

## 1.0 PURPOSE

The purpose of this Model Procedure is to identify precautions and provide guidance to Medical Examiners/Coroners on the handling of a body or human remains that are potentially contaminated with radioactive material.

## 2.0 SCOPE

This procedure outlines precautions and provides guidance to protect personnel involved in the recovery and disposition of a potentially radiologically contaminated body/human remains. The precautions and guidance outlined in this procedure are general and should not be considered all-inclusive. Medical Examiners/Coroners should already be aware of necessary precautions when handling a body/human remains which may have been exposed to hazardous materials. The documents referenced in Section 6.0 are an excellent resource for additional information on precautions for handling and decontaminating human remains.

## 3.0 RESPONSIBILITIES

Medical Examiners/Coroners who respond to a transportation incident involving a body/human remains that are potentially radiologically contaminated should perform the following:

- 3.1 Report to the Incident Command Post and coordinate identification, collection, and packaging activities with the Incident Commander.
- 3.2 Maintain established incident scene contamination control boundaries as established by the Incident Commander.
- 3.3 Utilize available monitoring resources provided by the Radiation Authority or other qualified person/agency to determine radiological contamination levels of the body/human remains.
- 3.4 Do not remove body/human remains or personal belongings from the area until the appropriate label/tag has been applied.

## 4.0 RECORDS

Follow local or jurisdictional procedures for records retention. The following items, included in this Model Procedure, should be recorded:

- 4.1 Radioactivity Tag (Attachment 1).
- 4.2 Radioactivity Report Form Accompanying Body/Human Remains (Attachment 2).
- 4.3 Contamination Survey Data Sheet (Attachment 3).

## 5.0 FREQUENCY

Use this procedure as needed.

## 6.0 ADDITIONAL REFERENCES

- 6.1 *Radiation Accidents* (March 1999), A Guide for Medical Professionals On Handling, Transporting, Evaluating and Treating Patients Accidentally Exposed To Radiation or Contamination with Radioactive Materials, Prepared by the Illinois Department of Nuclear Safety
- 6.2 *U.S. Department of Health and Human Services (HHS) Health and Medical Services Support Plan for the Federal Response to Acts of Chemical/Biological (C/B) Terrorism*, June 1996
- 6.3 *Precautions in the Management of Patients Who Have Received Therapeutic Amounts of Radionuclides*, NCRP Report No. 37, Fifth Reprinting August 1995
- 6.4 *Handbook of Health Physics and Radiological Health*, Third Edition
- 6.5 *Managing Hazardous Materials Incidents, Volume II*, Hospital Emergency Departments; A Planning Guide for the Management of Contaminated Patients, U.S. Department of Health and Human Services
- 6.6 *Mortuary Affairs Decontamination of Human Remains*, Appendix D Decontamination of Human Remains, Joint Chiefs of Staff Publication, Phillip R. Wagner

## 7.0 SAFETY

- 7.1 Respond and perform duties within boundaries identified by the Incident Commander.
- 7.2 Utilize protective clothing precautions as outlined by organizational procedures or as identified by the Incident Commander.

## 8.0 TERMS/DEFINITIONS

**Cold Zone** - Also referred to as the support zone, the cold zone is a contamination-free zone established around the warm zone where emergency operations can be directed and supported. The cold zone is normally established in an area where radiation levels are at natural background levels.

**Contamination** - As referred to in this document, contamination is undesired radioactive material that is deposited on the surface of or inside structures, areas, objects, or people.

**Contamination Control Zone** - An isolation zone that is typically set up around a hazardous incident site to control the spread of hazardous substances. See hot zone, warm zone, cold zone.

**Decontamination** - The reduction or removal of contaminating radioactive material from a structure, area, object, or person. Decontamination may be accomplished by: use of a tape press or wiping the surface (dry decon); washing or flushing the surface with water or other solution (wet decon); or allowing the material involved to decrease in radioactivity through natural radioactive decay.

**Hot Zone** - Also referred to as the exclusion zone in some jurisdictions. According to the ERG, the initial hot zone for radiological material should be established 75 feet around the spilled material. Access to the hot zone should be controlled for accountability and contamination control purposes.

**Incident Commander (IC)** - The person responsible for all decisions relating to the management of the incident.

**Radiation Authority** - A federal, state, or tribal agency designated official. Responsibilities include evaluating radiological hazard conditions during normal operations and emergencies.

**Radioactivity** - The spontaneous emission of radiation, generally alpha or beta particles, often accompanied by gamma rays, from the nucleus of an unstable isotope. Also, the rate at which radioactive material emits radiation.

**Radioisotope (radionuclide)** - An unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation. Approximately 5,000 natural and artificial radioisotopes have been identified.

**Radiological Survey** – Usually performed by the Radiation Authority, a radiological survey is performed using a radiation detection instrument specially adapted for inspecting an area or individual to establish the existence and amount of radioactive material present.

**Warm Zone** - Also referred to as the contamination reduction zone, the warm zone is usually established around the hot zone to provide a buffer between the hot and cold zones. Decontamination often takes place in the warm zone.

## 9.0 PROCEDURE

- 9.1 Upon your arrival at the scene, contact the Incident Commander for a briefing on the incident scene hazards, location of control zones, and activities that have already taken place.
- 9.2 If you are not informed of the radiation hazards and persons that will provide you assistance in disposition of the body/human remains, inquire about radiation/contamination monitoring services that are available from the local hazardous materials team, state Radiation Authority, or federal resources.
- 9.3 Discuss with the Radiation Authority the need for protective clothing. If protective clothing is recommended, the clothing will more than likely be similar to the clothing worn for protection of air and bloodborne pathogens.
- 9.4 As directed by the Incident Commander, enter the incident scene with a Radiation Authority escort. The Radiation Authority should monitor the incident scene as you enter and inform you of any radiation/contamination hazard present.
- 9.5 Conduct necessary incident/accident investigation procedures (pictures, identification, damage assessments, cause, etc.). Do not touch the body/human remains at this time.
- 9.6 Have the Radiation Authority escort conduct a radiological survey of the body/human remains. Upon completion of the radiological survey and

identification of contamination areas, completion of incident/accident investigation procedures (movement of the body/human remains) can be completed.

- 9.7 Conduct a gross decontamination of the contaminated body/human remains. This includes the removal of all outer clothing (shirt, shoes, pants, etc.). To assist in the identification of the body/human remains, all pockets shall be searched and any personal belongings (wallet, jewelry, watches, etc.) found, should be placed in a plastic bag. The removed clothing should remain at the incident scene for proper disposal by the cleanup team. However, if the Medical Examiner/Coroner determines the clothing could assist in the investigation and the clothing is to be shipped with the body/human remains, Step 9.13 outlines when the removed clothing can be placed in a plastic bag and shipped with the body/human remains.

*Note: The Radiation Authority will use standard contamination control practices (monitoring, double gloving, tagging, etc.) when bagging potentially contaminated items.*

- 9.8 Upon completion of the gross decontamination process, have the Radiation Authority conduct an additional radiological survey of the body/human remains to determine contamination levels.
- 9.9 If the Radiation Authority determines that contamination is still present, continue with the remaining steps of this procedure. However, it is possible that the gross decontamination process conducted in step 9.7 could eliminate previously identified contamination. If this occurs, the Radiation Authority can release the body/human remains as “radiologically clean” and custody of the body/human remains can be turned over to the Medical Examiner/Coroner for routine processing.
- 9.10 The Radiation Authority should tag the body/human remains with a radioactivity tag or provide such a tag to the Medical Examiner/Coroner (see Attachment 1).
- 9.11 The body/human remains should be placed in a body bag/pouch at this time. A blanket should be placed on the ground before lying the body bag/pouch down; this will help prevent contamination, which may be present on the ground, from getting on the outside of the body bag/pouch.
- 9.12 Any personal belongings removed from the body/human remains and previously placed in a plastic bag in step 9.7 should be placed inside the body bag/pouch.
- 9.13 If the clothing removed during the gross decontamination process will be useful in the forensic investigation, the contaminated clothing should now be placed in a plastic bag and tagged with a radioactivity tag (see Attachment 1). This bag should also be placed inside the body bag/pouch.
- 9.14 The Radiation Authority should also tag the body bag/pouch with a radioactivity tag (see Attachment 1) identifying the contents, radiation/contamination levels,

and their location on the body. The Radiation Authority may provide such a tag for application to the body bag/pouch.

- 9.15 Move the body bag/pouch containing the body/human remains to the incident scene hot zone control line.
- 9.16 Have the Radiation Authority perform a contamination survey on the body bag/pouch before transferring the body bag/pouch to the warm zone.
- 9.17 Transfer the body bag/pouch to the warm zone.
- 9.18 The Radiation Authority will need to survey the external surfaces of the body bag/pouch for contamination again before it transfers to the clean area. If contamination levels exceed acceptable limits, the exterior of the body bag/pouch will need to be wiped down (decontaminated) before it can be released to the clean area or it will need to be placed inside a second body bag/pouch to control the contamination.
- 9.19 Once the Radiation Authority determines that the outside of the body bag/pouch is free of contamination, the Medical Examiner/Coroner can take possession of the body/human remains and transport them to the appropriate facility for additional decontamination.

*Note: The Radiation Authority will need to ensure that transport of the body is done in compliance with state and federal transportation requirements. The Radiation Authority will provide escort, or special instructions, for transfer to the selected decontamination facility. A morgue, because of its inherent equipment and accessibility, will be the most likely location for additional decontamination to take place.*

- 9.20 The Radiation Authority will assist in decontamination of the body/human remains. This includes preparation of the decontamination facility and radiological monitoring. Dry decontamination is the preferred method and should be attempted first. If wet decontamination is used, special care should be taken to collect all run-off solution. All material from decontamination efforts will need to be properly packaged, labeled, and disposed of. If it is determined that the body/human remains are internally contaminated, the Medical Examiner/Coroner should work very closely with the Radiation Authority to determine exposure risk and the best method to conduct embalming. Determining the type of radioactive contamination (radioisotope) can also be very useful. Once identified, the Radiation Authority can determine if radioactive decay should be considered as a method of decontamination.

*Note: If necessary, the Radiation Authority can take samples from the body/human remains and with the use of specialized equipment, determine the radioisotope(s) present.*

- 9.21 Once the radiation/contamination levels are at or below acceptable levels, the Radiation Authority will release the body/human remains for embalming and burial. If radiation/contamination levels are determined to be above regulatory limits, the Radiation Authority should ensure the embalming process is carried

out in an appropriate facility and necessary precautions are taken to protect persons performing the embalming.

- 9.22 The Radiation Authority or designated disposal contractor will be responsible for proper disposal of all waste generated from the decontamination effort, autopsy, or embalming.
- 9.23 The Radiation Authority and Medical Examiner/Coroner should determine or consult with a higher medical authority (REAC/TS) on the need to attach a Radioactivity Report (see Attachment 2) to the death certificate.

ATTACHMENT #1 – RADIOACTIVITY TAG

ATTACHMENT #2 – RADIOACTIVITY REPORT FORM

ATTACHMENT #3- SURVEY DATA SHEET