
Lab Dept: Chemistry

Test Name: T4 (THYROXINE) TOTAL - PATIENTS <1 YEAR

General Information

Lab Order Codes: TT4M

Synonyms: T4, Total; Thyroxine, Total

CPT Codes: 84436 - Thyroxine; total

Test Includes: T4, Total level reported in mcg/dL.

Logistics

Test indications: Monitoring treatment with synthetic hormones (synthetic triiodothyronine [T3] will cause low total thyroxine [T4]). Monitoring treatment of hyperthyroidism with thiouracil and other anti-thyroid drugs. Index of thyroid function when the thyroxine-binding globulin (TBG) is normal and non-thyroidal illness is not present.

Lab Testing Sections: Chemistry - Sendouts

Referred to: Mayo Clinic Laboratories (Mayo: T4)

Phone Numbers: MIN Lab: 612-813-6280

STP Lab: 651-220-6550

Test Availability: Daily, 24 hours

Turnaround Time: 1 – 3 days

Special Instructions: See [Patient Preparation](#)

Specimen

Specimen Type: Blood

Container: SST (Gold, Marble or Red)

Draw Volume: 3 mL (Minimum: 2.25 mL) blood

Processed Volume: 1 mL (Minimum: 0.75) mL blood

Collection: Routine blood collection

Special Processing: Lab Staff: Centrifuge specimen, remove serum aliquot. Store and ship at refrigerated temperatures.

Patient Preparation: For 12 hours before specimen collection do not take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.

Sample Rejection: Gross hemolysis; unlabeled or mislabeled specimens

Interpretive

Reference Range:

Age:	Reference Range (mcg/dL):
0 – 5 days	5.0 – 18.5
6 days – 2 months	5.4 – 17.0
3 – 11 months	5.7 – 16.0
1 – 5 years	6.0 – 14.7
6 – 10 years	6.0 – 13.8
11 – 19 years	5.9 – 13.2
Adult <20 years	4.5 – 11.7
<p>Interpretation: Values of more than the age-related cutoff in children are seen in hyperthyroidism and in patients with acute thyroiditis.</p> <p>Values below 4.5 mcg/dL in adults or below the age-related cutoffs in children are typically seen in hypothyroidism, myxedema, cretinism, chronic thyroiditis, and occasionally, subacute thyroiditis.</p> <p>Increased total thyroxine (T4) is seen in pregnancy and patients who are on estrogen medication. These patients have increased total T4 levels due to increased thyroxine-binding globulin (TBG) levels. Decreased total T4 is seen in patients on treatment with anabolic steroids or nephrosis (decreased TBG levels).</p> <p>A thyrotropin-releasing hormone (TRH) stimulation test may be required for certain cases of hyperthyroidism.</p> <p>Clinical findings are necessary to determine if thyrotropin, TBG, or free T4 testing is needed.</p>	

Critical Values: N/A

Limitations:

In pregnancy, incomplete release of thyroxine (T4) from its binding proteins might result in falsely low total T4 levels. Therefore, total T4 should not be used as the only marker for thyroid function evaluation.

Thyrotropin (TSH) may be better than T4 as the initial test of thyroid status. TSH is elevated in primary hypothyroidism. TSH is low in primary hyperthyroidism.

Free T4 may more accurately measure the physiologic amount of T4.

Some patients who have been exposed to animal antigens, either in the environment or as part of treatment or imaging procedure, may have circulating anti-animal in primary hyperthyroidism.

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Some patients who have been exposed to animal antigens, either in the environment or as part of treatment or imaging procedure, may have circulating anti-animal antibodies present. These antibodies may interfere with the assay reagents to produce unreliable results.

Autoantibodies to thyroid hormones can interfere with testing.

Binding protein anomalies may cause values that deviate from the expected results. Pathological concentrations of binding proteins can lead to results outside the reference range, although the patient may be in a euthyroid state.

In rare cases, interference due to extremely high titers of antibodies to analyte-specific antibodies, ruthenium or streptavidin can occur.

Methodology:

Electrochemiluminescence Immunoassay

References:

[Mayo Clinic Laboratories](#) (January 2021)