

Triiodothyronine, Free (FT3)

MDL Test Number: 616

Methodology: Immunoassay

CPT Codes: 84481 x 1



Specimen Collection Platform:

Serum in Serum Separator Tube (SST)

Turnaround Time:

24 - 72 hours

Stability:

Room temperature

Test Additions*:

30 days to add tests



What is Free T3?

Triiodothyronine, usually shortened to T3, is the more active of the two thyroid hormones. Only a small share of it is made by the thyroid gland in the front of the neck. Most is produced elsewhere in the body, where tissues convert the other thyroid hormone, thyroxine (T4), into

T3. Almost all of it then travels attached to carrier proteins, which act as a reservoir and keep the supply steady. That leaves only a very small fraction — roughly a quarter of one percent — unattached at any moment. That fraction is what this test measures, and it is the part that matters: only free T3 can leave the bloodstream, enter tissues, and set the pace at which cells use energy.

Because carrier proteins hold the reserve rather than the working supply, the free level stays inside a narrow band even when the amount of carrier protein changes a great deal. That is the practical difference between this test and a total T3. A total adds the carried and free portions together, so it rises and falls with the carrier protein, whether or not the thyroid has changed. Like total T3, free T3 does not swing through the day or across the menstrual cycle, so one adult range applies to women and men at every age.

Specimen Collection:



1. Immediately after blood collection, invert the tube(s) gently 5 times to ensure mixing of clot activator.



2. Allow the tube to rest upright for at least 30 minutes after collection to ensure proper clotting.



3. Centrifuge for at least 15 minutes at 2200-2500 RPM within one hour of collection.



4. Do not remove the stopper or pour off serum.

Why test for Free T3?

A healthcare provider may order a free T3 test to measure the active, unattached portion of triiodothyronine in the blood. Common reasons include:

- **Confirming an overactive thyroid** and judging how far it has gone, after a thyroid-stimulating hormone (TSH) result comes back below the expected range
- **Identifying a form of overactive thyroid** in which T3 rises while thyroxine stays normal, sometimes called T3 toxicosis. It would be missed by a test that measured thyroxine alone
- **Checking thyroid function during pregnancy**, before conception, or in a fertility work-up, where carrier proteins are high, and a total T3 can be misleading
- **Sorting out symptoms that overlap heavily with gynecological ones.** Irregular, absent, or heavy periods, difficulty conceiving, recurrent pregnancy loss, fatigue, and weight change come from thyroid disease as readily as from a problem of the ovaries or uterus
- **Monitoring a patient taking liothyronine**, the synthetic form of T3, alone or with thyroid hormone replacement, to judge whether the current dose is holding levels where they should be
- **Investigating an overactive thyroid**, whether from Graves' disease or from a nodule or goiter that has begun producing hormone on its own



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Special Instructions:

- **Pregnancy, estrogen, and hormonal contraceptives:** Estrogen raises the amount of carrier protein in the blood, which is why a total T3 can look high during pregnancy or on estrogen therapy while the thyroid is healthy. Free T3 largely does not follow that shift, which is one reason it is preferred here. Patients should still say whether they are pregnant, because in pregnancy, thyroid results are judged against what is expected for that stage.
- **Recent heparin treatment:** Heparin, a blood thinner given in hospitals and infusion clinics, affects free T3 both inside the body and in the sample itself. Blood should not be drawn during heparin treatment or soon after a dose, so patients should tell the ordering provider if they are receiving it.
- **Thyroid medication timing:** Liothyronine is absorbed and cleared quickly, so a sample drawn in the hours after a dose can read considerably higher than the level the patient sits at for most of the day. Patients taking it should tell the laboratory when they last took a dose and keep that timing consistent from one test to the next.
- **Biotin supplements:** Biotin, sold on its own as vitamin B7 and included in many hair, skin, and nail products, interferes with this test above the manufacturer's stated threshold of 1500 nanograms per milliliter. No stop-taking interval has been established, so patients should tell the ordering provider about any biotin they take and follow their advice on timing.
- **Comparing results over time:** Free T3 methods differ from one another more than most, and the same sample can give different numbers on different systems. When results are tracked over time, use the same test at the same laboratory so the comparison is meaningful.

Limitations:

Every laboratory test has limits. For free T3, the main ones are:

- Free T3 works mainly as a confirmatory test for an overactive thyroid and is of limited value in an underactive one, where a result inside the expected range does not rule the condition out. The healthy and overactive ranges can also overlap, so the result is judged alongside a thyroid-stimulating hormone (TSH) measurement rather than by itself.
- Samples with a high free T3 cannot be diluted and re-measured, because diluting changes the balance between free hormone and hormone held on carrier proteins. A result above the top of the measured range is reported as being above that point rather than as an exact number.
- Free T3 is far less affected by carrier proteins than total T3, but it is not entirely free of them. An uncommon inherited condition that changes how tightly albumin — a major blood protein — holds thyroid hormone can make a direct measurement misleading. So can antibodies against T3 itself, and medicines that affect how T3 binds.
- When a patient is seriously ill from something unrelated to the thyroid, results become difficult to interpret because both the hormone level and the body's control of it shift during the illness. The manufacturer recommends a TSH measurement as confirmation there.
- A sample containing broken-down red blood cells (hemolysis) may have been mishandled between the draw and the laboratory, so results from such a sample are interpreted with caution. A heavily fatty sample needs additional processing first. A small number of patients also carry natural antibodies in their blood that can produce an unexpected result. They are most often people who work closely with animals, or who have had certain antibody-based treatments.
- A free T3 result is one piece of a larger picture. It is meant to be read together with the patient's symptoms, medical history, and other test results — never on its own.

Reference Range(s):

Free T3 is measured in picograms per milliliter (pg/mL). One adult range covers women and men and does not shift with age, because the thyroid is not governed by sex hormones or by the reproductive cycle. The manufacturer established this range in adults whose thyroid was working normally. The interval below is specific to serum, which is the sample type this laboratory reports:

- **Adults** (normal thyroid function, serum): **1.8–4.2 pg/mL (2.8–6.5 pmol/L)**

A result outside these ranges is not automatically a problem, and a result inside them does not rule one out. Only the ordering provider can interpret what a given number means for a given patient. Patients should always go by the reference range printed on their own laboratory report.

Analyte	Disorder	Expected Value*
Free T3	Hyperthyroidism (Graves' disease)	↑↑
Free T3	T3 toxicosis	↑
Free T3	Subclinical hyperthyroidism	N
Free T3	Underactive thyroid (Hashimoto)	V
Free T3	Severe non-thyroidal illness	↓

*N – Normal Range, V – Variable, ↓ – Decreased, ↑ – Increased, ↑↑ – Markedly Increased.

What are some references that discuss the medical necessity of testing Free T3?

1. Ross DS, et al. 2016 American Thyroid Association guidelines for diagnosis and management of hyperthyroidism and other causes of thyrotoxicosis. *Thyroid*, **26**, 1343–1421 (2016).
2. Chaker L, et al. Hypothyroidism. *Nat Rev Dis Primers*, **8**, 30 (2022).
3. Jonklaas J, et al. Evidence-based use of levothyroxine/liothyronine combinations in treating hypothyroidism: a consensus document. *Thyroid*, **31**, 156–182 (2021).
4. Fliers E, Boelen A. An update on non-thyroidal illness syndrome. *J Endocrinol Invest*, **44**, 1597–1607 (2021).
5. Korevaar T, et al. American Thyroid Association 2026 guidelines for thyroid disease in preconception, pregnancy, and postpartum. *Thyroid*, **36**, 481–544 (2026).
6. Krassas GE, et al. Thyroid function and human reproductive health. *Endocr Rev*, **31**, 702–755 (2010).



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