

# Thyroid Blood Tests Don't Always Tell the Whole Story

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It's a common scenario. A patient complains of fatigue, weight gain, brain fog, thinning hair, and feeling cold all the time – common symptoms of hypothyroidism, or too little thyroid hormone. But the “standard” TSH test comes back normal, and the doctor tells the patient that he or she is “fine,” with no explanation for their miserable physical symptoms.

The problem is not in the patient's head. It's in the TSH test.

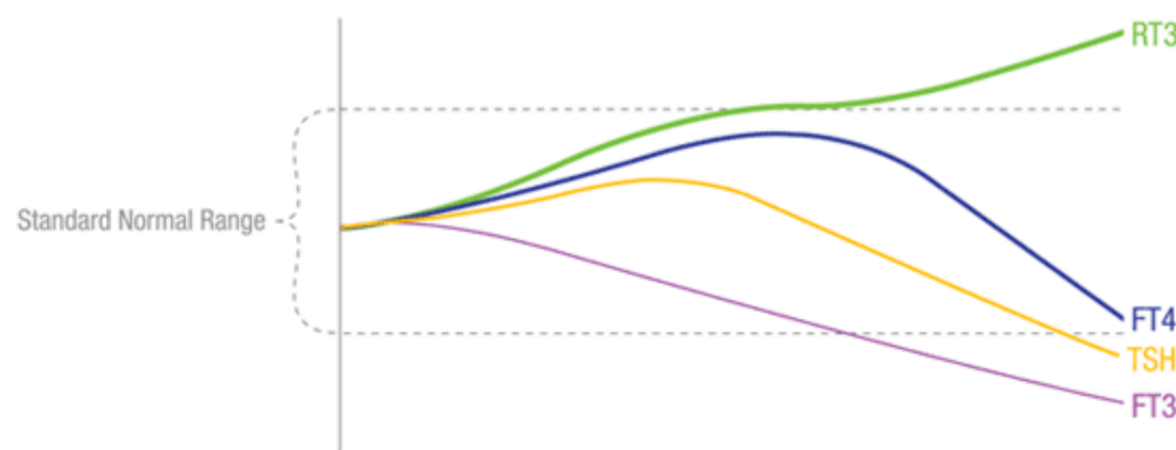
The TSH test, thought to be the gold standard in thyroid diagnosis and treatment, often leaves a patient untreated or undertreated. TSH stands for Thyroid Stimulating Hormone, which is a hormone produced by the pituitary to tell the thyroid how much thyroid hormone to make. Typically, a high TSH indicates too little thyroid hormone in the body, while a low TSH indicates too much. The key word here is “typically.” But this isn't always the case.

Several issues can make TSH levels decrease even while the patient is suffering from low tissue thyroid levels, and thus, is hypothyroid. Inflammation, depression, chronic illness, chronic dieting, obesity, stress, chronic fatigue syndrome, fibromyalgia, diabetes, insulin resistance, leptin resistance, and even normal aging can all cause the TSH to decrease.

The chart below shows the effect of several physical issues on thyroid hormone levels, including TSH, Free T3 (FT3), Free T4 (FT4), and Reverse T3 (RT3). As you can see, when the physical issues are absent or mild, the thyroid hormones all appear to be in the normal range. But slide the bar further to the right, at the substantial or severe level, and the hormone levels change dramatically.

Associated serum thyroid levels with progressively decreasing tissue thyroid levels due to stress, illness, depression, calorie reduction or aging (Why standard blood tests lack sensitivity to detect low thyroid in the presence of such conditions)

Demonstrates why TSH levels lack the accuracy to detect cellular levels and the free T3/reverse T3 ratio is the most accurate method to determine cellular thyroid levels in the presence of physiologic stress, illness, depression or obesity.



|   |           |                         |                 |             |
|---|-----------|-------------------------|-----------------|-------------|
| Severity of illness/depression stress/calorie reduction | none      | mild                    | moderate        | severe      |
| Normal aging  | young     | middle                  | older           | elderly     |
| Tissue hypothyroidism (diminished tissue T3 level)      | none/mild | mild/moderate           | moderate/severe | severe      |
| Inaccuracy of TSH and T4 levels                         | none      | potentially significant | significant     | substantial |
| Diminished utilization of T4                            | none/mild | mild/moderate           | moderate/severe | severe      |

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At the middle of the chart, where the physical issues begin to go beyond “mild,” the TSH starts to decrease until it finally is below the normal range. This decrease in TSH would typically be interpreted as the patient having too much thyroid hormone, and the doctor would decrease any thyroid medication. But if you look at the accompanying FT4 and FT3, you'll see these hormones also decrease. This reduction in FT4 and FT3 clearly indicates the patient is becoming hypothyroid, not hyperthyroid. FT4 could be considered the body's “storage” thyroid hormone, as it must be converted to FT3 for the body to have energy and the metabolism to work correctly.

Reverse T3 (RT3) levels are also important to examine. Reverse T3 is a marker for reduced T4 to T3 conversion. T4 can either be converted to T3 (energy) or RT3, which is the inactive form of T3 and has antithyroid effects. If too much RT3 is made in proportion to FT3, the excess RT3 blocks the T4 from getting into the cells, effectively blocking the effect of the thyroid.

So how do you get around this issue with the TSH test in the presence of physiological stress, illness, depression or obesity, or in the elderly patient?

The best indicator of thyroid hormone levels in the cells is the FT3/RT3 ratio. In healthy individuals, the RT3 is usually below 250 pg/ml, and the Free T3/Reverse T3 ratio is greater than 1.8 (if Free T3 is in ng/dl) or 0.018 (if Free T3 is in pg/ml).

## Topics

[Why Doesn't my Endocrinologist Know all of This?](#)

[Are we getting what we want from TSH testing?](#)

[Deiodinases: Understanding Local Control of Thyroid Hormones](#)

[Stress](#)

[Depression](#)

[Chronic Pain](#)

[Dieting/Weight Loss/Obesity/Insulin Resistance](#)

[Leptin](#)

[Exercise](#)

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[Inflammation Associated with Common Conditions](#)

[Toxins](#)

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[Growth Hormone](#)

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## Thyroid Hormone Transport

[Conditions Associated with Abnormal Thyroid Transport](#)

[Pituitary Thyroid Transport Determines TSH Levels](#)

[Stress](#)

[Dieting/Weight Loss/Obesity/Insulin Resistance](#)

[Reverse T3](#)

[Treatment](#)

[Conclusion](#)

If you feel tired all the time and have the typical symptoms of hypothyroidism, and also have any of the physical issues mentioned, perhaps you should ask your doctor to look deeper into your thyroid health. All it takes is a simple blood test to measure your Free T3/Reverse T3 ratio. Getting the right tests and diagnosis could mean the difference between living a life with energy or suffering with unnecessary fatigue and other health issues.

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