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Potassium Iodide (KI)

Over the past 18 months, there has been increased interest in the availability of the drug potassium iodide (KI) as an additional protective measure to prevent any adverse affects that might occur to the public if exposed specifically to radioactive iodine during such an accident at a commercial nuclear power plant.

At the request of the Department of Public Health, the Governor's Advisory Council on Radiation Protection (ACRP) has reviewed our policy regarding the availability and distribution of potassium iodide (KI) in the event of an accident at a commercial nuclear power plant that might affect residents of the Commonwealth.

Following review of information provided by the Department, the Massachusetts Coalition to Stockpile KI, and others, as well as testimony from many individuals and groups submitted at a public hearing held in September 1999, the ACRP has made several recommendations which have been accepted by the Department.

The Commonwealth of Massachusetts maintains emergency plans to protect the public health and safety of Massachusetts citizens who live within the 10 mile Emergency Planning Zones (EPZ) of the commercial nuclear power plants in Plymouth, MA, Seabrook, NH, and Vernon, VT. The Massachusetts Emergency Management Agency (MEMA) is the primary state agency responsible for implementing these emergency plans. In the event of an accident where there may be a risk of exposure to radiation, the emergency plans call for evacuation and sheltering of areas residents to ensure that the public will not receive any unnecessary radiation exposure.

The Department notes that the majority of the ACRP members support the present policy of stockpiling KI for emergency workers and institutional individuals, but not stockpiling KI for the general public. In particular, the ACRP recommendations state that "the material available for review does not support the premise nor the probability that large releases of radioactive iodine would occur in accidents at commercial power plants in this Country, as did occur in the accident at Chernobyl" and that there are "other radioisotopes of importance and the proper protective actions would be evacuation and sheltering."

Therefore, as recommended by the Governor's Advisory Council, the Department will continue to support stockpiling KI to be made available for emergency workers and institutionalized patients, but does not support stockpiling KI for the general public.

However, the Department recognizes that members of the public may be interested in having KI available to them and being educated about the uses of KI and about options for purchasing or otherwise obtaining the drug on their own.

Therefore, the Department, in cooperation with the Massachusetts Emergency Management Agency (MEMA), will upon request provide information about the use of KI and how to obtain it and will also contact manufacturers of KI and local pharmacies in an attempt to make KI supplies available at the retail pharmacy outlet:

- Encourage those considering obtaining a personal supply of KI to consult their health care providers to see if KI is appropriate for them to use;

- Develop informational materials in multiple languages that inform the public and health care providers residing in the three Emergency Planning Zones about KI. A draft *Questions and Answers* has been prepared for this purpose and is attached as Attachment 1; and,

- Routinely monitor local, state and federal policy on KI and revise it in keeping with current scientific research and public health policy.

Policies for making the drug available for Emergency Workers and Institutionalized Individuals are attached as Attachment 2.

If you have any questions concerning this policy, please direct them in writing to the MDPH's Radiation Control Program at 174 Portland Street, 5th Floor, Boston, MA, 02114 or by telephone at 617-727-6214.

ATTACHMENT 1

POTASSIUM IODIDE (KI) - QUESTIONS AND ANSWERS

QUESTION: What is KI?

ANSWER: KI is the abbreviation for potassium iodide which is a medicine that, when used properly, can prevent the uptake of radioactive iodine by the thyroid gland in humans. It comes in tablet form.

QUESTION: How does KI work?

ANSWER: Certain forms of iodine help your thyroid gland function properly. Most people get the iodine they need from foods like fish or iodized salt. The thyroid can store or hold a certain amount of iodine to aid in the proper functioning of the gland. In the unlikely event of a nuclear reactor accident, one of the gases that might be released is radioactive iodine. This material may be breathed or swallowed. It may enter the thyroid gland the same way regular iodine does and damage it. If KI is taken before you are exposed to the radioactive iodine, it can fill up your thyroid gland, and reduce the chance that harmful radioactivity will enter the thyroid gland.

QUESTION: Would KI protect me from all radiation releases in a reactor accident?

ANSWER: No. KI is not effective against any other type of radioactivity associated with cesium, strontium, or other fission products released in an accident. KI is also not effective against direct gamma radiation that penetrates the thyroid from a plume or ground deposition. The Department understands that radioactive iodine represented only 0.00017% of the radioactive gases released in the only major accident in this Country; namely, Three Mile Island (TMI) Nuclear Power Plant.

QUESTION: Can taking KI cause health problems?

ANSWER: In general KI does not present health risks. On rare occasions, the drug has been shown to create adverse reactions in the thyroid and other membranes, especially in children. Individuals who are allergic to iodine should not take it. Typically side effects occur when people take higher doses for a long time. Possible side effects include skin rashes, swelling of the salivary glands, and iodism (metallic taste, burning mouth and throat, sore teeth and gums, and sometimes stomach upset and diarrhea). Some individuals who have an allergic reaction may experience symptoms such as fever and joint pains, or swelling of parts of the face and body and at times severe shortness of breath requiring immediate medical attention.

QUESTION: Is KI always effective in these types of emergencies?

ANSWER: KI has a limited window of effectiveness. The body retains KI for a limited period of time. It does not grant immunity for an extended period of time. KI is only about 95% effective as a blocking agent for radioactive iodine if taken within several hours before, during or immediately after inhalation or ingestion. If taken around 4 hours after exposure, the blocking action diminishes to about 50%. After about 6 hours, the blocking action is essentially nil. Thus, delays in taking KI would negate the prophylactic benefit of the drug.

QUESTION: Is KI alone the best protection against exposure to radioactive iodine?

ANSWER: No, because it protects against possible adverse effects of exposure to only one type of radiation, KI should be viewed as an adjunct to sheltering and evacuation, not a substitute. Possessing and taking KI should be a matter of discussion between an individual and his or her health care provider(s).

QUESTION: Does the Department of Public Health recommend that the general public take KI in the event of an emergency at a nuclear power plant?

ANSWER: No. In the unlikely event of such an emergency, the MDPH recommends immediate evacuation of the general public because this is the most effective means of reducing exposure to radioactive iodine as well as to all other sources of radiation.

QUESTION: In the case of a nuclear emergency, who would need protection against radioactive iodine?

ANSWER: The Massachusetts Emergency Management Agency and the Department of Public Health both recommend that KI be stockpiled for emergency workers and institutionalized patients whose evacuation, in the unlikely event of a nuclear reactor emergency, may be delayed. Some groups and individuals feel that members of the public in the vicinity of a nuclear power plant also should have KI available in case a release during a nuclear reactor accident contains radioactive iodine. If you are in a community which has chosen to predistribute or stockpile KI locally, the taking of KI should be discussed with your health care provider.

QUESTION: What is the "shelf life" of KI? Under what conditions should it be stored?

ANSWER: The shelf live varies from five years to indefinite depending on the manufacturer's labeling. All manufacturers specify that the KI be stored in a dry, room temperature environment.

QUESTION: Do I need a prescription to obtain KI and where can I obtain a supply of KI?

ANSWER: No. Retail pharmacies are permitted to maintain supplies for purchase by the general public without a prescription. At present we are aware in the United States of two internet sites through which KI is available and the products available through these sites are also available by telephone and mail order. See Appendix A for details.

QUESTION: How much does KI cost?

ANSWER: The costs vary from $250.00 for a 100 person 14 day supply packages to $10.00 for an individual 14 days supply plus $4.00 shipping and handling.

QUESTION: Are other New England States stockpiling KI?

ANSWER: No. New Hampshire has attempted, so far unsuccessfully to encourage manufacturers to make the products available at retail pharmacy outlets.

QUESTION: WHAT ARE THE DPH's PLANS TO REVIEW AND UPDATE THIS POLICY?

ANSWER: The Department intends to monitor federal policy with respect to KI as well as KI policies of other states, especially those neighboring Massachusetts, and will regularly review and revise our policy on KI in keeping with current scientific research and public health policy.

QUESTION: Does anything preclude my city/town, school, business, or organization from stockpiling KI for use in a nuclear power plant emergency?

ANSWER: No. Individual cities and towns may stockpile KI based on local policies and decision making.

ATTACHMENT 2

CURRENT POLICY FOR DISTRIBUTING KI FOR EMERGENCY WORKERS AND INSTITUTIONALIZED INDIVIDUALS

The current Commonwealth policy for stockpiling and distributing KI for Emergency Workers and institutionalized individuals within the plume exposure Emergency Planning Zone (EPZ) has been in place for a number of years and is a result of criteria J.10.e and J.10.f from the NUREG REP I ″Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.″

In the June 29, 1982, Federal Register, 47 FR 28158, the Food and Drug Administration (FDA) published recommendations for State and local agencies regarding the projected radiation dose to the thyroid gland at which State and local health officials should consider the use of KI. The Federal policy on stockpiling and distributing KI was published in the July 24, 1985, Federal Register, 50 FR 30258. This policy recommended stockpiling or distribution of KI during emergencies for emergency workers and institutionalized persons, but did not recommend predistribution or stockpiling for the general public.

Emergency Workers

In the event of an accident at a commercial nuclear power plant, the Massachusetts Radiological Emergency Response Plan (MA RERP) contains provisions for designating individuals as emergency workers who may enter into or remain in an area that has been evacuated as a protective action. Workers who may incur increased levels of exposure under emergency conditions may include those employed in law enforcement, fire fighting, radiation protection, civil defense, traffic control, health services, environmental monitoring, transportation services, and animal care. In addition, selected workers at institutional, utility, and industrial facilities, and at farms and other agribusiness may be required to protect others, or to protect valuable property during an emergency. The above are examples - not designations - of workers that may be exposed to radiation under emergency conditions. These individuals may be required to remain in the evacuated area for the purpose of assisting institutionalized individuals and others who cannot be evacuated; to perform life-saving missions; and, to perform other duties to ensure public health and safety of the evacuees from the evacuated zone.

The use of stable iodine as a protective action for emergency workers has been recommended by the FDA and adopted by MDPH. The EPA Protective Action Guideline (PAG) for the administration of stable iodine is specified in terms of the committed dose equivalent to the thyroid from radioactive iodine. This PAG recommends the administration of KI when the projected dose to the thyroid from radioactive iodine is 25 rem. The decision whether to recommend the taking of KI will be made by the State Commissioner of Public Health or designee. The recommendation to take KI may be made as a precautionary measure if there is any indication the radioactive iodine is in the release. Emergency workers who know they

are sensitive to iodine or have thyroid disorders should not take KI and should not be assigned to work in locations where they risk radiological exposure (i.e., inside the 10-mile EPZ). If an emergency worker does not wish to take KI at the time it is recommended, they should report that to their supervisor and request a replacement.

Provision has been made by each locality, in its local radiological emergency response plan, to predistribute KI to each response organization's headquarters or location that issues dosimetry. Each response organization is responsible for distributing KI to its emergency workers at the time dosimetry is issued. The MDPH Commissioner or designee will issue a recommendation if KI should be taken.

Institutionalized Individuals

Also, during the course of an accident at a commercial nuclear power plant, when the state calls for an evacuation of areas that might be effected by a release of radioactive materials, there may be instances of Institutionalized individuals within the evacuated area whose presence in a hospital, nursing home, or rest home is unavoidable during a radiological emergency. For these individuals, generally hospital or nursing home patients whose attending physician as determined evacuation would not be appropriate and perhaps even life-threatening, KI may be administered at these facilities. The KI would also be provided to facility staff who must remain to care for these patients.

MEMA has purchased KI in sufficient quantities to cover both the emergency workers and institutionalized individuals. Supplies of KI are distributed by MEMA at the area offices, local emergency operations centers, institutions housing institutionalized individuals, reception centers, and other points from which emergency workers will be dispatched.

APPENDIX A

OBTAINING POTASSIUM IODIDE (KI)

The Commonwealth of Massachusetts is presently aware of two companies that supply KI directly to members of the public. You may order KI directly from these companies over the internet or by mail as follows:

Carter-Wallace Laboratories
Thyro-Block Tablets

Order from internet web sites:
www.nitro-pak.com
or
www.majorsurplusnsurvival.com
or
by calling
1-800-804-4147
or
1-800-804-4148

Anbex
IOSAT Tablets

Order from internet web site:
www.anbex.com
or
by calling
1-646-843-2744