

## The Mighty Thyroid: It Matters More Than You Might Think

**The information below has been gathered from multiple sources; it is in no way complete but I have found it very valuable for those either with full-blown thyroid disease or those who may have it and not even know it.**

### **Before we get to the Key Information:**

- Basal Metabolic Rate (BMR) includes the calories your body burns to keep you alive: powering your heartbeat, growing and repairing cells, adjusting hormones, and breathing.
- The BMR accounts for somewhere between 50 to 80 percent of all the calories a person burns. (The rest comes from exercise, digestion, and minor fidgeting movements, called non-exercise activity thermogenesis, or NEAT).
- Someone with no thyroid at all – due to surgical thyroid removal, for example – may experience up to a 40 percent drop in BMR.
- Someone with a functioning thyroid may experience a milder slowdown, in the neighborhood of 6 percent.
- Untreated thyroid issues can reduce the number of calories a person will burn in a typical day by more than 300 calories.
- Up to 60 percent of people with thyroid disease are unaware of their condition (per the American Thyroid Association).
- The medical community doesn't agree on what constitutes a truly "low" functioning thyroid or how and when to prescribe medicine.

### **Some Key Information**

1. Most physicians only check TSH (Thyroid Stimulating Hormone) and free T4 (thyroxine) when ordering labs → this is bad medicine as you must check other labs as well to make a definitive diagnosis for possible thyroid autoimmune conditions, as well as to know the possible reasons for hypothyroidism and hyperthyroidism.
2. Once an antibody (Ab) is present, a person will have fluctuating thyroid hormone levels that last for decades before hypothyroidism develops. And antibody levels can also wax and wane so that is something that also has to be taken into account.
3. Often times a person with thyroid disease will have signs and symptoms of both hypothyroidism and hyperthyroidism.

4. Signs and Symptoms of hypo or hyper: Anxiety, Insomnia, Depression, Heart palpitations, Hair loss (as well as coarse hair that easily breaks), Cold hands and feet (or overall coldness), Night Sweats, Menstrual irregularities, Weakness, Constipation, Diarrhea, Irritable bowel syndrome, Brain fog, Carpal tunnel syndrome, Dry skin, Decreased immunity with increased infection rate, Decreased libido, Muscle cramps, Joint pain (the list goes on and on).

5. When TSH is high, T4 and T3 are typically low and this is one of the easiest ways to diagnose hypothyroidism, which is the most common thyroid disorder. TSH may also be misleading as you may have intermittent fluctuations in T3 and T4 (most common with T3 decreasing and T4 increasing).

6. Easy to confuse hypothyroidism and Hashimoto's thyroiditis since 97% of hypothyroid disorders are in fact Hashimoto's.

7. In those with a normal thyroid, the TSH may fluctuate with stress, illness, lack of sleep, pregnancy, and low temperatures and thus a diagnosis should be made after a single blood draw.

8. Thyroid medications should not be prescribed simply because someone is having a hard time losing weight.

9. General rule for treatment: If TSH is greater than 10, but the patient does not have symptoms, TREAT. If TSH is between 3 to 10 and the patient has symptoms, TREAT. Thus, the general lab range of 0.45 to 4.5 (some labs even go up to 8.0) is not adequate for most people. And the reference range also does not account for different weights, comorbid status, and the elderly. The American College of Clinical Endocrinology uses a range of 0.3 to 3.0, which appears to be more appropriate for most people. Most functional medicine practitioners strive for a range of 1.0 to 2.0. And most patients feel best between 0.5 to 2.0.

10. Central Hypothyroidism:

- Miscommunication between the pituitary gland and the thyroid
- Low T4 and T3, with normal TSH (perhaps even decreased slightly)
- Often due to various medications: glucocorticoids (i.e. prednisone, steroids), dopamine, anti-depressants, and maybe metformin as well
- Medications such as these can all lead to decreased TSH

11. There is no perfect TSH, T3 or T4 level for any one of us, and this is why it can be a long journey to figure out what is best. The key is that you are improving your health, feeling better and working toward living your best life. So be weary of what your friends tell you, or what you hear or see over the Internet. Just because one website says one thing does not mean it is best or even valid.

12. Hypothyroidism is MOST prevalent in women (5 to 8 times more likely) possibly because oral contraceptives, hormone replacement therapy, and the hormonal shifts that take place during and after pregnancy as well as during perimenopause can all boost risk.

13. Up to 43 percent of people with hypothyroidism also have iron-deficiency anemia.

14. Key nutrients that may be lacking: Iodine, Iron, Selenium, Zinc (found primarily in sea food), Copper (too much Zinc can lead to copper deficiency), Tyrosine.

## **Basic Physiology**

1. Thyroid hormones are made from the amino acid tyrosine combined with iodine. The TPO enzyme converts iodide to iodine and hydrogen peroxide is produced. Selenium is needed to balance peroxide or else damage will ensue.

2. Iodine attaches to tyrosine and forms T1 or T2 then these can go together to form T1 + T2 and T2 + T2. And this is how we make T3 or T4 with just a little bit of math. But what is important is the fact that T3 and T4 are the only active forms (not T1 or T2).

3. Minerals such as Zinc, Iron, Selenium and others are essential in maintaining adequate thyroid function.

4. Absorption of thyroid medications:

- 40 to 80% is absorbed in the jejunum and upper ileum of the small intestine
- requires stomach acid, so using PPI and antacid medications will block what we are trying to achieve
- hot lemon water and apple cider vinegar are things to consider using on a daily basis to help build up adequate stomach acid
- Other supplements that may affect absorption: Magnesium, Calcium, Aluminum, Iron

Hormone/Antibody/Testing		
Free T4	Pro-hormone; ~300% more active than T3	T4 supplement such as Synthroid/Levothyroxine is typically first-line treatment for hypothyroid disease
Free T3	20% comes from Thyroid secretion; 80% from T4 to T3 conversion when an iodine molecule is removed in our	For those with positive antibodies, supplementing with both T4 & T3 may be essential; T3 has a 6 to 16 hour half life (this is how long it lasts

	organs (i.e., Liver, Kidneys)	in your system)
Thyroperoxidase Antibody (TPO Ab)	Deficiency in critical minerals leads to an increase in TPO Ab	Hashimoto's disease (antibodies present / auto-immune attack); 1 in 5 people with hypothyroid disease have this but only half of those know it because their antibody levels were never checked
Top 6 Thyroid Tests	TSH, Free T3, Free T4, TPO Ab, TG Ab, Thyroid Ultrasound	May also consider ordering a Reverse T3 (not essential in most cases)
Reverse T3	Thyroid Receptor Blocker	It if it is too high then the thyroid hormones have nowhere to bind

## Deciphering Thyroid Labs

TSH	Free T3	Free T4	TPO/TG Antibodies	Meaning
Normal	Normal	Normal	Negative	This is an indication that the person is euthyroid, with a low risk of Hashimoto's. May need additional testing.
Normal	Low	Low	+ / -	Central hypothyroidism
Normal	Normal	Normal	Positive	Euthyroid Hashimoto's
Elevated	Normal	Normal	+ / -	Subclinical hypothyroidism
Elevated	Low	Low	+ / -	Hypothyroidism
Low	Normal	Normal	+ / -	Subclinical Hyperthyroidism
Low	High	High	+ / -	Hyperthyroidism

\*At times, you may see one or the other thyroid hormones (T3/T4) high and or low, as the table above is just the standard example.

## Thyroid Medication Interference / Side Effects

1. Most people are instructed to take thyroid medications first thing in the morning on an empty stomach at least 30 minutes before the first meal (some people will take thyroid medications twice daily or even at night). This is essential as many things can affect absorption such as coffee. Proton-Pump-Inhibitors (PPIs) as well as ant-acids will also decrease thyroid absorption.
2. There is research data that shows there is an increased risk of osteoporosis with the use of thyroid medications. A great example where benefits and risks must be weighed and all precautionary methods taken.
3. Doctors should not use thyroid medications to induce weight loss in those with normal thyroid levels, even if a patient persists, especially in this day and age of the Internet. There should

always be a valid reason to use medication and or supplements (they are not always safe even though a functional medicine doctor, chiropractor, or naturopathic practitioner may tell you otherwise.

4. T3 medications have been shown to worsen the adrenal glands which is a necessity when it comes to controlling things like cortisol, so don't simply take T3/T4 combinations because you were told they are better than T4 alone. Those with adrenal insufficiency more often than not must stay away from using thyroid hormones.

5. When conducting follow-up labs after using thyroid medications one must postpone the morning dose and get the labs drawn first. And little extra fasting never hurt anyone.

## **The Gut and a Healthy Thyroid**

1. Celiac disease, as well as gut infections such as H. pylori may trigger thyroid disease. Lactose intolerance (75% of humans cannot digest lactose) affects thyroid.

2. Various microbiome kits/tests that you may want your physician to order:

- GI Map Kit
- Genova Kit
- Biohealth Kit
- Metameric Kit

But you must understand that just because you decide to check out the bacteria levels in your gut, there is not a prescription/supplement/diet that will automatically fix it.

3. You may need to check for various gut problems with tests such as the Hydrogen or Lactose breath test. As mentioned above, but worth repeating, Lactose is really bad for lots of people and more than 75% of people across the world are lactose intolerant. You don't need an actual test to confirm this, just stopping drinking or eating things with lactose and if that works you know you cannot tolerate it. An allergist has no reason to check you for lactose intolerance.

4. Many people have restored complete thyroid function (no medication use) once they restore their gut health, but it can take a long time, so you have to be willing to fight.

## **Various Medications That You May Come Across**

- Synthroid (T4 only; it is a pro-drug and needs conversion from T4 to T3 in the body; some T4 will convert to reverse T3)
- Tirosint (Hypoallergenic T4; not available with many insurance plans)
- NP Thyroid (typically in a ratio of 4:1 of T4:T3)
- Armour Thyroid (this medication has too much T3 for most people)

Synthetic thyroid medications are in fact identical in structure to the hormones in our bodies.

Armour and NP Thyroid may actually contain TPO and TG antibodies and thus perpetuate disease in people, yet many patients will argue that these medications are best.

Various protocols exist when it comes to the proper ratio of T4:T3 hormones that one should be prescribed. Common examples are 11:1 or 13:1. Sometimes the medications are taken in the morning, and sometimes the dose is split (12 hours apart).

Typically dosing for thyroid medications (not for everyone): 1.3 mcg/kg/day (example: 90mcg for a 150 lb person; 180mcg for a 300 lb person). This is a general rule, but it all comes down to the TSH level and the T4 and T3 levels as well, plus other comorbid auto-immune conditions.

## **Hashimoto's Disease**

- Unique signs and symptoms that may or may not be seen with hypothyroid disease, and may actually have both hyper and hypothyroid symptoms
- May have a normal TSH level (often years/decades before increased TSH is seen)
- May see high levels of hormones
- Eventually the thyroid hormones get depleted and thus hypothyroidism ensues
- Typically one type of Antibody (TPO or TG) will be elevated, but sometimes both