Radiological Preparedness & Emergency Response

Session III

Introduction to Radiation Surveys and Detection

Objectives

- Discuss exposure and contamination.
- Discuss the concept of radiation detection.
- Describes the use of a radiation detector.
- Describe the performance of a radiation survey.

2 Different yet Possible Overlapping Entities

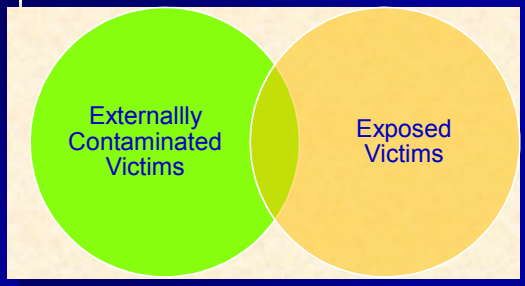
- Exposure
  - Whole body
  - Partial body
- Contamination
  - External
  - Internal

Contamination vs. Exposure

- **Exposure**: coming in contact with radioactive waves or particles, e.g., having a chest x-ray
- **Contamination**: deposition of radioactive material in undesired locations

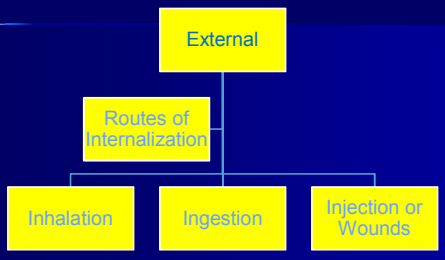
A person can be exposed but **not** contaminated – think x-ray exams!

Most Externally Contaminated Patients are Exposed



All Internally Contaminated Patients are Potentially Exposed

Contamination



To Explain this Important Concept Better: CDC Video

Radiological Preparedness & Emergency Response

What is a Radiation Detector

- Identifies the presence of radioactive material.
  - Gas-filled
  - Liquid-filled
  - Solid-filled

Before Performing a Radiation Survey

- Select your equipment.
- Check your equipment battery.
- Obtain a background reading.

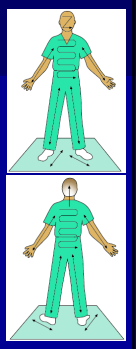
Commonly available radiation detectors used for contamination surveys

Radiation Detection in the ED

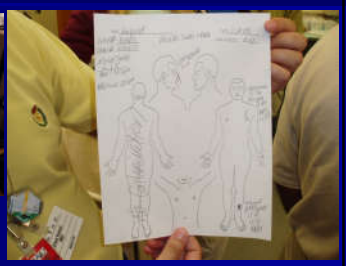
- Victims should be surveyed with Geiger-Muller counters.
- Standard G-M cannot detect radiation exposure; they detect external gamma, some beta, and no alpha unless using a specialized alpha probe.
- They can detect internal gamma, less beta, and no alpha regardless of the probe.

Radiation Survey

- **Survey patient for radiological contamination and mark areas on body diagram.**
- **Remove contaminated clothes and label them.**
- **Except for an instance of highly-radioactive shrapnel, contamination should NOT deter medical staff from treating life-threatening injuries.**



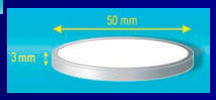
Radiation Survey in the ED and Decontamination



RadEye B-20ER







RadEye G's

Radiation Detection

- Pocket dosimeters.
- Film badges.
- Thermoluminescent dosimeters (TLD)

In Vivo Measurements

- Whole body counters.
- Chest counters for Plutonium and Uranium.
- Wound monitoring instruments.

Portal Monitors

- Gamma detectors.
- Patients walk through the monitor.
- The State of Georgia has 36 of these monitors in health districts – 10 more in counties near nuclear plants.

Summary Points

- Radiation is relatively easily detectable.
- There are different types of detectors with a similar operation principle.
- Performing a detection survey is an easy but meticulous step.


Any Questions?
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