

THE **THYROID RESET DIET**

30 Days to Fix Your Thyroid, Increase
Your Energy, Improve Your Mood,
and Lose Weight Fast

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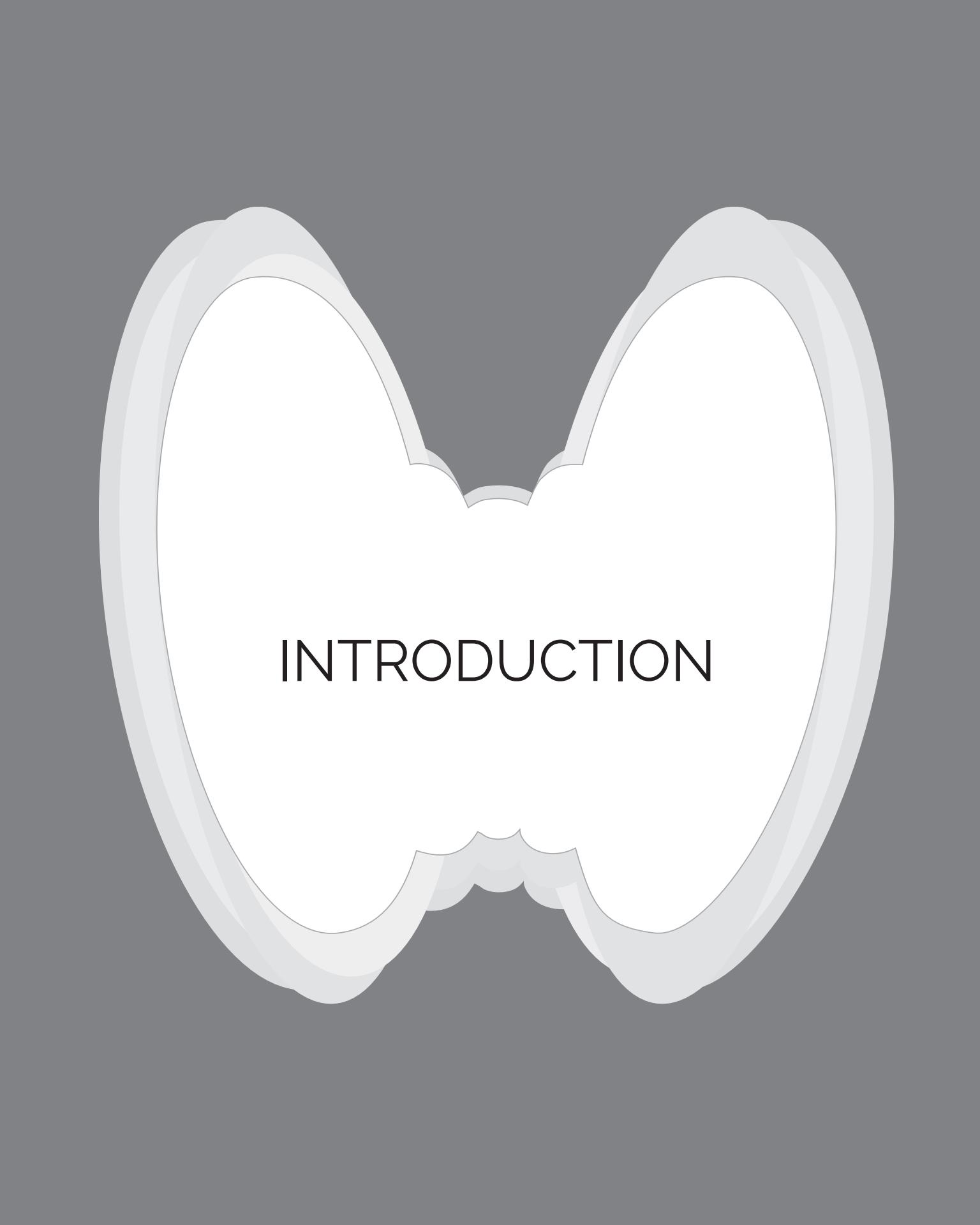
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INTRODUCTION

What do you do when your check-engine light comes on in your car? Hoping it's a short, do you give it a few taps? When it doesn't go out, do you cover it with duct tape, pretend it's not there, maybe reach under the dash and disconnect the wire? No, you take it to the mechanic. The mechanic finds the source of the problem and fixes it, and once it's fixed, the warning light goes off.

Thyroid symptoms (e.g., fatigue, weight gain, dry skin) work much the same way. The symptoms are your check-engine light. They aren't the problem—they're the signal that something is wrong. Just as you wouldn't carry around a roll of duct tape and slap it over your check-engine light, you also shouldn't treat thyroid symptoms by covering them up with pharmaceutical drugs. This doesn't address the source of the problem, the root cause. The symptoms may subside temporarily, but they will keep coming back until the root cause is fixed.

I became a functional-medicine doctor because it is one of the branches of medicine that actually explores the root cause of why people get sick and why their body isn't functioning optimally. I learned early on disease prevention isn't glamorous. It's really cool and exciting to be a surgeon on the cutting edge, fighting and researching the disease after it has already done its damage. But it was my own struggle with Hashimoto's thyroiditis that led me to want to dig deep into how the body systems connected. With this knowledge, I could help others *before* disease ravaged their bodies, *before* they ended up on life-long medications, *before* they had to have diseased samples or wedges or organs or limbs cut from their bodies, *before* their disease won.

No, disease prevention isn't glamorous, but despite this, getting to the root cause of what's driving the disease so we can prevent suffering is my goal and the goal of functional medicine.

As a university student, I worked in the surgical field. My job was to assist surgeons during limb amputations and organ removals. The surgeon would come in and tie off all the leg arteries, for example, and remove the leg. I would hold the amputated leg, wrap it up, and take it to the morgue. The leg would still be warm as I did my job and this, and the hundreds of other limbs and organs that passed through my hands on the way to the morgue, disturbed me—surely this could have been prevented.

I began to question myself: *How can we get in front of this? How can we get to the root cause of what's driving this?* I asked the surgeons, but I got nowhere. It really wasn't their field. It really wasn't within their scope of knowledge, or even on their minds. Most of them enjoyed the same vices (e.g., eating refined sugar, smoking, general lack of physical health, etc.) as those of the patients they treated. So I realized there was a disconnect in conventional medicine—with nutrition, diet, lifestyle, getting to the root cause, and treating these patients. Their focus was on “amputating” the disease, not on preventing it.

Years later as I started dealing with my health and working through my own health challenges, it became known to me that I had an autoimmune condition called Hashimoto's thyroiditis. When you have an *autoimmune condition*, it simply means that your immune system is attacking your own body. In *Hashimoto's thyroiditis*, the immune system attacks the thyroid, and about 90 percent of all thyroid issues are autoimmune in nature.¹ I had suffered from the symptoms of severe adrenal fatigue for many years before I discovered this underlying smoldering fire called Hashimoto's residing in the background.

I was able to diagnose my Hashimoto's while in doctorate school after finding antibodies in some of my lab work. *Antibodies* are produced by the immune system to fight off harmful substances in the body, but in this case, those antibodies mistakenly saw *my thyroid* as harmful and were fighting it as if it were a dangerous foreign substance? I was still consuming dairy, had nutritional deficiencies, and had underlying infections that were driving my autoimmunity. This diagnosis motivated me to learn more about autoimmunity and the thyroid, initially, because I wanted to improve my health. I wanted to fix myself.

I then began to study about the underlying connections that drive Hashimoto's. I learned about gluten and its connection to autoimmunity/autoimmune diseases.. I learned about infection and how it can drive autoimmunity. I learned about stress and sleep. I learned about everything that contributed to my condition.

After learning all I could about Hashimoto's, I turned my focus to the thyroid in general. I learned about the conversion of thyroid hormones (T4 to T3). I learned how to monitor thyroid issues. I learned how the gut and leaky gut were connected to the thyroid, how the adrenals were connected, how gluten was connected, how the liver and the body's detoxification system were connected, and how infection was connected. I also studied how the thyroid is impacted by toxins in our environment, blood sugar, diet, and lifestyle, and I figured out what supplements were needed to help accelerate and push the thyroid and body into healing.

The more I learned about the thyroid, the more obvious it was that there are many systems working together to keep it healthy. Thyroid function isn't just a one-man job; it's an orchestra, and if one instrument does its own thing or plays off-key, that beautiful music will turn into noise pretty darned fast.

So as I really dove into the field of functional medicine, I discovered that over twenty million Americans suffer with symptoms relating to thyroid issues: brain fog, sleep problems, depression, mood disturbances, constipation, cold hands, cold feet, thinning of the eyebrows, hair loss, lack of energy, and so on. A dysfunction in body systems *connected* to the thyroid

¹ www.ncbi.nlm.nih.gov/pubmed/3066320

can also manifest as symptoms and, typically, are a result of stressors (physical, chemical, or emotional) in our life not functioning at an optimal level. To help others eliminate their symptoms that lead to disease, prevent disease, and attain their ideal health level, I needed to search for the root cause of these symptoms and stressors. Functional medicine was the ideal path to lead me there.

Conventional medicine is primarily focused on treating these symptoms with medication—if you have a stomach issue, it's probably a proton-pump inhibitor; if you have a mood issue, it's Prozac or some other SSRI (antidepressant) medication; if you're fatigued, maybe some thyroid hormone.

Functional medicine, on the other hand, offers a filter and a lens to look at patients and evaluate their symptoms. What is the root cause? What is the underlying issue? We don't want to just treat it—we want to eliminate and prevent it!

Imagine conventional and functional medicine as two separate tool belts. In conventional medicine, your doctor has only a hammer (medication) in his or her tool belt. So every thyroid issue the doctor sees, he or she pulls out that hammer: here's your prescription for Synthroid (or Levoxyl or Levothyroid or some other thyroid drug). But here's the problem with this one-tool approach: What if it's the immune system or a leaky gut or a toxin that's driving the thyroid issue? How does hammering it with Synthroid get to the root issue? It doesn't. It may relieve a symptom or two, but it doesn't fix the problem. Hammers can be powerful tools, but there are oftentimes better tools for the job.

In functional medicine, doctors and practitioners have many custom tools in their tool belt. These can include supplements, natural bioidentical thyroid hormone, and specific lab testing to figure out a person's thyroid pattern. There are interventions for diet and blood sugar, to reduce inflammation, to address autoimmunity and gut healing, to address how and where toxins may be entering the body, and to help support the detoxification system so it can work better to handle the extra burden from the environment. In functional medicine, the doctor will utilize any or every tool necessary to find and address the root cause (leaky gut, adrenal failure, infection, etc.) of the thyroid issue.

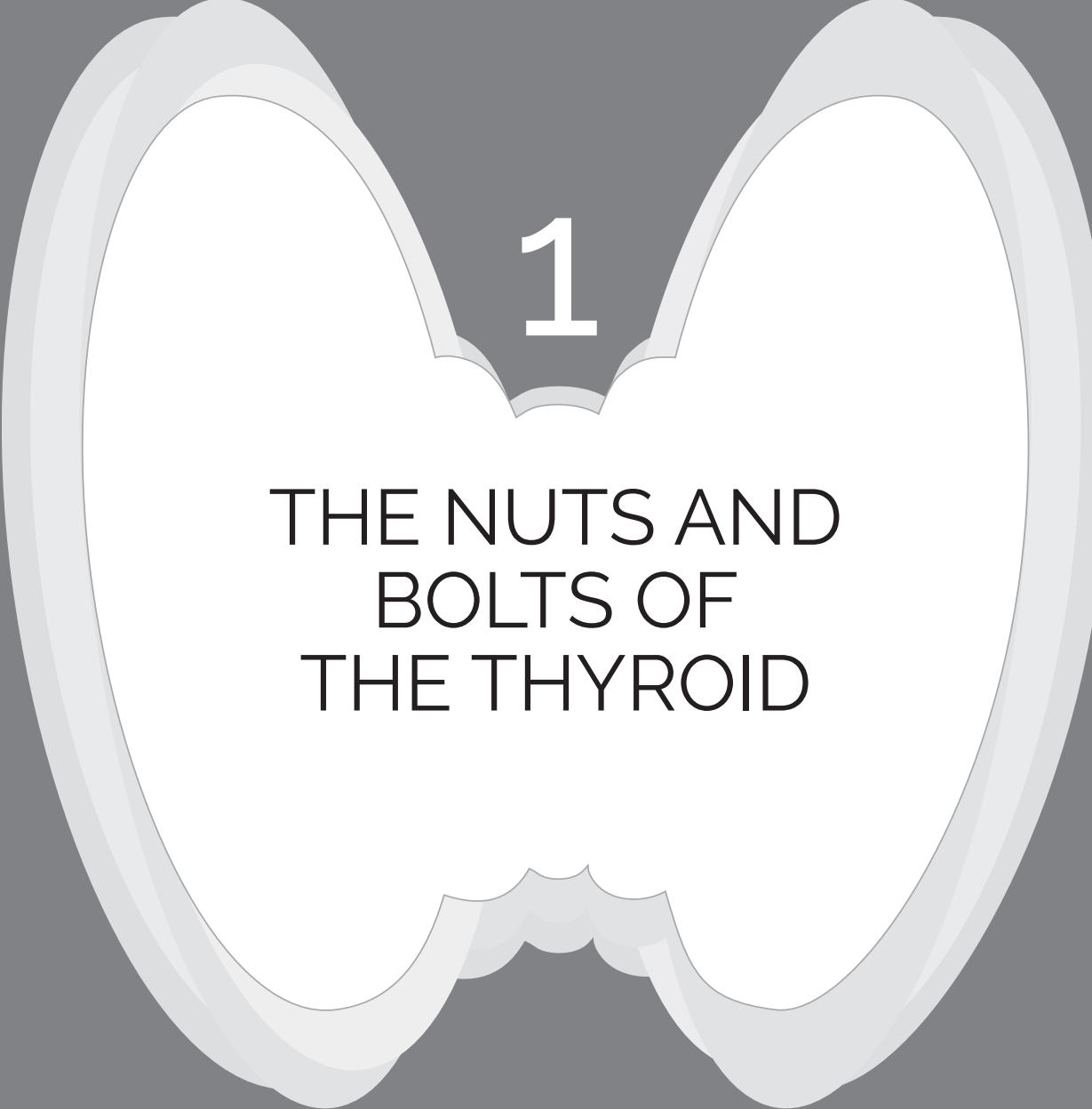
What makes functional medicine's approach to the thyroid so different, and why I'm so passionate about it, is it has an approach that is very specific and unique to getting to the root cause of each individual's thyroid issue. For one person, it may just be a simple, "Hey, we just need to work on your diet and your adrenals and cut out gluten." For someone else, it may be, "You have some serious nutrient deficiencies and some chronic infections we need to address." For yet another, it may be a combination of the two or three. My goal for each of my patients is to get to the root cause of the thyroid issue and customize a healing and prevention plan for that person.

If we continue to look at where the root cause is coming from and we eliminate the stressors and treat the body systems that aren't functioning properly, thyroid symptoms will eventually take care of themselves. We just have to make sure we do it holistically, and I will lay out the path to accomplish this in *The Thyroid Reset Diet*.

In the first half of the book we will explore thyroid fundamentals: What is it? What does it do? What diet and lifestyle best supports it? From there we will address thyroid connections: the gut, the adrenals, gluten, the liver and detoxification, and infection. Finally, we will iron out thyroid maintenance: vitamins, minerals, herbs, and supplements.

In the second half of the book we're going to incorporate specific eating and lifestyle approaches that will help with any type of thyroid issue. My hope is you will apply the action plan and utilize the recipes and meal plans included so you can fix your thyroid, increase your energy, improve your mood, and lose weight fast with *The Thyroid Reset Diet*.

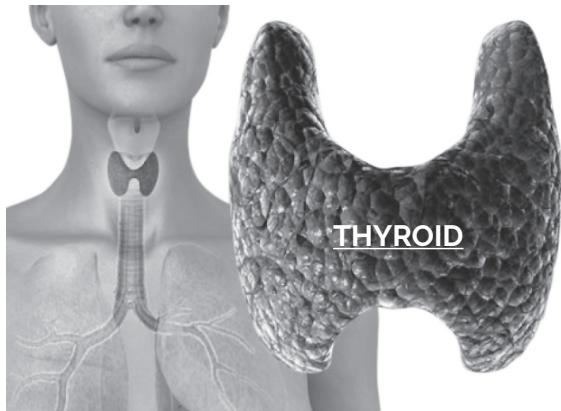
This book is for informational purposes only. I ask you not to self-diagnose or self-treat. Please see a functional-medicine practitioner and use this book in conjunction with the diagnosis, treatment, and advice provided by your practitioner. If at any point you need help during your journey to health, please reach out to me on my Just In Health website: www.justinhealth.com.



1

THE NUTS AND BOLTS OF THE THYROID

WHAT IS THE THYROID?



The thyroid is a gland that sits just below your Adam's apple on the front of your neck. It is a butterfly-shaped gland that hugs your windpipe, and you should be able to feel it easily just by running your fingers down the sides of your windpipe just below your Adams apple (tilting the head back slightly may help).

The thyroid gland resides and functions within the body's endocrine system. It works together with other glands (adrenal, sex, pituitary, etc.) to keep the body balanced and functioning optimally.

WHAT DOES THE THYROID DO?

The main function of the thyroid gland is to serve as the center of metabolism in the body. *Metabolism* is a chemical process that happens in the body's cells; it converts the food you consume into energy. The thyroid gland produces hormones that help control this cellular metabolism.

You need thyroid hormone to metabolize other hormones as well, so thyroid hormone is essential for life. If you don't have thyroid hormone or you start having lower amounts of thyroid hormone, you will start developing lots of unwanted symptoms, such as sleep issues, fatigue, and weight gain.

Think of your thyroid gland as your body's thermostat. If you turn that thermostat down low, it won't produce enough heat (thyroid hormone) to give you energy and keep you feeling comfortable. You'll start developing a lot of thyroid symptoms, and your metabolism will suffer without the proper amount of hormone to control it.

HOW DOES THE THYROID WORK?

First, it's important to understand the *thyroid-stimulating hormone (TSH)*. Conventional doctors will typically perform a TSH screening test when looking for thyroid issues. This is important because the TSH is not even part of the thyroid. It's actually a pituitary, or brain, hormone. This means they are looking at how the brain responds in order to diagnose a thyroid issue. Clearly, testing the TSH isn't going to be a direct indicator for thyroid dysfunction.

The thyroid gland produces a hormone called thyroxine, a *prohormone*, which means it is a “precursor of a hormone, usually having minimal hormonal effect by itself.”¹ T4 gets converted to triiodothyronine (T3). Though T4 makes up about 95 percent of thyroid hormone, T3 is 300 percent to 500 percent more biologically active than T4. T4 primarily feeds back to our TSH, and, unfortunately, T4 is the main hormone that most conventional doctors and endocrinologists test.

WHERE T4-T3 CONVERSION HAPPENS

Twenty percent of T4-T3 conversion happens right at the thyroid. The other 80 percent of the conversion happens *peripherally*, which means it happens in other parts of the body. Of that 80 percent, 60 percent happens in the liver, 20 percent happens in the gut, and the additional 20 percent is converted based on stress levels.

Conversion in the Liver

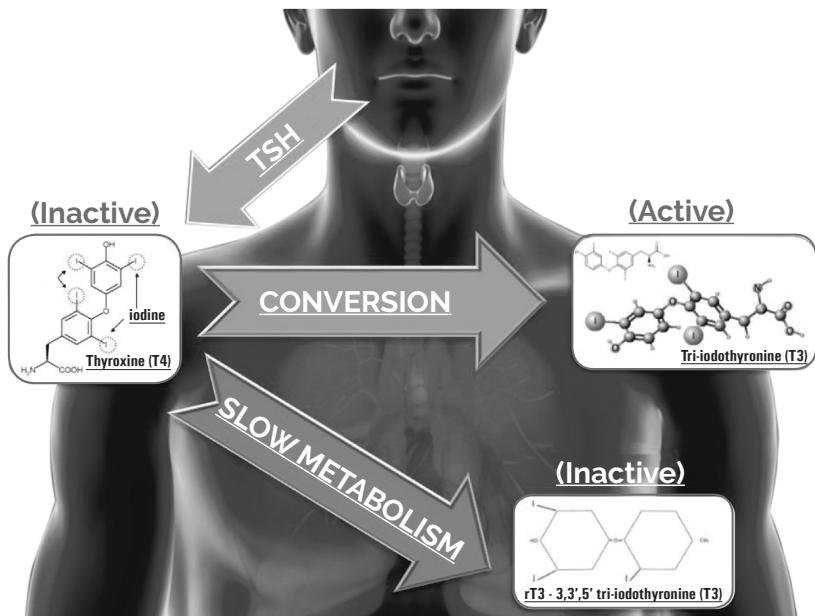
With 60 percent of T4-T3 conversion happening in the liver, it's easy to see why healthy liver function has such an important connection to healthy thyroid function. If the liver is not functioning optimally, if you have blood-sugar or detoxification issues, then you're going to have significant problems converting your thyroid hormone.

Conversion in the Gut

With 20 percent of T4-T3 conversion happening in the gut, you need healthy gut bacteria for this to happen optimally. So if you have dysbiosis (an imbalance of good and bad bacteria in the gut) from eating too much sugar or excessive antibiotic use, for example, that will negatively affect how your body converts thyroid hormone.

Conversion Based on Stress Levels

Additional percentages of T4



¹ <https://en.wikipedia.org/wiki/Prohormone>

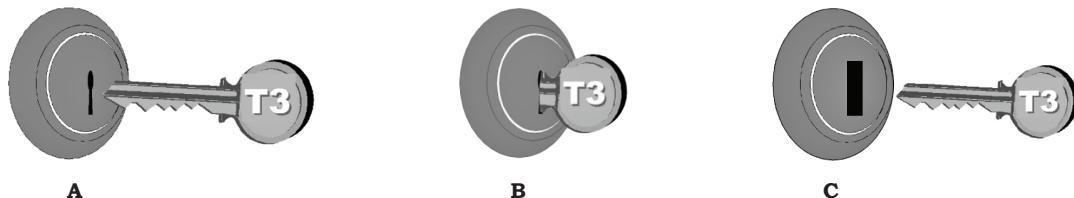
hormone will also be converted based upon your levels of stress. However, your stress level will cause it to convert to reverse T3 (inactive T3). There are three kinds of stressors that impact this process: physical, chemical, and emotional (these three stressors make up the Triangle of Health, which we will discuss in a later chapter). Stressors cause the body to conserve its energy so it can focus on the stress. The more stress, the higher the percentage of T4 converted to reverse T3. The lower the stress, the higher the percentage of T4 converted to the healthy active T3.

Think of reverse T3 as metabolic blanks in a gun. You put blanks in the gun and you fire that gun, but nothing comes out, just some noise. The same thing happens with the thyroid when we put reverse T3 in the receptor site (proteins on the surface of cells that receive messages). The thyroid is not going to respond as it would if we had put T3 in the receptor site.

HOW T4-T3 CONVERSION HAPPENS

Hormones have to bind into a cell's receptor site for a metabolic effect (that generation of energy) to occur. This is true for any hormone: testosterone, progesterone, estrogen, thyroid, and so on.

THYROID HORMONE BINDING V/S BLOCKED



If the body is converting our T4 hormone to T3, that T3 can then bind into a receptor site on our cells, like a key in a lock (images A and B above), and produce a metabolic effect. On the surface this might present itself as healthy hair, skin, nails, and gut function, for example.

If the thyroid hormone is converting T4 to reverse T3 (the metabolic blanks), the body is telling you to slow down so it can prevent its metabolism from going too high. This is represented by the key being unable to access the lock (image C above). On the surface this might present itself as fatigue, dry skin, constipation, and so on.

THE THYROID'S ESSENTIAL INGREDIENTS

There are essential nutrients and elements that must be present to keep the thyroid healthy and functioning optimally. Iodine and selenium are the main ingredients, but just like with any good recipe, a little too much or not enough can ruin the whole dish, so let's explore these important elements.

Iodine

Iodine is the main essential element for creating thyroid hormones. The government's recommended daily allowance (RDA) is 150 mcg of iodine per day².

In the United States, iodine deficiency is rare because we regularly consume foods rich in iodine, including salmon, eggs, cow's milk, strawberries, and yogurt. Common table salt (iodized salt) is also fortified with iodine. Worldwide, however, one of the main causes of low thyroid function, or hypothyroidism, is iodine deficiency. Iodine deficiency is common in locations where nutrition is poor or where iodine is deficient in the soil.

The American Thyroid Association states, "Hashimoto's thyroiditis, which is the most common cause of hypothyroidism, is associated with an increased risk of thyroid nodules. Iodine deficiency, which is very uncommon in the United States, is also known to cause thyroid nodules."³ One study following 2,941 people in a population where iodine was added to the food supply found the incidence of nodules decreased.⁴

On the flip side of the coin, excessive iodine intake can be a problem as well. Numerous studies published by the *Journal of Clinical Endocrinology and Metabolism* and others have shown high iodine intake can cause a *goiter* (a swelling of the thyroid gland)⁵. For example, one study showed that in Hokkaido, Japan, where goiters are common, "the major cause of the endemic coast goiter seems to be excessive and longstanding intake of iodine from seaweed...In a few patients restriction of seaweed induced a marked decrease in the size of goiter."⁶

This shows there's a fine balance between not enough and too much iodine. This is why it's so important to work with your functional-medicine practitioner to assure you are achieving the proper balance. Self-diagnosing and supplementing with iodine could cause

² ods.od.nih.gov/factsheets/Iodine-HealthProfessional/

³ www.thyroid.org/what-are-thyroid-nodules/

⁴ www.ncbi.nlm.nih.gov/pubmed/?term=22663551

⁵ (www.ncbi.nlm.nih.gov/pubmed/4307521), (www.ncbi.nlm.nih.gov/pubmed/?term=18578621),
(www.ncbi.nlm.nih.gov/pubmed/?term=8106628), (www.ncbi.nlm.nih.gov/pubmed/?term=12466344)

⁶ (www.ncbi.nlm.nih.gov/pubmed/?term=4158495). (www.eje-online.org/content/50/2/161)

more damage than you are trying to prevent, and there are more factors to consider besides just iodine deficiency; selenium deficiency, which we will address in a moment, plays a key role here as well.

Iodide, Iodine, and Iodination

Iodide is the consumable form of iodine. Two iodine atoms bonded together create iodine, and this form of iodine cannot be consumed or applied to the skin without causing severe damage. One iodine atom bonded to one atom of another element (e.g., sodium or potassium) creates iodide—the iodine form the body can safely utilize, the iodine form we consume in our table salt for example.

The conversion of iodide to iodine occurs through a process called *iodination*.

Once the body consumes (through food) or absorbs (through the skin) iodide, it is transported into the cells of the thyroid. The thyroid converts the iodide to iodine. The body then binds four molecules of the amino acid tyrosine to one molecule of iodine—this is the thyroid hormone T4.

Amino acids are essential to protein synthesis, and we need protein to make thyroid hormone. That's why low-protein diets and starvation can affect thyroid hormone production.

It's a downward-spiral effect: When iodine (iodide) is lacking in the diet, iodination cannot occur effectively. When iodination is lacking, amino acids can't synthesize protein. When protein can't be synthesized, thyroid hormone (T4) cannot be produced. This is how iodine deficiency can lead to hypothyroidism. Even if iodine is sufficient, if protein consumption is low, thyroid-hormone production will suffer.

Thyroglobulin and Hashimoto's

We have a compound called *thyroglobulin* that is inside the thyroid follicles. The thyroid follicles are little berry-shaped structures on either side of the thyroid gland. The thyroglobulin gets converted into thyroid hormone via the iodination process. In Hashimoto's, the autoimmune thyroid condition that eventually results in low thyroid function, or hypothyroidism, it's the thyroglobulin inside the thyroid follicle that is attacked along with the enzyme that helps bind the thyroid hormone together.

Selenium

Like iodine, the element *selenium* is also essential to our diet and thyroid function. It has an effect on lowering inflammation and decreasing autoimmune thyroid conditions and is important for converting T4 to T3. Right now, we know that 200–300 mcg of selenium per

day can drop thyroid antibodies 20 to 50 percent in just a few months.⁷

One of the by-products of T4 metabolism is hydrogen peroxide (H_2O_2). Hydrogen peroxide can be inflammatory, and selenium helps remove a molecule of oxygen from hydrogen peroxide, turning it to water (H_2O).

If a person supplements with iodine but has an unaddressed selenium deficiency, this can create a problem. When selenium isn't there to dampen the production of hydrogen peroxide, the inflammation that accompanies it can potentially exacerbate thyroid autoimmunity.

This autoimmunity is Hashimoto's thyroiditis, and 90 percent of thyroid issues in the United States are actually autoimmune-based, meaning, as mentioned before, the immune system is actually attacking the thyroid gland.

So if we're just supplementing iodine to provide the raw material, that's good, but if we're taking abnormally high amounts of it and we're spitting off hydrogen peroxide without having enough selenium to neutralize it to water, the inflammation will continue to flare our autoimmune condition. This is why it is so important to not start supplementing iodine without a proper treatment plan from your functional-medicine practitioner.

Iodine, Selenium, and the Bell Curve of Thyroid Function

Let's start looking at thyroid function by examining the bell curve created by iodine consumption.

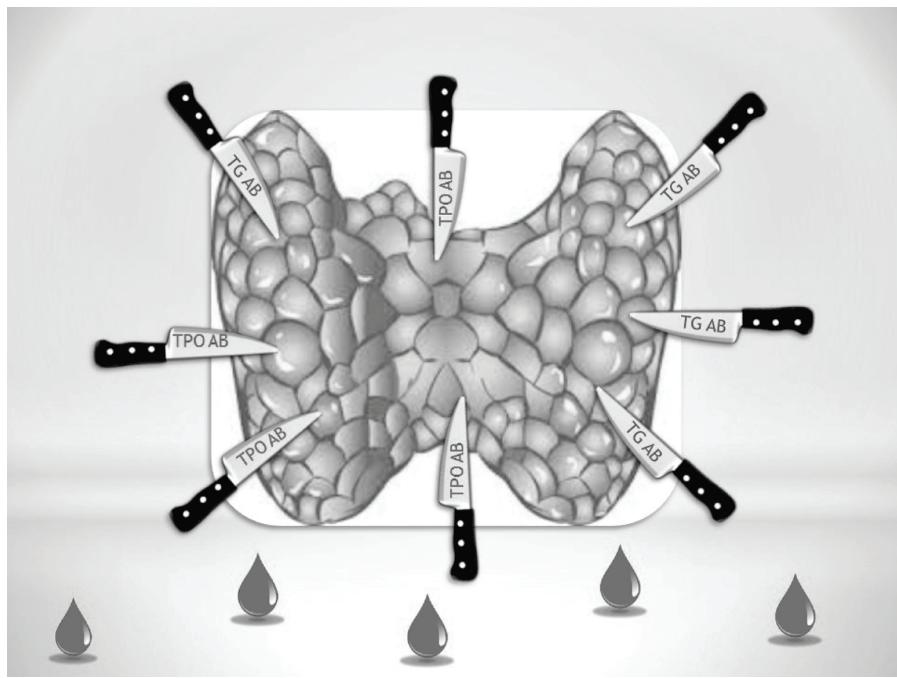
The Bell Curve

On one side of the bell curve, we have low thyroid function being driven by inadequate amounts of iodine. If we have inadequate amounts of iodine, then we're not going to have enough iodine coming in to actually make the building blocks of thyroid hormone.

While insufficient iodine intake can result in a goiter (where your thyroid swells). The TSH, the brain hormone, starts increasing when thyroid hormone gets lower. It's like if you're trying to talk to someone across the room but you're whispering. That person can't hear you unless you increase your volume.

It's the same thing when the pituitary and the brain (TSH) are talking to the thyroid. If the release of thyroid hormone (T4, T3) is too low, the TSH has to get higher; it has to start yelling. Without the iodine present as the building block to make thyroid hormone, the TSH gets higher and the gland will start to swell. The swelling is a result of the elevated TSH yelling at the gland... but there is no hormone there to hear it.

⁷ (www.ncbi.nlm.nih.gov/pubmed/23046013), (jeffreydachmd.com/2014/01/selenium-thyroid-good-news/)



On the other side of the bell curve, in cultures that consume high amounts of iodine, such as through excessive amounts of iodized salt or extra supplemental iodine, we could see Hashimoto's. The extra iodine stimulates the hydrogen peroxide (H_2O_2), and without the high levels of selenium being there to turn it to water (H_2O), the hydrogen peroxide creates inflammation. Our immune system responds by sending B cells to clean up

that inflammation, and while that's happening, we're developing antibodies and the immune system is starting to attack the thyroid tissue (the thyroglobulin inside the follicles) and enzymes that make the thyroid hormone. The more this happens, the more it causes the thyroid to become fibrotic, and scar tissue actually develops. Eventually, the thyroid tissues becomes less functional, and it's not going to be able to do what it was designed to do.

Imagine your thyroid as a four-month reservoir for thyroid hormone. It holds thyroid hormone in little follicles that look like berries. When your immune system attacks your thyroid, it starts to pop each berry one by one. Each knife represents either thyroid peroxidase (TPO) or thyroid globulin (TB) antibodies.

CONDITIONS OF THE THYROID

There are many thyroid conditions, and most can be traced to a root cause that resides somewhere else in the body. I'll cover these root causes in part 2 ("Thyroid Connections") of the book. Now, I'll address the common thyroid conditions: Hashimoto's thyroiditis, hypothyroidism, hyperthyroidism (Graves' disease), and goiter.

Hashimoto's Thyroiditis

Hashimoto's thyroiditis is an autoimmune condition of the thyroid, and 90 percent of

hypothyroidism cases in the United States are caused by Hashimoto's.⁸ Hashimoto's was first noted in 1912 by Japanese physician Hakaru Hashimoto.⁹ He termed the disease *struma lymphomatosa*.

In Hashimoto's, because of something called *molecular mimicry*—which basically means that to the immune system, the proteins of a foreign invader (e.g., bacteria or virus) look similar to the proteins of the thyroid—the immune system misidentifies and not only attacks invaders but also its own thyroid tissue. *Autoimmune* means “immune to self”—the body attacks itself.

In Hashimoto's the thyroid gland will begin to enlarge and possibly become nodular as well. Many things can exacerbate it, including the following:

- Nutritional imbalances (e.g., iodine, selenium, etc.)
- Gluten and grains
- Infections

We covered selenium and iodine and know they are very important for controlling Hashimoto's and keeping thyroid function healthy. We will cover gluten, infections, nutritional issues, and many other key factors that exacerbate Hashimoto's in depth later in the book.

Hypothyroidism

Hypothyroidism is the underproduction of thyroid hormone. Symptoms, such as weight gain, dry hair and skin, and fatigue, are typically not alleviated by conventional thyroid medications, such as Synthroid or Levoxyl, but they can be alleviated by addressing the root cause. Root causes of hypothyroidism can be traced to many sources, including the following:

- Hashimoto's thyroiditis
- Adrenal fatigue
- Selenium deficiency
- Iodine deficiency
- Anemia
- Infections

8 www.ncbi.nlm.nih.gov/pubmed/3066320

9 www.healio.com/endocrinology/thyroid/news/print/endocrine-today/%7B7429d42f-c45f-4de2-a312-egbagf6cc860%7D/hakaru-hashimoto-1881-1934

- Blood-sugar swings
- Low stomach acid production

Hyperthyroidism

Hyperthyroidism is the overproduction of thyroid hormone. It is primarily caused by another autoimmune condition called Graves' disease. Graves' disease may present with the following: hyperthyroid response, hyperreflexia (overactive or overresponsive reflexes), exophthalmos (eyeballs starting to bulge), and typically lower levels of TSH. TSH is an inverse hormone, which means *it goes low when thyroid hormone is high*, or vice versa.

If you're already taking thyroid hormone, that can cause the TSH to drop much farther. Conventional doctors will run a TSH test when the patient is on a thyroid supplement or thyroid medication, and they'll see incredibly low TSH and think their patient has a hyperthyroid condition. Yet if they actually run the T4 and T3, they would see that the thyroid hormone levels are perfect. So if someone's on thyroid medication, the TSH will be, for the most part, useless.

If someone's not on thyroid hormone, the TSH can be more valuable at picking up Graves' disease, but we also have to look at the direct thyroid hormone levels instead of fully relying on the indirect brain hormone TSH. We want to run the T4 free, T4 total, T3 free, T3 total, and we also want to run the specific antibodies that are common in Graves': thyroid-stimulating immunoglobulin (TSI) and TSH receptor antibodies.

Patients with Hashimoto's may present with Graves'-like symptoms because the autoimmunity condition can attack the thyroglobulin in the thyroid follicles. Our thyroid stores about three to four months of thyroid hormone, so there are some reserves in the thyroid tissue. This attack causes thyroid hormone to spill out, raising our thyroid-hormone levels acutely. This jump in hormone levels can feel like Graves' disease. That's why you want to test all thyroid hormones and antibodies to make sure you know what you are dealing with.

If it's not Hashimoto's, we want to fully evaluate if it is Graves' because Graves' left untreated can cause heart damage or stroke and can be life-threatening. If we are having hyperthyroid symptoms, we want to get the right test done to evaluate if Graves' is occurring. Once Graves' disease is diagnosed, depending on how advanced it is, we may be able to add natural strategies to cool the thyroid down before resorting to a more extreme approach, such as removing the thyroid or performing a radioactive thyroid ablation, which shuts down the thyroid using radioactive iodine. The sooner we catch it, the more conservative we can be in our strategy to control it.

Goiter

A goiter is a swelling of the thyroid, and it can be present in any of the conditions discussed above, but the most common cause of a goiter is iodine deficiency. As shown in the Hokkaido, Japan study in the “Iodine” section of this chapter, iodine can also be a culprit when there is too much being consumed. This is why it is so important to work with your practitioner on finding the ideal balance.



THYROID PATIENT EXAM

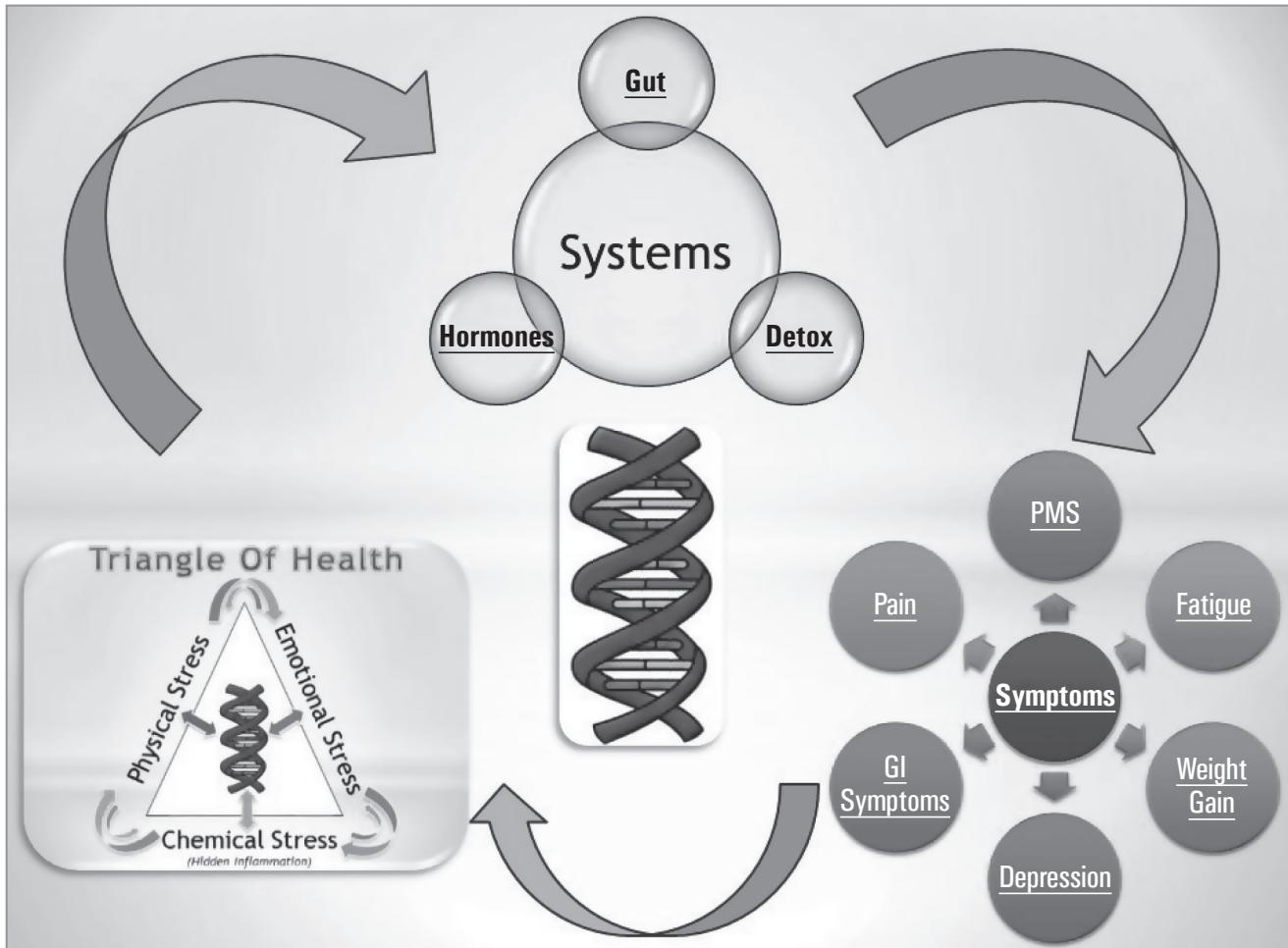
During the patient exam to assess the thyroid, the Triple-S Approach is a technique that can be used to thoroughly review your health status. The Triple-S Approach focuses on the following:

1. Stressors (the Triangle of Health)
2. Body Systems (or signs)
3. Symptoms

Stressors (The Triangle of Health)

Stressors come in three major forms, and these make up the Triangle of Health.¹⁰ The Triangle of Health is a concept that shows the need for balance among all three stressors: emotional, physical, and chemical.

¹⁰ The Triangle of Health is a concept created by Dr. George Goodheart. Watch my video on the Triangle of Health at https://www.youtube.com/watch?v=nRPL_i6vSxQ.



Emotional stress includes stress in relationships, finances, family, friends, and so on. Or maybe you're just sick and tired of being sick and tired. These are all strong emotional stressors that can keep us from not feeling optimal.

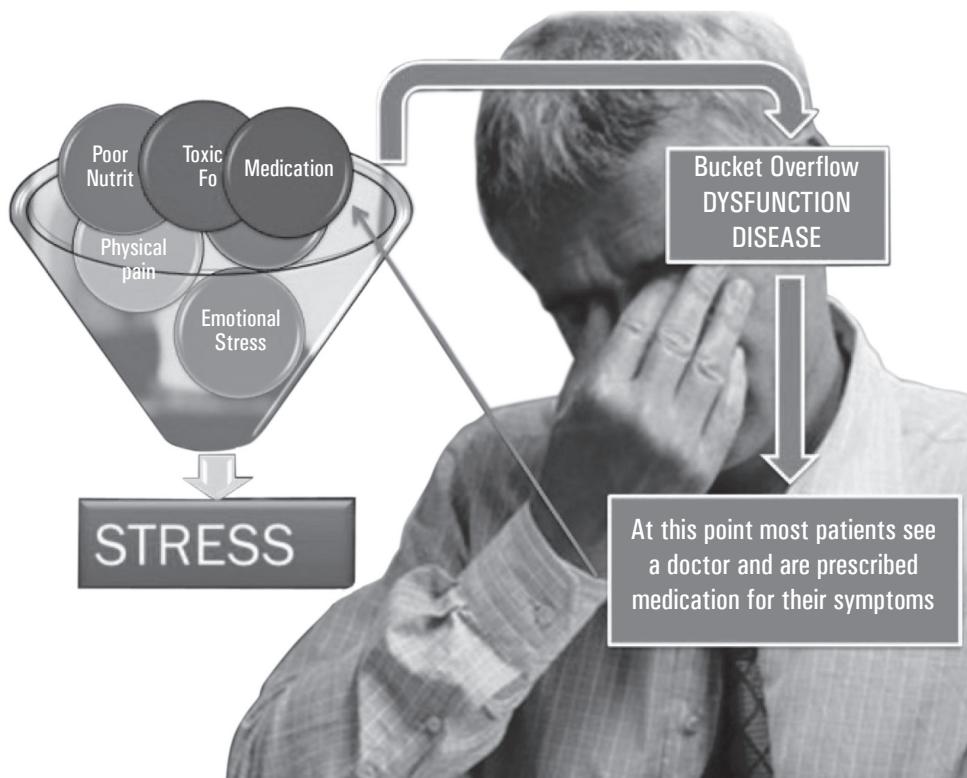
Physical stress can be too little exercise—you're sitting down all day; you're sedentary—or it can be too much. Maybe you are doing CrossFit or overdoing it as you train for a marathon. Physical stress can also be an unresolved injury (e.g., a back injury or an old knee injury) that's still keeping you in pain.

Most of us are familiar with emotional and physical stressors, but there's one more on the triangle, and that is chemical stress—also known as *the hidden stress* because we may not be aware it exists.

Chemical stressors can include nutritional deficiencies needed for healthy thyroid function, like iodine, tyrosine, zinc, selenium, or magnesium. Chemical stressors can also be blood-sugar imbalances, gut infections, dysbiosis (imbalances and bacteria in our gut),

malabsorption (taking in enough nutrients but not properly absorbing them), low stomach acid, insulin resistance, and poor sleep. Chemical stressors can also be exposure to toxins, like alcohol; tobacco; drugs; pesticides, chemicals, and exogenous hormones in our food; or excessive fluoride from drinking water.

The idea in the Triangle of Health is that all of the stressors accumulate. If we have chemical stress, this may create excessive inflammation that leaves our joints extra sore. This physical stress may keep us from doing things we enjoy, and this may cause emotional stress. So you can see how the stressors on the Triangle of Health can literally compact one another: by creating inflammation on one side, it spills into the other side of the triangle, and soon enough all of these stressors have overflowed your stress bucket.



Stressors may be referred to as the *allostatic load*, but I prefer to call this a *stress bucket* because this provides a clear visual of how stress can fill up and overflow your life (your bucket). When that stress bucket overflows, that's where a lot of the problems happen with our body systems.

Body Systems

During a review of the body systems, your practitioner will look for signs of thyroid dysfunction. Systems focused on will include the hormonal system (adrenals, thyroid, and male or female hormones), the digestive system and immune systems, and the detoxification system. Specific signs may present as the thinning of the outer third of the eyebrow, pale skin, or vertical or horizontal ridges in the fingernails (indicating protein malabsorption). Though you might be consuming enough protein, you might not be digesting it due to a gut infection or low stomach acid. That creates malabsorption and the inability to break down the protein and utilize it for healthy thyroid and hormonal function. Each system affects the other, and once the body systems become overwhelmed, we start having symptoms.

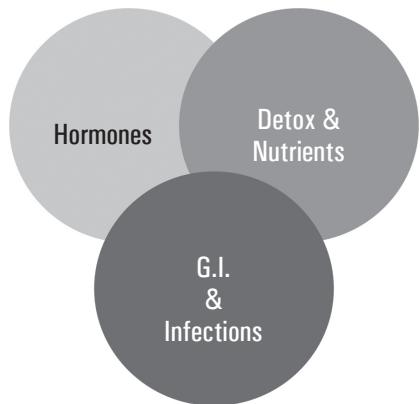
Symptoms

There are many symptoms of thyroid disorder, and a functional-medicine practitioner will review these during an exam. We don't look at symptoms because we want to prescribe a drug or a supplement to cover the symptoms up; we only look at the symptoms because if we trace the symptoms backward, they lead to the systems in the body that aren't functioning properly.

Common symptoms of thyroid disorder include the following:

- Chronic fatigue
- Difficulty losing weight
- Depression
- Muscle or joint aches
- Low libido
- Cold all the time
- Water retention
- Dry skin

3 Body Systems



- Eczema
- Fibromyalgia
- PMS
- Menopause
- Diffuse hair loss or dry hair
- Cold extremities
- Constipation
- Poor memory
- Poor concentration
- Anxiety
- Weakness
- Shortness of breath
- Palpitations
- Heavy menstrual flow
- Poor motivation

So in the Triangle of Health, the *stressors* are the first domino to fall, the *body systems* become stressed, and then the *symptoms* present themselves.

The Conventional vs. the Functional Approach

The typical conventional-medicine approach is to treat each symptom and knock them off one by one. So if there is depression, for example, you'd get an antidepressant. If there is hormonal imbalance, you might get a prescription for birth-control pills. Even natural medicine is guilty for choosing herbs and nutrients to do the same thing. Though this might relieve some symptoms, it doesn't address the root cause and alleviate the problem long-term.

In functional medicine, it may be necessary to treat the symptoms short-term. And that's OK as long as the long-term goal is to eliminate the stressors and heal the root cause. The key is to treat and heal holistically, addressing diet, lifestyle, stress management, sleep, blood sugar, adrenals, thyroid, infections, gut-bacteria imbalance, toxins and so on. If we eliminate the stressors and treat the body systems that aren't functioning properly, the symptoms will eventually heal.

THYROID LAB TESTING

For thyroid testing, there are *ideal lab ranges* (used in functional medicine) as well as standard lab ranges (used in conventional medicine) for the same tests. *Standard lab ranges* are basically created by lumping 95 percent of the population as normal. The remaining 5 percent is considered not normal and is broken into 2.5 percent high and 2.5 percent low.

This is why your lab tests are “normal” but you still feel sick:



In this area you will find lab results that a doctor will say are “normal” but they are not optimal

The problem with the bell curve that creates this normal range is it doesn't account for the fact that the population's getting sicker. If we look at chronic degenerative disease over the last three or four decades, we see more cancer, more heart disease, more obesity, more diabetes, and so on.

So if we know more people are dying of chronic disease, what does that mean—what does that say about the lab reference ranges? They need to get wider and wider because they have to encompass more people who are sick.

Functional medicine looks at the ideal normal range to get an earlier indicator of potential thyroid dysfunction or imbalance. These ideal ranges are narrower, allowing us to look at someone's thyroid on a spectrum of health, rather than to simply treat his or her disease.

Let's say that a pathological range (the abnormal zone) is on a scale of 1 to 10, and you're at a 1. Your primary care physician (PCP), however, wants you to fall somewhere around 8 before he or she diagnoses you. Well, what happens if your symptoms start around 5. Your PCP is telling you you're fine, but you're saying, "I don't feel good." The translation of "you're fine" is, *Hey, the technology that we're using to assess you isn't sensitive enough. Come back in a year or two and maybe we can help you.* In other words, come back when your condition is worse.

This is why your lab tests are “normal” but you still feel sick:



**In this area you will find lab results that a doctor
will say are “normal” but they are not optimal**

So in functional medicine, we use the ideal range that's more sensitive, and we test more than just the TSH. We also look at T4 total and free, T3 total and free, T3 uptake, reverse T3, and thyroid antibodies thyroglobulin (TG) and thyroperoxidase (TPO). If we can measure all of this, we know if there's an autoimmunity happening, because the autoimmunity could be driving inflammation and tearing up that thyroid gland. We know that if the thyroid gland keeps getting torn up, it will eventually result in hypothyroidism. This is because the gland isn't going to have the healthy, functional tissue that it needs to make thyroid hormone.

I have a reference handout on lab testing (“Blood Test Review”) that you are welcome to download: www.justinhealth.com/blood-test-road-map.

Thyroid-Stimulating Hormone (TSH)

Standard normal range: 0.5–4.5 | Ideal healthy range: 1–2.5

TSH is a pituitary hormone that signals the thyroid to make T4. It “is a poor measure for estimating the clinical and metabolic severity of primary overt thyroid failure.”¹¹ However, it is the only thyroid test, for the most part, used by conventional medicine. Typically, if TSH drops low (meaning thyroid hormone is high), it's a way of diagnosing hyperthyroidism or even Grave's disease. If the TSH becomes elevated (meaning thyroid hormone is low) but there is a deficiency in iodine, the thyroid gland can also swell, resulting in a goiter.

The problem with TSH is that it's a screening test, and it takes many, many years for it to elevate. So, in other words, a problem can be building for years before testing by conventional medicine discovers it.

¹¹ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC143526/>

If TSH is elevated, we know there's definitely a problem with the thyroid gland. But there are many people who have TSH tests that are normal, so a potential thyroid condition is missed by the standard TSH test. However, if they had looked at the downstream hormones, they could have seen significant imbalances in T4, T3, thyroid antibody levels, and even T3 uptake.

The standard range is 0.5 to 4.5, but we're going to make that range a bit tighter. Ideally, research shows that we need to look at about 1 to 2.5 as normal.¹² Using a more narrow TSH range can be super helpful at assessing if you have good thyroid function. When I start to see TSH go 3 or above, I become a little bit suspicious that there may be an underlying thyroid condition starting to develop.

Thyroxine (T4) Total

Standard normal range: 4.5–12.0 | Ideal healthy range: 6–10

When we look at hormones individually, we have to break them into a *free* and *protein* percentage. A *total* T4 count consists of 98 percent protein-bound hormone, meaning 98 percent can't really bind into a receptor site, and 2 percent free, which is the part of the hormone that can actually do something in the body.

A protein-bound hormone functions as if you were trying to write with a pen cap on. You can't write—the ink doesn't make contact with the paper, so nothing happens. The pen cap has to be off for that pen to work.

So total T4 is when we look at both free (2 percent) and protein (98 percent)—100 percent of T4 hormone.

Thyroxine (T4) Free

Standard normal range: 0.8–1.7 | Ideal healthy range 1.0–1.5

The *free* T4, that other 2 percent, is like writing your name with the pen cap off. The ink will make contact with the paper and serve a purpose—to write your name. This is free T4: it functions and provides an effect. That effect for your thyroid is the enhancement of metabolism, energy, hair, gut function, mood—all of the things that are important for optimal health.

The thyroid then converts 20 percent of that T4 into T3. And then the other 80 percent, as mentioned earlier, gets converted peripherally throughout the body—in the liver, gut, and by healthy adrenal stress levels.

¹² <https://www.aace.com/files/final-file-hypo-guidelines.pdf>

When we test T4 levels, we want to see an ideal total T4 in the range of 6 to 10 and a free T4 in the range of 1.0 to 1.5. Levels outside of these ranges are flags that something is going on with the thyroid.

Triiodothyronine (T₃) Total

Standard normal range: 71–180 | Ideal healthy range: 100–160

When we look at T₃, our active thyroid hormone, we also have to break it into the same *free* and *protein* percentages as T4. The *total* T₃ (98 percent protein-bound plus 2 percent free) and the free T₃ are going to be the two tests we look at.

As with free T4, the free T₃ levels are always going to be the most important to look at. But it's also good to look at the total T₃ just to get a window on how the gland is functioning and producing thyroid hormone.

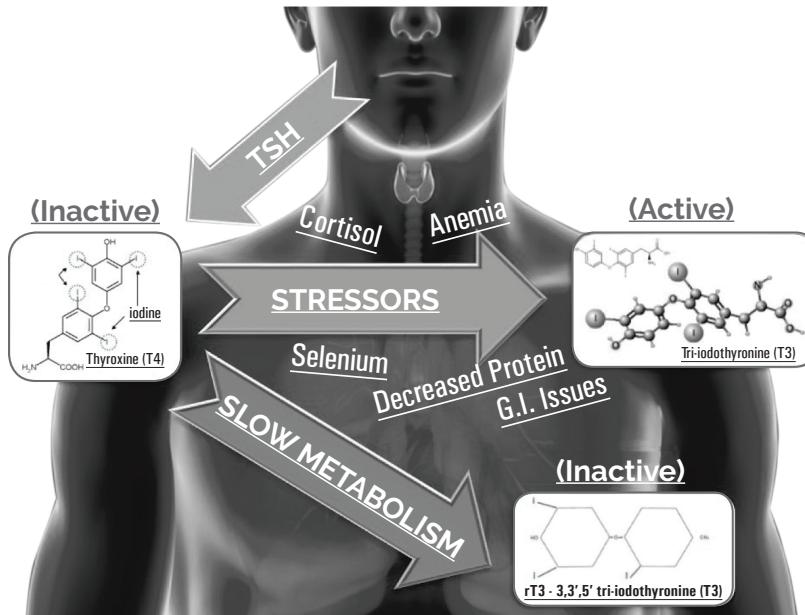
T₃ is going to be the most important level to focus on. One of the major issues that we see is when T4 does not appropriately convert to T₃, and there are many reasons this happens. Factors that can affect conversion include the following:

- Protein deficiency
- Selenium deficiency
- Zinc or magnesium deficiency
- Low iron or ferritin levels
- Imbalanced insulin levels
- Imbalanced cortisol levels
- Increased inflammation
- Gut infections and leaky gut
- Toxins like heavy metals or pesticides

Triiodothyronine (T₃) Free

Standard normal range: 2.0–4.4 | Ideal healthy range: 3.0–4.0

The free T₃, that 2 percent of the T₃ hormone, is the part of the hormone that is unbound by the proteins that transport it. This small amount of unbound hormone is the portion of T₃ that the body actually uses. When free T₃ is at proper levels, this enhances energy, mood, hair and skin, and so many other things that make us feel good and keep our bodies at optimal function.



When we test T3 levels, we want to see an ideal total T3 in the range of 100 to 160 and an ideal free T3 in the range of 3.0 to 4.0. Levels outside of these ranges are flags that something is going on with the thyroid.

T3 Uptake

Standard normal range: 24–39 | Ideal healthy range: 27–37

T3 uptake looks at how the body is able to utilize thyroid hormone. If we have low T3 uptake, we're not utilizing thyroid hormone as well. If we're seeing high amounts, then we're taking on too much, potentially due to other hormonal imbalances, like elevated testosterone.

Some factors that can block T3 uptake are elevated estrogen levels through birth control pills or estrogen in the environment. We'll also see the T3 uptake go low when there is inflammation due to thyroid autoimmunity or inflammation in the body due to an infection. High levels of T3 uptake can happen when we have elevated amounts of testosterone. This is very common in female patients that have polycystic ovarian syndrome (PCOS).

Reverse T3

Standard normal range: 9–24.1 | Ideal healthy range: 14.9–24.1

Reverse T3, remember, is those blanks in the gun. It is a sign of a stress and slower metabolism. The more stress we have, the more T4 converts to reverse T3 instead of the

healthy active T3. Finding reverse T3 outside of the ideal normal range would alert the functional-medicine practitioner that there is stress that needs to be addressed.

Thyroglobulin (TB) Antibody

Standard normal range: 0–0.9 | Ideal healthy range: 0–0.9

The presence of the TB antibody above the normal range should arise suspicion of autoimmunity, or Hashimoto's. The immune system calls on this antibody to fight the thyroid when it mistakenly sees it as an invader, and it needs to be addressed before the body can do too much damage to itself.

Thyroperoxidase (TPO) Antibody

Standard normal range: 0–15 | Ideal healthy range: 0–15

Like TB, the presence of the TPO antibody above the normal range should arise suspicion of autoimmunity, or Hashimoto's. The immune system also calls on this antibody to fight the thyroid when it mistakenly sees it as an invader, and it needs to be addressed before the body can do too much damage to itself.

Thyroid Temperature Testing

Thyroid temperature is important because heat is one of the by-products of metabolism. We can use heat and temperature as a measure of how someone's thyroid gland is functioning.

You can measure your thyroid temperature using a good-quality digital thermometer or a basal thermometer. If it's basal, shake it down below 96 degrees. Place the thermometer either in your armpit or in your mouth. A healthy thyroid temperature range if you're using the axillary, or the armpit, area is going to be 97.8 to 98.2 degrees. If you're measuring by mouth, it will be 98.2 to 98.6 degrees. Do this first thing in the morning each day to see if your temperature is consistently in that healthy range. If it's dropping, or if the temperature is fluctuating greater than 0.3 degrees each day, you may have adrenal stress, even if your temperature is in the normal range.

If the temperature runs chronically low (e.g., 97.2, 96.8), that's a sign of low thyroid function, and we'd want to follow this up with lab testing.

For a woman, thyroid temperature testing can be done on days 2-6 of her cycle. Since her temperature will drop before ovulation, and will rise again when she enters the luteal phase (the second half of her cycle), measuring her temperature early on will help get an accurate reading without the interference of other hormones. So looking at that those first five days

after her period can be really helpful at getting a good sense at what her temperature is without other hormones influencing it.

I have handouts on temperature testing (“Basal Temperature Instructions”) that you are welcome to download: www.justinhealth.com/temperature-test.

Other Tests for the Thyroid

Other tests your functional-medicine practitioner might perform include palpating the thyroid, which simply means manually feeling or pressing externally to check for asymmetry, nodules or bumps. He or she may send you for an ultrasound to see how the thyroid tissue looks. Up to 40 percent of thyroid autoimmunity blood testing can come back with a false negative, meaning the test is showing negative, but the person really is positive for Hashimoto’s. When the practitioner feels he or she may be getting a false negative, the patient can be sent for an ultrasound to see if anything comes up there. If the exam, lab work, and ultrasound are all coming back clean, it’s unlikely there is an autoimmune condition present.

Finally, a true diagnosis of Hashimoto’s can be confirmed through biopsy, but I do not recommend this because it is an invasive procedure, and it creates inflammation.

To get more information about the lab tests mentioned above and other lab tests I use, visit www.justinhealth.com/lab-tests.

THYROID HEALTH AND HEALING

We’ll explore thyroid health and healing options in depth when we delve into the connections chapters. Briefly, we want to do the following to assure thyroid health and healing:

- Make sure our diet is anti-inflammatory and nutrient-dense
- Get our gut functioning correctly
- Eliminate infections
- Properly manage our stress
- Address adrenal function
- Eliminate or limit gluten consumption
- Limit toxins to de-stress our liver and detoxification system
- Apply natural functional-medicine treatments
- Get to the root cause of our thyroid issue



Five Key Points to Remember

1. The main function of the thyroid gland is to serve as the center of metabolism in the body. The thyroid is the body's thermostat.
2. Twenty percent of thyroid-hormone conversion (T4 to T3) happens in the thyroid. The other 80 percent happens in the liver and in the gut, depending on stress levels.
3. Iodine and selenium are the main elements for thyroid-hormone production. However, there is a fine balance between too much and too little. Work with your functional-medicine practitioner to find this balance.
4. Most thyroid conditions are the result of a root cause that resides somewhere else in the body. Finding the root cause is the key to healing the thyroid.
5. Standard lab ranges, typically used by conventional medicine, are too wide and can delay the diagnosis of a thyroid condition by years. It is best to look at ideal lab ranges, used in functional medicine, and address thyroid issues before they become out of control.

