

Radiation Emergencies



## Radiation Emergencies

[Radiation Emergencies Home](#)

# Potassium Iodide (KI)

### What You Need to Know

- In a radiation emergency, some people may be told to take potassium iodide (KI) to protect their thyroid.
- **Do not take KI unless instructed** by public health or emergency response officials or a healthcare provider.
- There are **limits** to who should use KI and how much it can help. It only protects the thyroid from radioactive iodine (I-131) and does not protect other parts of the body from other types of radiation.
- KI is recommended only for people under 40 and pregnant or breastfeeding people. [Doses recommended by the U.S. FDA depend on age.](#)
- KI can have **harmful health effects**, especially if not needed or not taken correctly. If you are instructed to take KI, only use KI products that are approved by the U.S. FDA.

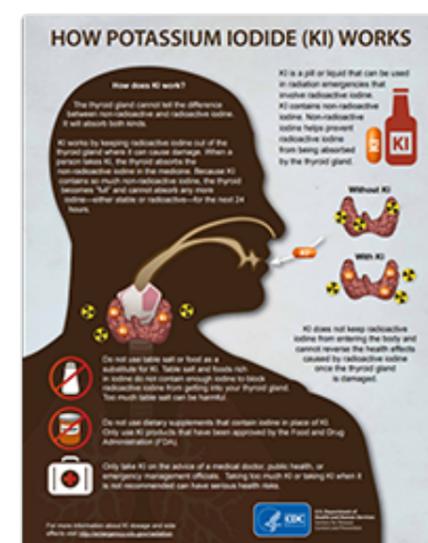
Potassium iodide (KI) is a type of iodine that is not radioactive and can be used to help block one type of radioactive material, [radioactive iodine \(I-131\)](#), from being absorbed by the thyroid.

Potassium Iodide (KI) and Radiation Emergencies | [\[Spanish\]](#)

In some radiation emergencies, usually nuclear power plant accidents, radioactive iodine may be released into the environment and enter the body through breathing or eating it. This is known as internal contamination. When the thyroid absorbs high levels of radioactive iodine, it can increase the risk of thyroid cancer in infants, children, and young adults many years after exposure. The thyroid is a gland in the neck that plays an important role in many body functions.

## How KI Protects the Thyroid

KI and radioactive iodine are both types of iodine. They are both absorbed by the thyroid. For KI to work, a person must take it before or shortly after exposure to radioactive iodine. When a person takes the right amount of KI at the right time, it can help block the thyroid from absorbing radioactive iodine. This happens because the thyroid has already absorbed the KI, and there is no room to absorb the radioactive iodine. Think of filling a jar with blue marbles. If you then pour green marbles over the jar, there will not be room and they will just spill out.



How Potassium Iodide (KI)

Works

## Use KI Only if Instructed

**Do not take KI unless you are instructed by public health or emergency response officials or a healthcare provider.** KI can cause harmful health effects. KI is helpful only in specific situations for certain groups of people.

KI should be used only as directed.

- Do not use table salt or foods as a substitute for KI. They do not help with radiation poisoning and eating large amounts could be harmful.
- Only use KI products that have been approved by the Food and Drug Administration (FDA). Dietary supplements that contain iodine may not work to protect the thyroid and can hurt you.

### KI Is Not an “Anti-Radiation” Drug

Radioactive iodine contamination is mainly associated with nuclear power plant accidents. In other types of nuclear emergencies, such as a nuclear detonation, the biggest risk is external exposure to many types of radioactive materials. It is best to shelter in place for protection. [Learn More](#)

## Limits of KI Use

KI may not give a person 100% protection. KI is most effective if taken shortly before or right after internal contamination with radioactive iodine. The effectiveness of KI also depends on how much radioactive iodine gets into the body and how quickly it is absorbed in the body.

KI is only recommended for people under 40 and pregnant or breastfeeding people. People with [certain medical conditions](#) [↗](#), including known iodine sensitivity, should not take KI or should talk to a healthcare provider about whether they can safely take KI.

KI only offers limited protection for specific situations and populations:

- KI protects only against radioactive iodine and does not protect against other [types of radiation](#).
- KI protects only the thyroid. KI does not protect other parts of the body.
- KI must be taken within 24 hours before or 4 hours after exposure to be most effective.
- KI is not a treatment and cannot reverse damage already done to the thyroid.
- KI may not give a person 100% protection from radioactive iodine.

Most radiation emergencies will involve other types of radiation and not radioactive iodine alone. Radioactive iodine is most common in nuclear power plant incidents. The best protection in a radiation emergency is always to get inside, stay inside, and stay tuned for more information from officials.

## How to Take KI

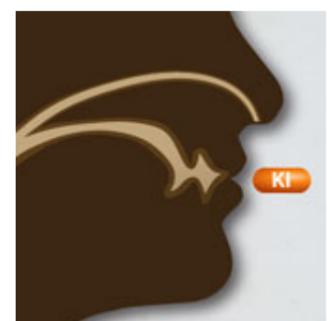
KI is recommended as a [medical countermeasure](#) to protect the thyroid from radioactive iodine **in people under 40 and pregnant or breastfeeding**. This is because cells are still growing and multiplying more quickly in younger populations, so they can be at risk for developing thyroid cancer after breathing in radioactive iodine.

Adults over 40 years old have a much lower risk of developing thyroid cancer and are more likely to have health conditions, like problems with their thyroids, that increase their risks for harmful health effects from KI. However, officials or healthcare providers may instruct adults over 40 to consume KI if the predicted exposure is high enough to cause hypothyroidism.

Breastfeeding people should consider temporarily stopping breastfeeding until evacuated from the impacted area, if possible, and [safely feed your baby other ways](#). Radioactive iodine can be passed to infants through breast milk.

There are two U.S. FDA-approved forms of KI:

- Tablets in two strengths, 130 milligram (mg) and 65 mg (The tablets may be cut into smaller pieces for lower doses.)



- Oral liquid solution available in one concentration, each milliliter (mL) containing 65 mg of KI. The solution comes in a 1 oz (30 mL) bottle with a dropper marked for 1, 0.5, and 0.25 mL dosing. For reference, 5 mL of liquid is one teaspoon. One mL would be about the size of a large drop of water.

### Recommended Single Dosage by Age\*:

#### Potassium Iodine (KI): Recommended Single Dosage by Age

	Predicted Thyroid Exposure	KI dose (mg)	Number or fraction of 130 mg tablets	Number or fraction of 65 mg tablets	Milliliters (mL) of oral solution, 65 mg/mL
Infants birth through 1 month	≥ 5	16	Use KI oral solution**	1/4	0.25 mL
Children 1 month through 3 years	≥ 5	32	Use KI oral solution**	1/2	0.5 mL
Children over 3 years through 12 years	≥ 5	65	1/2	1	1 mL
Adolescents, 12 through 18 years (adolescents that weigh over 150 pounds should take adult dose)	≥ 5	65	1/2	1	1 mL
Adults over 18 through 40 years	≥ 10	130	1	2	2 mL
Pregnant or Lactating Women	≥ 5	130	1	2	2 mL
Adults over 40 years***	≥ 500	130	1	2	2 mL

\*Source: <https://www.fda.gov/drugs/bioterrorism-and-drug-preparedness/frequently-asked-questions-potassium-iodide-ki> 

\*\* The U.S.FDA provides instructions on [how to make oral potassium iodide solution](#)  at home using KI tablets.

\*\*\*Adults over 40 should only take KI when recommended by officials when predicted exposure levels are high enough to possibly cause hypothyroidism.

**One dose of KI offers protection for 24 hours. Officials will tell you if another dose is needed after 24 hours.**

Pharmaceutical Countermeasures for Radiation Emergencies – KI  
(Potassium Iodide)

Infants (under 1 month) have the highest risk of developing thyroid cancer from contamination with radioactive iodine. More than a single dose may lead to later problems with normal development. Other protective measures should be used. In cases where more than one dose is necessary, medical follow up may be necessary.

Additional information is available for healthcare providers on the [Radiation Emergency Medical Management website](#) .

## Harmful Health Effects

KI can have harmful health effects and can cause allergic reactions. The risk of harm from KI increases when it is not taken exactly as directed by a medical or public health official.

Harmful health effects may include:

- Gastro-intestinal (stomach) upset, rashes, and inflammation of the salivary glands.
- Allergic reaction.
- The development of hypothyroidism in infants less than one month old who receive more than one dose of KI. Hypothyroidism is a condition when the thyroid doesn't produce enough hormones.
- Severe illness or death in people who take more KI than recommended.

Last Reviewed: October 26, 2022