Radiation injuries

Remove yourself and others from the area where there is radiation to prevent and reduce injuries from radioactive material.

Radiation sources exist in a variety of fields including industry, medicine and research. Radiation injuries can occur when there is a radiation emergency and might not be obvious immediately. If not controlled, exposure to radioactive material can have serious consequences to our health. Radiation exposure can lead to external or internal contamination of the body with radiation. Acute exposure can quickly cause burns, or damage to the brain or circulation and digestion systems. It can also cause a person to develop cancer in the longer term.

Guidelines

Good practice points

- Avoid touching or approaching suspected radioactive materials or accident scenes.
- The injured person should be removed from the scene as quickly as possible with due precaution and care.
- To avoid accidentally ingesting radioactive material, people who have been in the vicinity of radioactive materials or scenes should wash their hands and face thoroughly before touching them, smoking, eating or drinking.
- First aid providers should stay more than 100 metres away from the smoke caused by a fire or explosion from a potentially dangerous radioactive source.
- Exposure to a sealed source does not require decontamination.
- The decontamination process should be handled by those specially trained to do so. Clothing worn by anyone who may have been exposed to radiation should be removed while waiting for specialists to arrive.
- Any person who may have been exposed to radioactivity must be examined by medical specialists as soon as possible.
Chain of survival behaviours

Prevent and prepare

- Be aware of sources of radiation such as:
  > uncontrolled (abandoned, lost, stolen or found) dangerous sources or materials (particularly items found near or around nuclear power stations or other nuclear facilities)
  > misuse of dangerous industrial and medical sources (e.g., those used in radiography)
  > public exposure and contamination from unknown origins
  > malicious threats or acts
  > transport emergencies.
- In places where radiation is known to exist, such as in nuclear or other industrial facilities, preparedness to deal with radiation injuries must form part of the emergency preparedness plan and employees should be trained specifically in how to behave and respond in an emergency (Turai & Veress, 2001).
- Ensure familiarity with safe operating procedures and that appropriate education on safe behaviour is made available.

Early recognition

It may be challenging to recognise a radiation emergency because people may not be able to see or smell hazardous levels. Therefore, the initial response is often carried out based on secondary indications such as the presence of radioactive material, people showing symptoms of exposure or readings from specialised instruments.

Signs that someone might have been exposed to radiation might include (Turai & Veress, 2001):

- burns, blister or ulcers
- nausea, vomiting, diarrhoea
- weakness, headaches, dizziness and or fatigue.
The first aid provider should protect their own safety and avoid touching or approaching suspected radioactive materials or accident scenes.

**First aid steps**

1. Direct the person to leave the scene as quickly as possible with due precaution and care. Avoid exposure to radiation without protective clothing.
3. Assess the person’s level of response, breathing, and circulation and treat them accordingly as a priority. Then treat any other conditions such as burns.

**Access help**

- Depending on the type of radiation emergency, it may be necessary to access EMS as well as other specialised emergency services.
- Explain the radiation injury clearly to EMS so they are able to send the appropriate response.
- Radioactive materials can lead to a person having external or internal contamination and can have serious effects on the body in both the immediate and longer term. Any person exposed to radiation must be immediately assessed and then monitored over time by a doctor.

**Recovery**

- Radiation does not produce life-threatening early symptoms, immediate death or immediate burns, and exposure to radiation alone is not a medical emergency. However, the person must be taken for further assessment and medical assistance (Turai & Veress, 2001).

**Education considerations**

**Context considerations**

- First aid programme designers must determine whether to include this topic in International first aid, resuscitation, and education guidelines 2020. https://www.globalfirstaidcentre.org/
their first aid programmes depending on its relevance in specific contexts, local regulations and public health policies.

- Consider the emergency preparedness plans and availability of specifically trained workers or responders when designing learning for this topic.

**Learner considerations**

- Learners for this topic are likely to specifically face the risk of radiation because of their place of work. Programme designers should work closely with learners and their employees to understand risks, local practice, access to medical care and emergency procedures that are in place.

**Facilitation tips and tools**

- Encourage learners to become familiar with the radioactive symbol and be aware of emergencies that are dangerous due to potential radioactivity.
- Consider using photographs to illustrate the look of a radiation injury and video to explain the effects of radiation.
- Emphasise that the person exposed to radiation does not present a health risk to the first aid provider. Therefore, the focus should be on responding appropriately to the first aid priorities of ensuring the person is responsive, breathing normally with normal circulation (Turai & Veress, 2001).

**Scientific foundation**

No formal reviews were made on this topic. The recommendations are based on expert opinion.

**References**

**Non-systematic reviews**

International Atomic Energy Agency (1998). Diagnosis and treatment of radiation


Explore the guidelines

Published: 15 February 2021
First aid

Explore the first aid recommendations for more than 50 common illnesses and injuries. You’ll also find techniques for first aid providers and educators on topics such as assessing the scene and good hand hygiene.
First aid education

Choose from a selection of some common first aid education contexts and modalities. There are also some education strategy essentials to provide the theory behind our education approach.
About the guidelines

Here you can find out about the process for developing these Guidelines, and access some tools to help you implement them locally.