

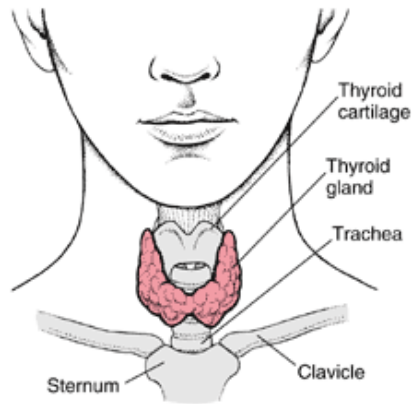


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Maybe it's your Thyroid!?



If you're having trouble losing weight, feeling low on energy and stamina, have aches and pains (especially in the hands and shoulders and neck areas), vacillating between hot and cold all day, having night sweats or hot flashes... have fat deposits on your body (upper arms or neck area or high back), then your thyroid and adrenal glands are simply not functioning like they should at optimal levels.... despite what any "normal" or "standard" blood testing is showing when you go to your regular medical doctor!

The classic signs of a sluggish thyroid gland include weight gain, lethargy, poor quality hair and nails, hair loss, dry skin, fatigue, cold hands and feet, and constipation -- and these symptoms are relatively well known.

However, some of the conditions *you might not associate with your thyroid* include:

- High cholesterol
- Irregular menstruation
- Low libido
- Infertility
- Gum disease
- Fluid retention
- Skin conditions such as acne and eczema

- Memory problems
- Poor stamina

Your thyroid plays a part in nearly every physiological process. When it is out of balance, so are you. This is why it is so important to understand how your thyroid gland works and what can cause it to run amok

Every process that goes on inside your body requires ENERGY. When the body doesn't have enough energy to function properly, each component of the body will malfunction in its own unique way. For example, if the brain has too little energy, though processes such as memory and focus become impaired. Another example is... Your body operates at an optimum temperature of 98.6 – if your temp goes lower than that, energy is impaired throughout your entire body even by a few degrees.

Symptoms of low metabolic energy (low thyroid function) are: low body temp, low energy or fatigue, weight problems, slow wound healing, depression, anxiety, poor memory – focus - concentration, sleep disorders, frequent infections (skin, sinus, bladder, yeast, etc), allergies, autoimmune diseases, fibromyalgia, generalized aches and pains, headaches, low libido, infertility, low or high blood pressure, constipation, digestive disorders, numbness in hands or feet, vision disturbances, dry skin, acne, hair loss, brittle or coarse hair.

The thyroid gland produces the main hormones that controls every function in your body. It literally determines the speed of every function and enhances the activity of every function in your body. It improves your mood; your skin, hair, and nails; your sex drive; your heart function; cholesterol; fertility; and hormonal symptoms such as PMS and menopause. It influences muscle aches and pains, joint pains, body temperature, and your metabolism. But did you know that depression, heart disease, chronic fatigue, fibromyalgia, PMS (premenstrual syndrome), menopausal symptoms, muscle and joint pains, irritable bowel syndrome, or autoimmune disease could actually indicate a problem with your thyroid?

FIRST LINE OF DEFENSE:

The human thyroid gland is located in the front of the lower part of the neck. All the blood in the body passes through the thyroid gland every 17 minutes. Because the cells making up this gland have an affinity for iodine during this 17-minute passage the gland's secretion of iodine kills weak germs that may have gained entry into the blood through an injury to the skin, the lining of nose or throat or through absorption of food from the digestive tract. Strong, virulent germs are rendered weaker during their passage through the thyroid gland. With each 17 minutes that rolls around they are made still weaker until finally they are killed off IF the gland has its normal supply of iodine! If it does not, it cannot kill harmful germs circulating in the blood as Nature intended it to do! This is why individuals with lower functioning thyroid develop sinus issues that never clear up, have numerous infections, impaired gut function, etc.

Common Symptoms

People often feel many subtle symptoms of low thyroid function, including significant fatigue, lethargy, and sluggishness, particularly in the morning. You may have hoarseness for no particular reason. Often there is decreased sweating with mild exercise, or you may be slow to heat up even in a sauna. Low mood and depression is common.

Chronic recurrent infections are also common because thyroid function is important for immunity. Sluggish bowels and constipation may be frequent. Many other symptoms can be clues as well, including poor-quality or cracked nails; high cholesterol in spite of a good diet; irregular periods or menstruation; severe PMS; low sex drive; infertility; excessive menopausal symptoms; ovarian cysts; endometriosis;

gum disease; fluid retention; weight gain; muscle aches and pains; dry skin; acne; eczema; balance issues; trouble with memory, focus, and/or concentration; hair loss; and poor stamina—all point to potential thyroid problems.

Other physical signs you may see include slowed movement, speech, and reaction time; muscle weakness; thickening tongue; swollen feet; swollen eyelids or bags under the eyes; enlarged thyroid gland; swelling of the face and the neck; lumpiness or irregularity of the thyroid gland; excessive earwax; dry mouth, dry eyes and excessively dry or coarse skin; cool skin; low blood pressure; low pulse; decreased ankle reflexes with slow recovery phase; and loss of the outer one-third of the eyebrows.

BODY TEMPERATURE

In addition to the many physical signs noted preciously... we can include a basal body temperature of less than 97.6 degrees as a major indicator of lowered thyroid function. To determine if this is a problem for you, take your temperature with a special basal body temperature thermometer over the course of three days first thing in the morning upon awakening. Here's how you measure your temperature:

****Men and postmenopausal women can measure temperature any three days in a row.**

****Premenopausal women should measure it on the first three days of the menstrual cycle (day 1 is the first day of bleeding).**

****Temperatures are measured orally. Make sure the thermometer is placed deep under the tongue. Take three temperatures approximately three hours apart, starting approximately three hours after waking up. For example, if one wakes up at 6 AM, measure temperatures around 9AM, 12 Noon, and 3 PM. Try to avoid taking temperatures after activity or eating and drinking for at least 20 minutes. Even climbing a flight of stairs can raise one's temperature for short period of time. Taking one's temperature several times in a row will yield temperatures that rise each time. This is usually due to the muscular activity of the tongue and mouth. So, take only one reading. I have found digital oral thermometers most appropriate for monitoring metabolism. There are many good models available. I have found the Lumiscope Digital Thermometer to be one of the most accurate for the price. I do not recommend mercury thermometers because: they expose you and the environment to toxic mercury when they break; they are too slow; and, the accuracy depends on leaving them in your mouth the same length of time each time you measure. I do not recommend axillary temperatures because the axillae are relatively cooler and more variable in people with stressed adrenals. Ear thermometers are the least accurate of all.**

****If your temperature is consistently lower than 97.6 degrees, you may have hypothyroidism. There are a number of other causes for a low temperature, but if your temperature is low, you should consider a problem with your thyroid.**

- Understand that thermal activity reflects metabolic activity. A low temperature means low metabolism and vice versa. For example, the temperature typically found in someone who is old, frail, pale and weak is low and typically ranges from 95 to 97 degrees if no infection is present. A healthy person will have an average temperature of 98.6 degrees, but may have a 100 degree or higher temperature in a hyperthyroid state or as high as a 104 to 105 degree temperature if there is a fever present these are high metabolic states.
- Wide variability in daily temperatures indicates a weak adrenal function since the adrenal glands help the body maintain stability. Good adrenal function produces a stable temperature. As adrenal function improves, the temperature variability decreases and vice versa. As adrenals get stressed (either from emotional stress, excess metabolic stimulation such as excessive thyroid stimulation, or for other reasons), the variability increases.
- In a hypothyroid state, the day-to-day averages are low and very stable. In a hypo-adrenal state including adrenal exhaustion or adrenal stress, the temperatures are low and unstable -- one day they may average 96 degrees and one to two degrees higher the next day.

Low body temperature indicates poisoned mitochondria. The poison could be any toxin, like heavy metals, or it could be bacterial, viral or fungal bugs! Probiotics are essential as is repairing the mitochondria.

REASONS FOR YOUR THYROID DYSFUNCTION can be any one or more of the following:

1. **Hashimoto's thyroiditis - an autoimmune disease attacking the thyroid gland**
2. **Post-partum**
3. **Bromide toxicity – bromide is a chemical compound found in high concentrations of seafood, breads, vegetable oils, some citrus sodas as well as pesticides, some plastics, dyes, carpets and mattresses. This chemical displaces iodine!**
4. **Iodine insufficiency**
5. **Selenium deficiency**
6. **Surgery to remove your thyroid gland**
7. **Head and/or neck trauma**
8. **Cellular thyroid hormone resistance**
9. **Pharmaceutical drug induces**
10. **Daily consumption of Soy**
11. **Candida**
12. **Estrogen Dominance**
13. **Menopause**
14. **Fluoride, mercury and other environmental toxins**
15. **Hepatitis C**
16. **Autism**
17. **High levels of Cortisol (adrenal dysfunction)**
18. **Low levels of Cortisol – will cause thyroid hormones to pool in your blood rather than making it to your cells**

Other Diseases Associated with Thyroid Dysfunction

In addition, other autoimmune diseases may be associated with thyroid disease, which makes these conditions worse and is often underdiagnosed. These diseases include type 1 diabetes, celiac disease, rheumatoid arthritis, lupus, sarcoidosis, scleroderma, Sjögren's syndrome, biliary cirrhosis, myasthenia gravis, multiple sclerosis, Crohn's disease, ulcerative colitis, and more.

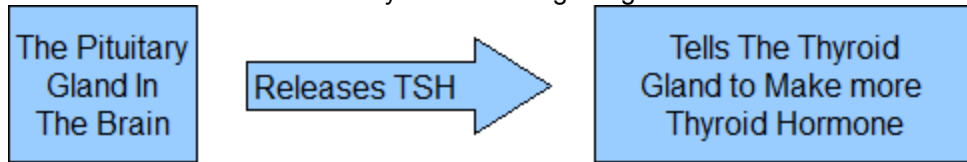
If you have other associated conditions, you might consider the possibility of thyroid disease. These conditions include mitral valve prolapse, carpal tunnel syndrome, Raynaud's disorder, dyslexia, persistent tendinitis, alopecia (hair loss), and vitiligo (persistent white patches on the skin often related to gluten sensitivity).

What is the THYROID Gland and How Does it Work?

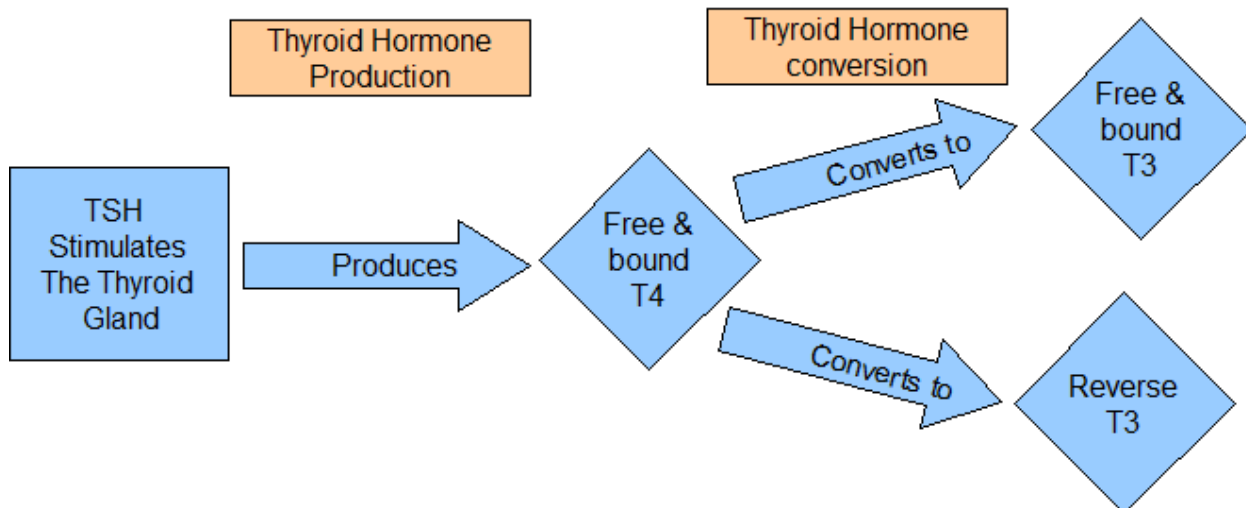
Let's take a look at your thyroid gland. The word "THYROID" originally meant "SHIELD"... and it looks like a shield at the base of your neck. Your thyroid gland gets its original communication to go to work from the pituitary gland in the brain. It works like this:

1. The pituitary gland sends out TSH (thyroid stimulating hormone) to "stimulate" the thyroid gland and tell it to literally go to work. If your TSH is high this means that the pituitary gland is YELLING at the thyroid gland in order to get it to do ITS job! (Kind of like a boss who is yelling at an employee to get them to do their job.) The ideal number on a standard blood test for TSH is .35 - 1.5. Most medical doctors do NOT operate with these levels... based on antiquated lab values most medical doctors will tell you that your thyroid is just fine even if your TSH is 4.5! Back in 2002 and 2003 the American Association of Endocrinologists acknowledged that lab values needed to be changed from .5- 5.0 down to .3-3.30... but sadly most labs and many doctors "never got the memo"! And even the suggested range of .3-3.30 still misses many thyroid issues. The other point that needs to be made is that TSH is a PITUITARY hormone NOT a thyroid

hormone. Monitoring that alone IS NOT A COMPLETE PICTURE of your thyroid gland's function... no matter how much your doctor might argue that it is!



2. Alright... once the thyroid is stimulated by the TSH coming from the pituitary it then produces T4 (thyroxine). T4's job is to convert into two more thyroid hormones: T3 (triiodothyronine) and Reverse T3. T3 operates in your body like the accelerator for your car. Reverse T3 operates like your brakes! 20% of the Free circulating T3 in the body comes directly from the thyroid gland... the remaining 80% of T3 in the body comes from the conversion of T4. (Hmmmmm.... Are you starting to get a clue as to what might be going on in YOUR body?) 9 times out of 10, I see clients who are making too much Reverse T3 and not enough Free T3... they're braking more than accelerating! Their entire metabolic rate and energy are literally put on STOP or SLOW! Their T4 is converting into too much Reverse T3!!! This is a key piece of the puzzle. Most medical doctors (including endocrinologists) never look at - much less monitor - the ratio between Free T3 and Reverse T3! In comparing T4 and T3... I want you to know a few key points... T4 and T3 are the two MAIN hormones... we get that. But... T3 is up to 8+ times as strong as T4, AND it is biologically more active! One doctor explained it like this: T4 is like the food in your refrigerator, while T3 is like the food on your plate ready to eat and Reverse T3 is the food in thrown in the disposal!



****ALERT** MONITORING TSH ONLY CAN BE MISLEADING!**

If you've been taking Levothyroxine or Synthroid... you're taking T4 only. Your doctor is most probably monitoring your TSH only (in some cases they might monitor T4 along with the TSH). No one is bothering to look at the real true FUNCTION of your thyroid system. Your doctor is ASSUMING that your body is converting T4 into enough FREE T3 to do the job. (We all know how much trouble we get into when we "ASSUME" anything!!!!) The ONLY way to determine the FUNCTION of your thyroid system is to look at and monitor the following serum levels:

TSH,

Free T4,

Free T3,

Reverse T3,

ratio of Free T3/RT3,

TPO (thyroid peroxidase antibodies),

Thyroglobulin,

Thyroglobulin antibodies,

Ferritin

NOTE ON TESTING: please ensure that correct testing is done on your thyroid. Your doctor may not know the correct tests to run... even if they are an endocrinologist! The correct levels are as stated above. To run "total T3" or "total T4" or "T3 uptake" is pretty useless and a waste of your or your insurance's money and time and can and can lead to improper thyroid handling.

Iodine supplement may cause an increase or fluctuation of your TSH on testing during the first 2-3 months of starting iodine. We usually suggest not testing the TSH until after 90 days of 50mg of iodine supplementation daily. Test ONLY the FREE T3 and FREE T4 and Reverse T3 during this time.

In publishing new clinical guidelines in 2002, the American Association of Clinical Endocrinologists dramatically formalized a reversal of its previous doctrine, establishing a new narrower "normal" TSH margin of 0.3–3.04. But sadly most labs and doctors didn't "get the memo"!

And in our view, a woman's TSH level should ideally be less than 2.0, but she should also be thriving and free from HYPOTHYROID symptoms. If she reports symptoms, or shows a TSH level greater than 2.0, she may have subclinical or clinical hypothyroidism. For women with more pronounced hypothyroidism symptoms, we feel that the TSH test is inadequate because it doesn't tell us enough about the underlying problem. To do that, we need more detailed tests (as stated above) to show what the thyroid is producing and what is available for the body to use.

The predominant production of the thyroid is T4 (thyroxine), which is then converted by the liver into the usable form T3 (triiodothyronine). There are many causes of inadequate T4 production, including adrenal stress, poor nutrition, and autoimmune thyroid disease. Similarly, many factors cause inadequate conversion of T4 into T3, including lack of adequate nutrients and minerals and poor liver function

Many holistic doctors monitor ONLY Free T3 and Reverse T3 along with body temps once their client/patient start thyroid hormones. This is a fairly logical approach since Free T3 and Reverse T3 are the end products of the thyroid.

It's a common scare tactic by uninformed doctors when you're on desiccated (natural) thyroid and feeling great: "Your TSH is too low and you will get osteoporosis and you may now be HYPER-thyroid."

But many clients have found out that this is totally ludicrous. A low TSH while on desiccated thyroid (our TG100 product or prescriptions of ARMOUR Thyroid or NATURE-THROID) simply means you are giving yourself the thyroid hormones you need, and the pituitary gland has no need to demand a thing.

Dr. David Derry, in his book "Breast Cancer and Iodine", remembers that before labs were used to diagnosis and treat thyroid disorders (i.e. before 1973), "the normal dose of thyroid was three times the

level seen now and there were no cases of fractures or osteoporosis ever reported in the previous 80 years.”

In fact, he also surmises that patients on doses used before labs came into existence “felt better, energetic and motivated, so they remained more active during all of their lives.” And this fact would be another factor in stopping Osteoporosis!

WHAT ARE YOUR THYROID HORMONE SUPPLEMENTATION OPTIONS?

Two thyroid hormones -- T3 and T4 -- are what control the metabolism of every cell in your body. But their delicate balance can be disrupted by nutritional imbalances, toxins, allergens, infections and stress. If your T3 is inadequate, either by insufficient production or not converting properly from T4, your whole system suffers. So which do you take? T4 or T3? Or Both? Let's take a look...

1. Synthroid or Levothyroxin– a totally synthetic version of T4. This is not truly a hormone but a drug. Big difference. It is a SYNTHETIC thyroxine (T4) therefore it is NOT bio-equivalent to the natural hormone your body normally should be producing. Please understand that your body is NOT lacking “Synthroid”! This is the 4th most prescribed medication in the United States and in over 90% of the cases it actually worsens a thyroid condition because the synthetic T4 will compete with a body's natural T4 for cellular receptor sites. Your body also has to try to convert a synthetic T4 into natural T3... something that can become almost impossible for the body to do. Your body needs to have both T4 and T3 at a minimum for overall thyroid function and for you to finally feel good!
2. Natural Desiccated Thyroid hormones – like ARMOUR or NATUR-THROID which are a combination of T4, T3 and T2 made from desiccated, or dried, porcine thyroid. Studies show that individuals that are on NDT (natural desiccated thyroid like Armour or Nature-Throid) showed greater improvements in mood and brain function compared to those on synthetic SYNTHROID (T4 only).
3. Cytomel (T3 only) – a synthetic version of T3 only that can assist temporarily when a person is having a conversion problem or thyroid resistance (see below).

What should you strive for on your test results:

You'll feel your best if you can get Reverse T3 below 16, and your TSH between 0.1 and 1.0, and get your free T3 to fall between 3.5 – 4.2. Check your labs. Aim for these, as well as a body temperature above 97.5 degrees Fahrenheit.

Bottom line: don't get fooled by the warning that a suppressed TSH, or a free T3 at the top of the range, equates to Osteoporosis or HYPER-thyroid!! And being in the “normal” range does not always equal optimal treatment. In many cases when someone is taking a thyroid compound that contains T3, they could expect to have virtually no TSH showing up. See references at end of this report for more medical proof concerning the TSH test.

Someone taking T3 (Cytomel or Sustained Release T3) only should know that testing for TSH or T4 is a waste of time and means nothing. Thyroid blood tests cannot be used to manage T3 based thyroid treatment.

However, many thyroid patients often have problems with their family doctor or endocrinologist because of concerns about low FT4 levels.

One thyroid patient has recently brought some additional information to my attention. With each prescription medication comes a manufacturer's insert - the piece of paper accompanying the medication for the pharmacist. This describes the medication, how to use it and any contra-indications. Sometimes, a

pharmacist will retain the insert and sometimes the insert will be provided to the patient along with the medication. The information on this insert is based on clinical research and on tests approved by the FDA (US Food and Drug Administration). This information on the manufacturer's insert with a drug is usually not in question. These inserts are sometimes not available on the Internet but they come in the box with the medication.

This thyroid patient uses Cytomel, which is a common brand of synthetic T3.

On the Cytomel insert it states: "Serum T4 levels can be used to test the effectiveness of all thyroid medications **except products containing liothyronine sodium.**"

That is the manufacture stating, **if it's got T3 in it, you can't rely on the tests for FT4!**

So this isn't in question - FT4 cannot be used to test the effectiveness of medications containing T3, or at the very least the same rules as normal cannot be used if the doctor is attempting to review FT4.

The same manufacturer states doctors should be using laboratory tests **in addition to "Full clinical evaluation"**, i.e, considering the patient's **presenting and stated symptoms**. The upshot being, the doctors failing to do a full clinical evaluation are the ones **not using T3 medications as directed**.

I see this information being particularly relevant to those thyroid patients using T3 medication or combining T3 medication with T4 or natural desiccated thyroid. Frequently, these people are asked by their doctors to reduce their T3 or add T4 because of FT4 levels that are lower than the doctor cares to see. This is clearly not a good approach, especially when the health of the thyroid patient is actually improving.

How do thyroid disorders affect the rest of the body?

"The pituitary gland, parathyroid glands, and sex glands all work together and are influenced by thyroid function. If there is a problem in one place, they all may be affected" (James F. Balch, MD, 1989, p. 211).

Elevated cholesterol levels - "Hypothyroidism is the second leading cause of high cholesterol, after diet. When TH levels drop, the liver no longer functions properly and produces excess cholesterol, fatty acids, and triglycerides, which increase the risk of heart disease. High cholesterol may also contribute to the risk of Alzheimer's disease.

Heart problems - "Hyperthyroidism causes accelerated heart rate and fatigue, even when patients are at rest. ... Some experience thyroid storms--high overloads of thyroid hormones that accelerate their heart rate to as high as 300 beats a minute. This is a very life-endangering condition and can result in arrhythmia or heart attack. ... (Phillips). "Untreated hypothyroidism can lead to an enlarged heart (cardiomyopathy), worsening heart failure. (medicinenet.com). "TH imbalance has a profound effect on cardiovascular fitness because TH helps control heart rate and blood pressure. (Phillips). Under hypothyroid conditions, the heart can slow to 30 heart beats a minute and develop arrhythmia. Blood pressure may fall from normal levels of 120/90 to 70/50" (Phillips). Hashimoto's thyroiditis may lead to ...heart failure" (healthsystem.virginia.edu). "In hypothyroidism, thyrotropin-release hormone (TRH) is usually increased, increasing release of TSH. TRH itself can cause tachycardia, "palpitations," high blood pressure... It can increase the release of norepinephrine, but in itself it acts very much like adrenalin. TRH stimulates prolactin release, and this can interfere with progesterone synthesis, which in itself affects heart function" (Raymond Peat, PhD, 2010).

Muscle weakness - Hypothyroid (underactive) "produces lower exercise tolerance because protein and fat catabolism are accelerated, resulting in build-up of ketones. Hypothyroid (underactive) "has the effect of slowing the body down" (NSW Health). "Hashimoto's thyroiditis may lead to muscle failure" (healthsystem.virginia.edu). "With respiration impaired and oxygen in short supply, exercise takes a heavy toll on the body, and muscles do not strengthen in response to exercise; nor does stamina improve" (Phillips).

Impaired breathing - Hypothyroidism also weakens muscles in "the diaphragm. As a result, breathing can become less efficient. A goiter impairs breathing even more. Snoring may start or become worse" .

Pleural effusion - "Untreated hypothyroidism can lead to ...an accumulation of fluid around the lungs" (medicinenet.com).

Yellowing of the skin - Hypothyroid patients may develop yellowed skin due to carotenoid (Vitamin A precursors) deposits in the skin when the liver no longer can store enough. Vitamin A usage and synthesis drops as thyroid hormone levels drop".

Non- Hodgkin's lymphoma - "Thyroid disorders are "associated with non-Hodgkin lymphoma" (healthsystem.virginia.edu).

Hashimoto's thyroiditis may result in hypothyroidism, although in its acute phase, it can cause a transient hyperthyroidism thyrotoxic state known as hashitoxicosis" An extremely rare condition associated with the thyroiditis is Hashimoto's encephalopathy" (healthsystem.virginia.edu).

Intestinal stasis (constipation) can result from hypothyroid.

Bulging eyes, swollen eye lids, increase of pressure in the eye.

Hyperventilation with alkalosis

Hormone Imbalance may have the following effects on a woman's body:

* "Thyroid disorders can cause abnormally early or late onset of puberty and menstruation. In addition, abnormally high or low levels of thyroid hormone can cause very light or very heavy menstrual periods, very irregular menstrual periods, or absent menstrual periods (a condition called amenorrhea).

* "An overactive or underactive thyroid may also affect ovulation. Thyroid disorders may prevent ovulation from occurring at all. In addition, the ovaries are at an increased risk for cyst development if the woman has an underactive thyroid (hypothyroid). Severe hypothyroidism can actually cause milk production in the breast, while preventing ovulation.

* "Thyroid disorders during pregnancy can harm the fetus and may lead to postpartum thyroid problems, such as postpartum thyroiditis.

* "Thyroid disorders may cause the early onset of menopause (before age 40 or in the early 40s). In addition, some symptoms of hyperthyroidism (overactive thyroid) such as lack of menstruation, hot flashes, insomnia, and mood swings may be mistaken for early menopause. Treating hyperthyroidism sometimes can alleviate symptoms of, or the actual onset of, early menopause" (healthsystem.virginia.edu).

THYROID RESISTANCE

If your body is producing too much Reverse T3 and not enough Free T3 there is a good chance that you have what is termed: **thyroid resistance (or a conversion problem)**. When we talk about "resistance to thyroid hormone" we are talking about people that don't respond properly to Thyroid Hormone supplementation and appear to have hypothyroid symptoms despite being on thyroid replacement and/or having normal blood test results (usually TSH only).

One of the most common causes of this lack of response to the thyroid hormone is something called "Reverse T3" (RT3). Reverse T3 (RT3) is what is made when the "wrong" iodine atom is removed from T4, it's a "mirror image" molecule to T3 and is not bio-active. This in itself is not a problem, the problem is that in excess it "fits into the T3 receptors" and gets stuck there blocking the action of T3 on the body. This means that your body doesn't respond properly to T3 leading to hypothyroid symptoms despite a normal TSH and normal T3 and T4 levels in the body. This is what we refer to as "Tissue Resistance to Thyroid Hormone". Doctors will tell you this is very rare, this is because they don't look for it!!

The main symptom of RT3 issues is that of hypothyroidism that won't respond well to treatment.

Tissue resistance to thyroid hormone is just what it says it is, there are normal amounts of Free T3 in the blood and yet the body behaves as though it's hypothyroid. This is often caused by Reverse T3 blocking the Receptors on the cells that the T3 should stimulate.

Important note: There are causes of this other than RT3, but treating resistant hypothyroid people with Natural Thyroid (Armour, Etc) or synthetic T4 leads to large doses being given. This leads to excess levels of Free T4 and that in turn leads to higher levels of RT3 being produced and resistance building up and the individual still having all the symptoms of low thyroid! The only successful way I have heard of to treat people with other resistance is to use T3 only (Cytomel or T3-SR compounded). Starting with 5mcg of Cytomel daily and working up to 10mcg (5 in am + 5 in the afternoon) - (and possibly going higher) - is the first course of action for many. Monitoring how you feel and your basal body temp will help you to know if you are at the right dose. Some individuals do well to stay on their Armour or Synthroid while adding in Cytomel (T3 only). And yet some feel much better ONLY taking Cytomel or T3SR (sustained release that is compounded at pharmacy). Most women feel much best when their FREE T3 serum level is 3.5 - 4.0 (lab ranges are from 2.0 - 4.4). This level along with your body's basal temp should be monitored for optimum results.

The body naturally produces some RT3 and this isn't a problem in most people. The problem arises when the ratio of FT3 to RT3 sinks too low as the RT3 then gets in the way of the T3 that we need to function causing hypothyroid symptoms. The ideal ratio of T3/RT3 is "greater than" 20.

There are several causes for this ratio getting disturbed, the principal ones that we know of are:

Extreme dieting, low iron (Ferritin), high or low cortisol levels (best monitored with saliva testing), low B12 levels, autoimmune diseases of the thyroid, toxic metal exposure, severe or systemic illnesses, chronic alcohol intake, ageing, liver diseases, extreme or prolonged stress, low D3, low functioning adrenal glands (imbalanced or insufficient or high levels of estrogens, progesterone, testosterone and DHEA), mycoplasma or other bacteria present.

T4 to T3 Conversion Problems:

Remember... as I stated T4 is mostly inactive and converts to T3 and/or Reverse T3. T3 is the ACTIVE hormone. It is produced by the conversion from T4 to T3 but is also produced in different parts of the body, with the liver being responsible for a good amount of this conversion! However, in order to convert T4 to T3, the enzyme 5'-deiodinase is required. And certain minerals are required to activate this enzyme.

Most medical doctors will prescribe only T4 drugs (Synthroid or Levothyroxine) and this just isn't enough to manage the person's symptoms. Sometimes giving T3 (Cytomel or compounded Slow Release T3) either alone or in conjunction with T4 might assist greatly with symptoms. But the real answer is to correct the conversion problem. That means correcting one or more of the following:

Mineral deficiencies (low zinc or low selenium, and **most likely low iodine, etc.**), Gastrointestinal problems (leaky gut or candida overgrowth), Liver issues (may need to detox liver since 20% of the conversion of T4 to T3 takes place here), Adrenal fatigue (high or low cortisol, estrogen dominance), Certain medications (beta blockers interfere with the conversion), Lack of protein or protein absorption.

HASHIMOTO'S Disease

If your thyroid antibodies are present you are having an autoimmune attack on your thyroid gland. Many medical doctors miss this when doing testing. They either don't bother to test the antibodies or they mis-read the results. Holistically if your antibodies are present at all then they are "doing something". Most doctors rely on the lab's range of 0-34 to determine whether or not to officially diagnose you with this disease. Holistically that is waiting too late. If the antibodies are present at all then you have something going on.

Probably 75% of my clients that are on Synthroid or Levothyroxine have either Thyroid Resistance/Conversion problems or Hashimoto's autoimmune thyroiditis and have never been diagnosed by their regular medical doctor properly... and therefore are NOT getting "treated" correctly!

Hashimoto's thyroiditis, also known as **chronic lymphocytic thyroiditis** was named after the Japanese physician, Hakaru Hashimoto (1881 – 1934), who first described the condition in 1912.

This disease causes **inflammation of your thyroid** (a small butterfly-shaped gland in your neck near your Adam's apple). It is an auto-immune disease, which means it causes your body to attack its own tissue. This is determined by monitoring your TPO (thyroid peroxidase antibody and Thyroglobulin antibodies).

With Hashimoto's thyroiditis the immune system mistakenly attacks the thyroid causing inflammation and tissue damage. Antibodies are made by white blood cells to fight germs and infections. But in Hashimoto's, auto-antibodies (antibodies which attack normal tissue) are made by white blood cells and appear in the bloodstream.

The result is an **infiltration of immune cells into your thyroid gland** and damage to the thyroid tissue. As a result, your thyroid gland then reduces its production of hormones, which leads to an underactive thyroid gland. This disease progresses slowly, and causes chronic thyroid damage. It is life-long, but with the correct treatment, healthy nutrition and exercise, it can be managed effectively.

Often, Hashimoto's Thyroiditis is mild and can go undetected for a number of months or years. **Hashimoto's disease is the most common cause of primary hypothyroidism in the United States.** Women are more commonly affected than men at a ratio of 8:1 and it is most prevalent in the 30-50 age group.

Hashimoto's Thyroiditis affects approximately 15 million women in the United States, most presenting with Hashimoto's in middle age. Hashimoto's Thyroiditis is more common in those individuals with a history of thyroid disease, other autoimmune conditions or other endocrine disorders.

The onset of Hashimoto's Thyroiditis is slow and insidious, with gradual progression over time. This means that many people with early Hashimoto's are not even aware of the problem as they do not have any symptoms of hypothyroidism.

The symptoms of Hashimoto's Thyroiditis are initially mild, sometimes barely noticeable, but as the disease progresses over a lengthy period more symptoms become apparent.

Some of the symptoms and signs of Hashimoto's Thyroiditis include:

- Fatigue & Exhaustion
- Unexplained Weight Gain
- Anxiety & Depression
- High Blood Pressure
- Bloating
- Periods of Sweating, Weight Loss, and Irritability
- Muscle Spasms
- Sore Throat
- Rashes
- Acne
- Headaches
- Infertility in Women
- Insomnia
- Forgetfulness
- Constipation
- Dry Skin
- Intolerance to Cold

- Swelling in the Front of the Neck
- Trouble Swallowing food or liquids
- Tender and stiff muscles

Hashimoto's normally involves a **slow and steady destruction of the thyroid gland** eventually resulting in the thyroid being unable to produce sufficient thyroid hormone. However, during this process there can be periods where the thyroid seems to come back to life, even causing temporary hyperthyroidism.

This **cycling between hypothyroidism and hyperthyroidism is one of the characteristics of Hashimoto's disease**. During this cycling back and forth, symptoms will vary too with alternating periods of anxiety, insomnia, diarrhea and weight loss may be followed by periods of depression, fatigue, constipation and weight gain.

NOTE: It is not uncommon to find women with both Thyroid Resistance/Conversion problems and Hashimoto's at the same time. It is best to first "clear out" the Reverse T3 with T3 treatment only for a few months or weeks and then to recheck your levels and then start using ARMOUR (which is a natural combination of T4, T3 and small amounts of T1 & 2). Some clients (myself included) do great on T3 only.

Mitochondria Repair:

The symbiotic relationship between mitochondria and the cell is mutually beneficial. The cell provides fuel, nutrition and a protective environment for the mitochondria, and mitochondria provide energy (ATP and reducing power) for the cell. This symbiotic relationship is also one of dependence. Most cells cannot survive or maintain their normal function without the energy produced by the mitochondria, and mitochondria can't survive outside of the protective environment of the cell.

Since mitochondrial energy production accounts for the vast majority of total energy production, mitochondrial function is a necessary and essential aspect of the regulation of basal metabolic rate. In other words, either decreased thyroid hormone or mitochondrial dysfunction can lower basal metabolic rate and induce the symptoms of hypothyroidism (cold hands and feet, sensitivity to cold weather, psychological depression, cognitive difficulties, dry skin, scaly scalp, brittle hair, menstrual problems, constipation, diminished stomach HCl production, etc.). Non-thyroid-related mitochondrial insufficiency could easily account for the high incidence of hypothyroid symptoms in individuals with otherwise-normal thyroid hormone levels. Probably a significant amount of subclinical hypothyroidism is really mitochondrial insufficiency.

Regardless of what it is called, decreased mitochondrial energy production reduces the capacity of the cell to function. Depending on the cell populations affected, this may decrease body temperature, lower immune function, impair growth, decrease DNA repair, impair hearing, weaken muscles, decrease steroid and neurotransmitter synthesis, and lower nervous system electrical potentials. These are all factors which are associated with both mitochondrial diseases and hypothyroidism.

IODINE AND YOUR THYROID

Since the atoms of thyroid hormones re composed of iodine, there's a strong connection between inadequate iodine intake and hypothyroidism. Iodine is a universal nutrient in that it regulates hormones and metabolism, enhances brain development and function as well as detoxifies toxic halogens and heavy metals. Iodine works as an "adaptogen," that is, it helps strengthen the body's ability to adapt to and compensate for physical disruptions. Some thyroid medications make the body metabolize iodine faster than normal. This can result in a functional loss of iodine if you are already taking thyroid hormones.

Iodine is an essential micro-nutrient ... that means that every cell in your body needs and uses iodine! The main form of iodine used for supplementation is Lugol's Iodine Solution or Lugol's in tablet or

capsule form (we have a specially formulated product called MOTION that is a natural Lugol's solution!). In the past (1800's-early 1900's) medical records show that iodine was used to treat medically: goiter, atherosclerosis, syphilis, uterine fibroids, mercury poisoning, scarlet fever, bronchitis and pneumonia, obesity, depression, breast pain, eczema, malaria, ovarian cysts, cough, tumors, tonsillitis, etc.

Up until the 1980's, potassium iodate was used as a dough conditioner in bakery products. But for some reason, it was removed and replaced with potassium bromate, a halide (salt) that inhibits thyroid function! Halides such as fluoride, chloride, bromide and mercury will block the absorption of iodine so enough iodine must be ingested to overcome these common environmental factors.

What is commonly thought to be a bad reaction to iodine is most likely bromide toxicity and/or lack of selenium. Iodine, Bromide, Fluoride and Chlorine are all halides. When we are low in iodine and are exposed to these other halides they will take a place on the iodine receptors. If we have been exposed to many of these halides over a long time period we may be considered bromide toxic.

It has been verified many times that people with Hashimoto's thyroiditis in the United States are usually deficient in iodine. However, if they are deficient in iodine then they are almost sure to be deficient in selenium also. Selenium is what the thyroid uses to manage H₂O₂. If a client runs into problems when taking iodine it is low selenium that is causing these bad reactions, not iodine! Think about it from an evolutionary standpoint. If soil is low in selenium it is very likely to be low in iodine. If soil is low in iodine it is very likely to be low in selenium. As people evolved and moved around the world, they had to be able to adapt to either low selenium and iodine or higher selenium and iodine. What they did not typically have to deal with was high iodine and low selenium. That is until some "smart people" started increasing one without increasing the other. I have yet to read of a bad reaction to iodine if the person was first started in 200 mcg per day of selenium as L-selenomethionine and then increasing the iodine.

Some clients might still have a "problem" with detoxing the bromines and/or mercury out of their body. Below are some of the symptoms that CAN occur. Please note I said, "CAN". Not everyone goes through this. If you've had a diet filled with breads, crackers, junk foods, pastas, etc you might notice a few of these detox symptoms when starting iodine supplementation. If you have heavy metals, yeast, fungus, etc... then you might also have a few detox symptoms. That is when you will need to literally replace the bad salts (bromides, flourides, etc) with good salt (see SALT LOADING PROTOCOL below).

Please note that NOT ALL WILL EXPERIENCE THE FOLLOWING...

Iodine-related bromide detox symptoms may include:

eye lid twitching – foot twitching – tingling in hands or feet
dark thoughts (e.g., there is no reason to live)
depression (e.g., there is no reason to get out of bed)
anxiety – emotionality – irritability – sedation – lethargy
skin "cuts"rash (bromaderma) bromide acne," "acne-like eruptions" without "coniform."
hair loss
leg and hip ache (feels like arthritis)
metallic taste – dry mouth – increased salivation
mouth and tongue sores and cuts or "sore mouth"
sinus ache – runny nose
headache- brain fog
odd swallowing sensation (reported in old medical literature as "swollen glottis")
body odor (bromos is Greek for stench)
ureteral spasm, frequent urination (mistaken for urinary infection) – unusual urine odor
diarrhea – constipation - nausea

kidney pain
vision changes
dream changes
hormone changes

SALT LOADING PROTOCOL:

SALT DOSING (different than SALT LOADING) : salt DOSING is 1/2 tsp of good salt (not white, like celtic sea salt) EVERY day, spread out throughout the day. This is great to do if there are no “detox” symptoms present and the person is starting iodine supplementation.

Salt LOADING is USED for when detox is troubling. See protocol below. The bromides displaced by the iodine bind to the chloride in the salt and are excreted in your urine. If you need to do this for more than 2 or 3 days, you need to either pulse dose your iodine or decrease your iodine dose.

(note: we've suggested people who are VERY sensitive "start low, start slow" with iodine. But there's an additional Pre-treatment Protocol that some of the doctors use. They start patients with NO iodine but all the companion nutrients for two weeks. (magnesium, selenium, celtic salt, Vit. C, B vitamins, Vit D, Vit. E, etc.)

When starting iodine supplementation you may need to do a Salt Loading program:

(1/2 teaspoon Celtic sea salt (or Himalayan) dissolved in 1/2 cup warm water, then followed immediately with 12-16 oz pure water. (MAY USE 2 SEA SALT CAPSULES instead of 1/2 tsp of salt). Repeat every 30-45 minutes until copious urination begins.

Do this for 1-3 days in late morning or early afternoon. The salt will bind to the toxins (bromides, fluorides, etc) that may be mobilized after starting the iodine treatment. You may notice for a few days detox symptoms of pimples, headaches, fatigue. They will go away as you continue supplementing iodine.

The average dose of iodine is 50mcg daily (don't take in afternoon or night as it could keep you awake!). Correct supporting minerals and vitamins should also be taken while supplementing iodine: B complex, Vitamin C, selenium (vital if you have Hashimoto's), Vit. D, Vit. E (or as directed by your holistic practitioner based on personalized testing)

Facts:

- 1. It is impossible to get enough iodine from iodized salt.**
- 2. If you're allergic to shellfish you can still take iodine supplements! People allergic to shellfish are allergic to the protein molecules in the fish, NOT the iodine!**
- 3. Eating dried seaweed or seaweed / Kelp supplements does not give you the iodine you need!**
- 4. The iodine in your multi-vitamin is not sufficient**
- 5. Iodine supplementation/replacement will NOT shut down your thyroid function**
- 6. Iodine supplement may cause an increase or fluctuation of your TSH on testing during the first 2-3 months of starting iodine. We usually suggest not testing the TSH until after 90 days of 50mg**

of iodine supplementation daily. Test ONLY the FREE T3 and FREE T4 and Reverse T3 during this time.

If you're taking "thyroid" (synthroid, etc.) for hypothyroidism, whether it's the whole natural variety or the single hormone, synthetic type " you've probably improved your energy levels, become a bit more alert, lowered your cholesterol and improved your overall health. (or maybe you've had no real results at all), in either case, unless you're getting enough iodine you simply won't get the results needed! There's a very good chance that you simply are not getting enough iodine even though you eat well and take supplements on a regular basis.

Raising iodine intake to an optimal level might also help women lower their endometrial and ovarian cancer risk as well as assist in ridding the body of ovarian cysts. In men, it can help lower prostate cancer risk. In both sexes it may also help reduce or even eliminate their need for thyroid hormone supplementation altogether by boosting iodine levels.

Iodine can actually help your body get rid of potentially harmful elements like lead, cadmium, arsenic, aluminum, mercury and toxic amounts of fluoride.

SOLUTIONS:

In the holistic field we offer a few points that must be done with anyone who has an autoimmune disease. All points are important... do not just pick and choose:

1. Avoiding GLUTEN might be called for. Researchers have found that organ-specific auto-antibodies (such as thyroid antibodies) will disappear after 3- 6 months of a gluten free diet. If you also have joint inflammation, skin rashes (eczema, psoriasis, and rosacea), respiratory congestion, brain fog, fatigue, migraines or memory loss then you might also need to be off of gluten.
2. Support the adrenal glands – get your adrenal glands working at optimum through proper saliva testing and nutritional supplements. Trying to increase thyroid hormones when adrenal function is low is asking for a disaster and you will feel worse.
3. Cleanse the body – getting a comprehensive stool test done to determine any bacteria, yeast, fungus, parasites, etc. and then cleansing and detoxing
4. Remove stress – stress build-up over time or acute is deadly and creates an acidic body that becomes overloaded with toxins and imbalanced nutrients.
5. Supplement with 200-400 Selenium, utilize glutathione cream daily to balance immune system, avoid iodine supplements, ensure that you are getting enough zinc (30-60mg), and supporting your gut health properly and feeding your body plenty of good B vitamins, supplementing with a good iodine supplement (not seaweed or kelp). (we do carry all of these supplements specially formulated in our office or website)
6. Exercise daily... even if it's only for 10 minutes a day.
7. Repair the mitochondrial damage, repair and restore cellular potential through the use of our product NT FACTOR Advanced Physician Formula for 60-90 days.
8. Adjust your diet...do a full check for food sensitivities (ie. Foods that cause your immune system to REACT incorrectly!) and/or at the minimum avoid grains.

Foods That May Impair or Help Thyroid Function

Dietary factors that can interfere with thyroid function include gluten and food allergies.

These need to be identified and addressed if they are a problem for a particular person. They are not always an issue but can be and need to be evaluated in any case of thyroid problems.

Eliminate FAKE or bad foods:

- That means processed foods; junk foods; artificial sweeteners; trans fats; anything in a box, package, or can; and anything with ingredients you don't recognize or can't pronounce.
- It means eating ONLY whole foods – not derivatives of real whole food like refined sugars and flours or sweetened drinks.
- It also means taking a 4-week break from uppers and downers – stimulants and sedatives – like caffeine and alcohol (and obviously nicotine)
- And it means eliminating all the foods that many of us have developed allergies to – foods that can interfere with thyroid function by creating inflammation – such as gluten, dairy, eggs, corn, yeast, citrus and nightshades.
 - Another food that is *bad for your thyroid* is soy - Soy is NOT the health food the agricultural and food companies would have you believe. Soy is high in isoflavones (or goitrogens), which are damaging to your thyroid gland. Thousands of studies now link soy foods to malnutrition, digestive stress, immune system weakness, cognitive decline, reproductive disorders, infertility, and a host of other problems -- in addition to damaging your thyroid. Properly fermented organic soy products such as natto, miso, and tempeh are fine -- it's the unfermented soy products that you should stay away from.

Add in the Good Stuff:

Include foods that optimize your health...

- Eat only whole, unprocessed, real foods
- Eat mostly plant foods -- vegetables, fruits, nuts, seeds, and beans
- Eat small amounts of lean animal protein – sardines, wild salmon, lean poultry, white fish – you need a minimum of 60 grams per day of good protein (up to 100 gram per day for first month if you have been deficient for a long time)
- For your thyroid add special foods like sardines, scallops, Brazil nuts, pumpkin seeds, dandelion greens, and other green leafy vegetables.

Additional Solutions:

In the medical field you may not find many doctors willing or able to assist you. It will be vital that YOU get educated so that you can find and educate a good medical doctor who will work with both you and your holistic practitioner to truly balance and cleanse your body. The answer to thyroid difficulties lies in both good medical handlings as well as holistic.

Your body might respond beautifully to T3-SR (sustained release T3) or it might prefer CYTOMEL (direct T3) alone or in conjunction with Synthroid/Levothyroxine (T4 only meds). Your body might prefer ARMOUR or NATURE-THROID (combo of T4 & T3) which are both natural prescriptions for thyroid hormones. Some individuals with Hashimoto's don't do well on "natural" thyroid medications/hormones as they come from desiccated glands. The reason for this is that your immune system detects more "thyroid gland" and can increase the attack! The bottom line is that you need to ensure that proper amounts of all the thyroid hormones are present along with sufficient iron and adrenal hormones. Coordinating with your holistic practitioner and medical doctor is vital!

Monitoring Ferritin: Ferritin is an iron-storage protein which helps to keep your iron in a dissolvable and usable state. You can have "normal" serum iron and saturation levels and even normal hemoglobin and

hematocrit, yet low Ferritin. Being hypothyroid can result in lowered production of hydrochloric acid which in turn leads to malabsorption of iron. It can lower your body temp (especially if you're on T4 hormones only) which causes you to make less red blood cells. Proper iron levels are needed in the production of cortisol (from the adrenal glands) – it's a good bet if your Ferritin is low so is your cortisol! Serum iron needs to be at least 90 in order to better tolerate desiccated thyroid or T3. Monitoring your Serum iron and Ferritin along with TIBC and % Saturation is important.

A new study details the dire metabolic consequences of having low iron. It shows that [low iron](#) turns on genes in your liver and muscles that promote fat storage and cause abnormal elevation of blood sugar – exactly what goes wrong with metabolism that leads to the metabolic syndrome.

The consequence to thyroid metabolism is twofold. First, the inactive thyroid hormone, T4, is converted to the biologically active hormone, T3, mostly on cell membranes of liver cells. Hepcidin is made in your liver and is being produced excessively in response to high inflammation. Such inflammation will also damage liver cell membranes, thus reducing the conversion of T4 to T3. This is one main reason why inflammation of any type disturbs thyroid function.

Second, when biologically active thyroid, T3, binds on to cell membranes and communicates to the nucleus of your cells how fast their metabolic pace should be set, it is like a hormone manager giving an order to a cell factory. The worker bees in the cell factory then need iron for the genes that will implement the thyroid order. In fact, the next 80 metabolic genes responding to a thyroid order all need iron. If iron is lacking metabolism simply cannot run at an optimal pace, which will give people all the symptoms of hypothyroid even if they have normal T4 and normal T3.

Iron can be normal on a blood test and a person can still have all the problems above, though levels tend to be toward the lower end of the normal range. Hemoglobin (Hgb) and hematocrit (Hct) are also on the low side of the normal range with this problem. If one or another is out of range on the low side it signifies a major problem

Monitoring and supplementing adrenal hormones: Your thyroid situation will never resolve on thyroid hormones alone! (Sorry!)...It is going to take some work as stated above in changing your "way of life" (diet) and handling stress, and cleansing your body.

Low adrenal symptoms are also often seen with low thyroid function. The conditions and symptoms of low thyroid and poor adrenal function tend to interact to produce even worse symptoms. Trying to fix the thyroid without addressing the adrenals may make you feel worse initially. That is because thyroid hormones will stimulate your metabolism, and if you are unable to cope with this increase in your metabolism you will often feel worse.

It is critically important to address adrenal gland health and the health of your autonomic, or automatic, nervous system, which controls unconscious functions such as breathing, digestion, heartbeat, and the flight-or-fight or stress response. Otherwise, a full recovery is simply not possible.

As I stated... you have to put attention on your cortisol, DHEA, Testosterone and balance your estrogen/progesterone you will never get a full resolution with your thyroid. T3 NEEDS enough cortisol and progesterone to do its job properly in the body. One does not work without the rest. Too much cortisol and too little can cause havoc with your thyroid gland and its resulting hormones. We strongly suggest getting a saliva adrenal hormone test done. The greatest advantage of saliva hormone testing (vs. blood testing) for adrenal hormones is that it measures only your active (usable) hormone levels... and this is

the only level that counts when it comes to assessing function and treating hormone imbalances. **If you are using hormone creams this is considered the ONLY way to monitor your results as the creams will NOT show up in the serum level of your blood in sufficient amounts to monitor properly.**

Detox Bath Done on a regular basis (once weekly), a detox bath can be one of the key ingredients to your full recovery from thyroid and adrenal fatigue. Follow these guidelines:

1. Use water as hot as you can tolerate and make it as deep as possible to immerse your body all the way up to your neck.
2. Start with 10 minutes in the bath at a time... work up in a few weeks to doing a full 30 minute detox soak. Should do this detox bath 2x weekly.
3. Drink 8 ounces of water before and after bath
4. Take 2000mg of our PROTECTION (buffered vitamin C) after the bath to help with detoxification
5. Use Epsom salt in the hot water. Pour 2 cups of Epsom salt into your bath before soaking. The magnesium is absorbed through the skin, as is the sulfate. Both are critical for detoxification. This can also help with circulation and perspiration
6. Add 8 ounces of baking soda to the bath to help with your acid/alkaline and mineral balance.
7. You can add in a few drops of essential oils for relaxation: germanium and lavender are great. Use about 10 drops.
8. Get out of the bath tub slowly. You might feel weak or a bit dizzy because your blood vessels are now all dilated. Simply crawl into bed and relax!

TSH Rerences:

For some inexplicable reason, modern medicine continues to argue within itself on the proper reference range for the TSH test (Thyroid Stimulating Hormone). This is for educational purposes for both you and your medical provider.

The New Reference Range for the TSH - The 2.5 cutoff

Here is a little history of the TSH reference range wars. In 2002-2003, three professional organizations revised the TSH references range lower.

2002- American Association of Clinical Endocrinologists narrowed the serum TSH reference range to 0.3-3.0 mIU/L, lowering the upper reference end to 3.0. ([Baskin et al. Endocrine Practice 8:457, 2002](#))

2003- The National Academy of Clinical Biochemistry, Recommends a TSH upper limit of 2.5 mIU/L. ([Baloch et al. Thyroid 13:42, 2003](#) & www.nacb.org)

2003 - the consensus panel (Endocrine Society, American Association of Clinical Endocrinologists, and American Thyroid Association) recommended a target TSH range of 1.0 to 1.5 mIU per liter in patients already receiving thyroxine therapy.

2007 - Endocrine Society Pregnancy Guidelines:

Preconception & 1st trimester -keep TSH below 2.5 mIU/L

2nd and 3rd trimesters -keep TSH below 3.0 mIU/L ([Abalovich et al. JCEM 92: S1-S47, 2007](#))

After all the above, it was therefore a surprise to me when I came across a laboratory that for many years, actually had been using the lower TSH range (0.3 to 2.5), and then in 2010, made the decision to move back up to 0.3 to 5.0. Many labs such as the one in Ontario ignored the lower recommendations and continued using the older upper range for TSH of 4.5.

Mary Shomon Reviews the TSH Wars

An excellent article by Mary Shomon summarizes the debate over what should be accepted as the TSH reference range. She cites Wartofsky as an advocate for the 2.5 cut off. Wartofsky and Dickey say -

"We will probably never have an absolutely cutoff value for TSH distinguishing normal from abnormal, but recognition that the mean of normal TSH values is only between 1.18 and 1.4 mU/liter and that more than 95% of the normal population will have a TSH level less than 2.5 mU/liter clearly imply that anyone with a higher value should be carefully assessed for early thyroid failure."

Carole Spencer MD PHD - How should the TSH reference range be determined?

Perhaps the most respected expert on the TSH test and reference range is Carole Spencer MD PhD, Professor of Research at the Keck School of Medicine at the University of Southern California. Carole Spencer says:

"It is impossible to establish a range using population data. The TSH upper reference limit is really a moving target. It depends upon the population being studied, the underlying pathology and iodine intake of that population, as well as the specificity of the assay for detecting the various TSH isoforms present in sera." She also says: *"It is not possible to establish a universal TSH upper limit from population data. **An appropriate compromise would be to adopt an empiric TSH reference range approximating 0.3 to 3 mIU/L, as suggested by AACE.** It is important to recognize that the upper TSH reference limit is not the therapeutic threshold for initiating levothyroxine replacement therapy. "*

Treating Patients with Labs Within Normal Range ??

The International Hormone Society has written extensively on this issue of Hypothyroidism with Labs in Reference Range, with a [Consensus Panel Statement](#) and listing of medical references supporting treatment in these cases

In Addition, the American Academy of Anti-Aging Medicine issued a 2007 "[White Paper Guidance](#)" on interpretation of lab tests such as the TSH

They state:

*"The use of "natural" thyroid in patients whose TSH levels for example are not yet over 5.5 has stimulated controversial cases where the treating physician has been dragged into court to explain why a thyroid supplement was administered to a patient who is not yet sick? Several, often recent, studies have now been published that show that levels of TSH within the reference range, between 2 and 5.5, in certain categories of patients have been reported to be associated with pathological abnormalities and even diseases. **It is therefore to no surprise that the American Association of Clinical Endocrinologists has therefore narrowed in 2002 the serum TSH reference range to 0.3-3.0 mIU/L, lowering the upper reference end to 3.** The National Academy of Clinical Biochemistry, the world's most respectful organisation for editing guidelines on laboratory test interpretation, reduced the upper end of the reference range from 5.5 to 4.1 mIU per liter in 2003. The latter group also stated that "more than 95% of healthy, euthyroid subjects have a serum TSH between 0.4 - 2.5 mIU per liter" and that "patients with a serum TSH above 2.5 mIU per liter, when confirmed by repeat TSH measurement made after three to four weeks, may be in the early stages of thyroid failure, especially if thyroid peroxidase antibodies are*

detected." ***In 2003, the consensus panel (Endocrine Society, American Association of Clinical Endocrinologists, and American Thyroid Association) recommended a target TSH range of 1.0 to 1.5 mIU per liter in patients already receiving thyroxine therapy. "***

Questioning TSH for Monitoring Thyroxine Treatment

To make matters worse, studies have shown TSH to be a poor indicator of thyroid status during thyroxine treatment. A 2005 study from Greece by Alevizaki concluded:

*" patients with T4-treated hypothyroidism have lower T3 levels, lower T3/T4 ratio and lower SHBG than normal individuals with the same TSH, perhaps indicating **relative tissue hypothyroidism in the liver.** "*

They go on to say:

*"TSH levels used to monitor substitution, **mostly regulated by intracellular T3 in the pituitary, may not be such a good indicator of adequate thyroid hormone action in all tissues.** The co-administration of T3 may prove more effective in this respect, provided novel suitable preparations are developed. Until this is accomplished, substitution in hypothyroidism **should aim at low normal TSH, to ensure normal T3 levels.**"*

TSH May Be Misleading In Certain Circumstances

In addition, there are clinical situations in which TSH levels may be misleading such as:

- 1) abnormalities in hypothalamic or pituitary function, including TSH-producing pituitary tumors.
- 2) transition periods such as early phase of treatment for hypothyroidism
Specifically, it takes 6-12 weeks for pituitary TSH secretion to re-equilibrate to the new thyroid hormone status.
- 3) Following an episode of thyroiditis, including post-partum thyroiditis when discordant TSH and FT4 values may also be encountered.
- 4) Certain drugs that influence pituitary TSH secretion (i.e. dopamine and glucocorticoids) or thyroid hormone binding to plasma proteins, may also cause discordant TSH values