Optimal Thyroid Health from a Functional Nutrition Perspective

Presented by Susan Allen RD, CCN
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What You’ll Learn
Upon successful completion of this webinar, the participant will be able to...

- Identify 4 lab parameters and at least 4 key symptoms used in the assessment of thyroid disease
- Recognize common endocrine disruptions that can negatively influence thyroid function
- Specify 3 foods that slow and 3 foods/nutrients that support thyroid function
- Describe 3 common nutrients used in nutritional supplements recommended for thyroid support

Thyroid

- Role in calcium balance
- Maintains rate at which the body uses fat and carb
- Helps control body temperature
- Helps regulate the production of protein
- Influences heart rate and cellular oxygenation
- Has a role in depression, anxiety and hormone balance

Statistics

- Thyroid disorders very common yet often overlooked
- 27 million Americans have thyroid disease according to the American Association of Clinical Endocrinologists
- 13 million Americans may have undiagnosed thyroid disease
- Statistics show that 1 in 8 women between the ages of 35 and 65 and 1 in 5 women over the age of 65 have some form of thyroid disease

Gay J. Canaris, MD, MPH; Neil R. Manowitz, MD; Gilbert Mayor, MD; E. Chester Ridgway, MD. The Colorado Thyroid Disease Prevalence Study. Arch Intern Med. 2000;160:526-534
Thyroid Basics

• Main Relationship and function occurs in the Thyroid, Pituitary, and Hypothalamus

Thyroid Metabolism

• Very sensitive to…
  • Nutrient Deficiencies
  • Medications
  • Endocrine disrupters
  • System inflammation
  • Hormones
  • Autoimmunity
  • Leaky gut
  • Infections
  • Adrenal Stress
  • Neurotransmitter imbalances (serotonin & dopamine)
• Metabolic Syndrome is the great thyroid mimic!

Examples of Thyroid Disruption

<table>
<thead>
<tr>
<th>Dietary Compounds</th>
<th>Environmental Toxins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isothiocyanates (cruciferous)</td>
<td>Perchlorate (fireworks)</td>
</tr>
<tr>
<td>Influenza virus</td>
<td>Bisphenol A</td>
</tr>
<tr>
<td>Gluten</td>
<td>Bromide</td>
</tr>
<tr>
<td>Some flavonoids (quercitin?)</td>
<td>Fluoride</td>
</tr>
<tr>
<td>Medications</td>
<td>Chlorine</td>
</tr>
<tr>
<td>Lithium</td>
<td>Alcohol</td>
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<tr>
<td>Estrogens</td>
<td>Lead</td>
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<tr>
<td>OCSs</td>
<td>Pesticides</td>
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<tr>
<td>Androgens</td>
<td>Radiation</td>
</tr>
<tr>
<td>Beta Blockers</td>
<td>Other</td>
</tr>
<tr>
<td>Steroids</td>
<td>Stress</td>
</tr>
<tr>
<td>Theophylline</td>
<td>Aging</td>
</tr>
</tbody>
</table>

Goitrogens negatively affect thyroid health?

Goitrogens:

• Cruciferous vegetables
• Soybeans and soy extract
• Peaches, Strawberries
• Millet
• Radishes, spinach
• Peanuts

** cooking can help decrease the this response

Note: Goitrogens will not cause thyroid issues in normal subjects
Note: And, common thought is that only “excess” of these foods would be problematic
Gluten and Thyroid

- Celiac disease increases the need for T4
- People with malabsorption issues (from celiac et al) may also be mal-absorbing T4, are they "getting" their medication?
- Numerous studies demonstrate link between gluten and thyroid issues (both Graves & Hashi)
- The molecular structure of gliadin closely resembles that of the thyroid tissue.


Soy and Thyroid

- Soy isoflavones can inhibit the activity of thyroid peroxidase (TPO). TPO needed for thyroid cells to extract the iodine from foods and produce thyroid hormones. Eating large amounts of soy products can therefore inhibit the production of thyroid hormones leading to hypothyroidism.
- In addition, the presence of isoflavones can cause the thyroid to become inflamed (goiter) to allow for additional blood to flow through in an attempt to extract more iodine.
- However, the Linus Pauling Institute indicates that eating soy products fails to produce a negative effect on the thyroid gland as long as iodine intake remains sufficient.

http://www.livestrong.com/article/322765-soy-isoflavones-thyroid/#ixzz2FJvN7OWE

Thyroid disorders

- Fatigue
- Muscle Ache
- Depression/lack of motivation
- Weight Gain
- Low Libido
- Memory Loss
- Constipation
- Decreased enzymes
- Hypochorhydria/low B12
- Altered neurotransmitters
- Low basal body temp
- Decreased phase 2 liver clearance
- Truncal obesity
- Anemia
- Dry skin
- Non-pitting edema (lower extremities)
- Thinning Hair/excessive hair loss
- Delayed Achilles Reflex
- Progestosterone receptor site insensitivity
- Thinning outer third of eyebrow
- High cholesterol
- Impaired methylation
Thyroid & MTHFR

- Research indicates that thyroid status affects the phenotypic expression of the MTHFR 677CT polymorphism by modifying FAD synthesis. This mechanism could partly explain how thyroid dysfunction affects the metabolism of folates and homocysteine.


Available at: http://ajcn.nutrition.org/content/80/4/1050.full#fn-2

Hypothyroid

- Peri-orbital edema
- Outer eyebrow thinning
- Hair loss
- Scalloped tongue
- Thin brittle nails

Autoimmune Thyroiditis

- Graves Disease (causing hyperthyroid)
  - Caused by thyroid autoantibodies activating the TSH receptor; stimulates thyroid hormone synthesis and secretion (hyperthyroid), and thyroid growth (causing a diffusely enlarged goiter).

- Hashimoto's Disease
  - Represents most autoimmune Thyroid
  - Here the thyroid gland is attacked by a variety of cell- and antibody-mediated immune processes, also possibly causing goiter. Eventually hormone synthesis is impaired leading to hypothyroid. Can have for years and not know it!

Autoimmune

- Most cases of hypothyroidism are due to autoimmune disease. However, it can also be due to the over-treatment of hyperthyroidism or to iodine deficiency.
  - You can tell if yours is the result of autoimmunity because a marker known as thyroid peroxidase antibodies (anti-TPO) will be elevated.
  - With increased antibodies, the pituitary gland compensates by producing more TSH, which tells the thyroid to pump out more hormone. In the early stages of this process, T4 and T3 levels are normal but TSH is elevated. If the illness progresses, thyroid hormone levels fall and TSH rises dramatically. Symptoms become more severe, then progress from subclinical to clinical hypothyroidism.
  - Hyperthyroidism in Hashimoto's thyroiditis is often triggered by: Gluten & Casein, blood sugar drops, physical and emotional stress, and TH1 or TH2 stimulation (inflammation/infections). By addressing these issues, one may possibly halt the process of the condition.
Dr. Datis Kharrazian

- Dr. Datis Kharrazian ("Dr. K"), whose 2010 book "Why Do I Still Have Thyroid Symptoms?" is popular among Hashimoto’s patients, vehemently opposes the use of iodine in Hashimoto’s.
- For 90% of Americans, hypothyroidism is caused by Hashimoto’s, an autoimmune thyroid disease.
- Thyroid replacements—Synthroid, Armour, Cytomel—may normalize TSH, but they do not manage the autoimmune disease symptoms.
- You should avoid gluten strictly—studies link gluten intolerance with Hashimoto’s.
- Pituitary function plays a role in underactive thyroid symptoms.
- Adrenal function plays a role in underactive thyroid symptoms.
- Thyroid hormone resistance, underconversion to T3, overconversion to T3, and other metabolic factors drive hypothyroidism symptoms.

Hyperthyroid symptoms (seen in Graves)

- Hypercalcemia
- Osteoporotic conditions and increased fracture risk
- Insomnia
- Irritability
- Anxiety
- Nervousness
- Excessive Sweating
- Excess BMs
- Tremors/inward trembling
- The presence of anti-thyroid antibodies is associated with an increased risk of unexplained subfertility.

Hyperthyroid

- Plummer’s Nails
- Goiter
- Exophthalmos
Hyper vs. Hypo?

- Presence of TPO Ab and normal TSH indicates that your thyroid is in the process of autoimmune failure. Not failed yet, and not failed enough to register in the standard TSH thyroid test. Yet, some patients are overtly symptomatic.
- Especially women feel better with TSH in 1.0-2.0 range.
- Traditional medicine typically does not treat this with thyroid hormone, however some integrative practitioners will.
- Alternatives to prescription thyroid hormone is thyroid glandular (best to administer under doctor’s supervision).
- Note: always take thyroid support away from food!

Lab Markers

Thyroid Stimulating hormone

- Thyroid-stimulating hormone (TSH) causes the thyroid gland to make two hormones: triiodothyronine (T3) and thyroxine (T4). T3 and T4 help control your body’s metabolism.
- The TSH blood test is used to check for thyroid gland problems. TSH is produced when the hypothalamus releases a substance called thyrotropin-releasing hormone (TRH). TRH then triggers the pituitary gland to release TSH.

Thyroid test markers

- **Total thyroxine (T4)**. Less than 1% of the T4 is unattached. A total T4 blood test measures both bound and free thyroxine. Free thyroxine affects tissue function in the body, but bound thyroxine does not.
- **Free thyroxine (FTI or FT4)**. Free thyroxine (T4) can be measured directly (FT4) or calculated as the free thyroxine index (FTI). The FTI tells how much free T4 is present compared to bound T4.
- **Triiodothyronine (T3) and Free T3**. Less than 1% of the T3 is unattached. A T3 blood test measures both bound and free triiodothyronine. T3 has a greater effect on the way the body uses energy than T4, even though T3 is normally present in smaller amounts than T4. Free T3 can be measured separately.
Thyroid Test Markers

- The thyroid-binding globulin (TBG) test measures blood levels of this protein, which is manufactured in the liver. TBG binds to T3 and T4, prevents the kidneys from flushing the hormones from the blood, and releases them when and where they are needed to regulate body functions.
- Low levels can be associated with hyperthyroid, high, with hypothyroid or liver issues.
- Levels can be increased by estrogens (including OCA).
- Levels can be decreased by prednisone, androgens, and high dose aspirin.
- The triiodothyronine resin uptake (T3RU) test measures the level of proteins that carry thyroid hormone in the blood. It can help to better assess T3 and T4 however because free hormone tests are widely available now, this test is rarely used anymore.

Thyroid Test Markers

- Thyroid antibody testing is primarily ordered to help diagnose an autoimmune thyroid disease and to distinguish it from other forms of thyroid dysfunction.
- Thyroid Peroxidase Antibody (TPOAb): presence of TPO antibodies in your blood suggests that the cause of thyroid disease is an autoimmune disorder.
- Thyroglobulin Antibody (TgAb): Thyroglobulin antibody is used as both a stand-alone marker for autoimmune thyroiditis and related diseases, and as part of the thyroglobulin tumor marker profile.
- Thyroid Stimulating Hormone Receptor Antibody (TRAb): useful for the differential diagnosis of clinically suspected Graves Disease.

Reverse T3 (rT3)

- Your body, especially the liver, can constantly be converting T4 to RT3 as a way to get rid of any unneeded T4. Some would say that RT3 is elevated when there’s a problem converting T4 to T3.
- In a state of alarm or when it needs to conserve energy and focus on something else, the body changes the % of conversion of RT3 to go up, (T3 goes down). Examples are emotional, physical, or biological stress, such as being chronically or acutely sick (the flu, pneumonia, etc), after surgery, after a car accident or any acute injury, chronic stress causing high cortisol (and eventually low cortisol), diabetes, aging, or even because you are iron deficient or are on drugs like beta blockers. The lower your T3, the worse you feel, including a lowered body temperature, fatigue, anxiety, weight gain, hair loss, a diagnosis of fibromyalgia and more.

Reverse T3

- When ferritin, aka storage iron, is low, as can be your serum iron and saturation (which is quite common in thyroid patients), your red blood cells become less plentiful, and carrying thyroid hormones via your blood becomes inadequate, causing thyroid hormones to pool in your blood. The body responds by producing excessive amounts of RT3 to clear out the excess T4.
- ***Note that you can have either an iron problem, or a cortisol problem, or BOTH. There are other reasons you have high RT3, such as the excess inflammation, selenium deficiency and more, but the above are quite common and worthy to explore first.
Reverse T3

- Another stress is simply being in the state of uncontrolled hypothyroid!
  Sometimes seen when on the inadequate treatment of T4-only or being “held hostage” to the TSH lab test (both which keep you underdosed or hyper), your adrenal glands produce high amounts of cortisol to help you cope with ongoing hypothyroidism and lingering symptoms and conditions. The excess cortisol inhibits the conversion of T4 to T3, and instead produces even larger amounts of RT3, creating an RT3 problem.

Stop the Thyroid Madness by Janie A. Bowthorpe, M.Ed
http://www.stopthethyroidmadness.com/reverse-t3/

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Typical Thyroid Lab Ranges

<table>
<thead>
<tr>
<th>Test</th>
<th>Abbreviation</th>
<th>Typical Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroid Stimulation Hormone</td>
<td>TSH</td>
<td>0.5-5.5 mU/L</td>
</tr>
<tr>
<td>Total Thyroxine</td>
<td>TT4</td>
<td>5.4-11.5 µg/d</td>
</tr>
<tr>
<td>Free Thyroid Index</td>
<td>FT3</td>
<td>4.6-10.9 ng/dL</td>
</tr>
<tr>
<td>Total Thyroxine</td>
<td>FT4</td>
<td>0.7-1.5 µg/d</td>
</tr>
<tr>
<td>Reverse T3</td>
<td>rT3</td>
<td>90-350 pg/mL</td>
</tr>
<tr>
<td>Thyroid Binding Globulin</td>
<td>TBG</td>
<td>15-30 µg/dL</td>
</tr>
<tr>
<td>Thyroid Antibodies</td>
<td>TPO-Ag, TGB-Ag</td>
<td>Detected</td>
</tr>
</tbody>
</table>

Typical Functional Thyroid Ranges

- TSH          1.8-3.0 mU/L (some say 2.0)
- Total T4    6.0-12.0 µg/dl
- Total T3   100-180 ng/dl
- Free T4   1.0-1.5 ng/dl
- Free T3  3.0-4.0 pg/ml
- T3 Uptake  28%-38%
- Thyroid Binding Globulin  18-27 µg/dl
- Reverse T3  90-350 pg/ml

Hyperthyroidism

- TSH – Low
- Total T4 – Normal or Elevated
- Free T4 – Normal or Elevated
- Free Thyroxine Index – Normal or Elevated
- T3 Uptake – Normal
- Free T3 – Normal or Elevated
- Reverse T3 – Normal
- Thyroid Antibodies – Positive
- Low TSH and low T4 = pituitary hypofunction/adrenal
- Thyroid Stimulating Antibodies and TSH receptor Antibodies = Graves
Hypothyroidism

- TSH – Elevated
- Total T4 – Normal or Low
- Free T4 – Normal or Low
- Free Thyroxine Index – Normal or Low
- T3 Uptake – Normal or Low
- Free T3 – Normal or Low
- Reverse T3 – Normal

Note when high TSH and all else normal, likely case of Hashi’s. Check Thyroid peroxidase Antibodies (TPOAb).

Hypothyroid Support

What if you don’t have a thyroid?

- Is it absolutely certain that a person with no thyroid needs meds. Functional medicine common view: typically used alone, Synthroid is not enough?

- For those on T4 alone, additional nutritional (and other – next slide) support will help support the conversion of T4 to T3, thus helping to prevent hypothyroid symptoms that result even in the face of normal TSH/T4. Likewise, additional support of T3 (natural or Rx) can be given.

- Address what was the problem in the first place? Gluten maybe? Other issues – next slide!

Hypothyroid Intervention

Nutrition:

- Minerals: Iodine, Selenium, Zinc, Chromium, Copper, magnesium and Iron
- Iodine (?? in Hashi’s – not unless tested deficient) - even then use caution – may only want to with doctor’s supervision) (Kharrazian vs Brownstein – opposing views)
- Amino Acids: Tyrosine, 5-HTP
- Vitamins: A, D, E, B-2, B-6, B-12
- Herbs: Forskolin, Ashwagandha, Guggul, Eleuthero (ginseng), bladderwrack

Anti-inflammatory support: Essential Fatty Acids, Curcumin, Boswellia

Detoxification and Immune Support: Glutathione, probiotics, etc

Cortisol and Stress Management (adrenal/deep support):
- L-Theanine, Magnolia, Phosphatidylserine

Balance blood sugar
Support iron anemia
Iodine deficiency: Thyroid & other health issues

- A key mineral for thyroid health, iodine is required to produce thyroid hormone.
- Implicated in various cancers:
  - Breast
  - Stomach
  - Thyroid
- Also implicated in fibrocystic breast disease (FBD)
  - For breast tissue, powerful antioxidant effect equivalent to Vit-C

Iodine RDA

- A recent article in the New England Journal of Medicine (June 29, 2006) claims that iodine deficiency is still widespread, our RDA is too low and argues for an increase to at least 300-400 mcg/day.
- Current RDA too low:
  - Adults 150 mcg/day
  - Pregnancy 220 mcg/day
  - Lactation 290 mcg/day

Iodine Deficiency: A thing of the past?

- Iodine deficiencies are becoming more commonplace in the USA.
- The most common reason for the increase in deficiencies is the decreased intake of iodized salt and also,

States in red have known iodine deficient soil.

With new US rec’ds to cut salt intake, will our kids be next?

Should we pay more attention to other iodine sources?
Iodine Deficiency and Pregnancy

- Higher risk for: miscarriage/stillbirth, preeclampsia, or congenital anomalies.
- Linked to infertility: the thyroid, adrenals and entire endocrine system can be affected, including the body’s ability to create sex hormones.
- Offspring are more likely to have low scores of verbal IQ, reading comprehension, and reading accuracy.
- Severe deficiency may lead to mental and growth retardation or cretinism in offspring.

Alex Stagnaro-Green, Scott Sullivan, Elizabeth N. Pearce. Iodine Supplementation During Pregnancy and Lactation. *JAMA* 2012; 308 (23): 2463-2464


Halide displacement of Iodine

- The lighter the halide, the more it displaces iodine.
- Iodine is displaced by Bromine, Chlorine, and Fluorine.

Halides sources

- Bromine:
  - Pesticides in the form of methyl bromide
  - Bakery goods and some flours that contain potassium bromate
  - Brominated vegetable oil (BVOs) in soft drinks
  - Fire retardants
- Chlorine:
  - Tap water/food prepared with tap water
  - Swimming pools
  - Cleaners
  - Solvents
  - Once these ions come into contact with natural water, it is possible and likely to form chloroform and other carcinogens by reacting with naturally-occurring compounds
  - EPA standard for chloride concentration in drinking water is 250 ppm

Halides sources
- **Fluoride:**
  - Tap water/food prepared with tap water
  - Toothpaste/mouthwashes containing fluoride
  - Some non-stick pans
  - Refrigerants
- High fluoride concentrations are harmful to all organisms, resulting in stunted growth, bone degradation, birth defects in animals, and low crop yields.
- The EPA has set 2 parts per million (ppm) as the maximum acceptable concentration of fluoride in drinking water.

Iodine Content in Table Salt
- Iodized salt in the United States contains 45 mcg iodine/g salt (approx 1/8 and 1/4 teaspoon)
- Bioavailability of iodine in table salt is variable and has been reported to be as low as 10%
- Bioavailability may also vary with type of additive: potassium iodate, potassium iodide, sodium iodate, sodium iodide, or cuprous iodide

Is Iodizing Table Salt Really Helpful?
- An opened box of table salt with iodide may lose its iodine content in about 4 weeks through the process of oxidation and iodine sublimation (changing from solid to gas form)
- Humidity affects iodine sublimation

Salt
- Two forms of salt available
  - **Refined**
    - White table salt commonly seen at any restaurant
    - Refined salt has been bleached and exposed to many toxic chemicals in order to get it to its final product. It has aluminum, ferrocyanide, and bleach in it
    - The sodium chloride in table salt is highly concentrated, denatured, and some say, toxic to your body.
  - **Unrefined**
    - Has not been put through a harsh chemical process.
    - The minerals supply the body with over 80 trace elements needed to maintain and sustain health. Furthermore, the minerals elevate the pH (correct acidity) and lower blood pressure.
    - Natural sea salt is far superior to chemically-treated iodized table salts as it contains all 92 trace minerals, and it’s only 84% sodium chloride while table salt is almost 98%.

For more information:
- [Halides sources](https://research.chemistry.ohio-state.edu/reel/research-modules/environmental-chemistry/chemistry-221-h221/significance-of-analytes-water/halides/)
- [Iodine content in Table Salt](https://research.chemistry.ohio-state.edu/reel/research-modules/environmental-chemistry/chemistry-221-h221/significance-of-analytes-water/halides/)
- [Salt](https://research.chemistry.ohio-state.edu/reel/research-modules/environmental-chemistry/chemistry-221-h221/significance-of-analytes-water/halides/)
Why choose unrefined salt

- Unrefined natural salt is important to many biological processes, including:
  - Being a major component of your blood plasma, lymphatic fluid, extracellular fluid, and even amniotic fluid
  - Carrying nutrients into and out of your cells
  - Maintain and regulate blood pressure
  - Increasing the glial cells in your brain, which are responsible for creative thinking and long-term planning
  - Helping your brain communicate with your muscles, so that you can move on demand via sodium-potassium ion exchange
  - There is a such thing as salt deficiency!

But, sea salt not enough iodine

- Our modern Iodized table salt has about 74 part per million of Iodide added to it. Thus, it has about a 25 times higher of a concentration of Iodide than sea salt does. If you replace your ordinary iodized table-salt with sea-salt because it is “more natural” and supposedly “healthier”, you may be cutting out the major source of Iodide in your diet.
- Still need another source of Iodine/Iodide such as seafood or Kelp (or kelp flake/sea salt combo)

Food Sources of Iodine

<table>
<thead>
<tr>
<th>Food</th>
<th>Serving</th>
<th>Iodine (mcg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt (iodized)</td>
<td>1/4 teaspoon</td>
<td>96</td>
</tr>
<tr>
<td>Cod</td>
<td>3 ounces*</td>
<td>99</td>
</tr>
<tr>
<td>Shrimp</td>
<td>3 ounces</td>
<td>35</td>
</tr>
<tr>
<td>Pork sticks</td>
<td>2 ine sticks</td>
<td>35</td>
</tr>
<tr>
<td>Tuna, canned in oil</td>
<td>3 ounces (1/2 can)</td>
<td>17</td>
</tr>
<tr>
<td>Milk (cow's)</td>
<td>1 cup (8 fluid ounces)</td>
<td>56</td>
</tr>
<tr>
<td>Egg, boiled</td>
<td>1 large</td>
<td>12</td>
</tr>
<tr>
<td>Turkey breast, baked</td>
<td>3 ounces</td>
<td>60</td>
</tr>
<tr>
<td>Seaweed</td>
<td>1/4 ounce, dried</td>
<td>Variable, may be greater than 4,500 mcg (4.5 mg)</td>
</tr>
</tbody>
</table>

Small, white print under “Light Grey Celtic” This salt does not supply Iodine

Excellent Source of Iodine

From ancient sea in Utah. It contains 62 trace minerals. Not a good source of Iodine
Sea veggies packed with nutrients

- Measurable amounts of Ca, Cu, iodine, Fe, Mg, Mn, Mo, phosphorus, K+, Se, vanadium, and Zn. Also phytonutrients, like sulfated polysaccharides that bring anti-inflammatory, anti-viral, and cardiovascular benefits. Sea vegetables also an excellent source of vit K and a very good source of folate.
- Among all of the heavy metals, arsenic appears to be the most problematic when it comes to sea vegetable toxicity risk. Virtually all types of sea vegetables have been determined to contain traces of arsenic. These types include arame, hijiki, kombu, nori, and wakame, hijiki being the highest. Best to choose certified organic to have the safest.

Dr. David Brownstein

- Iodine 12-13mg combination of iodine and iodide (what the Japanese average daily). Inhibit 95-96% of the uptake of radioactive iodine. Dr. Bronstein recommends. Especially with individuals on the west coast with the nuclear fallout. Take everyday and not as a one time dose.
- Relatively safe dose for vast majority of people. (adult dose, smaller dose for children)
- Safe for Hashimoto's and Graves (other's like Gaby and Kharrazian disagree)
- Rec'ds using as a comprehensive holistic treatment protocol (not Iodine alone)

Iodine effects: Is there a use for hyperthyroid?

- Iodine acutely inhibits hormonal within hours, but the responsible mechanisms are uncertain. This is the most acute effect of iodine on thyroid status, occurring within one to two days of the start of therapy.
- A second effect involves inhibition of thyroid hormone synthesis
-Must be used under medical supervision

Iodine: Caution with supplementing

- In normal subjects (not hyperthyroid), the administration of iodine leads to temporary inhibition of thyroid hormone biosynthesis, a phenomenon called the Wolff-Chaikoff effect.
- Autoimmune pts can respond differently (suppression continues)
- Within two to four weeks of continued exposure to excess iodine, thyroid hormone biosynthesis resumes in a normal fashion (again, not hyperthyroid)
- Point being, with iodine supplement support, folks may feel worse before they feel better! (dose dependent)
Iodine Supplements:

- One 12.5 mg tablet of Iodoral (a popular iodine supplement) supplies an amount of total elemental iodine, comparable to the average daily intake of this essential element by mainland Japanese, a population with a very low prevalence of fibrocystic disease of the breast and breast cancer.

- According to Alan Gaby MD, typical amount of Iodine as found in Iodoral supplement is too high. “We interpret the Japanese studies wrong and over estimate needs!” “Safer way to obtain iodine is from consuming iodine rich foods (sea vegetables and fish) and an unprocessed sea salt / kelp combo”.

Could High-Dose Iodine Be Dangerous?

- A recently published study has cast some doubts on high-dose iodine supplementation. The study, published December 28, 2011 in the American Journal of Clinical Nutrition, randomly assigned one of 12 different doses of iodine (ranging from 0 to 2,000 mcg/day) to healthy adults for four weeks.

- When diet was factored in, those taking 400 mcg/day were receiving a total of about 800 mcg of iodine per day.

- At doses at and above 400 mcg of supplemented iodine per day, some of the study participants developed subclinical hypothyroidism, which appeared to be dose dependent. At 400 mcg/day, 5% developed subclinical hypothyroidism; at the highest dose, 2,000 mcg/day, 47% were affected. Subclinical hypothyroidism refers to a reduction in thyroid hormone levels that is not sufficient to produce obvious symptoms of hypothyroidism (such as fatigue, dry skin, depression or weight gain, just to mention a few common tell tale signs).

- So, these findings suggest it might not be wise to get more than about 800 mcg of iodine per day, and supplementing with as much as 12-13 mg (12,000-13,000 mcg’s) could potentially have some adverse health effects. (BUT, is this the effect we previously spoke of?? And if left on the supplement, would the subclinical signs disappear??)

Iodine, Tyrosine, and Selenium

- So, what to do: Supplement or not?? Perhaps supplementation best left to the advanced level functional nutritionist, especially those working directly under functional medicine supervision.

- Iodine related to tyrosine metabolism….perhaps just supplement with tyrosine? Many thyroid support supplements contain both (as well as other ingredients).

- Use caution even with combo supplements: safe? Again diet may be the best: ensure adequate iodine, selenium, protein, etc.

- Selenium useful for converting T4 to T3. Trial supplement of selenium (not to exceed 400 mcg/day from all supplements) – or just eat a few brazil nuts!

Selenium in Brazil Nuts

Oils and Thyroid Health

- LA & ALA: It used to be that corn and soy were fed to pigs to fatten them; now pigs are fed saturated fat to keep them lean.

- In the 1940s fat from pigs (lard) was highly desirable, as were most saturated fats. Today, saturated fats are fed to pigs to keep them lean, while most people buy polyunsaturated soy and corn oils in the grocery stores as their primary cooking oil!

- Hmmm, so now we have a population characterized by lean pigs and obese people.

Highly refined polyunsaturated vegetable oils and trans fats can reduce thyroid function as they are damaged/rancid, impairing conversion of T4 to T3.

Coconut Oil and Thyroid

- Coconut oil is more stable as a saturated fat.
- Primarily Medium chain triglycerides (MCTs). MCTs are processed differently, conversion of T4 to T3 is not impaired with coconut oil.
- MCTs help raise basal temperature and increase metabolism.
- Coconut oil helps people with hypothyroid who have decreased metabolism.
- Coconut Oil helps rebuild cell membranes.
- Make sure it’s organic unrefined coconut oil!


Thyroid Basics - Most Important!

- Get enough sleep and de-stress (support adrenals).
- Eat a healthy, unprocessed diet.
- Avoid excess goitrogens if already Dx with thyroid condition.
- Ensure adequacy of dietary iodine.
- Support blood sugar balance.
- Prevent or treat iron anemia.
- Reduce toxic burden and support detoxification processes.
- Support healthy gut flora and digestion.
- Reduce chronic inflammation.
- Support overall nutritional status (screen for insufficiencies).

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