

## Is 98.6° Really Normal?

During the 1860s, an extensive study of over 25,000 patients revealed that the average temperature in the “normal” range was 98.6°F. Based on that study, we have accepted 98.6° as our “normal” temperature, with variations being cause for concern of illness or infection. However, in the *Townsend Letter for Doctors*, Dr. Alan Gaby cites a more recent study, which determined that the average body temperature was 98.2°F — somewhat lower than what we typically consider “normal.”

Some medical professionals believe that an increased prevalence of mild to moderate hypothyroidism may be contributing to the lowering of our “normal” body temperature. In other words, “normal” does not necessarily mean optimal. In fact, using thousands of patients as a basis for study, Dr. Broda Barnes (author of the book *Hypothyroidism: The Unsuspecting Illness*) promoted a simple body temperature test as the most reliable indicator of a potential thyroid problem.

Subtle hypothyroidism has become increasingly common throughout the 20<sup>th</sup> century. Dr. Gaby suggests that this apparent epidemic could be the result of several factors. Two such factors are a possible thyroid hormone resistance

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induced by pollutants, and the possibility that we are evolving into a population with a propensity for hypothyroidism. Dr. Gaby explains that, in the past, people with mild hypothyroidism typically died from fatal bouts of pneumonia or other infections before their thyroid condition was diagnosed; today, many of these other illnesses are cured with antibiotics, allowing the hypothyroidism to surface. Therefore, instead of dying prematurely, these individuals survive to propagate an increasingly large family tree with a tendency toward hypothyroidism. It seems that hypothyroidism is an inherited disorder, especially for women.

### **Understanding Thyroid Function**

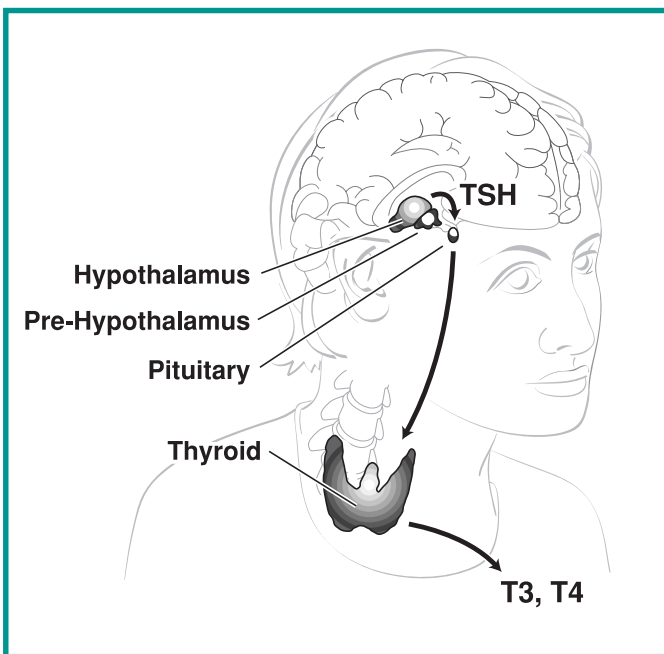
The thyroid gland produces thyroid hormones that regulate the body’s metabolism. The principal hormones secreted by the thyroid gland are:

- triiodothyronine (T3)
- thyroxine (T4).

Because nearly 80% of the thyroid gland’s production is devoted to T4, thyroxine is often called “the thyroid hormone” (much the same way that estrogen is considered “the female hormone”). Nonetheless, triiodothyronine, or T3, is functionally the more important thyroid hormone. According to Dr. Joseph Mercola, “T3 does 90% of the work of the thyroid in the body.”

The thyroid, pituitary, and hypothalamus glands all play a role in producing thyroid hormones (see figure on page 2). The thyroid gland is stimulated to produce T3 and T4 by the pituitary gland’s production of Thyroid Stimulating Hormone (TSH). The pituitary gland, in turn, is regulated by the hypothalamus. Dr. Thierry Hertoghe indicates that there may even be a pre-hypothalamic influence on thyroid hormone production, but it is not yet widely understood.

Proper thyroid function requires conversion of T4 to T3, which is the metabolically active derivative of T4. This conversion takes place primarily in the liver and kidney, and is somewhat sensitive to nutrition and a variety of vitamin, mineral, or hormonal excesses or deficiencies (see *Imbalances That Can Affect T4 to T3 Conversion*). If the conversion of T4 to T3 is impaired such that there is a deficit of T3, symptoms of hypothyroidism may persist, even with thyroid treatment.



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*The liver and kidney are also important to thyroid function because they convert T4 to T3, which is the metabolically active derivative of T4.*

## Diagnosis

The most common method of diagnosing thyroid function is to measure TSH and T4, and sometimes T3, with a laboratory blood test. Blood tests may also be used to rule out other potential causes for a thyroid imbalance, such as a pituitary or adrenal deficiency. However, some healthcare practitioners feel that these tests are somewhat limited for determining thyroid function, and that their results can be misleading.

Cases of mild to moderate hypothyroidism are often missed because the range of “normal” test results is overly broad, and the measurement is not sensitive enough. In addition, thyroid hormone levels are not static. They vary significantly throughout the day and are influenced by a variety of factors, such as the potential imbalances that can result from diet and lifestyle, as identified in the box below.

Another problem with using blood tests to gauge thyroid function is that the tests typically measure the serum level, not the “free” or biochemically available portion of the thyroid hormones. The majority of the thyroid hormones circulate in the bloodstream, bound to a carrier protein. However, only the unbound or “free” portion of the hormone is available for use by body cells. Furthermore, conventional thyroid blood tests account for only the thyroid and pituitary glands’ roles in the process. There are other aspects of thyroid function that can go wrong, which such tests do not measure.

According to Dr. Barnes, “More information often can be brought to the physician with only the aid of an ordinary thermometer than can be obtained with all other thyroid function tests combined.” With years of study and the successful treatment of thousands of patients to back

### Imbalances That Can Affect T4 to T3 Conversion

#### Excesses

<b>Nutrition:</b>	High-fat Diet, High-protein Diet
<b>Trace Minerals:</b>	Cadmium, Lithium
<b>Hormones:</b>	Estrogen (natural or synthetic), Stress-related hormones such as Cortisol

#### Deficiencies

<b>Nutrition:</b>	Fasting, Starvation, Anorexia, Protein Calorie Malnutrition
<b>Trace Minerals:</b>	Selenium, Iodine, Iron, Zinc
<b>Vitamins:</b>	Riboflavin (B2)
<b>Hormones:</b>	T3, T4, TSH

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him, Dr. Barnes promotes the use of a simple, easy, temperature test for detecting thyroid problems (see *Basal Temperature Test*). While Dr. Barnes admits that it is not a perfect test for determining thyroid function, it has proven to be quite reliable at detecting mild to moderate hypothyroidism. In his experience, he noted that relatively few other conditions lower the basal temperature below normal (including pituitary or adrenal deficiencies, starvation, and some drugs), but these can be fairly easily ruled out.

### Symptoms

Undetected thyroid problems have plagued people for years, and continue to be an underlying cause for a variety of ailments that doctors hear about today. The onset of hypothyroidism is subtle, with symptoms gradually worsening over time, making it more obvious as people age. To further complicate matters, the symptoms of hypothyroidism are varied, affecting each individual differently, including:

- Excessive fatigue
- Increasing sensitivity to cold, feeling chilly even at normal room temperature
- Slow, rapid, or irregular heartbeat
- Menstrual problems, with possible infertility
- Weight-related problems, including difficulty losing weight, or unexplained weight gain or weight loss
- Fluid retention, especially around the eyes

## Basal Temperature Test

Almost 60 years ago, Dr. Broda Barnes developed a simple temperature test for detecting thyroid problems. This easy test can be performed at home, and has proven to be even more reliable than blood tests for detecting cases of mild to moderate hypothyroidism.

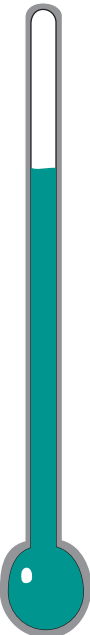
Menstruating women should take this test only on the second or third day of their menstrual flow. Young girls (pre-puberty), post-menopausal women, and males can take this test at any time of the month.

**Here's how you do it:**

1. Shake an ordinary thermometer down as far as it will go before placing it next to your bed.
2. In the morning, upon awakening and with as little movement as possible, place the thermometer under your armpit and lie quietly for ten minutes.

**Here's what it means:**

- ✓ If your temperature is **97.8°F to 98.2°F**, your thyroid is probably functioning normally.
- ✓ If your temperature is **above 98.2°F**, you may have an overactive thyroid (hyperthyroidism), or an infection.
- ✓ If your temperature is **below 97.8°F**, you may have low thyroid function (hypothyroidism).



- Coarse or brittle hair, with slow growth or excessive hair loss
- Skin problems such as dry, rough, scaly skin
- Mental impairment, including depression, inability to concentrate, and poor memory
- Decreased or minimal perspiration, even in hot weather or during exertion
- Constipation that is resistant to laxatives or magnesium supplements

- Infection, especially respiratory infections
- Muscle weakness
- Joint pain

Unfortunately, many health-care professionals still do not recognize these symptoms as being potentially related to thyroid function. This is another reason that hypothyroidism is often overlooked, remaining undetected until more severe symptoms develop.

## **Related Diseases**

Hypothyroidism is also often associated with other diseases, such as menstrual disorders (including infertility), heart disease, and osteoporosis.

### **Menstrual Disorders**

The fact that many menstrual irregularities are related to hypothyroidism has been commonly accepted for quite some time. As far back as 1914, Dr. Eugene Hertoghe, a distinguished Belgian endocrinologist, noted “The thyroid has a great influence on menstruation, pregnancy, lactation, and even uterine involution after childbirth.” And in 1982, Dr. Broda Barnes confirmed that “There are many possible causes for menstrual difficulties. Among them are ovarian cysts, fibroids, and cervical polyps, [as well as] endometriosis ... But in the vast majority of women, there is no evidence of any [organ-related] problem. What is commonly evident if it is sought is low thyroid function.”

Dr. Barnes continued, “Forty years ago, ... leading gynecologists ... were reporting that thyroid [therapy] had cured more menstrual disorders than all other medications combined. Unfortunately, that lesson seems to have been largely lost.” Even more unfortunately for the many women who suffer from menstrual problems, that lesson still seems lost today, almost twenty years later.

Reliance solely on blood testing for determining thyroid deficiencies, coupled with the development and use of synthetic thyroid hormones, has caused many menstrual-related thyroid disorders to go untreated, according to Dr. Barnes. He believed and practiced that, without evidence of an organ-related cause, most menstrual problems (including miscarriage and infertility) could be remedied with proper thyroid therapy. His book, *Hypothyroidism: The Unsuspecting Illness*, contains numerous anecdotes, examples, and case studies that demonstrate Dr. Barnes’ success rate. Some of this success was due to the fact that he looked at both members of a couple (not just the woman), and thereby recognized hypothyroidism in the father as a potential part of the problem.

Over the past few decades, it has been well documented that infertility is on the rise. There may be a link between the rise in untreated hypothyroidism and the rise in infertility. This possible connection warrants further research, especially in light of the success Dr. Barnes had with treating infertile couples.

### **Heart Disease**

Heart diseases may also be related to hypothyroidism. Thyroid secretions also control cholesterol levels, which means that hypothyroidism may be a primary contributor to atherosclerosis. Thyroid deficiencies can also lead to accelerated blood clotting (producing a clot that

may block a clogged artery), as well as increased blood pressure and excessive fatigue — all factors that can increase the risk of stroke or heart attack.

### **Osteoporosis**

Years ago, there was some concern that thyroid treatment could lead to osteoporosis. Even though this has not proven to be true, women are still warned about it today. In fact, according to Dr. Ray Peat in the *Townsend Letter for Doctors*, the opposite is more likely to be true. He states, “Hypothyroidism, whether natural or promoted by administered thyroxine, retards bone modeling and tissue repair in general.” Osteoporosis may result from hypothyroidism itself, or from thyroxine pills (which are only T4) *if there is poor conversion of T4 to T3*. Dr. Peat contends that the risk of osteoporosis is likely to be greater without administering the proper thyroid hormone therapy, as explained below.

### **Treatment**

The current method of treatment for hypothyroidism is some form of thyroid hormone replacement (synthetic or natural) that provides either T3 or T4, or a combination of the two.

The most commonly prescribed thyroid therapy is synthetic levothyroxine or L-thyroxine (with brand names such as Synthroid®, Levothroid®, or Levoxyl®), which contains only T4. Synthetic T3 is available as Cytomel®.

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Although the predominant treatment is synthetic T4, some medical practitioners question the value of T4-only treatment. In fact, a recent *New England Journal of Medicine* article reinforced the significance of T3 in treating hypothyroidism, which lends support to those practitioners' concerns.

For example, Dr. Mercola states that many people being treated for hypothyroidism with T4 are actually being undertreated. He suggests that the excessive reliance on single-thyroid treatments (T4) and the subsequent blood test results that indicate a "normal" TSH level are the primary reasons for the oversight.

Ray Peat, PhD, adds that "If the liver is the main source of the thyroid problem, then thyroxine pills [which are only T4] can make the problem worse ..." because the liver is not converting T4 to T3, and the treatment is further suppressing T3 production from the thyroid. In the majority of cases, it seems that the significance of T3 — the biochemically active

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As mentioned previously, there are many factors that can impair conversion of T4 to T3. A significant number of patients do not convert T4 to T3 at a sufficient rate (or at all), necessitating a treatment that combines both hormones. In fact, some practitioners do use compounded mixtures that include both T3 and T4.

Another alternative is natural thyroid therapy, which is desiccated (or dried) animal thyroid, with brand names such as Armour® thyroid. Some practitioners believe the natural thyroid more closely resembles the entire range of human thyroid hormones, including both T3 and T4, as

well as other potentially active thyroid hormones (see *Is There a 3<sup>rd</sup> Thyroid Hormone?* below). Because T3 is both fast-acting and has a short half-life, some practitioners encourage administering natural thyroid treatments twice daily instead of once.

One reason synthetic T4 persists as the conventional treatment is a perception that it may be more stable than the natural thyroids. However, Dr. Peat states that "Armour thyroid, USP, is often said to be of imprecise dosage, but in fact every batch is biologically standardized, and studies have shown it to be reliably within 1% of the labeled potency. The best known brand of the supposedly chemically precise levothyroxine, however, was for a long time 30% below the labeled potency."

### **Is There a 3<sup>rd</sup> Thyroid Hormone?**

Over the course of his many years in practice, the late Dr. Barnes noted that many patients who were being treated with synthetic thyroxine (T4) or a combination of T3 and T4 complained of residual symptoms, specifically dry skin and retention of fluid. However, when their therapy was modified to the natural Armour desiccated thyroid, which more closely resembles the full range of human thyroid hormones, both symptoms disappeared within one to two months. These observations suggested to Dr. Barnes that "there may be a diuretic factor in the thyroid gland separate from T4 and T3." He suggested that the possibility of additional thyroid hormones warrants more research.

### **Conclusions**

Overt hypothyroidism is fairly easy to detect. But, for the majority of people who have this disease in mild to moderate forms, the diagnosis is often missed. Once diagnosed, proper thyroid hormone replacement therapy can remedy the majority of symptoms.

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Not all people with hypothyroidism will exhibit the same symptoms. The symptoms that do surface will affect people to different degrees, from very severe to very mild. In addition, thyroid hormone levels are not a reliable indicator of how bad (or good) you feel. Some people with very “mild” deviations in their laboratory thyroid test results will feel just fine, while others will have any number of symptoms. Therefore, it is important for both you and your healthcare practitioner to keep in mind that the goal is not necessarily to force the blood test results into the “normal” range, but to make you feel better as well!

### For More Information

If you would like to learn more about hypothyroidism, you may refer to the following sources used in researching this article:

- Dr. Alan R. Gaby, MD, “Literature Review & Commentary,” *Townsend Letter for Doctors*, July 1997.

- Dr. Broda O. Barnes, MD, and Lawrence Galton, *Hypothyroidism: The Unsuspecting Illness*, Harper and Row, Publishers, New York, 1976
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- Dr. Thierry Hertoghe, “Nutritional Influences on Hormone Levels” at the Broda O. Barnes, MD Foundation, Inc.’s Annual Spring Conference, March 1996.
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- Ray Peat, PhD, “Thyroid: Misconceptions,” *Townsend Letter for Doctors*, November 1993.
- Drs. Bunevicius, Kazanavicius, Zalinkevicius and Prange, “Effects of Thyroxine as Compared with Thyroxine Plus Triiodothyronine in Patients with Hypothyroidism,” *New England Journal of Medicine*, 1999; 340:424-9.
- Stephen E. Langer and James F. Scheer, *Solved: The Riddle of Illness*, Keats Publishing, April 1995.

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**Illustrator:** Amelia Janes, Midwest Educational Graphics.

**Writer:** Kathleen McCormick,  
McCormick Communications, Inc.