

Potential Public Health Effects Relating to a Nuclear Event

Office of the Chief Medical Officer of Health

Public Information

Potassium Iodide (KI) Pills

This fact sheet provides some basic information about KI, and some things to consider before you or a family member takes KI.

What is Potassium Iodide (KI)?

Potassium iodide (also called KI) is a salt of stable (not radioactive) iodine. Stable iodine is an important chemical needed by the body to make thyroid hormones. Most of the stable iodine in our bodies comes from the food we eat. KI is stable iodine in a medicine form.

What does KI do?

Iodine in the body becomes concentrated in the thyroid gland. KI pills reduce how much radioactive iodine is taken into the thyroid gland and helps to protect this gland from injury.

What KI cannot do

KI cannot prevent radioactive iodine from entering the body. KI can protect only the thyroid from radioactive iodine, not other parts of the body. KI cannot reverse the health effects caused by radioactive iodine once damage to the thyroid has occurred. KI cannot protect the body from radioactive elements other than iodine.

How does KI work?

The thyroid gland cannot tell the difference between stable and radioactive iodine and will absorb both. KI works by blocking radioactive iodine from entering the thyroid. When a person takes KI, the stable iodine in the medicine gets absorbed by the thyroid. Because KI contains so much stable iodine, the thyroid gland becomes “full” and cannot absorb any more iodine—either stable or radioactive—for the next 24 hours.

Iodized table salt also contains iodine; iodized table salt contains enough iodine to keep most people healthy under normal conditions. However, table salt does not contain enough iodine to block radioactive iodine from getting into your thyroid gland. You *should not use table salt as a substitute* for KI.

How well does KI work?

KI may not provide 100% protection against radioactive iodine. The effectiveness of KI depends on:

- how much time passes between contamination with radioactive iodine and the taking of KI (the sooner a person takes KI, the better. KI should be taken before contamination if at all possible, but it can be taken too soon, so wait for an advisory to do so),
- how fast KI is absorbed into the blood, and
- the total amount of radioactive iodine to which a person is exposed.

Who should take KI?

The thyroid glands of a fetus and of an infant are most at risk of injury from radioactive iodine. Young children and people with low stores of iodine in their thyroid are also at risk of thyroid injury.

Infants (including breast-fed infants): Infants need to be given the recommended dosage of KI for babies (see How much KI should I take?). The amount of KI that gets into breast milk is not enough to protect breast-fed infants from exposure to radioactive iodine. The proper dose of KI given to a nursing infant will help protect it from radioactive iodine that it breathes in or drinks in breast milk.

Children: All children internally contaminated with (or likely to be internally contaminated with) radioactive iodine should take KI unless they have known allergies to iodine. Children from newborn to 18 years of age are the most sensitive to the potentially harmful effects of radioactive iodine.

Young Adults: Young adults (between the ages of 18 and 40 years) internally contaminated with (or likely to be internally contaminated with) radioactive iodine should take the recommended dose of KI. Young adults are less sensitive to the effects of radioactive iodine than are children.

Pregnant Women: Because all forms of iodine cross the placenta, pregnant women should take KI to protect the growing fetus. However, pregnant women should take only one dose of KI following internal contamination with (or likely internal contamination with) radioactive iodine.

Breastfeeding Women: Women who are breastfeeding should take only one dose of KI if they have been internally contaminated with (or are likely to be internally contaminated with) radioactive iodine. Because radioactive iodine quickly gets into breast milk, women internally contaminated with (or are likely to be internally contaminated with) radioactive iodine should stop breastfeeding and feed their child baby formula or other food if it is available. If breast milk is the only food available for an infant, nursing should continue.

Adults: Adults older than 40 years should **not** take KI unless public health or emergency management officials say that contamination with a very large dose of radioactive iodine is expected. Adults older than 40 years have the lowest chance of developing thyroid cancer or thyroid injury after contamination with radioactive iodine. They also have a greater chance of having allergic reactions to KI.

When should I take KI?

After a radiologic or nuclear event, local public health or emergency management officials will tell the public if KI or other protective actions are needed. For example, public health officials may advise you to remain in your home, school, or place of work (this is known as “shelter-in-place”) or to evacuate. You may also be told not to eat some foods and not to drink some beverages until a safe supply can be brought in from outside the affected area. Following the instructions given to you by these authorities can lower the amount of radioactive iodine that enters your body and lower the risk of serious injury to your thyroid gland.

How much KI should I take?

There are two different forms of KI—tablets and liquid—that people can take by mouth after a nuclear radiation emergency. Tablets come in two strengths, 130 milligram (mg) and 65 mg. The tablets are scored so they may be cut into smaller pieces for lower doses. Each milliliter (mL) of the oral liquid solution contains 65 mg of KI.

The following doses are appropriate to take after internal contamination with (or likely internal contamination with) radioactive iodine:

- Adults should take 130 mg (one 130 mg tablet OR two 65 mg tablets OR two mL of solution).
- Women who are breastfeeding should take the adult dose of 130 mg.
- Children between 3 and 18 years of age should take 65 mg (one 65 mg tablet OR 1 mL of solution). Children who are adult size (greater than or equal to 150 pounds) should take the full adult dose, regardless of their age.

- Infants and children between 1 month and 3 years of age should take 32 mg (½ of a 65 mg tablet OR ½ mL of solution). This dose is for both nursing and non-nursing infants and children.
- Newborns from birth to 1 month of age should be given 16 mg (¼ of a 65 mg tablet or ¼ mL of solution). This dose is for both nursing and non-nursing newborn infants.

How often should I take KI?

A single dose of KI protects the thyroid gland for 24 hours. A one-time dose at the levels recommended in this fact sheet is usually all that is needed to protect the thyroid gland. In some cases, radioactive iodine might be in the environment for more than 24 hours. If that happens, local emergency management or public health officials may tell you to take one dose of KI every 24 hours for a few days. You should do this only on the advice of emergency management officials, public health officials, or your doctor. Avoid repeat dosing with KI for pregnant and breastfeeding women and newborn infants. Those individuals may need to be evacuated until levels of radioactive iodine in the environment fall.

Taking a higher dose of KI, or taking KI more often than recommended, does not offer more protection, and can cause severe illness or death.

Medical conditions that may make it harmful to take KI

Taking KI may be harmful for some people because of the high levels of iodine in this medicine. You should not take KI if

- You know you are allergic to iodine (If you are unsure about this, consult your doctor. A seafood or shellfish allergy does not necessarily mean that you are allergic to iodine.) or
- You have certain skin disorders (such as dermatitis herpetiformis or urticaria vasculitis).

People with thyroid disease (for example, multinodular goiter, Graves' disease, or autoimmune thyroiditis) may be treated with KI. This should happen under careful supervision of a doctor, especially if dosing lasts for more than a few days.

In all cases, talk to your doctor if you are not sure whether to take KI.

What are the possible risks and side effects of KI?

When public health or emergency management officials tell the public to take KI following a radiologic or nuclear event, the benefits of taking this drug outweigh the risks. This is true for all age groups. Some general side effects caused by KI may include intestinal upset, allergic reactions (possibly severe), rashes, and inflammation of the salivary glands.

When taken as recommended, KI causes only rare adverse health effects that specifically involve the thyroid gland. **In general, you are more likely to have an adverse health effect involving the thyroid gland if you:**

- take a higher than recommended dose of KI,
- take the drug for several days, or
- have pre-existing thyroid disease.

Newborn infants (less than 1 month old) who receive more than one dose of KI are at particular risk for developing a condition known as hypothyroidism (thyroid hormone levels that are too low). If not treated, hypothyroidism can cause brain damage. Infants who receive KI should have their thyroid hormone levels checked and monitored by a doctor. Avoid repeat dosing of KI to newborns.

Where can I get potassium iodide?

Potassium iodide was distributed to every residence and business out to 20 kilometres from the Point Lepreau Nuclear Generating Station (PLNGS) in the summer of 2021.

Individuals within the 57 km Ingestion Planning Zone (IPZ) who are interested in obtaining potassium iodide can contact NBEMO at 1-800-561-4034.

Potassium iodide is also stockpiled in numerous locations in southern New Brunswick to be distributed in the unlikely event of a radiation emergency.

In the event of an emergency at the Point Lepreau Nuclear Generating Station (PLNGS), potassium iodide will also be made available to the public at Reception and Decontamination Centres.