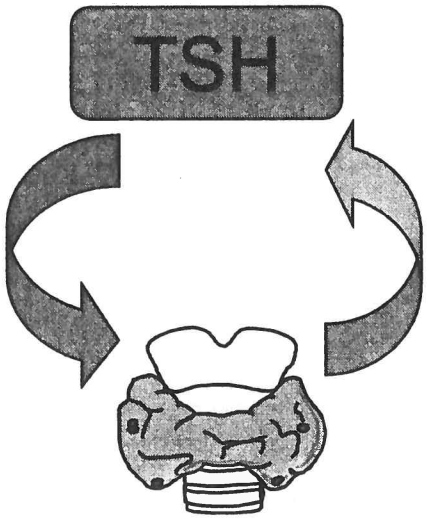
Typical Thyroid Hormone Levels in Thyroid Disease



	TSH	T4	T3
Primary Hypothyroidism	High	Low/N	
Hyperthyroidism	Low	High/N	

ML : Case of Low TSH with Normal FreeT4

48 years old AA female was referred to us on 12/14/12 in Endocrinology,Diabetes and Metabolism Clinic for evaluation of Low TSH and thyroid nodule.

She had a low TSH of 0.16 with a normal Free T4 on 5/18/12
Infact she had similar labs on 12/5/11.

31/12 US showed 3.8x 2.3x3.2 mm Rt lobe nodule.

She has been having symptoms of palpitation, fatigue, anxiety and tremors for the last few years.

Her workup showed TPO, TRAB ,TSI antibody to be negative.

She had Thyroid uptake and scan done on 1/30/13 showing homogenous 6 hours uptake 23.8% (normal range 5-12%) and at 24 hours was 35.3% (normal range 7-33%).

She was started on Methimazol 10 mg once a day, her dose was lowered to 5 mg on 4/18/13 which was then stopped on 8/20/13 as she thought it is causing swelling of her legs.

On 2/18/14 She was seen again as she became symptomatic with TSH of 0.247.

What is the diagnosis in this patient ?
How should she be treated?

Component	TSH, HIGH-SENSITIVITY	T4 FREE
Latest Ref Rng	0.550 – 4.780 uIU/mL	0.89 – 1.76 ng/dL
2/5/2016	0.600	
2/18/2014	0.247 (L)	0.98
11/3/2013	0.636	0.92
8/20/2013	0.322 (L)	0.86 (L)
7/2/2013	0.988	0.91
12/14/2012	0.304 (L)	0.96

CAUSES of low serum TSH and normal free T4 and T3 concentrations:

- Subclinical hyperthyroidism (SH)
- Central hypothyroidism on T4
- Nonthyroidal illness – Euthyroid patients with nonthyroidal illness, especially those receiving high-dose glucocorticoids or dopamine, may have low serum TSH but low or low-normal free T4 and very low serum T3 concentrations.
- Recovery from hyperthyroidism – Serum TSH concentrations may remain low for up to several months after normalization of serum T4 and T3 concentrations in patients treated for hyperthyroidism
- Recovering from hyperthyroidism caused by thyroiditis.
- The "physiologic" lowering of serum TSH in pregnancy
- An altered set point of the hypothalamic-pituitary-thyroid axis in some otherwise healthy older persons (Rare)

ATA/AACE Guidelines
ENDOCRINE PRACTICE Vol 17 No. 3 May/June 2011

Recommendation 1	A radioactive iodine uptake should be performed when the clinical presentation of thyrotoxicosis is not diagnostic of GD; a thyroid scan should be added in the presence of thyroid nodularity.

How should SH be managed? (Recommendation 65,66)

Factor	TSH (<0.1m U/L)	TSH (0.1- 0.5mU/L
Age >65	Yes	Consider Treatment
Age <65		
Heart Disease	Yes	Consider treating
Osteoporosis	Yes	No
Menopausal	Consider treating	Consider treating
Hyperthyroid Symptoms	Yes	Consider treating
Age <65, asymptomatic	Consider	No

Recommendation 67	If SH is to be treated, the treatment should be based on the etiology of the thyroid dysfunction and follow the same principles as outlined for the treatment of overt hyperthyroidism. 1/+00

AW: Case of Grave's disease with Methimazol

46 y.o. old AA female was referred to us for evaluation of hyperthyroidism on 4/15/14 in Endocrine, Diabetes and Metabolism Clinic at Ohio State University.

She has been diagnosed to have Grave's disease in 3/2013 but had not been taking methimazol all the time.

She had Thyroid uptake and scan on 5/21/14 showing homogeneous uptake bilaterally ,uptake at 6 hours was 69.7 (5-15%). 24-hour thyroid uptake was 79.6 (10-33%)

She was started on Methimazol 10 mg twice a day and a Beta blocker.

Her dose of methimazol had been tapered down over the next several months till she is on 2.5 mg with normal TSH.

Should we do anyother test to see if she has a chance for remission?

Component	TSH, HIGH-SENSITIVITY	T4 FREE
Latest Ref Rng	0.550 - 4.780 uIU/mL	0.89 - 1.76 ng/dL
1/22/2016	2.727	
6/16/2014	<0.008 (L)	1.30
4/15/2014	<0.008 (L)	1.81 (H)

Component	THYROTROPIN RECEPTOR AB
Latest Ref Rng	0.00-1.75 IU/L
1/22/2016	3.92 (H)
4/15/2014	12 (H)

Component	THYROID-STIMULATING IMMUNOGLOBULIN
Latest Ref Rng	<140 % baseline
1/22/2016	269 (H)
4/15/2014	

Endocr Pract. First published ahead of print May 24, 2011

Recommendation 19	If methimazole is chosen as the primary therapy for GD, the medication should be continued for approximately 12–18 months, then tapered or discontinued if the TSH is normal at that time.
Recommendation 20	Measurement of TRAb levels prior to stopping antithyroid drug therapy is suggested, as it aids in predicting which patients can be weaned from the medication, with normal levels indicating greater chance for remission

Clin Endocrinol Metab. 2013 Jun; 98(6):

2247–2255

MD: Thyroid storm?

29 y.o. African-American woman with Graves' Diseases who is seen in consultation in ER

She was diagnosed with Graves' Disease in Nov 2010 and initiated on 10 mg TID MMI. She presented to OSU in April 2011 on that dose with a TSH of 60 so the MMI was stopped.

MMI was resumed at 10 mg BID in May 2011 and has remained at that dose, with variable compliance till January 2016.
She was having flu like symptoms for the last few days.
She was having increased fatigue, weakness, weight loss (reports ~15 lb weight loss in the last month), rapid heart rate, increased appetite, nervous/anxious, tremor, increased sweating, hair loss, increased frequency and watery stools and came to ER.
She is still having regular menses.

She reports that her eyes are bulging (R>L) & dry, but no pain w/ movement or blurred vision.

BP 115/73
Pulse 119 /min
Temp 98.3 F
Bilateral exophthalmos R>L
Tremors+
Thyroid bruit +
AxOx3
Normal heart sounds

	Ref. Range	01:45
T3 FREE	Latest Units: pg/mL	>20.0 (H)
T4 FREE	Latest Units: ng/dL	5.20 (HH)
THYROTROPIN RECEPTOR AB	Latest Range: 0.00-1.75 IU/L	30 (H)
THYROID-STIMULATING IMMUNOGLOBULIN	Latest Range: <140 % baseline	450 (H)

Is she in thyroid storm?

Diagnostic Criteria for Thyroid Storm (Thyroid Score on Admission)

Parameter		points
Temp	98.3	0
CNS	Absent	0
GI	Diarrhea	10
HR	119	10
CHF	Absent	0
AFib	Absent	0
Precipitating event		0
Score		20

Score < 25 indicates thyroid Storm is unlikely

Hyperthyroidism Management Guidelines, *Endocr Pract.* 2011;17(No. 3) e19

Thermoregulatory Dysfunction Temp (F)		**GI-Hepatic Dysfunction**	
99.0-99.9	5	Absent	0
100.0- 100.9	10	Moderate(diarrhea,pain/vomiting	10
101.0-101.9	15	Severe(jaundice)	20
102.0-102.9	20		
103.0-103.9	25		
>104.0	30		
CARDIOVASCULAR		**CNS disturbance**	
Beats/min		Absent	0
110-109	5	Mild(agitation)	10
110-119	10	Moderate (delirium,psychosis, extremelethergy)	20
120-129	15	Severe(seizure, coma)	30
130-139	20		
>140	25		
Atrial fibrillation		**Precipitant History**	
Absent	0	Positive	0
Present	10	Negative	10
CHF			
Absent	0		
Mild	5		
Moderate	10		
Severe	20		

Scores totaled	
>45	Thyroid storm
25–44	Impending storm
<25	Storm unlikely

CW : Grave's with Urticaria

57 years old female H/o Graves since 2001 was initially treated with PTU or Methimazol intermittently for 8-9 years till she became euthyroid.

She stayed euthyroid between Feb, 2010 till Jan 2013 without any medication.

She started becoming symptomatic again and was seen by us on 1/16/13 with the following labs

Free T4 - >7.78 (.80-1.80)
T3 - 628 (80-200)

She was started on 30 mg Methimazol and Atenolol.

Repeat labs done on 2/5/13 showed improvement.

Free T4 - 3.07 (.80-1.89)
T3 - 317 (80-200)

2 weeks later, she started having hives and diffuse urticarial rash
Methimazol was changed to PTU but even with the lowest possible dose of PTU 50 mg once a day and atenolol, she developed rash.

What should be done next?

Hyperthyroidism Management (GD) Guidelines, *Endocr Pract.* 2011;17(No. 3)

RECOMMENDATION 13

Methimazole should be used in virtually every patient who chooses antithyroid drug therapy for GD, except during the first trimester of pregnancy when propylthiouracil is preferred, in the treatment of thyroid storm, and in patients with minor reactions to methimazole who refuse radioactive iodine therapy or surgery. **1/++0**

RECOMMENDATION 14

Patients should be informed of side effects of antithyroid drugs and the necessity of informing the physician promptly if they should develop pruritic rash, jaundice, acolic stools or dark urine, arthralgias, abdominal pain, nausea, fatigue, fever, or pharyngitis. Before starting antithyroid drugs and at each subsequent visit, the patient should be alerted to stop the medication immediately and call their physician when there are symptoms suggestive of agranulocytosis or hepatic injury. **1/+00**

RECOMMENDATION 15

Prior to initiating antithyroid drug therapy for GD, we suggest that patients have a baseline complete blood count, including white count with differential, and a liver profile including bilirubin and transaminases.

RECOMMENDATION 18

Minor cutaneous reactions may be managed with concurrent antihistamine therapy without stopping the antithyroid drug. Persistent minor side effects of antithyroid medication should be managed by cessation of the medication and changing to radioactive iodine or surgery, or switching to the other antithyroid drug when radioactive iodine or surgery are not options.

In the case of a serious allergic reaction, prescribing the alternative drug is not recommended. **1/+00**

Minor allergic side effects, such as a limited, minor rash, may occur in up to 5% of patients taking either MMI or PTU (81).