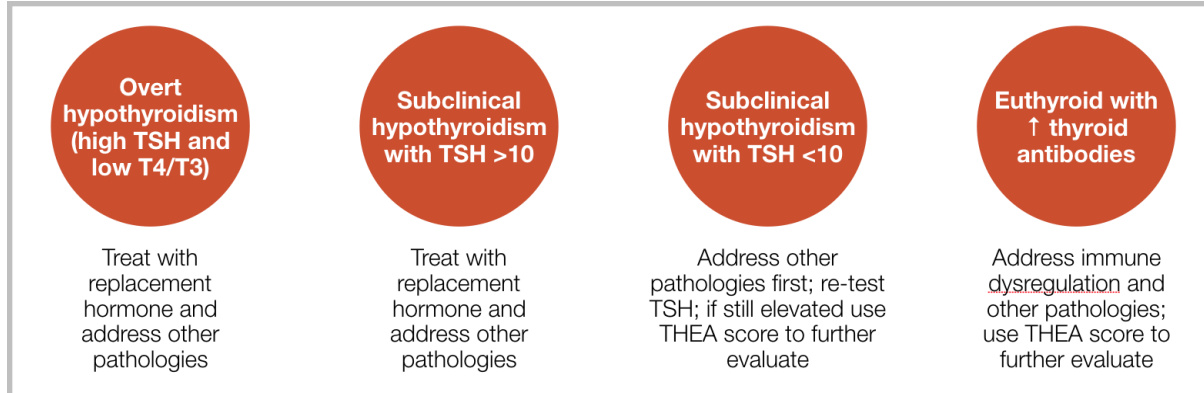


# Blood Chem Hypothyroid Part 2 Review

## THYROID HYPOFUNCTION TREATMENT



If the patient only has high TSH and/or high thyroid antibodies, you can use the THEA, Thyroid Events Amsterdam, to predict the progression of overt hypothyroidism. THEA is based on TSH, TPO antibodies, and family history of autoimmune thyroid disease.

Please see the handouts from this week including the THEA score thyroid risk patient questionnaire and THEA score thyroid risk calculator assessment for details. You can also use the online calculator [here](#).

## UNDERLYING CAUSE OF HASHIMOTO'S

- Treatment should consider mechanisms such as environmental toxins, GI dysfunction, HPA axis dysregulation, blood sugar dysregulation, reduced oxygen deliverability or anemia, nutrient imbalance, immune dysregulation, and chronic infections.
- Also, addressing things like sleep deprivation, chronic stress, inappropriate physical activity, lack of social connection, and not enough pleasure or play are key and lead to improvement in autoimmune conditions. These factors may be the most important things for people with autoimmunity to address along with diet.

## DIETARY NUTRIENTS FOR THYROID HEALTH

Nutrient	Sources
<b>Iodine</b>	Sea vegetables, dairy products, iodized salt
<b>Selenium</b>	Ocean fish, Brazil nuts, ham
<b>Iron</b>	Oysters, clams, liver, venison, beef
<b>Zinc</b>	Oysters, liver, crab, lobster, beef
<b>B12</b>	Clam, liver, oyster, mackerel, sardine
<b>B2</b>	Liver, mushrooms, seaweed, spinach
<b>Vitamin C</b>	Red pepper, kiwi, broccoli, citrus
<b>Vitamin A</b>	Organ meats, CLO, seafood, grass-fed dairy
<b>Vitamin D</b>	CLO, cold-water fatty fish, UV exposure
<b>Magnesium</b>	Clams, Swiss chard, spinach, beet greens, kelp

## HIGHEST FOOD SOURCES OF IODINE

Food	Iodine (mcg/serving)	Iodine (percent DV)
<b>Kelp, 1 gram</b>	1,542	10,280%
<b>Kombu, 1 gram</b>	1,350	900%
<b>Hijiki, 1 gram</b>	629	419%
<b>Arame, 1 gram</b>	586	391%
<b>Cod, baked, 3 ounces</b>	99	66%
<b>Dulse, 1 gram</b>	72	48%
<b>Iodized salt, 1/4 teaspoon</b>	71	47%
<b>Wakame, 1 gram</b>	42	28%
<b>Shrimp, 3 ounces</b>	35	23%
<b>Egg, 1 large</b>	24	16%
<b>Tuna, canned in oil, 3 ounces</b>	17	11%
<b>Nori, 1 gram</b>	16	11%
<b>Prunes, dried, 5 prunes</b>	13	9%
<b>Banana, 1 medium</b>	3	2%

Using kelp flakes in place of or in addition to sea salt just a few times a week should provide about 100 to 200 mcg a day, which is a sufficient level of iodine intake for most people and probably not enough to trigger or exacerbate autoimmunity in most patients.

Iodine is also present in dairy because iodine is in the cleansers that are used to sterilize the tanks that dairy products are stored in, and some of that iodine-based cleanser gets into the dairy products and can actually comprise a substantial source, 60 percent in some studies, of iodine in the diet for people who are consuming dairy.

Consider iodine supplementation for patients who are iodine deficient based on urine and hair testing and/or they are in the high-risk group and for whatever reason they can't or won't eat sea vegetables or dairy products.

- I recommend a liquid iodine supplement with a minimal dosage per drop.
  - Biotics has an iodine liquid with 75 mcg per drop.
- Start one drop for a week, and monitor for any changes and symptoms that are suggestive of immune dysregulation or exacerbation of hypothyroidism.
- If there are no problems, increase by one drop per week until they are taking a total of 300 mcg, which would be four drops.
- After one month at 300 mcg, retest the urine iodine, and measure thyroid antibodies in the thyroid panel.
- If you see an increased urine value and no worsening of thyroid values, you could continue at that 300 mcg dose.
- If you see no increase in the urine levels, you could consider increasing by one drop per week as tolerated, but stay below 900 mcg per day or maybe 1,000 mcg per day to be safe. After three months, do another hair test, which is a better reflection of iodine status long term, and another urine test and see where the levels are.

## **SELENIUM**

- You can assess selenium levels using hair analysis, for example with Doctor's Data toxic and essential elements hair profile.
- Urine and serum selenium are less accurate and less reliable.

## HIGHEST FOOD SOURCES OF SELENIUM

Food	Se (mcg/serving)	Se (percent DV)
<b>Brazil nuts</b> , 1/2 ounce (3–4 nuts)	277	389%
<b>Tuna</b> , yellowfin, cooked, 3 ounces	92	131%
<b>Halibut</b> , cooked, 3 ounces	47	67%
<b>Sardines</b> , canned in oil, 3 ounces	45	64%
<b>Ham</b> , roasted, 3 ounces	42	60%
<b>Beef steak</b> , bottom round, roasted, 3 ounces	33	47%
<b>Turkey</b> , boneless, roasted, 3 ounces	31	44%
<b>Chicken</b> , light meat, roasted, 3 ounces	22	31%
<b>Beef</b> , ground, 25% fat, broiled, 3 ounces	18	26%
<b>Egg</b> , hard-boiled, 1 large	15	21%
<b>Spinach</b> , frozen, boiled, 1 cup	11	16%

## SELENIUM SUPPLEMENTATION

- Remember that most Americans are not deficient in selenium, but people with autoimmune thyroid disease may benefit from higher dietary intake.
- One study found a higher risk of prostate cancer was associated with male patients who already had adequate selenium levels or even high-normal selenium levels.
  - Note that these patients were not selenium deficient.
- Two to three nuts a day would provide 200 mcg, more than enough selenium, especially if the patient is consuming fish.
- If they can't or won't eat fish or Brazil nuts, they can supplement with 200 mcg per day of selenomethionine.
  - Retest two to three months later. Tell the patient to stop supplementing if selenium levels are then sufficient.

## AVOIDING SUBSTANCES THAT IMPAIR THYROID FUNCTION, PRIMARILY GOITROGENS

- Goitrogens are substances that cause goiter, which is swelling of the thyroid gland.
- Goitrogenic foods (see table below) or chemicals have been associated with both hypothyroidism and hyperthyroidism, autoimmune thyroid disease, and thyroid cancer.

Bok choy	Radishes	Soy lecithin
Brussels sprouts	Rutabagas	Strawberries
Cauliflower	Broccolini	Millet
Collard greens	Canola	Pears
Kale	Choy sum	Tofu
Mustard greens	Kai-lan	Soy flour
Rapini	Mizuna	Sweet potatoes
Broccoli	Rapeseed	Peaches
Cabbage	Turnips	Pine nuts
Chinese cabbage	Bamboo shoots	Soy milk
Horseradish	Peanuts	Spinach
Kohlrabi	Soybeans	Yuca (cassava, manioc)

- The main goitrogenic chemicals include percolates, used in jet fuel; oxazolidines, used in paints; amiodarone, used in medication for irregular heartbeat; and lithium and benzodiazepines, which are drugs used for depression and anxiety.
- At relatively low concentrations, goitrogens decrease the uptake of iodine by the thyroid gland, and that effect can be offset by supplementing with iodine.
- However, exposure to large amounts of goitrogens impairs the incorporation of iodine into thyroid hormone itself, which means that even the iodine that gets taken up by the thyroid gland, it can't be properly utilized.
- Fermentation of cabbage into sauerkraut increases the amount of goitrogens it contains, but reduces nitriles by about 50 percent, and nitriles are a thyroid toxin present in cabbage, which is even more potentially harmful than goitrogens and can't be offset by iodine supplementation. The net effect of fermenting cabbage for the thyroid gland is probably positive.
- Most forms of cooking do reduce the goitrogenic effect. Steaming crucifers until they are fully cooked reduces the goitrogens to one-third original value.
- Boiling crucifers for 30 minutes and then discarding the water destroys 90 percent of the goitrogens, but it also destroys some of the nutrients, so that's probably not the best way to deal with the goitrogen issue.
- Cooking also greatly reduces the formation of nitriles, which may be even more important than the goitrogens.

### **SUMMARY: GOITROGENS SHOULD BE CONSUMED IN MODERATION, COOKED**

It is highly unlikely that consuming sauerkraut as a condiment, such as a tablespoon or two, with meals or three to six servings of cooked, not raw, cruciferous veggies or other mildly goitrogenic foods will have a negative impact on the thyroid gland if iodine intake is sufficient.

### **CONSIDER METHODS TO REGULATE AND BALANCE THE IMMUNE SYSTEM**

1. Paleo-type diet
  - a. Consider trying the autoimmune protocol for at least 60 days to see if that helps. Then reintroduce foods one by one if patient did have an improvement.
2. Nutrients especially important for optimizing immune function are glutathione, curcumin, and vitamin D.
  - a. Glutathione supports healthy T-regulatory cell function.
  - b. People with autoimmune disease often have low levels of glutathione.
  - c. Glutathione is found in dairy, especially raw dairy, raw fruits and vegetables, and raw meat, a little bit in cooked meat but not as much, but many patients will benefit from glutathione supplementation.
  - d. Clinically I have the best results with liposomal glutathione at a recommended dose of one to two teaspoons per day.
  - e. Curcumin
    - i. Liposomal curcumin dose is one to two teaspoons per day, or
    - ii. Longvida dose one to two capsules per day, in Optimized Curcumin from ProHealth and CurcuBrain from Now.
3. Vitamin D optimization through diet, UV exposure, and supplements.
4. Get adequate EPA and DHA, probiotics, and prebiotics.
5. Lifestyle and behavior to balance the immune system: appropriate physical activity, sleep, stress management, play, pleasure, and social connection.
6. Low-dose naltrexone LDN dose is 1.5 to 4.5 mg.
  - a. Promotes T-regulatory cell production and differentiation and reduce inflammation in the central nervous system.
  - b. [www.ldninfo.org](http://www.ldninfo.org)
  - c. Start LDN at 1 to 1.5 mg, and then gradually increase to 4.5 mg.
  - d. Common side effects are headache and sleep disturbance, which usually pass after a few days.
  - e. Patients may feel best at a dose between 2 to 3 mg rather than the full dose.
  - f. Patient should try LDN at least three months before they know for sure whether it will help. However, improvement can be literally overnight.

- g. There are two contraindications for LDN:
- Patients taking long-term narcotic pain medications. LDN is an opiate antagonist, so that could cause significant withdrawal issues.
  - The other contraindication is just speculation from people who prescribe LDN a lot. Anyone who has had an organ transplant and thus must take daily immunosuppressant medications should not start using LDN.

## SUMMARY OF IMMUNE-BALANCING INTERVENTIONS

Nutrient	Comments
<b>AIP</b>	Paleo diet with no eggs, nightshades, nuts
<b>Optimize vitamin D levels</b>	Diet, UV exposure, supplements
<b>Glutathione</b>	Liposomal form best; 1-2 tsp/day
<b>Curcumin</b>	Liposomal or Longvida form; 1-2 tsp/day or 1-2 capsules/day
<b>EPA &amp; DHA</b>	1 lb. of cold-water, fatty fish per week
<b>Probiotics</b>	Soil-based organisms, transient commensals, lactic acid
<b>Prebiotics</b>	RS, soluble fiber, non-starch polysaccharides
<b>Lifestyle</b>	Physical activity, sleep, stress management, play, pleasure, social connection
<b>Low-dose naltrexone (LDN)</b>	1.5-4.5 mg; start with low dose and build slowly

## THYROID HORMONE REPLACEMENT: WHY MONOTHERAPY WITH T4 RARELY WORKS

Factors that impair T4 to T3 conversion
Inflammation
HPA-D
GI dysfunction
Aging
Iron excess or deficiency
Fasting
Nutrient deficiency
Low testosterone
Genetics

Tirosint, liquid T4, works better than levothyroxine, but it doesn't address conversion issues. The best option for T4-T3 combo for most patients is natural desiccated thyroid, or NDT.

- NDT by prescription is real thyroid hormone that is isolated from several different pigs.
- NDT does meet the stringent guidelines of the U.S. Pharmacopeia.
- Desiccated thyroid gives you what your own thyroid would be giving you: T4, T3, T2, T1, and calcitonin. Both prescription and nonprescription options for NDT are available, and there is a great page on the *Stop the Thyroid Madness* website that includes all of the various NDT options, including their active and inactive ingredients. Link [here](#).

### NATURAL DESICCATED THYROID (NDT) OPTIONS

Intervention	Comments
<b>N.P. Thyroid</b> (Acella)	Generic NDT; works well for most patients; similar to Armour prior to 2009/2015 reformulations; can be taken sublingually
<b>Naturethroid</b> (RLC Labs)	In use for ~80 years; gluten- & corn-free; hard to do sublingually, but can be chewed before swallowing
<b>Westhroid/WP-Thyroid</b> (RLC Labs)	Has only porcine thyroid + 3 fillers (inulin, lactose monohydrate, MCT in minuscule amounts); gluten- & corn-free
<b>Armour</b> (Activas)	Reformulated in 2015, doesn't seem to work as well; also tripled in price; better options now available
<b>ERFA</b> (Erfa Canada)	NDT with effects similar to Armour prior to 2009/2015 reformulations; can be taken sublingually
<b>Nutri-meds</b>	OTC NDT; previously porcine & bovine sources, now only bovine; not as strong as Rx. NDT, patients need to take more
<b>Thyro-Gold</b>	OTC NDT; formulated by Dr. John C. Lowe; some patients claim it works as well as Rx. NDT

Another option is combining synthetic T4 such as levothyroxine or Synthroid with synthetic T3 such as Cytomel. NDT dosage is 1 to 3 grains; start at 1/2 grain (30 to 32.5 mg).

- Then increase by one-half grain a week until symptoms improve, and then retest after about four to six weeks.
- Nutri-Meds and Thyro-Gold: refer to detailed instructions on their respective websites.
- Goal is to normalize TSH and free T3.
- When the patient is taking a T4-to-T3 combo such as NDT, it is not unusual to see a reduction in free T4 levels. This is normal and expected.
- Watch for facetious hyperthyroidism, with TSH suppressed to zero and a very high T3.
- Experiment with different prescription and nonprescription medications. Some patients find that one works better for them than another.



### **WHEN NDT DOES NOT WORK:**

1. Dose is too low
2. Nutrient imbalance: iron, iodine, zinc, selenium, magnesium, and vitamin A
3. HPA dysfunction
4. Immune triggers still present: diet and environmental toxins
5. Diet/food intolerances/ goitrogens.
6. High dose L-carnitine