



## Thyroid Lab Testing and Interpretation

Order through Direct Labs at <https://directlabs.com/drritamarie> or have clients order through their Primary Care Physician (PCP)

### Important thyroid lab markers to order and indications for ordering

- **TSH:** Produced by pituitary to stimulate the thyroid to produce thyroid hormones. A high TSH level indicates that the thyroid gland is failing because of a problem that is directly affecting the thyroid (primary hypothyroidism). When TSH is low, it usually indicates that the person has an overactive thyroid that is producing too much thyroid hormone or an abnormality in the pituitary gland, which prevents it from making enough TSH to stimulate the thyroid. Always include in thyroid screening.
- **Total T-4 (Thyroxin):** Measures the total T4 made by your thyroid. T4 is the storage form of thyroid hormone and is the main hormone produced by the thyroid. It's meant to be converted to T3, the more active form. It's always a good idea to run this test to determine the thyroid gland's overall ability to produce.
- **Total T-3 (Triiodothyronine):** The total T3 produced by the thyroid. Only 20% of gland output is T3. This is important when looking at thyroid conversions.
- **Free T-4:** An intermediate that is good to see for a complete picture, but not as important as Total T4 and free T3 except in cases of thyroid conversion issues. Free T-4 is a good idea to investigate suspicion of binding globulin problems, or when conventional test results seem inconsistent with clinical observations.
- **Free T-3:** The primary thyroid hormone component that stimulates metabolic rate at the cellular level. It's important to run in all conditions related to low thyroid function or to monitor the effects of medication.
- **Thyroid Antibodies:** These indicate whether or not your body is producing antibodies that are attacking your thyroid gland. Anyone suffering from low energy, difficulty maintaining proper weight, or any other unexplained health challenges should order these. Often overlooked by conventional medical practitioners, these are extremely important to measure.
  - **Thyroid Peroxidase Antibodies:** Measures antibodies that attack the thyroid peroxidase enzyme, which assists the chemical reaction that adds iodine to a protein called thyroglobulin, a critical step in generating thyroid hormones.



- **Antithyroglobulin Antibodies:** Measures antibodies that attack a protein called thyroglobulin, which is used to make thyroid hormones T3 and T4. Autoantibodies to thyroglobulin can lead to the destruction of the thyroid gland.
- **Reverse T3:** Under normal circumstances most of the free T4 is converted to free T3; about 20% is converted to Reverse T3. Certain conditions, including being under a lot of stress for a long time or adrenal fatigue, cause more T4 to convert to reverse T3, resulting in decreased metabolic rate and low thyroid symptoms as a result of low free T3. Order this test if free T3 is low or free T4 is high, or in people who have been highly stressed or are suffering from adrenal fatigue, or have a long history of thyroid problems that are not responding to interventions.

### Thyroid Test Panels

The following special thyroid panels have been set up with Direct Labs for ease of ordering and cost savings. To order go to <https://directlabs.com/drritamarie> Click on order tests, choose **Thyroid** from the drop-down menu, then choose the tests or test panels from list to order.

- **Dr. Ritamarie's Basic plus Thyroid:** Includes all the thyroid tests above except Reverse T3, plus the Comprehensive wellness profile and Vitamin D
- **DrRitamarie's Complete Thyroid:** Contains all the thyroid tests above except Reverse T3
- **DrRitamarie's Complete Thyroid plus Vitamin D:** Contains all the thyroid tests above except Reverse T3 plus Vitamin D
- **Complete Thyroid Panel:** Includes all above tests EXCEPT the antibodies
- **Thyroid Antibodies Panel:** Contains both TPO and antithyroglobulin antibodies

\* **Vitamin D** levels need to be closely monitored in thyroid assessment.

\*\***CWP** is the comprehensive wellness panel and contains tests for most body systems including liver, kidney, cholesterol panel, anemia markers, immune system markers and more. It's a good general screen and can be ordered with the thyroid panel if you haven't done one in a while.



## Determining Thyroid Pattern from Lab Test Results

	Units	Ideal Low	Ideal High	Primary Hypo Thyroid	Pituitary/Hypothal amus Hypo Thyroid	Auto Immune Hypo Thyroid	Auto Immune Hyper Thyroid	Under Conversion T4 to T3	Over Conversion T4 to T3	High Thyroid Binding Globulin	Low Thyroid Binding Globulin	Thyroid Resistance
TSH		1.8	3.0	H	L	N or H	L	N	N	N	N	N
Total T4	ug/d	6.0	12.0	N or L	N or L, most often low	N or L	N or H	N or H	N or L	N	N	N
Free T4	ng/dL	1.0	1.5	N or L	N or L	N or L	N or H	N or H	N or L	L	H	N
T3 Uptake	md/dl	28.0	38.0	N or L	N	N or L	N	L	HN or H	L	H	N
Free T3	pg/mL	300.0	450.0	N or L	N or L	N or L	N or H	L	HN or H	L	H	N
Reverse T3 (rT3)	pg/ml	90.0	350.0	N	N	N	N	L	N	N	N	N
Thyroid Antibodies		0	2	N	N	H	H	N or H	N	N	N	N
<b>PLUS</b>												
Cholesterol	mg/dl	150	200	N or H			N or L					
Triglycerides	mg/dL	35	160	H			L					
Calcium	mg/dL	8.7	10.5	N or H			N or L					
<b>Possible Causes</b>				deficient iodine or cofactors such as Se, Mg, Cu, niacin, riboflavin, B6 and zinc	Serotonin/ dopamine deficiency, excess cytokines (inflam.) excess cortisol (stress), insulin resistance excess prolactin	antibodies to thyroid peroxi-dase, thyro-globulin (binding protein), TSH, T3 or T4	Anti-bodies to TSH, or viral	deficiency of cofactors, serotonin, dopamine, gut dysbiosis, inflammation (increased cytokines), excess cortisol (stress)	excess testosterone	excess estrogen	excess testosterone	inflammation (elevated cytokines), excess cortisol (stress), deficiency of Vitamin A, elevated homo cysteine



### Pattern Specific Thyroid Nutrition

Nutrients	Primary Hypo Thyroid	Pituitary/Hypothalamus Hypo Thyroid	Auto Immune Hypo Thyroid	Auto Immune Hyper Thyroid	Under Conversion T4 to T3	Over Conversion T4 to T3	High Thyroid Binding Globulin	Low Thyroid Binding Globulin	Thyroid resistance
Antioxidants: Glutathione, SOD and precursors: NAC, Protadim, Oxidicell	√	√	√	√	√	√	√	√	√
Ashwaganda	√								
Beet							√		
Betaine HCl							√		
Bugleweed				√					
Cabbage juice				√					
Choline							√		
Dandelion							√		
Enzymes: bromelain, protease 250 - 500 mg 3x/day between meals			√	√					
Essential fatty acids	√	√	√	√	√				√
Gamma oryzanol (rice bran)		√							
Gotu kola							√		
Guggulu	√				√	√		√	
Iodine	√								
Iron	√								
L-arginine		√							
Lemon balm				√					



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Magnesium		√							
Manganese		√							
Milk thistle							√		
Molybdenum							√		
Motherwort				√					
MSM, Tri methyl Glycine							√		
Panax ginseng							√		
Phosphatidyl choline 2000mg/day							√		
Phosphatidyl serine – 2000mg /day		√			√	√		√	
Rubidium sulfate		√							
Sage leaf		√							
Sea vegetables: laminaria digitata kelp, bladderwrack	√								
Selenium	√				√	√			√
Taurine							√		
Turmeric and ginger			√	√					
Tyrosine/phenylalanine	√								
Vitamin A	√								
Vitamin B Complex	√	√		√					√
Vitamin B6		√							



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Vitamin B12		√							
Vitamin C 1,000 mg per day			√	√			√		
Vitamin D	√	√	√						
Zinc	√	√			√				
Adrenal Support		√	√	√					√
Balance Blood Sugar		√	√		√		√		
Leaky Gut Repair			√	√					
Liver Detoxification/Methylation Support		√				√	√	√	
Support T-regulatory cells: TH1 and TH2 -- See details below			√	√					
Serotonin Support: 5-HTP, St. John's Wort, SAME, niacinamide, Vitamin B6, Methyl B12, magnesium citrate		√							



## Other Patterns of Thyroid Dysfunction

### Wilson's Temperature Syndrome

1. Deficient peripheral conversion of T4 to T3 (low free T3 – usually but not always)
2. Excessive peripheral conversion of T4 to reverse T3. Elevated rT3 – usually but not always rT3 is the inactive form of T3. Normally 20-40% of T4 is converted to rT3. In times of stress and nutrient deficiencies, this number can go up to 60%
3. Low body temperature (below 98.6 °)
4. Low BMR
5. Symptoms of low thyroid function
6. Normal TSH (usually)

#### Usual treatment of Wilson's Temperature syndrome:

- Eliminating as much physical and emotional stress as possible
- Moderate exercise for 12-15 minutes, 2 – 4 times/day (especially about 30 minutes after meals)
- Low carbohydrate meals
- Avoiding wheat and refined sugar products.
- Getting plenty of rest
- T3 only, USUALLY sustained release
- Increasing doses to a maximum, then taper back down
- Once ideal temperature is reached, stay at that dose for several weeks, then taper down.
  - Usually more than one "cycle" of treatment is needed to fully correct the problem.
  - Within 3 months, about 70% of patients successfully finish the treatment.
  - 90% finish within six months.
  - One year is the maximum treatment time for the remaining 10%.
  - About 20% of patients feel worse before they felt better.
  - 90% of patients are cured of most of their complaints. At times certain symptoms may persist after the treatment.
  - People typically feel the best when their temperatures are 98.6 and they are off the medicine. Only some people feel extremely well while at 98.6 and on the medicine.
- Up to 20% of patients may find the regimen too demanding and give up before completing the treatment

<http://www.wilsonssyndrome.com/>



## Dr. Kharrazian's 22 Patterns of Hypothyroid

*1-5 hallmarked by low TSH (<1.8) with low to normal T4*

1. Hypothalamus paraventricular defect- low serotonin
2. Hypothalamus paraventricular defect- low dopamine
3. Hypothalamus paraventricular defect- promoted by cytokines
4. Hypothalamus paraventricular defect- promoted by elevated prolactin
5. Pituitary suppression from cortisol
  
6. Autoimmune related to thyroid peroxidase antibodies (TPO)
7. Autoimmune related to thyroglobulin antibodies
  
8. Down-regulated TPO due to progesterone deficiency
9. Down-regulated TPO due to a deficiency of cofactors
  
10. Depressed T4 to T3 conversion due to deficiency of cofactors (5-diodinase activity)
11. Depressed T4 to T3 conversion due to gut dysbiosis
12. Depressed T4 to T3 conversion due to elevated cytokines
13. Depressed T4 to T3 conversion due to elevated cortisol
14. Depressed T4 to T3 conversion due to peripheral serotonin deficiency
15. Depressed T4 to T3 conversion due to peripheral dopamine deficiency
  
16. Increased T4 to T3 conversion due to elevated testosterone
  
17. Increased thyroid binding globulin activity leading to decreased free T3 and T4 due to elevated estrogen
  
18. Depressed thyroid binding globulin activity leading to increased free T3 and T4 and subsequent thyroid resistance due to insulin resistance, elevated estrogen or elevated testosterone
  
19. Thyroid receptor resistance due to elevation of cytokines
20. Thyroid receptor resistance due to elevation of cortisol
21. Thyroid receptor resistance due to deficiency of Vitamin A
22. Thyroid receptor resistance due to elevation of homocysteine