

How to manage patients externally exposed in radiation accidents

10 steps for medical personnel

Evolution of a local radiation injury from an industrial radiography accident



Ventanilla accident 2014, Peru

3 days post exposure



Ventanilla accident 2014, Peru

12 days post exposure



Ventanilla accident 2014, Peru

76 days post exposure



Ventanilla accident 2014, Peru

196 days post exposure

1. Apply universal precautions

Follow universal bio-safety precautions for handling the patient. Patients with external exposure pose no risk to others.

2. Prioritize life-saving

Treat life-threatening injuries as a priority. Only consider the next steps when the patient is stable.

3. Take a full medical history

Include a detailed summary of all information related to the accident in the medical history: the time and duration of exposure, the distance from the source, and the onset of clinical manifestations such as nausea, vomiting, local pain and erythema.

4. Perform a detailed physical examination

Identify any erythema, oedema, blisters and lesions on the skin that have no apparent cause. Document the development of any lesion identified using serial photographs, at least daily.

5. Screening for contamination

If radioactive contamination is suspected, consider performing radiological screening in parallel with the physical examination. This must not interfere with urgent medical actions.¹

6. Hospitalize for medical evaluation

When overexposure is suspected, consider hospitalizing the patient for periodic evaluation, depending on his/her clinical status. Take the following steps and include the results in the patient's medical record:

- Register and re-assess any clinical manifestations, such as vomiting, diarrhoea, fever, local pain, oedema, neurological deficit, etc.
- Periodically, examine the patient physically and check for any lesions on the skin.
- Every 8 hours, perform a haemogram. In particular, check for changes in lymphocyte counts.
- Every 24 hours, perform tests for C-reactive protein, amylase, liver function (ALAT, ASAT) and creatinine.

7. Notify the country's National Competent Authority

Notify your National Competent Authority, identified here:²

8. Perform dose assessment

Biological dosimetry and other physical dose assessment methods provide important information for the management of exposed individuals. Contact the National Competent Authority (see above) for dose assessment capabilities available in your country.

9. Transfer the patient

Consider transferring the patient to a designated hospital for radiation emergencies, or to a specialized hospital with facilities for plastic or burns surgery, internal medicine, and haematology or haemotherapy.

10. Request international assistance

If needed, the National Competent Authorities can request international assistance through the IAEA.³

¹ Involve the Radiation Protection Officer from your hospital to support you with this task.

² Complete the information for your country.

³ Under the terms of the "Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency". Contact the National Competent Authority for further information.