North Carolina First Receiver Hospital Decontamination Guidance

July 2015

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INTRODUCTION

Guidance Objective

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

Guidance Document

With the understanding that the decontamination capability of North Carolina hospitals will vary with facility size and services, the goal for North Carolina hospitals is to adopt a standardized approach toward patient decontamination.

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, North Carolina hospitals must maintain a hospital-wide decontamination program that meets recommended decontamination standards, and is compliant with published requirements for First Receiver worker health and safety (OSHA 29 CFR1910.120: Q).

Goals of Patient Decontamination

- Achieve an improvement in patients' acute health outcomes by reducing short and long term morbidity and mortality (DHS)
- Protect the health and functioning of the health care system by preventing secondary contamination of responders, receivers, and infrastructure (DHS)

Planning Assumptions for Guidance Document

This Hospital Decontamination Planning Guidance assumes the following:

- Decontamination should not delay or impede stabilization of any victim.
- Removal of all clothing can reduce contamination on the patient by up to 90%.
- 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), regional healthcare coalition, State Medical Assistance Teams Type III (if available), local and district Public Health and others as identified.
- The hospital is not the site of the hazardous substance release.

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Definitions

Patient Decontamination: Any process, method, or action that leads to a reduction, removal, neutralization – by partitioning or binding (as opposed to chemical neutralization, which is not recommended) or inactivation of contamination in order to: prevent or mitigate adverse health effects to the patient; protect emergency first responders, health care facility first receivers, and other patients from secondary contamination; and reduce the potential for secondary contamination of response and health care infrastructure. (DHS)

Hospital: Hospitals with emergency departments and free standing emergency departments. If there are special considerations for free standing emergency departments, it will be specified within that section.

First Receivers: Hospital employees are considered first receivers. This differs from emergency first responders (e.g. EMS, law enforcement, and fire service). First receivers 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.

Exposure: Exposure occurs when a person comes into contact with a substance by touching, breathing, eating or drinking it. Exposure does not necessarily lead to contamination if the substance is not deposited on or in the person. For example, a person may be exposed to carbon monoxide as they walk past a vehicle, but the carbon monoxide will not deposit on the clothing. A person is exposed to radiation when an x-ray is performed, but the person is not contaminated and poses no risk to others.

Contamination: A person is contaminated if material is deposited on clothing, skin, hair, or internally. This can pose a harm to the patient and provider.

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Background

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 Agency for Toxic Substances and Disease Registry developed the Hazard Substances Emergency Events Surveillance (HSEES) program in 1990. The data is only collected from 15 states. In 2010, it transitioned into the National Toxic Substances Incidents Program (NTSIP). The goal of the NTSIP is to develop a nationwide surveillance database. (Cox, 2013)

- About 9,000 chemical releases occur annually
- The most common substances were inorganic (24%) and volatile organic (20%)
- Annually, more than 2,000 people from the reporting 15 states are victims of hazardous materials release and approximately half are transported to the hospital
- More than 7,500 people required decontamination over a 4 year period in the 15 states. 2,643 were decontaminated at medical facilities. (Cox, 2013)

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 adequately. In addition, hospitals may not consider a patient decontaminated in the field as clean under some circumstances. Early planning and coordination between the hospital and first responders will improve communication regarding capabilities, expectations, and responsibilities during an incident.

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 places 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.

The majority of hazardous material contamination of patients involve only one patient. Over 68% of the events reported to the HSEES involved 1 person in 2009. Preparing your staff to recognize and respond to the small events is critically important to ensure the safety of the staff, facility, and patient. (HSEES, 2009)

Decontamination capabilities of North Carolina hospitals varies widely based upon hospital size, location, and services provided. Hospitals located in highly populated, urban areas are more likely receive large numbers of victims from a mass casualty incident than hospitals in more rural areas. However, many rural hospitals are located in areas with high risk of a contamination and due to their size, could be overwhelmed quickly.

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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)

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

GARNER, NC: In 2009, an explosion at ConAgra Foods plant killed four and injured dozens. Seventy-one people were transported to area hospitals. The explosion caused an anhydrous ammonia leak which injured three firefighters. Approximately 18,000 pounds of ammonia were released. The explosion was caused by intentionally purging natural gas into work areas.

- U.S. Chemical Safety Board (http://www.csb.gov/assets/1/19/CSB_Safety_Bulletin_Final_Embargoed_10_2_09.pdf)

- 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.

Liability

Failure to have an adequate plan to attend to victims of a hazardous substance event can result in injury to hospital employees, worsening injury to the patient(s), contamination with subsequent closure of facility, 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. (OSHA 29 CFR 1910.120 and OSHA First Receiver) This OSHA Best Practices for Hospital Based First Receivers document provides useful information regarding 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), DNV, and other accreditation agencies requirements and standards. (Medscape, 2011)

Free Standing Emergency Departments

Special consideration must be taken when planning for a free standing ED.

- The staffing resources will be extremely limited. The number of staff in the ED will be limited and additional support may have to come from miles away. Support may be provided by the lead hospital or other hospital nearby, but the length of time required to travel should be considered.
- Decontamination capabilities must be identified and communicated with partners like EMS and Fire.
- Cooperation with community partners like the local fire department, emergency manager, and EMS can assist in the creation of a realistic plan.

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DEVELOPING A HOSPITAL DECONTAMINATION PROGRAM

The following 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.

1. Hazard/ Vulnerability Assessment (HVA) for Hazardous Materials Event
2. Risk Communication Plan
3. Written hospital decontamination plan
4. Hospital Decontamination Team
5. Appropriate personal protective equipment (PPE) and equipment needed based upon the HVA
6. Decontamination process and site planning
7. Training requirements
8. Performance improvement measures that include exercises, after action reviews, improvement plans, and ongoing training

Hazard/ Vulnerability Assessment

The Hazard Vulnerability Analysis provides guidance for the risks faced by the hospital. It is the backbone to any emergency management program. The development of the HVA is a systematic analysis of risks across to local and regional area. The process should include critical partners like emergency management, healthcare coalition, fire department, EMS, and public health. Additional partners may be needed. Companies and businesses within the region that work with chemicals can be an excellent resource for planning. Once the risks are identified, they can be quantified and prioritized. The Hospital Decontamination plan will support the mitigation and response to a potential event. For example, if Hospital A is within a Nuclear Power Plant evacuation zone, has several train tracks that transport chemicals, has 4 interstates with heavy truck traffic, and have 4 chemical plants within its borders, it should have a more robust decontamination plan than hospital B that only has a county route with truck traffic in its area.

Risk Communication

Risk communication is a critical component of any emergency response plan. "The National Research Council defines risk communication as an 'interactive process of exchange of information and opinion among individuals, groups, and institutions." The definition includes 'discussion about risk types and levels and about methods for managing risks.'" (USPHS, 1995; CDC CERC, 2014)

Risk communication should be incorporated into planning and early into the response. It includes communication with community partners and the media. The goal is to decrease panic as well as to decrease the burden of non-necessary patients during an incident. It should include communication with hospital staff so that roles will be known.

Risk communication with patients and family is the most important. The patients will be under stress which can decrease comprehension and they may have special needs like hearing or

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vision loss, non-English speaking, or are children. Age and culturally appropriate instructions should be available during an incident.

Community Planning for a Hazardous Materials Event

Planning for a contaminated patient or multiple patients can be overwhelming. There are many resources across the community that can enhance hospital preparedness and response. These should be considered part of the planning team.

- *Fire Department*: Fire departments frequently have highly trained hazardous materials teams. Even if they do not have such a team, they will be responsible for gross decontamination in the pre-hospital setting.
- *Hazardous Materials Team*: These might be housed within the fire department, region, or state. They could be a resource for the hospital during planning and response.
- *Emergency Medical Services*: EMS will have the primary medical role in the pre-hospital setting and may have a decontamination team. (i.e. North Carolina State Medical Assistance Team Type 3)
- *Other hospitals*: Hospitals can provide planning resources as well as additional personnel, equipment, and/ or patient beds if necessary.
- *Regional Healthcare Coalition*: The Coalition can assist with planning and provide intellectual and physical resources in the planning phase. Each Coalition is different. Some might be able to assist during an event.
- *County Emergency Management*: EM is responsible for the development of the county hazard vulnerability analysis which will include hazardous materials. EM can provide access to resources from across the state as well as connections to subject matter experts.
- *Local Emergency Planning Committee*: LEPCs was established under the Emergency Planning and Community Right-to-Know Act (EPCRA) and is required to develop an emergency response plan and provide information about chemicals in the community to citizens. Often, the county emergency manager leads the LEPC. Members include government, public and private entities that are involved in preparedness and response.
- *City or County Water Works/ Sanitation*: County water can assist with identifying rules and regulations regarding water usage and effluent management.
- *Corporations or businesses that manufacture or utilize chemicals*: These businesses can provide insight into the risks within the community and planning resources.

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Hospital Decontamination Plan

Components of the Decontamination Plan may vary slightly across facilities, but there are general guidelines of critical components.

- Purpose
- Risk Communication Policy Internally and Externally
- Incident Command Structure
- Written Memorandum of Understanding with Community Partners like Fire and EMS
- Triggers and Notifications
- Team member roles during each level of notification
- Lockdown or restricted access process
- Patient belongings tracking
- Process to Don and Doff personal protective equipment
- Decontamination procedure
    - Address ambulatory and non-ambulatory
    - Address privacy concerns and temporary clothing
    - Address environmental protection in cold and hot weather
    - Identification of the contaminant: If you have methods to identify the contaminant, describe what you have and how it will be used. If you have no method to identify the contaminant, describe resources that can assist in the identification if necessary.
- Validation that decontamination is compete
- Medical monitoring process for decontamination team members
- Demobilization
- Effluent Management and Waste Disposal
- Appendices for specific contaminants, identification equipment utilization, layouts of tents and other equipment, and other critical items

CASE STUDY

Mecklenburg County, NC 2015: A female went to check on a foreclosed house. She found the door unlocked. Upon entering, she saw a white powder all over the floor. Her eyes and skin began to burn so she went to the local emergency department. The risk was identified quickly by the ED staff. The local police and fire departments were contacted to go to the house and determine the contaminant. Additional hazardous materials resources were requested from a neighboring city. The patient was immediately directed in the self-decontamination procedures. Hazardous Materials Decontamination team members placed on appropriate PPE. These 3 staff members assisted the patient and two other employees who were potentially contaminated. Ultimately, it was determined that the white powder was from a fire extinguisher.

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Hospital Decontamination Teams

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 or emergency management committee. Each have expertise in general safety, security, hazardous materials, emergency management, life safety, medical equipment, and utilities. The emergency department provides victim management, disaster response, and clinical care expertise. Additional stakeholders such as facility engineering staff, security, medical, and nursing administration services must be identified and involved.

Identification of team members should consider facility staffing patterns to ensure 24 hour coverage. Team membership should include staff from all work shifts, including weekends and holidays. The size and composition of the team is dependent upon the HVA and hospital resources. Consideration should be given to identifying what type of personnel will be required to fulfill the following decontamination functions.

Memorandums of Understanding and Memorandum of Agreements can be utilized to augment a response and implement recovery. While it is critical for all health care facilities to manage contaminated patients initially, a large number of patients or a prolonged response may require outside assistance. This agreement might be with specialty decontamination teams, the fire department, or other entities. In addition, a facility may choose to contract with a company for decontamination of equipment and remediation of the hospital.

Hospital Decontamination Team/ Hazardous Materials Branch Functions

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

- *Hazardous Materials Branch Director*: organizes and directs decontamination incident response activities and coordinates with hospital incident command for overall victim support
- *Decontamination Safety Unit:* monitors the decontamination area and assures the overall safety of the team. This position reports to the Safety Officer.
- *Detection and Monitoring Unit:* personnel and equipment that address agent identification
- *Spill Response Unit:* respond to spill.
- *Employee Health and Well*-Being Unit: responsible for rehabilitation of decontamination team members. This position is under the Logistics Section.
- *Victim Decontamination Unit*: facilitate and/or perform decontamination and clear victim for post-decontamination triage. This unit is responsible for the establishment of the decontamination areas and prioritizing patients for triage.
- *Facility/ Equipment Decontamination*: decontamination of the equipment and hospital. Ensure proper waste disposal. *HICS 2014*

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Team Member Selection

The specific team member composition is dependent upon the facility's resources and the risk assessment. Many models exist that range from all clinical staff to all non-clinical staff. Below are things to consider when developing the team.

Composition	Pros	Cons
All Clinical Staff	- Can quickly evaluate and treat a patient who decompensates during decontamination - Have a better understanding of physiologic changes after exposure to hazardous mart	- Can decrease available clinical resources in the patient care area - Expensive to maintain training
All Non-Clinical Staff	- May have more knowledge regarding the mechanical aspects of equipment set-up - More staff to choose from - Will not impact clinical care provided	- Cannot care for a patient who decompensates - Unable to conduct medical triage
Mixture of Clinical and Non-Clinical	- Larger staff pool to recruit - Can select people based on current skills - Will have personnel available to provide clinical care if required	

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)

CASE STUDY

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, Il., came seeking treatment. Both emergency rooms were cleared to open after being thoroughly decontaminated, the hospitals said.

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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, and 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)

Levels of Personal Protective Equipment

	Skin	**Respiratory**	**Comments**
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] Ar-purifying Respirator (APR)	Lower level of skin and respiratory protection
Level D	Limited protection	No respiratory protection	Standard Precautions

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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 or Air-purifying respirator (APR) with a NATO 40mm First Responder cartridges (NOT HEPA filters);
2) A Level C chemically resistant suit;
3) Double gloves;
4) Chemically resistant boots; and
5) Tape that meets the ASTM F1001test battery.

When determining which PPE is needed for a facility, consult the resources below as well as subject matter experts across the state.

- Centers for Disease Control (CDC) Emergency Response Resources (http://www.cdc.gov/niosh/topics/emres/ppe.html)
- Guide for the Selection of Personal Protective Equipment for Emergency First Responders (2007) developed by the U.S. Office of Homeland Security as well as subject matter experts.

The critical factors to evaluate are NIOSH approval, market price, chemicals protected against, length of time effective, durability, and others.

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

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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 (Fig 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 PAPRs include:

1) The 3-M Breatheasy 10 system,
2) The Scott Proflow 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. (Fig 1) PAPR system with motor, battery, flow rate meter, and loose fitting full length hood

While no filter cartridge can protect users from all hazards, hospitals should select cartridges that are rated to protect uses from particulates (P-100 rating). The cartridges should be effective on contaminants identified in the HVA. Be sure to review the specifications closely and contact the manufacturer if you have additional questions.

According to OSHA First Receivers Guidance, hospitals who have identified a Weapons of Mass Destruction (WMD) as a HVA risk must use the NIOSH-approved CBRN filters if they are available.

Examples of appropriate cartridges include:

1) 3-M model RBE57
2) Scott NBC cartridges,

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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 recommend 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. *They should be marked and separated from the in date filter. One suggestion is to remove them from the wrapper so that they are easily identifiable as expired.*

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 must initially be conditioned by running them through two or three charge cycles (charge, drain, and recharge). The batteries should be cycled monthly and should not be left charging all of the time. They need to be replaced when they start to fail to hold a full charge (typically 2 – 3 years after initial charge). Labelling the batteries with the acquisition date and maintaining a log of cycles can assist with monitoring the battery status. Different types of rechargeable batteries may have slightly different processes for cycling and conditioning. Read the manufacturers' instructions carefully.

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.

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

The suits with sealed seams are the recommended style. Suits with sealed seams typically provide a much higher level of protection. However, if suit seams are not sealed, they should be taped with duct or chemically resistant tape. Suits with attached hoods and booties are not necessary. It is better to use suits that are oversized than undersized, and excess suit material can be taped down as needed. Many hospitals are using all 4XL suits for every team member. This decreases the cost and time to maintain appropriate suit size for team members. Consider hanging or rolling suits for storage to reduce creasing and cracking.

Double Gloves: Employing two sets of gloves constructed of different materials provides the best protection. The HVA must be consulted to assess the risk and use this to determine which type and thickness of glove should be utilized. An outer layer of nitrile gloves can serve to indicate contamination or breach of gloves. Nitrile will tear before a thicker layered glove. In addition, it provides one more layer of protection if a change of gloves is necessary.

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. This is recommended because heavy equipment and patients will be moved with limited visibility. Crush injuries are a possibility. Boots should be a minimum of 8 inches tall and be washable.

Examples of chemically resistant boots 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 area, be inspected regularly and replaced as needed. The temperature should be maintained per manufacturers' guidance. In order to be ready to use, rechargeable batteries must be maintained monthly.

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OSHA Respiratory Protection Program

OSHA standards (29CFR1910.134), require hospitals that use respirators to develop a written respiratory protection program. The hospital may currently have a respiratory protection program. Integration with an existing program can decrease duplication and enhance standardization. The current program must be evaluated to ensure it meets the OSHA requirements for hazardous materials decontamination.

The Respiratory Protection Program must include the following components:

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) or Air-Purifying Respirator (APR), provides a protection factor of 1,000. Respirator must be National Institute for Occupation Safety and Health (NIOSH) approved.
- Skin Protection in the Hospital Decontamination Zone:
  - Chemical protective gloves
  - Chemical resistant suit and tape
  - Chemical protective boots

PPE in the Post-Decontamination Zone

Level D required in Cold Zone.

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Hospital Decontamination - System Components

The objective of hospital decontamination is to employ a high volume low pressure deluge of water to decontaminate patients.

Hospitals may also consider purchasing the following decon equipment:

Decontamination Set-Up

- Decontamination tent
- Shower in or near the emergency department
- Water heater
- Soft sponge or washcloth
- Outdoor lighting
- Barricades
- Barricade tape
- Signs for decontamination process
- Stretchers that can be decontaminated
- Generator
- Privacy tents
- Incident Command Vests
- Radios

Patient Care

- Triage tags
- Personal privacy kits

Detection

- Radiation survey meter
- pH paper

Decontamination Facility Set-Up

Decontamination facility set-up is defined as the assembly of equipment, supplies, and human resources required to commence and 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.

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Decontamination Process and Site Planning Considerations

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

Contaminated victims transported by EMS or self-referred are considered 'dirty' until they are decontaminated. After decontamination, they are considered 'clean'. In selecting your site for decontamination, two distinct areas need to be defined: hospital-*decontamination zone* (dirty) and hospital *post-decontamination zone* (clean). 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:

- Determine a Primary Decontamination Site
- Determine a Secondary Decontamination Site
- For each site, consider:
  - Access and security
    - What will be the route of travel for EMS? What will be the route of travel for self-referrals?
    - Can the area be secured?
    - Is there visual access to media or bystanders?
  - Does an alternate access point for the emergency department need to be established?
  - Staging Areas for dirty and clean victims (pre and post decontamination). Do these areas protect the patients from the environment and bystanders?
  - Is the chosen site in a large, well ventilated are away from air intakes?
  - What are the locations for water sources, wastewater drainage, external power, and lighting?
  - Site Map: A site map for all stages of decontamination should be readily available.
  - Staging Location:
    - Locations for PPE, equipment, staff
    - Location for post decontamination area including linens, gowns, and other essential supplies
    - Staff rehabilitation
    - Secure area for contaminated personal effects designated

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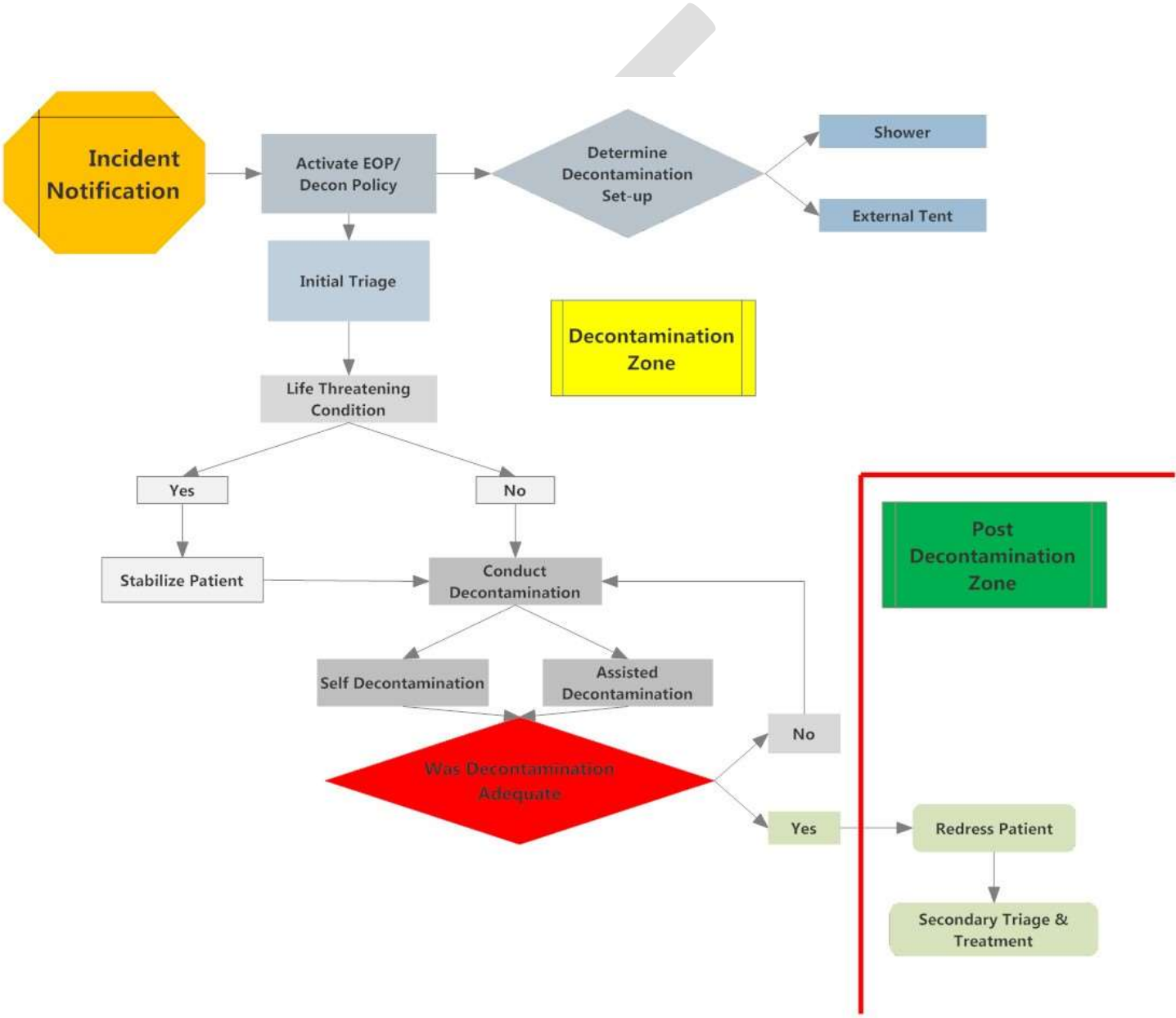
Algorithm for Decontamination

This is a flow-diagram of the steps taken when hospital decontamination of victims is required. This algorithm identifies what activities take place within the: Hospital Decontamination and Hospital Post-Decontamination Zones.

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



Response Overview

Table Quick Response Procedure[1]

Preparation • Notify hospital personnel • Alert security • Establish name and toxicity of chemical agent when possible • Assemble and brief decontamination team • Begin decontamination team registration • Set up decontamination zones • Set up team rehabilitation zone	**Protection** • Move casualties outside to limit facility contamination • Safeguard facility lock-down and cordon off entries • Crowd management • Provide scripted information to casualties awaiting decontamination • If hospital is contaminated, isolate and clean
Decontamination • Ensure decontamination teams are in place • Conduct triage • Basic life support delivered at triage, or in the decontamination area • Undress casualty and ensure privacy • Remove dressings prior to decontamination • Double-bag and secure clothing, effects, and linen • Tag belongings and valuables • Assist non-ambulatory casualties • Consider special needs victims • Head to toe, flush, soap and water wash, then rinse • Monitor decontamination staff in PPE	**Pre/Post Decon Treatment** • Establish duration and route of exposure • Assess clinical effect/ toxidrome • Obtain additional advice • Provide medical and physical supportive care • Consider antidote • Commence victim treatment regime • Consider off-gassing potential • Isolate if necessary • Plan and consult if transfer required for off-gassing victim
Recovery • Decontamination exposed staff • Clean up affected sites • Seek advice re: disposal of clothing • Contact hazardous waste contractor • Debrief staff, advising of potential health effects • Advise authorities when normalcy restored • Revise protocols as necessary • Follow-up potential short/ long term health effects of decon team members • Create/ file appropriate documentation of incident	

[1] Reproduced from Department of Human Services (2007), Decontamination Guidance for Hospitals

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Identification of Contaminant

Identification of the hazardous material is a challenging task for hospitals. Each hospital will need to determine what equipment will be utilized, if any. There are several considerations in this decision making process.

- What risks are identified in the HVA?
- What equipment is available for detecting the substances for which the facility is at risk?
- What is the cost to purchase and maintain the equipment and ensure that team members are adequately and continually trained to use the equipment?
- Will procedures or treatment change based upon the results of the tests?

Equipment to identify hazardous materials can be as inexpensive and simple to use as pH paper, more complex like a radiological pancake meter, to very expensive $20,000 multi-substance detector which requires a lot of maintenance and calibration. The HVA is key to determining what equipment is potentially useful. For example, if the hospital is within the contamination zone of a nuclear power plant, radiological detectors might be useful.

If treatment is not going to change even if the contaminant has been identified, it might not be worth the cost of purchasing and maintaining the equipment.

Within the hospital's community, there may be resources to assist with detection if it is needed. Developing strong partnerships with county emergency management, the fire department, and local hazardous materials teams are critical. In addition, the Poison Control Center (1-800-222-1222; www.ncpoisoncenter.org) is a valuable resource and should be utilized in planning and response. They can assist with agent identification and treatment.

Equipment, Effluent and Wastewater Management

A plan must be developed for the decontamination and return to service of the decontamination equipment. This includes the decontamination tent, PAPR, PPE, and the decontamination set-up location. This written plan should be included in the overall hazardous materials plan.

The management of effluent and wastewater requires its own plan and should be developed prior to an incident. Historically, there are low levels of contaminant found in wastewater from a decontamination shower. The hospital should work with the Local Emergency Planning Committee (LEPC), county emergency management, local water utilities, and the state water works to determine the requirements in your particular county.

The recommendations can be varied. In some areas, wastewater does not need to be contained. In others, the hospital must have a collection reservoir which is then emptied by a licensed chemical clean up company. A hospital should develop an MOU with the local wastewater publically owned treatment works and a company to provide clean up services at your facility. A template of the MOU is within the appendix.

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Decontamination Considerations during a Radiologic Event

Background: Based upon previous radiologic events, such as the radiation release in Japan from the Fukishima 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 expect large numbers of worried well who will self-refer.

Basic things to remember

- ❖ Decontamination should not delay or impeded stabilization of any victim.
- ❖ Provider should not be placed at risk to care for patient.
- ❖ Removal of all clothing can reduce contamination on the patient by up to 90%.
- ❖ Include Radiation Safety Officer in planning and response.
- ❖ Planning should include County EM and local Hazardous Materials Team

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 means a person has been exposed to radiation but does not have radioactive materials on their person do not need to be decontaminated. Exposure to radiation does not make a person radioactive

Internal vs. External Contamination

- 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.
- 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.

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

> ***Remember:*** "Medical and nursing personnel have never received a medically significant acute dose of radiation when providing patient care to radiation casualties."
>
> Ref: http://orise.orau.gov/files/reacts/medical-aspects-of-radiation-incidents.pdf, page 13
>
> With radiologic decontamination, if there are no additional hazards such as chemical contaminants, clinicians should treat a patient's life threatening injuries regardless of performance of decontamination.

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.

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.

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Special Considerations in Hospital First Receiver Planning

Special Needs or At- Risk Populations

At-risk populations should be planned included in the planning. What types of populations are you likely to see? Are there many summer camps that could send you unaccompanied minors? Do you have a large Korean population that doesn't speak English?

Considerations

- Signage: what special signs are needed for your community? Do they need to be pictures or in a different language?
- Special Equipment: Is there special equipment that is required for a local population? Are additional mobility resources like walkers and wheelchairs needed?
- Language: Are special interpreters needed or should picture books be developed for communication during the incident?
- Pediatrics: What additional resources would be needed? How would you decontaminate an infant?

Training of Hospital Personnel

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.

First Receiver 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. When determining who should have awareness level training, consider the portals that visitors enter through. It may be important to provide guest services and volunteer services training due to their roles at the entrances of the hospital. The 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 peripherally 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

First Receiver 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:

- 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

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    - How to properly put on (don), remove (doff), and 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 a 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 PAPR or 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.

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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 care for 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. 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 environmental services. This group could include those personnel who do not have a role in the decontamination process, reasonably would not be expected to encounter self-

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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.

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OSHA Guidance Regarding 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.

OSHA Guidance on Training for First Receivers

MANDATORY TRAINING	**FIRST RECEIVERS COVERED**
FIRST RECEIVER AWARENESS LEVEL **Initial training** **Annual refresher** *Both initial and refresher training may be satisfied by demonstration of competence.*	Security, set-up crew, and registration/ patient relations 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 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**.**
FIRST RECEIVER OPERATIONS LEVEL **Initial training** **Annual refresher** *Both initial and refresher training may be satisfied by demonstration of competence.*	All employees with designated roles in the Hospital Decontamination Zone 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.
Briefing at the time of the incident *Just-in-time Training*	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)
RECOMMENDED TRAINING	**PERSONNEL COVERED**
Training for all other hospital staff	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)

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Performance Improvement Measures

Hospital Decontamination Drills and Exercises

Hospital decontamination drills and exercises provide great value. They allow the team to practice and the plan to be rigorously tested. Realistic scenarios that include external partners provide the most benefit. For each drill or exercise, the hospital should develop 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

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:

- Regional or neighboring hospitals/public health partners/community responders
- 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)

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Summary

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:

- Development of a decontamination plan,
- Identification of decontamination team,
- Determination of required personal protective equipment,
- Identify required training for team members and all hospital employees,
- Identification of a decontamination site 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.

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APPENDIX A

GEORGIA Required Minimum Items to be Available

THESE ITEMS ARE NOT REQUIRED IN NORTH CAROLINA. THIS IS PROVIDED FOR REFERENCE ONLY

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**
MINIMUM REQUIRED ITEMS FOR PERSONAL PROTECTIVE EQUIPMENT						
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. http://www.kappler.com/access_chemtape.html 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-57Cartridges, 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	3 Spare Cartridges/ Per Kit	3 Spare Cartridges/ Per Kit	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**
MINIMUM REQUIRED ITEMS FOR DECONTAMINATION EQUIPMENT						
Decon Shower System	• Minimum of two people must be able to set up in 20 minutes or less with water running • Flow rate adequate for multiple victim decontamination • Decon capabilities for ambulatory and non-ambulatory patients • Ability to capture and retain post decon contaminated run off when necessary • Process supplies and equipment to collect patients' clothing and contaminated items • Privacy panels • Sufficient lighting to assure SAFE operations inside the decon tent **RECOMMENDED:** • Fixed or hand held sprayer for effective decon • Mass casualty litters and all terrain wheels or roller system and backboards - for non-ambulatory decon	ea	1	1	1	1
Patient Decon Kits (Doff and/or Don)	The decon kit can include: • Resealable opaque valuables bag • ID system with bracelets and labels for bags • Label with complete how-to-use instructions • Instructions in both English and Spanish with supporting pictograms • Re-sealable clothing bag • One redress gown "poncho" style • Towels	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

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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
Optional Items						
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.					

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APPENDIX B: Georgia Hospital Decontamination Workgroup Members

Travis Arrington, Safety Officer Tift Regional Medical Center RCH Region L, Tifton, GA	**Ricky Lee**, Emerg. Preparedness Specialist East Central health District 6 Augusta, GA
Laurice Bentley, Emer. Preparedness Specialist South Central Health District 5-1 Dublin, GA	**Joe Lockman**, Dir. Safety and Security St. Mary's Health Care System, Inc. Athens, GA
Kermitt Bryan, Safety Officer Tift Regional Medical Center RCH Region L, Tifton, GA	**Dominick Nutter**, Dir. Emergency Services(retired), US Army Evans, GA
Darryl Camp, Healthcare Community Liaison North Georgia Health District 1-2 Dalton, GA	**Mark Palen**, Emer. Preparedness Coordinator North Health District 2 Gainesville, GA
Rudy Castorina, Emergency Management Coordinator DeKalb Medical Center RCH Region D, Decatur, GA	**Barbie Salter**, Policy and Planning Specialist Southwest Public Health District 8-2 Albany, GA
Joe Claborn, Safety Manager The Medical Center Inc. RCH Region I, Columbus, GA	**Janet Smith**, Emer. Management Coordinator Tanner Health System Carrollton, GA
Matthew Crumpton, Training and Exercise Coordinator, GA Dept. Of PH, Emergency Preparedness and Response Atlanta, GA	**Courtney Terwilliger**, EMS Director and EP Coordinator, Emanuel Medical Center Swainsboro, GA
Cassandra Davidson, EOC Coordinator Northeast Georgia Health System RCH Region B, Gainesville, Ga	**Jim Walker**, Dir. of Physical Resources Oconee Regional Health Systems, Inc. RCH Region H, Milledgeville, GA
Bo Drinkard, Emergency Manager Fairview Park Hospital Dublin, Ga	**Kevin Wells**, Emer. Management Specialist MCG Health, Inc. RCH Region G Augusta, GA
Alfred Goosby, Emer. Preparedness Specialist Georgia South Public Health District 8-1 Valdosta, GA	**Cary Westgate**, Emergency Preparedness Manager Atlanta Medical Center Atlanta, GA
Betsy Kagey, Deputy Director GA Div. of PH, Emergency Preparedness and Response Atlanta, GA	**Hank Wilson**, Emer. Preparedness Specialist West Central Health District 7 Columbus, GA
Wesley Kolar, Hazmat Response Coordinator University of Georgia, Athens, Ga	**Jim Zerylnick**, Manager-Operations and Training, Emory Univ Critical Event Preparedness & Response, Atlanta, Ga

APPENDIX C

Memorandum of Understanding Hazardous Materials Effluent Template

APPENDIX D

HICS Job Action Sheets

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