

## **Karen Martel Nutrition**

### Part 2

## **Cheat Sheet: Testing**

### ***Insulin***

Testing is necessary to fully evaluate blood sugar and insulin dysregulation. The following are tests are recommended to most accurately evaluate possible blood sugar and insulin mishandling

#### **Doctor/Naturopath:**

Blood chemistry

#### **A. Lipid panel (cholesterol, HDL, LDL, triglycerides)**

The closer the cholesterol/triglyceride ratio is to a 1:1 ratio, the more likely a blood sugar issue exists; ideally it will be a 2:1 ratio. Additionally, high LDL and low HDL may also indicate a trend towards insulin resistance.

#### **B. Glucose**

Glucose is not an accurate marker by itself, but in conjunction with other markers can be valuable. When fasting glucose is above 100mg/dL, this can indicate a tendency towards insulin resistance. Along with an elevated Hemoglobin A1C and cholesterol/triglyceride ratio close to 1:1, elevated fasting glucose further indicates the likelihood of insulin resistance.

Glucose below 85mg/dL, along with an LDH below 140 IU/L, may indicate a tendency towards reactive hypoglycemia.

### **C. Hemoglobin A1C**

Above 5.2% can indicate a general trend towards insulin resistance. The higher the value, the more likely there is blood sugar and insulin dysregulation.

### **D. Insulin**

This is not a valuable marker due to its short half-life. However, in conjunction with other markers, including insulin levels can offer additional information. Elevated insulin often points to early signs of insulin resistance and possibly a causative factor of reactive hypoglycemia. If insulin is low this may be an indication of poor pancreatic production and late stage insulin resistance.

### **Your Checklist**

- ✓ Insulin
- ✓ Hemoglobin A1C
- ✓ Lipid Panel
- ✓ Glucose

Est. price: Free with standard medical plans

## At Home:

### Blood Glucose Monitor

1. Pick up a blood glucose monitor. You may want one that also tests ketones if you think you would like to experiment with testing ketones. Buy glucose & ketone test strips.
2. A fasting blood glucose test measures blood glucose levels after you've gone without food for at least eight hours. Best to do it first thing in the morning before consuming any food or beverage.
3. Why test: To determine if your blood glucose level is within a healthy range; to screen for diabetes and prediabetes and to monitor for high blood glucose.
4. Normal blood glucose levels are less than 100 mg/dL / 5.5 mmol.
5. If your blood glucose measures 126 mg/dL 7 mmol or higher, you should retest.
6. If a second test is done on a different day also measures 126 mg/dL 7 mmol or higher, you likely have diabetes. If this is the case, you should call your medical doctor to have him or her do their own blood glucose testing to determine if there is a problem.
7. If your blood glucose measures 100 mg/dL to 125 mg/dL, 5.5 mmol to 7 mmol you have higher-than-normal blood glucose levels, but the levels are not high enough to be diagnosed as having diabetes. Your doctor will confirm all abnormal tests with a second test to be sure and to monitor you.
8. Working with a health care professional if your numbers are over 100mg/dl is advised.

Est. price: \$80-\$100 (some monitors come free with the purchase of test strips.)

## *Testosterone, Estrogen, Progesterone, Cortisol*

The following tests are recommended to most accurately evaluate the above hormones.

### **Functional Medicine MD/Naturopath/Nutrition Coach:**

Saliva

#### **A. Saliva Hormone Test Kit**

Saliva testing is used for measuring hormones like cortisol, estrogen and testosterone, and its non-invasive collection asks patients to spit into a plastic tube. This sampling method allows patients to collect saliva at home at specific times, which is important for accurately measuring hormone levels.

Why do we test hormones in saliva? Steroid hormones in the bloodstream are 95-99% bound to carrier proteins, and in this form are unavailable to target tissues. Saliva testing measures the amount of hormone available to target tissues – the bioavailable amount. For this reason, saliva testing better relates to specific symptoms of excess or deficiency and is a good option for monitoring hormone therapy.

#### **Your Checklist**

- ✓ Testosterone
- ✓ Estradiol (estrogen)
- ✓ DHEA (is included in the hormone test kits and is great indicator of adrenal stress similar to cortisol)
- ✓ Progesterone
- ✓ 4 Point Cortisol (4 point is 4 collections spread throughout the day to test the cortisol diurnal pattern)

Est. price: \$260 USD

Order your test kit at <https://karenmartel.com/hormone-test-kits/>

## **Functional Medicine MD/Naturopath:**

- Urine

### **A. Dried Urine Testing**

Dried urine is a form of collection where patients saturate a filter card with a urine sample. Once dry, urine cards are extremely stable for shipment and storage.

Why measure in urine? Urine testing is the best way to measure adrenal and sex steroid hormone by-products and their respective metabolic pathways, providing a gauge for understanding the body's hormone metabolism.

Est. price: \$300-\$400 USD

## ***Thyroid***

### **Doctor/Naturopath:**

- Blood Chemistry

Blood chemistry tests are blood tests that measure amounts of certain chemicals in a sample of blood. They show how well certain organs are working and can help find abnormalities.

### **Thyroid Lab Tests**

**Warning: Most doctors get this wrong!**

The current paradigm is to treat **ONLY** if the TSH is elevated (meaning you are hypothyroid) and **ONLY** using Synthroid/Levothyroxine.

They look at your TSH and if it's in the "normal range" they declare that your thyroid is just fine. I'm going to teach you how to interpret your own labs. This way you can advocate for yourself at your doctor's office and be tested right and put on the right medicine (if necessary).

Knowing what tests to order is only about 5% of the problem. Interpreting the tests, diagnosing, and managing your lab results is the other 95% when it comes to thyroid.

And guess what? It doesn't matter if your doctor orders the right tests for you, if he or she doesn't know how to interpret them correctly you both are going to end up frustrated.

To properly evaluate the thyroid, you need the following tests (make sure you ask for these tests by your doctor! If he/she won't do it then simply move on to another doctor or order them through me - don't waste your time with doctors who won't work with you.

### **A. TSH (Thyroid Stimulating Hormone)**

Thyroid Stimulating Hormone is released by the pituitary gland. This is the most commonly used (but not the most indicative) marker of thyroid health. TSH increases when T4 drops as the pituitary gland tries to “wake up” the thyroid by releasing more TSH to stimulate T4 production. In hypothyroid cases, TSH is typically high. This is a good starting point of a diagnosis but should not be used as the only marker.

\*TSH alone is not enough to manage your thyroid condition. There is a big push from the thyroid advocacy world against the blindness of doctors of using TSH to treat thyroid patients.

## **B. Free T4**

Free T4 is produced by the thyroid gland when it binds with iodine. It is largely an inactive hormone that gets converted to T3, which is the active hormone.

## **C. Free T3**

Free T3 is the best marker for measuring the amount of an active hormone available for our body cells to utilize.

## **D. Reverse T3**

When the body is under stress, instead of converting T4 to T3 (the active form of thyroid hormone), the body conserves energy by making what is known as Reverse T3 (rT3), an inactive form of the T3 hormone. A high rT3 will block T3 from entering the cells making all symptoms of hypothyroidism even worse.

## **E. TPO antibodies (Thyroid Peroxidase)**

Thyroid peroxidase antibodies are an excellent marker to indicate the inflammation level of the immune system. TPOs are elevated in 75% of Hashimoto's patients. They are often not tested by doctors as there is no medication, they can prescribe to lower the antibodies.

## **F. Thyroglobulin Antibodies**

Thyroglobulin antibodies are also called anti-thyroglobulin antibodies (ATA). They attack thyroglobulin is the functional backbone of thyroid hormone. This will result in an autoimmune hypothyroidism called Hashimoto's thyroiditis. Since the thyroid produces TG, the antibodies chew up the thyroid tissue creating nodules, goiters and overall destruction. This is involved in 70% of cases of autoimmune thyroid disorders.

## Interpretation

So now that you have them in hand, let's go over how to interpret them:

- TSH: Your TSH should be below 2. If it is above 2 then you have a thyroid problem, period. HOWEVER, a TSH below 2 does not mean your thyroid is normal.
- Free T3: Should be in the upper 1/3 of the reference range for some people it may even be OVER!
- Free T4: Should be in the upper 1/3 of the reference range. This assumes that you are NOT taking T3 only thyroid medication. T3 only thyroid medication and even desiccated T4/T3 medication will drop your free T4 and this isn't necessarily a problem.
- Reverse T3: Should be below 15. High levels of reverse T3 indicate peripheral thyroid conversion, meaning your body isn't activating or turning on your thyroid.
- Ratio: Free T3 to Reverse T3 ratio (calculated by dividing Free t3/reverse T3): Should be  $> 0.2$  or 20 (depending on the units your lab uses). If your ratio is  $< 0.2$  then you have thyroid resistance. This is another way to help you determine if you are converting T4 to T3.
- TPO and Thyroglobulin antibodies: Should be below 15 or below 30 (they should be as low as possible).

If your lab tests are out of these "optimal" ranges, guess what? You most likely DO have a thyroid problem.



## Extras

These tests are important to get when determining and treating a thyroid issue.

- Sex hormone binding globulin: Should be 60-70 in Women, if it's less than that you have either too little estrogen or too little thyroid hormone. High SHBG means you might be getting too much thyroid hormone or that you have too much estrogen.
- Ferritin: Most Hypothyroid and Hashimoto's patients feel better with ferritin levels above 70 (Too much is a bad thing though so don't just take iron to raise it). Ferritin helps activate thyroid at the cellular level and ferritin is required for hair regrowth in thyroid patients!
- Serum Iron: Should be in the middle of the reference range. Iron is required for oxygen consumption and energy production. Low iron = low energy.
- TIBC: Total iron binding capacity (TIBC) is a blood test to see if you have too much or too little iron in your blood. Iron moves through the blood attached to a protein called transferrin. This test helps your health care provider know how well that protein can carry iron in your blood.
- Adrenal Stress Profile ( four point cortisol and DHEA saliva test).  
Stress hormones affect the enzymes that convert T4 to T3. Remember that Free T3 is the active form of the hormone. This imbalance essentially works to put the brakes on all of your metabolic processes, slowing them down and causing hypothyroid symptoms. Also released in the stress response are inflammatory immune cells called cytokines, which make thyroid receptors [less sensitive to thyroid hormones](#). This means that even if you're taking thyroid medication and your thyroid hormone levels are normal, you can still be suffering from underactive thyroid symptoms. Saliva hormone testing can not be done by majority of medical doctors. See above on saliva testing.

You can order your hormone saliva test kit, including adrenal stress profile and thyroid panel from: <https://karenmartel.com/hormone-test-kits/>

### **Your Checklist**

- ✓ **TSH**
- ✓ **Free T3**
- ✓ **Free T4**
- ✓ **Reverse T3**
- ✓ **TPO**
- ✓ **Thyroglobulin**

### **Extras**

- ✓ **Ferritin**
- ✓ **TIBC**
- ✓ **SHBG**
- ✓ **Iron**
- ✓ **Adrenal Stress Profile**

**Est. price:** this will differ between practitioners and countries of origin. Most of the above tests, minus the adrenal stress profile, can be done for free with your medical doctor.

\*If you are in Canada doctors will not test past TSH unless the TSH comes back out of range. Therefore, most people will have to pay out of pocket to get a full thyroid panel. Canadian doctors do not have access to test for reverse T3 and that will have to be done through your naturopathic doctor. Est. price per thyroid hormone \$25.

Blood spot

### **A. Blood spot thyroid**

Dried blood spot is a form of collection where patients place blood drops on a filter card after a finger prick with a lancet. Once dry, blood spot cards are extremely stable for shipment and storage. Can be done from the comforts of your own home without the need of a doctor's lab requisition.

### **Your Checklist**

- ✓ TSH
- ✓ Free T3
- ✓ Free T4
- ✓ Thyroid Peroxidase

Est. price: \$175 USD

Order your test kit at <https://karenmartel.com/hormone-test-kits/>

## **At Home:**

### **Basal Body Temperature Test**

Low body temperature is one of the hallmark symptoms of low thyroid function. People with low thyroid function often find themselves much colder than other people in the room.

You can use an old mercury thermometer. But seeing as how they are not as readily available anymore, your second-best thermometer is a “Geratherm”, which you can purchase online [here](#), or possibly at a pharmacy or drug store near you.

You want to try to avoid digital thermometers if possible as they will be the least accurate method.

Generally, the average temperature of an adult with a healthy thyroid and a healthy metabolism is 98.6 degrees Fahrenheit or 37.0 degrees Celsius.

### **Here’s how to do the basal body temperature test:**

1. Shake down the thermometer before going to bed and place the thermometer within arm’s reach from your bed. You will be using it first thing in the morning before getting out of bed.
2. First thing upon arising, place the thermometer underneath your tongue and lay in bed for 7-10 minutes. Do not get up to go to the bathroom, brush your teeth or drink a glass of water. It is important that you wake up, put the thermometer under your tongue, and remain still in bed for 10 minutes for this to be accurate.
3. Once the 10 minutes are up, record your temperature.
4. Midafternoon around 3pm sit quietly for 10 minutes before taking temperature. Don’t eat or drink during this time. Put the thermometer under your tongue for 7-10 minutes.

5. Ideally, you will do this for a minimum of five consecutive days so you can get a somewhat reliable average daily temperature.

If your average temperature over a five-day period is less than 97.8 and/or your midafternoon temperature is consistently below 98.6 degrees in the afternoon, there is a chance you may have a low metabolic rate due to low thyroid hormone function.

\*Try to test away from your period and ovulation as that can affect your temps.

Taking your body temperature is an excellent way to help you determine if you are on the right dose of thyroid medication! If you are currently taking thyroid medication and your temps are consistently low that is indication that you may need a dose increase. It can also point towards adrenal insufficiency. Hence getting the adrenal profile is key to recovering your metabolism as well as thyroid!

\*There are other factors that can cause low readings on your temperature for example low cortisol and illness.