

How to assess external contamination using a Geiger-Muller Counter

Preamble

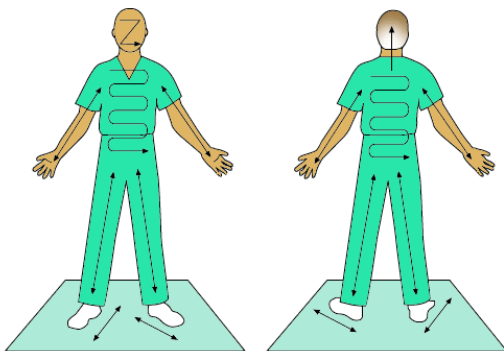
- The priority in radiological accidents is to stabilize the patient. Contamination risk assessment and decontamination procedures should only be undertaken after the patient has been stabilized.
- Wear personal protective equipment (PPE) (see the PPE summary sheet).
- Promptly contact your centre's Radiation Safety Officer (RSO) for guidance in assessing your patient's contamination risk.

Before You Begin

1. Ensure the instrument is calibrated and the battery is functional (ask the RSO for assistance if needed).
 1. Ensure the instrument is calibrated.
 2. Test the battery using the “Bat Test” button.
2. Measure background radiation
 1. Record the background radiation value while standing well away from the patient and all contamination sources (e.g., clothing). Record the value on the diagram in the appendix.
 2. Decontamination goal: obtain a final reading lower than 2× background radiation.
 3. Record the CPM (counts per minute) value and the multiplier used on the instrument (e.g., ×0.1, ×1, ×10, ×100).

Perform the Assessment with the Counter

1. Assessment technique
 1. Hold the counter 2 cm from the skin (avoid touching the body and contaminating the instrument).
 2. Move the counter slowly (approximately 5 to 7 cm per second).
 3. Follow the pattern shown in the image below.



Source : REMM, « how to survey », [How to Perform a Survey for Radiation Contamination - Radiation Emergency Medical Management](#), consulted on September 21st, 2026.

4. If a reading detects a radiation level above background, record the CPM value (with its multiplier) on the diagram in the appendix.
2. Assess contamination risk in body orifices
 1. Collect a sample using a moistened cotton swab from the ears, nose, and mouth.
 - Measure the radiation level at 2 cm away from the swab and record the value on the diagram in the appendix.
 - Use a different swab for each orifice (including a different swab for each nostril).
 2. If a wound is present, collect a sample directly from the wound with a swab and measure the radiation level on the swab.
 3. If radiation is detected in a nasal sample and/or a wound, identify the type of radiation (SKIP this step if there is no radiological contamination in nasal samples or wounds).
 1. Move the probe a few centimetres away from the swab
 - If the reading disappears = alpha particles
 - Note that swabs must be completely dry for alpha-emitter detection
 2. Turn the probe upside down and present the back of the probe toward the swab
 - If the reading disappears = beta particles
 3. If radiation can still be detected = gamma radiation
 4. Decontaminate the Patient
 1. Decontaminate contaminated areas by following the steps in the “External Radiological Decontamination” sheet.
 2. The goal is to obtain a radiation level less than twice the background radiation, or as recommended by the RSO.



Appendix

Contamination Assessment Form

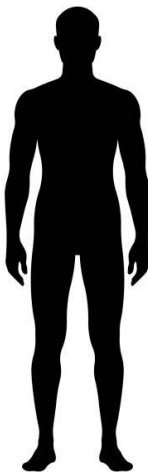
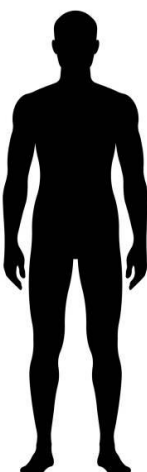
Name :

Date :

Record Number :

Background radiation _____ cpm (multiplier : _____)

Table 1 : PRE-decontamination measurement (in cpm) (multiplier : _____)

Areas			Diagram for recording the location of wounds and other signs of trauma Front  Back 
Head			
Chest			
Back			
	Right	Left	
Arms			
Hands			
Legs			
Feet			
Detection using a swab :			
Mouth			
Ears			
Nostrils			
Wound #1			
Wound #2			
Wound #3			