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## **Thyroid Function and Dysfunction**

By Ryan Drum, PhD, AHG

Thyroid dysfunction is epidemic in North America. One in ten adult American women have been diagnosed with thyroid disorders and some endocrinologists suggest that as many as 25% of adult American women are presenting with clinically detectable thyroid dysfunction. Health practitioners in Canada, Saudi Arabia, and Ireland report a similar apparent very startling increase in female thyroid disorders. Most veterinarians in small animal practice are seeing thyroid problems in cats and dogs balloon up to 40% of their respective practices.

What has happened? Are practitioners becoming more aware of the many facets of thyroid dysfunction presentations? Or, has something happened in the environment, which is responsible for the apparent great increase in clinical and subclinical thyroid dysfunction? In clinical practice I am somewhat incredulous at the recent rapid increase in patients (90% female) presenting with both diagnosed and probable thyroid dysfunction (1995-2001).

Just for a reality check, I went back to my old (1967) Robbins' Pathology to see if he had anything to say about frequency of thyroid presentations. He said,

*Diseases of the thyroid, while not common in clinical practice, are nonetheless of great importance because most are amenable to medical or surgical management.*

“Not common in clinical practice!” Either people, practitioners, or the environment have changed, singly or perhaps in concert. Robbin's hopeful prognosis for thyroid case management might bring bitter responses from the millions of women who have experienced surgical or radiation ablation removal of their thyroids only to have many or most of their presenting symptoms and others return with a vengeance. The patient help phone lines at the Thyroid Foundation of America are flooded with thousands of calls from women wondering, “how come I feel awful again?”

Too often their endocrinologists dismiss their valid complaints as imagination or psychological character flaws. These mostly female patients are being very poorly managed from my viewpoint. Currently, TFA endocrinologists are actively trying to improve this situation. Worldwide, thyroid dysfunction is a probable risk factor for 1 to 1.5 billion people (according to the WHO). This is usually considered as being due to simple iodine deficiency and presents as goiters (at least 200 million), complex mental retardation from

fetal and neonate iodine deficiency (iodine deficiency causes more mental retardation worldwide than all other causes combined) and physical deformities (at least 20 million). The two main thyroid gland hormones are T4 (65% iodine) and T3 (59% iodine); calcitonin does not contain iodine.

Recent surveys of food and diets now indicate that the American diet may be borderline deficient in iodine intake, down from 500-800 mg in 1980 to about 135 mg in 1995. The truth is difficult to ascertain about any of these numbers. The American thyroid dysfunction picture does not seem as straightforward as simple iodine deficiency; it is the thyroid gland itself, which seems to be failing.

The widely varying amounts of iodine in dairy products result from the use of copious amounts of iodine disinfectants used as teat dips in all commercial machine-milking dairy factories (hardly farms in the traditional sense). The iodine solutions drip into the milk instead of large quantities of topical microbes. Furthermore, most dairy factories wash their stainless steel equipment with strong iodine solutions for sterilization.

### **The Role Of Chlorine**

I mention all of this because I personally believe that situational iodine deficiency regularly occurs in modern Americans as a result of both dietary peculiarities and the chronic use of fluoridated, chlorinated, bromated water supplies, internally and externally. Fluorine, chlorine, and bromine are all more chemically reactive than iodine; when in the body, they all tend to disrupt stable iodine molecules, displacing the iodine and causing its excretion.

When experimental rats are fed high-bromine diets, the bromine enters their respective thyroid glands and replaces the iodine already there. The proportion of bromine in the thyroid glands of those rats is directly proportional to the amount of bromine in their diet. We get bromine from pesticides, dough conditioners, and from disinfectants for water in hot tubs and commercial spas. So, not only can we avoid eating iodized salt, we can also lose iodine from aggressive halides. Our bodies have no known mechanisms for dealing with relatively large amounts of fluorides, chlorine, bromine, since these substances are normally too reactive to be available in the so-called natural environment; our exposure is totally modern.

Gaseous chlorine is regularly released from shower and tub water freshly drawn from water supply taps. I recommend showering with the window open; I recommend bathing in tubs filled with the hottest water and allowed to out-gas while they cool to bearable

temperature. Reduce your exposure to iodine-robbing halides for optimal thyroid health. Aspirin and other related salicylates as well as anticoagulants like Warfarin (di-coumerol) increase iodine excretion and can induce mild hypothyroidism; always inquire of mild hypothyroid patients about aspirin and anticoagulant use.

## **Snack Foods**

Another peculiar phenomenon, biologically speaking, is “snack foods.” These are extended shelf life products that cater to the most basic food desires of the economically deprived: greasy, salty, fried carbohydrates with lots of spoilage retardants and mystery ingredients euphemistically called “spices and other flavorings.”

The world’s largest snack food supplier, Frito-Lay, a division of Pepsico, does not use iodized salt. Presumably neither do any of the other snack food manufacturers, in part to reduce actual product production costs, but also, with a wise eye to the risks involved in industrial mixing of potentially-deadly concentrations of potassium iodide in huge multi-ton batches of sodium chloride.

Dietary dosages of 3-5 grams of good powdered kelp should provide enough iodine and most of the essential trace elements. Any seaweed contains more available dietary iodine than any land plant. No land plants are a good reliable source of iodine. Only garlic grown near the sea has relatively high amounts of biological iodine.

The seaweeds with the most available iodine are the giant kelps of the northern hemisphere, with the highest concentrations of iodine occurring in the most northern kelps (8000 ppm in Icelandic kelp, 4000 ppm in Norwegian kelp, 1-2000 ppm in Maine and California kelp. The seaweeds with the least amounts of iodine are Nori, about 15 ppm, and Sargassum, about 30-40 ppm).

## **Radiation Releases**

There is one more terrible problem: the atomic age. Since 1945 every human has been repeatedly dusted with radioactive fallout from both acknowledged and unacknowledged nuclear explosions, nuclear power plant disasters, and most insidious of all, the regular, continual, intentional release of radioactive iodine-131 from all nuclear weapons facilities and all nuclear power plants with so-called normal operations.

In addition to this, the government-sponsored nuclear industry regularly released enormous quantities of radioactive iodine, cesium, and strontium into the atmosphere just to see what might happen. Eastman Kodak was forewarned so they would not lose photo

emulsion film to radioactive fogging. Families downwind of Hanford reservation in Washington were not warned. For nearly five years a 100,000-page report prepared by the National Institutes of Cancer, was suppressed until forced into the open by the efforts of some senators and congressmen, most notably Senator Tom Harkin of Iowa. The report shows total disregard for American citizens and military. Hundreds of thousands of delayed thyroid pathologies are the long-term heritage of this inexcusable outrage.

I believe that continual and regular exposure to incidental iodine-131 is the origin of most current thyroid disorders. The prescribed treatment would include cultural and political maturation.

It takes about 18 minutes for all the blood in the body to pass through the thyroid gland; it is the most thoroughly vascularized of all the endocrine glands. Most of our respective bodies are iodine conservative. We can absorb it in minutes when it is painted on our skin.

Iodine is easily absorbed from the intestines in efficiencies up to 98% in very low-iodine diets. The radioactive iodine we are all breathing and eating is released in bursts as a product of nuclear fission—usually within legally allowable amounts. These allowed amounts are calculated on a per day basis rather than as high-amount bursts or episodes. This helps perpetuate the myth that the allowable releases are no health hazard. The episodic rather than regular release of iodine-131 means we get big hits and then none at all, especially in milk and milk products.

The reason that iodine-131 is so dangerous is that it has a relatively short half-life of about 8 days. This means it has a radiogenic life of about 60 days, after that the amount remaining is probably biologically insignificant. Although this short half-life is touted as a great thing for patients—and incidental accumulators of iodine-131—the short half-life means that most iodine-131 taken into the body will decay in the body rather than being excreted.

Rather than occurring over a relatively long time, the short half-life means a lot of radioactive decay of iodine-131 within the thyroid gland, releasing unavoidably molecular-destructive gamma radiation into nearby cell molecules. There is no safe dosage of gamma radiation inside cells. Therapeutically, iodine-131 is fed to patients to fry their thyroids with gamma radiation, released by radioactive decay of iodine 131. Patient handouts claim that this is a totally safe procedure with no possible health hazards.

On the other side of the handout patients are severely warned to not nurse their babies for 5 weeks, not to

hold children and other loved ones close, to not share towels for a month or more. So much for totally safe!

Our bodies tend to be iodine aggressive in absorption and iodine conservative in excretion. If we are at all iodine deficient, we will readily take in radioactive iodine-131 and deposit it in our thyroid glands just as we do with non-radioactive iodine-127. If we have a full, ongoing whole-body complement of iodine-127, our bodies tend to not take up any iodine-131.

This means that eating seaweeds regularly in the diet, especially the big northern kelps, will provide both dietary iodine and protection against the ongoing iodine-131 hazards and the next unplanned nuclear disaster. The major health problems from the Chernobyl nuclear disaster on or about April 26, 1986 are all related to the huge and deliberately underreported releases of radioactive iodine-131 into the atmosphere and onto the soils, surface waters, plants, animals, and cities within 1000 miles of the Chernobyl site.

Within five years, large increases in thyroid disorders of all sorts began to occur, directly attributable to Chernobyl iodine-131 releases. The worst is still developing since we know that the cancer rates from short-term radiation exposure tend to peak 20-30 years after a particular release episode. The simplest protection against nuclear fallout is to simply dismantle all nuclear facilities immediately. Without that, we are all continually at risk for thyroid dysfunction.

Our next best protection against thyroid disruption is to body-load with iodine contained in iodine-rich whole raw seaweeds as regular daily consumption. If our bodies have an ongoing full complement of iodine-127, we can better resist taking in incidental iodine-131.

## Cancer

There are a few more pieces to the iodine part of the story: after the thyroid gland, the distal portions of the human mammary glands are the heaviest users/concentrators of iodine in tissue. Iodine is readily incorporated into the tissues surrounding the mammary nipples and is essential for the maintenance of healthy functioning breast tissue. I suspect that this is ignored in the attempts to understand the developmental dynamics of breast cancer; I believe that radioactive decay of iodine-131 in breast tissue is a significant factor in the initiation and progression of both breast cancer and some types of breast nodules.

Iodine also concentrates in the salivary glands and gonads. Salivary gland cancer, and testicular cancer (especially in men over 25, a relatively recent

phenomenon) and ovarian cancer are all increasing in actual numbers. I suspect that radioactive iodine-131 decay may be a significant contributing factor.

## Other Factors

The largest of the endocrine glands, the one-half to one ounce thyroid gland is almost twice as large in women on average, than in men. Its overt function seems to be to manufacture, store, and release under strict controls, thyroid hormones, mostly thyroxin (T4) and tri-iodothyronine (T3), in about a 4:1 ration. In very low iodine intake situations, that T4:T3 ratio is reversed to 1:4.

This view of the mechanistic thyroid is incomplete. To quote Robbins (Pathology, 1967) further

*From the physiologic standpoint, the thyroid gland is one of the most sensitive organs in the body. It responds to many stimuli and is in a constant state of adaptation... During puberty, pregnancy, and physiologic stress from any source, the thyroid gland increases in size and becomes more active functionally. Changes in size and activity may be observed during a normal menstrual cycle. This extreme functional changeability is manifest as transient hyperplasia of thyroidal epithelium (follicular cells) changing to tall, columnar. When stress abates, involution obtains and normal follicular cell shape (roughly spherical) and function resume.*

Instead of just a passive hormone factory, the thyroid gland overtly changes size, shape and function to reflect the changing reality of its particular person. When I see the same patients over several years, modest changes in their respective thyroid size and sometimes shape are often evident, and resolve with no overt intervention.

Impact trauma can apparently squeeze a burst of thyroid hormone out of the gland with a concomitant transient hyperthyroidism episode. This means a physical hit, or a compression squeeze from poorly placed shoulder belts in automobiles, where the vehicle has been hit or has hit something and a whiplash event has occurred. So, mechanical stress can also affect the thyroid gland.

Many endocrine changes occur in anorexia nervosa, including low levels of T4 and T3.

I further believe that the situational low thyroid presentations (hypothyroidism) which seem to be initiated by a known life trauma—particularly the loss of a loved one or similar grief-inducing events—are completely normal thyroid responses and a very desirable components of the grief response and should not be treated unless acute (life-threatening), or

persisting for more than one year. I believe that it is a failing of the cultural terrain that we do not honor and savor the natural grief response, with the personal consequence that many of us suffer from chronic secondary grief over the loss of therapeutic grieving and that this secondary grief is a major factor in the current plague of hypothyroidism.

## Mineral Deficiency

Other tissues in the body, particularly the liver, can greatly influence the accessibility of T4 to body cells; for T4 to be physiologically active, it must first be converted to T3. This conversion is accomplished primarily by 5-deiodinase in the liver. Of intriguing interest, this particular enzyme requires selenium as its cationic enzymatic cofactor. This means that chronic selenium deficiency can present as hypothyroidism due to reduced T4 to T3 conversion. The thyroid test for TSH and T4 will not reveal this and unnecessary thyroid medication may be prescribed.

In an associated consideration, mercury in the body tends to quell or cripple selenium in enzymes. This means that chronic or even possible acute mercury poisoning can present as hypothyroidism. We all have steadily increasing body burdens of mercury from both our foods and water. A test for selenium and mercury is always indicated in cases of obvious hypothyroid signs and symptoms with normal range TSH and T4.

## X-Ray Misuse

There is a sad note to the increasing clinical thyroid plague: between 2 and 8 million North Americans (the exact numbers will never be known due to poor record-keeping) were deliberately medically treated with X-rays to the head and chest, foolishly and often frivolously for a wide range of presenting conditions. These conditions included: scalp ringworm, asthma, chronic bronchitis, tonsillitis, acne, and neonate respiratory problems.

The thyroid glands of the respective patients received pathologically significant amounts of powerful ionizing radiation. These treatments (occurring between 1930 and 1980) have caused over 10,000 of cases of thyroid cancers—which develop 10-40 years after the medical exposures, with a peak incidence between 20-30 years after the episodes. These treatments are also responsible for as much as a million cases of other thyroid structural deformities, including nodular goiters (at least 27% of all children and adolescents irradiated).

Who was punished for this gross instance of medical malpractice? By the 1930's the connection between

cancer and radium exposure was known. The endocrinologists are relatively mum about responsibility for these poor trusting victims, more than the total number of victims wounded by the two atom bombs dropped on Japan in 1945.

If you have a person born before 1980 (most will be over 30 years old since the practice of sloppy upper body and head irradiation was largely discontinued by 1970—but persisted in some remote clinics and offices for up to another decade) who presents with nodular goiter or thyroid cancer, be sure and inquire about juvenile radiation exposure. Treatment prognosis is mixed with thyroidectomy usually recommended with subsequent lifelong obligatory thyroid replacement therapy.

## Seaweed

Seaweed seems to help relieve many of the presenting symptoms of thyroid dysfunction. Some of the results are very likely from whole body remineralization (especially potassium, zinc, calcium, magnesium, manganese, chromium, selenium, vanadium etc.) in addition to thyroid gland aid from both sustained regular reliable dietary sources of bio-molecular iodine and from thyroxin-like molecules present in marine algae (both the large edible seaweeds and their almost ubiquitous epiphytic microalgae, predominantly the silica-walled diatoms). Seaweeds provide ample supplies of most of the essential trace elements required for adequate enzyme functioning throughout the body but especially in the liver and endocrine glands.

Regular bio-molecular seaweed iodine consumption is more than just thyroid food: it can also protect the thyroid gland from potential resident iodine-131-induced molecular disruption and cell death when the thyroid gland is fully iodized with iodine-127.

## Folk Test

A simple folk test for iodine deficiency or at least aggressive iodine uptake, is to paint a 2 inch diameter round patch of USP Tincture of Iodine (strong or mild) on a soft skin area such as the inner upper arm, the inside of the elbow, the inner thigh, or the lateral abdomen between the lowest rib and the top of the hip.

If you are iodine deficient, the patch will disappear in less than two hours, sometimes as quickly as 20 minutes. If it fades in 2-4 hours, you may just be momentarily iodine needy. If it persists for more than 4 hours, you are probably iodine sufficient.

Iodine deficiency seems to predispose to thyroid malignancy; this could explain the apparent thyroid cancer “distribution fans” downwind of nuclear facilities in previous goiter belt areas. This test is, of

course, easier to use with Caucasians and may not offer sufficient color contrast in brown-skinned people.

## Common Symptoms

Many patients with under active thyroid glands complain of a sense of “coldness” or feeling cold all of the time; often they are over-dressed for warmth by thyronormal people’s standards. They may also present a low basal body resting temperature, as measured by taking their armpit temperature before rising in the morning. Other symptoms may include sluggishness, gradual weight gain, and mild depression.

## Steroids

All corticosteroids tend to depress thyroid function, including Prednisone and topical creams. These, as well as salicylates and anticoagulants can aggravate existing mild hypothyroidism.

## Fucus Spp

Fucus spp has been the thyroid folk remedy of choice for at least 5000 years. The best candidates are women who seek a less hazardous treatment than synthetic hormone (after reading variously that prolonged use of synthetic thyroid hormone increases risk for heart disease, osteoporosis, and adverse interactions with many prescribed drugs, particularly corticosteroids and antidepressants).

Women who were diagnosed with sluggish thyroid glands and who are or were on low or minimal maintenance replacement hormone dosages obtain the best results from the use of Fucus.

## Other Dietary Recommendations

I usually recommend reduction to little or no flour products in an effort to reduce erratic iodine intake and to reduce bromine intake as well as reduce the hyperglycemia that often accompanies the eating of flour products and simple sugars (also recommended to totally eliminate except in fresh fruit).

All non-organic meat and meat products are contraindicated since xenoestrogens can disrupt thyroid function just as intrinsic estrogens generated by the patient's body. I usually suggest elimination of all dairy products except unsalted organic butter to further reduce exposure to growth hormones and iodine and unwanted tetracycline residues. I usually recommend eating avocados, organic eggs, and sardines to provide quality fats to keep that bile flowing and wasted

thyroid hormones moving out of the liver.

All blood will contain some thyroid binding globulin-bound thyroid hormone. The consumption of red meat will always provide small but significant sources of extrinsic thyroid hormone and at the least, some dietary iodine. For meat-eating patients, I definitely suggest bloody organic meat and organic blood sausage from animals known to have no growth hormones or pesticide exposure.

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Ryan is available for consultations at (360) 739-4035 or [drum@earthcenter.com](mailto:drum@earthcenter.com) [www.partnereartheducationcenter.com/ryan.html](http://www.partnereartheducationcenter.com/ryan.html)

Online thyroid resources:  
[thyroidnews@onelist.com](mailto:thyroidnews@onelist.com)

## Thyroid Patient Support Organizations:

**American Foundation of Thyroid Patients**  
18534 N Lyford, Katy, TX 77449  
(281) 855-6608

**American Thyroid Association**  
[www.thyroid.org](http://www.thyroid.org)  
[admin@thyroid.org](mailto:admin@thyroid.org)  
(904) 353-7878

**National Graves' Disease Foundation**  
2 Tsitsi Ct, Brevard, NC 28712  
(704) 877-5251

**Thyroid Cancer Survivor's Association**  
POB 1545, NY, NY 10159-1545  
(877) 588-7904

**Thyroid Foundation of America**  
410 Stuart St, Boston, MA 02116-2698  
(800) 832-8321.

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