

# The Thyroid Gland:

## *Regulating Metabolism and Immunity*

by Ellen Tart-Jensen, PhD, DSc

The thyroid gland lies in the neck just below the Adam's Apple, which is the apex of the larynx or voice box. The gland measures about two inches across and has two lobes, one on each side of the trachea or windpipe. It is joined in the center by a narrow section of tissue called the isthmus. The function of the thyroid gland is to produce three important hormones, thyroxin (T4) in the greatest amounts, triiodothyronine (T3) in smaller amounts, and calcitonin. T4 and T3 regulate metabolism in the body. Metabolism is the chemical activity that increases cell oxygenation, releases energy from food and uses energy and nutrients to create other substances, such as proteins. The third hormone, calcitonin, works with the parathyroid hormone secreted by the parathyroid glands (located within the back of the thyroid gland) to regulate the level of calcium in the body. All three hormones produced by the thyroid are essential for normal physical growth and mental development in children.

### THE THYROID GLAND NEEDS IODINE TO FUNCTION

The thyroid gland needs iodine to produce thyroxin and triiodothyronine. The iodine concentrated in the thyroid can be as much as 25 times that of the blood. If iodine is lacking in the diet, the gland becomes enlarged, producing a goiter. In countries such as Japan where much of the food comes from iodine-rich seafood, goiter is practically nonexistent. In Switzerland where there is very little iodine in the soil, many people suffer from it. Foods rich in iodine are sea vegetables such as dulse, kelp, nori, and hijiki, as well as saltwater fish.

### THYROID DEFICIENCY OR HYPOTHYROIDISM

Hypothyroidism occurs when the thyroid gland does not produce enough thyroid hormones, including T3 and T4. Hypothyroidism often begins gradually—facial expressions become dull, the eyes become swollen and puffy, and the person begins to experience feelings of depression. People with decreased thyroid function have a lower metabolic rate and are often tired, sluggish, and cold. They suffer from constipation, infections, depression, headaches, skin disorders, and obesity. Hypothyroidism can cause a condition known as myxedema which is characterized by decreased body temperature, slowed pulse rate, lethargy, weight gain, and hair loss. Psoriasis and eczema can be caused by low thyroid function. Fungal infections under the fingernails and on the feet and toes can be the result of hypothyroidism causing poor blood circulation to the extremities of the body. Blood distributes oxygen which kills fungi and carries away toxins. Broda Barnes, MD, studied hypothyroidism during his 30 years of practice and wrote the book, *Hypothyroidism: The Unsuspected Illness*. In the book he explains how it can be the cause of many different illnesses and health conditions. He was not satisfied with results from blood tests because they were often within normal range while the patients were still producing symptoms, so he developed another reliable test based on basal temperature that can be taken by the layperson at home.

CONTINUES...

The basal temperature test is quite accurate when the body temperature is measured in the axilla (armpit) each morning for six consecutive days. Women that are menstruating must begin taking their temperatures on the morning of the second day of menstruation. If the temperature is consistently low, then the thyroid is considered to be underactive. To take this test, prepare the thermometer the night before by shaking it down below 97 °F (36 °C) and placing it on a table near the bed. Immediately upon awakening (before moving out of bed), place the thermometer under the bare arm in the armpit, pressing your arm against the body with no clothing in between. Keep still and quiet because any motion can upset the reading. Leave the thermometer in place for ten minutes. Normal thyroid function should yield temperatures between 97.8 and 98.2 °F (36.5 - 36.8 °C). If the temperature falls below 97.8 °F on several days, thyroid function may be low, especially if symptoms also exist.

If you suspect you have thyroid deficiency, you should read Dr. Barnes' book. Kelp and Nova Scotia dulse are high in natural iodine and other minerals that can help balance the thyroid gland. These seaweeds can be taken in powder form, as a seasoning on soups and salads, or as tablets. The amino acid tyrosine is converted to thyroxin and can be very helpful as well. L-Tyrosine is available in health food stores. The herb black walnut hull is rich in iodine and may be taken in capsule or tincture form. Natural glandular concentrates are available, made from raw bovine thyroid substance and can be most helpful if the body temperature does not improve with seaweeds. These thyroid tablets are available in low dosages in health food stores. Armour® Desiccated Thyroid tablets are also available but must be prescribed by a physician. Dr. Barnes had great success with his patients using Armour thyroid. If your physician requests more information on natural glandular concentrates, contact the Broda O. Barnes, MD, Research Foundation.\*

## **HYPERTHYROIDISM**

Hyperthyroidism occurs when the thyroid gland produces too much thyroxin. When this happens, bodily processes speed up and metabolism becomes overactive. People become hyperactive, nervous,

jittery, irritable, and fatigued. They have trouble sleeping at night, sweat more, have increased bowel movements, rapid heartbeat, and protruding eyeballs. The thyroid gland often becomes enlarged, causing a goiter to form. A common type of hyperthyroidism is Graves' disease. Graves' symptoms may include insomnia, fatigue, anxiety, irritability, a slight tremor in the hands, an increase in perspiration, frequent bowel movements, weight loss, a change in menstrual cycles, and enlargement of the thyroid gland (goiter). For more information, read *Graves' Disease, A Practical Guide*, by Elaine A. Moore with Lisa Moore.

People with hyperthyroidism should avoid stimulants such as caffeine found in coffee, chocolate, sodas, and black tea. They should avoid sugar and artificial sweeteners which can also act as stimulants. Since these people digest too rapidly, they often don't absorb the nutrients they need, so a good digestive enzyme just before meals can be helpful. Cruciferous vegetables can balance thyroid hormone production, especially when consumed raw. They are rich sources of sulfur-containing compounds known as glucosinolates. During the digestive process, the glucosinolates found in these vegetables release a compound known as goittrin, which lowers the production of thyroxin. However, if you are taking medication for hyperthyroidism, eating goitrogens in raw cruciferous vegetables may increase the effects of antithyroid medications, so it is best to eat them cooked. A multiple vitamin high in B complex plus ionic liquid trace minerals can help to calm the nervous system. Herbs like lemon balm, motherwort, and bugleweed have been beneficial in the treatment of hyperthyroidism because they are very soothing and calming to the entire nervous system. If you are taking medication of any kind, be sure to consult your physician or health care practitioner before taking these herbs. Sea foods including seaweeds can be beneficial in cases of hyperthyroidism as well.

## **LIFESTYLE CHANGES THAT ARE HEALING FOR THE THYROID**

Whether you have hypothyroidism, hyperthyroidism, or just wish to prevent thyroid issues in the future, here are some guidelines to follow:

1. Do not drink water, use toothpaste, or any other product containing fluoride. Studies have proven that fluoride suppresses the thyroid gland and can even cause it to stop functioning completely. As early as the 1930s, the researchers Litzka and May of Germany, and Gorlitzer von Mundy of Austria, used fluoride solutions to treat over-active thyroid illness.<sup>1</sup> Their patients bathed in water containing fluoride, swallowed fluoride tablets, and drank fluoridated water. As a consequence, many of the patients suffered a total loss of thyroid function.

A research study done in 1999 by Jooste et al. showed that goiter occurred in school children due to fluoride in areas of the Northern Cape Province of South Africa that were very sufficient in iodine.<sup>2</sup>

Fluoride cannot be processed properly by the body and its effects in the cells are cumulative over time.

2. People with hypothyroidism should limit their intake of foods that contain compounds called goitrogens to one cup or less a day. Goitrogenic foods tend to suppress thyroid function, so people with hyperthyroidism may consume more of these unless they are taking medication. Goitrogenic foods include the cruciferous vegetables such as broccoli, cabbage, cauliflower, Brussels sprouts, turnips, kale, and rutabagas. Goitrogens are also found in walnuts, pine nuts, radishes, millet, strawberries, peaches, and spinach. In addition, soy in all forms that are raw, including fermented and cultured, contains goitrogenic compounds. Cooking tends to deactivate goitrogenic compounds in all of these foods.
3. Get plenty of fresh air and sunshine. Oxygen from the air and vitamin D from sunlight help to strengthen the thyroid.
4. Try to walk one half hour per day to enhance the function of bodily tissues and improve blood circulation through the thyroid gland.
5. Drink half your pounds of body weight in ounces of purified, fluoride-free water per day to help the body and thyroid gland remain hydrated.

6. Avoid sugar, artificial sweeteners, and stimulants including caffeine and nicotine, as these can be very detrimental to the function of the thyroid.

Knowing how to take care of our bodies is crucial, especially during these times when the earth is more polluted than ever. Learning how to properly take care of the thyroid will empower us to feel stronger, healthier, and more balanced. ☐☐

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Ellen Tart-Jensen, PhD, DSc, CCII, has been a nutritionist, herbalist, and iridologist for 25 years. She studied at a famous natural health clinic in Switzerland and spent five years working with Dr. Bernard Jensen at his Hidden Valley Health Ranch in Escondido, California. She presently has a

busy practice in San Marcos, California, and teaches natural healing methods, nutrition, and iridology throughout the world. She is the author of *Health is Your Birthright: How to Create the Health You Deserve* and *Through the Eyes of the Masters, A History of Iridology*. For more information, see her website at [www.bernardjensen.com](http://www.bernardjensen.com) or call Bernard Jensen International at 760-471-9977.

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# Environmental Medicine Update

by Marianne Marchese, ND  
www.drmarchese.com

## Environmental Links to Thyroid Disease

Thyroid disease seems to be epidemic in this country. Over half of the women who come to see me have some sort of thyroid disorder, ranging from hypothyroidism to hyperthyroidism, Grave's disease to Hashimoto's. The thyroid gland produces two hormones that affect almost every organ in the body and regulate metabolism. The main hormone is thyroxine, T4, and a small amount of triiodothyronine, T3. T3 is mostly made from the conversion of T4 in the blood or other tissues of the body.

Hypothyroidism is where the thyroid gland does not produce enough thyroid hormone and metabolism slows down.

Signs of hypothyroidism include:

- fatigue or weakness
- weight gain
- infrequent or absent menstrual periods
- loss of sex drive
- being cold or chilled easily
- constipation
- muscle aches
- puffiness around the eyes
- brittle nails
- hair loss and dry skin

Hyperthyroidism is where the gland is overactive and producing too much thyroid hormone, causing metabolism to increase.

Signs of hyperthyroidism include:

- fatigue
- weight loss
- change in vision
- nervousness
- rapid heart beat
- increased sweating
- being hot or overheating easily
- menstrual spotting or frequent menses

- frequent or loose bowel movements
- tremors
- anxiety and panic

Grave's disease is an autoimmune disorder wherein the body produces antibodies against the thyroid gland, causing it to produce too much thyroid hormone and thus leading to hyperthyroidism. Hashimoto's disease is an autoimmune condition as well, but it causes hypothyroidism.

What causes thyroid disease? It depends on what type, but in general there are common elements affecting the production of T4 and T3 from the thyroid gland.

Common factors include<sup>1-3</sup>:

- pregnancy (1 out of 50 women are diagnosed with hypothyroidism during pregnancy)
- estrogen therapy
- stress
- elevated cortisol
- caloric restriction and anorexia
- low selenium
- low or high iodine intake
- genetic factors
- smoking
- infections
- systemic diseases
- family history
- medications such as lithium
- exposure to radiation
- environmental chemicals

In my practice I have been successful at treating thyroid disease from an environmental medicine perspective. Some patients have been able to get off of medication by identifying and removing chemicals that triggered the thyroid disease. But first we have to know which toxins are linked to thyroid problems, and how chemicals interfere with the thyroid gland. ➤

## Environmental Medicine



The ways in which chemicals affect thyroid function include<sup>4,14</sup>:

- alteration of thyroid hormone metabolism
- direct toxic effect on the gland, changing function and regulation
- production of thyroid antibodies (leading to autoimmune thyroid disorders)
- interaction with thyroid carrier proteins
- blocking iodine uptake by the thyroid gland

The main chemicals that affect thyroid function are:

*Polychlorinated biphenols (PCBs) and dioxins.* PCBs were once used in electrical transformers, capacitors, plasticizers, and adhesives. Although many are no longer used in the US, they still persist in the environment. Eating fish from contaminated waters, and farm-raised fish, are a major source of PCBs, as well as dairy and meat products. Dioxin is formed as a byproduct of industrial processes involving chlorine such as waste incineration, chemical and pesticide manufacturing, and paper bleaching. Dioxin was the primary toxic component of Agent Orange. The main way we are currently exposed to dioxin is through our food. It is a contaminant in meat, dairy products, and fish. PCBs and dioxins induce thyroid hormone metabolism through an enzyme called UDP-glucuronyl transferase. This simply means that they alter liver function of the enzyme that metabolizes thyroid hormone. They also directly attack the thyroid gland and thyroid hormone carrier proteins.<sup>5</sup> There are numerous studies linking PCBs and dioxins to thyroid dysfunction.<sup>6,7</sup>

*Pesticides* have also been linked to thyroid disease in numerous studies. We are exposed to pesticides every day, whether we chose to be or not. They contaminate our air, water, food, soil, playground equipment, personal care products, and more. There are numerous studies that link pesticides to thyroid dysfunction. Specifically, maneb and mancozeb, which are sprayed on fruits such as bananas and have been found to alter thyroid stimulating hormone (TSH), inhibit thyroid peroxidase enzyme and cause thyroid nodules.<sup>8</sup>

A recent study of women married to men who sprayed pesticides on agriculture for a living showed increased rates of thyroid disease. The study was published in the *American Journal of Epidemiology* (epub January 8, 2010). It looked at 16,500 women living in Iowa and North Carolina who were married to men using pesticides at work in the 1990s. Of these women, 12.5% developed thyroid disease. This is a 1.2- to 1.4-fold increase from the general female population. It is interesting to note that these women didn't actually use the pesticides themselves but were exposed secondhand through their husbands.

*Pentachlorophenol (PCP)* is a chemical used in industry and agriculture. We are exposed without even knowing

that it exists. It is used as a wood preservative and produces toxic byproducts that contaminate our air, food, and water. It too is linked to alteration of thyroid hormones and the formation of a goiter.<sup>9</sup> A goiter is an enlargement of the thyroid gland. It is not cancer but typically is a signal that something is wrong with the gland.

*Bisphenol A (BPA)* is another common chemical that we are exposed to every day through the lining of metal food cans, dental sealants, and plastic bottles. It too is linked to thyroid disorders. Even at low doses consistent with what the average person would be exposed to, there are links to changes in thyroid hormones.<sup>10</sup>

*Heavy metals* are found to affect the thyroid as well. One of the main heavy metals studied is cadmium. Cadmium is a component of cigarette smoke and a product of industry. It is in the air, soil, and water of most cities. We are exposed through cigarette smoke, food grown in contaminated soil, air pollution, and water contamination. There are numerous studies linking thyroid disease to cadmium exposure. In one study, 636 children in Germany had their blood tested for thyroid hormones and correlated abnormalities to urine and blood levels of heavy metals. It was determined that children with alterations in thyroid hormones had high blood levels of cadmium.<sup>11</sup>

Mercury is also linked to thyroid disease in women and children. Methylmercury, which is found in fish, is linked to alterations in thyroid hormones via the mechanism of depleting selenium. Selenium is a mineral that is essential for proper thyroid function.<sup>12</sup>

Lead is another heavy metal that we are exposed to daily through our food, air, and water. It too is linked to thyroid disorders in many studies. One of note shows the sensitivity of a woman's hormonal system compared with a man's. Women's hormones appear to be more interconnected than do men's. For example, many women develop thyroid disease during pregnancy due to increases in estrogen and progesterone. One study compared men's and women's blood levels of lead and mercury with alterations in thyroid hormones, and found that women were more affected by the heavy metals.<sup>13</sup>

*Infants and thyroid disease.* A recently published study showed a link between the chemical perchlorate and infant thyroid disorders. Perchlorate is used to make rocket fuel and explosives, including fireworks. It is a contaminant in drinking water, breast milk, and infant formula. A high urinary level of perchlorate was linked to high thyroid stimulating hormone (TSH) levels, which correlate with hypothyroidism. The thyroid disorders were only in infants with low iodine levels as well. Perchlorate and other chemicals are known to block iodine uptake by the thyroid gland, thus spelling out a mechanism of action for high TSH levels.<sup>14</sup>

*Perfluorooctanoic acid (PFOA)* is found in stain- and water-resistant coatings for carpet, furniture, fast-food containers, paints, and foams. We are often exposed without knowing. These chemicals build up in our adipose tissue, or fat, and alter thyroid function. The National Health and

Nutrition Examination Survey (NHANS) looked at 3973 adults and measured PFOA levels. It determined that high concentrations of PFOAs are linked to thyroid disease.<sup>15</sup>

### Summary

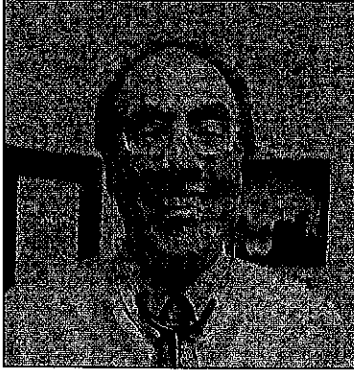
When a patient comes to see me for treatment or management of a thyroid disorder, I always ask why – not why did they come to see me, but why does she have a thyroid problem? I believe that too many doctors simply just treat the symptoms of hypo- or hyperthyroidism and never ask why the thyroid is not functioning properly. They simply discuss hormone options or a few supplements.

How do I treat thyroid? I try to treat the cause. The most common cause I see is environmental chemicals. I always take an environmental history on a patient, test for chemicals in the blood or urine, and initiate a cleansing program to remove chemicals from the body. If heavy metals are present, I include chelation with the cleansing program. Of course, I rule out other causes that are mentioned at the beginning of this article. Often it is hard to pinpoint one cause, chemical-related or otherwise; however, by beginning a gentle cleanse while working up the case, you are moving in the right direction.

## Environmental Medicine

### Notes

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# Letter from the *Publisher*

## **Criminalizing Doctors Who Diagnose Hypothyroidism**

Medical boards are responsible for taking disciplinary actions against physicians who practice medicine unprofessionally and dishonorably. Grossly repeating acts of negligence would be the basis for a board's taking action against a practitioner. A patient presenting to the ER in extremis complaining of abdominal pain, fever, and nausea who is diagnosed with flu and sent home when acute appendicitis is afoot would be an example of negligence. A patient undergoing a

nonemergent hysterectomy who has her ureter severed during surgery would be an example of negligence. A patient experiencing fatigue, cold intolerance, dryness of the skin, brittleness of the hair, low grade depression, constipation, and chronic neck and back pain diagnosed with hypothyroidism would be an example of negligence. Right? Well, yes; if that patient with a chronically low basal temperature has a normal free T4 and normal TSH, the diagnosis assuredly is not hypothyroidism. It may be depression, it may be chronic fatigue, it may be xerosis, it may be

back pain, it may be constipation; but it is not hypothyroidism. Why? Because hypothyroidism is diagnosed only when the TSH is elevated and free T4 is low. It does not matter if the patient has other thyroid function tests that are abnormal. It does not matter if the patient is given an empirical trial of thyroid supplement and has a positive clinical response. It does not matter if, after having a positive clinical response to being treated with thyroid, the symptoms relapse after the thyroid treatment is discontinued. Unless the TSH is elevated and the free

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T4 is low, a doctor may not diagnose hypothyroidism. To make such a diagnosis would be considered gross negligence, much like misdiagnosing appendicitis in the ER or clipping the ureter during abdominal surgery.

Broda Barnes, MD, championed the "alternative" hypothyroid diagnosis a half-century ago. His writing about the diagnosis and treatment of hypothyroidism has been well appreciated by the alternative medical community. The conventional endocrinology community has loudly rejected his theories and has made the diagnosis of hypothyroidism a laboratory diagnosis treated uniformly with synthetic thyroid preparations. In fact, most thyroid screening is limited to TSH testing only. If this result is normal, no further thyroid testing is necessary and the diagnosis of hypothyroidism is ruled out. When hypothyroidism is diagnosed, treatment is always based on prescribing levothyroxine and triiodo-thyronine, never the use of thyroid USP (Armour Thyroid). Treated hypothyroid patients are monitored with TSH testing – if the TSH level is below a defined level, the diagnosis of excess thyroid treatment is made and the prescribed thyroid is reduced in dosage. The diagnosis and treatment of hypothyroidism are not predicated on patient symptoms. It does not matter if there is symptomatic improvement. The only basis for making the thyroid diagnosis and prescribing medication is by testing the serum TSH level. Such is the "state of the art" of thyroid diagnosis in 2010.

### The State of Oregon v. John E. Gambee, MD

John Gambee, MD is a physician practicing in Eugene, Oregon, who subscribes to much of the thinking espoused by Barnes. Gambee believes that the diagnosis of hypothyroidism is a clinical diagnosis made by understanding the patient history, examining the patient, assessing basal temperature, measuring thyroid functioning, and treating the patient with thyroid USP supplement. Unfortunately, the Oregon Medical Board does not share such philosophies. The Oregon

board approves of thyroid diagnosis being made only based on abnormal TSH and free T4 testing.

In 1994 Gambee was disciplined by the Oregon Medical Board for "repeatedly demonstrating a willingness to move into uncharted waters in his practice without regard to the scientific merits of the proposed modality." Gambee's license was revoked but later reinstated. In 2004 Gambee's license to practice medicine was subjected to a modified stipulated order. The order required Gambee to "use thyroid function blood tests in conjunction with the history and physical in making the decision whether to use thyroid medication. (Gambee) is not to use thyroid medication unless the blood tests find a TSH level greater than the normal range and a free T4 below the normal range. While treating patients (Gambee) shall periodically retest the TSH level of his patients' blood no later than six weeks after initiating treatment and no less than annually thereafter. (Gambee) shall reduce the level of thyroid medication if the level of TSH falls below the normal range."

In January 2010, the Oregon Medical Board opened an investigation to determine whether Gambee violated the terms of the stipulated order. In May 2010, the board served Gambee with notification that he had violated the stipulated order by not following its terms for diagnosing hypothyroidism. In September 2010, the board issued an "emergency" order suspending Gambee's license based on his ongoing unprofessional conduct and gross negligence of diagnosing patients with hypothyroidism, exposing them to medical harm.

John Gambee is seeking to appeal the Oregon Medical Board decision. However, the board has not yet set a hearing date. Gambee is seeking relief by suing the medical board in federal court. In the interim, he is not able to practice medicine. Gambee's case deserves to be strongly supported. There is no evidence of gross negligence – just the artificial definition that hypothyroid diagnosis must be predicated strictly on laboratory measurements. No patients treated by Gambee for hypothyroidism suffered any harm. It is inappropriate for a medical board to

characterize the "alternative" treatment of hypothyroidism to be a matter of gross negligence. The endocrinology community has drawn a line in the sand, making hypothyroidism a black-and-white diagnosis when the diagnosis is not so clear-cut. The alternative community who advocates treating hypothyroidism even when blood tests are normal should stand up now and support Gambee.

Inquiries and support for John Gambee should be directed to him: 93224 Highway 99 S., Junction City, Oregon 97448; 541-998-0111; doctorgambee@gmail.com.

### Dr. Gaby's 'Take' on Hypothyroidism

In Dr. Alan R. Gaby's milestone nutritional textbook, aptly titled *Nutritional Medicine*, the arguments are spelled out for diagnosing hypothyroidism when a patient has "normal" blood tests. In an eight-page chapter, Gaby raises reasonable scientific mechanisms to explain a patient's thyroid symptoms with a normal TSH, normal T3, and normal T4 test. Gaby talks about genetic abnormalities in the two deiodinase enzymes that could potentially interfere with the body's ability to convert T4 to the active T3 thyroid hormone. Additionally, he explains that there are two beta receptors for thyroid hormone and that these receptors can be dysfunctioning by genetic or biochemical mechanisms. Gaby cites extensive literature to support these hypotheses.

If you are treating hypothyroid patients who have normal blood tests, you want to read this paper and have it available to support a patient's thyroid treatment. It's only available in the textbook – but you also will have a source with 300 other chapters on nutritional medicine, all heavily referenced for support of nutritional treatment. This textbook is a must for office reference and provides more support for using botanical and vitamin and mineral therapy than any other book previously printed.

To order *Nutritional Medicine*, go to [www.doctorgaby.com](http://www.doctorgaby.com); call 603-225-0134; or write 12 Spaulding St., Concord, New Hampshire 03301.

Jonathan Collin, MD