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Iodine for Radioactive Fallout

by [Donald W. Miller, Jr., MD](#)

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Fallout from a nuclear bomb explosion or a nuclear power plant meltdown is full of radioactive iodine-131 (I-131). Nuclear fission splits the nuclei of uranium-235 and plutonium-239, producing I-131. The stable, natural isotope of iodine is iodine-127. Iodine is the largest and heaviest element of the 25 elements that make up the human body.

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Iodine plays a number of important roles in the body. The thyroid gland uses it to make thyroxine, with 4 iodine atoms, and triiodothyronine (T3), with three. The active form, T3, regulates metabolism, thermogenesis, and protein synthesis. Other tissues and glands require iodine to function normally, including stomach mucosa, mammary glands, ovaries, salivary glands, prostate, and the thymus gland. Iodine functions as an antioxidant, strengthens the immune system, and suppresses autoimmunity. And it triggers apoptosis, destroying cells that become cancerous and cells infected with viruses. Iodine also removes toxic chemicals from the body – fluoride, bromide, lead, aluminum, and mercury. Iodine is essential for health. (For more on iodine's health benefits see [HERE](#).)

Radioactive I-131 emits Beta electrons and gamma rays, which destroy cells and cause cancer. People living downwind from a nuclear bomb explosion or power plant meltdown can inhale or ingest radioactive fallout, or have it come in contact with skin. The I-131 in fallout "dust" can damage the thyroid gland and cause it to become cancerous. Other tissues and glands in the body that concentrate iodine are also at risk, notably women's breasts. The most common sequel from exposure to radioactive fallout is thyroid cancer.

Taken in a sufficient amount, natural iodine can block uptake of radioactive I-131 in fallout and prevent thyroid cancer. The U.S. government's Department of Health and Human Services has approved potassium iodide (KI), in a dose of 130 milligrams (mg), as a thyroid blocking agent in radiation emergencies. This dose contains 100 mg of iodine, as iodide, in its salt form. But it doesn't have to be KI. Lugol's solution, Iodoral, SSKI (super saturated potassium iodide), and Nascent iodine work just as well.

Lugol's solution and Iodoral tablets are one-third elemental iodine (I_2) and two-thirds potassium iodide. One drop of full-strength, 5% Lugol's solution has 6.3 mg of iodine. But now, by FDA edict, Lugol's solution sold in quantities greater than 1 oz. can be no more than a 2% strength, where one drop has 2.5 mg of iodine. For a 100 mg-dose of iodine, one has to take 15 drops of the 5% solution or 40 drops of the 2% solution. Iodoral tablets are also one-third elemental iodine (I_2) and two-thirds potassium iodide. There is 12.5 mg of iodine in each tablet, so 8 of them constitute a 100 mg dose. Iodoral containing 50 mg of iodine per tablet is now available (see [HERE](#)). Lugol's/Iodoral is better than KI for blocking uptake of I-131 because the mammary glands in the breast like elemental iodine best and thus can better protect the breast against the harmful effects of radioactive iodine than can potassium iodide, which does not have any elemental iodine.

SSKI also works. Depending on the saturation (which varies), 3 to 5 drops of SSKI contain 100 mg of iodine. With Nascent iodine, 10 drops have 4 mg of iodine so one would have to measure out 250 drops to get 100 mg of iodine.

In order to be effective in blocking I-131 uptake, the 100 mg dose of iodine needs to be taken in a window of 24 hours before and 2 hours after exposure to fallout (*Health Physics* 2000;78:660–667).



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Consuming an average of 240 micrograms (mcg) of iodine a day, most Americans have an insufficient amount of iodine stored in their bodies. The conventional view is that the body contains 25–50 mg of iodine, and 70–80 percent of that amount resides in the thyroid gland. But as doctors in "The Iodine Project" have shown (see [HERE](#)), whole body sufficiency of iodine is 30 times greater than that – 1,500 mg – with only 3 percent of that amount residing in the thyroid gland. A person needs to take 50 mg of iodine a day for 3 months, or 12.5 mg a day for 1 year, and continue that dose, in order to achieve whole body sufficiency of iodine. Once achieved, people who take 12.5 mg or

more of iodine a day are already well protected against radioactive iodine in fallout. The thyroid glands in such people will retain less than 2 percent of absorbed I-131, similar to that after consuming a 130 mg KI tablet (in the appropriate time window).

Fortunately, this is the case with the Japanese. People in Japan eat a lot of seaweed, which protects them against the deleterious effects of I-131 in radioactive fallout from the meltdown of their Fukushima Daiichi nuclear plants. Compared to terrestrial plants, which contain only trace amounts of iodine (0.001 mg/gm), the seaweed that the Japanese consume – brown algal (kelp), red algae (nori sheets, with sushi), and green algae (chlorella) – have a high concentration of this nutrient (0.5–8.0 mg/gm). According to public health officials there, people in Japan consume 14.5 gm of seaweed a day. They don't need to take potassium iodide tablets for fallout. They consume enough iodine in the seaweed they eat.



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There are news reports that radiation fear has sparked panic buying of iodized salt in China. The iodine content in one teaspoon of iodized salt is 400 mcg. To get 100 mg of iodine this way would require eating 250 tsp of salt. But then, the much higher concentrations of chloride in salt (NaCl) inhibits absorption of its sister halogen iodine, such that the intestines will absorb only 10 percent of the iodine present in iodized table salt, so one would actually need to eat 2,500 tsp of iodized salt to get 100 mg of iodine.

With fears growing that fallout from the Fukushima Daiichi nuclear plants might hit the U.S. West Coast the price of iodine supplements has skyrocketed. A \$6 box of potassium iodide tablets at some outlets is now being sold for several hundred dollars a box. On Amazon.com, Iodoral tablets normally priced at less than \$20 are now going, as I write this, for

\$89.99 (with "only 5 left in stock").



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When the crisis has passed and the prices of iodine supplements come down, I recommend that if you don't like to eat seaweed start taking two drops of (5%) Lugol's solution – 5 drops of a 2% solution – or one Iodoral tablet a day. The health benefits people experience with milligram doses of iodine, at 100 times the government's RDA for iodine (150 mcg a day) is having increased energy, a sense of well-being, and lifting of brain fog. They feel warmer in cold climates, need 30 minutes to an hour less sleep, have regular bowel movements, improved skin complexion, a strengthened immune system, and a reduced risk of cancer.

When exposed to radioactive fallout, in addition to iodine, one also should have a radiation detector, like the [nukalert](#) which monitors and measures the intensity of the radiation and the time to 100 rad exposure (= 100 rem = 1 Sievert = 1 Grey).

Notes

Scientists have made 37 isotopes of iodine. Most of them disappear in seconds or minutes. Three of them, I-123, 124, and 125, with half-lives varying from 13 hours to 60 days, are made in a cyclotron. Physicians use them for diagnostic purposes. I-125 is also used in brachytherapy for prostate cancer, where urologists inject seeds containing this radioactive isotope to kill the cancer. I-131 is the only iodine isotope that is made by nuclear fission. Doctors use I-131 to treat hyperthyroidism and to burn out existing thyroid cancers and for Hodgkin's lymphoma. It has a half-life of 8 days.

Chernobyl (April 26, 1986), until now, has been the only accident in the history of commercial nuclear power where radiation-related fatalities have occurred. The steam explosion and fire in this reactor, uncontained

It is most unlikely that radioactive fallout of any significance from the Fukushima reactors' meltdown in Japan will reach the U.S. West Coast. Save your money. If the worst should happen and you don't have an oral source of iodine, buy some 2 percent tincture of iodine or betadine and put it on your skin (don't drink it!). It works almost as well. Painting iodine on the abdomen in a 4 x 8 inch patch blocks thyroidal radioiodine uptake by 95 to 99 percent, almost the same as KI.

When the crisis has passed and the prices of iodine supplements come down, I



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and lacking an emergency core-cooling system, released 5 percent of the reactor's radioactive core into the atmosphere. Some 134 employees developed acute radiation sickness and 28 died from it. No increase in cancer incidence or mortality has been observed attributable to the ionizing radiation it released. Thyroid cancer is another matter. The explosion spread significant amounts of I-131, raising the incidence of thyroid cancer in children in the Ukraine from 0.7 per million to 4 per million. Dr. Arthur Robinson reckons that only 70 extra cases of thyroid cancer have arisen in children living near Chernobyl as a result of the accident, and these cancers could have been prevented had the Ukrainian authorities provided these children with iodine.

At Three Mile Island (March 28, 1979), a partial core meltdown was largely contained within the reactor building. No deaths resulted from the accident, and the amount of radiation released into the environment was the equivalent of a single chest X-ray for people living within ten miles of the reactor.

Untoward effects of Iodine. Allergies, swelling of the salivary glands and thyroid, and iodism (an unpleasant brassy taste, runny nose, and acne-like skin lesions) occur rarely, in less than 1 percent. Iodism is caused by the bromide that iodine extracts from the tissues, and it subsides on a lesser dose of iodine. Thyroid function remains unchanged on doses up to 100 mg a day in 99 percent of people.

March 19, 2011

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