

Maintenance Supplementation: Iodine

Hey, everyone. In this presentation, we're going to talk about supplementing with iodine.

Iodine is required to make thyroid hormones, both T4 and T3. The thyroid gland of a healthy adult contains about 70 to 80 percent of the total amount of iodine found in the body at any given time. Iodine deficiency is recognized as one of the common preventable causes of brain damage, and deficiency can cause mental retardation, goiter, and other growth and developmental issues and possibly increase the risk of cancer.

The RDA for adults is 150 mcg per day, or 220 mcg per day for pregnant women and 290 mcg per day for breastfeeding women. During pregnancy and breastfeeding, infants are relying on the mother's store of iodine, so it's especially important to make sure mom is getting enough iodine during this time.

The World Health Organization estimates that over 30 percent of the global population is deficient in iodine. However, this is less likely in countries with iodized salt, though it is more common than you would think in developed countries, especially in populations such as the Paleo community that have moved away from using iodized salt or any of the health food diets, or so-called health food diets, that favor sea salt over iodized salt. Sea salt does have a lot of benefits, but one of the shortcomings or downsides is it doesn't contain much iodine, so if people aren't getting iodine elsewhere in their diet, and they switch from iodized salt to sea salt, that is one of the potential downsides.

Typically, one of the first signs that you will see of iodine deficiency is goiter, which is an enlargement of the thyroid gland. Iodine deficiency can also cause hypothyroidism, though you shouldn't rely on TSH or any other thyroid marker as the sole indicator of iodine sufficiency or deficiency.

In an effort to combat iodine deficiency, many countries in the developing world, including the U.S., started iodizing salt, and, as I just mentioned, a move toward sea salt, which has a lot of other benefits, has been problematic in some ways because it doesn't contain as much iodine as iodized salt. So if your patient is not consuming sea vegetables, fish heads, cod, or other common sources of iodine, and he is not using iodized salt, he very well may be deficient.

Food	Iodine (mcg/serving)	Iodine (percent DV)
Kelp, 1gr	1,542	1,028%
Kombu, 1gr	1,350	900%
Hijiki, 1gr	629	419%
Arame, 1gr	586	391%
Cod, baked, 3oz	99	66%
Dulse, 1gr	72	48%
Iodized salt, 1/4 tbsp	71	47%
Wakame, 1gr	42	28%
Shrimp, 3oz	35	23%
Egg, 1 large	24	16%
Tuna, canned in oil, 3oz	17	11%
Nori, 1gr	16	11%
Prunes, dried, 5 units	13	9%
Banana, 1 medium	3	2%

Here are the most iodine-rich foods in the diet, and if you look, at the very top of the list is kelp. Then we have kombu, hijiki, and arame. So the top four sources by iodine content are sea vegetables, and sea vegetables are not commonly consumed in the U.S. any more, with the possible exception of nori in sushi. Nori, as you can see, is a decent source, but it's pretty far down on the list compared to the other sea vegetables such as kelp, kombu, hijiki, and arame. Cod is the highest non-sea vegetable source in terms of iodine. It's even higher than a quarter of a tablespoon of iodized salt. Then we have shrimp, egg, tuna, prunes, and banana.

Commercial dairy products and some bread products also have been iodized. Iodine has been added to them, but many of your patients won't be consuming those foods. There is some evidence that just pasture-raised dairy products and dairy products that have not had iodine added to them have some iodine as well, but it's unclear how significant that is as a source.

One note about seaweed's iodine content. The iodine content will vary for each type of seaweed, and the way that it is cooked causes seaweed to lose iodine. So, for example, if you boil kombu, it loses 99 percent of its iodine. That is one thing to consider. On the other hand, the iodine content of seaweed is often so high that it still translates into a pretty hefty dose of iodine, as you can see.



A lot of your patients will not have any idea how to incorporate seaweed into their diet, so here are some ideas. One is to use kelp flakes in place of salt. Kelp, as you saw on that last slide, is one of the highest sources of iodine, and you're not cooking with the kelp flakes. You're just putting them on food. You can put them on eggs, soup, or any other food that you'd put salt on top of, and just a quarter-teaspoon a day would more than satisfy the daily need for iodine. So that, I think, is by far the easiest way to do it.

You can use kombu to flavor soups or stews. You can add one four- to six-inch piece, which is about six grams, to a soup about 15 minutes before it is finished, so even if it gets cooked, because you're using 6 grams and because it is such a high source of iodine, there is still going to be a lot in there.

You can eat seaweed as a snack or a side dish, so arame, hijiki, or wakame can be rehydrated and eaten as a snack or made as a side dish such as a seaweed salad in Japanese cuisine. Hijiki with carrots and nishime are popular dishes that feature seaweed in Japanese cooking.

You can also eat some of the nori snacks, the toasted nori. SeaSnax sells some popular nori snacks, but note that nori is the lowest in iodine among the seaweeds, so it's not going to be as strong of an iodine source as some of the other seaweeds that we've discussed.

Maintenance dose:
800mcg-1mg/day

As a maintenance dose for iodine, I recommend somewhere between 800 mcg to 1 mg a day.

Upper limit
1,100 mcg/day

The upper limit for iodine is set at 1,100 mcg, or 1.1 mg, per day for adults. However, this does not apply to those being treated with iodine under medical supervision.

While you want to ensure that all patients are getting enough iodine, there are two groups of patients that getting the right amount of iodine for is crucial, and the first is patients with hypothyroidism. There can be two main causes of this: autoimmune and iodine deficiency. You can test iodine levels with a 24-hour urine test or a spot urine and serum test, and if you see low levels, you can supplement. Some doctors treat people with thyroid issues with very high doses of iodine, up to 50 mg per day. There is little peer-reviewed evidence, or none as far as I can tell, to support that approach, and I definitely have some concerns about using iodine doses that are that high.

What about patients with Hashimoto's or other autoimmune forms of hypothyroidism or hyperthyroidism? You can test them as well. You may have heard that iodine can be problematic for people with Hashimoto's, and there is some research to support that. However, this is less likely if the patient is getting adequate amounts of selenium. So because of this, if you have a patient with Hashimoto's, you could start with a very low dose, especially if she is deficient and not getting enough in her diet, and then you can make sure she is getting adequate amounts of selenium in her diet, and then gradually build up her iodine dose and monitor her for reactions. If she doesn't have any reactions, either in terms of her symptoms or her antibody production, then getting an adequate amount of iodine into her system is going to be beneficial.

The next population is pregnant and breastfeeding women. As I mentioned previously, the RDA is 220 mcg a day for pregnant women and 290 mcg a day for breastfeeding women. We really need to educate our patients on the importance of iodine sufficiency during these times because iodine deficiency can cause hypothyroidism in the baby and in the mom, and maternal hypothyroidism has been associated with increased risk for preeclampsia, miscarriage, stillbirth, preterm birth, and low birth weight in the baby. Additional iodine is needed during pregnancy to increase thyroid hormone production and transfer to the fetus before the fetal thyroid gland is developed, to increase urinary excretion, and to increase iodine transfer to the infant during breastfeeding.

As far as drug interactions, you should be wary of high doses of iodine when your patient is on Coumadin, as it may decrease the anticoagulant properties of that drug. Otherwise, iodine has relatively few interactions with medications.

Okay, thanks for watching. In the next presentation, we'll talk about nutrients that you need to be cautious about supplementing with.