TEMPLATE
Standard Operational Guideline
Radiation Geiger-Mueller and Proportional Ionizing Radiation Detection
Model 2241-2
Dual Digital Scaler/Ratemeter

PURPOSE:

The purpose of this guideline is to facilitate the operation and maintenance of this device in safe and efficient manner. Utilizing the manufacturers guide as the basis for this document and training as the basis for competent use of this device will assist in achieving this goal.

The purpose of the Dual Digital Model 2241-2 is to assess patients for exposure to Alpha, Beta, or Gamma Radiation doses. To be utilized on the arrival of patients exposed to any type of chemical or biological terrorism attack especially in the presence of an explosive device to check for radioactive contamination. Patient will be surveyed after the decontamination process.

EQUIPMENT LOCATION: REMAIN BLANK FOR EACH HOSPITAL TO FILL IN)

OPERATIONAL INSTRUCTION GUIDELINES:

Operation of equipment

Get the Geiger/nuclear counter and batteries from storage; prepare the instrument and determine background level.

Preparing the Meter:

- Position the Geiger counter with the meter away from you. Locate and open the battery compartment.
- Put the batteries in the meter using proper orientation (up/down).
- Close and latch the battery compartment.
- Attach the pancake probe to the meter. (This is the probe with the plastic cover.)
- Check the batteries using the "range" switch or "bat" button; the method depends on the type of instrument. The meter needle should move to area on scale marked battery, indicating the batteries are good. Digital meters do not have a battery check function and will indicate “BAT” when the battery needs replacing. If the batteries need replacing, find a flashlight or other source of 2 D-cells and put them in the meter -- check these batteries also.
- Turn the "F/S" switch to "F" (Fast). (Use the “slow” response on the toggle switch on the survey meter only when quantifying contamination.
- Turn the "audio" switch to "ON."
- The number and color on the sticker on each probe corresponds with the toggle switch on the survey meter. Be sure that #1 (red) and #2 (yellow) stickers match on the probe and the survey meter.
- Using the radioactive check source on the side of the meter check the meter function. The expected reading should be noted on the side of the instrument.

Measuring the Background Radiation:

- Check that the "F/S" switch is on "F" (Fast).
- Move the range switch to the most sensitive position.
- Remove the probe cover if one is in place. Place the probe in a plastic bag or glove to prevent possible contamination when surveying the patients.
- Measure the background radiation: write down the reading. Since background radiation varies with time, it may be desirable to make several readings and average the results. Record the average reading.
- Expect a reading of 40-100 counts/min or a reading of approximately 0.02 mR/hr (i.e. 0.2 on the x 0.1 range setting), or 0.2 micro Sv/hr.

Record background reading.

How to Survey

Using the instrument:

- Move the "F/S" switch to "F" (Fast response).
- Set the instrument selector switch to the most sensitive range of the instrument. If probe not already in a plastic bag or glove complete this step to protect it from possible contamination.

If two meters are available scan the patient prior to entering the decontamination tent:

- When entering the vicinity where patient is hold the probe out in front of your body in the direction of the patient to assess danger level for staff. If meter reads high or is over the normal range, back up from the patient and talk them through the decon process from a safe range. If the meter is reading on scale the area is safe for the staff member dressed in protective clothing to enter.
- Perform a general body scan to isolate the maximum reading. -- Locate the point that produces the most clicks. (Document the reading at this location.)
- Contamination Determination is a reading that is double or greater than background radiation.
- Decontaminate highly contaminated areas first, preventing runoff from contaminating wounds and unexposed areas prior to doing a full body scan. If clothing is contaminated it must be removed, placed in a sealed plastic bag and removed from the area so that it does not affect the survey readings.

If only one meter is available scan the patient after they have been decontaminated.

- Perform a general body scan to isolate the maximum reading. -- Locate the point that produces the most clicks. (Document the reading at this location.)
- Contamination Determination is a reading that is double or greater than background radiation.
- After decontamination and large areas of contaminate have been removed survey the whole body by holding the probe approximately 1/2 to 1 inch from the person’s skin, systematically survey the entire body from head to toe on all sides.

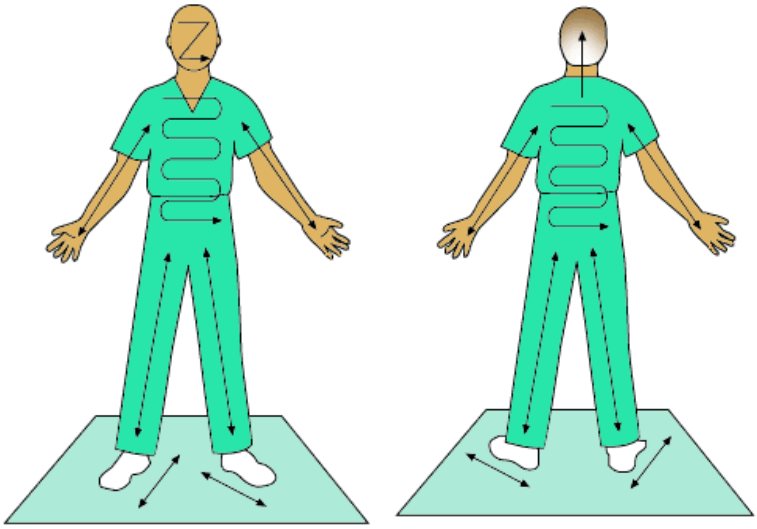
- Areas identified as being contaminated should be cleaned as survey is being performed.
    -- Move the probe slowly (about 1 to 2 inches per second).
    -- Do not let the probe touch anything.
    -- Try to maintain a constant distance.
    -- Pay particular attention to hands, face, and feet.

An increase in count rate or exposure rate above background indicates the presence of radioactive contamination.

-- When necessary, adjust the range of the instrument by moving the range selector switch.
-- Document time and radiation measurements.
-- In general, areas that register more than twice the previously determined background level are considered contaminated. For accidents involving alpha emitters, if the reading is less than twice the background radiation level, the person is not contaminated to a medically significant degree. If the accident circumstances indicate that an alpha emitter (such as plutonium) or low energy beta emitter could be a contaminant, a health physicist should always be consulted.

The following procedures are recommended for personnel monitoring:

1. Have the person stand on a clean pad.
2. Instruct the person to stand straight, feet spread slightly, arms extended with palms up and fingers straight out.
3. Monitor both hands and arms, then repeat with hands and arms turned over.
4. Starting at the top of the head, cover the entire body, monitoring carefully the forehead, nose, mouth, neckline, torso, knees, and ankles.
5. Have the subject turn around, and repeat the survey on the back of the body.
6. Monitor the soles of the feet.



Ending the radiation survey:

- Switch off the meter.
- Replace the cap on the meter probe.
- Take the batteries out.
- Put the Geiger counter back in its case.

Cleaning of equipment:
Equipment should be cleansed with soap and water after each use. Another detector will be needed to ensure the instrument is free of radioactive material.

MAINTENANCE
Storage of this equipment is per hospital protocol for other disaster equipment. Store the unit in the Watertight Protector Case. Store the batteries outside of the survey meter when not in use to prevent leakage.
Preventative maintenance for equipment includes removing the battery after each use.

Inspection and record keeping:
Calibration:
Calibration should be performed every year. The instrument should be calibrated with the exact detector with which it will be used. An electronic calibration alone is not sufficient to satisfy regulatory requirements. A calibration must include exposure of the detector to a known source and activity of radioactive material.

Use the check source on the side of the survey meter to verify that the unit is operational. The expected reading for the check source is listed on the side of the survey meter. This test needs to be completed on a monthly basis and prior to each use.

Inspection and record keeping Radiation Geiger-Mueller and Proportional Ionizing Radiation Detection

Date Inspected	Battery operational	Source check reading Within range?	Comments	Initials
		Reading: Within range:		
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