

A Typical EMS Standard Operating Procedure

Title:	Response Actions at Radiation Incidents	
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1.0 Background

Radiation incidents may come in different forms. Among these are “dirty” bombs, nuclear power plant accidents, nuclear weapons, and transportation accidents or fires involving radioactive materials. A “dirty” bomb is described as a conventional explosive combined with radioactive material, which is dispersed with an explosion. Release of radiation from transportation accidents is rare due to strict packaging and safety requirements.

2.0 Guidelines for Incident Management

- 2.1 Only units dispatched to the scene shall respond and approach the scene.
- 2.2 Approach site with caution. Approach the incident upwind and uphill of the site.
Position personnel and vehicles, a safe distance.
- 2.3 Establish incident command if not already established.
- 2.4 Detection. If radiological detection equipment is available on scene by another agency, obtain readings and position members outside of the radiation controlled zone. If no radiation detection equipment is already in use, utilize radiological detection devices per Radiation Detection and Metering S.O.P.
- 2.5 The controlled zone includes any area with readings of 2 mR/hr per hour or greater. The controlled zone boundary should be set up as close to the scene as necessary and in an as low a background radiation area as possible. The 2mr/hr limit is not primarily for personnel exposure control. In a multiple casualty incident the Incident Commander may allow timed operations in an area with an exposure of 2mr/hr or greater. However this limit is a useful boundary to set for examining surfaces of patients and equipment for contamination. Higher background limits would hinder your ability to monitor contamination on a patient.

3.0 Ensure safety of personnel.

- 3.1 Identify all hazards (danger of fire, explosion, toxic fumes, electrical hazards, structural collapse, secondary device etc.)
- 3.2 Don Personal Protective Equipment. For unidentified product this would include department issued protective outer garment, helmet, Scott AV 2000 face piece with NBC canister, boots and double gloves. Alternately, if it is confirmed that radiation only is the contaminate, a Tyvek suit, a N-95 face mask and double gloves should be

sufficient if approved by a supervisor/safety officer if particulate material in air is minimal.

3.3 Monitor changing conditions that could create hazardous situations.

4.0 Ensure radiation protection and contamination control

- 4.1 Limit entry to controlled area to as few personnel as possible. All members entering the controlled area must be logged in with the time recorded by a supervisor/safety officer.
- 4.2 Avoid direct contact with radioactive materials where possible. Utilize anything available for remote handling (shovels, branches, ropes, etc.) Maximize distance from radioactive sources. The chance of exposure to radiation decreases exponentially with any increase of distance.
- 4.3 Limit time near radioactive materials to the minimum necessary. Rotate staff as necessary. A supervisor must monitor times of any member inside the controlled area.
- 4.4. Do not allow eating, drinking, smoking, chewing or other activities within contaminated areas that might lead to intake of radioactive material.
- 4.5 Certain field personnel may be excluded from the controlled area for predetermined health reasons. i.e. pregnancy, radiation therapy. It is the member's responsibility to inform a supervisor in advance of any risk of exposure.
- 4.6 Determine radiation levels within the controlled area. This may be done by Hazmat teams, Bomb Squad unit State officials or supervisor / safety officer.
- 4.7 Monitor EMS personnel with dosimeters. In the active incident area TLD badges will be issued to all members. Electronic personal dosimeters or self-reading pocket dosimeters [pencil type] will be issued to EMS teams. These will be distributed by a supervisor / safety officer. The supervisor / safety officer will log total time of team operation in a controlled area, the collection of dosimeters and recording of readings.
- 4.8 Keep any exposure to radiation as low as reasonably achievable. Personnel conducting operations including triage or treatment at a radioactive incident should be limited to a 2.5 Rem exposure to the whole body. If at any time a dosimeter reads an accumulated dose of 2.5R it should be considered "a turn around and leave level" Under extreme circumstances, such as a life saving intervention the maximum exposure is 25 Rem if approved by the IC. Repeated exposure should be avoided, as dosages are cumulative.
- 4.9 Maintain distance. Even while working with or transporting contaminated patients, radiation exposure to the whole body will be limited by maintaining an arms length distance from the contaminated patient.
- 4.10 Potassium Iodide tablets may be supplied and should be taken within 4-6 hours after exposure to radioactive iodine. Typically, radioactive iodine is found as a result of a nuclear power plant accident or a nuclear bomb detonation, not after a dirty bomb.

- 4.11 All communications should be coordinated by Dispatch Operations protocols. Notify other state resource agencies through SOPs.
- 4.12 Dispatch Operations must notify hospitals of a radiological incident occurrence and that possible contaminated or exposed victims may have already left the scene by own means. Include levels of any scene readings in the notification.
- 4.13 Documentation
- 4.14 Record the names and addresses of all patients involved, including those who insist on leaving the area. The loading officer will record patients transported for medical attention.
The supervisor/safety officer will record the time spent at the incident of all members.

5.0 Guidelines for Emergency Medical Management of victims of a radiological incident.

- 5.1 Triage and tag all patients according to mass casualty incidents (MCI) protocols
- 5.2 Do not be overly concerned with the presence of radioactive material; it is improbable that emergency personnel will receive significant radiation injury during these operations.
- 5.3 Life threatening emergencies take priority over radiological concerns. Do not delay critical treatment and transport of a seriously injured, contaminated patient. Gross decontamination can be achieved with the simple removal of clothing. Full decon procedures should follow initial critical care.
- 5.4 Consider respiratory protection for patients if particular matter is visible in the air.
- 5.5 The primary objective of equipment and skin decontamination is to prevent internal contamination through ingestion or inhalation of radioactive materials and to minimize skin injury and ulceration from "beta" burns. While wearing PPE, remove patients clothing, flush previously exposed skin with water. Do not use irritants or methods that may abrade the skin as this could casue internal contamination. Dry and cover patient.
- 5.6 Stable patients should be surveyed for any evidence of radioactive contamination. The patient should be surveyed per the guidelines of the Radiation Detection and Metering S.O.P. Patients must be surveyed after decon to insure adequacy. Pay particular attention to areas around the nose and mouth were particles may have accumulated. It is possible to be exposed to a radiation source and not be contaminated. Such patients are no risk to others and will not require decon. All contaminated stable patients must be decontaminated prior to care and transport. This is done by removing clothing and trying to lift the contaminate with sticky tape or flushing with water. Note on the MCI tag that the patient has been decontaminated. If any source of radioactive contamination remains on a patient and cannot be removed (imbedded, internal) record the level on the MCI tag. Contamination remaining on a patient after decon attempts have failed should be covered with a dressing of some kind and blanket to prevent the spreading of

contamination. If any radioactivity was noted on the patient prior to decontamination that level should be noted as well on the MCI tag.

5.7 Patient belongings should be bagged and marked for identification with the patients name and secured at the scene.

6.0 Loading and Transport

6.1 Move the ambulance cot or long board to the clean side of the control line and unfold a clean sheet or blanket over it. Place the victim on the covered cot and package for transport. Cover the victim by folding the stretcher sheet or blanket over and securing them in the appropriate manner.

6.2 If possible, personnel who have not entered the controlled area should transport the clean victim. If this is not possible, members should remove any contaminated clothing and be decontaminated prior to transporting from the scene.

6.3 If time permits the transporting ambulance should be prepared by: placing a sheet on the floor, relocating all unessential bags and equipment from the patient compartment, close all cabinet doors and cover exposed equipment.

6.4 The Loading officer in conjunction with a recording assistant will obtain point of entry through C-MED.

6.5 Follow the hospital's radiological protocol upon arrival at hospital.

6.6 The ambulance and crew should not return to service until the crew, vehicle, and equipment have undergone monitoring and if necessary decontamination by a radiation safety officer. Per the Radiation Detection and Metering S.O.P.