

Psst!

Plan to Stay in Shape Today

KNOW AND
UNDERSTAND:

THYROID

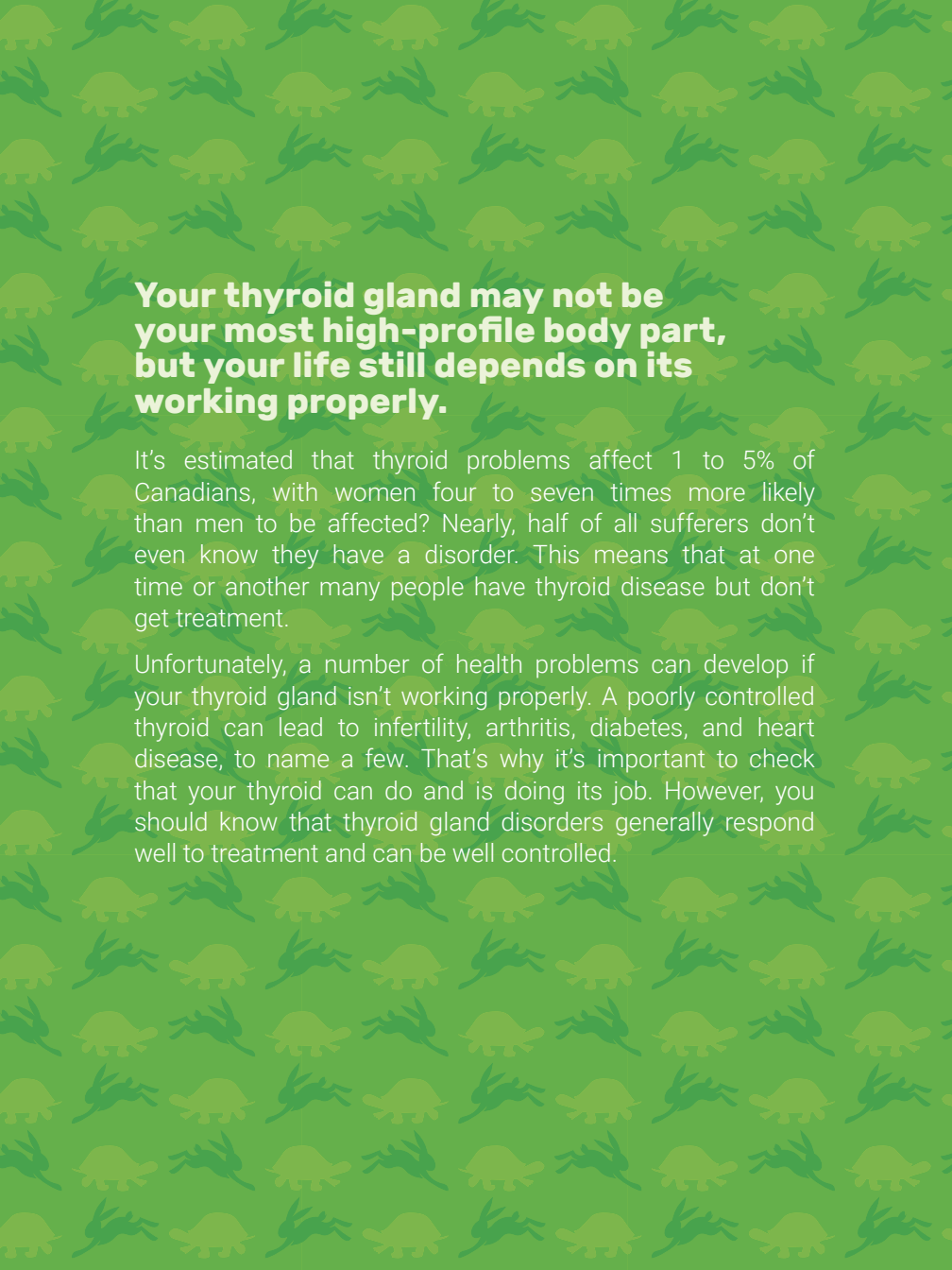


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Guide to
Thyroid Health

In collaboration with: **APOTEX**



The background of the entire page is a repeating pattern of stylized green turtles and rabbits. The turtles are facing right, and the rabbits are facing left. They are arranged in a grid-like fashion, with some overlapping.

Your thyroid gland may not be your most high-profile body part, but your life still depends on its working properly.

It's estimated that thyroid problems affect 1 to 5% of Canadians, with women four to seven times more likely than men to be affected? Nearly, half of all sufferers don't even know they have a disorder. This means that at one time or another many people have thyroid disease but don't get treatment.

Unfortunately, a number of health problems can develop if your thyroid gland isn't working properly. A poorly controlled thyroid can lead to infertility, arthritis, diabetes, and heart disease, to name a few. That's why it's important to check that your thyroid can do and is doing its job. However, you should know that thyroid gland disorders generally respond well to treatment and can be well controlled.

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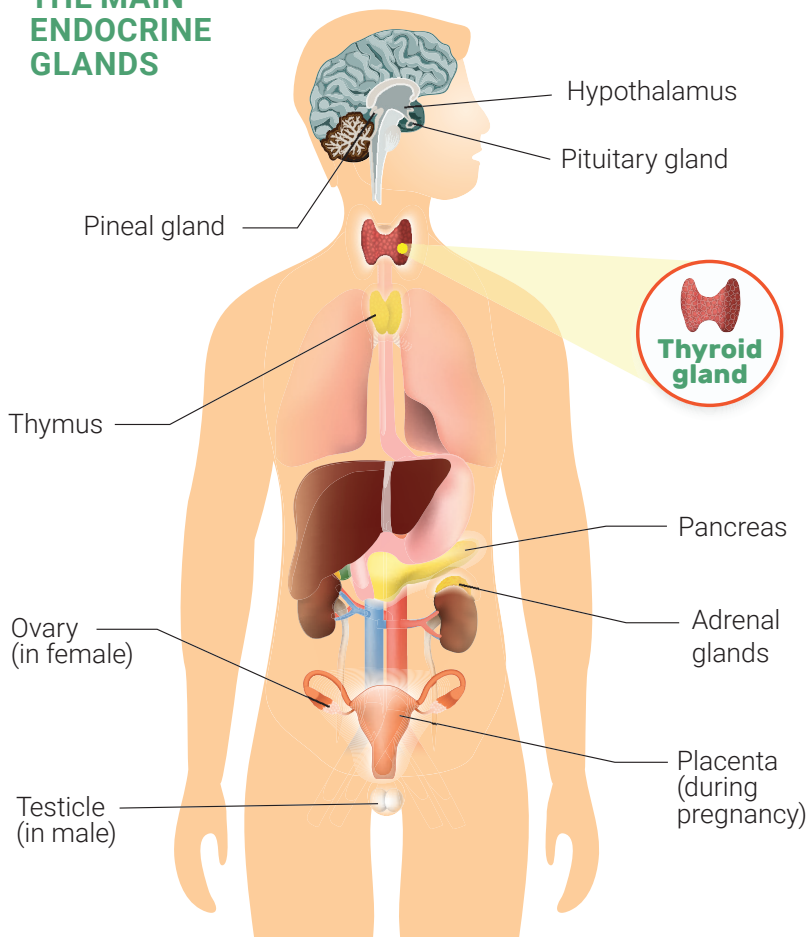
WHAT IS A GLAND?

Glands are structures in the body that specialize in synthesizing and secreting specific substances. There are two types of glands: **Exocrine glands** (exo- meaning “out of”) produce substances for release on the surface of the body or into the environment. Exocrine glands include those that secrete sweat, sebum and saliva.

Endocrine glands (endo- meaning “in”) synthesize hormones for release into the bloodstream. Hormones in the blood carry chemical messages that stimulate certain parts of the body. Hormones from endocrine glands thus take information to particular organs.

Therefore, glands exercise a kind of remote-control over other organs. In a threatening situation, for example, the adrenal glands (in the endocrine system) secrete adrenalin to kickstart the heart and lungs to help you deal with the perceived danger. Endocrine glands help the body adapt when the situation demands.

THE MAIN ENDOCRINE GLANDS





SO WHAT ABOUT THE THYROID GLAND?

The thyroid is a butterfly-shaped gland at the base of the throat. It's one of your body's biggest glands, much bigger for instance than the adrenal glands or ovaries (see illustration on page 5). It's considered an endocrine gland because the hormones it synthesizes are used inside the body. The hormones from your thyroid gland are essential to life and play a role in **growth**, **brain development**, and **regulating metabolism**. Among the specific functions the thyroid gland influences are:

- > **Energy consumption**
- > **Body temperature**
- > **Mood**
- > **Concentration**
- > **Heart rate**
- > **Nervous system function**
- > **Digestive tract function**
- > **Muscle tone**
- > **Etc.**

The thyroid is controlled by the **pituitary**, another endocrine gland at the base of the brain, which is in turn controlled by the **hypothalamus** acting on signals received from the body. When a message arrives from the hypothalamus, the pituitary gland is like the conductor of an orchestra, indicating the tempo of hormone synthesis in the body. Other glands are given instructions on exactly what to produce to keep hormones, the brain, and the environment in balance. It's all part of keeping us healthy.

So the hypothalamus tells the pituitary gland to send signals to the thyroid, which then sends the message on to the rest of the body.

IODINE

Iodine is the main ingredient in thyroid hormones and is indispensable to their synthesis. That's why you need a certain amount of iodine in your diet—to provide raw material for your thyroid to work with. Certain foods are sources of dietary iodine, such as fish and seafood, which naturally store up iodine from their salt sea habitat.

The body needs about **150 mcg of iodine per day** to synthesize the thyroid hormones it needs—just a little less than what's found in a **half-teaspoonful of table salt**.



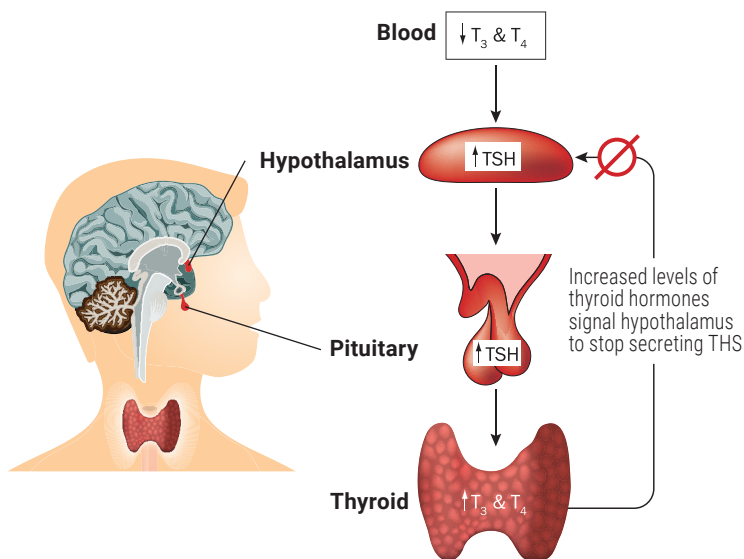


At one time, iodine deficiency was common among people who lived far from the sea. It largely disappeared in Canada many years ago when it became mandatory to enrich **table salt** with iodine.

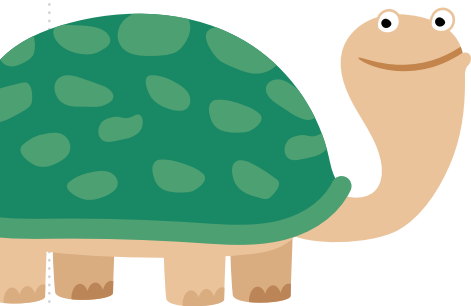
ASSESSING THYROID FUNCTION

The most common way to screen for thyroid function problems is with a **blood test** to assess two primary elements. First, it checks whether the **pituitary** is working properly stimulating the thyroid gland. This is done by measuring the level of thyroid-stimulating hormone (**TSH**) in the blood. Next, the test measures the hormones the **thyroid** produces directly. Specifically, these are thyroxine (**T4**) and triiodothyronine (**T3**).

The pituitary responds to thyroid hormone levels in the body. When it detects a shortage of thyroid hormones, it secretes extra hormones of its own to tell the thyroid to get going. This means that if thyroid hormone levels fall, TSH levels rise, and vice versa.



Some health professionals may supplement blood tests by feeling (palpating) your throat, as part of your annual checkup. Your doctor can sometimes feel something unusual about the size or shape of your thyroid and could order additional tests to see what's causing it.



HYPOTHYROIDISM

Hypothyroidism is the most common thyroid disorder. The prefix *hypo-* means “under,” so hypothyroidism means the thyroid can’t produce enough T3 and T4 hormones to maintain essential bodily functions—it’s under-producing. Thyroid disorders can appear at any age, but the prevalence increases as you get older, and an estimated 10% of people over 60 are afflicted. As previously mentioned, they are much more likely to appear in women.

SYMPTOMS

Hypothyroidism slows the body down. A variety of unpleasant symptoms may appear as organs become less active and can’t keep up their usual functions. The body can show that it’s short of hormones in a variety of ways.

A person suffering from hypothyroidism may experience:

- > **Chilliness**
- > **Weakness, fatigue, listlessness**
- > **Constipation**
- > **Dry skin and hair**
- > **Muscle cramps**
- > **Slow heart rate**
- > **Unexplained weight gain**
- > **Confusion, altered memory, difficulty concentrating**
- > **Loss of interest in activities ordinarily enjoyed, reduced initiative, lack of interest to participate or get involved because of a lack of energy**

It's important to bear in mind that these symptoms aren't necessarily caused by hypothyroidism. They may be linked to a number of health conditions. Symptoms can also vary considerably from one individual to the next. They appear very **gradually** and in proportion to the decline in thyroid hormones. Some hypothyroid individuals don't feel any discomfort or unease before being diagnosed. Sometimes the blood test is the only thing showing how much decline in thyroid function has occurred.





CAUSES

Most cases of hypothyroidism are caused by an immune system malfunction. For reasons still not fully understood, the body's own antibodies start to attack and gradually destroy the thyroid gland. It develops in certain predisposed individuals, often triggered by a highly stressful experience, an infection, or other event.

Transient hypothyroid episodes or a permanent loss of thyroid function can be triggered by many factors:

- > **Radiation therapy**
- > **Thyroid surgery**
- > **Prolonged use of certain medications**
- > **Problems with pituitary function**
- > **Genetic anomalies**

There are simple, focused and effective treatments available, whatever the cause of the thyroid disorder.

TREATMENT

Hypothyroidism can be treated simply and easily. The treatment consists of taking replacement thyroid hormones regularly. Hormone replacement therapy is not a cure unfortunately. It simply makes up for the hormones the thyroid gland can't provide anymore. Patients must in most cases continue taking the prescribed medication for the **rest of their lives**. The good news is that once the dosage is set, there are few side effects, which is because the medication simply replaces a hormone that's supposed to be found naturally in the body.

As mentioned earlier, blood tests are used to assess thyroid function and set the proper dose of replacement hormones. Samples are taken before starting treatment, then four to eight weeks in, and afterwards according to the doctor's recommendation.

The dose is also adjusted to the needs of each patient. Treatment is aimed mainly at establishing a state called *euthyroid*, i.e., a normal level of thyroid hormones in the blood.



Hypothyroid medication is taken once a day, ideally at the same time. It is important to always take the medication the same way and at the same time relative to meals. This keeps blood-hormone concentrations stable from day to day. **Individuals taking replacement hormones should always ask a pharmacist before taking over-the-counter medications or natural health products.** Many over-the-counter medications, for example, contain iron or calcium, which can interfere with the absorption of hypothyroid medications. Usually, the recommendation is to take them a few hours apart.



WHEN YOUR BODY TALKS...

How you feel can tell you a lot about the effectiveness of medications you're prescribed. Normally the **fatigue** and **constipation** commonly associated with hypothyroidism fade after about a month of treatment. If not, or if fatigue or constipation returns after a brief disappearance, perhaps your dosage is too low. You should plan an appointment with your doctor within a few weeks.

Other signs might be a hint that your dosage is a little too high. Such signs might include rapid or irregular heartbeat, sweating, tremors or sleeplessness. Don't hesitate to tell your healthcare professional about any unpleasant symptoms you experience and how they change. The information can be used to better control your condition.





HYPOTHYROIDISM AND CHILDREN

As noted above, normal thyroid hormone levels are essential for growth and brain development. Poorly controlled hypothyroidism can do irreversible harm to a child's physical and mental development. Fortunately, Canadian newborns get a blood test for congenital hypothyroidism as part of an extensive battery of screening. Medical teams respond rapidly to the results and begin treatment in the first days of the baby's life if necessary.

HYPOTHYROIDISM AND WOMEN

A shortage of thyroid hormones can disrupt the menstrual cycle, leading to heavy periods and problems with the ovulation cycle. Couples in which the woman suffers from uncontrolled hypothyroidism may have difficulty getting pregnant. But if thyroid hormones are controlled, fertility essentially goes back to normal. Most common treatments can be continued during pregnancy with no risk to the foetus. The medications used are, after all, derived from naturally occurring hormones produced by the body.

DID YOU KNOW?

Men's ability to produce sperm also depends on healthy thyroid gland function. That means that some male fertility problems may also be linked to thyroid problems. Once again, however, once thyroid hormone levels are controlled, fertility is generally restored.

There are two main concerns for hypothyroidism in pregnancy and in the months following birth. Women taking hormone-replacement therapy who want to get pregnant should see their doctor before they start trying to conceive. It's generally recommended that women undergoing hypothyroid treatment wait until they've been stabilized for at least two months before conception, to make thyroid hormone levels easier to control.



Women may also experience thyroid problems after giving birth. A woman with a predisposition to thyroid disease is more likely to develop hypothyroidism just after having a baby. This appears to be caused by the mother's immune system returning to full activity when the pregnancy is over. Her antibodies become more active and are more likely to attack the thyroid.

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Women with a history of
hypothyroidism should
be monitored more
closely by their physician
after giving birth.

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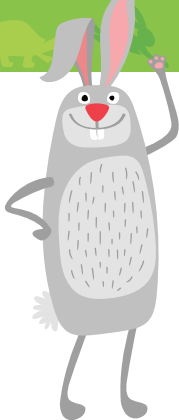


DID YOU KNOW?

Hormone replacement therapy dosages should be increased by 30 to 50%, according to the doctor's recommendation, as soon as pregnancy is confirmed. During the first trimester, the foetus's endocrine system isn't developed enough to produce its own hormones. That means that it is the mother's baby's only source of thyroid hormones for the first 13 weeks of existence. It's a critical period in the embryo's development. It's a critical period in the embryo's development.

We also know that the hormones synthesized by the thyroid gland are essential to the development of baby's brain and neurons. That makes it essential for women being treated for hypothyroidism to see their doctor as soon as pregnancy is confirmed to make the necessary adjustments to their medication. After you gave birth, your dose of replacement hormones is usually reduced at the same dose as before you became pregnant.





HYPERTHYROIDISM

Hyperthyroidism is the opposite of hypothyroidism, so it means the body produces **more hormones** than it needs. Metabolic functions speed up unnecessarily, urged on by a thyroid gland spurring the organs to work harder and faster. This hyperactive state is however much **less common than hypothyroidism**.

SYMPTOMS

The body has a variety of different ways to show there is an excess of hormones. Disagreeable symptoms occur because the organs are hyperactive and working harder than they need to. **The body responds by going into overdrive**; energy reserves and resources are used up too quickly.

A person suffering from hyperthyroidism might experience:

- > **Rapid resting pulse** and **palpitations** possibly leading to shortness of breath
- > **Hot flashes** with **excessive sweating**
- > **Tremor**
- > **Insomnia**
- > More frequent **bowel movements**
- > **Weight loss**, oddly associated with increased appetite
- > **Nervousness** and **irritability**, possibly associated with rapid mood and behavioural changes

Some rarer types of hyperthyroidism may lead to goitre (thyroid enlargement) or bulging eyes.



The illustrations below help you compare the symptoms of hypothyroidism with those of hyperthyroidism.

HYPOTHYROID Profile

The body runs in slow motion.

Hair loss, frizzy or dry hair

Pale, dry skin

Slow heart rate

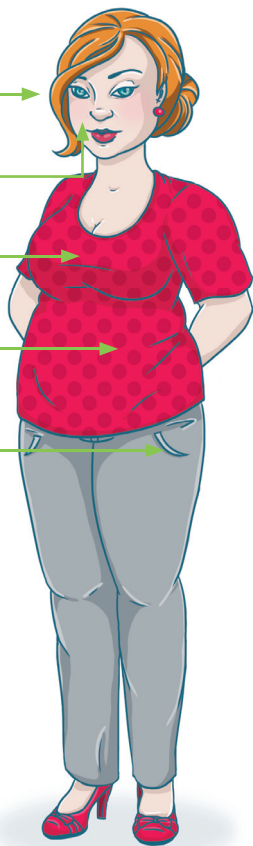
Constipation

Cramps

Weight gain

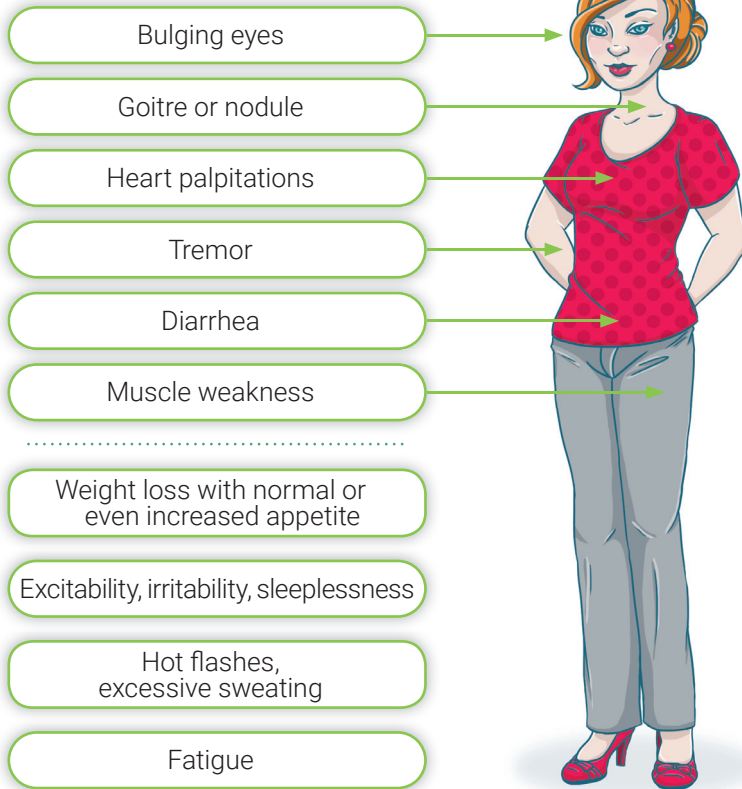
Weakness, fatigue and abnormal listlessness

Chilliness



HYPERTHYROID Profile

The body runs in overdrive.





CAUSES

Like hypothyroidism, hyperthyroidism is often caused by a glitch in the immune system. With hyperthyroidism, the antibodies become hypersensitive, stimulating the thyroid gland to step up hormone production.

Sometimes, for unknown reasons, a little lump, called a thyroid nodule, can appear on the thyroid surface. Certain types of nodules may produce hormones of their own, which are added to those secreted by the thyroid itself. This leads to an oversupply of hormones in the body and can lead to hyperthyroidism.

Excess secretion of thyroid hormones may also be triggered by thyroiditis, a condition in which the gland becomes inflamed. Thyroiditis sometimes leads to transient, cause-dependent hyperthyroidism, that may resolve on its own within a few months.

TRUE OR FALSE?

Poorly controlled hyperthyroidism may increase the risk of osteoporosis and heart problems.

TRUE!

Over the years, untreated hyperthyroidism can lead to a progressive deterioration of bone tissues. Hyperthyroidism interferes with bones' ability to absorb the calcium they need to stay solid and strong. Bone density declines and the skeleton grows increasingly frail.

In addition to osteoporosis, untreated hyperthyroidism can lead to atrial fibrillation, i.e., cardiac arrhythmia. Fortunately, with treatment, hyperthyroidism won't degenerate and these kinds of complications won't occur.





TREATMENT

There are a number of ways to treat hyperthyroidism. One approach involves the use of **medication** to slow the production of thyroid hormones. This gives the organs a chance to return to their usual speed of operation. Another option is to reduce thyroid hormone production by killing off some of the thyroid cells with small doses of **radioactive iodine**. The idea is to trick the thyroid. It is fed toxic iodine which are very similar to the element used for synthesizing hormones. This iodine is in fact cleverly disguised medication, which the unsuspecting gland unwittingly absorbs. The radioactive iodine kills off some of the tissue and the surviving cells can't maintain their previous overproduction. Sometimes, more rarely, **surgery** may be performed to remove part of the gland.

Sometimes radioactive iodine or surgery ends up destroying too much tissue and the gland can no longer secrete enough hormones to meet the body's needs. Instead of an excess, there is now a shortage of thyroid hormones, caused by treating the initial hyperthyroidism. This is treated like any other form of hypothyroidism, with the missing hormones replaced through medication.

Although physicians generally do whatever they can to avoid creating a new health problem when treating another, the fact is **they'd rather manage hypothyroidism than hyperthyroidism**. This is because the medications available for hormone shortages are better known, safer and more readily available than those for excess hormones.

Medications may also be prescribed to relieve the unpleasant symptoms associated with hyperthyroidism. Months can go by before treatment takes effect, so in the meantime it can be helpful to reduce tremor, relieve anxiety or steady the heart with the appropriate medications. Although they don't affect the disease, they can mask the symptoms until the main medication takes effect. It's a temporary solution to allow the patient to get on with his life during the initial treatment phase.





THYROID CANCER

It will probably come as no surprise that thyroid cancer is less common than breast or prostate cancer. Nonetheless, it's important to investigate medically if a lump is found at the base of the throat, around collar level.

Thyroid nodules—small lumps on the gland's surface—are by no means uncommon. According to ultrasound data, close to half the population have them. Most of the time, these little lumps are painless, stable and cause no symptoms. In most cases, thyroid nodules are harmless. However, the small percentage remaining, however, can be cancerous.

In any case, tests are warranted if any change in the size of the thyroid is found, as well as for hoarseness, difficulty swallowing, neck or throat pain or enlarged lymph nodes in the neck. Your family doctor can assess the situation and refer you to a specialist if necessary. Early detection and proper treatment generally result in full recovery from thyroid cancer.

DID YOU KNOW YOU CAN LIVE WITHOUT A THYROID GLAND?

Thyroid hormone replacement medications are so much like natural hormones that you can easily live your whole life without a thyroid gland. All it takes is a daily pill, to compensate the absence of the thyroid gland.





CONCLUSION

The purpose of this guide is to help you understand what the thyroid gland is for and the main diseases that can affect it. The main thing to remember though is this: whether your thyroid takes off like a jackrabbit or slows to a turtle's pace, there are ways to get things back under control. Don't hesitate to ask your healthcare professional if you suspect you are suffering from a thyroid problem.

SOURCES AND USEFUL LINKS

Canadian Cancer Society

cancer.ca

PasseportSanté (French only)

passeportsante.net

Thyroid Foundation of Canada

thyroid.ca

Health profession

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Only pharmacists are responsible for the professional activities of the pharmacy practice. They use various tools such as the Psst! (Plan to Stay in Shape Today) program.