

THYROID ASSESSMENT AND NUTRITIONAL MANAGEMENT

An Article by Dr Bryan Stern

Functional thyroid disorders are extraordinarily common and often overlooked in today's health care model. When they are recognized, they are usually treated in ways that don't successfully treat the underlying problem and fully relieve the symptoms.

This article was written in an attempt to bring some clarity to this misunderstood problem and to shed light on the key underlying causes and issues of thyroid dysfunction.

THYROID PHYSIOLOGY

The thyroid gland is one of the largest glands in the body. It is a butterfly-shaped organ composed of two lobes. It is situated on the front side of the neck just below the thyroid cartilage (the Adam's apple in men). It produces hormones that regulate the rate of the metabolism and effect the growth and rate of function of many other systems of the body.

Once the thyroid is stimulated by Thyroid Stimulating Hormone (TSH) produced by the pituitary gland, it produces the hormones thyroxin (T4) and triiodothyronine (T3). Iodine is necessary for this process and is transported into the thyroid which stimulates Thyroid Peroxidase Activity (TPO) which is involved in the formation of the T4 and T3.

93% of the hormone produced is T4 (which is inactive) and 7% is T3 (which is the active form). The inactive T4 has to be metabolized by the liver into the active form. Under normal circumstances about 40% of available T4 is converted into the active T3 hormone. About 20% of T4 is later converted into an active form (T3S) in the GI tract and is dependent upon a healthy gut micro flora.

The Influence of Thyroid Hormones on Physiological and Metabolic function

In this section, we'll take a look at the symptoms of thyroid dysfunction. We will then take a brief look at how and why the thyroid affects so many of our body systems creating such a wide range of symptoms.

SYMPTOMS OF HYPOTHYROID

- Tired, sluggish
- Feel cold – hands, feet all over/overly sensitive to cold weather
- Poor circulation
- Require excessive amounts of sleep to function properly
- Increase weight gain even with a low calorie diet
- Gain weight easily
- Chronic digestive problems
- Difficult, infrequent bowel movements/constipation
- Depression, lack of motivation
- Morning headaches that wear off as the day progresses
- Outer third of the eyebrow thins
- Hair falls out easily

- Dry and itchy skin and/or scalp
- Mental sluggishness
- Muscle cramps while at rest
- Catches colds and other viral and bacterial infections easily and has difficulty recovering
- Wounds heal slowly

SYMPTOMS OF THYROID HYPER FUNCTION

- Heart palpitations
- Inward trembling
- Increased pulse rate even at rest
- Nervous and emotional
- Insomnia
- Night sweats
- Difficulty gaining weight

THE EFFECTS OF THYROID METABOLISM ON BODY SYSTEMS

- Gastrointestinal transit time is often reduced in hypothyroid. Bowel motility, mal-absorption and dysbiosis may exist. This leads to all manner of GI absorption and elimination problems.
- Gall Bladder function can become impaired. The Gall Bladder may become distended and function sluggishly leading to: digestive problems from eating greasy/fried foods, lower bowel gas, bloating several hours after eating and bitter, metallic taste especially in the morning.
- Hypochlorhydria (low Hydrochloric Acid (HCL)): Gastrin is important for the production of HCL. In hypothyroid, gastrin levels are reduced. HCL must be supported in these cases until thyroid function is restored. Symptoms can include: belching, gas immediately after a meal, difficult BM, bad breath and a whole array of digestive symptoms.
- Hypothyroid can lead to the reduced clearance of toxins by the liver. Reduced thyroid hormone status will hinder phase II detoxification in the liver. Nutritional support of the liver to support clearance of toxins will usually meet with poor clinical results until thyroid function is restored.
- Adequate amounts of thyroid hormones are required for the healthy production of Growth Hormone. This can cause the loss of muscle mass and diminished ability to gain muscle mass.
- A common symptom of low thyroid is the inability to lose weight and weight gain. This is due to several factors, but the main reason is the reduction of metabolic activity. This decreased metabolic rate can also contribute to fatigue.
- Low thyroid slows the rate of glucose uptake and decreases the rate of glucose absorption leading to functional hypoglycemia. Due to the decreased uptake of glucose into the cells, blood tests will often show normal glucose levels even though the person may have many symptoms of hypoglycemia.
- The poor utilization of glucose causes stress to the adrenal glands which must release cortisol to increase the glucose load – but the cells are unable to utilize glucose efficiently.
- In hypothyroid disorders, the degradation of lipids is depressed resulting in elevated total

serum cholesterol, triglycerides and LDL. In all cases of high cholesterol hypothyroid must be ruled out. If hypothyroid is involved, the cholesterol can be managed by focusing on the thyroid imbalance. Statin drugs are absolutely useless in this regard, focusing only on the symptom, not the cause of the problem.

- The neurotransmitter epinephrine is hindered in low thyroid states leading to depression, weight gain, mood disorders and reduced initiative.
- Hot Flashes: In thyroid insufficiency, the reduced basal metabolic activity can cause hot flashes and night sweats. In perimenopause, hot flashes can be caused by impaired ovarian function due to loss of optimal estradiol levels, but there are often underlying thyroid issues also.
- Anemia: Hypothyroid often leads to reduced absorption of B12, Folic Acid and/ or iron due to decreased HCL production.

UNDERSTANDING THYROID MARKERS ON BLOOD PANELS

- The primary diagnostic marker for hypothyroid and hyperthyroid is TSH. The laboratory reference range for TSH is from .35 - 4.5 (and up to 5.5 with some laboratories). Any reading above the range is considered hypothyroid, in the traditional western model and below the range is diagnosed as hyperthyroid. I utilize a more functional range of 1.8 – 3.0. TSH will usually be below 0.08 with hyperthyroidism. Depressed TSH between 1.0 and 1.7 is usually due to pituitary hypo function. The symptoms of the two are totally different and help guide the diagnosis. Above 3.0 indicates hypothyroidism.
- T4: The ideal functional range is 6-12. A drop below this will cause an elevation of TSH.
- T3 uptake: The functional range is 28-38. Levels below 28 are likely due to increased thyroid binding states caused by elevated estrogens. Levels above 38 are likely due to elevated levels of testosterone. This may be caused when a person is taking testosterone, androstenedione and dhea hormones. In women (without this hormone supplementation), the most likely cause is Metabolic Syndrome.
- If the thyroid markers are normal, but a person has symptoms of hypothyroid, auto-immune thyroid and metabolic syndrome (which can mimic hypothyroid) must be ruled out.

NOT EFFECTIVE DIAGNOSTICALLY

Measuring axillary (armpit) temperature as a diagnostic test for thyroid function, postulated by Dr. Broda Barnes, in 1942, is not an accurate diagnosis of hypothyroidism. Lowered basal temperatures may be seen with thyroid dysfunction, but can have many other causes such as anemia, other endocrine problems, viruses etc.

UNDERSTANDING THYROID HORMONE REPLACEMENT

- Synthroid/levothyroxine is a synthetic form of thyroxine (T4). It is the most commonly used medication for hypothyroidism. It is currently the 7th most prescribed drug. It is also known as levoxyl and levothroid.
- Desiccated Thyroid Extract (Armor Thyroid) produced from animal thyroid tissue is prescribed by a minority of physicians. The majority of doctors do not prescribe it, as they believe it presents more difficulty than Synthroid in regulating TSH levels. Armor includes both T3 and T4. From a holistic viewpoint, Armor replacement is preferable to Synthroid.

- Cytomel is the brand name of a synthetic T3 drug. It is used to treat low thyroid symptoms by itself or used in combination with Synthroid.
- Bio-identical T3 is also prescribed.

HERBS AND SUPPLEMENTS THAT SUPPORT THYROID FUNCTION

The following are a partial list of herbs and supplements that support thyroid function:

- Thyroid Glandulars contain needed amino acids, fatty acids, co-enzymes and other raw materials needed to support the thyroid.
- Withania Somnifera (Ashwaganda) has compounds that stimulate T3 and T4 synthesis.
- Vitamin A affects thyroid receptors.
- Selenium helps the conversion of T4 into the active T3.
- Zinc improves thyroid hormone production.
- Commiphora Muku (gugulu) stimulates T3 production.

IODINE AND TYROSINE

- Iodine is essential for thyroid hormone production (T4). However, in America – iodine is added to salt and most of us are getting constant exposure to iodine. Too much iodine can actually suppress thyroxine (T4) synthesis. For this and other reasons, I do not recommend thyroid formulas with added iodine.
- Tyrosine is an amino acid often prescribed for thyroid dysfunctions. It should be used with caution because even though it is important for thyroid metabolism, in many cases its use will actually suppress thyroid function. Tyrosine has the immediate effect of increasing catecholamines. Catecholamines are hormones that are released by the adrenal glands in situations of stress or low blood sugar. Taking tyrosine can have the immediate effect of making a person with hypothyroid feel better with increased energy, but catecholamines will also suppress thyroid hormone production so tyrosine should be avoided in hypothyroidism.

AUTO-IMMUNE THYROID

Clinical Studies conclusively show that Hashimoto's Thyroiditis, an antibody-mediated auto-immune reaction is the leading cause of Hypothyroidism (except in areas of the world where iodine deficiency is common). Depending on the study, it is believed that somewhere between 50-80% of all hypothyroid conditions are auto-immune based.

WHEN TO SUSPECT AUTO-IMMUNE THYROID:

- Hypothyroid symptoms despite normal TSH
- Hypo and Hyper Thyroid Symptoms
- Hypothyroid and normal body weight
- Poor response to Thyroid medications – continued symptoms of hypothyroid
- Consistent need to increase thyroid hormones

HOW IS IT DIAGNOSED?

Thyroid Auto-Antibodies can be measured by specific blood tests.

- Thyroid Peroxidase Antibodies (TPO Ab)
- Thyroglobulin Antibodies (TGB Ab)
- Thyroid Stimulating Hormone Antibodies (TSH Ab) – for Graves’s disease (an auto-immune based hyperthyroid condition).

It is common for people with Hashimoto’s to fluctuate between periods of attack and remission. Thyroid hormones are released during periods of thyroid tissue destruction (attack) causing TSH to go down. During these periods, the Hashimoto’s person will have symptoms of hyper-functioning thyroid. In times of remission, TSH levels may be normal or high and the Hashimoto’s person will experience symptoms of hypothyroidism. For this reason, high TSH, which is the principle diagnostic of hypothyroid, is not particularly useful in the diagnosis of auto-immune thyroid or to track the success of treatment.

A typical Hashimoto’s patient may have a whole range of TSH readings over time. For example: (Jan 1) TSH 4.5, (Feb 1) TSH 0.08, (Mar 1) TSH 2.3, (Apr 1) TSH 3.8, (May 1) TSH 8.7, (June 1) TSH 7.4, (July 1) TSH 1.6

Even the TPO and Thyroglobulin Antibodies can fluctuate up and down, sometimes testing normal – other times abnormal. So, accurate diagnosis can sometimes be difficult. The unique symptom picture of Hashimoto’s must help guide us in our diagnosis.

Hashimoto’s is treated with Synthroid, in the Western Medical model, with the goal of bringing down the high TSH levels found in hypothyroidism. But, Hashimoto’s is not primarily a thyroid problem. It is an immune battle. The goal of treatment must be to dampen the auto-immune response by modulating an out of balance immune system and to prevent further triggering of auto-immune attacks. The Synthroid has absolutely no effect on the real problem.

THE ROLE OF T HELPER CELLS IN HASHIMOTO’S

In a normal immune response, as soon as an antigen (like bacteria) hits the immune system, the immune system attacks it with macrophages, NK cells and cytotoxic T cells. That is referred to as a TH-1 response, our first line of defense and the initial attack against an antigen attack.

The 2nd line of defense, known as the TH-2 response occurs several days later as the antibody producing system will kick to tag the antigen so that the immune system can find it faster.

In a normal immune response, we use both immune responses. In a healthy person, we have a balanced amount of TH1 and TH2 activity. In auto-immune diseases, one side gets more aggressive. The system goes out of balance and we become either TH-1 or Th-2 dominant.

HERBS AND SUBSTANCES THAT STIMULATE TH-1/TH-2

TH-1 STIMULATORS:

- Astragalus
- Echinacea
- Glycyrrhiza
- Melissa Officinalis
- Maitake Mushroom
- Beta Glucan

TH-2 STIMULATORS:

- Pine Bark Extract
- Grape Seed Extract
- Green Tea Extract
- Pycnogenol
- Resveratrol
- Caffeine

It is essential to the treatment of all auto-immune disorders that we determine if TH-1 or TH-2 is dominant (over-aggressive). The group of substances that stimulate the dominant response must be avoided and the substances that support the weakened response must be supplemented. This can be determined by specific lab tests.

TRIGGERS TO AUTOIMMUNE RESPONSE

The following are a list of factors that can trigger an autoimmune response:

- Gluten Intolerance is present in 98-99% of Hashimoto's people. It is essential to eliminate all gluten products from the diet entirely, as an immune attack triggered by gluten can cause a reaction lasting up to 8 months.
- Vitamin D Receptor Polymorphism – Hashimoto's people cannot utilize Vitamin D effectively, so large amounts are needed. (6000 IU or more daily in an emulsified form, to prevent toxic tissue build up). Vitamin D supports Regulatory T Cells and is absolutely essential to modulate the immune imbalance.
- Iodine Excess: A lot of people will benefit from iodine. But, it will trigger an attack in Hashimoto's people by increasing TPO which the immune system is already attacking. Do not supplement with iodine and limit use of iodized salt. Foods high in iodine like sea food, sea weeds, milk and yogurt shouldn't be a problem.
- Hydrogen Peroxide: Hydrogen Peroxide (H₂O₂) can trigger immune attacks in a person with Hashimoto's. H₂O₂ can be high due to the inflammatory response we see in Hashimoto's. Glutathione will break down the H₂O₂ by converting it to water (H₂O). Glutathione taken as a supplement will not boost cellular glutathione levels since it breaks down in the digestive tract before it reaches the cells. To be effective, glutathione must be injected or used as a crème. Taken orally, glutathione pre-cursors like N-acetyl cysteine, Glutamic Acid and Alpha-lipoic Acid can also be effective to boost cellular glutathione levels.
- GI infections: GI infections are fairly prevalent in cases of Hashimoto's. Guts have to be healthy. There is often a need to reduce inflammation in the gut.

- **Estrogen Surges:** (a) Birth Control Pills can turn on Hashimoto's due to surges from synthetic estrogen (b) Pregnancy can turn on Hashimoto's as the estrogen frequently surges and due to the fact that the body shifts into TH-2 dominance during the 3rd trimester and then shifts to TH-1 dominance following childbirth. If the auto-immune process has been turned on, the TH-1/TH-2 shift will inadvertently turn up a tissue attack. (c) Peri-menopause: a lot of Hashimoto's cases turn on as a woman loses the pituitary-ovary feedback loop due to normal aging - causing surges of estrogen. If the auto-immune expression is turned on, estrogen fluctuations will cause an attack on the thyroid tissue which releases thyroid hormone and increases the metabolic rate causing symptoms of hot flashes, insomnia and irritability.
- **Insulin Surges:** In Hashimoto's, whenever insulin surges it stimulates an autoimmune attack on the thyroid. This can be caused by either hypoglycemia or by insulin resistance. (a) Hypoglycemia (low blood sugar) people are typically not over weight. Their major symptoms are that they function better after eating and are irritable and shaky if meals are missed. Insulin surges to try and get any limited glucose there is, into the tissues. This turns on an immune attack. (b) Insulin is a hormone that stimulates the uptake of glucose into the cells. With insulin resistance, the cells become non-responsive to insulin. Over time, glucose levels rise and insulin surges to try and get glucose into the cells. People with insulin resistance are typically overweight. They often get tired after eating and crave sugar.
- **Heavy Metal Toxicity:** It is very likely that heavy metals and mercury in particular can turn on Hashimoto's. A study in 2006 showed that removal of amalgam fillings resulted in lowering of antibodies against TPO and Thyroglobulin.

The above triggers often work in concert with each other. Often, it is a combination of factors that turn on the autoimmune process. Once turned on, the autoimmune response will stay on (except in very rare instances) for life.

Our job is to limit and moderate these attacks by appropriately dealing with the above factors and balancing and strengthening the immune system. This will prevent further loss of thyroid tissue and dramatically improve symptoms.

The autoimmune process of tissue destruction usually takes place slowly over time. If not treated, as I have outlined above, more and more of the thyroid tissue will be destroyed with more extreme symptomology. Further, it can attack other tissues and lead to pernicious anemia (inability to produce B12) and autoimmune diabetes.

The good news is that we can slow or stop this destructive process by taking the proper steps and sticking with it – for life.