

THYROID DISORDERS

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Disclosures

- There is no actual or potential conflict of interest in relation to the content and views expressed during this lecture.
- Some of the slides are adopted from the roadmap that has been developed by leading GCC endocrinologists and policy advisors to guide the healthcare professionals addressing the management of hypothyroidism in GCC Countries written by the Saudi Arabia and Gulf Thyroid Advisory Board.

Lecture Objectives

1. How to Diagnose and Manage:

- **Hypothyroidism**
- **Subclinical Hypothyroidism**
- **Hyperthyroidism**
- **Subclinical Hyperthyroidism**

2. How and When to Screen for Thyroid disorders.

3. How to Manage Thyroid Disorders in Specific Groups:

- **New born**
- **Elderly**
- **Pregnancy**
- **Emergencies**

Hypothyroidism Disorders

Rational for the Diagnosis and Management of Hypothyroidism

- ▶ Hypothyroidism is common and frequently underdiagnosed, millions of people worldwide are unaware (60%) that they have the disease and remain untreated.¹
- ▶ In the GCC (Gulf Cooperation Council) countries, the prevalence of hypothyroidism ranges from **7% to 41%**, and **rates of subclinical hypothyroidism (10%)** are typically more than twice that reported in the USA.^{2,3}
- ▶ A high prevalence rate of hypothyroidism is typical among older women, pregnant women and in patients with comorbidities (sleep apnoea, diabetes) in the GCC countries.⁴
- ▶ Untreated hypothyroidism can contribute to hypertension, dyslipidemia, infertility, cognitive impairment, and neuromuscular dysfunction.¹

Rational for the Diagnosis and Management of Hypothyroidism

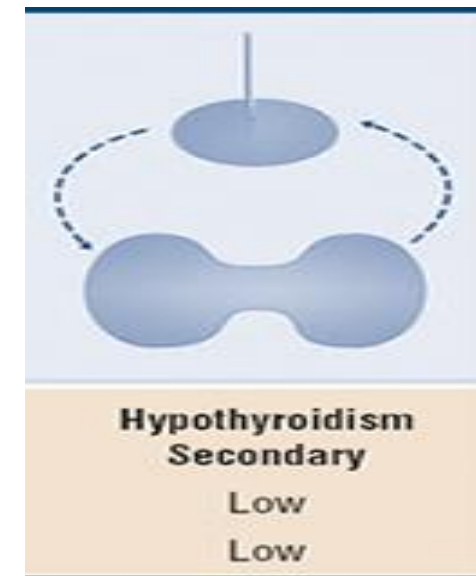
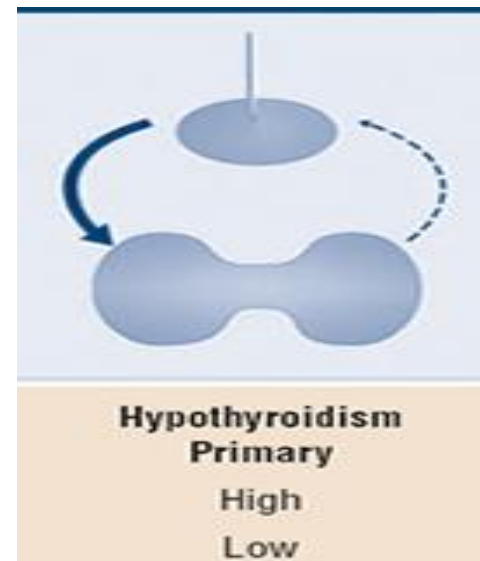
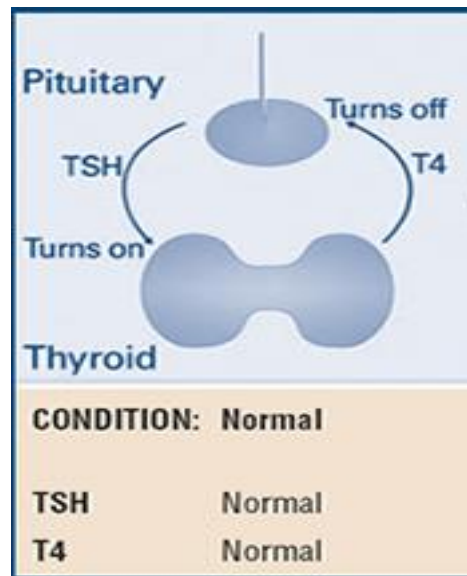
- ▶ The most common cause of hypothyroidism worldwide is iodine deficiency. In countries with routine iodine supplementation, **autoimmune thyroid disorders** are the most common causes of thyroid disorders.¹
 - ▶ There are currently inconsistency and some controversies in the management of hypothyroidism in the GCC countries.
-

Types of Hypothyroidism

- 1- Overt Primary Hypothyroidism
Is biochemically diagnosed by a high TSH and a low T4.
- 2- Subclinical Hypothyroidism
Is characterized biochemically by a high TSH and a normal T4.
- 3- Secondary or Tertiary Hypothyroidism
Caused by hypothalamic or pituitary disease, is characterized by a low serum T4 and serum TSH concentration that is not appropriately elevated.

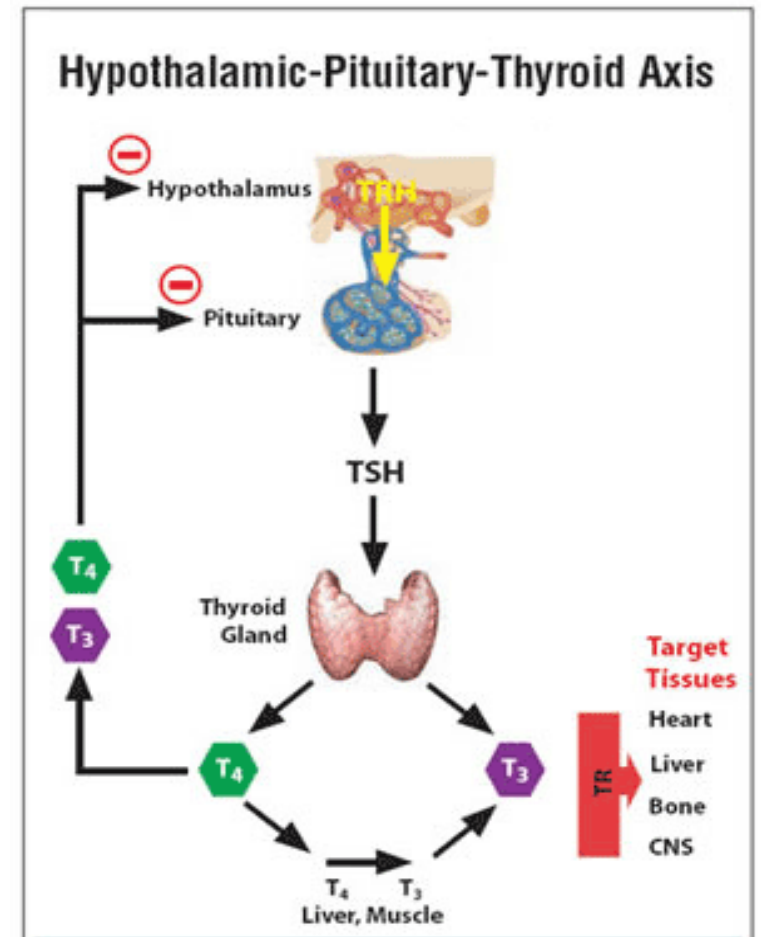
Types of Hypothyroidism

Type	TSH level	Free T ₄ level
Primary hypothyroidism	Elevated	Low
Subclinical hypothyroidism	Elevated	Normal
Secondary hypothyroidism	Normal or low	Low



Causes of Hypothyroidism

- Hypothyroidism can result from a defect anywhere in the hypothalamic-pituitary-thyroid axis.
- In the vast majority of cases, it is caused by thyroid disease (primary hypothyroidism).
- Much less often it is caused by decreased (TSH) from the anterior pituitary gland or by decreased (TRH) from the hypothalamus.



Causes of Hypothyroidism



The cause of hypothyroidism should be identified in every patient for the following reasons:

- Hypothyroidism may be transient and require no or only short-term therapy, as in patients with painless thyroiditis or postpartum thyroiditis.
- It may be caused by a drug, such as lithium, and disappear when the drug is discontinued.
- It may be the first or only manifestation of hypothalamic or pituitary disease.

Types of Hypothyroidism

1- Hashimoto's Thyroiditis

- This is most common cause of primary hypothyroidism in iodine-sufficient areas of the world.
- Caused by cell and antibody-mediated destruction of thyroid tissue.

Risk for Hashimoto's Thyroiditis

- Pre-existing autoimmune condition.
- High iodine intake.
- Selenium deficiency.
- Childhood weight gain and being overweight or obese at age 14 years have been associated with thyroid autoimmunity and hypothyroidism.
- Cigarette smoking.

Types of Hypothyroidism

2- Iatrogenic Hypothyroidism

- Surgical Thyroidectomy
- Radioiodine therapy
- External neck irradiation
- Drugs :
 - Lithium
 - Amiodarone
 - Antithyroid drug
- Iodine
- Other rare cause such environmental exposures
 - eg. Flame retardant

Types of Hypothyroidism

3-Transient Hypothyroidism

- Hypothyroidism occurs transiently during the course of several types of thyroiditis.
 - Conditions that cause acute illness with severe thyroid pain.
 - Conditions in which there is no clinically evident of inflammation and the illness is manifested primarily by thyroid dysfunction or goiter.

Subclinical Hypothyroidism

- It is defined biochemically as a normal serum free thyroxine (T4) concentration in the presence of an elevated serum thyroid-stimulating hormone (TSH) concentration.
- It can only be diagnosed on the basis of laboratory test results.

Subclinical Hypothyroidism

- The prevalence of subclinical hypothyroidism ranges from 4 to 15 percent.
- The causes of subclinical hypothyroidism are the same as those of overt hypothyroidism.
- It may occur in the presence or absence of mild symptoms of hypothyroidism.

Secondary and Tertiary Hypothyroidism

- Secondary hypothyroidism is that caused by TSH deficiency.
- Secondary hypothyroidism can be caused by any of the causes of hypopituitarism, most often a pituitary tumor.
- Tertiary hypothyroidism is caused by (TRH) deficiency.

Secondary and Tertiary Hypothyroidism

Secondary and Tertiary Hypothyroidism should be suspected in the following circumstances:

- If there is a known hypothalamic or pituitary disease.
- A mass lesion is present in the pituitary.
- When symptoms and signs of hypothyroidism are associated with other hormonal deficiencies.

Always Rule Out Other Causes of the Symptoms

Alternative Causes of Persistent Symptoms in Patients with Normal-Range Thyroid-Stimulating Hormone Levels

Adrenal insufficiency (rare)

Anemia

B₁₂ deficiency

Iron deficiency

Chronic kidney disease

Depression, anxiety disorder, and/or somatoform disorders

Liver disease

Obstructive sleep apnea

Viral infection (e.g., mononucleosis, Lyme disease, human immunodeficiency virus/AIDS)

Vitamin D deficiency

Screening and Diagnosis of Hypothyroidism

- There is no current consensus regarding population screening for hypothyroidism.
- There is no evidence that early detection and treatment with thyroxine (T4) improves clinically important outcomes in individuals with hypothyroidism detected by screening.

Screening and Diagnosis of Hypothyroidism

Screening recommendations from major groups have been conflicting.

- The American Academy of Family Physicians (AAFP) recommends periodic assessment of thyroid function in older women.
- The American College of Physicians (ACP) suggests that office screening of women older than 50 years may be indicated.

Screening and Diagnosis of Hypothyroidism

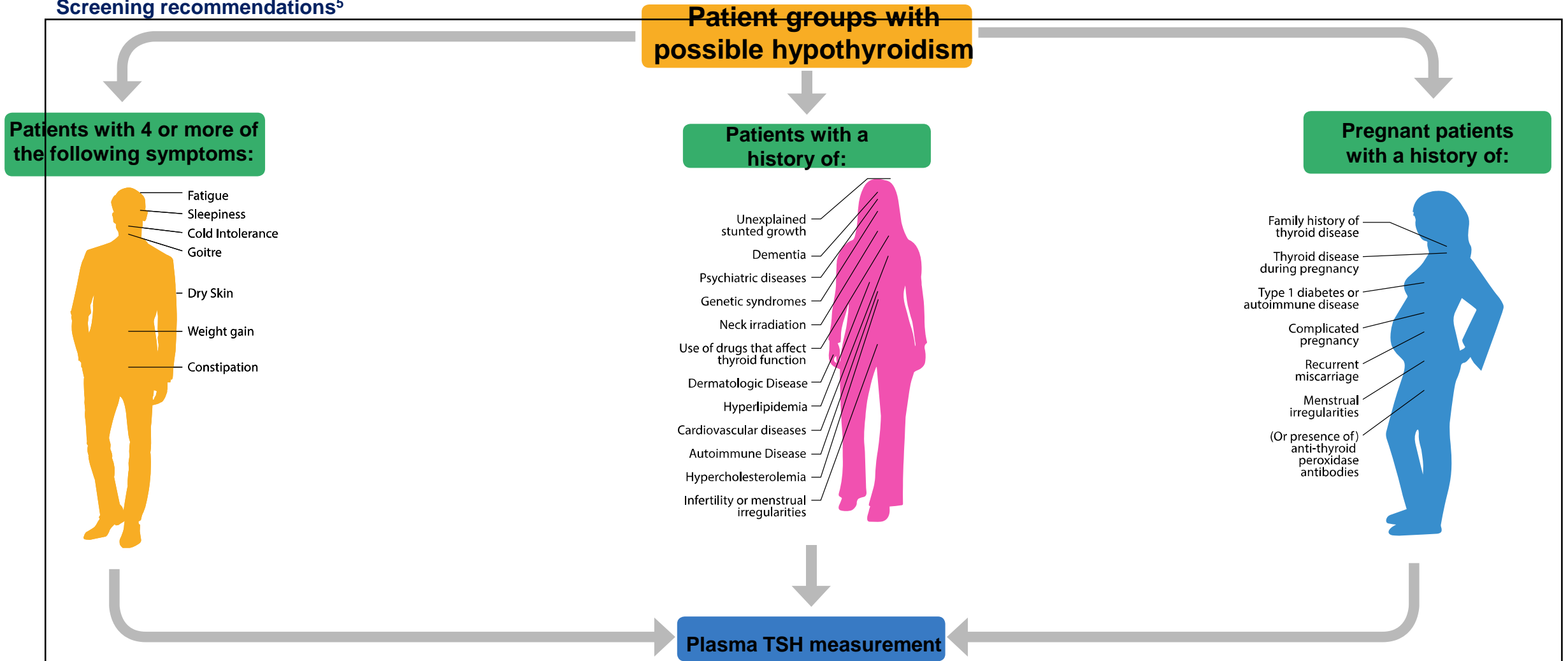
The American Thyroid Association Recommendations:

- At age 35 years and every 5 years thereafter.
- Closer attention to patients who are at high risk:
 - H/O head or neck irradiation
 - F/H/O Thyroid disease
 - On drugs known to affect thyroid function (e.g. steroids/dopamine agonist, lithium)
 - Consideration of measurement of TSH in patients over the age of 60 years.

Screening and Diagnosis

It is recommended that the following patients be screened for hypothyroidism by measurement of plasma (TSH) level.

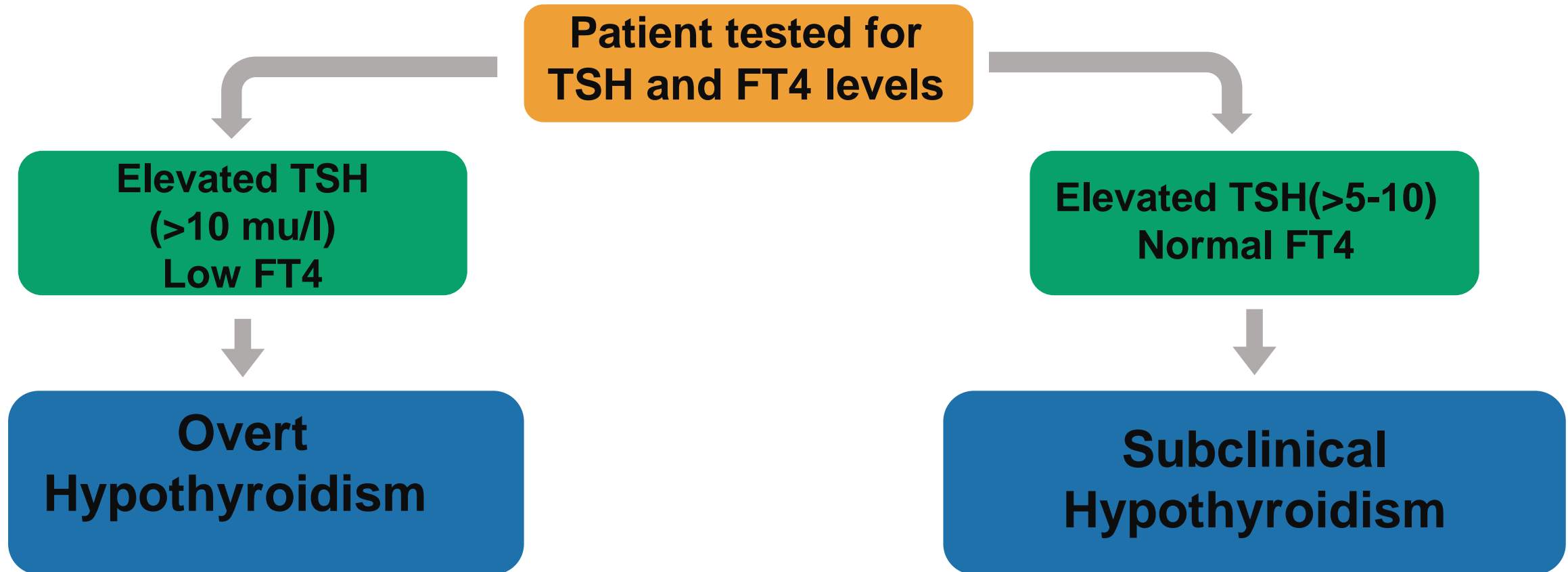
Screening recommendations⁵



Diagnosis of Hypothyroidism

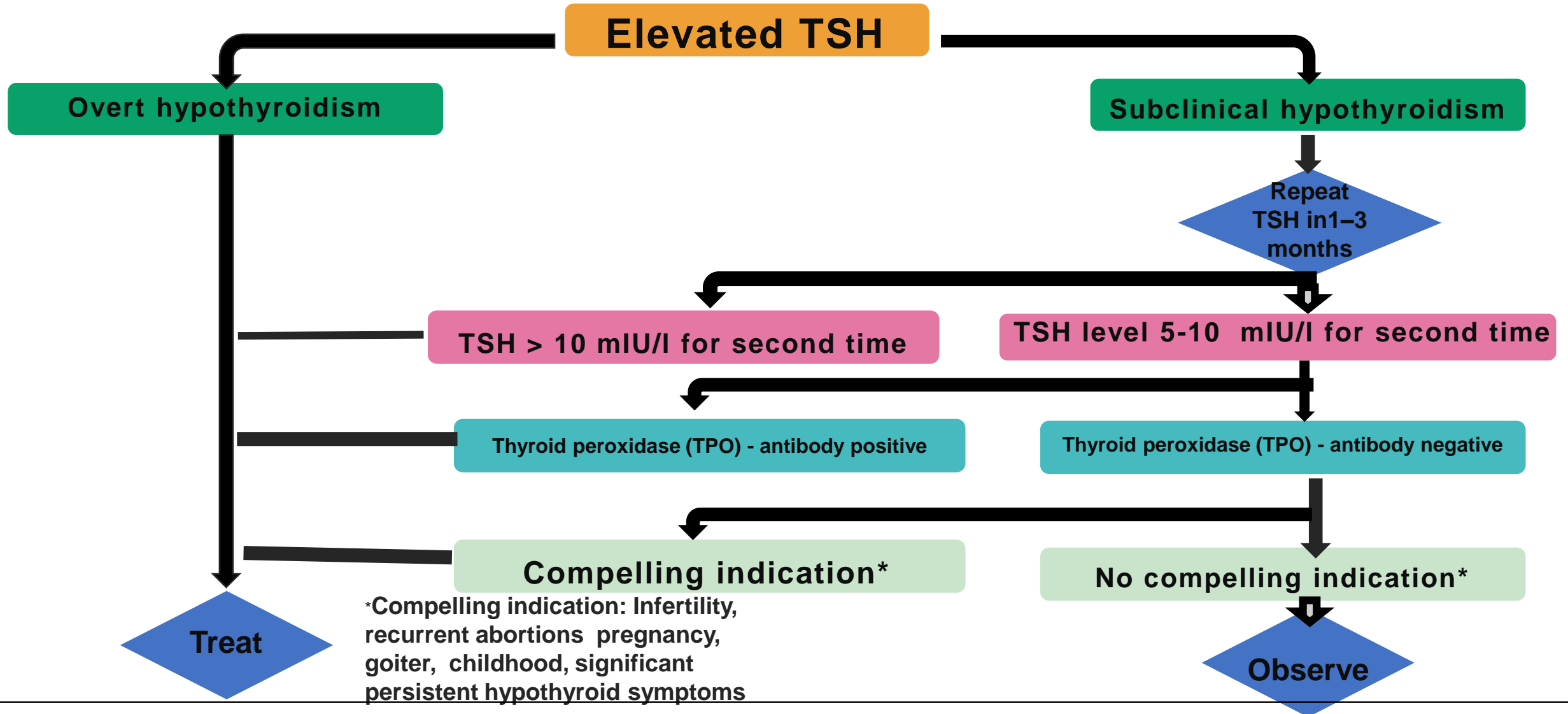
Patients who are found to have an elevated TSH level are classified into two groups according to their free thyroxine (FT4) level; subclinical and overt hypothyroidism.

Determining pathways for hypothyroidism patients^{1,6,7}



Routine measurement of triiodothyronine (T3) is not recommended.

Management of Hypothyroidism



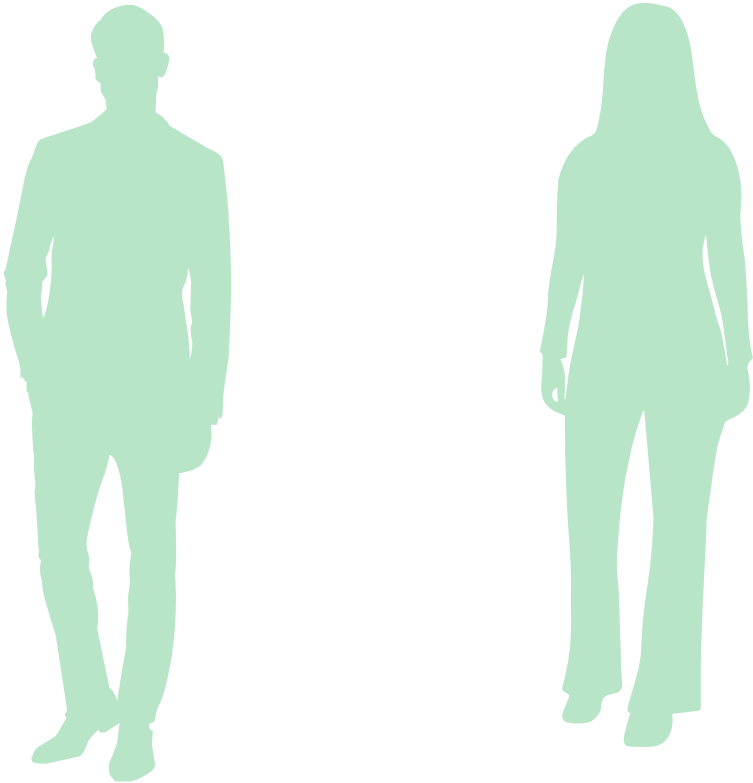
Dosing and Monitoring

There are 2 approaches to initiating T4 therapy in subclinical Hypothyroidism:

- One option is to start with the lowest dose necessary to normalize the serum TSH concentration, typically 25 to 50 mcg daily.
- An alternative approach for younger patients is to initiate treatment at slightly below full replacement doses (1.6 mcg/kg/day).

Management of Hypothyroidism in Adults

Management of adult patients⁶



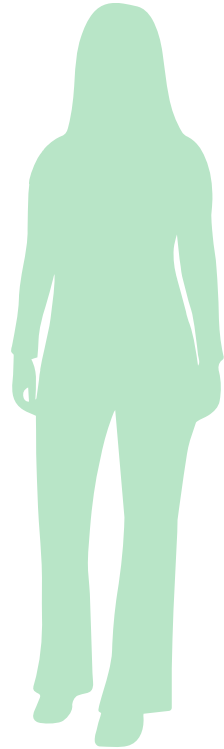
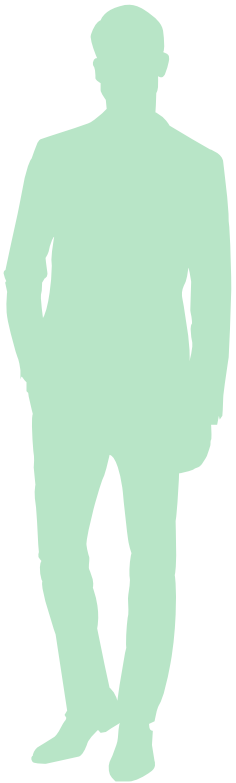
Newly diagnosed, healthy, young to middle aged patients (<65 years of age) who have no comorbidities or cardiovascular risk factors



**Full levothyroxine starting dose:
1.6 µg/kg body weight**

Management of Hypothyroidism in Adults

Management of adult patients⁶



For patients with significant morbidities, cardiovascular disease (CVD) or multiple CVD risk factors



25–50% of the calculated dose should be used initially and the dose should be gradually increased to the full dose over the next few weeks

Levothyroxine

How should levothyroxine be taken?^{1,6}

Levothyroxine should be taken:

- On an empty stomach
- At least

30-60 minutes before the meal, usually the breakfast or at bed time no less than 3hrs after evening meal.

The following drugs should be administered at least 4 hours either side of levothyroxine dose to minimize possible interactions:

- Calcium supplements
- Proton-pump inhibitors
- Bile acid sequestrants (cholestyramine and colesevelam)
- Bisphosphonates
- Ferrous sulfate
- Aluminium-containing antacids
- Sucralfate
- Anticonvulsants

Monitoring Patients

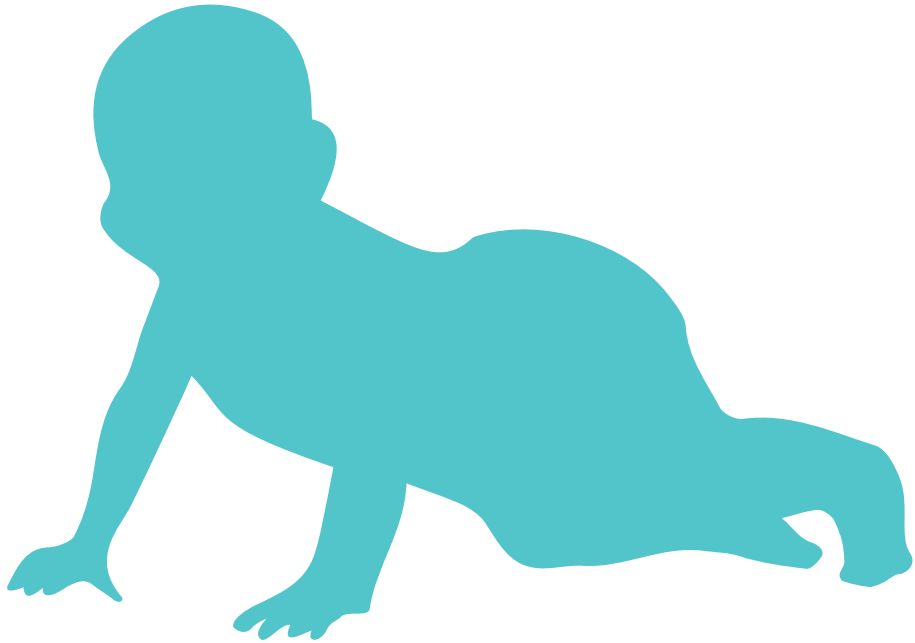
- After any adjustment in T4 dose, the serum TSH should be rechecked in six weeks.
- Once the correct dose has been achieved, serum TSH levels can be assessed annually.
- For patients with **subclinical hypothyroidism** who do **Not** receive thyroid hormone replacement, thyroid function tests (TSH, free T4) should be repeated initially at six months and, if stable, yearly thereafter.

Congenital Hypothyroidism

- All newborn babies should be screened for congenital hypothyroidism by measurement of bloodspot TSH using a sample collected within 2-8 days after birth.
- Confirmation of the diagnosis of congenital hypothyroidism involves measurement of serum TSH and FT4 in both mother and neonate.
- In Kuwait and in Kingdom of Bahrain, all newborns are screened for congenital hypothyroidism (CH) by TSH measurement.
- All hypothyroid neonates should be treated as early as possible. Treatment must be started within the first 18 days of life.

Management of Hypothyroidism in Children

Management of young patients⁶



Normal TSH levels are:

✓ **1-3 days: 0.68 – 29 mIU/L**

✓ **4-30 days: 51 - 11 mIU/L**

✓ **2 – 12 months: 0.55 – 6.7 mIU/L**

Levothyroxine starting dose

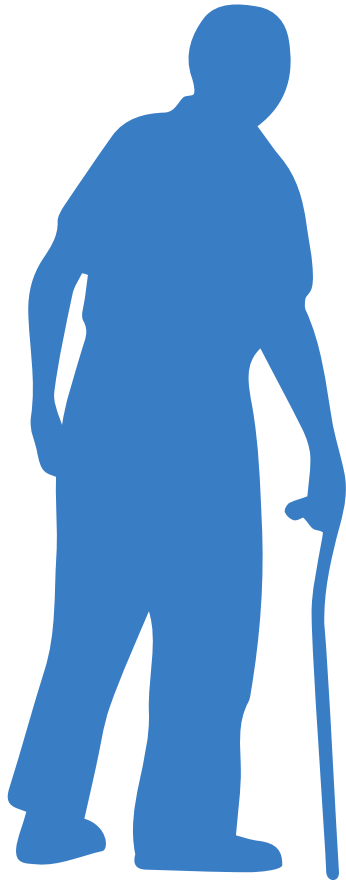
- Neonates to 6 months: 10-15 mcg/kg/day
- 6 months to 1 year: 8-10 mcg/kg/day
- 1-2 years: 6-8 mcg/kg/day
- Older than 2 years: 5-6 mcg/kg/day



The tablet can be dissolved in a small amount of water

Management of Hypothyroidism in Elderly

Management of elderly patients ^{6,8}



In the elderly, the TSH level may normally be slightly over the normal range and therefore should not be automatically treated. It is recommended to look for the following before initiating treatment

Symptoms or signs suggestive of hypothyroidism, associated cardiovascular disease or multiple risk factors for cardiovascular disease, and/or positive anti TPO antibodies

Levothyroxine therapy could be considered at starting dose of 25–50mcg/day, raised by 25mcg every 1–2 weeks until the full dose is reached

No signs or symptoms

A period of **observation** and reassessment is recommended

Hypothyroidism- When to Refer ?

- Age younger than 18 years
- Cardiac disease
- Coexisting endocrine diseases
- Myxedema coma suspected
- Pregnancy
- Presence of goiter, nodule, or other structural thyroid gland abnormality.
- Unresponsive to therapy

Hypothyroidism Key Summary Points

Hypothyroidism is common, but often underdiagnosed disease.

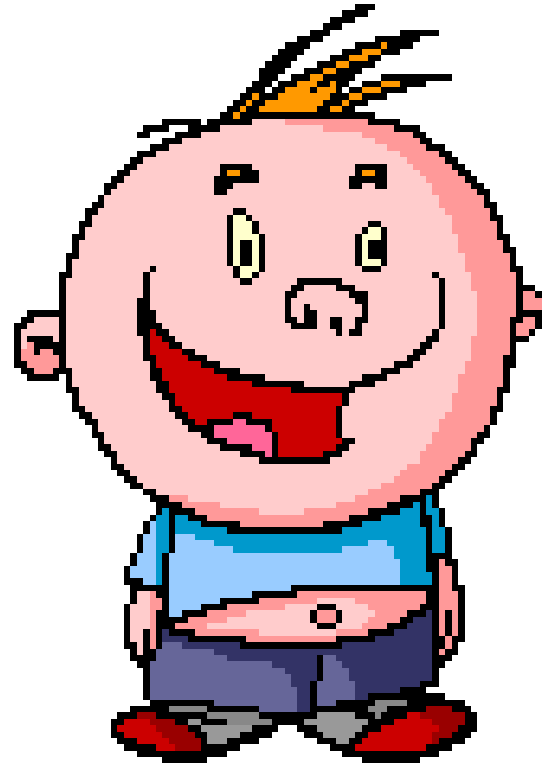
All patients at-risk or possible risk of hypothyroidism should undergo measurement of plasma TSH level.

The decision to initiate treatment depends on multiple factors including baseline TSH and FT4 levels, symptoms and signs, TPO-positivity, comorbidities, patient age, fertility, thyroid size and other factors.

Pregnant women, elderly patients, and children have different clinical considerations and/or TSH cut-off levels which require different thyroid replacement approaches and doses.

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Lets Focus on the Cases Now



Case 1

A 32 years old female, came to discuss her TFT result with you. She denies any symptoms of hypothyroidism, and her thyroid examination is normal.

Her TSH level is 7mU/L.

➤ How would you approach her?

Case 1 Answer:

- Look at her T4 level..... Normal
- Repeat TSH (after 6-8 weeks) & ask for the TPO.
- Consider Rx with L-Thyroxine if:
 - Asymptomatic patients with normal T4 and TSH levels > 10 mIU/L.
 - In patients with normal T4, and TSH levels between 5-10 mIU/ L, if TPO is high +/- symptoms and for patients who are pregnant or trying to conceive and in those with goiter or dyslipidemia.

Case 2

- A 35 years old female, not known to have any medical illnesses, asymptomatic at the moment, requesting to check her thyroid function test as she is worried because her mother has hypothyroidism.
- Thorough history and physical examination: Unremarkable
- Thyroid gland examination: Normal.

➤ Would you order TSH in this case? Why?

Yes, +ve family history

Case 2. Cont...

- Her TFT result came back as follows: TSH 8.0 mIU/L and free T4 19 pmol/L.
 - What will you do next?
- After 6-8 weeks → TSH 9.0 mIU/L and free T4 20 pmol/L and +ve serum thyroid peroxidase antibodies.
 - What is the diagnosis?
- Subclinical hypothyroidism
 - Will you treat this patient? Why?
- Treatment can be considered.

Case 3

A 50 years old housewife complains of progressive weight gain of 10 kg in 1 year, fatigue and constipation.

➤ How would you approach this case?

Case 3 Answer:

- History about other hypothyroid symptoms & to rule out other differential diagnosis. Ask about risk factors of hypothyroidism.
- Physical examination.
- Lab. Investigations.

Cont...

- **H'x:** cold intolerance & menorrhagia. There is +ve F/H of hypothyroidism.
- **Physical examination:**

Vital signs: Afebrile, pulse 58/minute and Regular, BP 118/76mmHg
- She is moderately obese and speaks slowly and has a puffy face, with pale, cold, dry, and thick skin.
- Normal examination of the thyroid gland.
- The deep tendon reflex time is delayed.

Cont...

- **Laboratory studies:** CBC and differential WBC are normal.
- The serum TSH is 11.0 mIU/L and serum T4 concentration is 3.8 pmol/l (Repeated twice 6-8 weeks apart).
- What is your diagnosis?
- How would you manage this patient?
- When will you ask the patient to come for follow up?

Hyperthyroidism Disorders

Hyperthyroidism Disorders

- Graves' disease is the most common cause of hyperthyroidism.
- It is an autoimmune disease caused by an antibody, active against the thyroid-stimulating hormone (TSH) receptor, which stimulates the gland to synthesize and secrete excess thyroid hormone. **(Anti-thyroid peroxidase antibody and Thyroid-stimulating immunoglobulin will be positive).**
- It can be familial and associated with other autoimmune diseases.
- An infiltrative ophthalmopathy (periorbital edema, diplopia, or proptosis) accompanies Graves' disease in about **50%** of patients.

Hyperthyroidism

Younger patients tend to exhibit symptoms of sympathetic activation (e.g: anxiety, hyperactivity, tremor).

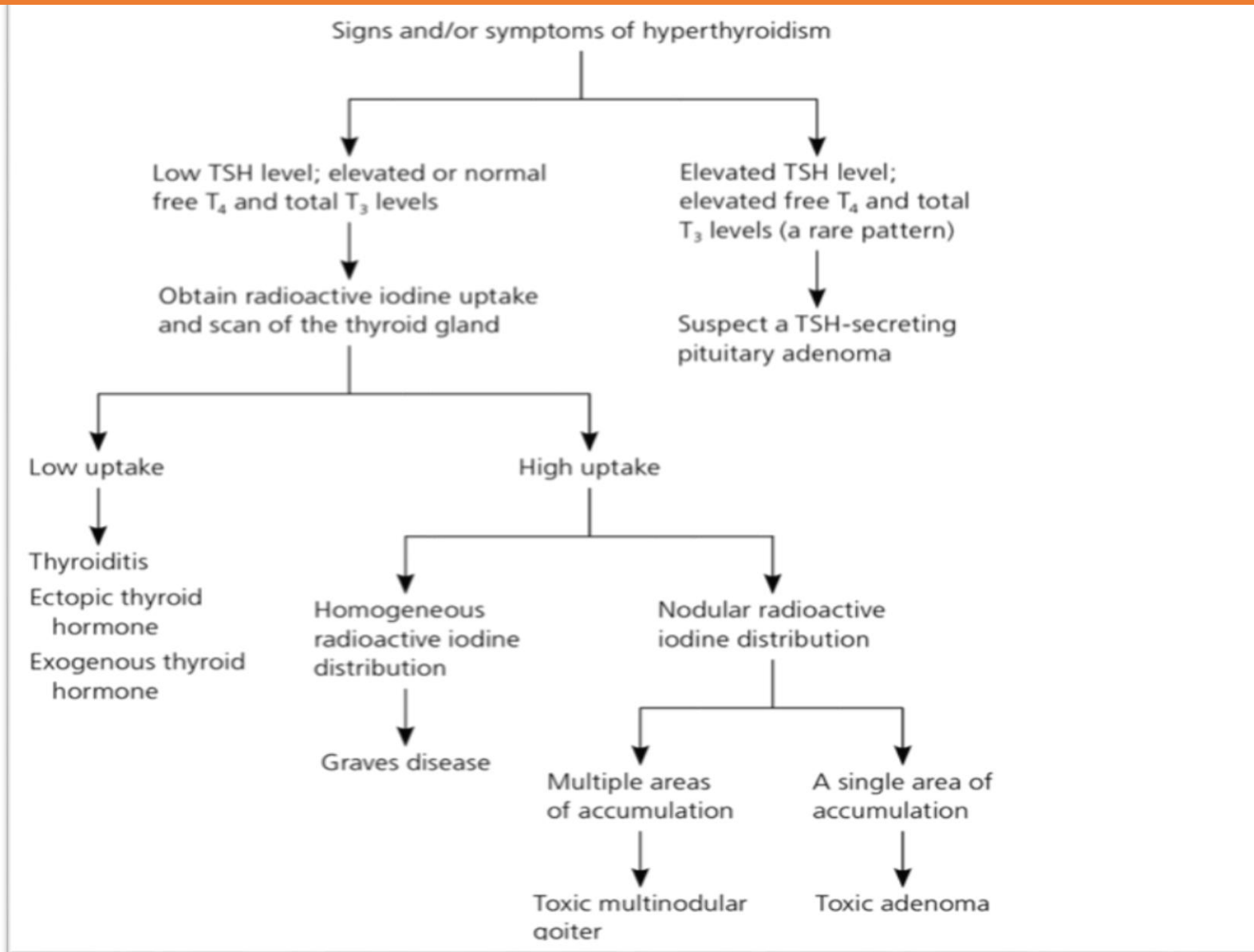
Older patients have more cardiovascular symptoms (e.g: dyspnea, atrial fibrillation) and unexplained weight loss.

Symptoms	Signs
Weakness	Goiter/thyroid bruit
Fatigue	Hyperkinesis
Heat intolerance	Ophthalmopathy
Nervousness	Lid retraction/stare
Increased sweating	Lid lag
Tremors	Tremor
Palpitations	Warm moist skin
Weight loss	Hyperreflexia
Hyperdefecation	Tachycardia/arrhythmia
Dyspnea	Systolic hypertension
Menstrual abnormalities	Widened pulse pressure

Lab Investigations:

- If you suspect hyperthyroidism, ask for TSH.
- If the TSH is **0.0 – 0.25** mIU/L, measure T4.
- If T4 is elevated >>>> primary hyperthyroidism.
- If T4 is normal, then measure T3, to R/O T3 toxicosis.
- Anti-TPO antibodies to R/O autoimmune thyroid disease.

Diagnostic Work Up of Hyperthyroidism



Hyperthyroidism Management

- Reassure the patient and explain the condition.
- Advice about compliance with medication and eye care.
- Start patient on beta-blocker if symptomatic, Propranolol 10-40 mg TID.
- Referral to Endocrinologist.
- ECG + BP (IOP + Vision if eye symptoms).
- Follow up in 2ndry care – can repeat TFTs 6-8 weeks following starting treatment.
- Refer to the secondary care for radioactive iodine uptake and scan of the thyroid gland +/- surgery.

Hyperthyroidism Management

1- B-blockers

2- Anti-thyroid medications:

➤ Carbimazole /methimazole

➤ Propylthiouracil

3- Radioactive Iodine

4- Thyroidectomy

Anti-Thyroid Medications

- ❑ **Carbimazole /methimazole**: It is the drug of choice in adult men and non-pregnant patients because of its lower cost, longer half-life, and lower incidence of hematologic side effects.

It is the preferred antithyroid medication except in the first trimester of pregnancy and in patients with an adverse reaction to the medication.

- ❑ **Propylthiouracil**: Is used in thyroid storm, first trimester of pregnancy, and if there is methimazole allergy or intolerance.

- ❑ **Antithyroid drug** doses are titrated every 4 weeks until thyroid functions normalize.



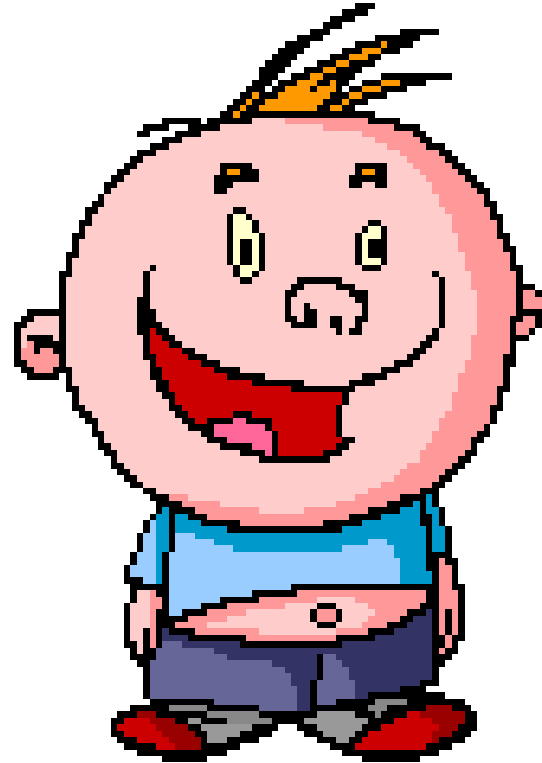
<i>First-line agents</i>	<i>Dosage</i>	<i>Adverse effects</i>
Beta blockers		
Atenolol	25 to 100 mg orally once per day	Exacerbation of congestive heart failure
Propranolol	Immediate release: 10 to 40 mg orally every eight hours Extended release: 80 to 160 mg orally once per day	Exacerbation of congestive heart failure or asthma
Antithyroid medications		
Methimazole (Tapazole)	5 to 120 mg orally per day (can be given in divided doses)	Dose-related agranulocytosis
Propylthiouracil	50 to 300 mg orally every eight hours	Agranulocytosis not related to dose; liver dysfunction; rash, including ANCA-associated vasculitis
Radioactive iodine	Usually 10 to 30 millicurie, depending on uptake and the size of the thyroid gland	May aggravate hyperthyroidism in the early posttreatment period Causes hypothyroidism three to six months after treatment
Ancillary agents		
Cholestyramine	1 to 2 g orally twice per day	Constipation or diarrhea; bloating
Glucocorticoids	Prednisone: 20 to 40 mg orally per day for up to four weeks Hydrocortisone: 100 mg intravenously every eight hours with subsequent taper	Hyperglycemia in patients with diabetes mellitus, otherwise few short-term adverse effects
Nonsteroidal anti-inflammatory drugs	Depends on the specific agent	Nephrotoxicity; gastrointestinal bleeding
Supersaturated potassium iodide	5 drops orally every eight hours	May aggravate hyperthyroidism if given before an antithyroid agent

Anti-thyroid Medications



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Lets Focus on the Cases Now



Case 4:

A 33 years old female, came to discuss with you her TSH level which was 0.1 mU/L, with normal T4 & T3. She is asymptomatic with normal thyroid gland examination.

➤ How would you manage this case?

Case 4 Answer:

- Repeat the TSH, T4 & T3 after 6-8 weeks. If all still the same, this is a **persistent subclinical hyperthyroidism >>>> refer** to the secondary care.
- Subclinical hyperthyroidism is associated with an increased risk of atrial fibrillation in older adults, and with decreased bone mineral density in postmenopausal women .

Case 5:

A 38 years old female, presented with H/O sweating, palpitations & weight loss.

➤ How would approach this case?

Case 5 Answer:

- History.
- Physical examination.
- Lab. Investigations.

Cont...

- She is having insomnia & nervousness.
- O/E her BP is 140/70 mmHg, pulse is 110 beats/min, regular. Diffusely enlarged thyroid gland. CVS: loud S1 & S2, no murmurs.
- ECG: sinus tachycardia.
- TSH: 0.0 mU/L, T4 30 pmol/L.
- What is your diagnosis?
- What is your next step?

Thyroid Disorders in pregnancy



Thyroid Disorders in pregnancy

- Thyroid diseases affect up to 5% of all pregnancies.
- The treatment goal for hypothyroidism and hyperthyroidism is to achieve euthyroidism quickly and maintain it throughout pregnancy.
- In affected females, serum TSH should be measured in each trimester.
- Both hyper & hypothyroidism should be seen by a specialist.

Indications for Thyroid Testing in Pregnancy

Current thyroid therapy

Family history of autoimmune thyroid disease

Goiter

History of:

Autoimmune disorder

High-dose neck radiation

History of: *(continued)*

Postpartum thyroid dysfunction

Previous delivery of infant with thyroid disease

Therapy for hyperthyroidism

Type 1 diabetes mellitus

Hypothyroidism in Pregnancy

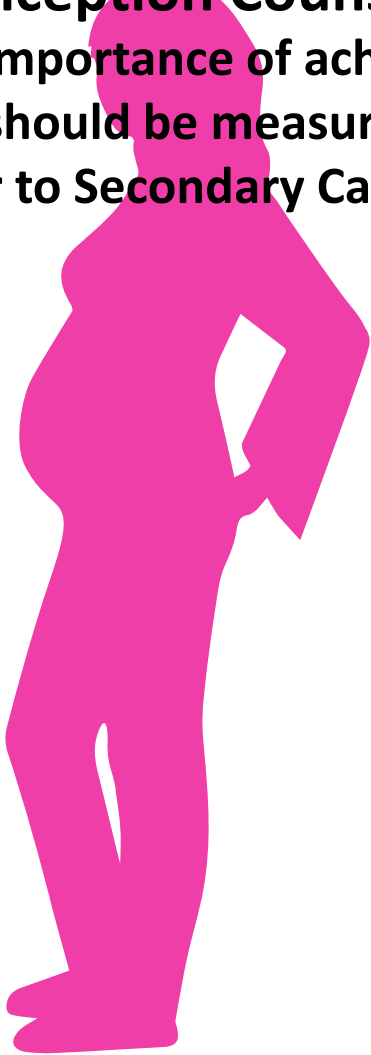
Effects on pregnancy

- **Maternal:** Miscarriage, pre-eclampsia, preterm delivery, placental abruption.
- **Fetal:** Preterm birth, low birth weight, and increased perinatal morbidity and mortality.
- **Childhood:** Poorly controlled hypothyroidism during pregnancy has been associated with impairment of neuropsychological and developmental indices and school learning abilities.

Management of Hypothyroidism in Pregnant Women

Preconception Counseling

- The importance of achieving euthyroidism before conception.
- TSH should be measured directly after conception.
- Refer to Secondary Care.



Levothyroxine-titrated dose to keep TSH within trimester-specific range

- First trimester: 0.1–2.5 mU/l
- Second trimester: 0.2–3.0 mU/l
- Third trimester: 0.3–3.0 mU/l

Serum thyrotropin levels assessed every 4 weeks during first half of pregnancy to allow dose adjustment

Serum thyrotropin reassessed during second half of pregnancy every 4-6 weeks to allow dose adjustment

A known Case of Hypothyroidism & Pregnant

- In pregnancy, serum TSH should be measured in **each trimester** to reach < 2.5 mIU/L all throughout the pregnancy.
- If the TSH is not on target and patient is compliant, increase Thyroxin dose by 25mcg OD and make sure that she is referred to secondary care already.
- TSH should be checked 2-4 weeks postpartum to consider dose reduction to the pre-pregnancy level.

A new Case of Hypothyroidism & Pregnant

- If the pregnant lady is not a known case of hypothyroidism and presented with an abnormal TFT during the current pregnancy.
- The highest cut point reading of TSH for a pregnant lady who is not known to have thyroid disease previously is **< 4.0 mIU/L**.

Hyperthyroidism in Pregnancy

Effects on pregnancy

- **Maternal:** heart failure, placental abruption, preeclampsia, preterm delivery.
- **Fetal:** goiter, intrauterine growth restriction, small for gestational age, stillbirth, thyroid dysfunction.

Management of Hyperthyroidism in Pregnant Women

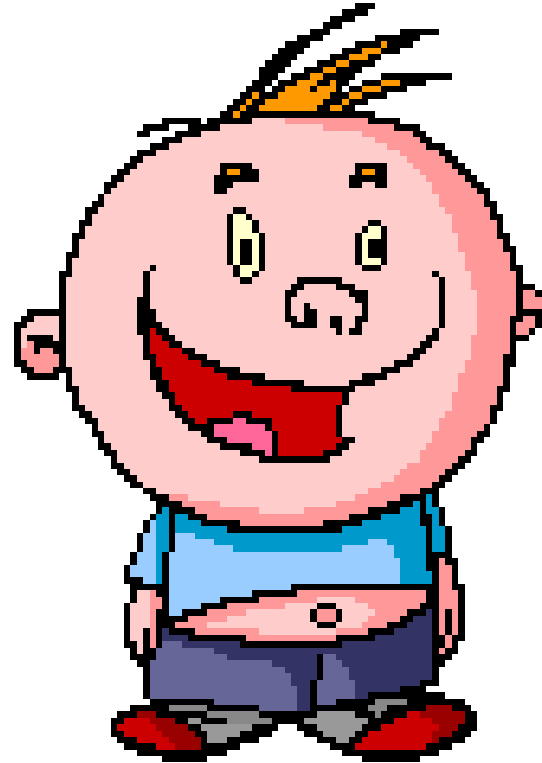
- Should be seen by specialist.
- In pregnant women who are a known case of hyperthyroidism, serum TSH and FT4 should be measured every two weeks until the patient is on a stable medication dosage.
- Patients on carbimazole should be switched to PTU.
- Propylthiouracil is recommended to be used during the first trimester and switch to carbimazole is recommended thereafter to reduce risk of hepatotoxicity.
- Carbimazole is safer than PTU in lactating mothers.
- Patients on radioactive iodine should wait six months after the therapeutic dose is administered before attempting conception (risk of gonadal dysfunction, neonatal goiter & hyperthyroidism).

Post Partum Thyroiditis

- All women with a past history of postpartum thyroiditis should have a thyroid function test:
 - Annually.
 - Prior to getting pregnant.
 - At 6 to 8 weeks after future pregnancies.

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Lets Focus on the Cases Now



Case 6:

- A 38 years old female patient is planning to conceive. She is K/C/O hyperthyroidism since 5 years, and she is on Carbimazole 5 mg TDS.

➤ How will you counsel her?

Hypothyroidism in Pregnancy Cases

- **Scenario 1:** TSH > 4.0 mIU/L
T4 < Trimester specific range (Repeated twice)
- **Scenario 2:** TSH > 4.0 mIU/L
T4 is normal (Repeated twice)
- **Scenario 3:** TSH > 2.5 but <4.0 mIU/L
T4 is normal, TPO Positive (Repeated twice)

Scenario 1:

TSH > 4.0 mIU/L

T4 < Trimester specific range (Repeated twice)

- D'x: **Overt Hypothyroidism**
- Start L-Thyroxin treatment at a dose of **1.6 mcg/kg OD** pre-breakfast
- Refer to secondary care as soon as possible.
- Check TFT after 4 weeks.

Scenario 2:

TSH > 4.0 mIU/L

T4 is normal (Repeated twice)

D'x: **Subclinical Hypothyroidism**

- Start L-Thyroxin **1 mcg/kg**
- Refer to secondary care
- Repeat TSH after 4 weeks

Scenario 3:

TSH > 2.5 but <4.0 mIU/L

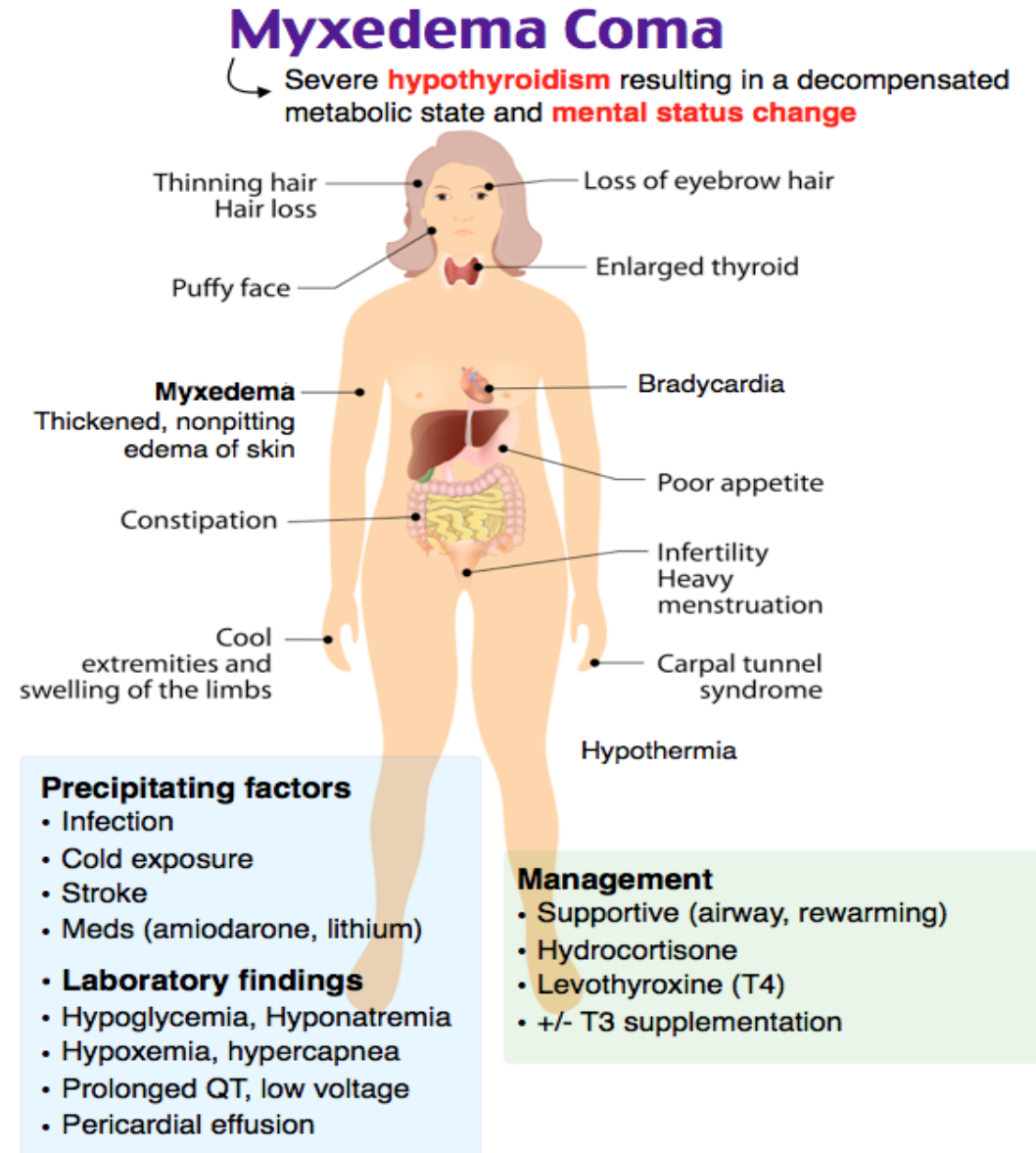
T4 is normal, TPO Positive (Repeated twice)

- Start L-Thyroxine at a dose of **25 mcg OD**
- Refer to secondary care

Thyroid Emergencies

Myxedema Coma

- A clinical diagnosis.
- Loss of brain function due to longstanding low level of thyroid hormones in the blood.
- Life threatening → mortality 1:3
- Usually in a patient with undiagnosed hypothyroidism
Or
Diagnosed but didn't take their medications.



Thyroid Storm (Thyrotoxic Crisis)

- An acute, life-threatening, hypermetabolic state induced by excessive release of thyroid hormones in individuals with thyrotoxicosis.
- Thyroid storm may be the initial presentation of thyrotoxicosis in undiagnosed children, particularly in neonates.
- Heat intolerance and diaphoresis are common and manifested as hyperpyrexia in thyroid storm.
- The clinical presentation of thyroid storm includes fever, tachycardia, hypertension, and neurological and GI abnormalities.
- Hypertension may be followed by congestive heart failure that is associated with hypotension and shock.

- Thyroid storm is almost invariably fatal if left untreated, rapid diagnosis and aggressive treatment are critical.
- **Diagnosis is primarily clinical, and no specific laboratory tests are available.**
- If the patient's clinical picture is consistent with thyroid storm, do not delay treatment pending laboratory confirmation of thyrotoxicosis.
- With adequate thyroid suppressive therapy and sympathetic blockade.
- Clinical features: anxiety, restlessness, mania or psychosis, weakness, fever & diaphoresis, tachycardia, AF, CHF, pedal edema, nausea, vomiting, diarrhea, myopathy.

Cont...

- Precipitating factors: infection, trauma, surgery, stress, MI, PE, withdrawal of Rx.
- DD: infection, heat stroke or exhaustion, pheochromocytoma, psychosis, OPP.
- Labs: low TSH, high T3 & T4, hyperglycemia, hypercalcemia, elevated LFTs.
- ECG: AF, arrhythmia.

THANK YOU..

Do you have
any
Questions?



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