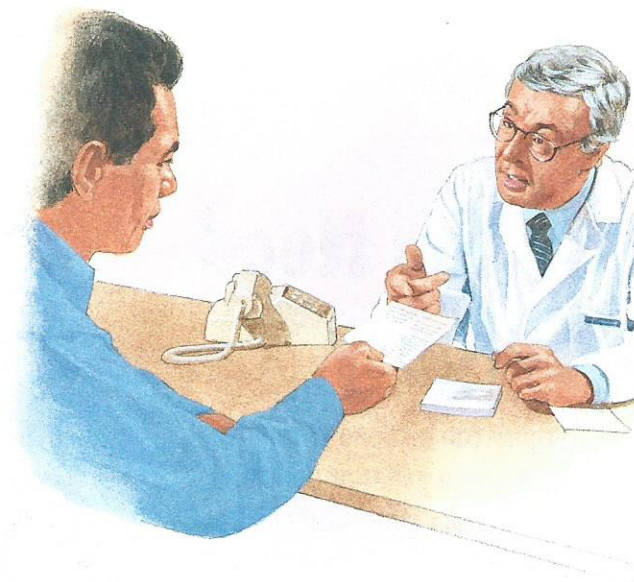
Treating Thyroid Problems

When your doctor has determined what thyroid problem you have and what may have caused it, he or she can develop a plan for treating it. This plan may include taking thyroid hormone pills or medications. Nodules may be monitored or removed. The thyroid gland itself may be destroyed with radioactive iodine (**radioiodine ablation**) or surgically removed (**thyroidectomy**). Your doctor will discuss treatment recommendations with you.

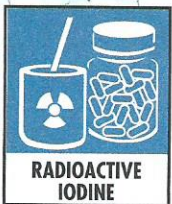


Treating Hypothyroidism

To treat hypothyroidism and return blood levels of thyroid hormone to normal, your doctor may prescribe thyroid hormone pills. The dose of hormone may need to be adjusted a few times before the best level is found for you. Once you begin taking thyroid hormone, your symptoms should clear up. If your thyroid gland has enlarged, it may return to normal size. To maintain your thyroid hormone at the right level, you'll probably need to take thyroid hormone pills for the rest of your life. Your doctor will regularly monitor the level of thyroid hormone in your blood, usually once a year, to be sure the hormone dosage continues to be right for you. Thyroid hormone is natural and easily accepted by the body. If taken as instructed, it generally has no side effects.



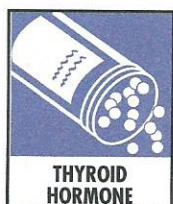
MEDICATIONS



RADIOACTIVE IODINE



SURGERY



THYROID HORMONE



SURGERY

Treating Hyperthyroidism

Several methods are available to treat hyperthyroidism. Medications may slow the production of thyroid hormone, returning the level of hormone to normal. If medications don't work, another option is radioiodine ablation of the thyroid. For this test, a large dose of radioactive iodine is given in pill or liquid form. The thyroid absorbs the radioactive iodine, which kills the thyroid cells. Because no other part of the body absorbs much iodine, other areas of the body aren't affected. Sometimes the thyroid gland is removed surgically (thyroidectomy). After treatment for hyperthyroidism, you may need to take thyroid hormone pills to keep your thyroid hormone at normal levels.

Treating Nodules and Goiter

If you have one or more nodules and no cancer is present, you may take thyroid hormone pills to help keep the nodules from getting larger. Your doctor can monitor any change in the size of nodules by physical exam or by using ultrasound. If a nodule grows very large, interferes with breathing or swallowing, or is cancerous, a thyroidectomy may be performed. Radioiodine ablation may be done after surgery for a cancerous nodule to be sure that all cancerous tissue has been destroyed. A large goiter that doesn't get smaller with other treatment may also be surgically removed. After thyroid surgery, you may need to take thyroid hormone pills to maintain normal thyroid hormone levels.

If Surgery Is Necessary

Removing part or all of your thyroid gland may be the best way to treat your thyroid problem. If this is the case, your doctor or a surgeon can discuss the procedure with you. A complete physical exam may be done to prepare you for surgery. This exam may include a routine check of your blood and your heart and an x-ray of your chest.

If You Need Surgery

Surgery can be done to remove a very large goiter or nodule, a hyperthyroid gland that can't be controlled with medications, or a thyroid gland that may be cancerous. The amount of gland removed depends on several factors. Your surgeon can discuss these factors, what to expect during the procedure, and the possible complications of thyroid surgery with you.

Preparing for Surgery

Ask your surgeon whether you need to stop taking aspirin or other medications before your procedure. Unless instructed otherwise, don't eat or drink anything for 12 hours before the procedure. You'll probably be admitted to the hospital or surgery center on the day of surgery. You usually need to be monitored after surgery, so prepare to spend one or more days in the hospital.



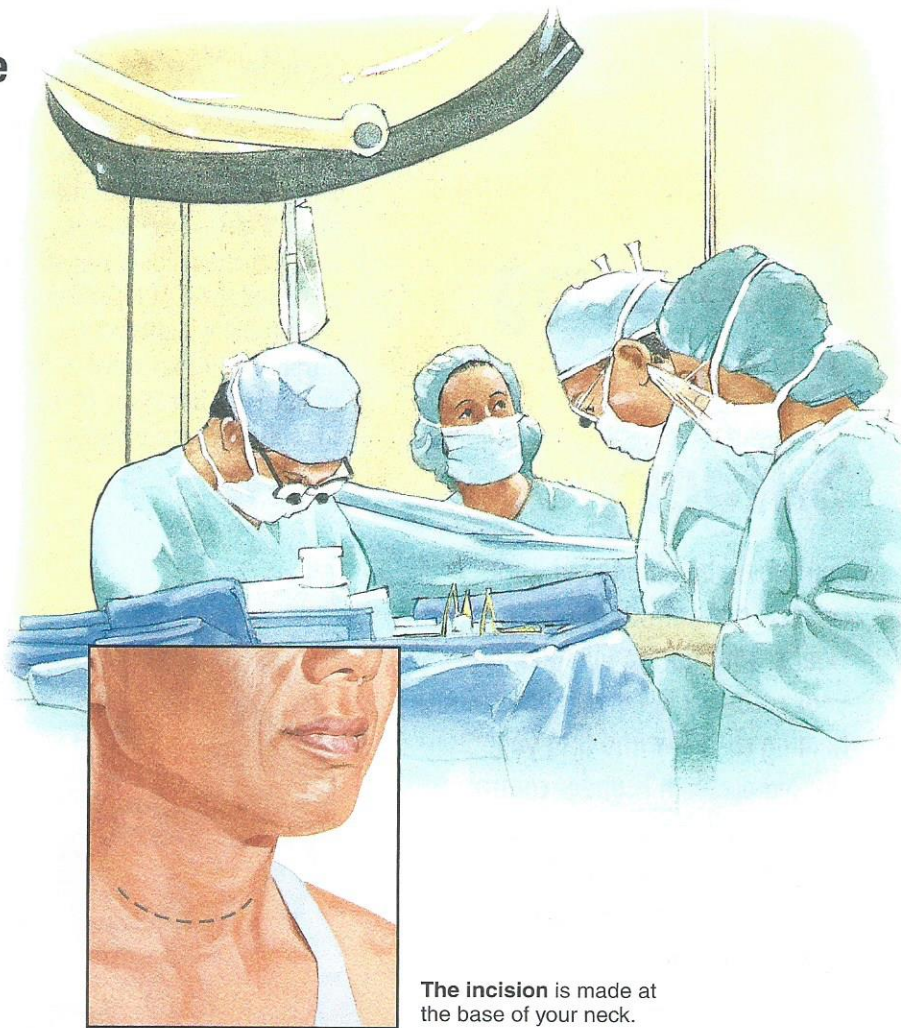
Risks and Complications of Thyroid Surgery

As with any surgical procedure, thyroid surgery has possible risks and complications. Your surgeon can discuss them with you. They include the following:

- Bleeding
- Infection
- Damage to nerves in your voice box leading to temporary or permanent hoarseness
- Permanent damage to the parathyroid glands, making them underactive (**hypoparathyroidism**). Because these glands control the amount of calcium in your bloodstream, permanent calcium supplements may then be necessary.

The Surgical Procedure

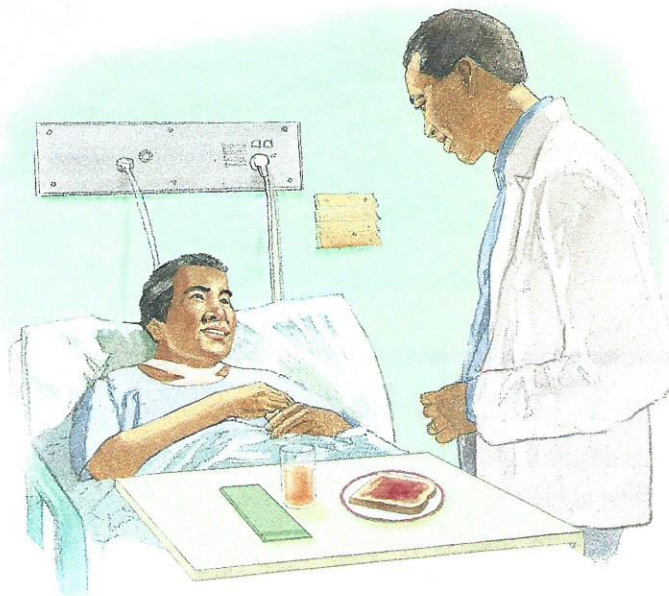
During the procedure, an **intra-venous (IV)** line provides you with fluids and medications. You'll be given general anesthesia, so you'll be asleep during the procedure. An incision is made in your neck, along a crease in your skin. The surgeon may remove one half of the thyroid gland (**lobectomy**), most of the gland (**subtotal thyroidectomy**), or the entire gland (**total thyroidectomy**). Sometimes, the decision about how much of the thyroid to remove can't be made until the surgeon makes the incision and can see the area around the thyroid. Once the procedure is completed, the incision is closed with surgical strips, surgical clips, or sutures. Occasionally, a drain may be left in the incision to remove fluid that can build up.



The incision is made at the base of your neck.

After the Procedure

You can usually begin to eat and drink normally the evening after the procedure, but you may still be a little queasy from the anesthesia. Once the anesthesia has worn off and you're feeling up to it, you'll be able to get up and walk around. You may be given oral medication for pain the first day or so, but discomfort is usually minimal. A sore throat and hoarseness are common and may last for a week or so after surgery. During your hospital stay, you'll be monitored for bleeding and to make sure your parathyroid glands are working normally. The stress of surgery may stun these glands for a short time, so you may be given calcium supplements for a few days.

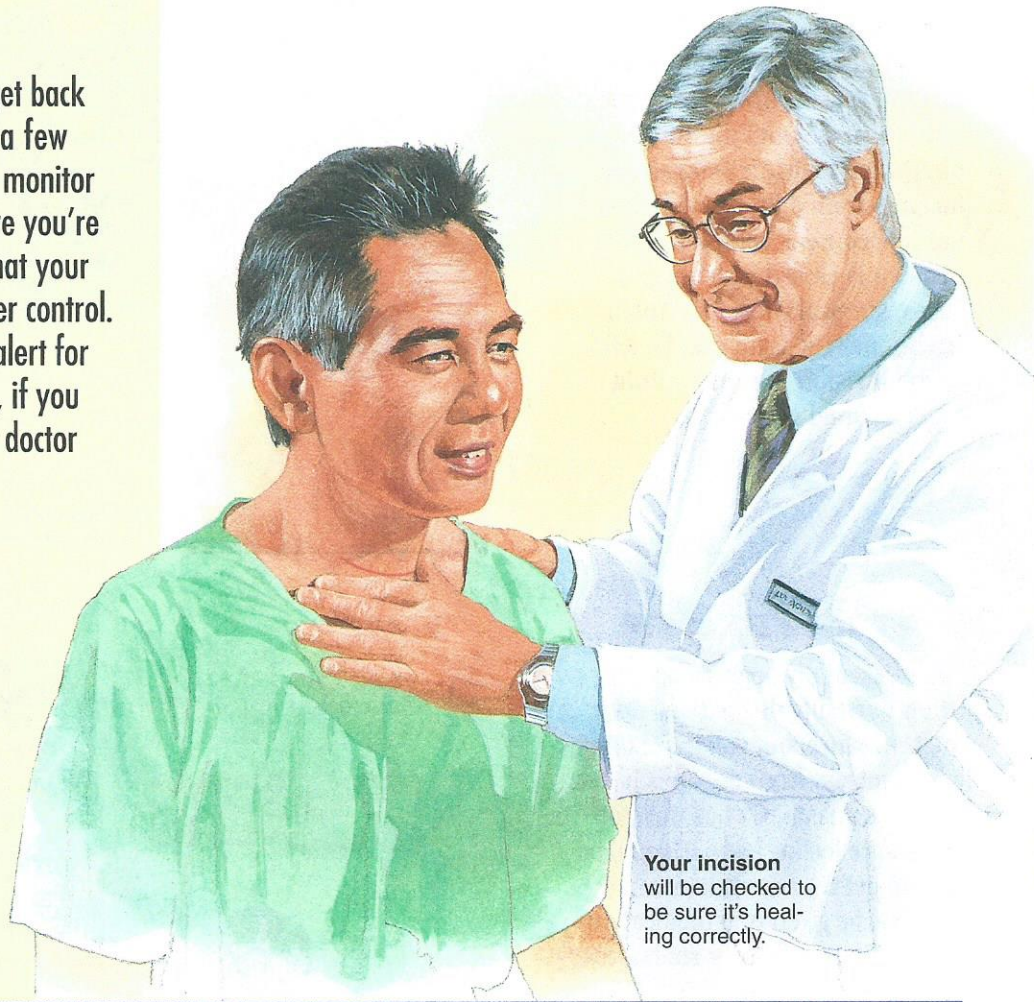


Recovering After Surgery

You should be able to get back to your normal life in a few weeks. Your doctor will monitor your recovery to be sure you're healing correctly and that your thyroid problem is under control. You can help by being alert for signs of a problem and, if you notice any, letting your doctor know right away.

While You're Healing

Your surgeon may ask you not to get your incision area wet for a few days after your surgery. Avoid strenuous physical activity for a few weeks, and don't return to work until your doctor says it's okay. Within a week or so, you'll visit the surgeon to have your incision checked. If you still have clips or sutures, they may be removed then. Your incision will be red and raised at first, but it will probably flatten out and fade in about six months. After your surgery, you may need to take thyroid hormone pills. These pills replace the hormone that your thyroid used to make. Your doctor will adjust the dosage of this hormone until it's right for you.



Your incision will be checked to be sure it's healing correctly.

When to Call Your Doctor

Call your doctor if you notice any of these signs, or any other problems:

- Swelling at the incision site
- Bleeding at the incision site
- Warmth, fever, or tenderness (signs of infection)
- A sore throat that continues beyond three weeks
- Tingling or cramps in the hands, feet, or lips (signs of a problem with the parathyroid glands)

In the Years to Come

Once your thyroid problems are under control, you can get back to doing the things you like to do. To keep feeling good, follow your doctor's instructions closely. Take your medications or hormone pills every day. And see your doctor for regular checkups.



Back to Feeling Good

After you're feeling better, the right care can keep you feeling good. If you've been given thyroid hormone or other medications, take your pills regularly to help keep your thyroid hormone at the right levels and your body running smoothly. See your doctor as directed for regular blood tests. These tests confirm that your hormone pills or medications are still at a dose that's right for you. If you have a nodule, monitoring may be necessary to check for changes in its size or for the appearance of additional nodules. If you've had treatment for cancer, regular exams help catch it early if it returns. No matter what the cause, thyroid problems don't have to keep you from feeling good and doing what you like.



Glossary

Exophthalmos: Bulging of the eyes that may occur in people with Graves' disease.

Fine-needle aspiration biopsy: A test that uses a needle to collect cells from the thyroid gland. These cells are then examined with a microscope.

Goiter: An enlarged thyroid gland, often resulting in a visible neck lump.

Graves' disease: The most common cause of hyperthyroidism.

Hashimoto's thyroiditis: The most common cause of hypothyroidism.

Hormone: A chemical produced by the body that travels through the bloodstream and carries messages to different parts of the body. Thyroid hormone carries messages from the thyroid.

Hyperthyroidism: When the thyroid gland produces too much thyroid hormone.

Hypothyroidism: When the thyroid gland produces too little thyroid hormone.

Iodine: What the thyroid uses to make thyroid hormone.

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Nodule: A lump. Thyroid nodules can be single or multiple.

Parathyroid glands: Four small glands behind the thyroid. They produce a hormone that controls the amount of calcium in the bloodstream.

Pituitary gland: A small gland at the base of the brain. It controls the amount of thyroid hormone made by the thyroid gland.

Radioiodine ablation: A treatment that uses radioactive iodine to destroy overactive or cancerous thyroid tissue.

Radioiodine uptake test: A test that uses a small amount of mildly radioactive iodine to measure how much iodine the thyroid absorbs.

Thyroid scan: A test that uses a small amount of a mildly radioactive substance to create an image of the thyroid gland.

Thyroid stimulating hormone (TSH): A hormone produced by the pituitary gland. It tells the thyroid gland to make more thyroid hormone.

Thyroidectomy: Surgical removal of some or all of the thyroid gland.

Ultrasound exam: A test that uses harmless sound waves to take a picture of the thyroid gland.



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