

Thyroid –Summary

Hypothyroidism

TSH above upper limit of normal and normal FT₄ (termed *subclinical hypothyroidism*): Start levothyroxine (Synthroid®) at 0.025 milligrams (mg) once a day. Recheck TSH and FT₄ in 6 weeks and adjust as necessary every 6 weeks until TSH is between 1.0 and 3.0 uIU/ml.

TSH above upper limit of normal and low FT₄ (*clinical hypothyroidism*): Start levothyroxine (Synthroid®) at 0.075 mg to 0.125 mg once a day for all patients under age 60 and no known coronary artery disease (CAD). Recheck TSH and FT₄ in 6 weeks and adjust as necessary every 6 weeks until TSH is between 1.0 and 3.0 uIU/ml. If patient is over age 60 years of age and / or has known CAD, start with 0.025 mg and adjust every 6 weeks. The usual full replacement dose is around 1.6 micrograms per kilogram of body weight per day.

The half-life of levothyroxine is one week. All drugs take five to six half-lives to reach their peak efficacy. Therefore:

Check TSH and FT₄ five to six weeks after starting levothyroxine.

Check TSH and FT₄ five to six weeks after changing the way the patient takes their levothyroxine.

Check TSH and FT₄ five to six weeks after changing the dose of levothyroxine.

Levothyroxine should always be taken on an empty stomach (meaning it should be at least 3 hours since ingestion of anything other than water). No food or drink other than water should be ingested for one hour after taking the levothyroxine. Calcium supplements, soy products and iron interfere with the absorption of levothyroxine. Therefore, there should be a four hour time difference from ingestion of levothyroxine and ingestion of calcium, soy products and/or iron (including multivitamins with iron)

Target TSH for replacement is between 1.0 and 3.0 uIU/ml

If the TSH is below the lower limits of normal, the patient is taking too much levothyroxine. The only time that TSH should be lower than normal is in a patient taking levothyroxine with a history of thyroid cancer (the FT₄ should still be in the normal range). The other time involves pituitary insufficiency or secondary hypothyroidism whereby the TSH is not useful and the FT₄ has to be followed exclusively.

Remember that the levothyroxine pills are scored and can be cut in half. Sometimes, patients need 6 ½ pills per week, sometimes 7 ½ , and sometimes 8 pills per week.

You do not always need to increase to the next dose level. You can add an extra pill per week, if needed.

Remind the patient to use a pill box to make sure that the daily dose is taken.

Hyperthyroidism

If TSH is suppressed (and patient is not on levothyroxine or thyroid hormones), obtain a FT₄, FT₃ with repeat TSH. If TSH is still suppressed, order a thyroid uptake and scan through nuclear medicine (order through CHCS) and have the patient call nuclear medicine (916-4062-SAMMC) to obtain the appointment.

If the patient is tachycardic and/or has a resting heart rate above 90 / min, start a β -blocker (atenolol or long acting propranolol since these are once a day medications and thus help with compliance). Remember that patients will metabolize the medication quickly. Diltiazem or verapamil can be used if the patient does not tolerate the β -blocker. Titrate the β -blocker to keep the resting heart rate under 90.

Treatment options for Hyperthyroidism (*Graves' Disease, Toxic MNG, Toxic Adenoma*- high uptake on nuclear medicine study):

¹³¹I (radioactive iodine):

Has been used for over 50 years, effective by 2 to 6 months after ingesting

This treatment causes permanent hypothyroidism most of the time

Patients sometimes have a transient increase in symptoms for the first two weeks after ingestion

Physician should check TSH and FT₄ once a month after ¹³¹I to follow trend

It is **very** unusual to need a second dose of ¹³¹I

Physician and patient should wait for 6 months after first dose to determine if failure

Cannot use ¹³¹I in breast feeding females or in pregnancy

Propylthiouracil (PTU) and methimazole (Tapazole®):

These medications stop thyroid hormone production

Are traditionally used on average for 12-24 months

Physician must monitor TSH and FT₄, LFTs, and CBC every 3 months

After 12- 24 months, consider discontinuation, as risk of side effects of drug induced hepatitis and agranulocytosis increase over time

>50% of patients revert to hyperthyroidism after stopping medication

Surgery:

Rarely done -- Only if patient desires surgery despite knowledge of less risky treatment and/or if patient will not take ¹³¹I or does not tolerate medications.

Also a consideration if patient does not tolerate anti-thyroidal drugs or is pregnant.

Thyroiditis- lasts 2 months on average, transient, treated with NSAIDS (β -blockers if needed). Prednisone is very rarely needed. Can represent a hypothyroid phase following the hyperthyroidism. Usually the hypothyroid phase is transient. Follow thyroid function tests monthly while monitoring progress. Uptake on nuclear medicine scan will be very low in thyroiditis.

Thyroid Nodules:

Very common, especially over the age of 60

Most nodules (95%) are benign

If goiter is large, compressive symptoms are present, or there is a question of the presence of a nodule, order a thyroid ultrasound. Have the patient call radiology for the appointment (916-4697 for SAMMC, 292-XRAY for WHASC). Also, if compressive symptoms are present, consider a barium swallow and supine and upright pulmonary function tests depending on the clinical situation and/or other imaging modalities of the neck (CT or MRI).

Concern is for nodules **over ONE centimeter**. If nodules are less than ONE centimeter or have a benign FNA, follow with yearly thyroid ultrasound. If nodules change in size significantly or increase in size to over ONE centimeter, FNA should be performed. The 2006 American Thyroid Association (ATA) guidelines define significant thyroid nodule growth as a 20% increase in one dimension with a minimum increase in two or more dimensions of at least 2 millimeters or an increase in volume of 50%.

Check TSH and FT₄ when thyroid nodule is found. If TSH is suppressed, obtain thyroid scan and uptake as under **Hyperthyroidism** above.

* For all medications, please consult Up-To-Date, a PDR, or other comprehensive drug reference for interactions and full list of indications and contraindications. Check hospital formulary status and use formulary drugs whenever possible and as indicated.