

How to Perform a Radiation Survey

- This resource supports hospital-based health care providers in performing a radiation survey on a patient with suspected contamination by radioactive material using a radiation detection device, such as a Geiger-Müller detector.
- Always prioritize medical stabilization and trauma care before addressing radiation-related concerns.
- Notify the hospital's Radiation Safety Officer (RSO) as early as possible.
- Ensure appropriate personal protective equipment (PPE) is worn prior to performing the survey. Refer to institutional guidance for PPE requirements, or OPC'S Resource [on PPE]

Before You Begin

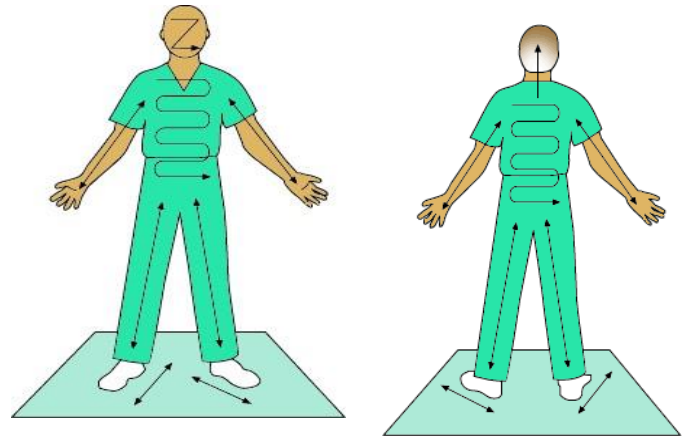
1. Ensure the correct device is being used.
 - Use the hospital-designated contamination survey meter, typically a thin-window “pancake” Geiger-Müller (GM) probe.
 - If you are unsure whether the device is appropriate, contact the Radiation Safety Officer (RSO).
 - Ensure any beta shield on the probe is open (if applicable).
2. Confirm device readiness
 - Verify the device is within its calibration date (check the calibration sticker).
 - Perform a battery check using the “Bat Test” or equivalent function.
 - Turn the device on and confirm it responds (e.g., audible clicks or fluctuating reading).
 - Contact the RSO if the device appears to malfunction or readings seem inconsistent.
3. Measure and record background radiation
 - Measure background radiation in the survey area before assessing the patient.
 - Record the background counts per minute (CPM) and the multiplier setting (e.g., $\times 0.1$, $\times 1$, $\times 10$, $\times 100$).
 - Background levels may vary by location within the hospital.
 - As a general guide, decontamination is considered adequate when readings are near background or less than approximately 2 times background, unless otherwise advised by the RSO.
 - Use a standardized documentation form to record background levels and patient survey readings. The REMM Contamination Assessment Form may be used:
https://remm.hhs.gov/Contamination_Assessment_Form.pdf
4. Prepare the environment
 - Ensure appropriate PPE is worn.
 - Refer to institutional guidance for PPE requirements, or OPC'S Resource [on PPE].
 - Designate a person to be a “clean recorder” if possible to document readings.
 - Avoid contaminating the detector or surrounding environment.



Conducting the Survey

1. Survey Technique

- Hold the detector approximately 1- 2 cm from the patient's skin.
- Move the probe slowly, about 5-7 cm per second.
- Follow a consistent head-to-toe scanning pattern (front and back, see figure to right).
- Avoid direct contact with the skin to prevent contaminating the detector.
- Record elevated readings systematically and document location and CPM.



Source: <https://remm.hhs.gov/howtosurvey.htm>

2. If contamination is detected, determine if body orifices are contaminated.

- 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 with REAC/TS for internal contamination assessment.

3. If contamination is detected on a nasal swab or wound swab, identify the type of radiation (if not, skip this step).

- Increase distance from the surface by a few centimeters:
 - If the reading drops to background, alpha contamination is likely
- Rotate or shield the detector window according to device design:
 - If the reading decreases significantly or disappears, beta contamination is likely.
 - If the reading remains elevated despite shielding or increased distance, gamma radiation may be present.
- Consult the RSO for interpretation and guidance.

4. Survey directed decontamination and re-surveying.

- If contamination is detected, initiate decontamination steps. Follow institutional protocols, or refer to OPC's Decontamination of Contaminated Patients resource.
- After each decontamination cycle, repeat the radiation survey of previously elevated areas.
- Document post-decontamination readings and compare to background levels.
- Continue the cycle of decontamination and re-survey until readings are near background (generally < 2x background), or no longer significantly decreasing, unless otherwise directed by the RSO.
- Do not delay urgent medical care in order to achieve complete radiological clearance.



CONTAMINATION ASSESSMENT FORM

Name: _____
(Last)
(First)
(MI)

ID Number: _____ Date: _____ Time: _____

Has the person recently had a stress test, brachytherapy, PET scan, thyroid ablation, or other nuclear medicine procedure?

Yes No If yes, contamination screening results may be elevated.

Screening Criteria: _____ cpm Background: _____ cpm
 (counts per minute)

Instructions:

- Record measured levels of contamination for specified areas.
- Mark contamination findings on diagrams.
- Identify contaminated wounds, if present.
- Place an "X" in the box if no measurements were taken.

Table 1: Pre-Decontamination Measurements (in cpm)

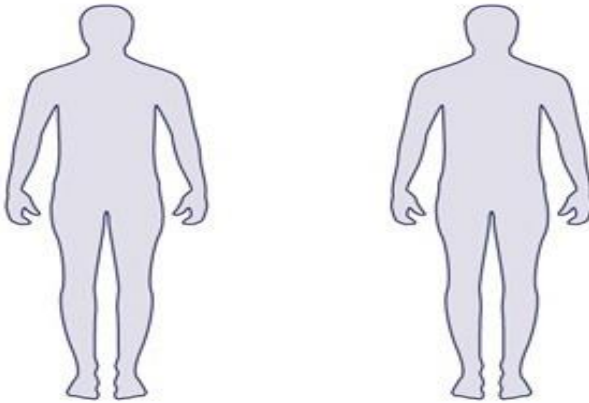
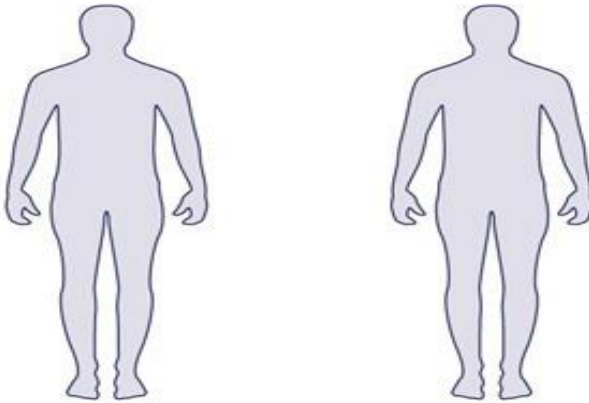
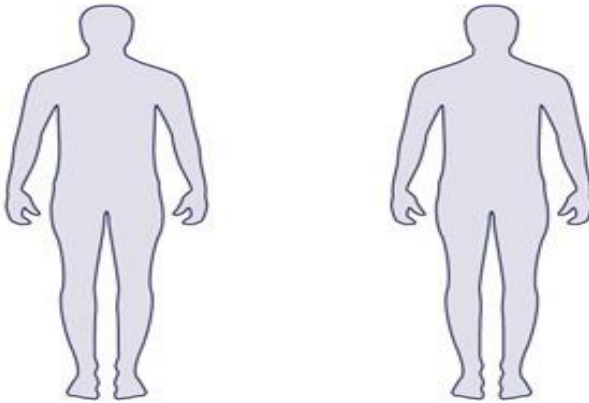
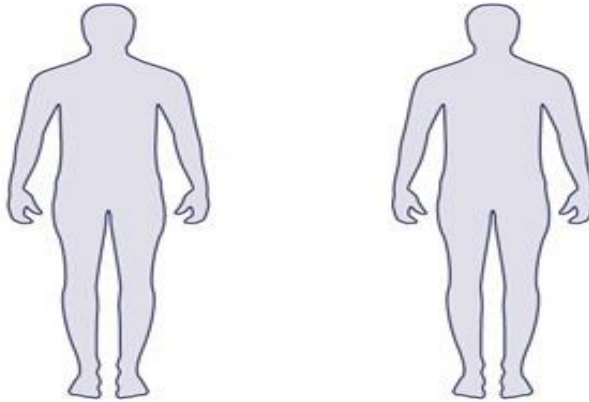
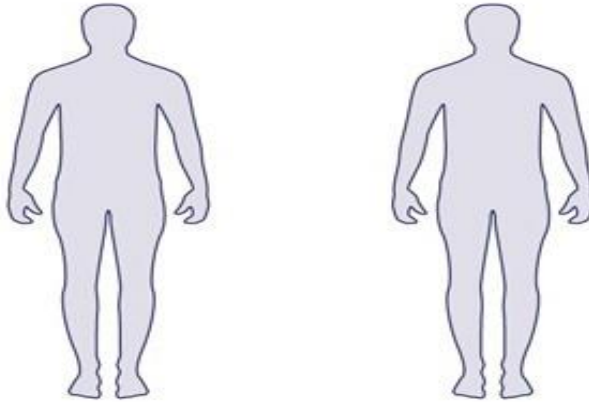
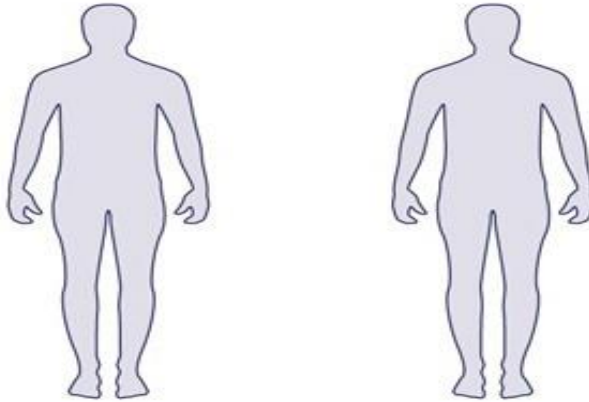
	Front	Back		
Head				
Breathing Zone				
Torso				
	Left	Right		
Arm				
Hand				
Leg				
Sole of Shoe				

Table 2: Post-Decontamination Measurements (in cpm)

	Front	Back		
Head				
Breathing Zone				
Torso				
	Left	Right		
Arm				
Hand				
Leg				
Sole of Shoe				