# Thyroid Disorders:

## What Every Psychiatrist Should Know

**Sowmya Boddhula, MD**
Assistant Professor | Department of Endocrinology
University of Texas at Austin – Dell Medical School
April 25, 2026

# Learning Objectives

*By the end of this presentation, you will be able to:*

- ✓ Identify common thyroid and endocrine disorders
- ✓ Recognize when to refer patients to endocrinology
- ✓ Understand how thyroid dysfunction exacerbates psychiatric symptoms
- ✓ Optimize collaborative care for patients with comorbid conditions

# Why This Matters – The Psychiatry-Endocrinology Interface

**30–69%**

Depression prevalence in hypothyroidism

**~60%**

Anxiety disorders in hyperthyroidism

**4–20%**

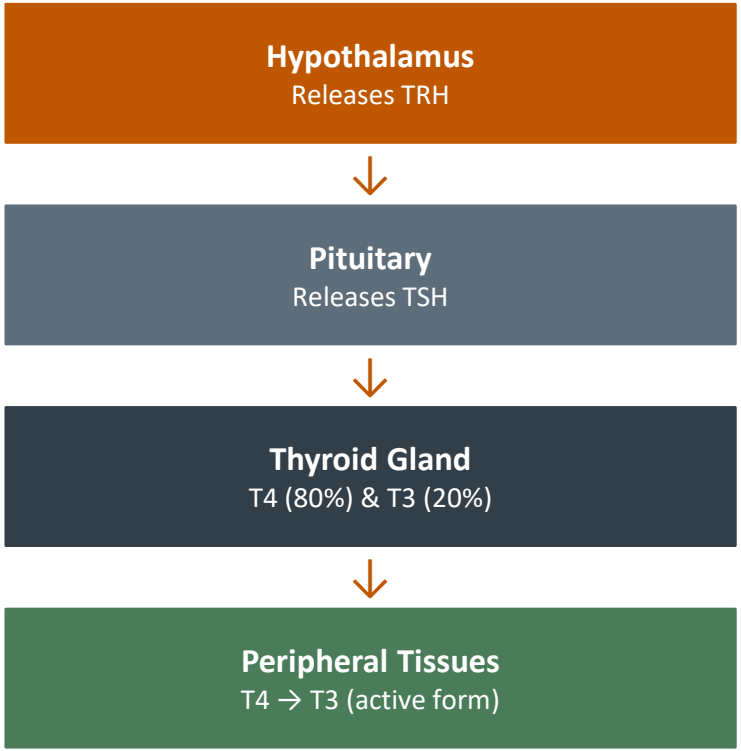
Subclinical thyroid disease in psychiatric patients

**↔**

Thyroid dysfunction often mimics psychiatric disorders

*Sources: Bauer M, et al. J Neuroendocrinol. 2008 | Feldman AZ, et al. Circulation. 2016*

# Thyroid Physiology – Quick Review




## Key Clinical Points

- ⚡ T3 is 3–4x more potent than T4
- 🧠 Brain has high T3 receptor density
- 🔄 Thyroid hormones regulate neurotransmitter synthesis and metabolism
- 💊 T4 is converted peripherally to active T3 in tissues

# Case Study #1 – Hypothyroidism Mimicking Depression

Patient: 45-year-old woman | 6 months of low mood, fatigue, weight gain, poor concentration | No prior depression

## Initial Management

Started on SSRI with minimal improvement after adequate trial

## Lab Results

**TSH: 12.5 mIU/L** (normal: 0.4–4.0)
**Free T4: 0.7 ng/dL** (normal: 0.8–1.8)

## ✓ Outcome

Started levothyroxine 50 mcg → Significant mood improvement within 6–8 weeks

💡 **Teaching Point: Always check TSH before diagnosing primary depression!**

# Case Study #2 – Hyperthyroidism Mimicking Anxiety

Patient: 32-year-old man | 3 months of anxiety, panic attacks, insomnia, 15-lb weight loss | No prior anxiety disorder

### Physical Exam Findings

- Tremor
- Tachycardia (HR 110 bpm)
- Warm and moist skin

### Lab Results

**TSH: <0.01 mIU/L**
**Free T4: 3.2 ng/dL (elevated)**
**TSH receptor antibodies: Positive**

**Diagnosis: Graves' Disease**

✓ **Treated with methimazole → Anxiety improved**

### 💡 Teaching Point

Always look for physical signs (tremor, tachycardia, weight loss) when evaluating anxiety — hyperthyroidism is a common masquerader!

# Common Endocrine Disorders – Overview

| Disorder | Prevalence | Psychiatric Overlap |
|---|---|---|
| Hypothyroidism | 4–5% (women) | Depression, cognitive impairment |
| Hyperthyroidism | 1.2% | Anxiety, mania, psychosis |
| Subclinical hypothyroidism | 4–20% | Subtle mood/cognitive changes |
| Hashimoto's thyroiditis | Most common hypothyroid cause | Autoimmune encephalopathy |
| Diabetes mellitus | 10.5% | Depression (2× risk) |
| Cushing's syndrome | Rare | Depression, psychosis |
| Addison's disease | Rare | Depression, fatigue |

# Hypothyroidism – Clinical Presentation

## Classic Symptoms

- Fatigue, weight gain, cold intolerance
- Dry skin, hair loss, constipation
- Bradycardia, delayed reflexes

## Psychiatric Manifestations

- **Depression (most common)**
- Cognitive slowing / "brain fog"
- Psychomotor retardation
- Memory impairment
- **"Myxedema madness" (severe): psychosis, hallucinations, paranoia**

### ⚠ Key Clinical Insight

Hypothyroidism is one of the most common reversible causes of depression. Always consider it before attributing symptoms solely to a primary psychiatric disorder.

**Citation:**

*Hage MP, Azar ST. "The link between thyroid function and depression." J Thyroid Res. 2012;2012:590648*

# Hypothyroidism – Laboratory Diagnosis

## Diagnostic Findings

**First-line test: TSH**
**Primary hypothyroidism:** TSH ↑, Free T4 ↓

**Subclinical:** TSH 4.5–10 mIU/L, Free T4 normal

## 💡 Clinical Pearl

TSH is the single best screening test for thyroid dysfunction. A normal TSH makes primary thyroid disease very unlikely.

## When to Screen in Psychiatric Patients

- Treatment-resistant depression
- Rapid cycling bipolar disorder
- New-onset cognitive impairment
- Lithium therapy (annual screening)
- Women >60 years

2012

# Hyperthyroidism – Clinical Presentation

## Classic Symptoms

- Weight loss, heat intolerance, tremor
- Palpitations, tachycardia
- Exophthalmos (Graves' disease)

## Key Point

*"Apathetic hyperthyroidism" in elderly may present as depression rather than anxiety — don't be misled!*

## Psychiatric Manifestations

- **Anxiety and panic attacks (most common)**
- Irritability, emotional lability
- Insomnia
- Mania-like symptoms
- **⚠ Thyroid storm: delirium, psychosis — MEDICAL EMERGENCY!**

*Citation: Bunevicius R, Prange AJ Jr. CNS Drugs. 2006;20(11):897-909*

# Treatment Considerations – Hypothyroidism

## Levothyroxine (T4) Therapy

### Starting Dose

- Young, healthy: 1.6 mcg/kg/day
- Elderly or cardiac disease: 25–50 mcg/day

### Monitoring

- Recheck TSH in 6–8 weeks after dose change
- Goal TSH: 0.4–4.0 mIU/L (individualize)

### Patient Education

- Take on empty stomach, 30–60 min before breakfast
- Avoid calcium, iron, PPI within 4 hours

### Psychiatric Impact

- Mood improvement typically within 6–8 weeks
- May enhance antidepressant response

# Hyperthyroidism – Laboratory Diagnosis

| Primary Hyperthyroidism | Subclinical Hyperthyroidism | First-Line Test |
|---|---|---|
| TSH (<0.001) ↓<br>Free T4 ↑ and/or Free T3 ↑ | TSH <0.4 mIU/L<br>Free T4/T3 normal | TSH<br>(always start here) |

## Additional Tests to Determine Etiology

### TSH Receptor Antibodies

Diagnoses Graves' disease

### Thyroid Uptake Scan

Differentiates causes (Graves vs. nodules vs thyroiditis)

### Thyroid Ultrasound

Identifies nodules, goiter, vascular flow

# Treatment Considerations – Hyperthyroidism

| Antithyroid Drugs | Radioactive Iodine | Surgery (Thyroidectomy) |
|---|---|---|
| Methimazole, PTU<br>First-line in Graves'<br>Psych symptoms improve in 2–6 weeks | Definitive treatment<br>Risk of hypothyroidism post-treatment<br>Requires TSH monitoring | For large goiters, nodules, or in pregnancy<br>Definitive but irreversible<br>Requires lifelong levothyroxine |

## Psychiatric Management

- Beta-blockers (propranolol) for acute anxiety and tremor — rapid symptom relief
- Avoid stimulants until euthyroid state is achieved
- Psychiatric symptoms usually resolve with successful treatment of hyperthyroidism — give it 2–6 weeks

# Subclinical Thyroid Disease – The Gray Zone

**Subclinical Hypothyroidism**

TSH 4.5–10 mIU/L
Normal Free T4

**Subclinical Hyperthyroidism**

TSH <0.4 mIU/L
Normal Free T4/T3

## Psychiatric Relevance

- May contribute to treatment-resistant depression
- Associated with cognitive impairment in elderly
- Controversial whether to treat — individualize based on symptoms and risk

### When to Consider Treatment

TSH >10 mIU/L • Positive thyroid antibodies • Symptoms present • Treatment-resistant psychiatric illness

*Samuels MH. "Psychiatric and cognitive manifestations of hypothyroidism." Curr Opin Endocrinol Diabetes Obes. 2014;21(5):377-383.*

# Thyroid Dysfunction & Depression – The Evidence

## Neurotransmitter Dysregulation

- ↓ Serotonin synthesis
- Altered norepinephrine metabolism
- Reduced dopamine activity

## Neuroplasticity Impairment

- ↓ BDNF (brain-derived neurotrophic factor)
- Hippocampal volume changes

## HPA Axis Dysfunction

- Altered cortisol regulation
- Stress response dysregulation

*Citation: Bauer M, et al. Mol Psychiatry. 2002;7(2):140-156 | Almeida OP, et al. Am J Geriatr Psychiatry. 2011;19(9):763-770*

# Rapid Cycling Bipolar Disorder & Thyroid Disease

**20–30%**

of rapid cyclers have thyroid abnormalities

**Up to 20%**

of lithium patients develop hypothyroidism

## Key Associations

- Hypothyroidism associated with rapid cycling
- Lithium causes hypothyroidism (up to 20%)
- Thyroid status affects mood stability directly

## Clinical Recommendations

✓ Screen TSH in ALL bipolar patients
✓ Monitor TSH every 6–12 months on lithium
✓ Treatment with T4 supplementation based on TSH levels.

*Bauer MS, Whybrow PC. "Rapid cycling bipolar affective disorder. II. Treatment of refractory rapid cycling with high-dose levothyroxine: a preliminary study." Arch Gen Psychiatry. 1990;47(5):435-440.*

# Thyroid Autoimmunity & Psychiatric Symptoms

## Hashimoto's Encephalopathy

- Rare but treatable autoimmune condition
- Presents with: confusion, seizures, psychosis, cognitive decline
- High anti-thyroid antibodies (anti-TPO, anti-thyroglobulin)
- **TSH may be NORMAL — don't be reassured!**
- Responds to corticosteroids

*Citation: Chong JY, et al. Arch Neurol. 2003;60(2):164-171*

## ⚠ Clinical Pearl

**Consider Hashimoto's Encephalopathy in patients with:**

- Acute psychiatric symptoms + neurological signs
- Treatment-resistant psychiatric illness
- Fluctuating clinical course
- Unexplained seizures or cognitive decline

# Medications That Affect Thyroid Function

| Drug | Effect | Monitoring |
|---|---|---|
| Lithium | ↓ T4/T3 release, ↑ TSH | TSH every 6–12 months |
| Amiodarone | Hypo- or hyperthyroidism | TSH every 3–6 months |
| Carbamazepine | ↑ T4 metabolism | Check TSH if symptomatic |
| Valproate | Can ↓ T4 | Monitor if symptomatic |
| Interferon-α | Can trigger autoimmune thyroiditis | Monitor |
| Tyrosine Kinase inhibitor | Associated with hypothyroidism | Monitor and treat accordingly |
| Immune checkpoint inhibitors | Thyroiditis | Monitor and treat |

Rizzo LFL, Mana DL, Serra HA. Drug-induced hypothyroidism. Medicina (B Aires). 2017;77(5):394-404.

# When to Screen for Thyroid Disease in Psychiatry patients

💡 **Remember: TSH is inexpensive, widely available, and high-yield. Keep a low threshold for screening!**

- ✓ Treatment-resistant depression or anxiety
- ✓ New-onset psychiatric symptoms in older adults
- ✓ Rapid cycling bipolar disorder
- ✓ Cognitive impairment / dementia workup
- ✓ Before starting lithium (baseline)
- ✓ Postpartum depression
- ✓ Family or personal history of thyroid / autoimmune disease

**Samuels MH.** Psychiatric and cognitive manifestations of hypothyroidism. *Curr Opin Endocrinol Diabetes Obes.* 2014;21(5):377–383.

# When to Refer to Endocrinology

## Diagnostic Uncertainty

- Abnormal thyroid tests with unclear etiology
- Discordant TSH and Free T4 results
- Suspected central hypothyroidism (low TSH + low T4)

## Treatment Challenges

- Difficulty achieving euthyroid state
- Pregnancy with thyroid disease
- Thyroid nodules or goiter
- Suspected thyroid cancer

## Special Populations

- Pediatric thyroid disorders
- Complex comorbidities (cardiac disease)
- Elderly with first-time thyroid abnormality

**Any confirmed hyper- or hypothyroidism warrants endocrine evaluation — refer early!**

# Other Endocrine Disorders with psychiatry symptoms

## Diabetes Mellitus

- ↑ Risk of depression (about **2×** vs general population)
- **Bidirectional**: depression worsens glycemic control; diabetes increases depression risk
- **Screen:** Hemoglobin A1c, fasting plasma glucose

## Cushing's Syndrome

50-80% Depression prevalence. Also anxiety, psychosis.

**Screening tests:**
- 24-hr urinary cortisol
- late-night salivary cortisol
- Dexamethasone suppression

## Addison's Disease

Symptoms: fatigue, weight loss, **depression**, apathy, cognitive slowing

**Screening tests:**
8 a.m. serum cortisol
If low/indeterminate → ACTH stimulation test

## Pheochromocytoma

- Panic attacks- Paroxysmal anxiety, palpitations, sweating, tremor, headache, hypertension.
- Red flag: “panic attacks” with marked hypertension or triggered by surgery, anesthesia, or certain meds.
- **Screen:** Plasma free metanephrines or 24-hour urine fractionated metanephrines

# Collaborative Care Model

## Psychiatrist

- Screen TSH in appropriate patients
- Monitor psychiatric symptoms
- Adjust psychotropics accordingly
- Educate patients on thyroid-mood link
- Communicate with endocrinologist

⇄

**Shared Decision Making**

## Endocrinologist

- Diagnose and treat thyroid disorders
- Adjust thyroid medications
- Monitor thyroid function labs
- Manage complex or special cases
- Communicate with psychiatrist

**References (model adapted from):**
Archer J, et al. Collaborative care for depression and anxiety problems. *Cochrane Database Syst Rev.* 2012;10:CD006525.
Hage MP, Azar ST. The link between thyroid function and depression. *J Thyroid Res.* 2012;2012:590648.

# Clinical thyroid Pearls

1. Screen TSH in treatment-resistant depression, rapid cycling bipolar DISORDER, and new cognitive impairment
2. Hyperthyroidism mimics anxiety — look for physical signs (tremor, tachycardia, weight loss)
3. Subclinical thyroid disease matters — especially TSH >10 or symptoms present
4. Refer early — any confirmed hyper/hypothyroidism warrants endocrine evaluation
5. Think autoimmune — Hashimoto's encephalopathy in acute psychiatric + neurological symptoms
6. Hypothyroidism mimics depression — check before starting antidepressants
7. Lithium causes hypothyroidism — monitor TSH every 6–12 months
8. TSH is cheap and high-yield
9. Psychiatric symptoms improve with thyroid treatment WHEN INDICATED — give it 6–8 weeks
10. Low threshold for TFTs screening

# Case Study #3 – Complex Case: Bipolar + Long-Term Lithium

58-year-old woman with bipolar disorder on lithium × 10 years — increasing depression, weight gain, worsening memory, fatigue

## Initial Assessment

Psychiatrist considers medication adjustment
TSH ordered → 18.5 mIU/L
(Normal: 0.4–4.0 mIU/L)

## Management

- Referred to endocrinology
- Started levothyroxine 75 mcg
- Lithium continued with monitoring

## ✓ Outcome

TSH normalized to 2.1 mIU/L at 3 months. Significant improvement in mood and cognition. No change needed in psychiatric medications.

💡 **Teaching Point: Long-term lithium users need regular thyroid monitoring — hypothyroidism can develop slowly!**

# Special Populations – Pregnancy & Postpartum

## Normal Physiologic Changes

- ↑ TBG (thyroid binding globulin) → ↑ total T4
- hCG has TSH-like activity → ↓ TSH in first trimester
- ↑ T4 requirements by 30–50%

## Clinical Recommendation

✓ Screen TSH in all cases of postpartum depression
✓ Especially if family/personal history of autoimmune disease

## Postpartum Thyroiditis

- Occurs in 5–10% of women postpartum
- Timing: 1–6 months after delivery
- Phases: Hyperthyroid → Hypothyroid → Recovery (or permanent hypothyroidism)
- **Often misdiagnosed as postpartum depression!**

*Citation: Stagnaro-Green A. J Clin Endocrinol Metab. 2012;97(2):334-342*

# Special Populations – Elderly

## Unique Presentations

- "Apathetic hyperthyroidism" — depression-like rather than anxiety
- Subclinical hypothyroidism more common (up to 20%)
- Cognitive impairment may be primary presentation

## Screening Considerations

- Lower threshold for TSH screening in older adults
- Include as part of dementia workup
- Consider in 'failure to thrive' presentation

## Treatment Considerations

- Start levothyroxine at lower doses (25 mcg)
- Cardiac monitoring needed (arrhythmias, angina risk)
- Goal TSH may be higher — individualize per patient

### Euthyroid Sick Syndrome (Nonthyroidal Illness)

Abnormal thyroid tests in acutely ill patients WITHOUT primary thyroid disease. Do NOT treat — recheck when acute illness resolves. Common in severe depression, anorexia, critical illness.

# Red Flags – When to Act Urgently

## Thyroid Storm

(Hyperthyroid Crisis)

⚠ **Mortality: 20–30%**

**Symptoms:**

- Fever >104°F, severe tachycardia
- Altered mental status, delirium, psychosis

**ACTION:**

Immediate hospitalization + urgent endocrine consult

## Myxedema Coma

(Severe Hypothyroidism)

⚠ **Mortality: 30–60%**

**Symptoms:**

- Hypothermia, bradycardia, hypotension
- Altered mental status, coma

**ACTION:**

ICU admission + IV levothyroxine urgently

## Hashimoto's Encephalopathy

(Autoimmune)

⚠ **Treatable if caught early**

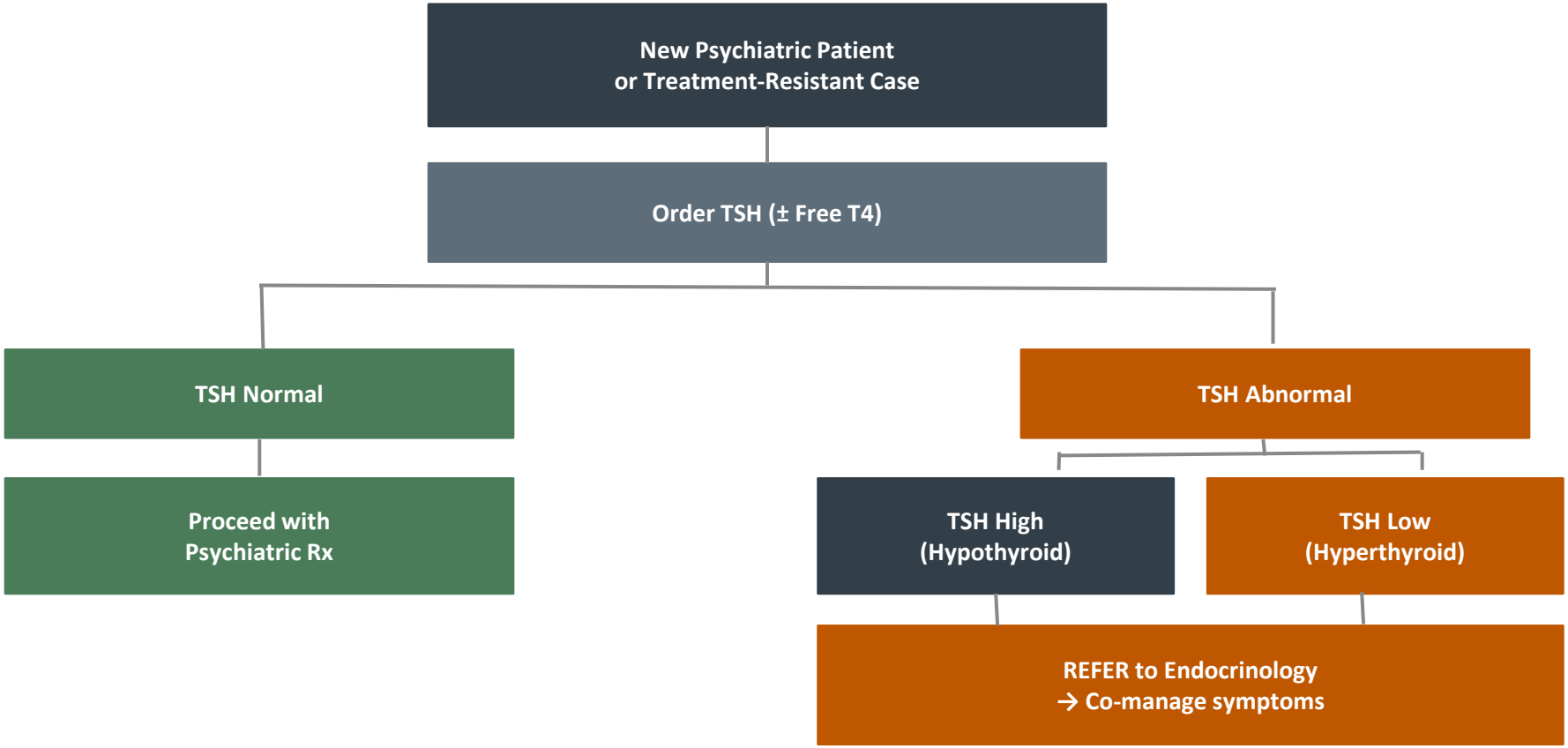
**Symptoms:**

- Acute confusion, seizures, stroke-like episodes
- Psychiatric symptoms + neurological signs

**ACTION:**

Urgent endocrine + neurology consult

# Practical Screening Algorithm



# Laboratory Interpretation Guide

| TSH | Free T4 | Interpretation | Action |
|---|---|---|---|
| Normal (0.4–4.0) | Normal | Euthyroid | Proceed with psychiatric care |
| High (>4.0) | Low | Primary Hypothyroidism | Refer to endocrinology |
| High (4.5–10) | Normal | Subclinical Hypothyroidism | Consider referral if symptomatic or TSH >10 |
| Low (<0.4) | High | Primary Hyperthyroidism | **Refer to endocrinology (urgent)** |
| Low (<0.4) | Normal | Subclinical Hyperthyroidism | Refer to endocrinology |
| Low | Low | Central Hypothyroidism | Urgent endocrine referral |
| Normal/Low | High | Thyroid Hormone Resistance (rare) | Endocrine referral |

# Resources for Psychiatrists

| American Thyroid Association (ATA) | American Association of Clinical Endocrinologists (AACE) | The Endocrine Society |
|---|---|---|
| www.thyroid.org<br>Guidelines for hypothyroidism and hyperthyroidism | Clinical practice guidelines<br>Endocrine clinical algorithms | Clinical practice guidelines and patient resources<br>www.endocrine.org |

## Key Review Articles


- *Bauer M, et al. "Thyroid-brain interaction in thyroid disorders and mood disorders." J Neuroendocrinol. 2008.*
- *Samuels MH. "Psychiatric and cognitive manifestations of hypothyroidism." Curr Opin Endocrinol Diabetes Obes. 2014.*
- *Bauer MS, Whybrow PC. "Rapid cycling bipolar disorder — high-dose levothyroxine study." Arch Gen Psychiatry. 1990.*


Patient Education: American Thyroid Association patient resources • Hormone Health Network (Endocrine Society)

# Summary – Key Takeaways

**1**

## SCREEN Appropriately

- Treatment-resistant psychiatric symptoms
- Rapid cycling bipolar disorder
- Lithium therapy (baseline + monitoring)
- Cognitive impairment workup

**2**

## RECOGNIZE Patterns

- Hypothyroidism → Depression-like symptoms
- Hyperthyroidism → Anxiety-like symptoms
- Physical signs guide diagnosis

**3**

## REFER When Indicated

- Any confirmed thyroid dysfunction
- Diagnostic uncertainty or complexity
- Special populations (pregnancy, elderly)

**4**

## COLLABORATE for Best Outcomes

- Shared care model
- Regular communication
- Patient-centered approach

# Thank You

## Questions?

**Sowmya Boddhula, MD**
**Assistant Professor**
Division of Endocrinology
Department of Internal Medicine

Dell Medical School – University of Texas at Austin

Sowmya.boddhula@austin.utexas.edu

(903) 235-2091