

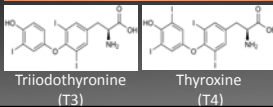
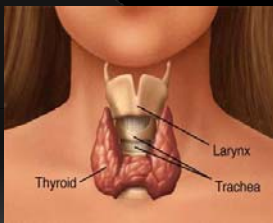
Cosmetic Changes Associated with Hypothyroidism

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Objectives

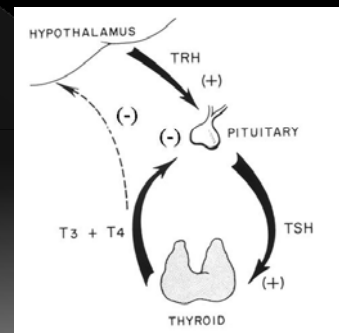
- Provide an overview of hypothyroidism and common etiologies
- Discuss the common physiological signs and symptoms
- Explain different treatment modalities for hypothyroidism

Thyroid Gland

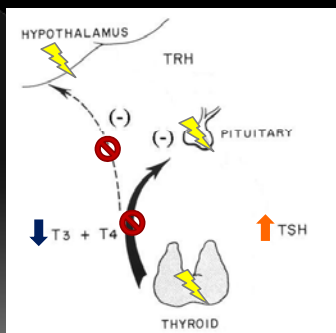


- Responsible for:
 - > Metabolism
 - > Brain development
 - > Breathing
 - > Heart and CNS functions
 - > Body temperature
 - > Muscle strength
 - > Skin dryness
 - > Menstrual cycles
 - > Weight
 - > Cholesterol levels

Thyroid Function



Hypothyroidism



Risk Factors

- More common in:
- Women
 - > 10:1 female to male ratio
 - > Small body size at birth and low BMI during childhood
 - Caucasians
 - Elderly
 - Areas of iodine deficiency
 - Thyroid peroxidase antibodies
 - TSH levels in the upper normal range

Etiology

Primary Hypothyroidism

- ⊙ Thyroid gland produces insufficient amounts of hormone
- ⊙ Responsible for majority of hypothyroid cases
- ⊙ Common causes:
 - > Chronic autoimmune (Hashimoto's) thyroiditis
 - Most common cause in iodine-sufficient areas of the U.S.
 - > Iodine deficiency
 - > Thyroidectomy or thyroid gland ablation with radioactive iodine
 - > External radiation
 - > Replacement of the thyroid gland by tumor
 - > Medications



Etiology

Central Hypothyroidism

- ⊙ Secondary
 - > Pituitary gland disease or defect
 - > Inadequate secretion TSH
- ⊙ Tertiary
 - > Hypothalamus disease or defect
 - > Decreased thyrotropin-releasing hormone (TRH)
- ⊙ Disorders that can cause central hypothyroidism:
 - > Pituitary adenomas (most common)
 - > Pituitary apoplexy
 - > Sarcoidosis
 - > Tuberculosis
- ⊙ May be reversible or permanent

Types of Hypothyroidism

- ⊙ Clinical or Overt Hypothyroid
 - > High TSH
 - > Low free T4
 - > Prevalent in 0.3% of population
- ⊙ Subclinical Hypothyroid
 - > High TSH
 - > Normal free T3 and T4 levels
 - > Prevalent in 4.3% of population

Clinical Manifestations

- ⊙ Influenced by:
 - > Duration and severity of hypothyroidism
 - > Rapidity at which hypothyroidism occurs
 - > Psychological characteristics of the patient
- ⊙ Manifestations reflect one of two changes:
 - > Generalized slowing of metabolic processes
 - > Accumulation of matrix glycosaminoglycans in the interstitial spaces of many tissues

Clinical Manifestations

Slowing of Metabolic Processes

- ⊙ Fatigue and weakness
- ⊙ Cold intolerance
- ⊙ Dyspnea on exertion
- ⊙ Weight gain
- ⊙ Cognitive dysfunction
- ⊙ Mental retardation (infants)
- ⊙ Constipation
- ⊙ Growth failure
- ⊙ Slow movement and speech
- ⊙ Delayed relaxation of deep tendon reflexes
- ⊙ Bradycardia
- ⊙ Hyperlipidemia
- ⊙ Anemia
- ⊙ Hyponatremia
- ⊙ Increased creatinine
- ⊙ Cool and pale skin
- ⊙ Decreased sweating
- ⊙ Carotenemia



Clinical Manifestations

Matrix Glycosaminoglycan Accumulation

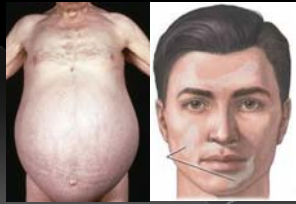
- ⊙ Dry and coarse skin
- ⊙ Hoarseness
- ⊙ Coarse hair
 - > Hair loss
 - > Alopecia areata
- ⊙ Brittle nails
- ⊙ Puffy facies and loss of eyebrows
- ⊙ Periorbital edema
 - > Graves ophthalmopathy
- ⊙ Myxedema
 - > Pretibial myxedema
- ⊙ Enlargement of the tongue



Clinical Manifestations

Other

- ◉ Decreased hearing
- ◉ Myalgia and paresthesia
- ◉ Depression
- ◉ Menorrhagia
- ◉ Arthralgia
- ◉ Pubertal delay
- ◉ Diastolic hypertension
- ◉ Pleural and pericardial effusions
- ◉ Ascites (rare)
- ◉ Galactorrhea
- ◉ Vitiligo



Clinical Manifestations

Consultation with an endocrinologist is recommended in the following situations:

- ◉ Patients 18 years old or younger
- ◉ Patients unresponsive to therapy
- ◉ Pregnant patients
- ◉ Cardiac patients
- ◉ Presence of goiter, nodule, or other structural changes in the thyroid gland
- ◉ Presence of other endocrine disease

Treatment

- ◉ Goals:
 - > Return patient to euthyroid state
 - > Reverse clinical progression
 - > Correct metabolic abnormalities
- ◉ Supplementation or replacement of endogenous production
- ◉ Clinical benefits begin in 3 to 5 days and level off after 4 to 6 weeks
- ◉ Monitor patients for signs and symptoms of overtreatment

Treatment

Chronic Thyroiditis & Clinical Hypothyroidism

- ◉ Treatment must be individualized
- ◉ Chronic Thyroiditis
 - > Patients with a goiter may be treated with levothyroxine, even if TSH levels are normal
- ◉ Clinical Hypothyroidism
 - > Levothyroxine
- ◉ T3 (liothyronine), combinations of thyroid hormones or desiccated thyroid hormone should not be used as replacement therapy

Levothyroxine

(Synthroid, Levoxyl, Levotheroid, Unithroid)

- ◉ Mean replacement dose: 1.6 mcg/kg/day
 - > Elderly and CAD patients: 25 – 50 mcg/day initially
- ◉ Single daily dose
- ◉ Take on an empty stomach, 1 hr before breakfast
- ◉ Separate administration from calcium, iron, antacids, anticonvulsants and proton pump inhibitors



Levothyroxine

(Synthroid, Levoxyl, Levotheroid, Unithroid)

- ◉ Initial Dose: Re-evaluate patient and measure serum T4 and TSH after three to six weeks
- ◉ Maintenance Dose: Examine patient and measure serum TSH once yearly
- ◉ Patients should receive the same brand of levothyroxine throughout treatment
 - > Bioequivalence ≠ Therapeutic Equivalence
 - > If a patient must switch brands or use a generic, serum TSH should be checked six weeks later

Liothyronine (Cytomel, Triostat)



- Should not be used as monotherapy for long term treatment
 - > Can rapidly increase serum T3 to 300 – 1000 ng/dL within 4 hours due to almost complete absorption
 - > Potential increased cardiac risks due to patient being in a chemically hyperthyroid state for several hours a day
- Standard doses range from 25 to 37.5 mcg twice daily

Combination Thyroid Hormones

- Thyrolar (Liotrix)
 - > Mixture of T3 and T4
 - > Increases in serum T3 occur gradually, and normal levels are maintained when adequate doses of T4 are given
- Desiccated animal preparations (Armour Thyroid)
 - > Contains T3 and T4 (1:4 ratio)
 - > Derived from bovine or porcine thyroid glands
 - > Should not be prescribed unless the patient is already taking the preparation and has normal serum TSH



Treatment Subclinical Hypothyroidism

- Indicated in patients with:
 - > TSH levels >10 µIU/mL
 - > TSH levels between 5 and 10 µIU/mL in conjunction with goiter or positive anti-thyroid peroxidase antibodies (or both)
- Initial dose of levothyroxine: 25 to 50 mcg/day
- Serum TSH level should be measured in 6 to 8 weeks, and levothyroxine dose adjusted accordingly
- The target TSH level should be between 0.3 and 3.0 µIU/mL

Clinical Pearls

- Levothyroxine is the drug of choice
 - > Patients should receive the same brand of levothyroxine throughout treatment
- TSH levels are important for the diagnosis of hypothyroidism and for medication dose adjustments
 - > Patients should be monitored every six weeks until a maintenance dose is found
- Monitor patients for signs and symptoms of overtreatment

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Questions

- The most common cause of hypothyroidism in the United States is Hashimoto's thyroiditis.
- Symptoms of hypothyroidism generally occur rapidly and are very noticeable.
- Blood levels of thyroid stimulating hormone (TSH) should be checked six weeks after initial thyroxine doses are prescribed as well as after any dose adjustments are made.