

# THYROID TESTING

## INFORMATION FOR PATIENTS



### Thyroid Hormones

Thyroid hormones are essential for proper development of all cells. They regulate protein, fat, and carbohydrate metabolism, and affect how human cells use energy. The thyroid hormones that work in tissue are T3 and T4.

#### Triiodothyronine (T3)

T3 is the form of thyroid hormone that is active in the body. T3 is produced in the thyroid gland and is also made from T4. Low levels of T3 in a 24-hour urine sample correlate strongly with symptoms of low thyroid function.

#### Thyroxine (T4)

T4 is released by the thyroid gland and is converted into T3 by the liver, kidney and other target tissues.

#### Selenium

Selenium is required for the body to convert T4 into T3.

### Common Thyroid Related Conditions

Hormones produced by the thyroid gland are involved in regulating heart rate, body temperature, blood pressure, and weight. Thyroid hormones can also increase energy, help food move through the gastrointestinal tract and increase perspiration. Given their broad effects, deficiencies of thyroid hormone can result in a number of health conditions including:

**Depression:** Low thyroid function reduces the effect of serotonin in the brain, and reduced serotonin can lead to depression. Correcting underlying thyroid imbalance may improve or, in some cases, even eliminate symptoms of depression.

**Fatigue:** Severe tiredness and exhaustion can be symptoms of low thyroid function. These may also be signs of poor adrenal function, so talk with your health care provider to decide whether a thyroid test or an adrenal function test is best for you.

**Coldness:** Because thyroid hormone is needed to get the body's 'furnace' working, low thyroid function often results in low body temperature. In fact, monitoring body temperature is another way to assess thyroid function. Patients with consistently cold hands and feet may have a poorly functioning thyroid.

**Arthritis and muscle cramps:** Low levels of thyroid hormone can cause deposits to form in joints and tissues. Most cases of joint pain related to hypothyroidism involve knees and hands. Muscle cramps can occur in almost any muscle.

**Headaches:** The headaches associated with hypothyroidism tend to be mild but continuous, and often affect both sides of the head. It is not known why people with low thyroid function are more prone to headaches.

**Weight gain:** A lack of thyroid hormone can cause weight gain, even though appetite may decrease. The weight gain occurs because there is insufficient thyroid hormone to regulate protein, fat and carbohydrate metabolism.

**Poor reflexes:** A poor Achilles tendon reflex (back of the ankle) is often associated with low thyroid function. Your physician should be able to tell you whether you have a good reflex response or not. Note that consumption of caffeine-containing beverages can speed up the reflex, but does not improve thyroid function. A poor Achilles tendon reflex also occurs in disease states like diabetes and neuropathy.

### Why Do A Urinary Thyroid Assessment?

- TSH (thyroid stimulating hormone) is a hormone secreted in the brain to control thyroid function. A blood test for TSH is still considered the 'gold standard' test for diagnosing thyroid disease however, many women and men have normal serum TSH levels despite having classic symptoms of low thyroid function. The urinary thyroid assessment offers an alternate means of measuring thyroid function when the patient is symptomatic but conventional serum tests are normal.
- If heavy metal toxicity or high levels of cortisol are present, TSH levels in serum may be normal, even if thyroid function is poor.
- Patients who are taking thyroid hormones (e.g. Synthroid or Eltroxin) may experience low thyroid symptoms even though serum TSH is normal. This is because the serum TSH frequently fails to reflect how well supplemented thyroid hormone is being delivered to tissue.

## Why Test?

Good health has a lot to do with maintaining balance: the right balance of work and play, the right balance of nutrients in the diet, and the right kinds of foods.

Because thyroid hormones affect all systems, thyroid disease can result in significant health issues. Therefore, it is extremely important to maintain good thyroid function.

Rocky Mountain Analytical is committed to offering tests that identify hormone imbalances and other conditions - so they can be corrected before disease develops!

## About Rocky Mountain Analytical

Rocky Mountain Analytical is an accredited medical laboratory located in Calgary, Alberta. We started in 2002 with saliva hormone testing, and have since added numerous other tests including food allergy testing.

In 2008, we added hair element analysis to our test menu. Exposure to toxic elements may also affect thyroid function.

Ask your health care provider for more information about these or any other Rocky Mountain Analytical tests.

**We're on the web!**  
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## What Do Urinary Thyroid Assessment Results Mean?

The Urinary Thyroid Assessment reports the levels of T3, T4, and selenium in a 24-hour collection of urine. Because the urine sample is collected over a full day, it is easier to measure T3 and T4 in urine than to measure the very small quantities found in serum. However, many factors affect the levels of T3 and T4 in urine, so the relationship between T3 and T4 in urine and thyroid symptoms is not always clear-cut. Nevertheless, selenium and T4 levels in urine correlate well with symptoms of hypothyroidism. This test can also be used to monitor how well thyroid hormone therapy is working.

Depending on the degree of deficiency, low thyroid function may be treated with nutritional supplements or with prescription thyroid hormones. Your health care provider may also recommend some lifestyle changes to improve overall health and assist thyroid function. Other laboratory tests may be recommended to look for hidden causes of thyroid dysfunction.

### Supplements

- Supplementation with iodine, selenium, and/or the amino acid tyrosine supports production of the thyroid hormones T4 and T3.
- The herb guggul has been shown to increase production of T3.
- Thyroid extracts from animals may also be recommended by your health care provider to help support thyroid function.

### Hormone Therapy

- Levothyroxine is the name for the thyroid hormone T4, which is sold by prescription in Canada under the brand names of Eltroxin and Synthroid.
- Liothyronine is the name for the thyroid hormone T3, which is sold in Canada under the brand name of Cytomel.
- There is a standardized porcine thyroid extract available on prescription, called Thyroid.<sup>Pr</sup> Thyroid<sup>Pr</sup> contains a prescription strength mixture of T3 and T4 hormones in a ratio similar to what occurs in the body.

### Lifestyle

- Learning to manage stress can help thyroid function. High levels of the stress hormone cortisol can cause TSH levels to fall into normal range even if hypothyroidism is present. Cortisol can also reduce levels of the active thyroid hormone, T3.
- Limit or eliminate exposure to toxic metals (e.g. cadmium, arsenic, mercury), environmental pollutants, and free radicals as these can affect thyroid hormone production.
- Reduce alcohol intake as alcohol may cause the body to retain more toxic metals like cadmium, which can affect thyroid hormone levels.

## Hyperthyroidism

Hyperthyroidism (overactive thyroid) is much less common than hypothyroidism (low thyroid function). Disease progression is more gradual with hypothyroidism than with hyperthyroidism, and the Urinary Thyroid Assessment is effective at uncovering low thyroid function in its early stages. Hyperthyroidism progresses more rapidly and is better diagnosed through conventional blood tests.

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