

## The Thyroid

The thyroid is a gland located below the larynx (voice box), and its function is to regulate metabolism. Metabolism is the chemical activity that occurs in cells. This chemical activity releases energy from nutrients or uses energy to create other substances for the body, such as proteins. The speed of metabolism affects all cells and organs in the body; as well as brain and heart function. Metabolism also affects how efficiently you burn calories, it ensures that your nerves and muscles work properly, and influences how you think and feel. The thyroid accomplishes the task of metabolic regulation through the secretion of two important hormones, T4 (**thyroxin**) and T3 (**triiodothyronine**). In addition, the thyroid secretes **calcitonin**, which is important for calcium metabolism. The pituitary gland (which is the master gland in the brain) oversees and monitors thyroid hormones through secretion of TSH (**thyroid stimulating hormone**).

Many people suffer from a suppressed thyroid and are not aware of it. Furthermore, once they are diagnosed, they are often told just to take drugs. This article will illustrate exactly how the thyroid gland affects almost every cell in the body and its energy production. It will also cover the complicated process of thyroid hormone production and the ways it can be influenced. Possible problems with the thyroid and solutions for these problems that are alternatives to taking drugs will be simplified and outlined. In the end, you will know exactly what to do if you suspect that you may have a problem with your thyroid. We will provide you with a comprehensive list of how to support your thyroid functions and recommended supplements.

First, let's look at how the thyroid ideally works. The steps in thyroid hormone production are:

- (1) The thyroid gland has all the raw materials (iodine, Tyrosine (an amino acid), and vitamins) it needs and makes the hormone T-4, **Thyroxin**.
- (2) Well-functioning kidneys and liver convert inactive T-4 to active T-3, **Triiodothyronine**, through an enzymatic process.
- (3) T-3 lands on a healthy receptor site, which acts like a "lock and key" mechanism to let hormones in and out of the cell membrane.
- (4) A fluid, phospholipid cell membrane allows T-3 into the cell to turn on the mitochondria, which is the organelle within the cell responsible for energy production.
- (5) All glands and hormones have a feed forward (turn on) – feed backwards (turn off) mechanism in order to achieve balance. The pituitary gland makes **TSH** (Thyroid Stimulating Hormone), which is released when there is a low level of T-4 in the blood. TSH levels go up when T-4 is low and TSH goes down whenever the T-4 is high. Therefore, you need a healthy pituitary gland in order to have good thyroid regulation. (*Adrenal glands also effect the T-4 T-3 conversion. This will be discussed later under number 4 in possible problems and their solutions*).

That is the basic outline of thyroid production. There are two other factors that can influence the overall process. First, reverse T-3 looks a lot like normal or active T-3 and lands on the T-3 receptor site, but is only 1/100 as strong, practically inactive. Reverse T-3 is called an antagonist to active T-3. Second, there is something called "Thyroid Binding Globulin" (TBG), which binds to T-4 and makes it inactive. So you want free T-4 not bound T-4 with TBG attached. When you start to look at thyroid function, problems can show up either in the basic thyroid function or with the other players. You can have a primary thyroid problem, which is actually the thyroid gland malfunctioning or you can have a secondary problem, where the regulating pituitary or adrenal glands are malfunctioning. Problems can also show up as either an under active or slow thyroid or an overactive thyroid. If you have an under active or slow thyroid, it is called **hypothyroid**. Usually, women suffer from this condition. The most common symptoms are chronic tiredness, depression, constipation, dry skin and hair, chill easily, hair loss, decreased sex drive, unexplained weight gain, loss of the outside third of both eyebrows, mental confusion, muscle cramps, and headaches in the morning that go away as the day proceeds.

**Hashimoto's Disease**, an autoimmune disease that causes your body to form autoantibodies that attack and destroy your thyroid gland, is a common cause of hypothyroid. Your immune system usually forms antibodies only to attack outside invaders such as bacteria or viruses. The cause of this malfunction is unknown. An independent study in Germany has shown that **Hashimoto's** patients are ten times more likely to have a wheat allergy than the average person. Gluten is a protein in wheat that causes the allergic reaction and this condition is known as **Celiac DZ**. Some of the proteins of the thyroid gland seem to be very similar to the protein in wheat and we believe that the antibodies are attacking both proteins. There are very specific blood tests for determining if you have these autoantibodies. Not all doctors or labs perform this test. Please ask Dr. Orwick the specifics of the test, if you are interested. If in doubt, cut wheat, or more specifically, gluten, out of your diet. Ask Dr. Orwick for a list of gluten free grains.

An overactive thyroid is called **hyperthyroid** or **Grave's Disease**. Some of the symptoms are nervousness, unexplained weight loss, heart palpitations, exophthalmia (eyes bulging out of the sockets), anxiousness, and a racing heart. Hyperthyroidism (overactive) is much less common than hypothyroidism (under active). Another type of thyroid malfunction is **goiter**. A goiter is simply an enlarged thyroid gland due to a malfunction somewhere along the line. The most common cause is lack of iodine. Iodine is a precursor for the production of T4 (a hormone), and the precursors for making hormones are stored in the thyroid. When someone is iodine deficient, T4 cannot be manufactured correctly. The pituitary gland senses low T4 blood levels and stimulates the thyroid to make T4. The thyroid ends up overworking to make T4, but it does it without iodine. Because the T4 has no iodine, it is not any good and cannot be used. Everything keeps backing up and this back up causes an enlarged thyroid gland, also known as a goiter.

Hypothyroid, hyperthyroid, and goiter are all examples of primary thyroid malfunction, where the thyroid itself is not working properly. Next, we will look at some of the reasons these disorders occur and look at the causes of some of the secondary thyroid problems, which originate with the pituitary and adrenal glands. In addition, we will suggest possible solutions and how they work. Here is a list of 14 causes of thyroid malfunction and some natural solutions to help support the body:

1. Iodine has been depleted out of the soil and even though some salts are iodized, **lack of iodine** is the number one cause of a *goiter*. The body needs iodine to make the T4 molecule. The solution to this problem is to supplement the diet with iodine and the seaweed called **bladder wrack** is one of the best sources of available iodine (this is found in the Metagenics product **Thyrosol**). The herb, **Ashwagandha**, has been shown to help increase T4 levels. **Primalin**, another Metagenics product, has this herb in it.
2. **Heavy metals** such as lead, mercury, and cadmium, suppress the enzyme that converts inactive T4 to active T3. **Bladder wrack** helps remove heavy metals from your system. A hair analysis will test for heavy metal toxicity and let you know if this is an issue for you.
3. **Selenium deficiency** can prevent the body from making T3 because selenium is necessary in the process of converting the hormone T4 to T3. Selenium is also used in the process of removing used hormones from the system. It is also an antioxidant, an anti-cancer agent, it removes heavy metals from our systems, and it aids in the prevention of heart disease. Two things that cause selenium depletion are mercury amalgam dental fillings, and a liver that is struggling with toxicity. Whatever causes your lack of selenium; the result is the body's decreased ability to convert T4 to active T3. The pituitary will sense this lack of T3 and release TSH (thyroid stimulating hormone), telling the thyroid to make more T4. As mentioned above, this can back up the system and cause a goiter. **Selenium** is in the Metagenics product Thyrosol.
4. **Stress**, physical or emotional, can have an adverse effect on the thyroid through a secondary problem caused by the **adrenal glands releasing cortisol**. **Cortisol** also suppresses the conversion of T4 to T3. The solutions for this include anything that reduces stress in your life, such as: (1) getting plenty of sleep, (2) scheduling down time, fun time, and alone time, and (3) joining either a yoga, meditation, or Tai Chi class. If you have been under stress for an extended amount of time, you might need adrenal support. The Metagenics product, **Adreset**, is an excellent form of adrenal support. **Adreset** is a combination of Chinese herbs used by Chinese doctors for hundreds of years. Another herb that has been shown to assist with the T4 to

T3 conversion process is **Guggul Gum**. This herb is found in the Metagenics product, **Lipotain**, and has been shown to lower cholesterol as well.

5. Another way that **lack of selenium** or **increased cortisol**s affect thyroid function is that while they both **suppress** T4 conversion to active T3, they **do not affect** the conversion of T4 to **reverse** T3. Reverse T3 is an antagonist to active T3. If reverse T3 is occupying the receptor site, active T3 cannot get into the cell to do its job. The job of active T3 is to increase metabolism and to give the body energy. The effect of reverse T3 occupying the receptor site will be a sluggish metabolism and decreased energy. The solution is to supplement selenium and reduce stress, see 4 and 5 above.

6. **The other halogens (chlorine, fluorine, and bromine)** are all very similar chemically to iodine and compete with it in the production of T4. A T4 molecule is tyrosine (an amino acid) with four iodine molecules attached. If other halogen molecules replace the iodine molecules, an unusable T4 molecule is formed. This is a waste of energy and a waste of iodine. The body works hard to form a correct molecule and this can cause thyroid problems. Two solutions are: (1) to drink only reverse osmosis or distilled water and (2) to get a shower filter to help remove chlorine and fluorine from your shower water. Because the skin is like a sponge and very absorbent, it is especially important for swimmers to shower immediately after leaving the pool with a filtered showerhead.

7. Some foods interfere with thyroid function and hormone conversion. They are called **goitrogenic foods** and among them are cruciferous or brassica family of vegetables. The brassica or cruciferous vegetables are very high in vitamins and antioxidants and are normally very good for most people. They should be avoided by patients who have a primary thyroid dysfunction (i.e. a problem with the thyroid and not the adrenals or the pituitary gland). Here is a list of the brassica or cruciferous vegetables to avoid if you have a primary thyroid problem:

If you have a primary thyroid dysfunction and want to eat Brassica (cruciferous) vegetables, it is important to cook them. Cooking them helps to neutralize the goitrogenic affect. If you must eat goitrogenic foods and are taking thyroid medications or supplements, be sure to eat them at least two hours before or after taking thyroid medication (such as synthroid, levothyroid, or natural armour) or thyroid supplements.

Here is a list of other goitrogenic foods:

Bok Choy Collards Watercress  
Horseradish Broccoli Kale  
Mustard Greens Kohlrabi Brussel Sprout  
Radishes Cabbage Rutabagas  
Cauliflower Turnips  
Soy Almonds Walnuts  
Tapioca Pine Nuts Sorghum  
Millet

**L-Carnitine** is an amino acid used as a supplement. If you are taking large doses in the realm of two to four grams a day, it will suppress thyroid function as well.

8. Another example of secondary thyroid dysfunction occurs when the **liver is backed up with toxins** (this is true for most people). The liver and kidneys are necessary for proper thyroid hormone conversion. If the liver is backed up with other toxins, hormone conversion is put on hold or slowed down. The liver has a very heavy load detoxifying the body these days because of the myriad of pesticides, herbicides, food additives, air pollutants, water pollutants, and so on. The solution is to eat organic foods, avoid processed foods, and limit exposure to chemicals. In addition, do a liver detoxification program such as **Ultra Clear Plus** or **AdvaClear** by Metagenics.

9. When the **kidneys do not perform** the very important function of **ridding the body of excess acid**, the body cannot maintain a balanced pH. Clean, wellfunctioning

kidneys are necessary to rid the body of excess acid. Balanced pH is necessary for proper enzyme function, and enzymes are necessary to convert T4 to T3. The solution is to **stay away from foods that form excessive acid such as meat, sugar, alcohol, colas, and coffee**. It is important to **drink plenty of water** and to **eat a good quantity of fresh, alkalizing vegetables**. In addition, Metagenics makes a product called **Renagen** for kidney support. Here is a list of alkalizing vegetables:

Broccoflower Jicama Onion  
Bell Pepper Okra Parsnip  
Beets Squashes Asparagus  
Eggplant Collard Greens Parsley  
Celery Endive Turnip Greens  
Cucumber Potato \*Cauliflower  
\*Brussels Sprouts \*Mustard Greens \*Broccoli  
\*Kale

The vegetables marked with a \* are goitrogenic; remember to cook them and eat them two hours before or after taking thyroid medication or thyroid supplements. Dr. Orwick has a complete chart on the pH of foods. It lists everything from the very acidic to the very alkalizing and everything in between. One way to include plenty of these vegetables in your diet is to make an alkalizing, detoxifying broth.

**Here is a recipe:**

Make a vegetable broth using cauliflower, cabbage, onion, lentils, peas, green pepper, parsley, carrots, beets (and their tops), garlic, potatoes, broccoli, and/or Brussels sprouts. Approximate guidelines for amounts are: 2 large potatoes, 1 cup carrots, 1 cup parsley, 1 cup beets, etc.

**Purchase organic vegetables when possible.**

Put all the vegetables into a large pot. Add ½ gallon clean, pure water. Let simmer for two hours, then drain the broth from the vegetables and keep the broth. Mash up the vegetables, put them back in a pot with another ½ gallon of water, and simmer this mixture for another two hours. Drain and throw the mash away. Combine the two broths. Season with herb seasoning or dry vegetable broth seasoning. Add Dr Bronner's Mineral Bouillon or Bragg's Liquid Aminos to individual taste.

10. If the body is **high in estrogen or estrogen mimics** (for example, pesticides or herbicides), it causes production of excessive amounts of **Thyroid Binding Globulin (TBG)**. T4 needs to be free of any adjoining proteins, such as TBG, in order to convert to active T3. TBG attaches to free T4, making it unavailable for conversion to T3. Sensing inadequate amounts of free T4 in the blood stream, the pituitary gland releases TSH (thyroid stimulating hormone), which tells the thyroid to overwork making more T4. This over stimulation can cause a goiter and if the body does not get enough T4, it cannot keep up with its metabolic needs. This shuts things down metabolically and causes weight gain. Liver function is very important in getting rid of estrogen and estrogen mimics. Use liver detoxifying **Ultra Clear Plus** to support its functioning. If you have any hormonal problems, such as PMS, perimenopause, etc., use **Estrobalance**. Both are meal replacement medical foods created by Metagenics. Regular bowel elimination is very important for getting rid of excess estrogen. Exercise, water, and fiber are basic to regular bowel elimination. Hypothyroid patients are usually constipated and might need to supplement with **Magnesium Citrate**. Magnesium Citrate works to stimulate the smooth muscle of the colon, causing peristalsis. Stay away from synthetic or chemical estrogens such as the pill, Premarin, Provera, pesticides, herbicides, etc. In 1999, the third most prescribed drug in America was Premarin and the fourth most prescribed was Synthroid.

**11. Consumption of bad fats** (trans fats or hydrogenated oils, such as those found in fried foods) will cause your cell membrane to become very rigid and not allow molecules to pass through with ease. Once the T3 molecule has successfully landed on the receptor site, it must now pass through the cell's phospholipid membrane. For healthy, fluid membranes, plenty of **omega 3 essential fatty acids** are essential. **Flax seed** and **salmon** are excellent sources of omega 3 essential fatty acids. Very few people get enough in their diets; **EPA-DHA Extra Strength** is highly recommended as a supplement. It is good for cell membranes, hormone formation, insulin sensitivity, healthy skin, and it helps with pain (because it is anti-inflammatory). Because fish oil comes from ocean fish and the ocean is now polluted, Metagenics makes sure that their product is free from any contaminants such as heavy metals. Fish oil also tends to break down, causing free radicals. Free radicals can cause DNA damage, which can lead to degenerative diseases. Metagenics puts Vitamin E in their EPA-DHA to prevent it from breaking down and forming free radicals.

**12.** When **extra sugar builds up in the bloodstream**, it attaches to proteins (this process is called glycosilation) and impairs protein function. T3 receptors are these types of proteins; consequently, their functions are impaired when there is too much sugar in the bloodstream. It is important to keep your blood sugar balanced. Some suggestions for maintaining healthy blood sugar balance are:

(1) Eat **5 small balanced meals** spaced throughout the day.

(2) **Avoid** candy, cookies, sodas, and processed foods.

(3) Learn about the **Glycemic Index** of foods. The Glycemic Index tells you whether a food will release slowly into the bloodstream (low Glycemic index) or rapidly (high Glycemic index). Foods such as **protein** and **green leafy vegetables** have a low Glycemic index and promote a balanced blood sugar level. Sodas have a high Glycemic index: they will shoot your blood sugar levels very high and then allow it to plummet.

(4) Ask about Metagenics' blood sugar balancing products. These include **UltraMeal** and **UltraGlycemX**.

**13. Vitamin A deficiency** can cause thyroid dysfunction. The T3 receptor site on the cell needs Vitamin A in order to have good bonding ability. **Thyrosol** is an excellent source for Vitamin A.

**14. Vitamin D deficiency** can contribute to thyroid dysfunction. Vitamin D helps to suppress any autoantibodies that may be attacking your own thyroid gland. Hashimoto's Disease is an autoimmune disease that is the most common cause of this problem. Autoantibodies can be detected with a test called the comprehensive Thyroid Blood Panel. Great Smokies Laboratory has a very

comprehensive Thyroid Blood Panel, which includes testing for two types of autoantibodies, free T4, T4 bound to TBG, T3, reverse T3, and TSH. Very few doctors order a thorough blood panel such as the one offered by Great Smokies, because very few labs offer it. This is leading edge information. To suppress autoantibodies, take Metagenics **Thyrosol**, which contains Vitamin D, and get **twenty minutes of sunshine at least four times weekly**.

Now that we have gone over the possible problems that can occur with the thyroid, the associated symptoms, and given specific recommendations for each of the fourteen problems, we would like to provide you with a short list of how to support your thyroid function.

### Here are nine things to do:

1. If you suspect you have thyroid issues, get a comprehensive thyroid blood panel and a gluten (Gliatin) autoantibody blood test.
2. Decrease the stress in your life and support your adrenals with the abovementioned supplements.
3. Avoid halogens, heavy metals, and estrogen mimics.
4. Detoxify your liver and kidneys with the methods outlined above.
5. Avoid goitrogenic foods if you have a primary thyroid issue.
6. Avoid bad fats and supplement with good fats (omega 3 essential fatty acids).
7. Keep you blood sugar balanced.
8. Keep your pH balanced by avoiding acidic foods and eating plenty of alkalizing foods.
9. Avoid gluten until you are tested.

The above list is the bottom line protocol for thyroid support. In addition, here is list of the products recommended in this article and a short description of how they support the thyroid:

1. **Thyrosol**: general thyroid support, contains bladder wrack, selenium, vitamin A, and vitamin D
2. **EPA-DHA Extra Strength**: clean, essential omega 3 fatty acids with vitamin E
3. **Adreset**: adrenal support, good for if you are always stressed or do not deal with stress very well
4. **UltraClear Plus** (medical food powder) or **AdvaClear** (pill): liver detoxification
5. **Renagen**: kidney support
6. **EstroBalance**: estrogen metabolism and detoxification, helps with PMS or perimenopausal symptoms
7. **UltraMeal** or **UltraGlycemX**: balances blood sugar, meal replacements that taste good and are full of vitamins and minerals

Dr. Orwick is available to assess your thyroid function and for nutritional counseling. She can provide the Great Smokies tests mentioned in this article. Please contact us to schedule an appointment with Dr. Orwick at (520) 740-1718.