Radiological Emergencies: OPC First Receiver Patient Care Toolkit

Decontamination of Contaminated Patients

- This resource supports hospital-based health care providers in decontaminating a patient with suspected contamination by radioactive material.
- Medical stabilization and trauma care are the priority. Do not delay life-saving interventions for decontamination.
- Stop decontamination if the patient becomes unstable or if it interferes with essential medical care.
- Notify the hospital's Radiation Safety Officer (RSO) as early as possible.
- Ensure appropriate PPE is worn (refer to institutional guidance or OPC PPE resource).

1. Determine Whether Decontamination is Needed

Is there radioactive material on or in the body (clothes, wounds, inhaled, ingested)?

- If NO (patient exposed to a radiation source, but not contaminated, e.g., near a source, or after an X-Ray):
  - No decontamination is required.
  - Standard precautions are sufficient.
- If YES or UNSURE:
  - Proceed with decontamination steps below.

2. Before You Begin

- Stabilize the patient first.
- If available and safe, decontamination outdoors or in a designated area is preferred.
- Gather supplies:
  - Soap and lukewarm water
  - Towels
  - Bags for contaminated clothing and belongings
  - Clean clothing or linens
  - Radiation survey meter, typically a thin-window "pancake" Geiger-Müller (GM) probe (if available)
    - If not available, do not delay decontamination.
- If staffing allows, assign 1) a decontamination lead, 2) a "clean" recorder

3. Perform a baseline radiation survey using a Geiger-Muller counter, or equivalent

- Refer to OPC resources: How to Perform a Radiation Survey, or institutional protocols.
- If a Geiger-Muller counter is unavailable, do not delay decontamination efforts.

4. Remove clothing and personal items

- Carefully remove clothing, jewelry, shoes. Avoid shaking.
- Place items in double-bags clearly labelled as "radioactive material".
- Move bags to a designated area.
- Re-survey patient after clothing removal: if radiation is still detectable, continue with the next step.

5. **External Decontamination (Skin, hair, wounds, orifices)**

General Principles

- Address wounds first.
- Work from head to toe.
- Use lukewarm water and mild soap.
- Gently wash; do not scrub aggressively.
- If a radiation survey was completed, focus on areas with elevated readings.
- Pat dry rather than rubbing

Address Open Wounds

- Cover intact surrounding skin.
- If indicated and feasible, collect a wound swab before irrigation and survey the swab. Note the value.
- Gently irrigate wounds with saline or water.
- Remove visible debris if clinically appropriate.
- Cover cleaned wounds with waterproof dressings (eg. Tegederm).

Body Orifices (Ears, Mouth, Nose)

- Perform a whole-body radiation survey to identify and localize areas of contamination, including orifices.
- Gently swab ears, nose, and mouth using a moistened sterile cotton-tipped applicator.
- Survey each swab with the radiation detection device and document readings.
- If inhalation is suspected, obtain nasal swabs before irrigation. Nasal swab activity may correlate with inhaled lung contamination and should prompt consultation for internal contamination assessment. Keep the swab and note the value.

Ears	Mouth	Nose
• Check tympanic membrane integrity. • If intact, irrigate with room-temperature water using an ear syringe. • Sample irrigation fluid for residual radioactivity.	• Encourage tooth brushing and frequent rinsing. • Encourage gargling with 3% hydrogen peroxide or with water. • Sample irrigation fluid.	• Swab each nostril **before** decontamination if internal contamination is suspected. • Have patient blow their nose, then perform nasal irrigation.

Head-to-Toe Decontamination

- Wash hair first, then the rest of the body.
- Avoid skin abrasions.
- Do not shave hair or use conditioner.
- Prevent contaminated water from entering orifices.

6. **Re-survey and repeat**

If a radiation detection device is available:

- Re-survey previously elevated areas after each decontamination cycle.
- Document readings and compare to background levels.
- Repeat washing and re-survey as needed.

Continue until:

- Readings are near background (generally < 2× background), or
- Readings no longer significantly decrease with repeated washing, or
- Clinical status of patient requires definitive care (do NOT delay urgent medical treatment to achieve complete radiological clearance), or
- Directed by the RSO.

7. **Internal Contamination Considerations**

External decontamination does not address internal contamination.

Suspect internal contamination if there has been:

- Inhalation of dust or aerosol
- Ingestion
- Contaminated open wounds

Additional testing and samples may be indicated. Consult REAC/TS (1-865-576-1005), or OPC to discuss further.

Additional Resources:

- **REMM** – Procedures for Decontamination: https://remm.hhs.gov/ext_contamination.htm#wholebody
- **CDC-** How to Decontaminate after a Radiation Emergency: https://www.cdc.gov/radiation-emergencies/prevention/self-decontaminate.html
- **REAC/TS**- Procedure Demonstrations: https://orise.orau.gov/reacts/resources/guide/procedure-demonstrations.html