

# Georgia Hospital Decontamination Program Guidance

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Table of Contents

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Hospital Decontamination Workgroup Members .....3

Introduction.....4  
    Definition, Goal, Objective, Assumptions and Format

Background .....5  
    Scope, First Receivers, Guidance Standards and Liability

Developing your Hospital Decontamination Program.....9

Hospital Decontamination Teams.....10

Personal Protective Equipment .....12  
    Recommended PPE  
    PPE in the Pre-Decontamination Zone  
    PPE in the Post-Contamination Zone

Training of Hospital Personnel.....20  
    Awareness Level Training  
    Operations Level Training

Hospital Decontamination Drills and Exercises.....24

Training Resources.....24

Summary: OSHA Guidance on Training for First Receivers.....25

Hospital Decontamination – System Components.....26

Decontamination Facility Set-up.....26

Decontamination Site Planning Considerations .....28

Response Overview.....29

Decontamination Considerations During a Radiologic Event.....30

Summary.....33

References.....34

Appendix A: Decontamination Equipment Supplies List –  
    Purchasing Requirements.....35

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## INTRODUCTION

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### **Definition:**

Hospital Decontamination: To treat victims exposed to a hazardous substance and/or remove the hazardous substance from the victims as quickly as possible and prevent the spread of contamination to other victims, staff, visitors and the physical environment.

### **Goal:**

The goal for Georgia hospitals with emergency departments is to adopt a standardized approach toward victim decontamination. A basic component of this approach is the capability to begin the decontamination process within 20 minutes, 80% of the time, following notification of a victim exposed to a hazardous substance.

### **Guidance Objective:**

The objective of this planning guidance is to assist Georgia hospitals with emergency departments in developing and/or maintaining a standardized hospital-wide decontamination program and which is compliant with federal requirements for worker health and safety.

### **Planning Assumptions:**

This Hospital Decontamination Planning Guidance assumes the following:

- hospital decontamination plans are built upon and compatible with the hospital's Emergency Operations Plan(EOP) and Incident Command structure.
- hospital decontamination plans are developed in conjunction with community partners: Fire Department, Emergency Medical Services(EMS), local Emergency Management Agencies(EMA), local and district Public Health and others as identified.
- the hospital is not the site of the hazardous substance release.

### **Format:**

The format of this guidance includes a list of steps and system components which are recommended for hospitals with emergency departments within Georgia, followed by specific components of hospital decontamination plans/programs including:

- designated responsible person to oversee the hospital decontamination program.
- decontamination teams
- personal protective equipment
- training and sustainability
- system components of hospital decontamination



*Note: All references to hospitals within this document refer to hospitals with emergency departments.*

## Background

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### **Scope:**

Disasters, natural or manmade, can occur in rural and urban settings; the unintentional agricultural pesticide event or poultry plant ammonia release can produce casualties as serious as an urban terrorist event. Past disasters have demonstrated that hazardous substance events do not respect city, county, or state borders.

Though there is no national reporting system for hazardous substances events, the following information from a 15 state hazardous substances surveillance reporting system demonstrates the magnitude of hazardous substances events and the impact of these events may have on surrounding hospitals(ref: HSEES, 2005).

- *Of approximately 25, 000 hazardous substance emergency events reported in 15 states over a 3 year period (2003-2005), 75% occurred at chemical facilities and 25% occurred during transportation.*
- *Of these reported events, there were approximately 5700 victims with 3078(54%) treated at hospitals.*
- *Of the 5,175 victims for which decontamination status was known, approximately 356(7%) victims were decontaminated at medical facilities.*

When compared to conventional disasters, the significant difference in responding to hazardous substance incidents is the presence of chemical contamination of the environment and casualties from the incident. In general, during a hazardous substances event, fire departments decontaminate victims at the scene prior to transportation to the hospitals. However, during mass casualty hazardous substance incidents, first responders may not be able to decontaminate large number of contaminated/exposed victims.

Ambulatory victims do not always wait at the scene to be decontaminated. They self-refer to the nearest hospital and enter the hospital through any common public entryways sometimes even before the hospital has been notified of a hazardous substance event. Arrival of self-referred contaminated victims put hospital employees and the facility at risk of exposure to hazardous substances. All hospital employees must be aware of the potential dangers associated with victims exposed to hazardous substances.

**JAPAN:** A worst case real-life scenario happened in 1995 during the Tokyo Sarin Subway event where 640 contaminated victims presented at the hospital emergency department: 23% of hospital staff dealing with chemical contaminated casualties suffered from symptoms due to secondary exposure to chemicals off gassing from the casualties' clothing. (Ponampalam,2003)



- Closer to home, hazardous substances events due to occupational or transportation accidents are more probable than terrorist events.
- Emergency department staff caring for victims contaminated with toxic chemicals are at risk for developing toxicity from secondary contamination. (Geller, 2001)
- Decontamination of exposed victims is a necessary precursor to the treatment and care of victims in the emergency department order to protect the integrity of hospital staff and facilities.

**SOUTH CAROLINA:** The Graniteville, SC train derailment and resulting Chlorine release in 2005, also taught us that hazardous substance events occurring in neighboring states can impact our medical facilities and capabilities, and stretch available resources. (Photo source: Environmental Protection Agency, Region 4, Southeast.)  
[http://www.dot.gov/disaster\\_recovery/resources/TrainWreckChlorineSpillGranitevilleSC.pdf](http://www.dot.gov/disaster_recovery/resources/TrainWreckChlorineSpillGranitevilleSC.pdf)



April 2014

*Note:* Hospital care for a person exposed to hazardous materials should begin with adequate planning well before the incident occurs.

### **Hospital Decontamination:**

The objective of decontaminating a victim exposed to hazardous substances prior to entry into a hospital facility is to protect the victim from further exposure, and to protect the hospital staff and facility from secondary contamination. Hospital decontamination is essentially removing the victims' contaminated clothing, showering them with water to remove any contamination on their person, providing them with temporary clothing for entry into the emergency department for treatment.

### **First Receivers:**

Hospital employees are considered first receivers. This differs from emergency first responders (e.g. EMS, law enforcement and fire service) because they work at a site remote from where the hazardous substance release occurred. It is assumed that their exposure is limited to material transported to the hospital on the victims' skin, hair or clothing.

While emergency first responders at the site of the release are covered under the Occupational Safety and Health Administration (OSHA) Standards on Hazardous Waste Operations and Emergency Response (HAZWOPER), OSHA recognizes that first receivers require somewhat different training and personal protective equipment (PPE) and developed an OSHA guidance entitled: Best Practices for Protection of Hospital-Based First Receivers document.(OSHA, 2005)

The OSHA Best Practices document provides practical information to help hospitals address employee protection and training as part of emergency planning for single victim exposure up to events involving mass casualties. It encourages sound planning by hospitals as the first line of defense in all types of emergencies and encourages hospital emergency plans to reflect the reasonably predictable "worst case" scenario under which first receivers might work. Accreditation agencies require an "all hazards" approach to allow hospitals to be flexible enough to respond to emergencies of all types, whether natural or manmade.

Decontamination capabilities of Georgia Hospitals vary widely based upon hospital size and services. Hospitals located in highly populated urban areas are more likely to receive larger number of victims from a mass casualty incident than hospitals in less populated areas. However it is important to remember that the smaller rural hospitals may become quickly overwhelmed by a smaller number of contaminated victims, effectively making the incident a mass casualty scenario.

### **Guidance Standard:**

With the understanding that the decontamination capability of Georgia hospitals will vary with facility size and services, the goal for Georgia hospitals with emergency departments is to adopt a standardized approach toward patient decontamination. A basic component of this approach is the capability to begin the decontamination process within 20 minutes, 80% of the time, following notification of a victim exposed to a hazardous substance; with the realization that hazmat incidents may require hospitals to decontaminate more than one victim.

April 2014

While the technical expertise required to successfully implement decontamination protocols at a facility rests with a trained and equipped decontamination team, it is necessary for all hospital employees to have a level of awareness of hospital decontamination procedures designed to protect the facility and staff from exposure and contamination.

Because hospitals may be confronted with victims that have been exposed to Chemical, Biological, Radiological, Nuclear, or high yield Explosive (CBRNE) contamination from natural or manmade disasters, Georgia hospitals must maintain a hospital-wide decontamination program that meets recommended decontamination standards, and is compliant with published requirements for worker health and safety (OSHA 29 CFR1910.120).

**Liability:**

Failure to have an adequate plan to attend to victims of a hazardous substance event can result in injury to hospital employees and subsequent liability.

In order to protect their employees, hospitals benefit from emergency planning for responding to incidents involving hazardous substances. Emergency first responders at the scene of the incident, including fire, law enforcement, and emergency medical personnel, are covered by the requirements of OSHA's Standard on Hazardous Waste Operations and Emergency Response (HAZWOPER), or by parallel state standards in states with OSHA-approved State Plans.

Since the extent of a hazard to hospital employees (first receivers) can differ from that at the release site, OSHA has developed letters of interpretation which help clarify when and how the HAZWOPER Standard applies to first receivers. (ref: OSHA) This OSHA document provides useful information on how to provide adequate protection for hospital employees who are first receivers during incidents involving hazardous substances.

Hospital Decontamination Plans are an essential part of an overall strategy to protect employees, victims, visitors, victims, and the facility from secondary contamination carried to the hospital by people contaminated with hazardous substances seeking medical aid. Having a decontamination plan helps to reduce potential liability of the hospital by meeting their Emergency Medical Treatment & Labor Act (EMTALA), Centers for Medicare and Medicaid Services (CMS, The Joint Commission (TJC) and other accreditation agencies requirements and standards.(Medscape, 2011)

## Developing your Hospital Decontamination Program:

The following steps and components are recommended for all hospital Decontamination Programs. Please note that this list is not all inclusive and that the development and sustainability of your hospital's Decontamination Program will be dependent upon the resources and capabilities of your individual hospital.

- Define the purpose of hospital decontamination
- Conduct Risk Assessment for a Hazmat Event
- Based upon your hospital's Hazard and Vulnerability Assessment (HVA) and in conjunction with your county Emergency Management Agency's HVA, establish scope, goals, and objectives of your hospital's decontamination program.
- Define authority for establishment of the program, including regulatory requirements (OSHA 29 CFR 1910), Hospital Accreditation Standards and Hospital Policy.
- Designate responsibilities for development and oversight of the Hospital Decontamination Program (e.g., Hospital Safety Council, Emergency Response Committee, etc.)
- Identify Hospital Decontamination Team
- List required Personal Protection Equipment(PPE)
- Identify Training requirements
- Identify equipment and scheduled maintenance
- Develop written plan including: procedure(s) on notifications, site set up procedures, hazard material containment, lock down/security measures, triage & treatment, Hospital Decontamination Team safety considerations, recovery and post incident management, post event notification & documentation, After Action Report/Improvement Plan (AAR/IP) & Action Plan, performance improvement measures.

*Note:* Hospitals should also be prepared to decontaminate first responders who transport victims, such as EMS personnel.

## Hospital Decontamination Teams

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Hospitals must develop and maintain their own all-hours decontamination capability and establish a decontamination team. Hospital decontamination teams should be designed to support decontamination operations, by providing trained personnel and a standard cache of equipment. This requires a significant amount of organizational and institutional commitment. However, existing resources both within and external to the hospital may help to reduce the effort.

At each hospital, clear leadership for the decontamination response must be established. This leadership may come from the environment of care committee which has expertise in general safety, security, hazardous materials, emergency management, life safety, medical equipment and utilities. The emergency department brings victim management, disaster response, and clinical care expertise. Additional stakeholders such as facility engineering staff, medical and nursing administration services must be identified and involved.

Since not all emergencies occur during 9-5 weekday business hours, when identifying Decontamination Team members, consideration should be given to facility staffing patterns. Team membership should include staff from all work shifts, including weekends and holidays. Consideration should be given to identifying what type of personnel will be required to fulfill the following decontamination functions:



### **Hospital Decontamination Team Functions:**

- *Decontamination Leadership:* organizes and directs decontamination incident response activities and coordinates with hospital incident command for overall victim support
- *Decontamination Safety:* monitors the decontamination area and assures the overall safety of the team.
- *Decontamination Set Up/Support:* set up and provide supplies to the decontamination area and coordinate clean-up activities.
- *Decontamination Triage:* prioritizing victims for decontamination
- *Victim Decontamination:* facilitate and/or perform decontamination and clear victim for post-decontamination triage.

*Note:* Several of these functions may be assigned to one team member.

### **Job Action Sheets:**

- should be developed for all functions identified in the hospital's Decontamination Program.
- should be reviewed during training sessions and exercised as part of the hospital's Decontamination Program.
- Sample Job Action Sheets can be obtained through the California Emergency Medical Services Authority (<http://www.emsa.ca.gov/hics/default.asp>) and Hazmat for Healthcare (<http://www.hazmatforhealthcare.org>).

*Note:* Though basic hospital decontamination methods are recommended for victims exposed to radiation, a separate guidance will be developed to address specific issues in regard to decontamination, training and risk communication during a radiologic event.

*Note:* The use of PPE (i.e., inspection, donning, doffing, and maintenance) must be included in the hospital's Decontamination Team training program.

### **EMERGENCY ROOMS REOPEN AFTER CHEMICAL-SPILL LEADS TO QUARANTINE OF VICTIMS**

September 1, 2008 AP ST. LOUIS — One of eight people sickened by a dangerous chemical spilled at an Illinois packaging plant remained hospitalized Monday as crews continued cleaning up the mess blamed for shutdowns of emergency rooms at two Missouri hospitals. Officials said the chemical appears to be nitroaniline, a highly toxic material used in the synthesis of dyes, antioxidants, pharmaceuticals and gasoline. Emergency departments at St. Louis County's SSM DePaul Health Center and St. Anthony's Medical Center reopened Sunday, a day after being closed under quarantine when some victims of the previous day's chemical release at Ro-Corp. in East St. Louis, Ill., came seeking treatment. Both emergency rooms were cleared to open after being thoroughly decontaminated, the hospitals said.

## Personal Protective Equipment (PPE)



Personal Protective Equipment(PPE) is any device, equipment or clothing worn or used by workers to protect against injury from, or exposure to, the hazardous conditions they encounter while performing their duties. The major components of PPE include respirators, ear and eye protection, chemical protective suits, boots and gloves.

There are two basic types of personal protective equipment: skin and respiratory. Based upon the level of protection required, there are four levels of Personal Protective Equipment(PPE) recognized by regulatory agencies: Level A, Level B, Level C & Level D. (Table 1)

**Table 1: Levels of Personal Protective Equipment**

	<b>Skin</b>	<b>Respiratory</b>	<b>Comments</b>
Level A	Vapor Protective (also known as gas tight or fully encapsulating)	Atmosphere Supplying Respirator (Self Contained Breathing Apparatus [SCBA] or Supplied Air Respirator [SAR])	Highest level of skin and respiratory protection.
Level B	Liquid Splash Protection	Atmosphere Supplying Respirator (Self contained breathing apparatus [SCBA] or Supplied Air Respirator [SAR])	Lower level of skin protection with highest level of respiratory protection
Level C	Liquid Splash Protection	Power Air-Purifying Respirator [PAPR]	Lower level of skin and respiratory protection
Level D	Limited protection	No respiratory protection	Standard Precautions

## **Recommended Personal Protective Equipment (PPE)**

Based upon OSHA's Best Practices for Hospital-Based First Receivers(OSHA 3249-08N 2006) and ATSDR's Managing Hazardous Materials Incidents(ATSDR, 2001), the following personal protection equipment (PPE) recommendations are for hospital first receivers who may be working with patients contaminated with either chemical, biological or radiological substances. PPE recommendations are made with the assumption that the hospital is not within the hot zone of an incident.

PPE recommended for hospital first receivers is Level C+ (Level C with additional respiratory protection), and consists of;

- 1) A powered air-purifying respirator (PAPR) with chemical cartridges,
- 2) A chemically resistant suit,
- 3) Double gloves, and,
- 4) Chemically resistant boots.

*Note: Hospital's hazard vulnerability analysis (HVA) will determine if their specific needs exceed the recommended PPE equipment document.*

**Powered Air Purifying Respirator and Filter Cartridges** Several styles of PAPRs are currently available including those with tight fitting face masks, and units that contain both full length and partial (chin strap) loose fitting hoods. PAPRs do not provide oxygen, and are not permitted for use in oxygen deficient atmospheres. The current recommendation for first receivers is to use PAPRs with full length loose fitting hoods (see figure 1). In most settings single use hoods that are constructed from a chemically resistant material provide adequate protection. Full length hoods do not have a chin strap, but rather fit loosely around the shoulders of the wearer. Examples of appropriate PAPRs include;

- 1) The 3-M Breatheasy 10 system,
- 2) The Scott Prowflow II system, and,
- 3) The Bullard PA30 system.

**Filter Cartridges** are employed to protect the user from both particulates and a wide variety of chemical vapors. Figure 1. PAPR system with motor, battery, flow rate meter, and loose fitting full length hood



Figure 1

While no filter cartridge can protect users from all hazards, hospitals should select cartridges that are rated to protect users from particulates (P-100 rating), acid gases, and organic vapors. Examples of appropriate cartridges include;

- 1) 3-M model FR-57,
- 2) Scott NBC cartridges, and,
- 3) Bullard acid gas/organic vapor/P-100 cartridges.

Filter cartridges have a shelf life from 5 to 10 years. Criteria should be developed for replacing used/expired chemical cartridges and should be replaced at the first sign of breakthrough (chemical odor, user irritation, watery eyes etc.).

*Note:* It is best to purchase both PAPRs and cartridges that are manufactured by the same company. The battery that is recommended by the manufacturer of the PAPR should be employed, and may vary depending on the chemical cartridge that is used with the PAPR.

*Note:* Expired cartridges can be used as training aids, but must not be used in real life situations.

**Battery Selection:** Most PAPRs are available with a choice of batteries including disposable alkaline, rechargeable (NiCd and NiMH), and non-rechargeable (lithium). While all three choices are acceptable, certain limitations are associated with each:

*Alkaline batteries* have a limited shelf life and can run out of power during standard equipment use. A fresh set of batteries should be provided before each use.

*Rechargeable batteries*, initially, must be conditioned by running them through two or three charge cycles (charge, drain, recharge). They must also be charged monthly and need to be replaced when they start to fail to hold a full charge (typically 2 – 3 years after initial charge).

*Note: The typical life of a rechargeable battery is on the order of 2 – 3 years. After this they should either be replaced or used with caution.*

*Lithium batteries* maintain sufficient charge for up to 10 years but are relatively expensive. It is important to keep track of the length of time used, e.g. if rated for 8 hours of use, and has been used for 3 hours, it only has 5 hours remaining.

*Note: It may be beneficial to use either alkaline or rechargeable batteries for training, and lithium batteries for real life events.*

**Suits:** While no suit will protect the wearer from all chemical hazards, suit selection should be based upon a hospital's HVA. Light weight and inexpensive suits such as Tyvek QC and Tychem QC, provide minimal protection against many chemical agents and should be used with caution. Chemical resistance charts are available from manufacturers that provide data on a given suits ability to resist chemical permeability. Examples of level C suits that provide more than minimal protection include;

- 1) Kappler Zytron 300,
- 2) Tychem SL, and,
- 3) Dupont CPF 3

Suits with sealed seams typically provide more protection. However, if suit seams are not sealed, they should be taped with a chemically resistant tape. Suits with attached hoods and booties, are not necessary. It is better to use suits that are slightly oversized than undersized, and excess suit material can be taped down as needed.

*Note: While duct and masking tapes are acceptable for training purposes, chemically resistant tape should be used for all incidents that may involve chemical contaminants.*

**Double Gloves:** Employing two sets of gloves constructed of different materials provides the best protection. Excellent chemical protection can be achieved by using the following combination;

- 1) Inner glove – Butyl rubber, 14” length, thickness of at least 8 mil
- 2) Outer glove – Nitrile, 10” length, thickness of at least 4 mil

*Note: Nitrile gloves are inexpensive and can be replaced frequently. If butyl gloves are not available, nitrile gloves 14” long and a 10 mil minimum thickness can be used in their place.*

**Chemical Resistant Boots** that are rated to provide light chemical resistance are adequate. Steel toes and shanks are recommended, and one piece injection molded boots are preferable and should be a minimum of 8 inches tall. Examples include;

- 1) Servus Pro+ steel toed boots,
- 2) Onguard Polymax Ultra, and,
- 3) Tingley Hazproof.

*Note: Boots may need to be oversized to accommodate chemically resistant suits that contain booties.*

**Storage:** All PPE equipment should be stored in a temperature controlled (between 50 and 90 degrees F) area, be inspected regularly and replaced as needed. In order to be ready to use, rechargeable batteries must be maintained monthly.

**OSHA RESPIRATORY PROTECTION PROGRAM:** OSHA standards (29CFR1910.134), require hospitals that use respirators to develop a written respiratory protection program that addresses the following issues;

- 1) Method of selecting a respirator,
- 2) Medical evaluation of persons who will wear respirators,
- 3) Fit testing procedures (not required with PAPRs equipped with loose fitting hoods),
- 4) Procedure for proper use of respirators,
- 5) Procedures for cleaning, storing, inspecting and maintaining respirators,
- 6) Training of employees that addresses potential hazards to which they may be exposed,
- 7) Training of employees in the proper use of their respirator,
- 8) Procedure for determining when a cartridge needs to be replaced, and,
- 9) Routine evaluation of the effectiveness of the respiratory protection program.

## PPE within the Decontamination Zone

This guidance recommends two types of Level C PPE for hospital personnel working in the hospital decontamination zone: 1) respiratory protection and 2) skin protection. This document also adheres to OSHA Best Practices document for minimum standards for PPE:

- Respiratory Protection in the Hospital Decontamination Zone:
  - Powered Air-Purifying Respirator (PAPR), provides a protection factor of 1,000. Respirator must be National Institute for Occupation Safety and Health (NIOSH) approved. (Medical Assessment information...training/use)
- Skin Protection in the Hospital Decontamination Zone:
  - Chemical protective gloves
  - Chemical resistant suit and tape
  - Chemical protective boots

## PPE in the Post-Decontamination Zone

Following the OSHA Best Practices, hospital personnel working in the hospital post-contamination zone that are receiving 'clean' victims and working in an enclosed environment need respiratory and skin PPE because victims may not be completely decontaminated. These include normal work clothes and PPE, as necessary, for infection control purposes

## Recommended Equipment Resources

One of the intentions of this guidance is to make an effort to standardize regional assets/resources within Georgia. In addition to those cited within the text, below are several examples of recommended PPE equipment:

- **Level C Tyvek Suits without hoods, with or without booties** :e.g., Dupont CPF3, Kappler Zytron 300 or equivalent
- **Gloves(triple glove protection)**: e.g., Nitrile Gloves(14”), Nitrile Exam Inner Gloves
- **Boots**: Light hazard knee boot(medium/large sizes)
- **PAPR with loose fitting hood: Mil-C-51251A for resistance to chemical and biological weapons, NIOSH Approved TC-23C-2071**; e.g., 3M Breathe Easy or equivalent,
- **PAPR Filters - UN Standard 33 mm threads**: e.g., FR-57 or equivalent
- **Tape that meets the ASTM F1001 test battery**: e.g., Kappler Chem Tape or equivalent

## Decontamination Equipment

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The objective of hospital decontamination is to employ a high volume low pressure deluge of water to decontaminate patients. Water spigots typically do not provide a high enough volume of water to accomplish a deluge, and hospitals are encouraged to identify alternative sources of water including fire hydrants. Two different options are available for producing a deluge of water using a fire hydrant including:

- 1) The Trident One system (<http://tridentone.com/>) with appropriate hoses and wrenches,
- 2) The HZ5Z Decon. Deluge Hose System available from Hot Zone and GHA.
  - a. Includes
    - i. 3 - 1 1/2 Single Jacket Mill Hose NPSH (50 feet each)
    - ii. 1 - 2 1/2 Single Jacket Mill Hose NST to come off of the hydrant (50 feet each)
    - iii. 3 - 1 1/2 E Nozzle
    - iv. 1 - Spanner Wrench
    - v. 3 – Hoses (garden hose 50 feet)
    - vi. 3 - Spray Nozzles
    - vii. 1 - Adj. Hydrant Wench

In order to produce a deluge of water while reducing the risks associated with electrical shock, both systems employ E nozzles. The HZ5Z kit contains all of the hoses, connectors, and wrenches necessary to connect to a fire hydrant.

While more expensive than the HZ5Z kit, the Trident One system affords a user the advantage of setting up a standalone decon line: it can either be connected directly to a fire hydrant, or placed on the ground.



Fig. 2 Standalone Trident One



Fig 3. HZ5Z Deluge E Lines

## **Additional Equipment**

Although not specified, hospitals may also consider purchasing the following decon equipment:

- Decon. tent
- Radiation survey meter
- IC vests
- Outdoor lighting fixtures
- pH paper
- Decon. lane signs
- Soft bristle sponges
- Barricade tape
- Triage tags
- Personal privacy kits
- Stretchers that can be decontaminated
- Radios and
- Generator

## **Training of Hospital Personnel**

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The training indicated for hospital first receivers depends on the individuals' roles and functions, the zones in which they work, and the likelihood that they will encounter contaminated victims. The following levels of training are directed toward specific employee roles and responsibilities, methods used to recognize specific types of emergencies and information and skills required to perform assigned duties during emergencies.

### **Awareness Level Training:**

Awareness Level training is required for all employees who might be in a position to identify a contaminated victim who arrives unannounced. This group includes emergency department clinicians, clerks and triage staff who would be responsible for notifying authorities of the arrival of a contaminated victim, but would not reasonably be anticipated to have contact with them. This group also includes decontamination set-up crew members and victim tracking clerks if their roles do not put them in contact with contaminated victims; e.g.; setting up the decontamination system before victims arrive or tracking victims from a location outside the decontamination zone.

First Receiver Awareness Level training also is required for hospital security guards who work *away from* the Hospital Decontamination Zone, but who may be involved tangentially in a mass casualty event (specifically, those security personnel who would not reasonably be anticipated to come in contact with contaminated victims, their belongings, equipment, or waste).

### ***OSHA requires the following employee competencies for Awareness Level training:***

- An understanding of what hazardous materials are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- The ability to recognize the presence of hazardous substances in an emergency.
- The ability to identify the hazardous substance, if possible.
- An understanding of their role in the hospital's emergency response plan, including site security and control, and decontamination procedures.
- The ability to recognize the need for additional resources and to make appropriate notifications.

The OSHA Best Practices document(OSHA 3249-08N, 2005) recommends that in addition to these topics, hospital staff should be well trained in the following procedures:

- Avoid physical contact with the victim.
- Immediately notify a supervisor of possible contamination
- Allow other properly trained and equipped staff to isolate and decontaminate the victim according to the hospital emergency management plan.

*Note: Annual refresher training is required for employees trained to the Awareness Level*

## Operations Level Training

Hospitals must provide hazardous materials and emergency response training to first receivers who are expected to decontaminate victims or handle victims before they are thoroughly decontaminated. This level of training is appropriate for anyone with a designated role in the Hospital Decontamination Zone; including, security staff assigned to roles in the Hospital Decontamination Zone.

Training requirements for First Receivers Operations Level indicate a minimum training duration of 8 hours and includes the following competencies:

- The competencies listed for Awareness Level training.
- Knowledge of the basic hazard and risk assessment techniques.
- Knowledge on how to select and use proper PPE.
  - When PPE is necessary
  - What PPE is necessary
  - How to properly put on(don), remove(doff), adjust and wear PPE
  - Limitations of PPE
  - Proper care, maintenance, useful life, and disposal of PPE.
- An understanding of basic hazardous materials terms.
- Knowledge of how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and PPE available.
- Knowledge of how to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

Refresher training is specified under OSHA regulations and requires all employees trained at the operations level to receive annual refresher training of sufficient content and duration to maintain their competencies, or employees shall demonstrate their competency in those areas at least yearly.

Note: OSHA requires the employer to determine the competencies and content of awareness and operations level training for their employees. [29 CFR 1910.120 (q) (6) (ii)]

Any employee who must wear a respirator must be trained in the proper use and limitations of that device *prior* to its use in the workplace. OSHA's Respiratory Protection Standard (29 CFR 1910.134) requires at minimum, training which must cover the following topics:

- The nature of the respiratory hazard and why a respirator is needed.
- Respirator capabilities, limitations, and consequences, if the respirator is not used correctly.
- How to handle respirator malfunctions and other emergencies.
- How to inspect, put on, remove, use, and check seals on the respirator.
- Maintenance and storage procedures
- When to change the cartridges on Air Purifying Respirators(APR)
- How to recognize medical signs and symptoms that may limit or prevent effective use of a respirator
- General requirements of the respiratory protection program.

First receivers who wear respiratory protection must be deemed medically qualified to do so, following the process required by CFR 1910.134(e)(1) through (e)(6) of OSHA's Respiratory Protection Standard. Employees who wear tight-fitting respirators must also be properly fit-tested. Employees must demonstrate their understanding of the training by showing they can use the PPE properly, prior to using the protective equipment in the workplace.

Refresher training is required *at least annually*, or sooner if changes in the workplace or type of respirator render previous training inadequate. Refresher training is also required if the employee does not demonstrate proficiency in the proper care and use of the respirator, or any other time when retraining appears necessary to ensure safe respirator use. Refresher training is warranted when the employee cannot demonstrate proficiency in the proper care and use of the PPE, when changes in the workplace render the previous training obsolete, or when changes in the type of PPE to be used render the previous training obsolete.

**Note:** OSHA specifies that hospitals must maintain a written record of employee training and competency.

### **Just-in-Time Training for Skilled Support Staff**

Just-in-time training may be appropriate for any member of the hospital staff who has not been identified or trained as a member of the Decontamination Team, but might be unexpectedly called on to minister to a contaminated victim, or perform other work in the hospital decontamination zone. Examples include a medical specialist or a trade person, such as an electrician.

These individuals must receive expedient (just-in-time) orientation to site operations, immediately prior to participating in any emergency response. The initial briefing shall include instruction in the wearing of appropriate PPE, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to personnel in the Hospital Decontamination Zone shall be used to assure the safety and health of these personnel. As part of the briefing, these personnel also must be medically cleared for respirator use and properly fit tested.

**Note:** This training is to be used only under extreme conditions as a last resort for personnel that may be required to keep decontamination operations functioning.

While a "just-in-time" briefing during the response is the only *required* training for these personnel, time and resource limitations inherent in a crisis likely will diminish the effectiveness of such training. Thus, hospitals should diligently consider the broad range of skills/capabilities that may be required within the Decontamination Zone during a mass casualty event and attempt to identify, and train, all persons who may be called to work in the Decontamination Zone prior to a mass casualty event.

## Training for Other Hospital Staff

Hospitals should consider offering a basic level of training for other employees in the hospital or ED, such as housekeeping staff. This group could include those personnel who do not have a role in the decontamination process, reasonably would not be expected to encounter self-referred contaminated victims, and reasonably would not be expected to come in contact with contaminated victims, their belongings, equipment, or waste.

OSHA's Hazard Communication Standard offers a useful model for appropriate training, which could include general information on the hospital's emergency procedures and plans for mass casualty incidents involving contaminated victims, steps the employees can take to protect themselves (usually by leaving the area), and the measures the hospital has implemented to protect employees in the ED. While *not required* under the OSHA Act, such training could help to ensure that all staff in the ED understand what precautions and actions would (and would not) be expected of them if an incident occurred. In developing a training program of this type, hospitals should consider which specific topics would best help this group of employees respond appropriately during an incident.

## Hospital Decontamination Drills and Exercises

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Hospitals note that the greatest value occurs when their hospital decontamination program is tested rigorously as part of a drill or exercise, when realistic scenarios are involved (including interaction with outside organizations), and when the hospital follows the drill with a detailed evaluation and post-drill action plan for improvement.

It is essential to the success of the hospital decontamination program that drills are conducted and that they reflect the actual conditions, resources, and personnel that would be available during a real incident. Specifically, performing actual decontamination of simulated victims (whether they are live role-players or manikins) with water flowing is an example of a drill/exercise that uses ‘actual resources’ to increase the training value and realism factors.

In addition to self-assessments, some hospitals find it helpful to receive a performance evaluation from an outside organization. Hospitals use the evaluators’ findings and comments to improve future performance of the emergency management program. Alternatively, organizations that share post-drill analysis can critique each other. Any of these methods of assessment can lead to corrective actions and improved response, particularly if the process is formalized with hospital administrators.

## Training and Exercises Resources:

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Many resources are available to either provide or supplement the training and skill maintenance of a hospital decontamination team. Listed below are just a few examples:

- Instructors from neighboring hospitals/public health partners/community responders
- The Regional Coordinating Hospitals
- Use of expired suits, filters, etc. for training
- ASPR funded courses offered by GA DPH (<https://www.gha911.org/>)
- Online training resources and reference materials,(Agency for Healthcare Research and Quality(AHRQ) (<http://www.ahrq.gov/>) website is an excellent source of pediatric guidance.)
- Center for Domestic Preparedness(CDP)( <https://cdp.dhs.gov/>)
- HSEEP: Homeland Security Exercise and Evaluation Program ([https://hseep.dhs.gov/pages/1001\\_HSEEP7.aspx](https://hseep.dhs.gov/pages/1001_HSEEP7.aspx))



## OSHA GUIDANCE ON TRAINING FOR FIRST RECEIVERS

The following table summarizes OSHA's current guidance on training first receivers for mass casualty emergencies. Training is categorized according to zone (i.e., Pre-decontamination and Post-decontamination Zones); designated roles and the likelihood of contact with contaminated victims, their belongings, equipment, or waste. Training levels presented on Table 2 are *minimum* training levels and can be increased or augmented, as appropriate, to better protect employees, other victims, and the facility in general.

**Table 2: OSHA Guidance on Training for First Receivers**

MANDATORY TRAINING	FIRST RECEIVERS COVERED
<p><b>OPERATIONS LEVEL</b>  <b>Initial training</b>  <b>Annual refresher</b></p> <p><i>Both initial and refresher training may be satisfied by demonstration of competence.</i></p>	<p>All employees with designated roles in the Hospital Decontamination Zone</p> <p>Including but not limited to: Decontamination Team; clinicians who will triage and/or stabilize victims prior to decontamination; security staff [e.g., crowd control and controlling access to the ED]; set-up crew; and registration staff.</p>
<p><b>AWARENESS LEVEL</b>  <b>Initial training</b>  <b>Annual refresher</b></p> <p><i>Both initial and refresher training may be satisfied by demonstration of competence.</i></p>	<p>Security, set-up crew, and registration staff in receiving areas proximate to the Decontamination Zone where they might encounter, but are not expected to have contact with, contaminated victims, their belongings, equipment, or waste</p> <p>ED clinicians, clerks, triage staff, and other employees associated with emergency departments, who might encounter self-referred contaminated victims (and their belongings, equipment, or waste) without receiving prior notification that such victims have been contaminated.</p>
<p><b>Briefing at the time of the incident</b>  <i>Just-in-time Training</i></p>	<p>Other employees whose role in the Hospital Decontamination Zone was not previously anticipated (i.e., who are called in incidentally such as a medical specialist or an electrician)</p>
RECOMMENDED TRAINING	PERSONNEL COVERED
<p><b>Training for all other hospital staff</b></p>	<p>Other personnel in the Post-decontamination Zone who reasonably would not be expected to encounter or come in contact with unannounced contaminated victims, their belongings, equipment, or waste. (e.g., other ED staff, such as housekeepers)</p>

## Hospital Decontamination - System Components

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To ensure speedy, efficient decontamination of victims while protecting hospital personnel, the following are considered minimum system components:

- A strong command and control process using the Incident Command System(ICS)
- A written and tested hospital Lockdown Policy which must be rapidly initiated upon notification of an external hazardous materials incident.
- Provision for temporary clothing for victims following the decontamination process.
- A medical monitoring procedure, as outline in the OSHA Best Practices document, for hospital decontamination team members.
- A decontamination system that addresses gender and privacy concerns
- A decontamination system that addresses ambulatory and non-ambulatory victims.
- Communication Policy: internal and external: Denoting how communication occurs with staff, victims, command structure and community partners: fire service, EMS, EMA.
- A written Memorandum of Understanding(MOU) with local fire department(s) and EMS providers to make all reasonable attempts to:
  - Initiate early notification that a release of a hazardous substance has occurred.
  - Perform field-decontamination of victims prior transport to hospital.
  - Assist hospital with decontamination efforts during mass casualty incidents.
  - To test and exercise these plans.
- Provide a capability to separate, isolate and secure personal property for later possible decontamination or evidence.
- Cold weather decontamination “dry-decontamination” procedures to allow rapid victim decontamination without using water. (e.g., remove victim’s clothing prior to bringing them into a controlled environment.)
- A written hazardous waste management procedure.

## Decontamination facility set-up

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Decontamination facility set-up is defined as the assembly of equipment, supplies and the human resources required to commence and to maintain decontamination operations, until completed. Decontamination equipment, maintenance, and set-up should be exercised per guidance and be widely understood within each hospital. Set-up procedures need to be developed to deliver a 24-hour capability, for urgent response, regardless of environmental conditions.

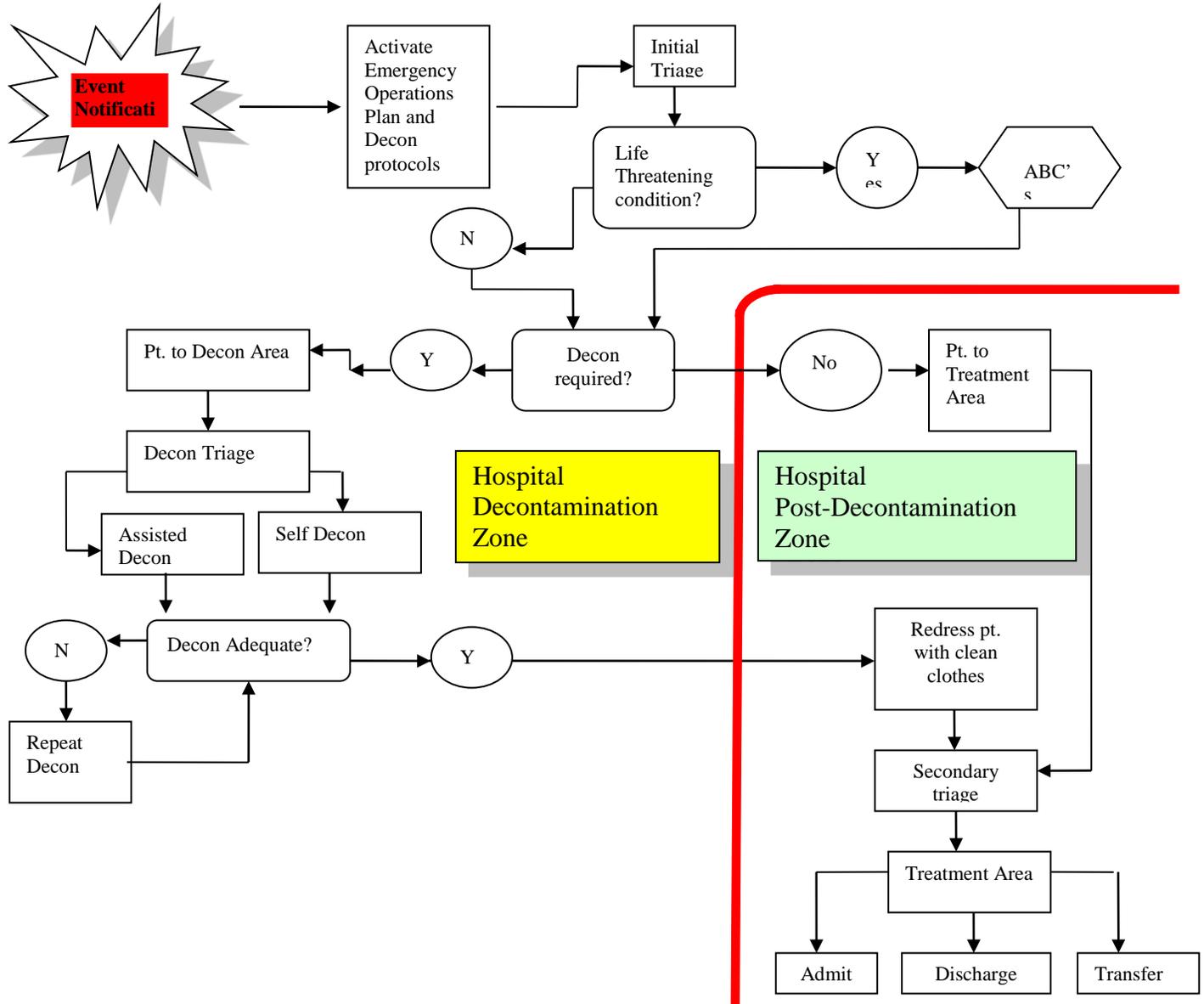
On the following page is a flow-diagram of the steps taken when hospital decontamination of victims is required (adapted from The California Emergency Medical Services Authority).

This algorithm identifies what activities take place within the: Hospital Decontamination and Hospital Post-Decontamination Zones.



# Algorithm for Decontamination

Ref: Recommendations for Hospitals: Decontamination, California Emergency Medical Services Authority, 2003.



## Decontamination Site Planning Considerations

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### **Dirty/Clean: Hospital Decontamination and Hospital Post-Decontamination Zones**

Contaminated victims whether they are transported by EMS or self-refer are considered 'dirty' until they are decontaminated. After decontamination, they are considered 'clean'. Thus, in selecting your site for decontamination, two distinct areas need to be defined: hospital-*decontamination zone*(dirty) and hospital *post-decontamination zone*(clean). Refer to chart on previous page. Decontamination Site selection is dependent upon multiple factors and based upon the physical characteristics of each individual hospital. The following is a list of factors which need to be considered to determine the most appropriate site to set up and perform decontamination:

- access: security, traffic control and flow to decontamination site
- security perimeter set-up to control site access
- an alternate route to the Emergency Department for admission of victims not involved in the incident.
- staging areas for pre- and post-decontamination triage for ambulatory and non ambulatory victims.
- a holding area protected from the elements and ideally, away from prying eyes.
- locations of water sources, access, wastewater drainage,
- location and access to external power supply and lighting considerations.
- a site map and decontamination hose placement plan with unobstructed stretcher and wheelchair access into and exit from the decontamination site.
- an equipment and PPE staging area.
- a large, well-ventilated area away from fresh air intakes.
- consider existing features to facilitate set-up such as: curbing/roadways/paths/walls/fences, existing external lighting, shading in high-heat and shelter in cold environments, and wind barriers
- a secondary or backup site in case the primary site is compromised.
- a site for a staff safety area for rest, rehydration and rehabilitation out of the line of sight of the decontamination area
- a secure area for contaminated personal effects (possible forensic evidence)
- a staging area for hospital post-decontamination zone linens, equipment, gowns, and other essential supplies

*Note: PPE is required in the hospital decontamination zone*

## Response Overview

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The following is a summary table of the hospital decontamination procedure.

**Table 3: Quick Response Procedure<sup>1</sup>**

<p style="text-align: center;"><b>Preparation</b></p> <ul style="list-style-type: none"> <li>● Notify hospital personnel</li> <li>● Alert security</li> <li>● Establish name and toxicity of chemical agent when possible</li> <li>● Evaluate casualties for radiological contamination</li> <li>● Assemble and brief decontamination team</li> <li>● Commence decontamination team register</li> <li>● Set up decontamination zones</li> </ul>	<p style="text-align: center;"><b>Protection</b></p> <ul style="list-style-type: none"> <li>● Move casualties outside to limit facility contamination</li> <li>● Safeguard facility lock-down and cordon off entries</li> <li>● Crowd management</li> <li>● Provide scripted information to casualties awaiting decontamination</li> <li>● If hospital is contaminated, isolate and clean</li> </ul>
<p style="text-align: center;"><b>Decontamination</b></p> <ul style="list-style-type: none"> <li>● Ensure decontamination teams are in place</li> <li>● Conduct triage</li> <li>● Basic life support delivered at triage, or in the decontamination area</li> <li>● Deluge Area ( If available)</li> <li>● Undress casualty and ensure privacy</li> <li>● Remove dressings prior to decontamination</li> <li>● Double-bag and secure clothing, effects, and linen</li> <li>● Tag belongings and valuables</li> <li>● Assist non-ambulatory casualties</li> <li>● Consider special needs victims</li> <li>● Head to toe, flush, soap and water wash, then rinse</li> <li>● Monitor/decontamination staff in PPE</li> </ul>	<p style="text-align: center;"><b>Pre/Post decon treatment</b></p> <ul style="list-style-type: none"> <li>● Establish duration and route of exposure</li> <li>● Assess clinical effect/toxidrome</li> <li>● Obtain additional advice</li> <li>● Provide medical and physical supportive care</li> <li>● Consider antidote</li> <li>● Commence victim treatment regime</li> <li>● Consider off-gassing potential</li> <li>● Isolate if necessary</li> <li>● Consider additional ventilation/extraction fans</li> <li>● Plan and consult if transfer required for off-gassing victim</li> </ul>
<p style="text-align: center;"><b>Recovery</b></p> <ul style="list-style-type: none"> <li>● Decontamination exposed staff</li> <li>● Clean up affected sites</li> <li>● Seek advice re: disposal of clothing</li> <li>● Contact hazardous waste contractor</li> <li>● Debrief staff, advising of potential health effects</li> <li>● Advise authorities when normalcy restored</li> <li>● Revise protocols as necessary</li> <li>● Follow-up potential short/long term health effects of decon team members</li> <li>● Create/file appropriate documentation of incident</li> </ul>	

<sup>1</sup> Reproduced from Department of Human Services (2007), Decontamination Guidance for Hospitals

## Decontamination Considerations During a Radiologic Event

**Background:** Based upon previous radiologic events, such as the radiation release in Japan from the Fukushima power plant after the tsunami in 2011, hospitals need to be prepared to receive and decontaminate victims exposed to radiation. Furthermore, with radiologic events, hospitals should also expect large numbers of worried well who will self-refer.



*Planning Assumption:* There has been a radiological event.

*Three basic things to remember...*

- \* Decon should not delay or impeded stabilization of any victim.
- \* Removal of all clothing can reduce contamination on the patient by up to 90%.
- \* Contact Radiation Safety Officer.

The following section is intended to provide some basic information necessary to respond safely and effectively when working with patients contaminated by radioactive materials.

### Exposure vs. Contamination

- Contamination is the presence of radioactive materials in an unwanted location such as on a patients' skin or clothing, or inside of a person.
- Exposure to radiation does not make a person radioactive. Persons who have been exposed to radiation but who do not have radioactive materials on their person do not need to be decontaminated.

### Internal vs. External Contamination

- External contamination occurs when radioactive materials – gases, liquids and/or solids are released and land on a person's clothes, skin, hair or wounds. When radiation is dispersed using an explosive device (Radioactive Dispersal Device(RDD) or Dirty Weapon), radioactive contamination may also be imbedded in a patient's wounds.
- Internal contamination occurs when a person inhales or ingests material that is radioactive. External decontamination procedures do not remove internal radiologic contamination. Internal contamination requires supportive care and identification of the radioisotope. Treatment consists of time-critical intervention with antidotes, and should be performed in consultation with the Radiation Safety Officer/Nuclear Medicine physician/health physicist/poison center.





## **Testing for Radioactive Contamination:**

**Detection:** In contrast to biological agents, radiation is readily detectable with proper equipment.

DO NOT RELY ON CLINICAL SIGNS/SYMPTOMS to detect the presence of radiation. The presence of radioactive contamination can only be determined by employing radiation detectors such as survey meters. If radioactive material contamination is suspected, decontamination teams should test victims for the presence of radioactive contamination.

Testing for radioactive contamination should be accomplished by individuals who have been trained in the proper use of radiation survey meters and scanning techniques. In the absence of survey equipment, all potentially contaminated persons should undergo decontamination.

**Acceptable levels:** Less than 2 times background radiation should be used as a target for acceptable levels of residual contamination after decontamination procedures. (Reference: “Manual of Protective Action Guides and Protective Actions for Nuclear Incidents”, <http://www.epa.gov/radiation/docs/er/400-r-92-001.pdf> ).

**Radiological Decontamination:** When radioactive contamination is present or suspected, clothing should be collected for proper disposal (e.g., red bag clothes). Following the removal and collection of clothing, the method of choice for radioactive decontamination involves deluge with copious amounts of water. Ensure that any areas that are contaminated during this process are clearly identified, marked, and isolated/cleaned as needed.

**Post-Decontamination Survey:** If possible, perform a post-decontamination survey to verify that the contamination has been removed effectively. At post-survey, if a victim is still greater than 2 times background, they should be decontaminated again. However, the victim should only be decontaminated twice.

**Radiation Safety Officer** should be involved with radiologic decontamination planning as well as response, and will determine when clean is clean.

**Staff:** When properly attired, the presence of radioactive contamination does not present a significant health hazard to medical staff. Decontamination personnel should wear level C plus personal protective equipment (PPE) as outlined previously in this document. In addition, radiologic events require risk communication to both victims and staff with regard to potential health threats and misconceptions.

## Additional Considerations



When developing a hospital decontamination plan please consult the following additional sources of information with regard to radiological decontamination;

- 1) “Radiation Emergency Medical Management”, U.S. Dept. of Health and Human Services, [www.remm.nlm.gov/ext\\_contamination.htm](http://www.remm.nlm.gov/ext_contamination.htm),
- 2) “Emergency Preparedness and Response to Radiation Emergencies”, Centers for Disease Control and Prevention, <http://emergency.cdc.gov/radiation/>.
- 3) “The Medical Aspects of Radiation Incidents”, Oak Ridge Institute for Science and Education, <http://orise.orau.gov/files/reacts/medical-aspects-of-radiation-incidents.pdf> .



## Summary

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Though hazardous substances incidents do not happen often, they do occur in every community. Planning and preparing to activate hospital decontamination response is essential to protecting the health and safety of your employees and your facility from secondary contamination.

Key components of this program include:

- identification of a decontamination site,
- identification of decontamination team,
- required personal protective equipment,
- required training for team members and all hospital employees,
- identification of an area to perform decontamination and
- integration of this Hospital Decontamination Program into your hospital's All Hazards Emergency Operations Plan.

This guidance was developed to provide baseline information on planning for hospital decontamination responses.

## Reference and Resources

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### References:

Geller, 2001: Nosocomial Poisoning Associated With Emergency Department Treatment of Organophosphate Toxicity --- Georgia, Mortality and Morbidity Weekly Review 49(51);1156-8  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4951a2.htm>

HSEES, 2005: The Hazardous Substances Emergency Events Surveillance (HSEES) System  
<http://www.atsdr.cdc.gov/HS/HSEES/annual205.thml#dcon>, accessed April 2011

Medscape, 2011: Hospital and Community Planning for Hazmat Incidents,  
<http://emedicine.medscape.com/article/764812-overview#>, accessed March 2011.

Ponampalam, R, (2003) Decontamination - Rationale and Step-By-Step Procedure, SGH  
PROCEEDINGS . VOL 12 . NO 4

OSHA, 2005: Occupational Safety and Health Administration (2005). Best Practices for Hospital Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances (OSHA 3249). <http://www.osha.gov/Publications/osha3249.pdf>

Occupational Safety and Health Administration. Standards Interpretations for 29 CFR 1910:  
[http://www.osha.gov/pls/oshaweb/owasrch.search\\_form?p\\_doc\\_type=INTERPRETATIONS&p\\_toc\\_level=2&p\\_keyvalue=1910&p\\_status=CURRENT](http://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=INTERPRETATIONS&p_toc_level=2&p_keyvalue=1910&p_status=CURRENT)

### Resources:

The Joint Commission (2011) Advancing Effective Communication, Cultural Competence, and Victim- and Family-Centered Care: A Roadmap for Hospitals.  
<http://www.jointcommission.org/assets/1/6/ARoadmapforHospitalsfinalversion727.pdf>

Centers for Medicare and Medicaid Services (CMS) Overview of Emergency Medical Treatment & Labor Act (EMTALA): <https://www.cms.gov/EMTALA/>.

Centers for Disease Control and Prevention (September 2002). Summary Report- CDC Roundtable on the Identification of Emerging Strategies for Hospital Management of Mass Casualties from a Radiological Incident, May 14-16, 2002. <http://www.bt.cdc.gov/radiation/pdf/rt-strategies-hospital-management.pdf>

### AHRQ References

*Decontamination of Children*. October 2008. Agency for Healthcare Research and Quality, Rockville, MD.  
<http://www.ahrq.gov/research/decontam.htm>

*Preparedness for Chemical, Biological, Radiological, Nuclear, and Explosive Events: Questionnaire for Health Care Facilities. Administrator Guide*. Publication No. 07-0016-EF, April 2007. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.ahrq.gov/prep/cbrne/admin/admingd.htm>

## APPENDIX A

1. The Provider must meet the required minimum quantities before being reimbursed for any other item listed in the Mass Casualty Incident (MCI) Equipment & Supplies List. Required minimum items are found on the "Minimum Requirements" tab of the List, and on each applicable equipment category tab.
2. Equipment purchased is intended to be readily accessible on-site or initiated within 20 minutes of a no-notice disaster event.
3. Hospitals can choose to use ASCN funds to maintain a cache of supplies that are inventoried, rotated and maintained, or can choose to increase par levels of appropriate supplies per specified amounts beyond seasonal surge levels. Funds are NOT to be used to only bring par levels up to seasonal surge levels.
4. Hospitals must maintain equipment & supplies in a climate controlled environment with a minimum of an annual inventory.
5. Georgia Department of Public Health may conduct announced and/or unannounced programmatic monitoring visits to verify available inventory.
6. Hospitals are encouraged to focus on purchasing equipment to meet the minimum expected standards within the priority areas (listed in order) of: Communications, PPE, Detection and Decontamination and MCI General equipment. Optional equipment can be purchased within categories after minimum required supplies have been obtained and are maintained
7. The minimum standard may not reflect the optimal amount of equipment needed for an individual hospital. Hospitals may elect to purchase equipment that exceeds the minimum standard.

**Required Minimum Items to be Available  
(For Decontamination Equipment Categories)**

Note: Additional Information about items and expected quantity are included under each category tab.						
Item Description	Special Requirement / Performance Standard	UNIT	QTY for up to 100 Beds	QTY for 100-300 Beds	QTY for 300-500 Beds	QTY for 500+ Beds
<b>MINIMUM REQUIRED ITEMS FOR PERSONAL PROTECTIVE EQUIPMENT</b>						
Level "C" coverall style PPE suits	To be worn by hospital personnel directly interacting with contaminated patients. The suits listed have sealed/taped seams. Should be CPF-3HD or CPF-3 or Tychem F or equivalent.	case of 6	3 Cases	6 Cases	9 Cases	9 Cases
Chemical Agent Tape for PPE Suits	To be used to seal boots and gloves to the PPE suit and to seal zippers and seams, to prevent leaks. Regular Masking Tape or Duct Tape should only be used for training purposes. <a href="http://www.kappler.com/access_chemtape.html">http://www.kappler.com/access_chemtape.html</a> Note: This tape is not required with the CPF-3HD PPE Suits.	roll	6	6	9	9
PAPR Butyl Hood Respirator	The Breath Easy 10 PAPR is sold as a complete kit: Hood, Turbo Air Pump, Breathing Tube, Lithium Battery, 3 FR-57 Cartridges, Flow test kit, bags, inserts to keep shape of hoods.	ea	4-8	8-12	12-18	18-24
	Lithium Replacement Battery (Prefer 1 non-rechargeable)	Ea	2 Per Kit	2 Per Kit	2 Per Kit	2 Per Kit
	FR-57 Cartridge (Within Current Shelf Life)		3 Spare Cartridges/ Per Kit			
Boots	Chemical resistant boots to be worn with level "C" PPE suits. Consider multiple & larger sizes.	pair	4-8	8-12	12-18	18-24
Inner glove	Nitrile exam glove. NOTE: The CPF3-HD has inner and outer gloves permanently attached making these gloves necessary only for training. The CPF-3 and Tychem F will require these gloves for incidents and training. Quantities may be adjusted depending on the type of suit that is purchased.	Box of 100	6	6	9	9
Outer glove	Nitrile or Butyl glove, 11 Mil thickness or greater, long cuff, to be worn as outer glove; NOTE: The CPF3-HD has inner and outer gloves permanently attached making these gloves necessary only for training. The CPF-3 and Tychem F will require these gloves for incidents and training. Quantities may be adjusted depending on the type of suit that is purchased.	ea	24	36	60	72

Note: Additional Information about items and expected quantity are included under each category tab.						
Item Description	Special Requirement / Performance Standard	UNIT	QTY for up to 100 Beds	QTY for 100-300 Beds	QTY for 300-500 Beds	QTY for 500+ Beds
<b>MINIMUM REQUIRED ITEMS FOR DECONTAMINATION EQUIPMENT</b>						
Decon Shower System	<ul style="list-style-type: none"> <li>Minimum of two people must be able to set up in 20 minutes or less with water running</li> <li>Flow rate adequate for multiple victim decontamination</li> <li>Decon capabilities for ambulatory and non-ambulatory patients</li> <li>Ability to capture and retain post decon contaminated run off when necessary</li> <li>Process supplies and equipment to collect patients' clothing and contaminated items</li> <li>Privacy panels</li> <li>Sufficient lighting to assure SAFE operations inside the decon tent</li> </ul> <p><b>RECOMMENDED:</b></p> <ul style="list-style-type: none"> <li>Fixed or hand held sprayer for effective decon</li> <li>Mass casualty litters and all terrain wheels or roller system and backboards - for non-ambulatory decon</li> </ul>	ea	1	1	1	1
Patient Decon Kits (Doff and/or Don)	<p>The decon kit <u>can</u> include:</p> <ul style="list-style-type: none"> <li>Resealable opaque valuables bag</li> <li>ID system with bracelets and labels for bags</li> <li>Label with complete how-to-use instructions</li> <li>Instructions in both English and Spanish with supporting pictograms</li> <li>Re-sealable clothing bag</li> <li>One redress gown "poncho" style</li> <li>Towels</li> </ul>	ea	50	100	150	150
Portable outdoor Weather resistant lighting	Lighting must be sufficient to allow safe operation during a night time incident	ea	Min. 2	Min. 2	Min. 2	Min. 2
GFIC Protection Outlet / Plugs (Pigtails)	Multiple Outlet, 15-Amp	ea	2	2	2	2
Outdoor, Waterproof Extension Cords	Must be waterproof and high visibility. NOTE: 100' cord or any combination (50', 25 ' ) to equal 100'	ea	1	1	1	1
Note: Additional Information about items and expected quantity are included under each category tab.						

Item Description	Special Requirement / Performance Standard	UNIT	QTY for up to 100 Beds	QTY for 100-300 Beds	QTY for 300-500 Beds	QTY for 500+ Beds
Disposable Wipes	Used for cleaning face shields after use	Box/50	1	2	4	4
Training PPE Suits (Disposable)	Tyvek coveralls. NOTE: Use duct tape or masking tape with the suits for training.	Case of 25	1	2	4	4
Training Batteries (Battery Charger appropriate for training batteries)	Nickel Cadmium batteries (Rechargeable) (Hospitals should have one battery charger for each training battery)	Ea	4-8	8-12	12-18	18-24
Mass/Gross Decon System	Mass/Gross decon device and associated accessories (attaches to a fire hydrant). Can be used to support gross decon; not to replace required decon capabilities. (NOTE: If the decon area is within 200 feet of hydrant and permission to utilize hydrant has been granted.)	Ea	1	1	1	1
<b>Optional Items</b>						
Decon stretcher device unit (for those hospitals that choose not to use the optional roller system and backboards listed under the decon shower system specifications)	Lightweight, durable construction. This is an impermeable, washable, reusable unit.					

Decon wheelchairs Consider standard and bariatric sizes.

Plastic chairs/seats For team members to use during the donning and doffing process and during rehab and for use by patients who need to rest during decon.