

Radiation Emergencies

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Radiation emergencies are rare and uncomfortable to think about. There are several basic measures that can be taken to increase the safety of people in such circumstances. The following information comes from CDC.

Basics:

In a radiation emergency, the most basic thing is to get inside a building and take shelter for at least 24 hours. This reduces radiation exposure.

Radiation exposure: This refers to exposure of the body to penetrating radiation from an external source.

Radioactive contamination: This refers to when radioactive material is released in the environment and contaminates air, water, surfaces, people, and animals.

Internal contamination: This occurs when an individual swallows or breathes in radioactive materials. Alternatively, radiation materials can enter the body through open wounds or absorbed in the skin.

External contamination: Radioactive material, in the form of dust, liquid, or powder can come in contact with the skin, hair, or clothing. These people are at risk of internal contamination.

Self decontamination: The first thing to do is to remove outer layer of clothing. This removes 90% of radioactive material. Put the clothing in a sealable bag or container.

Second, it is important to wash yourself preferably a warm shower, but a damp clean cloth/towel material can do. No hotwater, scratching, or irritating the skin. Also no hair conditioner which causes radioactive material to stick to hair.

Keep in mind that even if the tap water is contaminated, it is still advised to shower to decontaminate since the amount of contaminant will be diluted and safe. However bottled water to drink is indicated in that situation.

If possible put on clean clothes.

Potassium Iodine: KI is taken orally and has stable Iodine that gets absorbed by the thyroid. This stable iodine can block radioactive iodine from getting absorbed for 24 hours.

KI should be prioritized in all infants since they are at highest risk for thyroid cancer in a situation of exposure to radioactive iodine.

Children, Young adults 18-40, pregnant women, and breastfeeding women with internal contamination (or likely to be internally contaminated) should also take KI in this situation.

Adults older than 40 years old should not take KI unless contamination with very large dose of radioactive iodine is expected. This age group is less likely to develop thyroid cancer after contamination and more likely to have allergic reaction to KI.

Prussian blue taken orally can help remove radioactive cesium and thallium from the body. It does this by trapping these substances in the intestines to keep them from getting absorbed.

DTPA, diethylene triamine pentaacetic acid, can accelerate renal excretion of radioactive plutonium, americium, and curium. This is given intravenously although can be inhaled in the lungs.

Neupogen is expected to help patients with bone marrow damage from radiation to recover and produce WBC's and other cells from the bone marrow.

References:

More detailed information can be found at the CDC website:

https://www.cdc.gov/nceh/radiation/emergencies/index.htm?CDC_AA_refVal=https%3A%2F%2Femergency.cdc.gov%2Fradiation%2Findex.asp

The ACR provides the above link for the CDC and other links on the topic of radiation safety at:

<https://www.acr.org/Clinical-Resources/Radiology-Safety/Radiation-Safety>