# FAQ: Nuclear Radiation and the Thyroid

## What is the thyroid gland?

The thyroid gland located in the neck produces thyroid hormones which help the body use energy, stay warm and keep the brain, heart, muscles, and other organs working normally.

### Why does the thyroid gland need special protection after a release of radioactive material?

The thyroid gland needs iodine to produce the hormones that regulate the body's energy and metabolism. The thyroid absorbs available iodine from the bloodstream. The thyroid gland cannot distinguish between stable (regular) iodine and radioactive iodine and will absorb whatever it can.

In babies and children, the thyroid gland is one of the most radiation-sensitive parts of the body. Most nuclear accidents release radioactive iodine into the atmosphere which then can be absorbed into the body. When thyroid cells absorb too much radioactive iodine, it can cause thyroid cancer to develop several years after the exposure. Babies and young children are at highest risk. The risk is much lower for people over age 40.

### What is Potassium Iodide (KI)?

Potassium iodide (KI) is the same form of iodine used to iodize table salt. KI floods the thyroid with iodine, thus preventing radioactive iodine from being absorbed. KI is made in pill and liquid forms. KI products approved by the Food and Drug Administration (FDA) are: Iosat Tablets (130 mg), ThyroSafe Tablets (65 mg) and ThyroShield Solution (65 mg/ml). Properly packaged, KI's shelf life is at least 5 years and possibly as long as 11 years. If you take a very old pill, it may not work fully but it won't hurt you.

### What is the proof that KI works?

After the 1986 Chornobyl nuclear accident, as many as 3,000 people, mostly babies or young children living in Ukraine, Belarus, or Russia at the time of the accident developed thyroid cancer over the next 10 years. Poland, immediately next to Belarus and Ukraine, distributed KI to >95% of their children within 3 days of the accident and does not appear to have had an increase in thyroid cancer.

### Who should take KI?

Babies, children and pregnant women should be provided with KI. Adults are at a lower risk but still may benefit from KI. In addition to KI, priority should be given to evacuation, sheltering (staying in an unventilated room with the doors and windows closed) and avoiding contaminated food, milk, and water. KI should not take the place of any other protective measure.

### When should KI be taken?

People should take one dose a day while they are being exposed to radioactive iodine until the risk no longer exists. KI should be used only under instruction from local health authorities.

### What are the recommended KI doses?

The FDA recommends the following doses:

| Age | Dose |
|---|---|
| 0 – 1 months | 15 mg |
| 1 months – 3 years | 30 - 35 mg |
| 3 – 12 years | 65 mg |
| >12 years | 130 mg |

The easiest way to prepare a 16-mg dose for a newborn 0-1 month is to dissolve a 130-mg pill in 8 oz of a clear liquid and feed the newborn 1 oz of the liquid.

### Who should not take KI?

Millions of people have taken KI but few serious side-effects have been reported. The only people who should not take KI are those who have had a major allergic reaction to iodine.

Patients with thyroid disease can safely take the pills in the FDA recommended doses for a short period of time as determined by public health officials.

During a nuclear emergency, KI's benefit far outweighs any potential risk. Adults over age 40 do not need KI at all unless they are exposed to extremely high levels of radioactive iodine.

### Where can I find additional information?

Further details on this and other thyroid-related topics are available in the patient information section on the American Thyroid Association website at *www.thyroid.org* and at the FDA website *www.fda.gov* (search for Potassium iodide).