



INE | INSTITUTE OF
NUTRITIONAL
ENDOCRINOLOGY

Blood Chemistry: Thyroid

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Medical Disclaimer: The information in this presentation is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Ritamarie Loscalzo, drritamarie.com, and the experts who have contributed. We encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.



Thyroid Lab Ranges

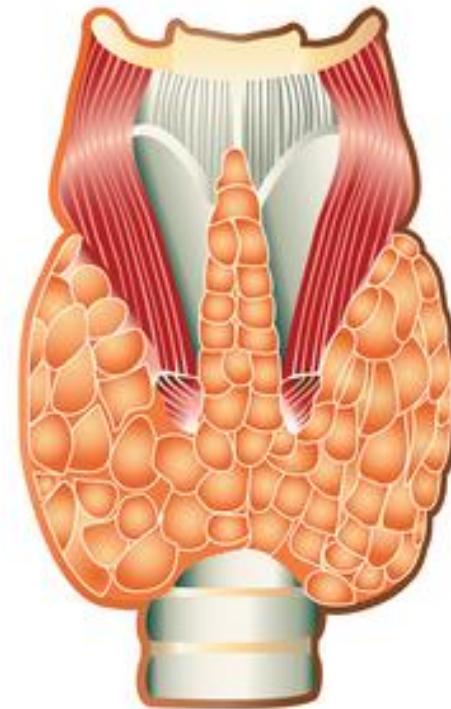


NAME of TEST	US Units	Lab Range	Ideal Range
TSH: Thyroid-stimulating hormone	µIU/mL	0.3-5.7	1.5-3.0
Total T4 or TT4 (total thyroxine)	µg/mL	4.5-12.5	6.0-12.0
Total T3 or TT3 (total triiodothyronine)	ng/dL	100.0-180.0	100.0-180.0
Free T4 or FT4 (thyroxine, free)	ng/dL	0.7-2.0	1.0-1.5
Free T3 or FT3 (triiodothyronine, free)	pg/dL	2.0-4.4	3.0-4.5
Thyroglobulin antibody screen (or antithyroglobulin)	IU/mL	0.0-1.0	0.0-1.0
Thyroid peroxidase (TPO) antibodies	IU/mL	0.0-34.0	0.0-2.0
Thyroxine-binding globulin (TBG)	µg/mL	18.0-27.0	18.0-27.0
Reverse T3 or RT3 (reverse triiodothyronine)	ng/dL	90.0-350.0	90.0-350.0
T3 uptake	%	27.0-37.0	28.0-38.0
Free Thyroxine Index (FTI)		1.2-4.9	1.2-4.9



Types of Thyroid Dysfunction

- ✓ Hypothyroidism
- ✓ Hyperthyroidism
- ✓ Autoimmune Thyroid Conditions
 - Graves Disease
 - Hashimoto's Thyroiditis
- ✓ Subclinical Thyroid Conditions
 - Binding Protein Problems
 - Thyroid Receptor Resistance
 - Wilson's Temperature Syndrome
- ✓ Cancer



Thyroid Lab Analysis

Basic Screen

- ✓ Total T-4 (Thyroxin)
- ✓ T-3 uptake
- ✓ Free — Thyroxin Index (FTI) aka T-7
- ✓ TSH

Essential Extras

- ✓ Thyroid Peroxidase Antibodies
- ✓ Antithyroglobulin Antibodies
- ✓ Free T3
- ✓ Free T4
- ✓ Total T3
- ✓ Reverse T3



Medications Affecting Thyroid

- ✓ Antibiotics
- ✓ Antidepressants
- ✓ Diabetic medication
- ✓ Hypertensive medication
- ✓ Pain medication
- ✓ Antacids
- ✓ Cholesterol lowering medications
- ✓ Growth hormone modulators
- ✓ Anti-nausea medications
- ✓ Diuretics
- ✓ Amphetamines
- ✓ Adderall
- ✓ Anti-inflammatory
- ✓ Arrhythmia medications
- ✓ Hormone replacement
- ✓ Steroids and androgens
- ✓ Anti-addiction drugs
- ✓ Psychoactive medications,
i.e. lithium, thorazine



Thyroid Case 1

	Units	PATHOLOGICAL RANGE	FUNCTIONAL RANGE	12/22/09
Markers				
TSH	mIU/L	0.3-5.7	1.8-3.0	2.58
Total Thyroxine (T ₄)	ug/d	4.5-12.5	6-12	6.7
Total Triiodothyronine (T ₃)	ng/dL		100-180	
Free T4	ng/dL		1.0-1.5	
Free Thyroxine Index	mg/dl		1.2-4.9	2.2
Free T3	pg/mL		300-450	
T3 Uptake	md/dl	27-37	28-38	33
Reverse T3	pg/ml		90-350	
Thyroid Binding Globulin	ug/dl		18-27	
Thyroid Peroxidase Antibody (TPO)	IU/mL		< 2	140
Antithyroglobulin Antibody	-	a negative test is normal	< 1	

Would have been missed on normal screen



Thyroid Case 2

CATEGORIES	Units	PATHOLOGICAL RANGE		FUNCTIONAL RANGE		10/06/09	06/26/08	11/20/06	
		Min	Max	Min	Max				
THYROID MARKERS									
TSH	mIU/L	0.3	5.7	1.8	3.0	4.08	3.964	3.333	
Thyroxine (T4)	ug/d	4.5	12.5	6.0	12.0		7.5	7.5	
T3 Uptake	md/dl	27.0	37.0	28.0	38.0				
Free Thyroxine Index	mg/dl			1.2	4.9		2.9	2.9	
Total Triiodothyronine (TT3)	ng/dL			100.0	180.0				
Free T4	ng/dL			1.0	1.5	1.12			
Free T3	pg/mL			300.0	450.0				
Reverse T3	pg/ml			90.0	350.0				
Thyroid Binding Globulin	ug/dl			18.0	27.0				
Antithyroglobulin Antibody	a negative test is normal	0.0	1.0	0.0	1.0				
Thyroid Peroxidase (TPO) Ab	IU/mL	0.0	34.0	0.0	2.0				



- ❖ Insufficient information
- ❖ Progressively worsening TSH
- ❖ Follow-up:
 - ❖ Thyroid antibodies
 - ❖ Total T3, T4
 - ❖ Free T3
 - ❖ T3 Uptake



Thyroid Case 3

CATEGORIES	Units	PATHOLOGICAL RANGE		FUNCTIONAL RANGE		CURRENT 01/25/10
		Min	Max	Min	Max	
THYROID MARKERS						
TSH	mIU/L	0.3	5.7	1.8	3.0	1.38
Thyroxine (T4)	ug/d	4.5	12.5	6.0	12.0	10.4
T3 Uptake	md/dl	27.0	37.0	28.0	38.0	31
Free Thyroxine Index	mg/dl			1.2	4.9	3.2
Total Triiodothyronine (TT3)	ng/dL			100.0	180.0	
Free T4	ng/dL			1.0	1.5	
Free T3	pg/mL			300.0	450.0	
Reverse T3	pg/ml			90.0	350.0	
Thyroid Binding Globulin	ug/dl			18.0	27.0	
Antithyroglobulin Antibody	a negative test is normal	0.0	1.0	0.0	1.0	20
Thyroid Peroxidase (TPO) Ab	IU/mL	0.0	34.0	0.0	2.0	7



Would be missed by standard analysis



- ❖ TSH below optimal
- ❖ T4 getting close to top of range
- ❖ Positive antibodies, although low
- ❖ Follow-up
 - ❖ TSI antibodies – to differentiate Hashimotos from Graves
 - ❖ Free T3, T4



Most Important Nutrients For Thyroid Gland

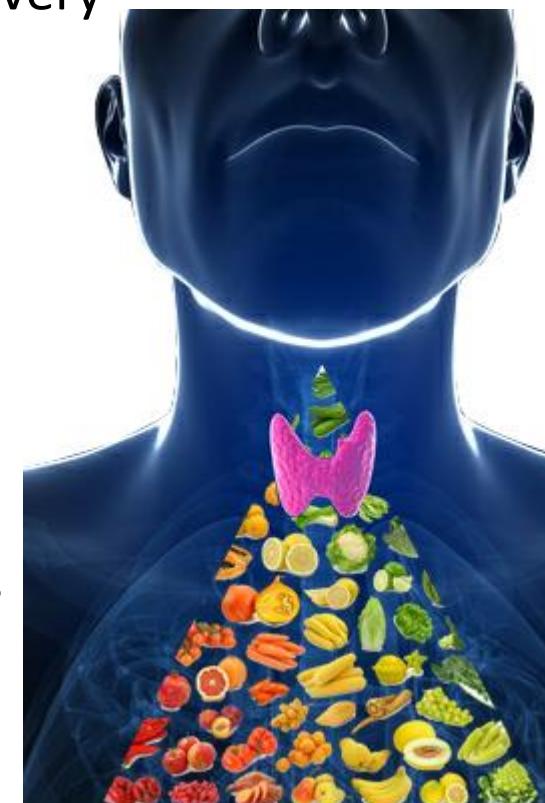
- ✓ Iodine ***
- ✓ Selenium
- ✓ Zinc
- ✓ Iron
- ✓ Tyrosine
- ✓ Vitamin A
- ✓ Vitamin D3
- ✓ Vitamin B2
- ✓ Vitamin B6
- ✓ Vitamin B12
- ✓ Bioflavonoids

*** *Most important nutrient for the thyroid*



Management of Autoimmune – Hashimoto's

- ✓ Support immune system
 - Support T regulatory cells (TH1 and TH2)
 - Avoid gluten and other allergy containing foods. In my experience, 100% gluten avoidance is mandatory for recovery
- ✓ Essential fatty acids
- ✓ Balance blood sugar
- ✓ Repair gut
- ✓ Decrease stress and support adrenals
- ✓ Increase vitamin D levels: ideal closer to 100
- ✓ Antioxidants:
 - Glutathione and glutathione enhancing foods and nutrients
 - Turmeric, ashwagandha, CoQ10, rehmannia



Vitamin D With Hashimotos



Optimal Range: 90.0 -100.0 in the presence of antibodies

- ✓ **Vitamin D <20:** Take 20 000 IU every day for a week or up to a month, then 10 000 IU for 2 months, then retest
- ✓ **Vitamin D 20-30:** Take 10 000 IU for 3 months, then retest
- ✓ **Vitamin D 30-40:** Take 6000 IU for 3 months, then retest
- ✓ **Vitamin D 40-60:** Take 4000 - 6000 IU per day; retest in 3 months
- ✓ **Vitamin D 60-90:** Take 2000 - 4000 IU per day; retest in 3 months
- ✓ **Vitamin D 80-100:** Take 1000 - 2000 IU per day; retest in 3 months
- ✓ **Vitamin D >100:** Get out in the sun regularly and retest in 3 months.

It's a good idea to maintain vitamin D in the 90 - 100 range when thyroid antibodies are present.



Thyroid Resources and Books

✓ *Why Do I Still Have Thyroid Symptoms When My Lab Tests are Normal?*

– Dr. Datis Kharrazian, DHSc, DC, MS

✓ *Overcoming Thyroid Disorders*

– David Brownstein, M.D.

✓ *Thyroid Health: 10 Steps to Total Health*

– Richard L. Shames, M.D., and Karilee Halo Shames, R.N., PhD

✓ *Iodine Why You Need It and Why You Can't Live Without It*

– David Brownstein, M.D.

