



Roy Romanow Provincial Laboratory Testing Guidelines for the Diagnosis and Monitoring of Thyroid Disease

Background: Thyroid function tests are among the most commonly ordered laboratory tests in the province. In the past, investigations of thyroid disease required more than one test. Sensitive thyroid stimulating hormone (TSH) is the initial test in the diagnosis of hypothyroidism and hyperthyroidism. Free T4 is preferred over total T4 (TT4) measurement to confirm the diagnosis of hypothyroidism or hyperthyroidism. Free T4 (FT4) is the metabolically active form of Total T4 and is a better indicator of thyroid status than Total T4 because it is unaffected by protein binding abnormalities such as pregnancy and oral contraceptives. In some cases of hyperthyroidism the Free T3 may be a more sensitive indicator of hyperthyroidism, whereas the sensitivity of this test in hypothyroidism is very low.

Limitations:

1. These guidelines do not apply to neonates.
2. TSH is not reliable in the investigation of hypothalamic or pituitary disease.
3. TSH may be an unreliable indicator of thyroid status in patients with acute severe non-thyroidal illness (e.g. CCU and ICU patients) and the test is only recommended when there are clinical indicators of possible pre-existing thyroid disease.
4. Medications such as lithium, amiodarone, glucocorticoids, and dopamine affect TSH and may also affect the individual's thyroid status.

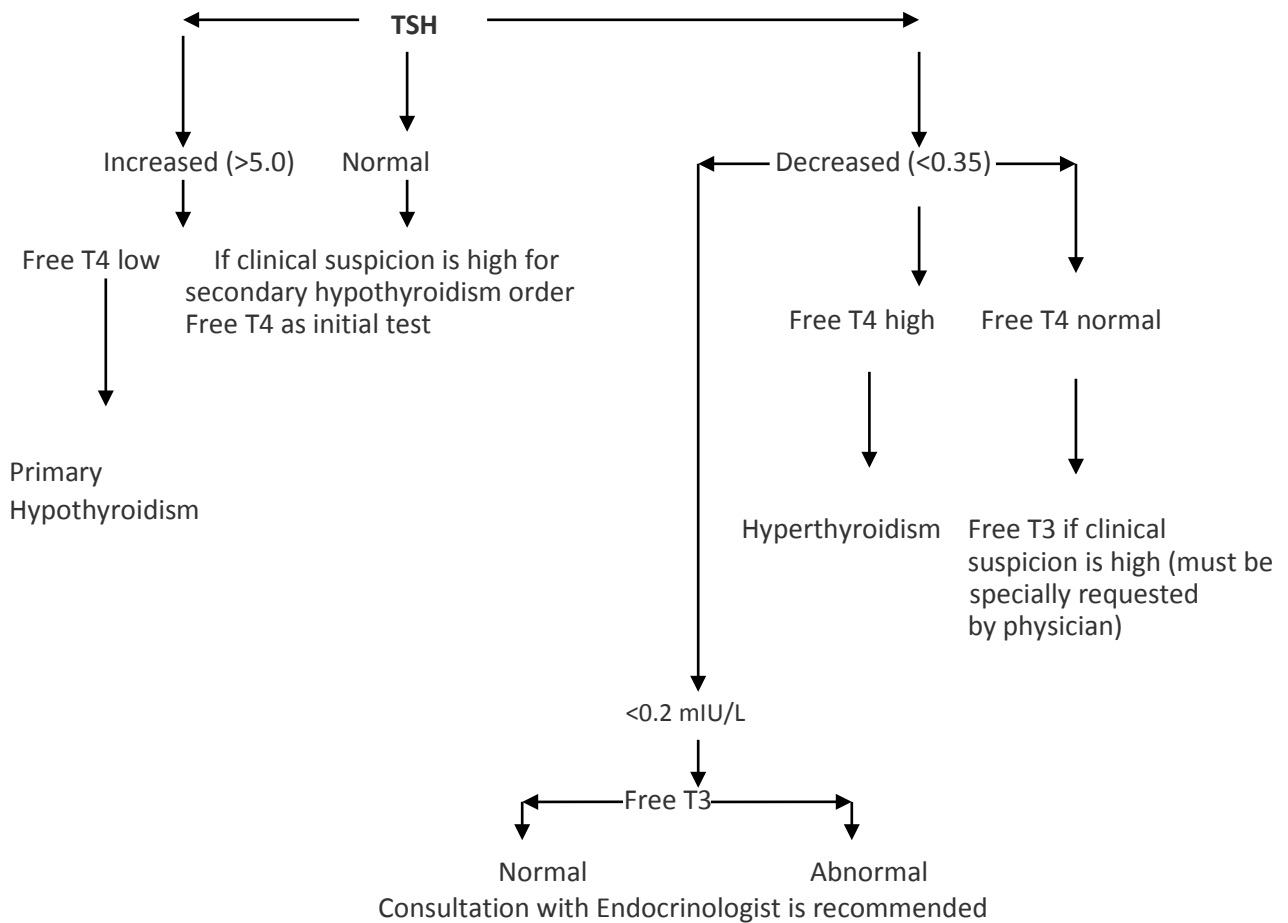
Clinical Aspects of Testing:

1. Screening asymptomatic, apparently healthy patients for thyroid disease is not considered indicated at this time.
2. Testing is indicated in the presence of symptoms or signs that are suggestive of thyroid disease especially in high-risk populations.
3. High-risk groups include women over 50, the ambulatory elderly, postpartum, individuals with a strong family history of thyroid disease and other autoimmune diseases such as Type I diabetes.

Symptoms and Signs of Hypothyroidism: Cold intolerance, lethargy, depression, constipation, menstrual disorders, dry skin, weight gain. There will be slow growth in children.

Symptoms and Signs of Hyperthyroidism: Palpitations, fatigue, weakness, increased appetite, heat intolerance, usually enlarged thyroid, weight loss, warm moist skin, tremor and tachycardia. Restlessness, sleep disturbances, difficulty maintaining attention and concentration occur in children.

Recommended Testing Algorithm:



If TSH screen is abnormal, a Free T4 will be done on the same sample reducing the need to call back the patient for subsequent testing. If the TSH is less than 0.2 mU/L a Free T4 and Free T3 will be done on the same sample. Free T3 is a better indicator of the degree of thyrotoxicosis in most patients.

Further Testing Recommendations:

Follow-up for Primary hypothyroidism or replacement therapy: TSH should be performed 6 - 8 weeks after start of therapy or dosage adjustment. After normal results have been achieved, TSH should be done annually, unless the clinical condition changes or unless the clinical condition warrants retesting. In children under one year of age the TSH and Free T4 should be measured every 3 months and every 6 months for children under six years of age. Also rapidly growing adolescents should have a TSH checked once every 6 months.

After Radioactive iodine treatment: A Free T4 should be done at 4-6 weeks interval for the first 6 months or until normal. At 6 months and then annually a TSH should be done to detect

hypothyroidism. In most children and young people following thyroid ablation the Free T3 is a better indicator of control.

1. Antithyroid drugs for Hyperthyroidism: Patients should be monitored by means of Free T4 monthly until controlled and then at least every 3 months while on medication. If clinical signs and symptoms are present a Free T3 may be indicated. In cases of T3 toxicosis a Free T3 should be ordered. In patients with thyrotoxicosis the TSH may not recover for quite some time after euthyroidism has been achieved and sometimes requires a period of hypothyroidism before recovery.
2. Suppressive doses of thyroxine: Designed to support a neoplasm or goiter. TSH and Free T4 every 2 months until TSH has reached a level of suppression acceptable to the clinician.
3. Subclinical hypothyroidism: Borderline results are fairly common in elderly patients and individuals with an autoimmune mechanism are more likely to progress to a hypothyroid state. Observation and monitoring by TSH at 6-12 month intervals is recommended.
4. Subclinical hyperthyroidism: Patients with low or suppressed TSH but thyroid hormones in the normal levels with minimal or no symptoms are followed by Free T4 and/or Free T3 at 6-12 months to gauge the progression of their condition.

References:

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