

## Hypothyroidism Diagnosis

Hypothyroidism is a relatively common disorder. It affects more women than men, but I happen to be one of the men who does have it. Symptoms of hypothyroidism include fatigue, gradual weight gain, constipation, muscle aches, joint pain, feeling cold, menstrual irregularities, weakness, hair loss, dry, cold skin and slow reaction time. Many patients will have a goiter (enlarged thyroid). Although it has received much discussion, I believe low body temperature is not a reliable sign of hypothyroidism.

The incidence of hypothyroidism increases with increasing age. In other words, the older we get, the more likely a thyroid deficiency will show up. The most common cause of *primary* hypothyroidism (hypothyroidism originating in the thyroid gland itself), is Hashimoto's Thyroiditis. Hashimoto's is an autoimmune condition. The body's own antibodies attack the thyroid gland and destroy it, leading to hypothyroidism. Hashimoto's Thyroiditis may be a manifestation of multiple autoimmune syndromes and may occur in families. Hypothyroidism can also be due to a pituitary problem (*central* hypothyroidism).

Diagnosing all types of hypothyroidism is important, because treatment with thyroid hormone will improve symptoms in patients with hypothyroidism, but is unlikely to help those who do not have hypothyroidism. In primary hypothyroidism, the thyroid gland, located in the neck, is less able to produce the thyroid hormones, T<sub>4</sub> and T<sub>3</sub>. The pituitary gland, located in the head, responds to this deficiency by secreting more TSH. Thus, in more mild cases of primary hypothyroidism, T<sub>4</sub> and T<sub>3</sub> levels are normal, but the TSH is high. In more severe cases, T<sub>4</sub> and T<sub>3</sub> levels drop. Although the normal range for TSH is often between 0.5 and 5 mU/mL, values at the high end of the normal range may be abnormal. T<sub>3</sub> is the more bioactive hormone compared to T<sub>4</sub>, but T<sub>4</sub> is more stable in the circulation.

My approach to diagnosing hypothyroidism is to start with a careful history and physical. Then an Endocrinologist should perform a hands-on thyroid examination to determine if the patient has a goiter. Blood TSH, free T<sub>4</sub>, free T<sub>3</sub> and anti-TPO antibodies should be tested. Patients with an enlarged thyroid and/or a positive anti-TPO antibody test AND a TSH > 4.0 mU/mL should be considered to have *primary* hypothyroidism. Patients without an enlarged thyroid and without a positive anti-TPO antibody test but WITH a TSH > 7.5 mU/mL should also be considered to have *primary* hypothyroidism. Patients with a free T<sub>4</sub> of < 0.9 ng/dL and a TSH < 1.0 mU/mL are likely to have *central* hypothyroidism. Patients with symptoms of hypothyroidism but who do not meet these criterion should be watched and retested in 6 months.

## Hypothyroidism Treatment

Once hypothyroidism is diagnosed, there are many treatment options, including synthetic L-thyroxine (T<sub>4</sub>) preparations (Synthroid, Levoxyl and Unithroid), synthetic L-triiodothyronine (T<sub>3</sub>) preparations (Cytomel), synthetic T<sub>4</sub>/T<sub>3</sub> combinations (Thyrolar) and desiccated thyroid preparations (Armour, Naturethroid, Bio-Throid, and Westhroid). All of the L-thyroxine preparations contain the same active ingredient, but contain different fillers and have different quality control. Until recently, Synthroid did not have FDA approval, but now all L-thyroxine preparations have FDA approval. Thyrolar and the desiccated thyroid preparations probably have a higher T<sub>3</sub>/T<sub>4</sub> ratio than desirable and thus, I often give a lower amount of these preparations supplemented with T<sub>4</sub>.

Most Endocrinologists use L-thyroxine preparations for the initial treatment of all forms of hypothyroidism. Although the use of L-thyroxine ( $T_4$ ) compared to L-triiodothyronine ( $T_3$ ) may be surprising as  $T_3$  is the more bioactive thyroid hormone,  $T_4$  is most frequently used. This is because tissues convert  $T_4$  to  $T_3$  to maintain physiologic levels of the  $T_3$ . Thus, administration of  $T_4$  results in bioavailable  $T_3$  and  $T_4$ . As  $T_4$  is more stable than  $T_3$ ,  $T_4$  therapy gives even blood levels, while  $T_3$  therapy leads to high levels after taking the medicine and low levels before the next dose. Armour thyroid is the least expensive preparation. Because Armour thyroid comes from pig thyroids, some Endocrinologists feel that there is high pill to pill variability, but this is unlikely to be true.

A recent study published in New England Journal of Medicine in 1999 suggested that brain  $T_4$  to  $T_3$  conversion may be impaired in some patients and that a select group of patients should be treated with both  $T_4$  and  $T_3$ . Other studies published in Journal of Clinical Endocrinology and Metabolism in 2003 suggested that addition of  $T_3$  to  $T_4$  treatment is not needed for most patients with primary hypothyroidism. I recommend that most patients be started on a  $T_4$  preparation, which improves symptoms in the large majority of the patients. I have found that most patients prefer Levoxyl or Unithroid to Synthroid, but this varies with each patient. After initial treatment with  $T_4$ , I adjust their  $T_4$  dose until their TSH is between 0.5 and 2 mU/mL. If they remain symptomatic despite an optimized TSH, then low doses of  $T_3$  given two or three times a day can be added cautiously to  $T_4$ . If patients start with a low blood free  $T_3$  level, then I am more inclined to treat them with  $T_4$  plus  $T_3$ . On  $T_4$  plus  $T_3$  therapy, I use blood tests to make sure the free  $T_4$  and free  $T_3$  are in the upper-normal range. The TSH value is usually suppressed on combination treatment.

A percentage of patients will have symptomatic improvement on  $T_4$  plus  $T_3$  therapy. For those that do not improve, I occasionally recommend treatment with desiccated thyroid preparations, usually Armour, plus synthetic  $T_4$ . This combination is needed as desiccated thyroid preparations have a higher  $T_3/T_4$  ratio than desirable and need to be supplemented with synthetic  $T_4$  to achieve normal ranges of both hormones. Again, I aim for a free  $T_4$  and free  $T_3$  in the upper-normal range.

Patients with central hypothyroidism can be treated with any of the preparations available for patients with primary hypothyroidism. The difference is that treatment needs to be monitored by aiming for a free  $T_4$  and free  $T_3$  in the upper-normal range, as TSH is suppressed with proper treatment. Patients with both central and primary hypothyroidism also needed to be treated by aiming for a free  $T_4$  and free  $T_3$  in the upper-normal range.

I was diagnosed with primary hypothyroidism in February 2003. An Endocrinologist performed an examination of my thyroid gland and I was found to have a goiter. My blood values showed a TSH of 8 mU/mL and strongly positive anti-TPO antibodies. I have a strong family history of Hashimoto's Thyroiditis but I was lucky to be fairly asymptomatic prior to treatment. I am now on 150 mg a day of Levoxyl, have a TSH of 1.9 mU/mL and feel great. I have lost a few pounds on  $T_4$  therapy and my cholesterol profile has improved.

For more information about Dr. Friedman's Endocrinology clinic, visit his website at [www.goodhormonehealth.com](http://www.goodhormonehealth.com). To schedule an appointment with Dr. Friedman, please email Kimberly at [appointments@goodhormonehealth.com](mailto:appointments@goodhormonehealth.com).