

Just-In-Time Training: ESSENTIALS FOR RADIATION EMERGENCIES



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What is radiation?

Radiation is energy given off by matter in the form of waves or highspeed particles.

Radiation can be *ionizing* or *non-ionizing*.

In a clinical setting, we are most concerned with ionizing radiation which can result in cellular damage. This can lead to acute illness and an increased risk of developing cancer.

Acute Radiation Syndrome

Occurs with large doses of total body radiation exposure over a short period of time. Clinical syndrome progresses through prodromal phase, incubation phase, onset phase, and convalescent phase. Onset phase can have hematologic, gastrointestinal, and neurologic manifestations.

THERE ARE TWO BROAD CATEGORIES USED TO DESCRIBE RADIATION CONTACT:

EXPOSURE

A patient who is exposed to radiation, but who is not associated with the source of radiation, is said to experience radiation exposure or irradiation. These patients become ill due to exposure but do not represent a risk to healthcare workers as they do not carry radioactive material. One example of radiation exposure is a patient who receives an x-ray.

Because patients with exposure to radiation do not have radioactive material on them, healthcare workers would not need PPE when providing medical care.

PPE should always be used when the potential for contamination is unknown.

CONTAMINATION

A patient who is contaminated with radiation is directly associated with the radioactive material. A contaminated patient will also have radiation exposure and has the potential to further expose healthcare workers to radiation. Contamination can occur as a result of an accident, an event in nature, or an act of terrorism and can affect people, both internally or externally, their surroundings, and their personal property.

Level C PPE is recommended for healthcare workers treating a contaminated patient. This includes hooded, chemical-resistant clothing, a face shield, gloves, boots, and respiratory PPE including a full-face piece air purifying respirator with a P-100 or HEPA filter. A personal radiation dosimeter should also be used when there is concern about exposure to penetrating ionizing radiation.

DECONTAMINATION

In cases of contamination or when contamination is unknown but possible, the first step in management is decontamination. Patients should be in stable condition before addressing contamination. Removing a patient's clothes and using soap and water to remove evidence of radioactive material are simple first steps to take towards decontamination. A Geiger counter can be used to identify areas where radioactive material still presents a threat in the event that initial efforts are not sufficient. Once radioactive material is removed, any traumatic, medical, or burn presentation can be triaged as normal.

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References: <https://www.cdc.gov/nceh/radiation/emergencies/contamination.htm>; <https://remm.hhs.gov/>; <https://www.cdc.gov/nceh/radiation/emergencies/arsphysicianfactsheet.htm>