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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 Levothroid 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.
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

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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.

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 day.\(^2\)

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

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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  
6 (www.ncbi.nlm.nih.gov/pubmed/?term=4158495), (www.eje-online.org/content/50/2/161)
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 by 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 (H2O2). Hydrogen peroxide can be inflammatory, and selenium helps remove a molecule of oxygen from hydrogen peroxide, turning it to water (H2O).

If a person supplements with iodine but has an unaddressed selenium deficiency, this can create a problem. When selenium isn’t there to damper 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.

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 ($\text{H}_2\text{O}_2$), and without the high levels of selenium being there to turn it to water ($\text{H}_2\text{O}$), 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

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9 [www.healio.com/endocrinology/thyroid/news/print/endocrine-today/%7B7429d42f-c45f-4de2-a312-e9baef6cc860%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.\(^\text{10}\) 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 (imbbalances 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
• 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:**

![Diagram showing normal, low, and high values](image)

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:

![Functional Lab Ranges Diagram](image)

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.” 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.

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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.\textsuperscript{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.

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
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.
2

THYROID-SUPPORTING DIET AND LIFESTYLE
Diet is really important when managing the thyroid. Every bite of food you take puts your body into either an anti-inflammatory state, where you’re consuming nutritious foods that help your body heal and rebuild on a healthy aging path, or into a pro-inflammatory state, where you’re consuming less nutritious foods that drive your body to break down faster.

We know the thyroid is really important for metabolism and energy. We need a healthy thyroid diet in order to metabolize cholesterol, which gets converted into our hormone building blocks. Low thyroid levels can cause elevations in cholesterol. The first signs we tend to see with lower thyroid function are energy and fatigue issues. We see peristalsis, the lessening of the wave-like contractions that move stool through the digestive tract, and we start seeing constipation. If we don’t get that fecal material out of the body within eighteen to twenty-four hours, we can reabsorb toxins from the stool. All of this can put stress on our body, and most of the time this stress can be alleviated through a proper diet.

In addition to diet in this chapter, we will also look at activity levels and lifestyle (sleep patterns, alcohol consumption, etc.), which are also key factors to healing and maintaining a healthy thyroid.

THREE MAJOR CRITERIA FOR THE THYROID RESET DIET

When we’re dealing with thyroid issues, the following three major criteria make up the foundation of the thyroid reset diet:

1. **Nutrient dense**: A nutrient-dense diet includes quality vitamins, minerals, and antioxidants and supports our body’s ability to heal and to run our metabolic pathways.

2. **Anti-inflammatory**: An anti-inflammatory diet promotes healing and extinguishes the metabolic fires from the stress in our daily lives.

3. **Low in toxins**: A diet low in toxins (e.g., alcohol, drugs, chlorines, pesticides, chemicals, etc.) helps relieve the stress on our hormonal and detoxification systems.

These three major criteria, the foundation, should form the foundation of our diet. From there, we can manage our blood sugar and tweak our macronutrients: proteins, fats, and carbohydrates.
THE BLOOD-SUGAR CONNECTION

Our blood sugar can swing high or low following certain types of foods. Typically, these swings are caused by excessive or processed carbohydrates or refined sugars in the diet. When we’re eating real foods (wholesome, rich foods your ancestors may have eaten a hundred years ago), it’s hard to get too much refined sugar—sugar that typically comes from added high-fructose corn syrup, sodas, candies, and even grains—in our body.

To keep the blood sugar stable, sugars should come primarily in the form nonstarchy vegetables, such as broccoli, brussels sprouts, asparagus, cauliflower, and sauerkraut, and the lower-sugar fruits, such as berries, grapefruit, lemons, limes, and green apples.

If you are coming in to this thyroid reset already being overweight, there’s a really good chance there’s insulin resistance and a metabolic syndrome making your body’s receptor sites numb to insulin. If you’re numb to insulin, it means you’re consuming too much, and the body is getting really fatigued in regard to its metabolism. If you can’t metabolize your sugar properly, it gets stored as fat and puts a stress on your metabolism.

Vegetables must be the foundation of the diet because they are lower in sugar, and that blood-sugar connection to a healthy thyroid is so important. We need healthy insulin and sugar levels to convert our thyroid hormone from T4, the inactive hormone, to T3, the active hormone. If our blood sugar is too high or we are making too much insulin, that’s going to keep our body from metabolically activating our thyroid hormone.

Reactive Hypoglycemia

When our blood sugar goes up and down because we’re going too long between meals or we’re eating the wrong foods, this is called reactive hypoglycemia. So eating the right foods every four to five hours is important because it helps stabilize our blood sugar.

When we eat that extra sugar, our body brings it into our bloodstream really fast, our blood sugar spikes, and then our body tells our pancreas to spit out a whole bunch of insulin. This insulin surge drops the blood sugar really low. This sugar spike and sudden drop is what you’ve probably heard called a sugar crash. You may feel fatigued, dizzy, irritable, and anxious. It’s particularly important to avoid this blood-sugar roller coaster if you have thyroid issues. Eating proteins, fats, and the right carbohydrates is the perfect step in moving forward.
THE PROTEINS, FATS, AND CARBS CONNECTION

The picture on right is not an exact recommendation but a good general macronutrient percentage. The range shows about 50 percent fat, 30 percent protein, and 20 percent carbs, give or take 10 to 15 percent in either direction depending on your metabolic type or carb tolerance.

Consuming a healthy balance of macronutrients—proteins, fats, and carbohydrates—is important. Let’s say you’re eating healthy proteins—beef, chicken, fish, turkey, salmon, and so on. Let’s say you’re also eating healthy fats—coconut oil, fish oil, ghee, or grass-fed butter. But then you go off the deep end with your carbohydrates and eat a lot of grains, high-sugar tropical fruits, or refined-sugar snacks. This
will throw off the balance of macronutrients and cause a problem. We have to make sure we have the carbohydrates in check.

**Protein Recommendations**

I recommend eating about one palm size of proteins every four or five hours. Typically, bigger people have bigger palms, so this is a good measurement. The best proteins are typically in the range of three to six ounces of high-quality animal protein, and I usually recommend having a protein that is full of fat, as long as you’re getting it from organic pasture-fed sources. Toxins tend to concentrate in the fat portion of meats. Choosing proteins from the following types of meat sources tends to guarantee that we’re going to have less toxicity in the fat.

- Beef should be organic, grass-fed meat.
- Fish should be wild, such as Alaska sockeye salmon.
- Chicken should be pasture-raised chicken.

**Fat Recommendations**

Fats are essential for good health. Fats tell our body we’re full and also provide building blocks for our hair, skin, and nails. Our cell membranes have a lipid or fat bilayer, which leads to healthy tissues, which leads to a healthy body. Healthy cells can’t happen without good fat.

I recommend three to six ounces of full fat three to four times per day. Animal meats tend to be a great source, so if you’re already getting proteins from animal sources, you’re also likely getting fat. It’s pretty hard to go low fat with animal proteins unless you choose boneless, skinless chicken breast (I always recommend if you’re doing the chicken breast to keep the skin on).

If you’re main source of proteins isn’t through meat, avocado is another excellent source of fat. If you use protein powders, for example, add it to some unsweetened coconut milk, or add a scoop of coconut oil into your protein shake. This will add that extra bit of fat you need to help stabilize your blood sugar and make the meal more balanced.

**Carbohydrate Recommendations**¹

Your body can roughly hold about 300 to 350 grams of carbohydrates in your muscles. When your carbohydrate levels are tapped off in your muscles, the next place carbohydrates are stored is in your liver. Your liver can only hold about 60 to 80 grams more carbohydrates

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¹ http://justinhealth.com/recommended-carbohydrate-intake/
than your muscles, and it can become saturated much quicker. Any remaining carbohydrates are converted to fat. Your body is very efficient at turning carbohydrates into fat and will do so if there are too many carbohydrates coming into your diet.

For the first month, the thirty days of the thyroid reset diet, my default dietary template is 20 to 50 grams of carbohydrates. Going into month two, we can customize the carbohydrates according to stress, activity levels, and blood-sugar sensitivity. The healthier our blood sugar is, the more we can handle carbohydrates. The more out of balance our blood sugar becomes or the more insulin resistance or metabolic syndrome we have occurring, the more we have to be very careful of our carbohydrate intake.

If you’re entering this program at a relatively normal, healthy weight, within ten pounds or so where you want to be, and your activity level is stable (e.g., exercising thirty minutes four times a week) you may be able to keep your carbohydrates at the higher end of that scale or even increase the maximum range to 75 or 100 grams.

If weight gain is in your top-three chief complaints, we’d want to start in the 20 to 50 grams range, and we’d start by primarily making sure most of the carbohydrates come from nonstarchy vegetable sources and maybe 10 to 20 percent from a low-sugar source, such as the low-sugar fruit (e.g., a half a grapefruit, one to two handfuls of berries, or a squeeze of lemon in your water).

Once we’ve assessed where you are, we can individualize your diet plan based on your activity level and overall metabolic health. We might even be able to add in some of the healthy starches (e.g., sweet potatoes, yams, squash, beets, or plantains). “The Meal Map,” (shown below) is one tool I use. It has columns for proteins, fats, carbs, and seasonings. The carbohydrates that are nonstarchy are underlined. The carbohydrates that are starchy are starred. Lower-sugar fruits are italicized. The diet can be customized using the Meal Map plan.
I have a reference handout for “The Meal Map” that you are also welcome to download and print: https://justinhealth.com/the-steps-to-creating-a-healthy-meal.

### THE MEAL MAP

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<th>SEASONINGS</th>
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<td><strong>Grape Fruit</strong></td>
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<td><strong>Berries</strong></td>
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<td><strong>Black Berries (F)</strong></td>
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<td><strong>Lemon</strong></td>
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<td><strong>Green Apple (F)</strong></td>
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<td><strong>Passion Fruit</strong></td>
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**AIP: Autoimmune**
- **Non Starchy**
- **Safe Starch**

* Italics: Low Sugar Fruit
  (F): FODMAP

**The Steps To Creating a Healthy Meal:**
1. Pick your Protein, carbs and fat
2. Cook, saute, grill or bake your protein. Steam or saute your carb with fat or eat raw.
3. Add herbs or seasoning to your dish for flavor and variety.
4. Combine protein with carbs, if you protein is lean add additional fat to the meal.
5. Serve yourself a reasonable amount of food containing protein, fat and carbs.
6. If still hungry 5-10 minutes after your meal continue with a second serving till comfortably full
7. The meal should keep you full for at least 4-5 hours, if you are hungry sooner, you need to eat more
Carbohydrate Levels\(^2\)

The carbohydrate levels we will explore in this section provide ranges in grams (g), provide some clue as to where you should be, and define the effects at each level.

**Ketosis and Fat Burning (0 to 50g per day)**

When you keep your carbohydrate intake near 50g per day, you’re going to enter a physiological state known as *ketosis lipolysis*. Ketosis lipolysis is a normal state of physiology that involves primarily using fat for energy (this happens in fasting, too). Fatty acids are broken down into ketones. These ketones are then used for fuel by the body and brain. Ketones also have an appetite-suppressing effect, and after a few weeks in ketosis, you will tend to lose your sweet cravings, too.

**The Sweet Spot! (50 to 100g per day)**

This is a spot I typically like to keep my carbohydrate range within; it allows me to not rely on exercise to stay lean and fit. If you have a damaged metabolism, a 0 to 50g per day range may be where you need to live for a while. Some people also do well cycling in and out of ketosis: three or four days in a row in ketosis and one day in the sweet-spot range or higher. Carbohydrates are primarily used for instant energy, so if you’re doing lots of exercise or you’re under higher amounts of stress, getting a little bit of extra carbohydrates from healthy sources may be beneficial.

**Maintenance (100 to 150g per day)**

Most people do well in maintaining their weight when their carbohydrates are within this range. Everyone is different, so depending on how damaged your metabolism is, this range may be too high for you. If you’re relatively lean, exercise three to four times a week, and engage in activities like CrossFit, this will be a great place for you to be. I recommend timing a good chunk of your carbohydrate intake post workout as a means to help improve recovery.

**The Steady Track to Weight Gain (150 to 300g per day)**

When your carbohydrate levels are this high on a continuous basis, especially when there is no energy output to back it up, you are starting to push your body into an insulin-resistant state. The hormone that is secreted when you eat carbohydrates is insulin, and it primarily works by pulling carbohydrates and amino acids into your muscles. Like we talked about above, when your muscles and liver are saturated with carbohydrates, the rest of those

carbohydrates will be stored as fat. When your carbohydrate intake is within the 150 to 300g per day range, it’s highly likely it will be stored as fat.

**Danger, Will Robinson! (300g or more per day)**

If you’re eating based on the Food Guide Pyramid3, it’s more than likely your carbohydrate intake will be in or around this range. All you have to do is eat a bagel every morning along with a glass of orange juice or bowl of cereal, have a sandwich for lunch with a Gatorade, and eat a plate of pasta for dinner, and you’ll be on your way. Most people who are eating carbohydrates at this high level tend to have insulin resistance as well as increased risk markers for inflammation and metabolic syndrome.

**Eat Your Carbohydrates at Night**

Dr. Alan Christianson, in his book *The Adrenal Reset Diet*, references a study on obese firefighters. Researchers placed the firefighters into two groups with the firefighters in both groups consuming the same amount of calories. The only difference was they the firefighters in one group consume all of their carbohydrates at night, while those in the other group consumed them throughout the day.

In the group that ate their carbohydrates primarily at night, they saw a significant improvement in weight loss and blood sugar and insulin levels. This result is fascinating because most people have been told, don’t eat before bed, spread your carbs throughout the day, eat your carbs at breakfast. Breakfast is actually the worst time to eat your carbs.

Cortisol levels are highest in the morning, and that cortisol allows our body to liberate stored glucose from our muscles and liver, which are easy to access. Glucose can also be created from protein (muscle tissues) or amino acids from our diet via gluconeogenesis.

Our body also converts a lot of energy from fats. So if we consume protein and fat in the morning, this primes our body to be a fat burner throughout the day. Protein-rich foods require a lot of energy for the body to break them down. Over 30 percent of the calories you take in from protein will be used in the digestion process of protein. At nighttime your cortisol levels are the lowest, so providing extra carbs during this time frame can actually be beneficial. When cortisol is lower, it’s for your body’s blood sugar to drop, which can cause your adrenals to make more adrenaline. A little more carbs at night in the form of some sweet potatoes or berries can help prevent these adrenaline spikes.

So on the thyroid reset diet, this study tells me that when we start to add our carbohydrates back in, the best time to eat them is going to be at night.

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THYROID DIET AND AUTOIMMUNITY

Remember from chapter 1 that in an autoimmune thyroid condition, such as Hashimoto’s, the immune system creates specific antibodies against itself, causing immune cells to attack and destroy thyroid tissue and the ability for the thyroid gland to make thyroid hormone. Since 90 percent of thyroid issues are autoimmune in nature, it’s important to cut out any foods that could stimulate an autoimmune reaction. The big foods we want to cut out of the bat, for at least the first thirty days, are grains, legumes, dairy, nuts, seeds, eggs, and nightshades (tomatoes, potatoes, eggplants, and peppers).

With the percentage of autoimmunity in thyroid issues being so high, we have to make sure we aren’t eating foods that could potentially exacerbate the autoimmune condition. We really want to set ourselves up for success. So the first thirty days, eliminating all autoimmune-provoking foods is going to be the best way to go because when we start adding foods—nuts, seeds, nightshades, legumes, and so on—back in after that first month, if we have a reaction, we’re going to notice it.

DIETARY TIPS

To help you balance blood sugar, optimize hormone levels, minimize adrenal fatigue, prevent ups and downs in energy and mood, improve autoimmune conditions, and promote weight loss, you need to know how to eat and what to eat. The following lists are from my Just In Health Eating Plan. I also have a reference handout for my “Just In Health Eating Plan” that you are also welcome to download and print:


How to Eat

1. **Eat every four to five hours:** This relieves your stress-handling glands from the job of maintaining normal blood-sugar levels between meals via epinephrine and cortisol. If you are waiting until you’re hungry, it’s too late. If you can’t last four to five hours, you probably aren’t eating enough protein and fat.

2. **Do not eat carbohydrates alone:** Always combine proteins, fats, and carbohydrates. It is important you consume thirty grams of protein in the first thirty minutes of waking for breakfast. A fist size, about four ounces, of animal protein is roughly thirty grams.

3. **Minimize stimulants:** Caffeine and refined sugar stimulants work by provoking the stress-handling glands into releasing epinephrine and cortisol to raise blood
sugar and release energy. If you consume them, make it organic, and do it after a meal. This will help protect your GI tract.

4. **Avoid junk foods:** These foods cannot rebuild a healthy body. They are also antinutrients, meaning they rob any remaining nutrient stores from your body.

5. **Avoid trans-fats:** Cell membranes, nerve tissue, and steroid hormones (healthy-aging hormones) all require healthy fats. Unhealthy fats interfere with these functions and structures.

6. **Eat real food:** Eat real foods, ideally three times more veggies than fruit. If you are currently overweight, you may need to remove fruit and starch from your diet until you become leaner and healthier. Avoid fruit juices; they can be very high in sugar.

7. **Use sea salt:** Your adrenal glands need plenty of salt for normal function. Research has proven that eating salt does not cause high blood pressure or heart disease. Only people with organ damage, like kidney disease, need to be concerned with keeping a low-salt diet. Lack of minerals in the diet can contribute to adrenal fatigue. My favorite brands include Real Salt, Himalayan sea salt, and Celtic sea salt.

8. **Drink plenty of clean water:** You should be drinking half your body weight in ounces. If you weigh two hundred pounds, that’s one hundred ounces of water. Use water that is filtered or a reliable spring water source, not tap water. Check out [www.justinhealth.com/water](http://www.justinhealth.com/water) for reliable water filters that I personally use. Do not drink water with food; after drinking wait ten to fifteen minutes before you eat, and wait at least two hours after a meal to prevent indigestion.

9. **Chew your food.** Chew each bite about twenty-five or thirty times. Leaky gut and gut infections are common conditions in autoimmune thyroid disorders. Gut infections are typically accompanied by low stomach acids, which compromise the digestion of protein and fat. Chewing well increases stomach acid’s ability to break down food and relieves stress on the digestive system.

**What to Eat**

1. **Eat omega-3 fats:** Eat foods rich in fatty acids, such as cold-water fish including salmon, tuna, trout, herring, and mackerel. Or, if you prefer, take an omega-3 supplement recommended by your practitioner. Avoid fish that are high in mercury, like shark and sword fish, and eat fish that are wild not farmed.

2. **Eat healthy fats:** Healthy fats include coconut oil, ghee, MCT oil, grass-fed butter, tallow, and extra-virgin olive oil. Avoid canola oil and soy oil, which are
highly refined and genetically engineered and have none of the benefits of the oils mentioned above.

3. **Eat healthy carbs:** Eat seven or more servings of organic vegetables and fruits every day. It is important that you consume three times more vegetables than fruit. Fruits should be minimized until your weight loss goal is achieved. Vegetables and fruits should be fresh or frozen, not canned. Vegetables can be slightly cooked or steamed. If you have no digestion issues, vegetables can be eaten raw.

4. **Eat healthy proteins:** Great choices include fish, chicken, beef, eggs, lamb, venison, and pork. Be sure to get pasture-raised, grass-fed, and free-range meats—and preferably choose organic.

5. **Take the sixty-day challenge:** No grains, legumes, or dairy for at least sixty days. Grains include wheat, barley, rye, rice, spelt, kamut oat, corn, quinoa, and amaranth. Legumes include beans, lentils, peanuts, and soy. Dairy would be milk, yogurt, and cheese.

6. **Follow an autoimmune diet:** For more serious cases, an autoimmune diet is necessary. Remove eggs, nuts, seeds and nightshade vegetables (potatoes, tomatoes, eggplant, and peppers) from the diet. Remember to rotate your proteins and vegetables to avoid creating food allergies.

7. **Avoid bad fats:** This includes any fat that comes from a package, including hydrogenated oils, soy, safflower, canola, or refined vegetable oil.

8. **Avoid artificial sweeteners:** Splenda, or sucralose, and aspartame are artificial sweeteners. Healthier sweetener options include stevia, hoodia, xylitol, and lo han. Please use in moderation.

9. **Be diligent:** The unhealthier or more overweight you are, the stricter you need to be about adhering to your dietary guidelines. You may or may not be able to introduce certain foods back into your diet; the only way we can be sure is if you eliminate the recommended foods for a period of time and then introduce one at a time.

10. **No gluten-free junk food:** These foods tend to be higher in sugar and contain other refined grains.

11. **Use the Just In Health Meal Map:** There are literally thousands of potential meal options or combinations if you use the meal map. If you are becoming bored with your food, you need to start mixing things up.
DIETARY TOOLS

There are many dietary tools you can utilize to keep track of your progress on the thyroid reset diet. A couple of apps I recommend are MyFitnessPal or CRON-O-meter! You can plug your foods in and get a macronutrient breakdown of how much you are consuming and what your percentage is for each.

If you functional-medicine practitioner uses the application, you can set it up so he or she can log in and monitor your progress. Are your macronutrients good? Are you eating a good amount of fats? How’s your protein consumption based on your activity, height, and weight? Are the carbohydrate levels at a good place? We can also look at the quality of your food choices and advise you based on what we find.

If you prefer the paper route, you can use a diet diary that records your meals, meal times, bedtimes, and so on and share it with your practitioner at each visit. There is a reference handout for the “Diet Diary” I give my patients, which you are welcome to download and print: https://justinhealth.com/wp-content/uploads/2013/05/Diet-Diary-7-day-Fill-In.pdf.

EXERCISE

Exercise can increase your energy and make you feel good when done properly. But it can be a physical stressor (remember the Triangle of Health from chapter 1) and wreak havoc on your body when it’s overdone or not done correctly.

There are three questions you need to ask yourself and answer yes to in order to make sure you’re doing exercise right.

1. Is the exercise energizing me, and do I feel good after the exercise?
2. About ten to fifteen minutes after I finish exercising, do I emotionally feel I could repeat the exercise?
3. Do I feel good later that day and the next morning?

Do you finish your exercise and think, I’m done—I just don’t have one more ounce of energy in me? Do you feel that runner’s high, but know there’s no way you could possibly repeat the exercise that day or the next morning? Do you feel like you’re hit by a bus? If so, your exercise level or duration needs to be adjusted. It may be normal to feel sore if we’re doing newer movements, but if you’re doing things that are relatively the same or similar, your body shouldn’t feel that rundown.

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4 Watch my video on the Triangle of Health at https://www.youtube.com/watch?v=nRPIi6vSxQ.
Exercise's Effect on Metabolism

If you’re doing lots of long-distance aerobic exercises, such as your typical marathon running or distance running, the research is very clear that this type of exercise is very cortisol-stimulating, and it actually lowers your metabolism. The reason it lowers your metabolism is your body is designed to be as efficient as possible when doing exercise. When you’re running, your body is actually trying to get more energy done with less calories (i.e., lowering your metabolism).

When you exercise, you want your body to be incredibly inefficient when it comes to burning fuel. This is because you want the fuel your body is burning to come from fat. When the body is inefficient with burning fuel, meaning it’s burning a lot more than normal, this will boost your metabolism. It’s also important to choose the right kinds of exercises that aid this process—ideally resistance training, where we’re doing movements that involve moving weights, or functional full-body movements (squatting, lunging, etc.) that will stimulate our muscles to grow.

What Kind of Exercise Is Best?

High-intensity interval training—high-intensity bursts followed by periods of rest and relaxation—is great for metabolism because it stimulates a hormone called human growth hormone (HGH).

HGH increases our metabolism and helps us put on muscle for up to thirty hours after the movement is completed. This is the big advantage of doing resistance training and high-intensity interval training. High-intensity sprints or biking, for example, maybe thirty seconds followed by a sixty- to ninety-second rest or relaxation period, can be incredibly powerful because your metabolism after ten to thirty minutes of that movement is now increased for up to thirty hours afterward.

The main metabolic benefit that you get from aerobic training only happens while you’re doing the movement, so you don’t get that major metabolic increase after a long-distance, steady aerobic session. Aerobic exercise tends to be more cortisol-stimulating, so if you already have adrenal fatigue issues and your cortisol is already out of balance, continuing with more aerobic exercise is actually going to beat down your adrenal glands. The adrenals are really important for thyroid health as you will see when we get to the adrenal chapter.

SLEEP

We all know that feeling of waking up from a really good sleep, when you feel like a brand-
new person. But, unfortunately, we also know the feeling of waking up to that alarm and asking ourselves, “Did I even sleep?” The difference is whether we got all four stages of restorative sleep, which includes rapid-eye-movement (REM), when our body repairs and heals, or whether we just hit two or three stages of superficial sleep that night because we didn’t get to bed on time or our sleep was restless.

![Typical Sleep Cycles](chart)

The body is naturally programmed to repair physiologically and structurally between the hours of 10:00 p.m. and 2:00 a.m. That’s when your healing and repairing growth hormone peaks, so if you’re not getting to bed on time, you’re limiting your ability to tap into that needed growth hormone. When you are stressed and inflamed, your body needs that repair, so the sooner you can get to bed, the more you’re going to be able to build muscle and help your body heal.

Muscle is the most metabolically active compound in the body, so the more muscle you have, the more you’re going to be able to burn fat for energy while resting and the more reserves we have for our carbohydrates and sugars. People who tend to handle carbohydrates better are the ones who have more muscle because the extra carbohydrates can be put into our muscle cells for fuel versus put into our fat cells for storage. Extra carbohydrates and sugars always get thrown into fat cells if there is no room in the muscles or the liver for them. The more
extra muscle we have, the more our metabolism can burn it up and the more our muscle can act as a reservoir for storage.

Muscle is like a sponge for glucose or sugar. The more muscle you have, the more it acts like wringing out a sponge. Once the sponge is wrung out, it has more ability to absorb liquid or, in this case, glucose. A sponge that is not wrung out adequately loses its ability to absorb water or, in this case, sugar and glucose. So the next time you are exercising, imagine you’re wringing out a sponge.

Healing, repairing sleep during the optimal hours helps build this muscle.

**The Circadian Rhythm—the Body’s Natural Clock**

![Cortisol and Melatonin Levels](chart)

The circadian rhythm is the body’s natural clock based upon light and dark cycles. We have this beautiful rhythm: When the sun comes up in the morning, this stimulates cortisol, a hormone that tells the body it’s time to get up. When the sun goes down and darkness sets in, this drives down cortisol and stimulates melatonin, a hormone that tells the body it’s time to sleep.

There have been many studies done on the circadian rhythms of shift workers. According to an article regarding night workers in the *Monitor on Psychology*, “ Millions of American
workers fight against their circadian clocks every day,” and even with plenty of sleep during other hours, “All the sleep in the world won’t make up for circadian misalignment” (Price).

The World Health Organization (WHO), through its component agency the International Agency for Research on Cancer (IARC)\(^5\) has actually found that lack of sleep is the only nonsubstance carcinogen known to man, in the same category as asbestos and smoking. Shift workers have an increased risk for all-cause mortality, especially cancer and heart disease.

Sleep deprivation also disrupts the body’s circadian rhythm and can lead to an imbalance in blood sugar, insulin issues, and thyroid problems. So getting enough sleep and getting it during the right hours is vital.

**The Earlier to Bed, the Better**

The lowering of cortisol and stimulation of melatonin peaks between 10:00 p.m. and 12:00 a.m. This is when neurological and structural repair happens. This is why, physically, healing and restorative sleep is most benefitted with bedtimes during those hours.

The body also repairs, psychologically, during sleep, and this happens between 2:00 a.m. and 6:00 a.m. So if you get to bed at 3:00, you may still be able to function mentally, but your body may not feel very good.

**Tips for Getting Good Sleep**

There are many things we do, especially in today’s technology-driven world, at night that that can throw off our melatonin production and keep our cortisol artificially high. This list of sleeping tips will help you establish the right nighttime conditions that will allow you to go to sleep on time and stay asleep:

- Turn off all electronic devices (TVs, computers, tablets, etc.) by 8:00 p.m. The blue light in these suppresses melatonin.
- If you must use electronic devices after 8:00 p.m., use blue-blocking sunglasses. There’s also an app for your computer called f.lux (justgetflux.com) that can help block blue light.
- Use dimmers or keep the lights low in your house before bedtime. Bright lights can slow the production of melatonin.
- Make sure your bedroom is completely dark at night. Lights from clocks, phones, nightlights, and so on, and lights coming in through the windows can disrupt your body’s rhythm. If you can see your hand in front of your face when you turn out your light, it’s not dark enough.

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\(^5\) [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2954516/#R1](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2954516/#R1)
1. Maintaining a proper diet is the most important thing you can do to keep your thyroid healthy and manage the thyroid connections (gut, adrenal, gluten, liver/detox, and infection) we will discuss in part 2 of this book.

2. The foundation of the thyroid reset diet is formed by three major criteria: it must be nutrient-dense, anti-inflammatory, and low in toxins.

3. High blood sugar or the production of too much insulin will keep your body from metabolically activating your thyroid hormone.


5. High-intensity interval exercise and restorative sleep that balances your circadian rhythm are two important things you can do to positively impact your thyroid health.
3

THE GUT CONNECTION
What happens in the gut doesn’t stay in the gut! We absorb a lot of the nutrients that make our thyroid hormone in the gut. Our immune system, detoxification system, circulatory system, and all other systems in our body are impacted by the function, or dysfunction, of our gut. This is why the gut connection is so important.

Remember we have our T4 and T3 thyroid hormones, and T4 is our inactive hormone, while T3 is our active hormone. The enzyme that actually breaks down T4 to T3 is a selenium-based enzyme. So we not only need iodine, but we also need healthy levels of selenium to make this thyroid conversion from inactive to active thyroid hormone. Without healthy gut function and a nutrient-dense diet, we wouldn’t have enough building blocks to make this conversion happen.

THE IMPORTANCE OF STOMACH ACID

We discussed on the Triangle of Health and the Triple-S Approach in chapter 1, and one of the big systems on that second S (body systems) is our gastrointestinal (GI) system. When our GI system starts becoming stressed, one of the biggest things that happens is low stomach acid, or hydrochloric acid (HCl). We need stomach acid to lower the pH in our stomach. When we have healthy stomach acid, it starts the following domino rally in the first steps of digestion:

1. Healthy stomach acid lowers the pH.
2. Low pH activates proteolytic enzymes, which break down protein.
3. The broken down food is called chyme, and chyme needs to ideally measure around a 2 or 3 on the pH scale.
4. Chyme gets released into our small intestine, and triggers our gallbladder to produce bile and our pancreas to produce lipase, trypsin, and chymotrypsin.

5. Bile and lipase help break down and emulsify fat, kind of like dish detergent breaking down fat on a greasy pan. Trypsin and chymotrypsin help break down proteins.

**THE EFFECTS OF STRESS ON THE GUT**

Healthy stress levels are important because part of our nervous system gets turned on when we’re stressed. Imagine the nervous system has only a gas pedal and a brake pedal. The brake is the slow down, rest, and digest part of the nervous system: the brake is the *parasympathetic nervous system*. The gas is the go, go, go, accelerate, accelerate, accelerate part of the nervous system: the gas is the *sympathetic nervous system*.

When your parasympathetic nervous system is turned on, you’re resting, you’re relaxing, you’re meditating, you’re going for a walk, you’re having a really engaging conversation. When your sympathetic nervous system is turned on you’re eating gluten, you’re stressed out, you’re fighting with your spouse, you’re eating a lot sugar, and so on.

You drive that car with only one foot, your right foot, and your right foot can’t be on the gas and the brake on the same time. So you’re either hitting the gas pedal (sympathetic), which is you’re rushing, stressing out, eating poorly...or you’re hitting the brake pedal (parasympathetic), which is you’re slowing down, resting, repairing, being mindful, and so on.

When we’re stressed and our foot is on the gas pedal, we can’t make stomach acid optimally. The gas pedal of our nervous system blocks stomach acid, while the brake supports it and stimulates it. So the more stressed we are, the more we’re hitting the gas pedal, the more we’re turning off our digestion. And if our digestion is turned off, we’re not making stomach acid. If our stomach acid is not there, it’s not creating that nice, healthy, sterile environment for the gut.

Because the hydrochloric acid (HCl), our stomach acid, also keeps the bad microbes from accumulating, and the HCl lowers the pH, it keeps the gut cleaner and kills outside invaders.

**Disruption of Peristalsis**

*Peristalsis* is the wavelike contraction in our intestines that helps move stool out. Think of peristalsis as the process of getting toothpaste out of a toothpaste tube. You have to roll the
tube to move that toothpaste out. Thyroid hormone is instrumental in helping to create peristalsis, and one of the big things we see in hypothyroidism (low thyroid hormone) is constipation.

Relief of constipation is one of the first things that happens when someone is given thyroid hormone because the hormone is restoring peristalsis.

**Anemia**

*Anemia* just means abnormal cell. If we have a B12 deficiency, we have what’s known as a *macrocytic anemia*. The blood cells stay really big and goofy. As red blood cells get older and more mature and refined, they should actually get smaller. If we have an iron deficiency, we have what’s known *microcytic anemia*. The red blood cells get too small.

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Stomach acid breaks down and ionizes minerals, such as iron and B12. This basically means it turns them into a form in which the body can take them up, absorb them, and bring them into the bloodstream. If our stomach acid is low, we cannot properly ionize minerals. It’s like sand on a street: rather than absorbing, it will just wash right through our body and go out the other end.

**B12 Deficiency (Macrocytic Anemia)**

B12 deficiency is another condition that leads to gut stress. We need B12 to make healthy red blood cells. Red blood cells are needed to carry nutrition and oxygen everywhere in the body, and we need oxygen for metabolism. Think back to middle-school science class when you had to place a glass jar over a candle. Within a few seconds, that candle went out because it needed oxygen for metabolism. It needed oxygen to stay alive.

With a deficiency in B12, red blood cells can’t perform optimally, and we’re impairing our
body’s ability to carry oxygen. This will affect our energy, which will affect our mitochondria, and which will affect thyroid-hormone function because we need oxygen for healthy thyroid hormone, and we also need B12 in regards to making thyroid hormone.

According to the *American Journal of the Medical Sciences*, in people with Hashimoto’s, 28 percent also have a B12 deficiency, and of those with a B12 deficiency, 31 percent also have pernicious anemia.¹ The compound in our gut that produces B12 is our *parietal cells*. The compound that absorbs B12 is our *intrinsic factor*. The parietal cells produce intrinsic factor that helps bind to the B12 in our diet. Our immune system, especially if we have autoimmune condition, will attack either that parietal cell, rendering the cell unable to make intrinsic factor, or it will attack the intrinsic factor made by the cell.

So what happens is we have this low level of B12 due to a gut issue: The end response is we need B12 to attach to intrinsic factor. If our parietal cell is knocked out, we won’t be able to have the intrinsic factor made because the cell is not there making it, and if the intrinsic factor is being destroyed, the intrinsic factor won’t be there to bind to the B12; therefore, we have low levels of B12.

**Iron Deficiency (Microcytic Anemia)**

Iron is part of the red blood cell called the hemoglobin, which also helps carry oxygen. Iron is also another building block in the thyroid-hormone cascade. We’ve talked about tyrosine and iodine and selenium, but there are some background nutrients that are also important for that process, and iron is one of these background nutrients.

**Zinc Deficiency**

Zinc is a building block for stomach acid. If we have low stomach acid, then we can’t break down zinc. But we also need zinc to *make* more stomach acid, so if we can’t break down our zinc, we create a larger deficiency, and the initial low-stomach-acid problem actually gets worse and worse, like a downward spiral. Zinc is an important building block for the thyroid because if we don’t have zinc, we can’t make stomach acid. And if we can’t make stomach acid, we can’t absorb all of the nutrients we need for healthy thyroid function.

**Additional Deficiencies**

In addition to iron, B12, zinc, and iodine and selenium (which we covered in chapter 1), other mineral and vitamin deficiencies that can lead to gut stress and affect thyroid function include the following:

¹ http://journals.lww.com/amjmedsci/Abstract/2006/09000/Prevalence_and_Evaluation_of_B12_Deficiency_in.4.aspx
GUT BACTERIA AND THE THYROID

Keeping gut bacteria under control is imperative for gut and thyroid health. It’s so important that an entire chapter, “The Infection Connection,” is dedicated to it later in the book. But for reference purposes, there are a few things about bacteria that need to be addressed here as well.

In order to function appropriately, the gut should have bacteria—a lot of bacteria. However, the proper balance is no less than 80 percent good bacteria and no more than 20 percent bad bacteria. When these numbers become unbalanced, this is called dysbiosis.

There are two types of bacteria: gram-negative and gram-positive. Gram-negative bacteria have two membranes, or two walls, and gram-positive bacteria have one. So gram-positive bacteria are like a house that has a door to go through, one barrier (one wall) to entry. Gram-negative bacteria are like a castle that has a moat and a steep wall to go through, two barriers (two walls) to entry.

What this means is, those gram-negative bacteria, those pesky guys, are harder to kill because they have more walls that the antimicrobials, whether it’s an herbal or an antibiotic, have to penetrate. So the harder the infection is to kill, typically, the more side effects you’ll get from the medications because you have a die-off reaction, or a Herxheimer reaction.
What is *Helicobacter pylori* (*H. pylori*)?

*Helicobacter pylori* (*H. pylori*) is a particularly stubborn gram-negative bacteria because it has what’s called and *efflux pump* that pumps the antimicrobial or antibiotic right out of the bacteria.
Imagine your *H. pylori* infection is a canoe. You take antibiotics or antimicrobials to kill the infection, and the canoe (*H. pylori*) starts taking in water (the medicine). We want to sink that canoe, right? But the efflux pumps are like someone inside the canoe (inside the *H. pylori*) bailing the water back out into the ocean. So as long as the person can bail the water (the antibiotics or antimicrobials) out as fast as it’s coming in, the canoe won’t sink—the *H. pylori* won’t die. There are strategies that we’ll talk about in “The Infection Connection” chapter that we can utilize to kill *H. pylori* better by knocking out these efflux pumps.

**H. pylori’s Effect on the Gut**

In the 1980s, Dr. Barry Marshall discovered that *H. pylori* was the primary driver of ulcers. Before this, it was believed that ulcers were due to stress and that bacteria couldn’t survive in the acidic levels of the stomach.

In reality, *H. pylori* makes an enzyme called urease that lowers stomach acid. Urease takes the protein that’s being digested and creates the by-product urea. Urea breaks down into ammonia and carbon dioxide (CO2), and that ammonia has a high pH. So that ammonia’s higher pH will lower the overall acid in the stomach. The measurement of pH is on scale of 1 to 14: 1–6 are acidic, 7 is neutral, and 8–14 are alkaline. So if we’re making that pH go up, we’re making the stomach environment less acidic.

*H. pylori* is will also create inflammation in the gut, and inflammation can lead to a leaky gut.

**WHAT IS A LEAKY GUT?**

The intestinal lining contains layers of cells connected by tight junctions. The intestinal lining is supposed to only allow the appropriate nutrients to pass through and into the bloodstream. When the tight junctions become inflamed due to gluten, other irritating foods, or infection, they can open up, and food and infections can slip through, introducing toxic materials, such as yeast, bacteria, and parasites, into the bloodstream. This is a leaky gut.

The bloodstream carries these toxins throughout our body where they are absorbed in a variety of locations, creating inflammation. As we continue to feed our bodies offending foods, the leaky-gut cycle continues, keeping our bodies in a constant state of inflammation.

A leaky gut can create an immune response known as *molecular mimicry*. The surface proteins on gluten, for example, can look very similar to the thyroid and cases of “mistaken identity,” or molecular mimicry, occur. (This is true for other body tissues as well—dairy can look like the pancreas, for example.)
So the immune system starts making antibodies for the thyroid because it can’t tell the difference, and the now the thyroid is under attack. Infection and a leaky gut are two of the prime mechanisms that exacerbate the breakdown of the thyroid.

Leaky gut can present itself in a variety of ways and can lead to chronic conditions. Some people may have irritable bowel syndrome (IBS), Crohn’s disease, or other pathological conditions. Others may have skin issues, bloating and gas, or gastroesophageal reflux disease (GERD). Still others may fall somewhere in the middle.

When we have healthy gut function, our gut works like the oil filter in our car; it keeps things moving better. When infections and undigested food particles slip through and into the bloodstream, they are carried to the liver, our body’s detoxification system, and put additional stress on our liver (we’ll discuss more on this in “The Liver Connection” chapter later in the book). It’s like having oil in your car but not having the oil filter (the solid, tight junctions in the intestines), and if the oil filter isn’t present in the car, the oil can thicken, become very gelatinous and actually cause the engine to stall. In our gut, our cells get sticky due to the inflammation of a leaky gut. So not only are bad things passing into our bloodstream and putting extra stress on our liver, but now, things are moving slower through our intestines.
Healthy gut bacteria is the key because good bacteria eats poop and poops nutrition, while bad bacteria eats nutrition and poops poop. In other words, good bacteria eats the bad stuff and produces good stuff, while the bad bacteria eats the good stuff and produces bad stuff.

Common Gut Infections

Gut infections aren’t only driven by bacteria. Parasites, viruses, and yeasts are found in the gut as well. A few common infections, which we will discuss more in the infection chapter, that are found when dealing with leaky gut and thyroid issues follow:

- **H. pylori**—This bacteria is common in greater than 50 percent of the population and can drive autoimmunity in Hashimoto’s. It is linked to other autoimmune conditions. It is transmitted through saliva or fecal contamination.

- **Borrelia burgdorferi** (Lyme disease)—This bacteria looks similar to the thyroid, so it can exacerbate autoimmunity and trigger diseases such as Parkinson’s and ALS. It can be acute or chronic and is transmitted by the deer tick.

- **Yersinia enterocolitica**—This parasitic infection can trigger thyroid conditions and autoimmunity. It is transmitted through contaminated food and water.

- **Candida**—This fungal infection disrupts digestion, throws off good-bad gut bacteria balance, and creates constipation. It is transmitted through direct contact and can be spread by contact with contaminated objects.
Epstein-Barr virus (mono, the kissing disease)—This virus causes an imbalance in the immune system and is present in 80–90 percent of the population. It’s connected to many autoimmune conditions, including Hashimoto’s and multiple sclerosis. It is transmitted through saliva.

**HOW TO HEAL A LEAKY GUT**

These are the six strategies, which I call the 6R Strategy, I like to follow when helping patients heal their leaky gut (these strategies must be followed in this order):

1. Remove hyperallergenic foods.
2. Replace enzymes, acids, and bile salts.
3. Repair with healing nutrients and adrenal support.
4. Remove infections.
5. Reinoculate with probiotics.
6. Retest to ensure the infection has cleared.

Let’s explore each of these more in depth.

**Remove Hyperallergenic Foods**

The first step is to remove all irritating foods causing the leaky gut. This would include foods that are not nutrient-dense, noninflammatory, and low in toxins. Physical, chemical, and emotional stressors can lead to inflammation, and inflammation tends to cause our bodies to break down faster. Irritating, hyperallergenic foods introduce physical and chemical stressors to the body.

Stressors cause the immunoglobulin A (IgA) in the mucosal barrier in our gut lining to break down. When this happens, we may see sinus infections, gut issues, irritation, fungal infections, or even urinary tract infections. Removing irritating foods can help remove this stress to the gut.

What foods to remove varies by individual. Common irritating foods include, but are not limited to, the following:

- Grains
- Sugar
- Dairy
If there is an autoimmune issue as well, we may need to add a rotation component to the diet and also eliminate foods that include the following:

- Nuts
- Seeds
- Tomatoes
- Potatoes
- Eggplants
- Peppers

Again, there’s not a one-size-fits-all plan here. Each person has to find his or her offending food and eliminate it.

Since 70 to 80 percent of our immune system is located in our gut, removing allergenic foods is very important to keeping the body healthy.

**Replace Enzymes, Acids, and Bile Salts**

When our body is under the control of the sympathetic nervous system (SNS)—our foot’s hitting the gas pedal—it’s in a fight-or-flight state. As we get more stressed, our blood rushes toward the extremities so we can fight or flight. As blood leaves our digestive system, we are not able to produce the enzymes, hydrochloric acid (HCl), and bile salts we need for proper digestion. This makes the environment more susceptible to dysbiosis, small intestinal bacterial overgrowth (SIBO), and chronic infections.

Our parasympathetic nervous system (PNS) is our “rest and digest” state—our foot’s on the brake. The PNS actually brings the blood inward toward the gut, and this allows for proper enzyme, HCl, and bile salt production. So getting our bodies back under the control of the PNS is important.

**Repair with Healing Nutrients and Adrenal Support**

There are specific healing nutrients that will help repair the gut. What nutrients, how much, and whether or not they are needed will depend on the specific gut issue, how long it has existed, and if there is inflammation. L-glutamine, slippery elm, marshmallow root extract, aloe vera, and licorice are soothing and will assist with healing the gut.
Having healthy adrenal glands also is very important for healing the gut.

The adrenals produce cortisol, which helps neutralize inflammation and maintain a healthy gut lining. If we have too much cortisol—if we’re too inflamed, and our body’s inflammatory response is too high—we’ll actually break down our gut lining. If our cortisol function is too low, we won’t have enough of it to build our gut back up.

So having an appropriate stress response, having healthy adrenal function is important to creating the right hormonal response, to having healthy levels of cortisol. Cortisol is also there to help deal with inflammation, so if we have inflammatory compounds in the gut, cortisol can also put out that flame before it grows into a five-alarm fire.

Remove Infections

Removing infections is imperative, and this step is often missed in traditional medicine. Infections can drive a leaky gut, keeping us in a stressed-out state, which keeps the SNS activated, preventing digestion.

Blood work or a comprehensive stool analysis needs to be done to determine if there is an infection (SIBO, dysbiosis, bacteria, virus, etc.) and what infection we are dealing with.

Most people when they find out they have an infection—a parasite, a bacteria, a fungal overgrowth, a viral infection—make the mistake of saying, “Oh, my God! I have to get rid of this infection.” Then they take any or every antibiotic or herbal medicine known to man to knock it out, and they end up feeling worse. There is a reason removing infections is near the bottom of our step-by-step list of strategies: it can actually be stressful to your detoxification system and immune system to remove an infection. Also, in some people the hormonal system (adrenals, thyroid, and male or female hormones) must be addressed first to decrease the risk of side effects and other issues. It’s important to do steps one through four first because it sets up our body to deal with the immune stress, detoxification stress, and the lymphatic stress of dealing with the biotoxins from the infection.

Reinoculate with Probiotics

Imagine you have a backyard garden full of weeds. You can’t plant new seeds in that weedy garden. There’s not enough room for those seeds to grow. You’re going to have to pull out the weeds and prepare the soil before you can plant your new seeds.

In our first four strategies, we removed all the weeds (the bad stuff) and prepared the soil (our gut). Now we can reseed (reinoculate)—put the good bacteria back in.

Many people have issues with adding in probiotics. These issues occur when they are trying
to plant seeds in a garden that’s full of weeds. Get the first four strategies in check first, and then introduce probiotics into your properly prepared gut.

Re-test to Ensure the Infection Has Cleared

Make sure you retest the original test that caught your infection in the first place. Some people need second and third treatment rounds to clear the infection out completely. Some people even come by with a new infection that was burrowed deeper into the gut lining and finally made its way to the surface after the other infection was cleared.

TESTING FOR GUT ISSUES

There are a number of tests we can use to look for proper gut function, infections, and problems, such as leaky gut. These include blood tests, comprehensive stool tests, SIBO breath tests, and transit-time tests.

Blood Tests

Basic blood tests can look indirectly at protein absorption. These tests will include your typical complete blood count (CBC) and comprehensive metabolic profile (CMP). These tests will also look at things such as creatinine, albumin, globulin, and blood urea nitrogen (BUN). They will even look at some of our immune markers, like neutrophils, lymphocytes, eosinophils, basophils, and monocytes that will tell us how our immune cells are responding.

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

Comprehensive Stool Test

<table>
<thead>
<tr>
<th>H. pylori</th>
<th>2.6 E4</th>
<th>High</th>
<th>&lt;7.0 E3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virulence Factor, cagA</td>
<td>Negative</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>Virulence Factor, vacA</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parasites by PCR</th>
<th>Quantitation</th>
<th>Units</th>
<th>Assay Range</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blastocystis hominis</td>
<td>47</td>
<td>MFI</td>
<td>10-5000</td>
<td>Negative</td>
</tr>
<tr>
<td>Entamoeba histolytica</td>
<td>688</td>
<td>MFI</td>
<td>10-5000</td>
<td>Positive</td>
</tr>
<tr>
<td>Giardia spp.</td>
<td>94</td>
<td>MFI</td>
<td>10-5000</td>
<td>Negative</td>
</tr>
<tr>
<td>Trichomonas spp.</td>
<td>30</td>
<td>MFI</td>
<td>10-5000</td>
<td>Negative</td>
</tr>
</tbody>
</table>
In a comprehensive stool test, we are looking for pieces of DNA, and this test will tell us what infections we are dealing with and if there are any other gastrointestinal issues to consider. I recommend at least a 3-day comprehensive stool test for a stool culture. The test I like is the 401H by BioHealth or the Doctor’s Data 3-day Comprehensive Stool Test, and my new favorite is the DRG Genetic Stool Test.

**SIBO Breath Test**

In a SIBO breath test, a sugar solution is given and we’re looking at the time it takes for the sugar to metabolize in the body and where and at what time various gases are produced.

<table>
<thead>
<tr>
<th>Fungi/Yeast</th>
<th>Candida albicans</th>
<th>&lt;dl&gt;</th>
<th>&lt;5.0 E3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candida spp.</td>
<td>Negative</td>
<td>Mod</td>
<td>Neg</td>
</tr>
<tr>
<td>Geotrichum spp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microsporidia spp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trichosporon spp.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In a SIBO breath test, a sugar solution is given and we’re looking at the time it takes for the sugar to metabolize in the body and where and at what time various gases are produced.

So, for instance, you would blow into a tube to measure your baseline. You would then take a sugar solution of lactulose (a really big sugar molecule you can’t digest it, so the only thing that’s able to break it down is the gut bacteria). You blow into the tube every 20 minutes (20, 40, 60, 80, 100 and 120), and you would get readings of the methane and hydrogen gases at these various times. At 120 minutes the lactulose should be able to get to the end of the
small intestines, and if there’s an overgrowth there, that bacteria comes up from the colon, eats a lot of that sugar, and produces methane and hydrogen gas. And gases are nothing more than an indirect marker of bacteria. The gases aren’t just naturally there. They’re there because of that overgrowth in bacteria. If there’s an abundance of methane, it can potentially drive constipation; if there’s an elevation of hydrogen gas, it can typically drive diarrhea. And if we have both, we can alternate between constipation and diarrhea.

<table>
<thead>
<tr>
<th>Compounds of Bacterial or Yeast/Fungal Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacterial - general</strong></td>
</tr>
<tr>
<td>32. Benzoate</td>
</tr>
<tr>
<td>33. Hippurate</td>
</tr>
<tr>
<td>34. Phenylacetate</td>
</tr>
<tr>
<td>35. Phenylpropionate</td>
</tr>
<tr>
<td>36. p-Hydroxybenzoate</td>
</tr>
<tr>
<td>37. p-Hydroxyphenylacetate</td>
</tr>
<tr>
<td>38. Indican</td>
</tr>
<tr>
<td>39. Tricarballylate</td>
</tr>
</tbody>
</table>

For breath tests, I like to use the Genova breath test, the National College of Naturopathic breath test, and the Commonwealth Labs breath test.

**Transit-Time Test**

Transit-time tests measure the time it takes your body to produce a bowel movement. The test can typically be done by consuming some beets or charcoal. You set the time as you eat it. Ideally, within 18 to 24 hours, you want to produce a bowel movement that’s black if it’s charcoal or red if it’s beets.

If it takes less than 18 hours, it could be a sign of malabsorption. If it takes over 24 hours and/or you’re not having 12 inches of stool per day, you can reabsorb a lot of the toxins from the stool, creating a problem known as autointoxication where you are poisoning yourself. Again, a lot of what’s in our stool is toxic. It’s bacteria. Our body needs to move it out to keep a healthy balance.
1. We need healthy stomach acid to lower the pH in our stomach. When we have healthy stomach acid, it starts an effective domino rally of digestion.

2. Thyroid hormone is instrumental in helping to create peristalsis, and one of the big things we see in hypothyroidism (low thyroid hormone) is constipation.

3. As we continue to feed our bodies offending foods, the leaky-gut cycle continues, keeping our bodies in a constant state of inflammation.

4. Healthy gut bacteria is the key because good bacteria eats poop and poops nutrition, while bad bacteria eats nutrition and poops poop.

5. Follow this step-by-step 6R Approach to healing the gut: remove hyperallergenic foods; replace enzymes, acids, and bile salts; repair with healing nutrients and adrenal support; remove infections; reinoculate with probiotics; and retest to ensure the infection has cleared.