

Potassium Iodide for Nuclear Emergencies

CHANCES OF RADIATION FROM JAPAN REACHING CANADA? ¹

Based on the information currently available, there is no radiation health risk to Canadians resulting from the events in Japan. Health Canada has been working closely with Environment Canada's Canadian Meteorological Centre to predict wind patterns and identify areas that might be affected by a radiation release. Given current wind patterns, it would take several days for any radioactive material to reach Canada. As it stands now, it is anticipated that the amount of radiation reaching Canada, if any, would be negligible and not pose a health risk to Canadians. The Radiation Protection Bureau operates monitoring stations across Canada and continuously receives data from these stations.

WHEN SHOULD POTASSIUM IODIDE PROPHYLAXIS BE IMPLEMENTED?²

Stable iodine administration is recommended for the reduction of doses from inhalation when a release of radioiodines is expected. Iodine administration should not be regarded as a stand-alone countermeasure, as it protects against only one exposure pathway and one radionuclide. It is most effective when used in conjunction with other countermeasures (sheltering, evacuation), however the manner of implementation of this countermeasure must not delay implementation or reduce the effectiveness of these other countermeasures.

The effectiveness of stable iodine prophylaxis depends highly on its administration just before or shortly after release of radioiodine to the environment. A decision on prior distribution of stable iodine tablets is the responsibility of the local/provincial authority, and should be based on site-specific conditions and the manner in which emergency plans for all early countermeasures are to be implemented.

For further information regarding Canadian Guidelines for Intervention during a Nuclear Emergency, see <http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/guide-03/summary-resume-eng.php>

IN THE EVENT OF A NUCLEAR EMERGENCY ³:

Oral potassium iodide blocks the uptake of radioactive isotope of iodine and minimizes the risk radiation-induced thyroid cancer. Uptake can be decreased by 90 – 99 % if potassium iodide is started shortly before or immediately after exposure; if started within 3 – 4 hours of exposure, a 50 % decrease; some limited benefit up to 12 hours after exposure. The thyroid-blocking effect of a single dose lasts for about 24 hours. For optimal prophylaxis, potassium iodide should be administered daily until a risk of substantial exposure no longer exists.

Threshold Thyroid Radioactive Exposures and Recommended Doses of KI for Different Risk Groups ⁴				
	Predicted Thyroid exposure(cGy)	KI dose (mg)	# of 130 mg tablets	# of 65 mg tablets
Adults over 40 yrs	≥500	130	1	2
Adults over 18 through 40 yrs	≥10			
Pregnant or lactating women	≥ 5			
Adolescents over 12 through 18 yrs	≥ 5	65	1/2	1
Children over 3 through 12 yrs		32	1/4	1/2
Over 1 month through 3 years				
Birth through 1 month				

Contraindicated: hypersensitivity to iodine, dermatitis herpetiformis, vasculitis, nodular thyroid conditions with heart disease. ⁵

Caution: Addison's disease, acute bronchitis, cardiac disease, cystic fibrosis, renal impairment, tuberculosis and history of hyperthyroidism. ⁵

Adverse effects: acne flare-ups and / or dermatitis; prolonged use can lead to hypothyroidism. ⁵

Drug interactions: Caution with other agents that increase potassium, e.g. potassium-sparing diuretics, ACE inhibitors, potassium-containing salt substitutes.⁵

Pregnancy: Iodine crosses the placenta, therefore pregnant women should receive potassium iodide for the protection of both mother and fetus. Repeat administration should be avoided if possible to prevent blocking fetal thyroid function.³

Lactation: Nursing mothers should receive potassium iodide for their own protection. Nursing does not provide an adequate dose for the infant so the infant should be supplemented with the recommended dose of potassium iodide. Avoid repeat dosing if possible.³

RadBlock™ is the only potassium iodide tablet currently licensed by Health Canada.⁶ According to the manufacture's website. RadBlock™ is out of stock for at least three weeks.⁷

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References:

1. Canadian Nuclear Safety Commission. What are the chances of radiation from Japan reaching Canada? Available at <http://nuclearsafety.gc.ca/eng/mediacentre/updates/march-11-2011-japan-earthquake-canadian-perspective-qa.cfm#H1>. Accessed 15Mar2011.
2. Health Canada. Canadian Guidelines for Intervention During a Nuclear Emergency. Available at <http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/guide-03/intervention-eng.php>. Accessed 15Mar2011.
3. Potassium Iodide. AHFS Drug Information. Accessed 15Mar2011.
4. FDA. Guidance: Potassium iodide as a thyroid blocking agent in radiation emergencies . Available at <http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/UCM080542.pdf>. Accessed 15Mar2011.
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6. Health Canada. Licensed Natural Health Products Database. Available at <http://www.hc-sc.gc.ca/dhp-mpps/prodnatur/applications/licen-prod/lnhpd-bdpsnh-eng.php>. Accessed 15Mar2011.
7. Canadian RadBlock potassium iodide. Available at <http://www.kicanada.com/radblock.html> . Accessed 15Mar 2011.