



Thyroid Hormone Treatment

WHAT IS THE THYROID GLAND?

The thyroid gland is a butterfly-shaped endocrine gland that is normally located in the lower front of the neck. The thyroid's job is to make thyroid hormones, which are secreted into the blood and then carried to every tissue in the body. Thyroid hormone helps the body use energy, stay warm and keep the brain, heart, muscles, and other organs working properly.

THYROID HORMONE TREATMENT

Thyroid hormone is used in two situations:

1. to replace the function of a thyroid gland that is underactive or has been surgically removed (*"replacement therapy"*) and
2. to prevent further growth of thyroid tissue (*"suppression therapy"*). Suppression therapy is used primarily in patients with thyroid cancer to prevent recurrence or progression of their cancer.

DEFINITION, THERAPY & TREATMENT

THYROID HORMONE REPLACEMENT THERAPY

Many people have a thyroid gland that cannot make enough thyroid hormone for the body's needs. This is called Hypothyroidism and is most commonly caused by an under functioning thyroid gland due to *Hashimoto's disease*. Other causes of hypothyroidism are: surgical removal, destruction of thyroid gland from radiation treatment, or a nonfunctioning pituitary gland (see *Hypothyroidism Brochure*). Hypothyroidism is the most common reason for needing thyroid hormone replacement.

Thyroid hormone is necessary for the health of all the cells in your body. Taking thyroid hormone is different from most medications, because its job is to replace a hormone that is missing. The goal of thyroid hormone treatment is to closely replicate normal thyroid functioning. Thyroid hormone is available as levothyroxine, which is biologically equivalent to your own thyroid hormone, thyroxine (*T4*). It is most commonly prescribed in tablet form but is now also available in gel capsule or liquid forms. The only safety concerns about taking thyroid hormone are taking too much or too little. Your thyroid function will be monitored by your physician to keep your levels at the goal range.

HOW IS THE DOSE OF THYROID HORMONE CHOSEN?

When you are first started on thyroid hormone, the initial dose is carefully selected based on information such as your weight, age, and other medical conditions. The dose may need to be adjusted periodically by your physician to keep the thyroid levels normal. Your physician will make sure the thyroid hormone dose is correct by performing periodic physical examination and checking TSH levels.

There are several brand names of thyroid hormone available. Although these all contain the same levothyroxine (*T4*), there are different inactive ingredients in each of the brands. In general, it is best for you to stay on the same brand, or the same manufacturer of a generic for consistency. If a change in brand or manufacturer is unavoidable, you should make your physician aware of the change, so that your thyroid hormone levels can be rechecked. If your pharmacy or insurance plan changes your thyroid hormone to a generic preparation, it is important for you to inform your physician.

HOW DO I TAKE THYROID HORMONE?

Thyroid hormone stays in your system for a long time, it is taken once a day, and this results in very stable levels of thyroid hormone in the bloodstream. When thyroid hormone is used to treat hypothyroidism, the goal of treatment is to keep thyroid function within the same range as a person without thyroid problems. This is done by keeping the TSH level in the normal range. The best time to take thyroid hormone is typically first thing in the morning on an empty stomach. This is because food in the stomach can affect the absorption of thyroid hormone. If you are taking several other medications, you should discuss the timing of your thyroid hormone dose with your physician. As an alternative, taking your thyroid hormone at bedtime can make it simpler to prevent your thyroid hormone from interacting with food or other medications. Overall, the most important thing is to be consistent, and take your thyroid hormone in the same way, every day.

Do not stop your thyroid hormone without discussing this with your physician. Most thyroid problems are permanent; therefore, most patients require thyroid hormone for life. It is very important that your thyroid hormone and TSH levels are checked at least annually, even if you are feeling fine, so that your dose of thyroid hormone can be adjusted if needed.

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WHAT IF I MISS A DOSE?

If you miss a dose of thyroid hormone, it is ok to take the missed dose as soon as you remember. It is also safe to make up the missed dose by taking a double dose the next day. If you miss more than one or two doses, you should contact your physician for further guidance.

DOES THYROID HORMONE INTERACT WITH ANY OTHER MEDICATIONS?

Taking other medications can sometimes cause people to need an adjustment of their thyroid hormone dose. Medications that may cause people to need a different dose include birth control pills, estrogen, testosterone, heart medications like amiodarone, some anti-seizure medications (for example phenytoin and carbamazepine), and some medications for mood such as lithium. Other medications and supplements can prevent the absorption of the full dose of thyroid hormone. These include iron, calcium, soy, certain antacids and some cholesterol-lowering medications. Biotin supplements can interfere with the blood tests used to measure thyroid levels, so it is recommended to stop taking biotin containing supplements for 2-3 days prior to thyroid blood tests.

SHOULD I TAKE THYROID HORMONE WHILE I AM PREGNANT?

Since thyroid hormone is a hormone normally present in your body, it is absolutely safe to take while pregnant. In fact, it is especially important for pregnant women, or women who are planning a pregnancy, to have normal thyroid function for the health of their baby. If you are on thyroid hormone, you will likely need an increased dose of thyroid hormone during pregnancy. As soon as you know you are pregnant you should immediately increase your dose by 20-30% and contact your doctor. An easy way to increase the dose is to take double your usual dose two days a week. You should discuss the timing of thyroid blood tests with your physician, but often thyroid function is checked at least every trimester, and more frequently in the first half of pregnancy.

WHAT ABOUT “NATURAL” THYROID HORMONES?

Desiccated (*dried and powdered*) thyroid extract obtained from pigs or cows, was a common and inexpensive form of thyroid therapy before the individual active thyroid hormones were discovered. It is currently available for purchase as a supplement, or by prescription as a medication (*Armour®*, *NatureThyroid®*, *NP Thyroid®*). Since pills made from animal thyroid are not purified, they contain hormones and proteins that do not exist in the body outside of the thyroid gland. Desiccated thyroid contains both T4 and T3, however the balance of T4 and T3 in animals is different from the human thyroid. The amounts of both T4 and T3 can vary in every batch of desiccated thyroid, making it harder to keep blood levels stable throughout the day. Desiccated thyroid pills contain chemicals (*binders*) to hold the pill together, so they are not completely “natural”. Animal thyroid extract should not be used in pregnancy, as the T3 portion does not reach the developing baby. For these reasons, desiccated thyroid extract is less frequently prescribed today.

THYROID HORMONE TREATMENT

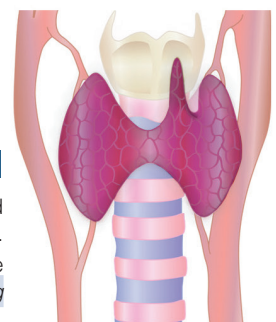
WHAT ABOUT T3?

The thyroid gland makes T4 predominantly, along with a small amount of T3. T3 is the active form of thyroid hormone, and is mainly formed when T4 is converted to T3 on an as-needed basis in the cells of the body. This conversion of T4 to T3 occurs normally even if your thyroid gland is sick or absent. T3 has a very short life span in the body, while the life span of T4 is much longer, ensuring a steady supply. A preparation of synthetic T3 (*Cytomel®*) is available. After taking a tablet of Cytomel® there are very high levels of T3 for a short time, and then the levels decrease very rapidly in the bloodstream. This means that T3 has to be taken several times each day, but even this does not smooth out the T3 levels entirely. In addition, it is impossible to avoid having too much thyroid hormone in the system soon after each dose of T3 is taken. High T3 levels can lead to unpleasant symptoms such as rapid heartbeat, insomnia and anxiety. High T3 levels also can possibly harm the heart and the bones. Another concern with using T3 treatment is that the body is deprived of the ability to adjust the conversion of T4 to T3 to regulate the supply of T3 according to the body's own needs. Thus, there is no indication for the use of T3 alone for the treatment of hypothyroidism.

FURTHER INFORMATION

Further details on this and other thyroid-related topics are available in the patient thyroid information section on the American Thyroid Association®.

For information on thyroid patient support organizations, please visit the [Patient Support Links](#) section on the ATA website at www.thyroid.org



Thyroid Hormone Treatment

WHAT ABOUT COMBINATION T4 AND T3 TREATMENT?

Some hormone preparations containing both T4 and T3 are available in the United States (*Thyrolar®*). Combination T4/T3 preparations contain much more T3 than is usually produced naturally within the body. Because of this, they can have the same side effects as T3 given by itself. It is also given once a day, despite the short life span of T3 in the body. There has been interest in whether a combination of T4 and T3 given separately might result in better symptom control in treatment of hypothyroidism, especially in those patients that do not feel completely normal on T4 alone. In these cases, Cytomel® (T3) is taken in addition to levothyroxine (T4), in doses that are closer to the normal human thyroid balance of T4 and T3. One challenge of adding T3 is that it is currently available only as a short acting formulation, requiring multiple doses in a day. Studies are underway to provide more information on the benefits and best dosing of combination therapy. A trial period of 3 – 6 months may be reasonable to determine if combination T4 and T3 therapy will help.

WILL THYROID HORMONE HELP ME IF I HAVE HYPOTHYROID SYMPTOMS BUT NORMAL THYROID HORMONE LEVELS?

Some people with normal thyroid blood tests have symptoms that are similar to symptoms of hypothyroidism. Several scientific studies have looked at whether T4 therapy would be of benefit to patients with symptoms that overlap with hypothyroid symptoms and normal thyroid function. There has been no proven benefit in taking T4 for improving symptoms if thyroid hormone levels are normal. If thyroid lab values are normal, symptoms are not likely to be due to a thyroid problem and patients should discuss other potential causes or treatment with their physician.

THYROID HORMONE SUPPRESSION THERAPY FOR BENIGN NODULES AND GOITER

In the past, thyroid hormone suppression therapy was used to prevent benign thyroid nodules and enlarged thyroid glands from growing. More recent evidence has shown that this practice is not effective in regions of the world that have adequate iodine intake (*such as the USA*). Moreover, excess thyroid hormone can increase the risk of heart rhythm problems and bone loss, so this is no longer a standard practice in iodine sufficient populations.

TREATMENT OF THYROID CANCER

After surgery for differentiated thyroid cancer, thyroid hormone is needed both to replace the function of the removed thyroid gland and to prevent thyroid cancer cells from growing (see [Thyroid Cancer brochure](#)). Thyroid hormone suppression therapy is an important part of the treatment of thyroid cancer and is effective in inhibiting the growth of microscopic thyroid cancer cells or residual thyroid cancer. In this case, patients usually require a higher dose than is typical for replacement. It is felt that the benefit of preventing growth of residual thyroid cancer cells outweighs the risks of taking higher doses. Because there may be a small increase in the risk of fast heart rhythms, insomnia, or decreased bone density, your physician should closely monitor this treatment so that necessary adjustments can be made. The duration of suppression therapy is variable and depends on the status of the cancer.



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