

Flaws in the Urine Iodine Loading Test Can Lead to High Dose Iodine Therapy and Disrupted Thyroid Function

I began the study of iodine because I believe it has benefits to human health. As a breast cancer researcher I believe that iodine protects the breasts and uterus against toxic and mutagenic estrogen metabolites that form in some people more than others. Thus, choosing the most reliable test to a) determine iodine status, and b) supplementation to maintain levels seen in populations with the lowest rates of breast cancer (i.e. the Japanese), is a key health consideration with or without breast cancer risk factors.

That leads us to the all-important discussion of iodine testing methods. Have you ever had your levels evaluated with a 24-hour iodine loading test and been found to be deficient? If so, you are not alone. This is a test where 98-99% of people who take it will be deemed “whole body iodine deficient.” On the basis of this test result, you may be advised to take iodine supplements at a dose that makes some people ill and raises iodine to hundreds of times the levels recommended by health organizations around the world. In the most serious cases, the dosing recommended to get you to “whole body iodine sufficiency” may cause your thyroid to stop working normally, producing either too much (hyperthyroid) or too little (hypothyroid) thyroid hormone.

Considering that this test is aimed at improving health, how could it potentially result in health problems? It started with a false premise based on a miscalculation of how much iodine the Japanese consume on a daily basis, which was thought to average 13.8 mg/day¹, mostly in the form of seaweeds known to be high in iodine. However, a more thorough analysis of the literature finds that the Japanese daily consumption is in fact much lower than this, ranging between 1 and 3 mg/day². Based on this miscalculation, a product (Iodoral) was created that delivered in one small tablet 12.5 mg of iodine/iodide, which is more than 10 times the iodine consumed by most of the Japanese population, and a hundred

Available Tests

Iodine Panel

Tests: Iodine (dried urine)

Allows a physician to see if an individual has too little, or too much, of the essential nutrient iodine. Consider for patients with thyroid issues.



Iodine Testing

Non-invasive home test kits



times higher than the amount needed to keep the thyroid functioning properly (150 mcg/day) as recommended by the WHO, FDA, UNICEF, ICCIDD, THYCA, and the American Medical Association.

A second error was made in assuming that 90% of a 50 mg dose of iodine taken as a bolus can be cleared from the body within 24 hours. It's true that 90% of dietary iodine is eventually cleared from the body via the urine. But according to the loading dose theory, if your body doesn't clear at least 45 of the 50 mg dose of iodine within 24 hours, you're flagged as having whole body iodine insufficiency and needing iodine supplements.

That brings us to the second all-important part of the discussion: whether the results of the iodine loading test lead to high dose therapy. While I don't have much problem with people taking higher amounts of nutritional supplements that don't seem to cause adverse side effects (e.g. vitamin C and many of the B vitamins) and are apparently beneficial based on the medical literature, I began to have a problem with high-dose iodine supplements for several reasons. First, the literature is replete with scientific articles showing that iodine consumption over about 1 mg can be toxic in some individuals and cause the thyroid to go "off" and produce too little (hypothyroidism) or too much (hyperthyroidism) thyroid hormone. Second, the literature supporting the loading dose theory, which assumes a Japanese dietary iodine intake far in excess of that presented in the bulk of the scientific literature, was published in an obscure online journal¹.

Third, I noticed that two popular websites that promote the loading dose test and high dose iodine, namely the Yahoo Iodine Group and the Curezone Iodine Supplementation Forum, kept getting complaints from consumers using the high dose iodine who were feeling ill. Some even mentioned

they were developing goiters. They were advised on these sites to take more iodine because they are purging bromine. Unfortunately, these individuals just kept getting sicker and sicker the more iodine they were told to take. We researched the literature on bromine toxicity and studied individuals who were actually given massive amounts of bromine, without side effects. So the bromine detox theory just doesn't hold water. Besides, seaweed, which the Japanese consume, contains about 10 times more bromine than iodine, and bromine has more recently been shown to be an essential element.

To investigate how much bromine is actually being spilled into urine following a loading dose of iodine, we sent matched urine samples containing high levels of iodine (exactly 50 mg of Iodoral dissolved in a urine sample with very low iodine levels) to a lab using the Ion Electrode method and to a second lab using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). We asked them to measure iodine and bromine. Both labs gave similar and accurate iodine levels, but only the lab using the Ion Electrode method came back with high bromine. ICP-MS is the gold standard for testing elements like iodine and bromine, so its results trump those of an Ion Electrode method. As a lab scientist, I know quite well what this means as I see the same thing in immunoassays when a particular hormone is quite excessive and cross-reacts with other antibodies meant to measure a completely different hormone. Bottom line is that the Ion Electrode method was likely measuring iodine instead of bromine - it's an artifact or false bromine signal caused by the very high levels of iodine in the urine. Our laboratory performs elemental analyses using an ICP-MS, and we can confirm that iodine at high dose is not pushing out bromine. However, if the same samples are tested for bromine by the Ion Electrode method the bromine levels would be falsely

elevated. It's very unfortunate for those individuals who are being told to take more iodine, after a high dose of iodine has already made them sick.

ZRT has been instrumental in developing a simple dried urine method to monitor the iodine status of individuals. Our methodology, published in a peer reviewed journal³, allowed us to investigate the flaws behind the loading dose theory. In three papers authored recently by ZRT's Theodore Zava and colleagues, the myths of Japanese iodine consumption and utility of the loading dose test have been shattered and brought to light^{2,4,5}.

We aren't saying that a higher consumption of iodine is going to make everyone have thyroid problems. What we are saying is that you are highly likely to be diagnosed with an iodine deficiency if you do the iodine loading test. And if you take the doses recommended by those who advocate the loading test, beware that the excessive amounts of iodine could make you sick, and it's not necessarily because you're pushing bromine out of your body; it could also be related to iodine toxicity and effects on the thyroid.

So given the recognized health and breast protective benefits of iodine, how much is enough? The majority of Japanese consume about 1-3 mg of iodine in foods derived from seaweeds. The breast cells are protected by iodine, not iodide, the latter of which is the form taken up by the thyroid.

A quarter tab of Iodoral, or about a small drop of Lugol's contains about 3 mg of iodine and 3 mg of iodide, which should be an adequate supply of each to protect the thyroid, as well as the reproductive tissues. If you're borderline thyroid deficient, meaning you have been diagnosed with subclinical hypothyroidism (normal free T4, normal free T3, high TSH), and suffering from thyroid deficiency symptoms (e.g. cold intolerance, low stamina mostly in the evenings, depression, dry hair, dry skin, and brittle finger nails), be cautious with iodine supplements > 1-3 mg, as it can make your symptoms worse and cause total T4 to drop and TSH to shoot up to much higher levels. The American Medical Association set the upper tolerable limits for iodine consumption at 1.1 mg, and the Japanese Ministry of Health set it at 3 mg.

If you feel bad after taking iodine, it may be wreaking havoc on your thyroid. You can find out with a couple of simple tests developed at ZRT Laboratory. ZRT developed the dried urine/dried blood spot test to determine if the iodine you are taking is making you hypothyroid and a candidate for thyroid therapy.

Advantages of Dried Urine for Iodine Testing

- Urine collection and shipment of the dried filter strips are simple and convenient for the patient and practitioner.
- Dual collections of urine directly on a filter strip, upon awakening and just before bed, are far more convenient and less subject to the inherent inaccuracies of a 24 hr urine collection.
- Iodine and creatinine in dried urine are exceptionally stable for weeks at room temperature allowing more flexibility in collection, shipment, testing, and storage.
- Iodine results expressed in μg iodine per g creatinine helps to normalize results when problems exist with urine that is very concentrated or dilute.
- Iodine testing allows for determination of iodine status based on CDC and WHO guidelines for thyroid sufficiency, as well as extra-thyroidal sufficiency.

David Zava, Ph.D



Biochemist and breast cancer researcher David Zava, PhD founded ZRT in 1998. His extensive background in laboratory research and his commitment to promoting wellness through preventative health care led him to form a company focused on providing easy and accurate testing methods for patients and health care providers.

His desire to innovate the science of hormone testing provides the guiding force behind the development of all ZRT's technology.

His insistence that patients have access to information to help them achieve wellness motivates his quest for research-based hormone testing solutions.

He is the author of numerous published and peer-reviewed articles, and is the co-author of the book *What Your Doctor May Not Tell You About Breast Cancer: How Hormone Balance Can Help Save Your Life*.

ZRT Laboratory

ZRT Laboratory developed the methodology that made saliva hormone testing commercially viable for healthcare providers and patients around the globe.

We also developed the science for accurately measuring steroid hormones in dried blood spot, and are currently the only laboratory offering this technology commercially. And we didn't stop there. Hormone testing in dried urine is yet another scientific advancement for the industry that was pioneered by ZRT.

Today we are one of few laboratories capable of testing across three methodologies, which means that ZRT tests in the most appropriate medium, not just the most convenient.

Learn more at: www.zrtlab.com

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