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 as they should.

THYROID HORMONE TREATMENT

Thyroid hormone is used in two situations:

1. to replace the function of the thyroid gland, which is no longer functioning normally (*"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 may be caused by a non-functioning thyroid gland (*for example Hashimoto's disease*), by destruction of thyroid gland by surgery or radiation treatment or by a non-functioning pituitary gland (see *Hypothyroidism Brochure*). Hypothyroidism, is the most common reason for needing thyroid hormone replacement.

The goal of thyroid hormone treatment is to closely replicate normal thyroid functioning. Pure, synthetic thyroxine (T4) works in the same way as a patient's own thyroid hormone would. Thyroid hormone is necessary for the health of all the cells in the body. Therefore, taking thyroid hormone is different from taking other medications, because its job is to replace a hormone that is missing. 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 make sure this does not happen.

HOW IS THE DOSE OF THYROID HORMONE CHOSEN?

When someone is first started on thyroid hormone the initial dose is carefully selected based on information such as a person's weight, age, and other medical conditions. The dose will then need to be adjusted by a physician to keep the thyroid function normal. The physician will make sure the thyroid hormone dose is correct by performing a physical examination and checking TSH levels.

There are several brand names of thyroid hormone available. Although these all contain the same synthetic T4, there are different inactive ingredients in each of the brand names. In general, it is best for you to stay on the same brand name. If a change in brand name is unavoidable, you should be sure your physician is aware of the change, so that your thyroid function can be re-checked. If your pharmacy plan changes your thyroid hormone to a generic preparation, it is important for you to inform your physician.

A LISTING OF THE FDA-APPROVED MEDICINES

PRODUCT	FDA RATING	MANUFACTURING
Unithroid®	AB	(Stevens)*+
L-Thyroxin	AB	(Mylan) *#
Levo-T®	BX	(Alara)
Levoxyl®	BX	(Jones)*
Novothyrox®	BX	(GenPharm)
Synthroid®	BX	(Abbott)*
Levothroid®	BX	(Forest/ Lloyd)*
Levolet®	BX	(Vintage)
Tirosint®	None	IBSA

LEGEND:

AB = interchangeable
BX = not interchangeable
* = currently available
\+ = This is BX rated vs the other name brand LT4s
\# = This is AB rated only to Unithroid and is considered the only "generic".

Thyroid Hormone Treatment

HOW DO I TAKE THYROID HORMONE?

Thyroid hormone is easy to take. Because it stays in your system for a long time, it can be taken just once a day, and this results in very stable levels of thyroid hormone in the blood stream. When thyroid hormone is used to treat hypothyroidism, the goal of treatment is to keep thyroid function within the same range as people without thyroid problems. Keeping the TSH level in the normal range does this. The best time to take thyroid hormone is probably first thing in the morning on an empty stomach. This is because food in the stomach can affect the absorption of thyroid hormone. However, the most important thing is to be consistent, and take your thyroid hormone at the same time, and in the same way, every day. If you are taking several other medications, you should discuss the timing of your thyroid hormone dose with your physician. Sometimes taking your thyroid hormone at night can make it simpler to prevent your thyroid hormone from interacting with food or other medications.

Do not stop your thyroid hormone without discussing this with your physician. Most thyroid problems are permanent, and therefore most patients require thyroid hormone for life. If you miss a dose of thyroid hormone, it is usually best to take the missed dose as soon as you remember. It is also safe to take two pills the next day; one in the morning and one in the evening. It is very important that your thyroid hormone and TSH levels are checked periodically, even if you are feeling fine, so that your dose of thyroid hormone can be adjusted if needed.

DOES THYROID HORMONE INTERACT WITH ANY OTHER MEDICATIONS?

Taking other medications can sometimes cause people to need a higher or lower dose of thyroid hormone. Medications that can potentially cause people to need a different dose of thyroid hormone include birth control pills, estrogen, testosterone, some anti-seizure medications (for example Dilantin and Tegretol), and some medications for depression. Yet other products can prevent the absorption of the full dose of thyroid hormone. These include iron, calcium, soy, certain antacids and some cholesterol-lowering medications. For all these reasons, it is important for people taking thyroid hormone to keep their physician up to date with any changes in the medications or supplements they are taking.

SHOULD I TAKE THYROID HORMONE WHILE I AM PREGNANT?

Since thyroid hormone is a hormone normally present in the body, it is absolutely safe to take while pregnant. Indeed, it is very important for pregnant women, or women who are planning to become pregnant, to have normal thyroid function to provide the optimum environment for her baby. Women who are taking thyroid hormone often need an increased dose of thyroid hormone during their pregnancy, so it is important to have thyroid hormone and TSH levels measured once you know that you are pregnant. You should discuss the timing of thyroid blood tests with your physician, but often thyroid function is checked at least every trimester.

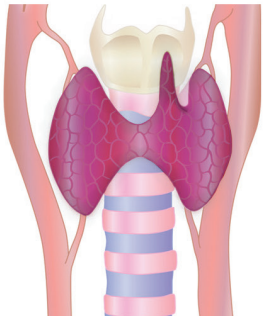
WHAT ABOUT "NATURAL" THYROID HORMONES?

Desiccated (*dried and powdered*) animal thyroid (*Armour®*), now mainly obtained from pigs, was the most common form of thyroid therapy before the individual active thyroid hormones were discovered. People can still buy it over the Internet—legally if it's sold as a food supplement, but illegally if it's sold as a medicine. It is also available still as a prescription. Since pills made from animal thyroid are not purified, they contain hormones and proteins that never exist in the body outside of the thyroid gland. While desiccated thyroid contains both T4 and T3, the balance of T4 and T3 in animals is not the same as in humans, so the hormones in animal thyroid pills aren't necessarily "natural" for the human body. Further, the amounts of both T4 and T3 can vary in every batch of desiccated thyroid, making it harder to keep blood levels right. Finally, even desiccated thyroid pills have chemicals (binders) in them to hold the pill together, so they are not completely "natural". Desiccated animal thyroid is rarely prescribed today, and there is no evidence that desiccated thyroid has any advantage over synthetic T4.

FURTHER INFORMATION

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

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 T3?

While most actions of thyroid hormone are most likely due to T3, most T3 in the body comes from the conversion of T4. The conversion of T4 to T3 is normal in hypothyroid patients. T3 has a very short life span in the body, while the life span of T4 is much longer, ensuring a steady supply of T3. 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 fall off very rapidly. This means that T3 has to be taken several times each day, and even doing this does not smooth out the T3 levels properly. 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 heart beat, insomnia and anxiety. High T3 levels also can 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.

WHAT ABOUT COMBINED 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, ignoring the short life span of T3 in the body. There has been interest in whether a combination of T4 and T3, with a lower amount of T3 given more than once a day, might result in better 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 T4. A trial period of 3 – 6 months is 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?

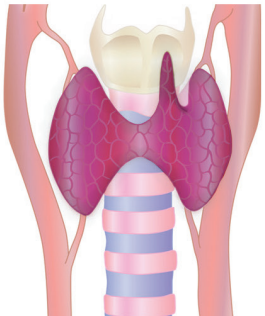
Some people with normal thyroid blood tests have symptoms that are similar to symptoms of hypothyroidism. Several scientific studies have looked at whether T4 therapy would be of benefit to patients with symptoms that overlap with hypothyroid symptoms and normal thyroid function. In all cases, there was no difference between T4 and a placebo (sugar pill) in improving symptoms or well-being.

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 making the use of thyroxine for suppressing benign thyroid tissue more risky than beneficial in iodine sufficient populations.

TREATMENT OF THYROID CANCER

After surgery for thyroid cancer, thyroid hormone is needed both to replace the function of the removed thyroid gland and to keep any small or residual amounts of thyroid cancer cells from growing (see *Thyroid Cancer brochure*). Thyroid hormone suppression therapy is also an important part of the treatment of thyroid cancer and is effective in stopping the growth of microscopic thyroid cancer cells or residual thyroid cancer. In this case, the benefit of preventing the growth of residual thyroid cancer cells outweighs the risks of a mild increase in the risk of fast, irregular heart rhythms, exacerbation of chest pain and decreased bone density. A physician should closely monitor this kind of treatment. The duration of suppression therapy in cancer patients is currently being debated.



FURTHER INFORMATION

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

For information on thyroid patient support organizations, please visit the *Patient Support Links* section on the ATA website at *www.thyroid.org*