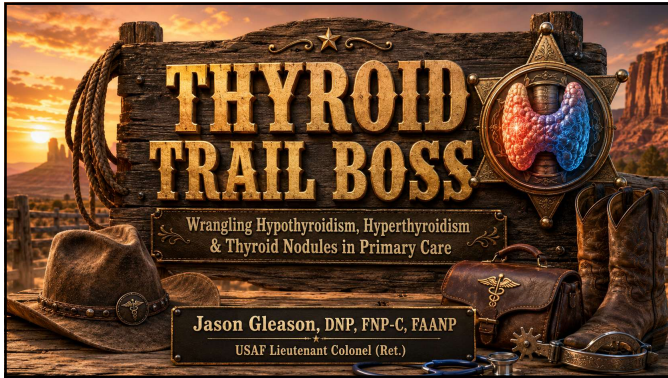




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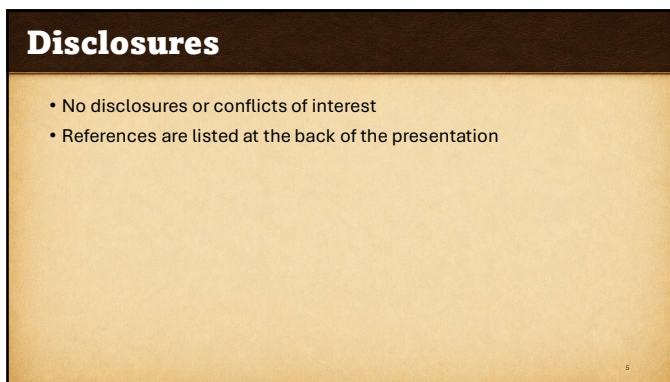
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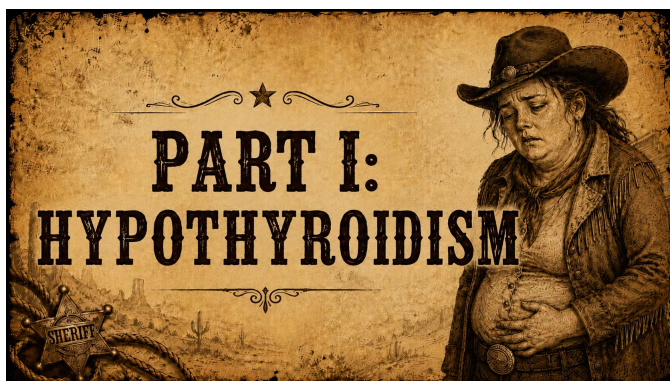
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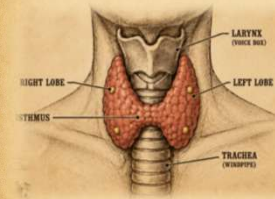


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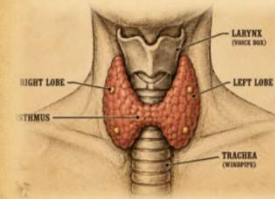
Anatomy and physiology



- Divided into two lobes
- Connected by the isthmus
- 2nd and 3rd rings of trachea
- Releases thyroid hormone (T3 and T4)
- T3 is active and T4 is mostly inactive.

7

Anatomy and physiology



- Body transforms T4 into T3
- Induces effects on every cell in body
- Generally increased metabolism and function
- Releases calcitonin
- Regulates calcium levels

8

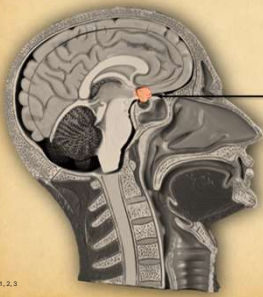
Anatomy and physiology



**Hypothalamic
Pituitary
Thyroid Access**

9

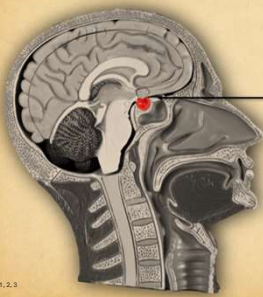
Anatomy and physiology



Hypothalamus detects low T_3 and T_4 hormones and releases thyrotropin releasing hormone (TRH) to stimulate the pituitary.

10

Anatomy and physiology



TRH stimulates thyrotropin cells in the anterior pituitary to release thyroid stimulating hormone (TSH)

11

Anatomy and physiology



TSH stimulates thyroid follicular cells to release T_4 (80%) and T_3 (20%).

12

Types and causes

Primary	Secondary
<ul style="list-style-type: none"> Worldwide #1 cause Iodine deficiency United States #1 cause Chronic autoimmune thyroiditis (Hashimoto's) Autoimmune thyroid disease 5–10 time more likely in women than men Common in people with other autoimmune diseases Goiter may or may not be present 	<ul style="list-style-type: none"> Pituitary damage Insufficient production of TSH Less common than primary 1 in 1,000 hypothyroid cases

13

Types and causes

Tertiary	Subclinical
<ul style="list-style-type: none"> Hypothalamus does not secrete enough thyrotropin releasing hormone (TRH) TRH stimulates the pituitary gland to release TSH 	<ul style="list-style-type: none"> Often caused by inflammation Often resolves on its own TSH is $\uparrow$ Normal free T₄ level

Normal lab values:
 TSH: 0.4 to 4.0 mIU/L (0.4 to 2.0 mIU/L if still symptomatic)
 Perfect TSH for most adults: 1.8 mIU/L
 Free T₄: 0.8 to 1.9 ng/dL

Refs: 2, 3, 4, 5, 6
Reference: 2

14

14

Pharmacologic etiology



- **Amiodarone** (Cordarone® and Pacerone®)
- **Thalidomide** (Contergan®)
- **Interferon** (Avonex®) and others
- **Rifampin** (Rifadin® and Rimactane®)
- **Phenobarbital** (Solfoton®, Tedral®)
- **Phenytoin** (Dilantin®)
- **Carbamazepine** (Tegretol® and Curatil®)
- **Interleukin-2** (Aldesleukin® or Proleukin®)
- **Lithium** (Priadel®, Camcolit®, Liskonum®)

Refs: 17, 18, 19

15

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Signs and symptoms



- Everything slows down
- Signs and symptoms are reversible.
- Most often in women ages >50 years
- Most common thyroid disorder
- Most patients have normal thyroid exam findings
- Symptoms can be mild and nonspecific

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Signs and symptoms

Symptoms reported by Patient

- Hair loss
- Weight gain
- Fatigue
- Constipation
- Cold intolerance
- Menstrual cycle changes
- Weight gain
- Galactorrhea (pituitary issue?)
- Depression
- Anxiety
- Cognitive impairment (memory loss)

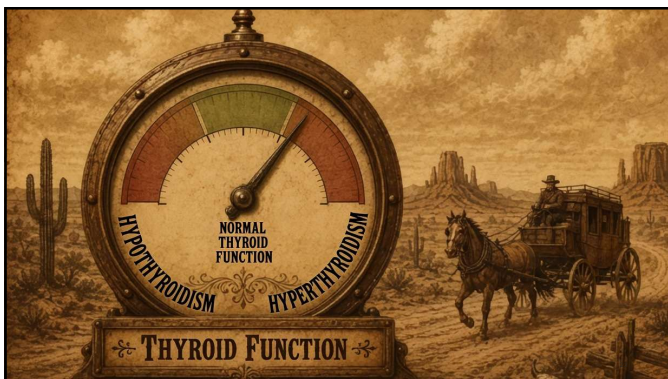
Signs noted on physical exam

- Dry skin
- Weight gain (**10 lbs. of water weight**)
- Slowness of speech and reflexes
- Course or brittle hair
- Dull facial expressions
- Bradycardia

Clues pointing to Hashimoto disease:

Fullness of throat, fatigue, painless thyroid enlargement, episodic neck pain or sore throat

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Diagnostic workup

Test	Normal Range	Importance	Notes
Thyroid Stimulating Hormone	0.4–4.0 mIU/L Perfect TSH: 1.8 mIU/L	Signals thyroid to release thyroxine (T_4)	Most reliable test for diagnosis of hypo- and hyperthyroidism. If TSH is normal, hypo- and hyper- are ruled out
Free T_4 (Thyroxine)	10–27 pmol/L	Unbound, metabolically active portion of T_4	Next best test to confirm hypo- or hyperthyroidism
Thyroid Peroxidase Antibody	<35 IU/mL	Measures antibody against peroxidase – An enzyme held within the thyroid	Test to detect autoimmune thyroid disease = likely hashimotos disease Useful with subclinical

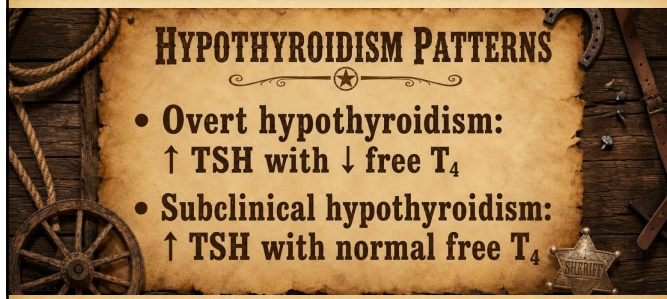
19

Diagnostic workup

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Diagnostic workup



HYPOTHYROIDISM PATTERNS

- **Overt hypothyroidism:**
↑ TSH with ↓ free T_4
- **Subclinical hypothyroidism:**
↑ TSH with normal free T_4

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Diagnostic workup



- **Central hypothyroidism**
 - Caused by pituitary or hypothalamic etiology
 - Use free T4 instead of TSH, if central hypothyroidism is suspected
- **Subclinical hypothyroidism + positive TPO Ab**
 - Increased risk of developing overt hypothyroidism
 - 50% develop overt hypothyroidism within 20 years
 - Regular screening helpful
 - Imaging studies are not routinely recommended

Refs: 4, 5, 6, 22, 24

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Diagnostic workup



Screening

- **U.S. Preventative Services Task Force**
 - No universal guidelines on screening
- **American Thyroid Association**
 - Commence at age 35 years
 - Continue every 5 years

Refs: 3, 4, 7, 18, 20

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Diagnostic workup



Patients at increased risk for hypothyroidism...

- Women over 60 years of age
- Pregnancy
- Prior history of head or neck irradiation
- Other autoimmune disorders
 - Type 1 diabetes, rheumatoid arthritis, etc...
- Positive thyroid peroxidase antibodies (TPO Ab)
- Family history

Refs: 3, 4, 7, 18, 20

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Treatment



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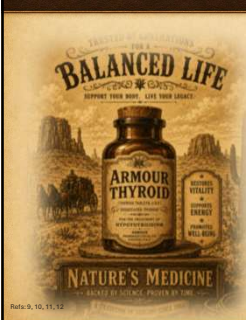
Treatment



- Only treat with levothyroxine monotherapy
- Armour® thyroid is not recommended
- Doses vary based on age
- Children require higher doses
- Older adults require lower doses
- Take on empty stomach
- Not within 1 hour of any meds or food
- Three hours post meal at bedtime
- Helpful to get creative

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Treatment: Armour® Thyroid

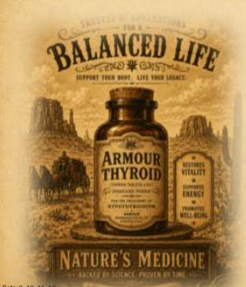


Armour® Thyroid

- Porcine-derived desiccated thyroid extract containing both T4 and T3
- Remains available in the United States
- Not FDA approved
- **August 6, 2025:** FDA releases letter
 - Act against animal-derived thyroid products
 - Allow 12-months for patients to transition

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Treatment: Armour® Thyroid

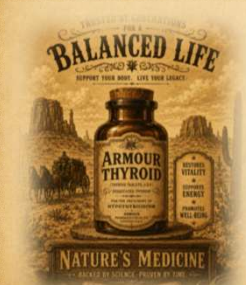


Armour® Thyroid

- March 2026: FDA plans to issue guidance describing its compliance and enforcement priorities by August 2026
- July 2026: FDA has not announced a definitive nationwide withdrawal date for Armour® Thyroid
- FDA is currently using a risk-based enforcement approach

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Treatment: Armour® Thyroid



Armour® Thyroid

- FDA may act against manufacturers with safety, potency, quality, or manufacturing violations
- FDA is developing guidance to help manufacturers pursue formal approval
- Levothyroxine remains the guideline-preferred first-line treatment
- Some patients may prefer or respond to desiccated thyroid extract

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Treatment: Armour® Thyroid

Armour® Thyroid potential benefits

- Contains both T4 and T3 hormones
 - Levothyroxine contains only T4
 - T4 has longer ½ life and adds stability
 - T4 converts into T3 as needed
 - T3 influences metabolism
 - Most T3 is produced by conversion of T4 in the liver and kidneys
 - Brain, pituitary, skeletal muscle, brown adipose tissue, and heart generate T3 locally for tissue-specific needs

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Treatment: Armour® Thyroid

Armour® Thyroid potential benefits

- Some patients report improved energy, mood and well-being
- May help carefully selected patient who have tried Levothyroxine but remain symptomatic

Refs: 1, 8, 9, 10, 13

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Treatment Synthroid® / Levoxyl®



Synthroid / Levoxyl® (Levothyroxine)

- 1949: Levothyroxine available for use
- 1970: Became the standard of care
- Provides same T4 hormone produced by the thyroid gland
- Predictable formulation
- Preferred during pregnancy
- Absorption is sensitive

Refs: 1, 3, 8, 17, 18, 20

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Treatment Synthroid® / Levoxyl®



Synthroid / Levoxyl® (Levothyroxine)

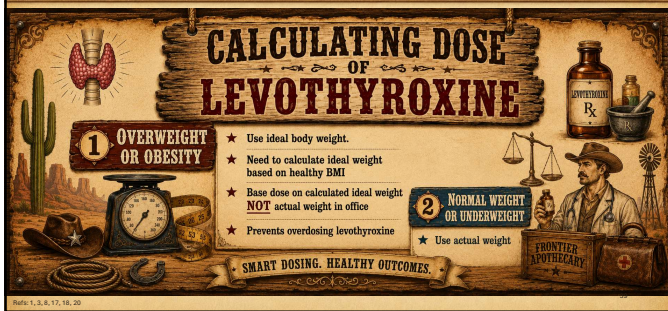
- Overtreatment risk – careful on dosing
- Dose requirement can change with aging
- Avoid taking calcium and iron supplements within 4 hours
- T4 ½ life is 6-7 days

Refs: 1, 3, 8, 17, 18, 20

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Treatment



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Treatment



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Follow-up monitoring

- Check TSH after 8 weeks of consistent daily use
- Don't check the TSH
 - Patients who don't take it on a daily consistent basis
 - Patients who don't take it on an empty stomach
 - FDA: 30 to 60 minutes before breakfast/meal
 - Americal Thyroid Association: 60 minutes before breakfast/ meal
- Checking sooner or in patients who don't take on an empty stomach and consistent daily use recommendations leads to dosing errors

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TSH normal but symptoms persist?



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TSH normal but symptoms persist?

- Cautious levothyroxine dose adjustment may be reasonable in selected patients with persistent symptoms after excluding other causes of symptoms
- Avoid suppressing TSH below the laboratory reference range
- Hypothyroid-like symptoms are nonspecific and may not be caused by thyroid dysfunction
- Review medication adherence and confirm correct levothyroxine administration

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TSH normal but symptoms persist?

- Review proton pump inhibitors, biotin use, food timing, and changes in medication manufacturer
- Evaluate for other causes of fatigue, weight gain, brain fog, constipation, hair loss, or low mood
- Small dose increase may be reasonable when TSH is near the upper end of reference range after excluding other causes of symptoms

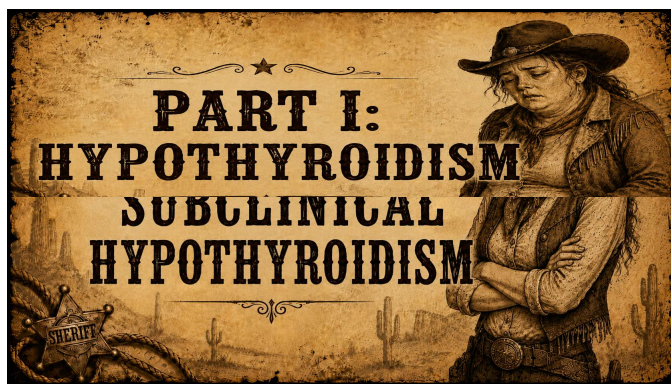
Alternative
causes may
include

- Anemia
- Iron deficiency
- Vitamin B12 deficiency
- Depression
- Anxiety
- Sleep apnea
- Menopause
- Chronic kidney disease
- Heart failure
- Medication side effects

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The Puzzle



- Subclinical hypothyroidism presents
 - Normal thyroxine (T4)
 - Elevated thyroid stimulating hormone (TSH)
- Incidence estimated at 3% to 15%
- Correlates with...
 - Coronary artery disease events
 - Congestive heart failure
 - Stroke
- Higher incidence in women and older adults

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Half of cases resolve



40% to 60% of cases normalizes spontaneously within one year

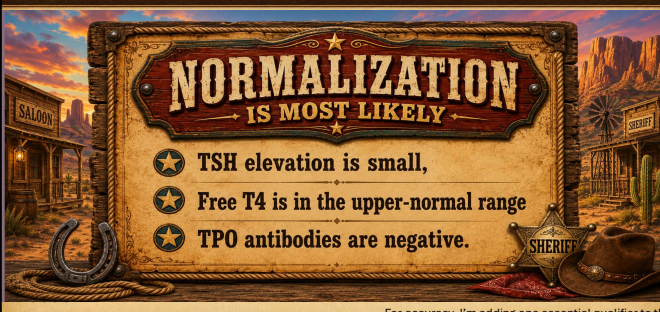
Mild TSH elevation = temporary metabolic wobble rather than permanent failure

Potential causes:

- Normal circadian and variation
- Recovery from acute illness
- Temporary thyroid inflammation (pain on exam)
- Medication or supplement effects
- Age-related TSH elevation
 - Older adults
- Lack of autoimmune thyroid damage (TPO)

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Most likely to self-resolve



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Evaluation tips

- Asymptomatic most of time
- Can present with symptoms of hypothyroidism
- Assessing symptoms influences whether replacement is needed
- Illness and some medications (Lithium, Amiodarone, others)
 - Can cause an elevation of TSH
 - Need to be ruled out as cause before a diagnosis of subclinical hypothyroidism
- TSH <10 mIU/L and normal free T4
 - TSH and FT4 repeated in 3 to 6 months before initiation of therapy
 - Half of these patients return to normal TSH on their own

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Evaluation tips

THYROID PEROXIDASE (TPO) ANTIBODIES

- ✓ Thyroid Peroxidase (TPO) Antibodies
- ✓ Positive TPO antibodies = autoimmune etiology of hypothyroidism
- ✓ Correlate with progression of subclinical hypothyroidism to overt hypothyroidism
- ✓ Evaluate for the risk of atherosclerotic cardiovascular disease and other comorbidities (lipids, tobacco use, HTN, etc.)

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Should I treat or not?

★ BASED ON ATA & AACE GUIDELINES ★

1. CONFIRM DIAGNOSIS	2. ASSESS TSH LEVEL		
<ul style="list-style-type: none"> • Elevated TSH with normal free T4 • Repeat TSH and free T4 in 2-3 months to confirm • Assess TPO antibodies 	A) TSH < 4.5 mIU/L ↓ OBSERVE No treatment	B) TSH 4.5-10 mIU/L ↓ CONSIDER TREATMENT Individualize decision based on factors	C) TSH > 10 mIU/L ↓ TREAT Levothyroxine recommended
TREAT THE PATIENT NOT JUST THE NUMBER			
Consider treatment in those with symptoms, positive TPO antibodies, progressive TSH rise, goiter, pregnancy or planning pregnancy, infertility, or age < 65-70 years.			

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Should I treat or not?

★ BASED ON ATA & AACE GUIDELINES ★

3. ONGOING MONITORING

- If untreated: Check TSH (and free T4) every 6–12 months
- If treated: Recheck TSH in 6–8 weeks after starting or adjusting dose
- Once stable: Monitor TSH every 6–12 months
- Goal TSH: Within reference range (generally 0.4–4.0 mIU/L)

TREAT THE
PATIENT
NOT JUST
THE NUMBER



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Pregnancy considerations

- Pregnant or planning pregnancy
- Start on levothyroxine replacement
 - especially when TPO antibody is positive
- Higher risk of pregnancy and fetal outcomes if not treated
- **ALWAYS** refer to OB/GYN/Nurse Midwife, and Endocrinology



50

Should I treat or not?

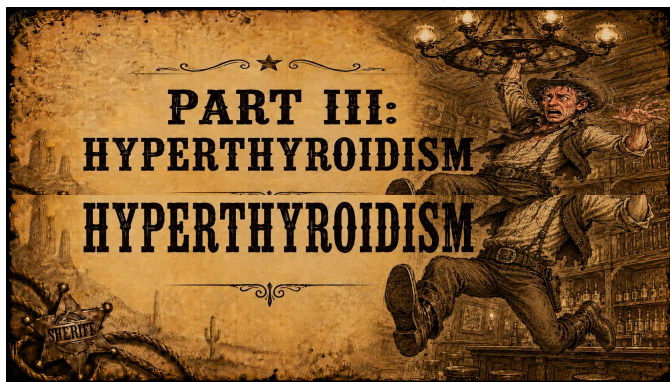
- Should I start levothyroxine therapy or do some watchful waiting?
- Factors that need to be considered...
 - Age
 - Extent of the elevation of TSH
 - Associated cardiovascular risk factors
 - Clinical symptoms of hypothyroidism
 - Presence of thyroid peroxidase antibodies
- First strategy is "Watch and wait" approach
- Recheck TSH in 2 to 3 months to confirm elevation of TSH

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Treatment considerations

- Patients do not typically need a full dose of levothyroxine
- Start with 25 to 75 mcg levothyroxine in individuals with a history of cardiovascular disease (without symptoms of active disease)
- Aged 70 or younger, the lowest dose of levothyroxine 25 mcg should be started to assess tolerability
- Individuals aged 70 or older
- Decision to treat is made on a case-by-case basis
- Based on symptoms and history of cardiovascular disease
- TPO antibody positivity
- Start on levothyroxine replacement since
- Have a two-fold risk of progression to overt hypothyroidism

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Etiology

- Thyrotoxicosis: Clinical state caused by excessive circulating thyroid hormone
- Hyperthyroidism: Thyrotoxicosis caused specifically by increased thyroid hormone synthesis and secretion
- Hyperthyroidism:
 - Suppressed TSH
 - Elevated free T4
- Subclinical hyperthyroidism: Low or suppressed TSH with normal free T4

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Etiology

INCREASED THYROID HORMONE SYNTHESIS	RELEASE OF PREFORMED THYROID HORMONE	EXOGENOUS OR ECTOPIC HORMONE
<ul style="list-style-type: none"> Graves disease Toxic multinodular goiter Toxic adenoma Iodine-induced hyperthyroidism Amiodarone-induced hyperthyroidism type 1 Gestational transient thyrotoxicosis Rarely, TSH-secreting pituitary adenoma 	<ul style="list-style-type: none"> Subacute painful thyroiditis Painless or silent thyroiditis Postpartum thyroiditis Drug-induced destructive thyroiditis Amiodarone-induced hyperthyroidism type 2 	<ul style="list-style-type: none"> Excess levothyroxine or liothyronine Factitious thyroid hormone use Struma ovarii Functioning metastatic thyroid carcinoma, rarely



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Graves disease



- **Most common cause** of hyperthyroidism in iodine-sufficient regions
- **Autoantibodies** activate the TSH receptor
- Produces diffuse thyroid stimulation and excessive T4 and T3 synthesis
- Those at risk:
 - Genetic susceptibility
 - Female sex
 - Those with other autoimmune diseases

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Graves disease

CLINICAL TIP #1

★

A patient with a suppressed TSH, diffuse goiter, and eye findings has Graves disease until proven otherwise

CLINICAL TIP #2

★

Don't mix up Graves Disease and Hashimotos. Hyperthyroidism is more deadly than hypothyroidism and can send your patient to the grave

CLINICAL TIP #3

★

Graves disease = Goiter and/or Goldfish eyes (Exophthalmos) on exam



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Thyroid eye disease



- Exophthalmos is a sign of TED
- 25% of patient with Graves' disease
- Excessive thyroid hormone stimulates orbital fat, muscle and fibrous cell growth
- Refer to eyecare specialist
- Treat with Teprotumumab (Tepezza®)
- Blocks insulin-like growth factor 1 receptor
 - ↓ inflammation, muscle and fat remodeling
 - 8 out of 10 patients report reduced eye bulging
- Given IV every 3 weeks for 8 infusions

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Toxic nodular hyperthyroidism

- One autonomously functioning thyroid nodule
- More common with increasing age and long-standing nodular thyroid disease
- Often develops gradually
- Spontaneous remission is **unlikely**
- Definitive treatment generally requires radioactive iodine or surgery



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Thyroiditis



- Thyroiditis releases **previously synthesized** hormone
- Antithyroid drugs such as methimazole generally do not help
- **Anterior neck pain, tenderness, fever, and elevated inflammatory markers**
- Painless and postpartum thyroiditis are usually autoimmune and minimally tender

60

Apathetic hyperthyroidism in older adults

- May **lack** tremor, anxiety, diaphoresis, and hyperactivity
- May present with fatigue, depression, weakness, or cognitive decline
- Weight loss attributed incorrectly to aging
- Atrial fibrillation may be the first recognizable manifestation
- A low TSH should not automatically be dismissed as an age-related change



Info: 18, 26, 27

61

Apathetic hyperthyroidism in older adults



Clinical Tip:
 In older adults, hyperthyroidism may whisper, not shout.
 New atrial fibrillation, unexplained weight loss, or proximal weakness deserves thyroid testing to look for apathetic hyperthyroidism.

62

Complications

- | | |
|---|--|
| <ul style="list-style-type: none"> • Atrial fibrillation • Systolic hypertension • Heart failure • Myocardial ischemia • Loss of bone density and osteoporosis • Fragility • Fractures • Weight loss – muscle/fat | <ul style="list-style-type: none"> • Skeletal muscle weakness • Neuropsychiatric symptoms • Menstrual irregularity • Reduced fertility • Adverse pregnancy and fetal outcomes • Thyroid eye disease <ul style="list-style-type: none"> • Exophthalmosis • Thyroid storm |
|---|--|

Info: 26, 27, 28
 Reference: 3

63

Thyroid storm



- Life threatening – to the ED stat, don't wait for in-office lab results to confirm
- Uncontrolled hyperthyroidism
- Major stressors often trigger

CLINICAL TIP:

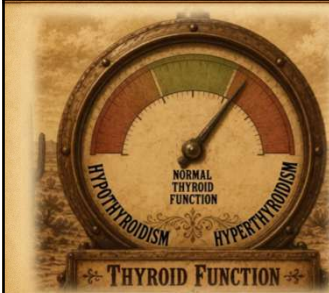
Hyperthyroidism **becomes** thyroid storm when **fever, severe tachycardia** and **mental status changes** are present

Common signs

- Fever
- Marked tachycardia
- Acute mental status changes
- Vomiting, nausea, diarrhea, jaundice

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Diagnosis: Common symptoms



- Palpitations
- Heat intolerance
- Excessive sweating
- Unintentional weight loss
 - Muscle mass and fat store
- Increased appetite
- Anxiety or irritability
- Insomnia
- Proximal muscle weakness
- Bowel changes/diarrhea

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Diagnosis: Physical exam findings

- Tachycardia or irregular rhythm
- Systolic hypertension
- Fine postural tremor
- Warm, moist skin
- Hyperreflexia
- Proximal muscle weakness
- Diffuse or nodular goiter
- Proptosis, diplopia, or restricted eye movement



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Diagnosis: Other tests

Ultrasound

- Not routinely required
- Indications
 - Nodule, asymmetric gland, compressive symptoms, or structural abnormality is
- Ultrasound does not directly measure thyroid function
- Avoid ordering ultrasound on every patient with elevated TSH but order when indicated

TRAb (Thyrotropin Receptor Antibody)

- Used to confirm Graves disease
- Positive: Graves disease
- Negative: Graves disease less likely but still possible

Additional tests

- Radioactive iodine uptake scan
- ECG, CBC, TSH, Pregnancy test, ESR, CPR, Bone density testing, Echocardiogram, thyroid US as indicated

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Diagnosis: Other tests

Radioactive iodine uptake scan

- Use when the cause remains unclear
- Use when thyroid nodules are present
- Diffuse uptake suggests Graves disease
- Focal uptake suggests toxic adenoma
- Patchy uptake suggests toxic multinodular goiter
- Low uptake suggests thyroiditis, exogenous hormone, or iodine exposure

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Treatment



HYPERTHYROIDISM TREATMENT PRIORITIES DAY ONE

- Beta-blocker for symptomatic tachycardia, tremor, anxiety, when indicated
- Propranolol is commonly used and reduces peripheral T4-to-T3 conversion at higher doses
- Atenolol or metoprolol may provide convenient once-daily or cardioselective therapy
- Use caution with asthma, decompensated heart failure, bradycardia, and conduction disease
- Diltiazem may be used for rate control when beta-blockers are contraindicated
- Symptom control does not replace treatment of the underlying cause
- Call Endocrinology while patient is in the office. Followup in days to weeks
- For acute emergent issues such as atrial fibrillation: TO THE ED BY AMBULANCE

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Treatment



ANTITHYROID MEDICATION

Methimazole is preferred for most nonpregnant adults

PTU IS GENERALLY RESERVED FOR:

- First trimester of pregnancy
- Thyroid storm
- Selected patients unable to take methimazole

HOW THEY WORK

Methimazole and PTU block thyroid peroxidase, reducing new thyroid hormone synthesis

PTU also decreases peripheral T4-to-T3 conversion

IMPORTANT SAFETY POINT

These drugs can cause liver toxicity

Should be started by or in consultation with an endocrinologist

TYPICAL COURSE

Treatment is usually about 12-18 months

Longer-term low-dose methimazole may be appropriate for selected patients

REMISSION IS MORE LIKELY WITH:

- Mild disease
- Small goiter
- Low or negative TRAb

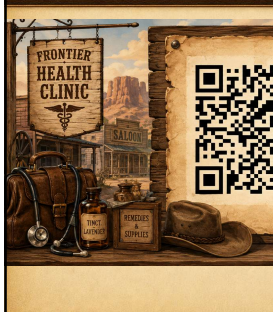
DEFINITIVE TREATMENT

- Radioactive iodine
- Total or near-total thyroidectomy

Treat as hypothyroidism after completion

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Don't forget about mental health



FRONTIER HEALTH CLINIC

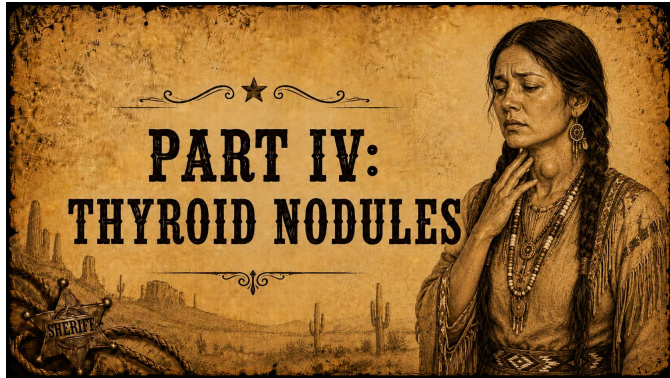
NURSE PRACTITIONERS MENTAL HEALTH TOOLBOX

Scan for screening tools and resources

MINI HEALING HOPE

COMPASSION COMPETENCE COMMUNITY

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Thyroid nodules

- 90%-95% of thyroid nodules are benign
- May represent thyroid cancer in 4-6% of cases
- Discrete lesion within the thyroid gland
- Radiologically distinct from rest of thyroid
- Solitary, multiple, cystic or solid
- 5-7% are detected during physical exam
 - Patients know their bodies well
 - **Always** get a thyroid ultrasound even if you don't feel anything



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Thyroid cancer

- Non-medullary thyroid cancer (NMTC)
 - 95% of all thyroid malignancies
 - Arise from epithelial cells
- Ionizing radiation increases risk of
 - Benign and malignant thyroid nodules
- Other risk factors
 - Smoking
 - Alcohol consumption
 - Obesity
 - Uterine fibroids
 - Metabolic syndrome
 - ↑ insulin-like growth factor-1



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Signs and symptoms

Red flag exam findings for malignancy...

- Nodules >4 cm (19% risk of malignancy)
- Firmness on palpation (like your knuckle)
- Fixation on adjacent tissues
- Cervical lymphadenopathy
- Late signs: Dysphonia, dysphagia, hemoptysis, cervical lymphadenopathy
- Solitary nodule + cervical lymphadenopathy (>1 cm) + dysphonia = 100% malignancy
- Still need biopsy to confirm



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Next step: Diagnostic ultrasound

Patients know their bodies better than providers do

Palpation least sensitive: 5-7%

ALWAYS order diagnostic ultrasound regardless of physical exam findings



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Next step: Diagnostic ultrasound

Thyroid imaging reporting and data system (TIRADS)

Test results

TIRADS-1
TIRADS-2
TIRADS-3
TIRADS-4
TIRADS-5

Interpretation

Benign
Not suspicious
Mildly suspicious
Moderately suspicious
Highly suspicious

Next best step

No FNA
No FNA
FNA if ≥ 2.5 cm Follow if ≥ 1.5 cm
FNA if ≥ 1.5 cm Follow if ≥ 1 cm
FNA if ≥ 1 cm Follow if ≥ 0.5 cm

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Next step: Diagnostic ultrasound

Thyroid imaging reporting and data system (TIRADS) calculator

www.tiradscalculator.com



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Next step: FNA Biopsy

Test results	Interpretation	Next best step
Bethesda I Non-diagnostic	<ul style="list-style-type: none">• Considered cytologically inadequate• Absence of malignant cells NOT interpreted as a negative biopsy	<ul style="list-style-type: none">• FNA usually repeated in 4 to 6 weeks.
Bethesda II	<ul style="list-style-type: none">• Include macrofollicular, colloid nodules, nodular goiter, Hashimoto thyroiditis	<ul style="list-style-type: none">• Usually followed without surgery• Ultrasound every 12–24 months• Ultrasound shows suspicious findings – FNA biopsy repeated within 12 months

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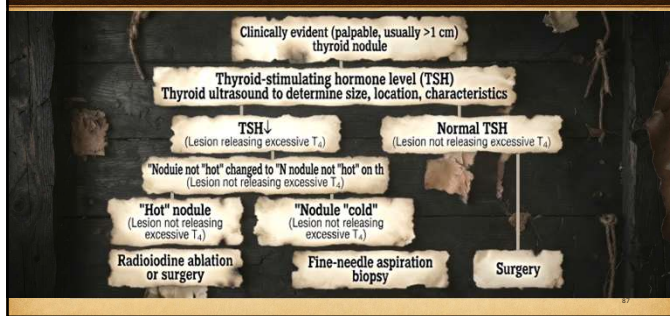
Next step: FNA Biopsy

Test results	Interpretation	Next best step
Bethesda III–IV	<ul style="list-style-type: none">• Indeterminate cytology	<ul style="list-style-type: none">• Approach varies based on institution.• FNA for molecular testing• Repeat FNA in 6–12 weeks.• Consider Radionulcide scan.
Bethesda V	<ul style="list-style-type: none">• Suspicious for malignancy	<ul style="list-style-type: none">• Referred for surgery
Bethesda VI	<ul style="list-style-type: none">• Papillary cancer, medullary thyroid cancer, thyroid lymphoma, anaplastic cancer, other cancer metastatic to the thyroid	<ul style="list-style-type: none">• Referred for surgery

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Next step: Other considerations



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Prognosis

Ultrasound

- Prognosis for malignant thyroid nodules
- Papillary thyroid cancer 5-year survival rate:
 - 99.5% local
 - 74% distant
- Factors that increase risk of recurrence or death
 - Male gender
 - Mediastinal lymph node involvement
 - Delay in primary surgical therapy for more than 1-year after detection



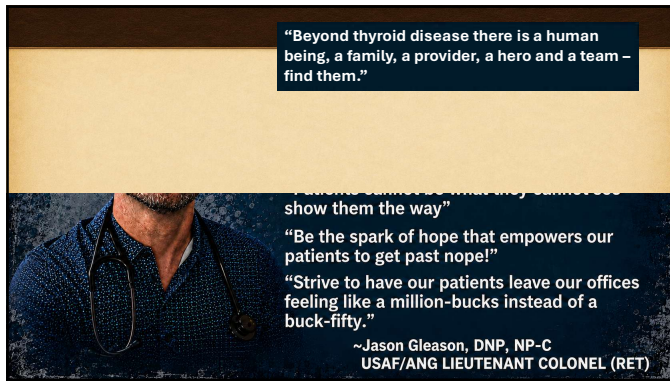
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Prognosis

- Follicular cancer generally occurs in older adults
 - Aggressive
 - Distant metastasis
- 5-year survival rate:
 - 99.5% local
 - 67% distant



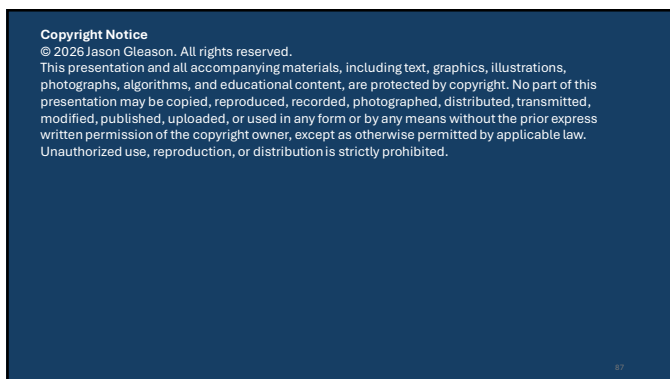
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