

American Academy of Pediatrics

“Radiation Disasters and Children” Speaking Points

1. There is concern that children are increasingly at risk of exposure to significant amounts of nuclear materials from various types of radiation disasters. Children are more vulnerable to the effects of such disasters than the general population. Besides their proportionately greater level of exposure, children could be affected by loss of parents, displacement from their homes, and post-traumatic stress.
2. While it is hoped that such incidents can be prevented, the AAP has written this statement to address appropriate precautions and responses in the event of a radiation disaster.
3. Radiation exposure scenarios may be intentional, as in acts of terrorism, or unintentional, as in nuclear power plant mishaps. Incidents involving nuclear power plants or detonation of nuclear weapons would result in release of radioiodines into the atmosphere over a wide area, posing a high risk of thyroid cancer and other health effects. Administration of potassium iodide (KI) would have a protective effect in these cases. However, KI is not effective against other types of radiation and would not prevent development of leukemia, for example.
4. An example of a different type of radiation disaster would be the explosion of a “dirty bomb,” a conventional explosive device containing radioactive materials. If a terrorist detonated such a device, it could injure people directly and render portions of a community uninhabitable from the presence of radioactive material. A similar incident would be a mishap during the transport of radioactive materials. Because these scenarios would probably not involve radioiodines, KI would not be effective in preventing adverse health effects.
5. Appropriate response to any radiation emergency, including evacuation vs. sheltering and other precautions, depends on the source of the radiation. Members of the public should follow the instructions of their local officials in the event of such an emergency.
6. Potassium iodide (KI) is effective in preventing radioiodine from reaching the thyroid. It is the cornerstone of preventive treatment after exposure to radioiodines (likely to be emitted in a nuclear power plant incident or detonation of a nuclear weapon). Administered immediately before exposure, it can prevent 100 percent of radioiodine from reaching the thyroid gland. The efficacy of KI diminishes as time passes – it is 80%, 40% and 7% effective when administered at 2, 8, and 24 hours after exposure, respectively. Potassium iodide is the same compound used, in smaller amounts, to iodize table salt; however, the public must understand that KI tablets or drops are the only form of the compound that can or should be used to protect the thyroid in the event of radiation exposure; in other words, people should not ingest table salt to prevent health effects of radioiodine.
7. Homes within 10 miles of a nuclear power plant should keep KI on hand, and schools and child care centers in this radius should have immediate access to KI. There has been discussion as to whether homes in outlying areas should also obtain it. Population density should be considered in coming up with local public health recommendations in any given community.

8. Pediatricians should discuss risks and benefits of KI with parents. It can be obtained without a prescription at some pharmacies, but is not yet widely available. Consumers may purchase KI through the Internet, but families must be cautioned not to use it before consulting with, or hearing from, authorities. The AAP calls on the FDA to facilitate development of a pediatric preparation of KI.
9. The FDA has instructions for preparing KI so that it can be administered in the proper dosage. Particularly for young children, KI tablets should be mixed with a flavored liquid to disguise the very salty taste. Raspberry syrup works best, but low-fat chocolate milk, orange juice, or flat soda are acceptable options. Repeated dosing may be advised in some situations. A mixture of KI in flavored liquid may be kept in the refrigerator and used for up to one week.
10. There are special considerations concerning administration of KI to pregnant or nursing women, newborns, and older adults. (See attached chart.)
11. Pediatricians and mental health professionals should be included in all public health planning efforts addressing possible radiation exposure to ensure that children's unique health, safety and psychosocial needs are considered. This includes planning for emergency department configuration for management of radiation-exposed patients.
12. Pediatricians should work with schools and child care centers on plans to reunite children and families after a radiation disaster. Families should designate an out-of-town relative as a contact for such a disaster, so that the school and various family members may stay connected through a central person who lives outside the disaster zone. During a disaster, it is often easier to call someone long-distance than calling someone locally.
13. Because radioiodines are secreted in breast milk, lactating mothers who are exposed to radiation should temporarily stop breastfeeding their infant (unless no alternative exists) until further instructions from public health officials are available.
14. Through daily practice, pediatricians have an important role in prevention of these potential consequences. By limiting children's exposure to the small doses of radiation found in many diagnostic tests (particularly CT scans), they can actually minimize morbidity and mortality to children from a radiation disaster. This is because effects of radiation are cumulative. While diagnostic X-rays are frequently essential for medical and dental procedures and people do not need to fear them, it is prudent for pediatricians to utilize diagnostic X-ray procedures, particularly CT, only when the benefits outweigh the risks.

Guidelines for Potassium Iodide (KI) Administration*

Patient	Exposure, Gy (rad)	KI dose (mg)
>40 years of age	>5 (500)	130
18-40 years of age	=0.1 (10)	130
Adolescents 12 through 17 years of age†	=0.05 (5)	65
Children 4 through 11 years of age	=0.05 (5)	65
Children 1 month through 3 years of age‡	=0.05 (5)	32
Birth through 1 month of age	=0.05 (5)	16
Pregnant or lactating women	=0.05 (5)	130

*KI is useful only after exposure to a radioiodine. KI is given once only to pregnant women and neonates unless other protective measures (evacuation, sheltering and control of the food supply) are unavailable. Repeat dosing should be on the advice of public health authorities.

† Adolescents weighing more than 70 kg should receive the adult dose (130 mg).

‡ KI from tablets or as a freshly saturated solution may be diluted in water and mixed with milk, formula, juice, soda, or syrup. Raspberry syrup disguises the taste of KI the best. KI mixed with low-fat chocolate milk, orange juice, or flat soda (eg, cola) have an acceptable taste. Low-fat white milk and water did not hide the salty taste of KI.