



Los Angeles County Emergency Medical Services Agency



MASS CASUALTY DECONTAMINATION FOR HOSPITALS

2006

Mass Casualty Decontamination for Hospitals Student Workbook

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Introduction

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The Mass Casualty Decontamination for Hospitals training DVD program was created to provide retraining for students that have already participated and have been certified in mass decontamination awareness and operational training. Maintaining competency in the proper use of personal protective equipment (PPE) during training or an actual decontamination event is required under Occupational Safety and Health Administration (OSHA) standards. This DVD series will provide the student an opportunity to review either individually or in a group setting topics such as weapons of mass destruction (WMD) and terrorism awareness, the Hospital Incident Command System (HICS) related to the hospital decontamination operation, PPE donning and doffing, medical considerations while wearing chemical protective clothing, establishing the decontamination zone, and victim decontamination. Two scenarios are included to prompt discussion on procedures and planning on decontamination team activation/utilization that can be applied to your particular facility.

Hands on practice with PPE must also be a part of the student's retraining. Familiarization with equipment through inspection and proper use leads to individual competency and safety. Those students who are either physically or medically unable to wear a respirator or use PPE can still be an integral part of the hospital decontamination

team. It is imperative that all team members be familiar with all team roles and responsibilities. Donning and doffing cannot be accomplished and should not be done alone. Assistance will be required from non-suited members in the support zone.

The concepts in the video regarding hospital decontamination have been developed from existing industrial and first responder systems that have already proven to be successful. These work practices have been applied to the hospital setting with the intention of providing a safe working environment for the team member, reducing the possibility of facility contamination, while addressing the immediate needs of the victims.

Mass decontamination in a hospital setting simply stated is large numbers of contaminated persons who must take off their clothes and take a shower in a parking lot (or other outdoor decon area). Although this sounds simple, to be accomplished with expedience and safety, the student must have complete knowledge of the operation. Be honest with yourself regarding your competency of this subject. Address these knowledge deficits through individual and group study. Ultimately, this will lead to a fully functioning decontamination team that will allow its associated medical facility to maintain service to the community during a hazardous material terrorist event.

Course Agenda

This course may be presented in one of two ways, depending on the schedule of participants and the needs of the facility. The order of activities is slightly different for the two versions.

Four 2-hour segments:

- Segment 1 Introduction, Welcome, Pre-Seminar Quiz and discussion
Module 1, video and activities
- Segment 2 Module 2, video and activities
Module 3, video and activities
- Segment 3 Module 4, video and activities
Post-Seminar Test
- Segment 4 Module 5, video
Exercise
Exercise critique/Wrap-up

Two 4-hour segments

- Segment 1 Introduction, Welcome, Pre-Seminar Quiz and discussion
Module 1, video and activities
Module 2, video and activities
Module 3, video and activities
- Segment 2 Module 4, video and activities
Module 5, video
Exercise
Exercise critique
Post-Seminar Test
Wrap Up

Module One

Introduction to Weapons of Mass Destruction



Weapons of Mass Destruction (WMD) are devices, usually chemical, biological, explosive, or radiological in nature, that are intended to cause death or serious bodily injury to a large number of people. In the hands of terrorists, WMDs are likely to be particularly deadly.

Emergency health care providers are important elements of the nation's first line of defense and response against terrorist attacks involving Weapons of Mass Destruction.

It is important that health care workers become familiar with the etiology and clinical symptoms of WMD agents, not only to be better prepared to assist victims but also to prevent exposing themselves and their facilities to the danger of cross contamination.

If victims are contaminated with liquid chemical agents, decon is necessary. If the chemical is in gaseous form, mass decon beyond the removal of clothing may or may

not be necessary. If there is any doubt, decontamination should be carried out.

If victims are contaminated by radioactive materials, life-saving procedures may take precedence over decontamination. If available, radiation detectors may be deployed to triage victims, although it may take longer to carry out surveys, than it does to decontaminate. If readings are more than three times above background, victims should undergo decon. Following decon victims must be surveyed again to determine if the process was successful.

Usually victims of biological terrorism will not have to be decontaminated. Exceptions are those known to have had skin contact with aerosolized pathogens, powders, or droplets, or who may have the material on their clothing. Although these persons can be directed to decon themselves especially in the instance of suspicious substance calls, decon may have psychological benefits for victims, but at the same time raise concern in the community.

Pre-Seminar Quiz

1. What is decontamination and why is it necessary?

2. List some of the challenges that hospitals will face in mass decontamination situations.

3. What are some basic safety precautions that first receivers should take to avoid becoming contaminated?

Pre-Seminar Quiz, cont.

4. What types of weapons might terrorists use?

5. What are some of the potential problems for first receivers working in personal protective equipment?

6. What are the four levels of personal protective equipment?

7. Why is it important to have an organized incident management system to deal with terrorist and other types of major incidents?

Pre-Seminar Quiz, cont.

8. List some of the equipment and other items needed in the decon area.

9. How do you determine that a victim presenting at the hospital requires decon?

10. What are some ways of obtaining information about chemicals or WMDs?

Objectives – Module One

Following successful completion of Module One, the seminar participant will be able to:

- Define terrorism & recognize the impact that a terrorism event would have on their community
- Characterize biological agents, chemical agents, radiological agents and explosive agents
- Discuss how biological agents, chemical agents, radiological agents and explosive agents could be used as a Weapon of Mass Destruction (WMD)
- Describe signs and symptoms that would indicate the use of a WMD
- Identify the need for specialized Weapon of Mass Destruction (WMD) training
- Discuss Occupational Safety and Health Administration (OSHA) regulations regarding emergency response to hazardous materials incidents

CBRNE Mass Casualty Decontamination for Hospitals

Quick Reference Guide

Agent	Signs and Symptoms	Symptom Onset	Antidote/Treatment	Hospital Decontamination	Minimum Level of Protection for Hospital Personnel
¹⁾ Biological a) Bacterial, Viral	a) Flu-like symptoms, possible rash depending on agent	a) Delayed (days to weeks)	a) Anthrax and plague treated with antibiotics, vaccine given for smallpox and yellow fever	a) No	a) Protection during in-hospital treatment of patients with contagious diseases such as smallpox and plague: (Universal precautions - gown, N95 mask, gloves) Anthrax: (Standard precautions - gloves, gown) since it is not transmissible by airborne route
b) Toxins	b) Botulinum: Muscle weakness/paralysis; Ricin: (symptoms vary by system affected) Ingestion: Nausea, vomiting, abdominal pain Inhalation: Shortness of breath, chest pain, fever, cough	b) Hours to days	b) Botulinum antitoxin limited availability	b) Yes if exposure is recent	b) Level "C" during decontamination

CBRNE Mass Casualty Decontamination for Hospitals Quick Reference Guide

Agent	Signs and Symptoms	Symptom Onset	Antidote/Treatment	Hospital Decontamination	Minimum Level of Protection for Hospital Personnel
2) Radiological a) Dirty bomb will leave radioactive dust on victims	a) Alpha, Beta, Gamma: Dose dependent; usually asymptomatic at doses <100 REM	a) Delayed depending on dose received	a) Some antidotes may remove heavy metals from the body depending on radioisotope (DTPA, SSKI, Prussian Blue, etc.)	a) Yes, if contaminated with dust or debris	a) Level "C" during decontamination; N95 mask, gown, gloves, foot covers during in-hospital treatment of non-decontaminated victim with life threatening injuries
b) Pure exposure to radiation source will NOT cause victims to become radioactive	b) Radioactive elements are also commonly toxic heavy metals	b) Delayed depending on dose received	b) Some antidotes may remove heavy metals from the body depending on radioisotope (DTPA, SSKI, Prussian Blue, etc.)	b) No decon necessary for pure exposure to radiation	b) Level "D" (normal work clothing) if victim exposed to radiation but not contaminated

CBRNE Mass Casualty Decontamination for Hospitals Quick Reference Guide

Agent	Signs and Symptoms	Symptom Onset	Antidote/Treatment	Hospital Decontamination	Minimum Level of Protection for Hospital Personnel
3) Chemical a) Blister agents (Mustard agent, Lewisite) b) Choking agents (e.g., ammonia, chlorine) c) Blood agents (e.g., cyanide) d) Nerve agents (e.g., Tabun, Sarin, Soman, VX)	a) Mustard: Skin blisters, eye/throat irritation. Lewisite: Blisters & arsenic poisoning b) SOB, chest pain, burning eyes, throat, etc. c) SOB, dizziness, headache, rapid breathing, seizures d) SLUDGE (salivation, lacrimation, urination, defecation, GI disturbance, emesis), SOB, paralysis	a) Mustard: blisters appear after several hours Lewisite: immediate blisters b) Immediate c) Immediate d) Immediate	a) Mustard agent: No antidote Lewisite: British Anti-Lewisite (BAL), helps to remove arsenic, does not affect blisters b) Symptomatic treatment c) Cyanide treatment kit d) Mark I nerve agent antidote kit	a) Yes b) Yes c) Yes d) Yes	a) Level "C" during decontamination b) Level "C" during decontamination c) Level "C" during decontamination d) Level "C" during decontamination
4) Explosive	4) Trauma from overpressure, winds, shrapnel, burns	4) Immediate	4) Specific to traumatic injury. Look for hidden blast lung & abdomen.	4) Only if suspected CBRN agent added to bomb	4) Level "C" during decontamination if CBRN component added to explosive device

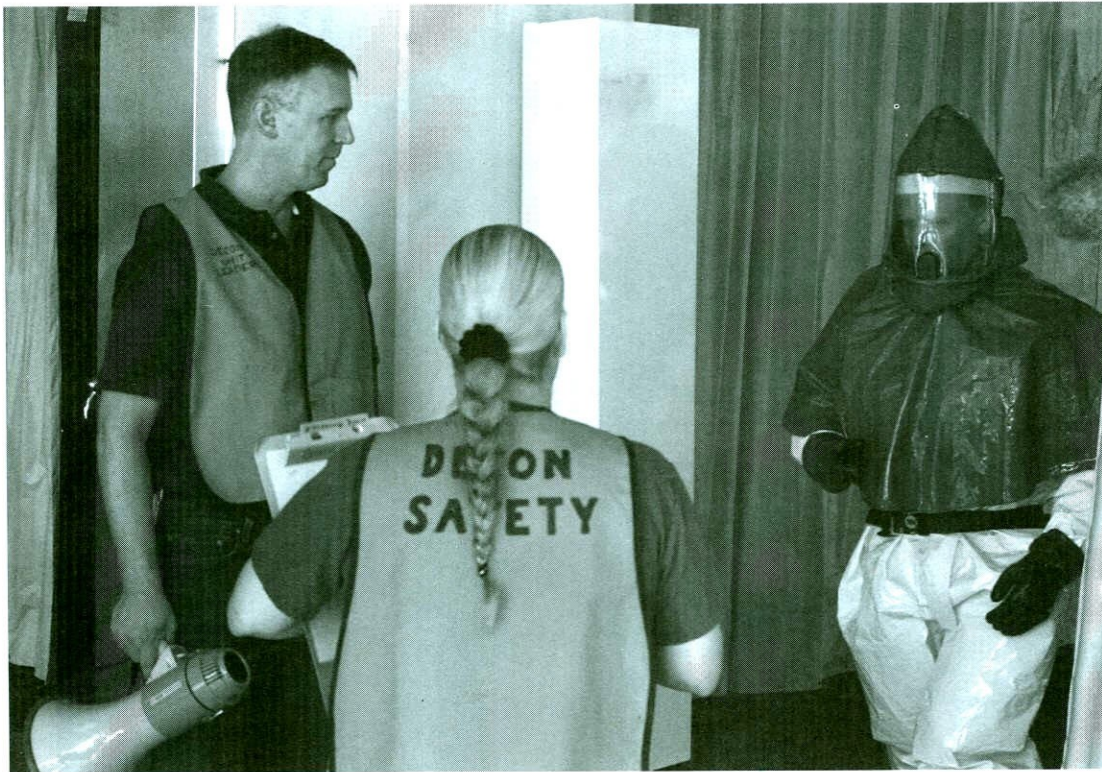
Note: Exposure to or contamination with any CBRN agent can result in death depending on route of exposure and dose received.

This chart contains an abbreviated listing of signs and symptoms of select CBRNE agents for quick reference only.

Student resource

Module Two

Hospital Incident Command System



A terrorist incident, flood, earthquake or other incident with mass casualties will overwhelm any community, especially the hospitals. There, it is important that hospitals develop a plan to work together and with local government agencies to meet the challenge of this type of situation.

The Hospital Incident Command System, or HICS, has been developed as a way to organize a medical facility's response to incidents that could cause a disruption of services and safety. HICS is the health care industry's version of the Incident Command System, which is used by fire departments, law enforcement and other emergency agencies. Using terminology and organizational structure the same as these organizations permits medical

facilities to more easily coordinate response activities.

Because it is modular in design, HICS is designed to be flexible enough to meet any type of emergency situation, large or small. Only those portions of the plan that are needed to effectively meet the immediate and short-term needs of the incident are activated.

Key positions in the structure have roles that are pre-defined. 'Job Action Sheets' are prepared as a part of the Emergency Plan to identify the roles, responsibilities and tasks for each position. Throughout the incident, the responsibilities of any given position remain the same even if the person holding that position changes.

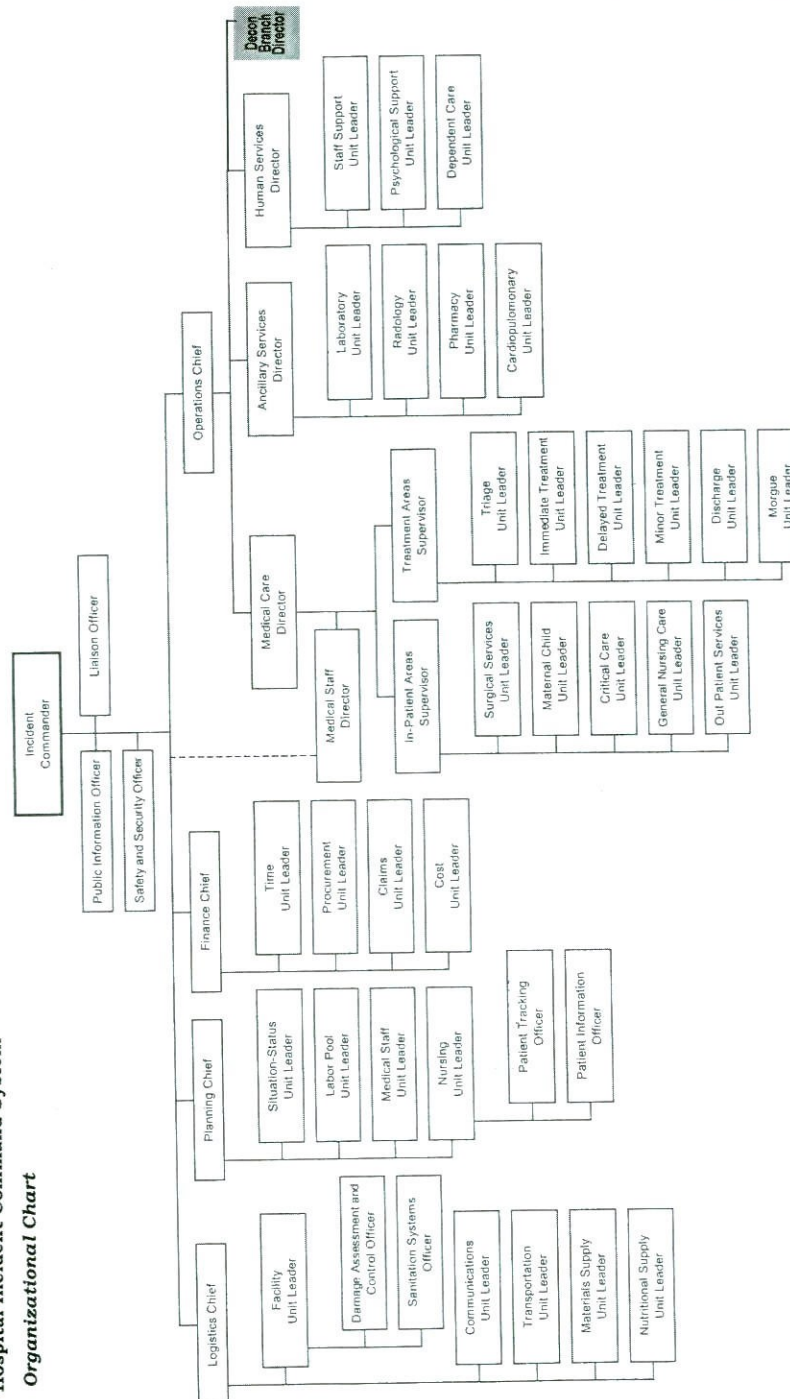
Objectives – Module Two

Following successful completion of Module Two, the seminar participant will be able to:

- Understand the impact that disasters have on hospital facility and personnel
- Describe the need for controlling and organizing personnel during a disaster
- Describe the essential components of an Emergency Management Plan
- Understand the HICS model and its integration into the current hospital organization
- Describe the three steps of implementing HICS during hospital emergency response
- List the responsibilities of each branch of HICS
- List the benefits of HICS during internal and external disasters
- Explain where the decon operation fits in the HICS structure in your facility

Organizational Chart Hospital Incident Command System (HICS)

Hospital Incident Command System
Organizational Chart



Note: This is one way to handle decon. It may differ in your hospital. Please note that changes in the HICS structure may be made from time to time.

HICS JOB ACTION SHEET

Decontamination Branch Director

Position Assigned to: _____

You report to: _____ (Operations Section Chief)

Operations Command Center: _____ Telephone: _____

Mission: Oversee all aspects of decontamination activities of victims arriving to the hospital requiring decontamination. Coordinate with the Decontamination Safety Officer in management of the Decontamination Team and safety concerns. Coordinate with the Decontamination Zone Officer to maintain patient flow or re-supply of materials.

Immediate

- _____ Receive briefing from Operations Chief (or other designated supervisor).
- _____ Respond to the Decon Trailer.
- _____ Read this entire Job Action Sheet and review the organizational chart.
- _____ Initiate Ambulatory Decon set up and support zone with Decon Unit Leader post.
- _____ Put on position identification vest.
- _____ Evaluate available information and confirm/re-confirm.
- _____ Consult with Decon Safety Officer regarding safety issues.
- _____ Consult with Security Director regarding access and security issues.
- _____ Assign primary decon personnel and their back-ups to their tasks. Distribute job action sheets.
- _____ Inform Emergency Operations Center and Emergency Department that Decon Unit is prepared to receive patients.
- _____ Request medical staff support through Treatment Area Supervisor as needed.
- _____ Request Communication Equipment from Emergency Operations Center.
- _____ In absence of adequate personnel, the Decon Unit Leader will perform all functions of the Decon Safety Officer. Decon operations will not commence without a minimum 3 team members consisting of a Decon Branch Director/Safety Officer, a Safe Refuge Area Officer, and an Ambulatory Decon Person.

Intermediate

- _____ Assess need for non-ambulatory decon set up.
- _____ Ensure second and third shift relief for decon team.
- _____ Communicate with ED Treatment Area Supervisor for appropriate patient disposition. Communicate regularly with Patient Tracking Officer.

HICS Job Action Sheet, Decon Unit Leader, cont.

- _____ Ensure that all patients transferred from decon area are tracked and documented in regards to disposition.
- _____ Ensure that a belongings/valuables holding site is secured.
- _____ Report frequently and routinely to Treatment Area Supervisor on situational status.
- _____ Authorize release of water runoff if containment capabilities have been maximized or it is determined that no agent was involved. All other release of water runoff will require approval from the Safety Director.
- _____ Determine possible Plan adjustments, as follows:
 1. Upgrade considerations:
 - Need more decon personnel.
 - Need decon personnel backups.
 - Need longer wash cycles for victims.
 - Need help from external resources.
 2. Downgrade considerations:
 - Reduce level of protective clothing or respiratory protection.

Extended

- _____ Review and approve the area documenter's recordings of action/decisions in the Decon Area. Send copy to the Treatment Area Supervisor.
- _____ Direct non-utilized personnel to Labor Pool.
- _____ After receiving authorization from Health Department, notify appropriate hazardous waste personnel/agency for removal of water runoff.
- _____ Notify Safety Director regarding release of contaminated water runoff down storm drain.

HICS JOB ACTION SHEET

Decontamination Safety Officer

Position Assigned to: _____

You report to: _____ (Decontamination Unit Leader)

Operations Command Center: _____ Telephone: _____

Mission: Monitor and have authority over the safety of decontamination operations for hazardous conditions and team member safety. Maintain communications with the Safety and Security Officer and the Decon Branch Director. Control the flow of ALL personnel in and out of the Decontamination Zone (DZ). Provide direction and instructions to anyone entering or exiting personnel working in the DZ as part of the decontamination process.

Immediate

- _____ Receive appointment & briefing from Decon Branch Director.
- _____ Read this entire Job Action sheet and review organizational chart.
- _____ Put on position identification vest or note position on PPE.
- _____ Restrict or remove unauthorized persons from the DZ.
- _____ Assist Decon Branch Director in the establishment of Decon area.
- _____ Provide safety check for each team member entering the DZ.
- _____ Assist Medical Monitoring in marking each Decon Team Member with name, position and time suit donned.
- _____ Oversee tracking of Decon team members.
- _____ Assess water runoff collection is taking place
- _____ Assure water runoff containment is set up prior to decontamination
- _____ Advise Safety Director and Decon Branch Director immediately of any hazardous or security related conditions.
- _____ Observe for any Decon Team Members who exhibit signs of contamination, dehydration, or fatigue. Provide for decon and removal from the DZ.
- _____ Communicate regularly with the Decon Zone Officer.
- _____ Don PPE should entry into the DZ become necessary.

HICS Job Action Sheet, Decon Safety Officer, cont.

Intermediate

- _____ Provide for staff rest periods and relief.
- _____ Observe and assist any staff or patient who exhibits signs of contamination.
Report concerns to the Treatment Area Supervisor.
- _____ Secure and post non-entry signs or barricades around unsafe or restricted areas.
- _____ Ensure that water runoff is contained or at least not flowing into the Support Zone.
- _____ Secure areas to limit unauthorized personnel access.
- _____ Advise the Emergency Operations Center immediately of any unsafe, hazardous or security related conditions.
- _____ Assure any release of wastewater is directed to the storm drain.
- _____ Other concerns:
 - Correct use of PPE
 - Heat stress
 - Run-off
 - Ergonomics
 - Need to obtain samples
 - Wind direction
 - Proximity to air intakes

Extended

- _____ If entry in DZ is necessary, ensure proper decontamination before entering the Support Zone.

HICS JOB ACTION SHEET

Decontamination Zone Officer

Position Assigned to: _____

You report to: _____ (Decontamination Area Leader)

Operations Command Center: _____ Telephone: _____

Mission: Control and manage the incoming patients within the Decontamination Zone (DZ). Coordinate with the Decontamination Branch Director to manage the flow of patients into the Decontamination Zone. Manage your area and supplies.

Immediate

- _____ Receive briefing from Decon Branch Director.
- _____ Read this entire Job Action sheet and review organizational chart.
- _____ Assist Decon Unit Leader in the set up for Ambulatory Decon.
- _____ Don proper PPE.

Intermediate

- _____ Assess the need for Non-ambulatory Decon set up.
- _____ Systematically per your SOPs, provide control of movement within the DZ.
- _____ Communicate regularly with the Decon Branch Director.
- _____ Establish priority for patient decontamination.
- _____ Report number of victims to the Decon Branch Director.
- _____ Obtain history of event from victims if possible.
- _____ Note signs and symptoms of victims and notify the Decon Branch Director.
- _____ Ensure that all patients are tracked.
- _____ Ensure collection of belongings and valuables.
- _____ Ensure that all needed items such as scrubs, towels and containers are restocked.
- _____ Ensure that water runoff is contained or at least not flowing into the Support Zone.

Extended

- _____ Observe and assist any staff or patient who exhibits signs of contamination.
- _____ Report concerns to the Decon Branch Director.
- _____ Provide for staff rest periods and relief.
- _____ Ensure that you pass through proper decontamination before entering the Support Zone.
- _____ Report other concerns:

HICS JOB ACTION SHEET

Decon Ambulatory (Male/Female)

Position Assigned to: _____

You report to: _____ (Decontamination Unit Leader)

Operations Command Center: _____ Telephone: _____

Mission: Control the flow of patients into the Ambulatory Decontamination Corridor ensuring clothing removal and a five-minute shower with soap and water head to toe. Ensure all appropriate efforts to provide modesty protection for patients are in place. Provide direction and instructions to patients for the decontamination process. Manage your area and supplies. Male decontamination personnel should be assigned to the male corridor and female decontamination personnel assigned to the female corridor whenever possible.

Immediate

- _____ Receive briefing from Decon Branch Director.
- _____ Read this entire Job Action sheet and review organizational chart.
- _____ Assist Decon Branch Director in the set up for Ambulatory Decon Corridor.
- _____ Don proper PPE.

Intermediate

- _____ Supervise patient self decontamination and assist patients as needed through the Decon Zone up to the Support Zone.
- _____ Ensure that clean sponges are kept separate from used/contaminated sponges.
- _____ Communicate regularly with the Decon Zone Officer.
- _____ Ensure that all patients are tracked and documented.
- _____ Ensure that all needed items such as plastic bags, tags and containers are restocked.
- _____ Ensure that proper patient modesty measures are used.

HICS JOB ACTION SHEET

Decon Non-Ambulatory

Position Assigned to: _____

You report to: _____ (Decontamination Unit Leader)

Operations Command Center: _____ Telephone: _____

Mission: In coordination with a team partner, control the flow of patients in the Non-Ambulatory Decontamination Corridor providing removal of clothing and thorough decontamination (with soap and water) from head to toe. Provide a final assessment of patients' signs of contamination. Ensure all appropriate efforts to provide modesty protection for patients are in place. Manage your area and supplies.

Immediate

- _____ Receive briefing from Decon Branch Director.
- _____ Read this entire Job Action sheet and review organizational chart.
- _____ Don proper PPE.
- _____ Assist Decon Branch Director in the set up for Non-Ambulatory Decon Corridor.

Intermediate

- _____ Systematically per your SOPs, provide patient decontamination.
- _____ Communicate regularly with the Decon Zone Officer.
- _____ Ensure that all patients are tracked and documented.
- _____ Ensure that all needed items such as soap, sponges and containers are restocked.
- _____ Ensure that water runoff is contained or at least not flowing into the Support Zone.

Extended

- _____ Observe and assist any staffs or patient who exhibits signs of contamination.
- _____ Report concerns to the Decon Branch Director.
- _____ Ensure that you pass through proper decontamination before entering the Support Zone.
- _____ Other concerns:

Module Three

Personal Protective Equipment



Personal protective equipment (PPE) is the ensemble of chemical protective clothing plus respiratory protection designed to shield or isolate individuals from chemical, radiological, biological, environmental, and physical threats. Although clothing is available in many different types of materials, not all materials are appropriate for the response to all types of hazardous

materials. Healthcare facilities should evaluate the chemicals that may be encountered in the community when determining what PPE to have available for a response.

The selection and proper use of personal protective equipment are core competencies required of Operations Level responders.

Objectives – Module Three

Following successful completion of Module Three, the seminar participant will be able to:

- Discuss the role that pre-incident planning plays in selecting personal protective equipment (PPE)
- Correctly don, work in, and doff provided PPE
- Discuss how the use of protective clothing can increase the risk of heat stress
- Identify the types and symptoms of heat related illness
- Identify measures that can be taken to reduce heat stress for personnel wearing PPE

Donning Procedures for Personal Protective Equipment

Assistance should be provided because donning is difficult to perform alone.



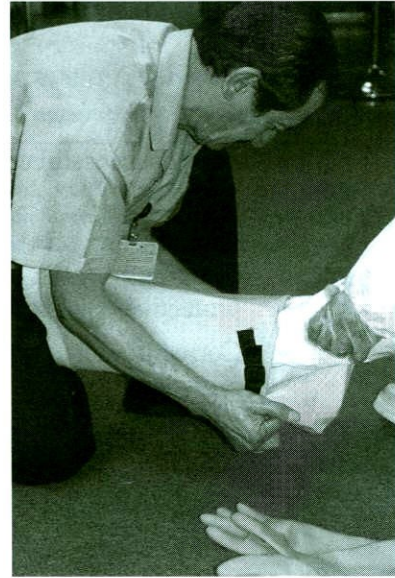
Step 1 – Inner gloves

Inner gloves are donned first.



Step 2 – Suit

The suit is donned and zipped to the level just above the beltline.



Step 3 – Boots

The chemical-protective boots are donned.



Step 4 – PAPR belt

The respirator belt or vest is donned and the battery is attached and turned on.



Step 5 – Hood inside suit

Zip the suit to the neck with the outer collar draped over the shoulders. Seal the adhesive strip over the zipper.



Step 6 – Outer gloves

The outer gloves are then donned and sealed with tape or bands. Once the equipment has been donned, its fit should be evaluated and a safety check conducted before personnel enter the Decon Zone.

Doffing Procedures for Personal Protective Equipment

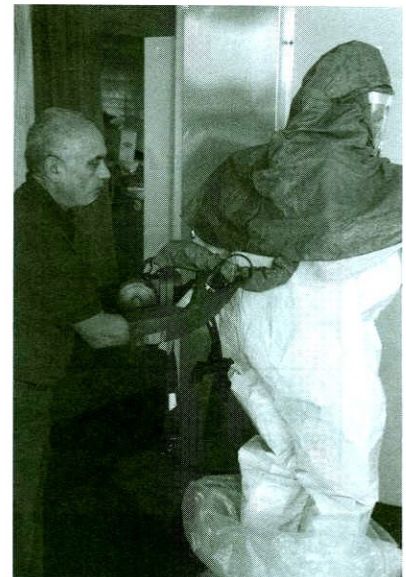


Step 1 – Stand in bag



Step 2 – Remove outer gloves

Both gloves should be removed simultaneously to avoid contaminating inner gloves. Pull fingers half way, then let drop into bag.



Step 3 – Remove PAPR

Assistant holds PAPR while the suited First Receiver first unclips the belt then unzips the suit.



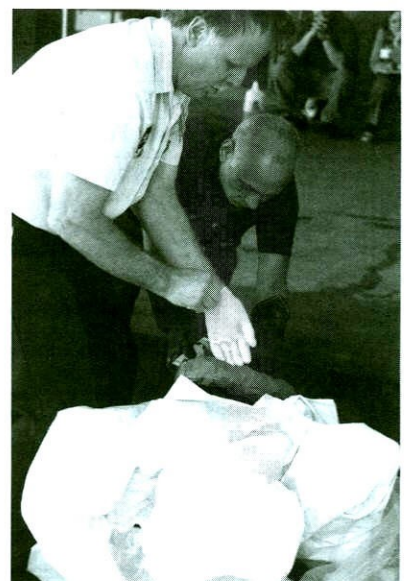
Step 4 – Step out of suit

Assistant helps push suit down from the inside to the level of the boots. Suited First Receiver steps out of the suit, away from the shower area towards the clean zone.



Step 5 – Remove hood

From the outside, remove the hood keeping hands away from face. Drop in bag.



Step 6 – Remove inner gloves

Drop gloves in bag. Secure bag and place in designated location.

Student Resource

STUDENT CHECKLIST

Donning Procedure for Level “C” Personal Protective Equipment (PPE) with the 3M™ Breathe Easy 10 Powered Air Purifying Respirator

PERFORMANCE OBJECTIVES The examinee will demonstrate proficiency in assembly, layout, and donning of level “C” PPE.	EQUIPMENT Chemical protective suit, outer boots, inner and outer gloves with bands (or chemical resistant tape) and respirator (3M™ Breathe Easy 10 powered air purifying respirator)
CONDITION The examinee shall don level “C” personal protective equipment ensemble with help from one or two assistants.	PERFORMANCE CRITERIA 100% accuracy on all items.

PROCEDURE			
Skill Component	Met Criteria	Did Not Meet Criteria	Reason
Equipment assembly: Assemble entire level “C” ensemble and lay it out in the order that each component will be donned.			
1) Inner gloves			
2) Chemical protective suit			
3) Outer boots			
4) Powered Air Purifying Respirator (PAPR)			
5) Outer gloves with bands or chemical resistant tape			
Donning the PPE: With one or two assistants, the participant will don PPE			
1) Team member dons inner gloves			
2) Team member steps into chemical protective suit			
3) Assistants help with donning of outer boots			
4) Assistants help with donning of powered air purifying respirator (PAPR)			
a. Assistant holds turbo pack, battery, and hood and places it against team member’s back			
b. Team member attaches belt around waist and tucks in excess length of belt			
c. Assistant attaches battery to belt and turns battery to “on” position			
d. Assistant places hood onto team member’s head			
e. Assistant tucks inner collar of hood under suit, raises zipper to level of neck, applies adhesive strip of suit over zipper			
5) Assistants help with donning of outer gloves with bands or chemical resistant tape			

PROCEDURE			
Skill Component	Met Criteria	Did Not Meet Criteria	Reason
Safety check: Assistant performs a safety check prior to team member entering decontamination zone.			
1) Check breathing tube connections (both ends)			
2) Check filters for tightness, and that no caps are blocking the air inlet.			
3) Check that battery is secured to belt and that it is in the "on" position.			
4) Check that excess belt material is tucked in and that PAPR is not riding low.			
5) Check that exhalation valve is pointing down and that it is secure to face shield.			
6) Check that suit is completely zipped to the neck and that adhesive strip of suit completely covers the zipper.			
7) Check that outer gloves with bands (or chemical resistant tape) are on, boots are on.			
8) Check that team member inside suit is feeling well and is ready to enter decontamination zone.			

Student Resource

STUDENT CHECKLIST

Doffing Procedure for Level “C” Personal Protective Equipment (PPE) with the 3M™ Breathe Easy 10 Powered Air Purifying Respirator

PERFORMANCE OBJECTIVES The examinee will demonstrate proficiency in doffing of level “C” PPE.	EQUIPMENT Chemical protective suit, outer boots, inner and outer gloves with bands (or chemical resistant tape) and respirator (3M Breathe Easy 10 powered air purifying respirator)
CONDITION The examinee shall doff level “C” personal protective equipment ensemble with help from an assistant in the post decon zone or from another suited decon team member.	PERFORMANCE CRITERIA 100% accuracy on all items.

PROCEDURE			
Skill Component	Met Criteria	Did Not Meet Criteria	Reason
Doffing steps:			
1) Team member removes outer gloves			
2) Assistant in clean area holds PAPR and battery then team member unclips PAPR belt			
3) Team member unzips chemical protective suit			
4) Team member pushes suit down to level of boots			
5) Team member steps out of boots and suit towards the post decontamination zone			
6) Team member grabs PAPR hood and places in container for isolation or disposal			
7) Assistant steps to the side of team member then places turbo pack and battery in container			
8) Team member removes inner gloves and places them in container			

Student Resource

STUDENT CHECKLIST

3M™ Breathe Easy 10 Powered Air Purifying Respirator Monthly Equipment Inspection

PERFORMANCE OBJECTIVES The examinee will demonstrate proficiency in checking all components of the respirator.	EQUIPMENT 3M Breathe Easy 10 PAPR components, including the disposable and rechargeable batteries, and flow meter.
CONDITION The examinee shall identify and check for functionality all components of the respirator and completely assemble to a state of readiness.	PERFORMANCE CRITERIA 100% accuracy on all items.

PROCEDURE			
Skill Component	Met Criteria	Did Not Meet Criteria	Reason
Identify all components of the respirator and check each component for functionality Hood: 1) Check all material for color changes, stickiness, gritty texture, tears/cracks			
2) Check seams on outer collar and inner collars (no light should be visible through seams of outer collar) Note: the inner collar seams are not sealed and light will be visible			
3) Check face shield for cracks, discoloration, and deformity which could distort vision			
4) Check one-way exhalation valve (the opening should be facing down and the valve should be tight and not easily rotated)			
5) Check breathing tube inlet port			
6) Check neck band for elasticity			
7) Check headband for elasticity			
8) Identify serial number for documentation			
Turbo Pack: 1) Check overall condition of casing (no missing screws or bolts, look for cracks)			
2) Check that o-rings are present and are not cracked			
3) Check that red and white wires are visible and intact			
4) Battery wire is without frays, 3 prongs are present and straight			
5) Belt slides easily along the pack, is without frays, belt clip is intact and slides easily along belt			
6) Identify serial number for documentation			

PROCEDURE			
Skill Component	Met Criteria	Did Not Meet Criteria	Reason
Filters: 1) Three FR-57 filters are present in unopened foil pouches with current expiration dates			
Batteries: 1) Lithium Ion battery (disposable with 10 yr. shelf life) is present.			
2) Re-chargeable battery is connected to cord and checked for function.			

Powered Air Purifying Respirator (PAPR) Monthly Equipment Checklist

[illegible]

The following procedure was used to check the components of each PAPR listed by serial number above:

1. Following procedure was used to check the components of each PAPR listed by serial number above:
 - Hood** – Outer and inner shroud material is free from discoloration, perforations, tacky or gritty feel; seams are intact, breathing tube inlet is free from cracks, face shield is clear, without distortions or cracks; exhalation valve is secure with the outlet facing down; headband and neckband are pliable with elasticity.
 - Breathing tube** – Cover removed to check for cracks, kinks, perforations; tube is connected securely to turbo pack with metal hose clamp and blue clamp at opposite end of hose is securely holding white plastic hose end.
 - Turbo pack** – Observe for cracks in housing, with filters removed, look for cracks in gaskets, battery cable is without frays, 3 prongs are present and straight; 3 filters (FR-57) are present in foil pouches with current expiration date; belt is not frayed, clip is intact and moves freely.
 - Battery maintenance** – Fully functional disposable batteries are stored with respirators, or re-chargable batteries are maintained per manufacturer's recommendations.
 - Cleaning** – Respirators are cleaned and disinfected after each use.
 - Storage** – Respirators are protected from sunlight, dust, extreme temperatures, moisture, damaging chemicals, and stored to prevent deformation of the facepiece and exhalation valve. They are kept accessible to the work area and stored in compartments or covers that are clearly marked as containing emergency respirators.

Documentation of Equipment Failure		
Serial number	Problem	Action taken
Inspector (Print name)		Signature

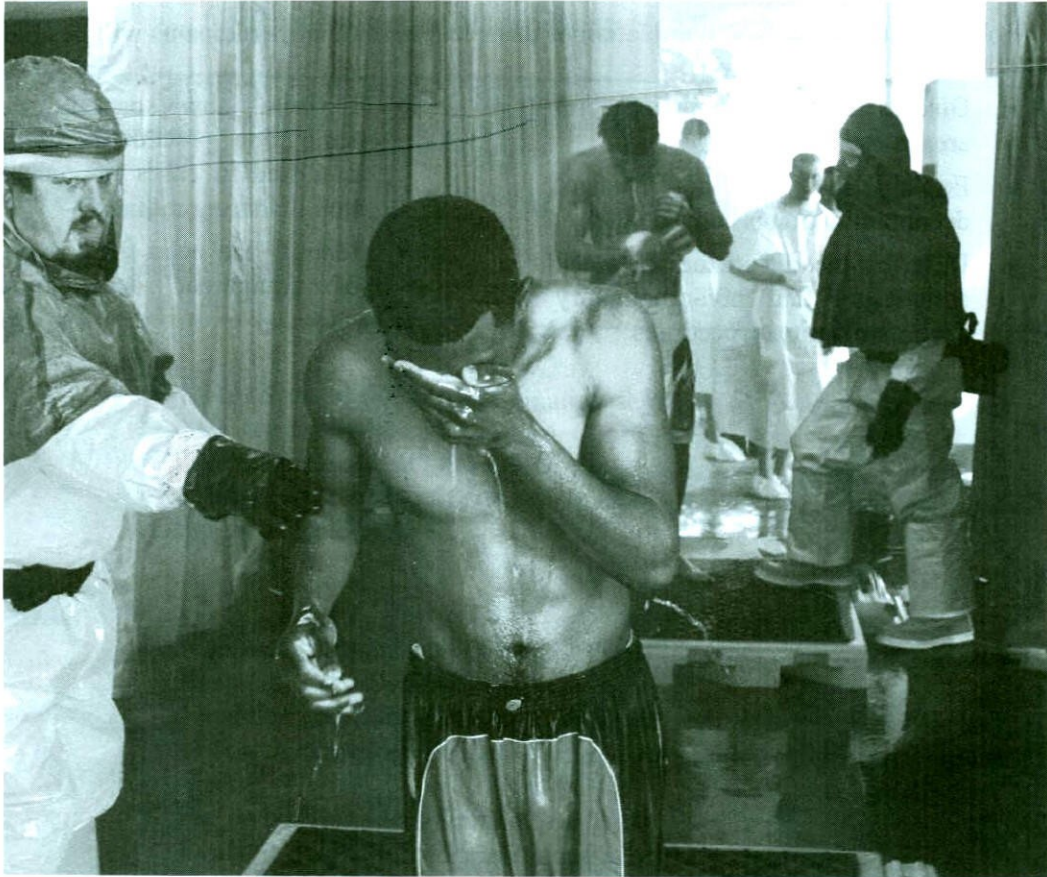
Student Resource

3M Breathe Easy 10 PAPR monthly checklist

1. Hood:
 - a. Outer and inner shroud (collar): material is free from discoloration, perforations, tacky or gritty feel. Seams are intact and sealed (can't see light through them; inner collar seams are not water tight and light will be visible)
 - b. Face shield: Clear, distortion free, no cracks
 - c. Exhalation valve: Outlet is facing down, valve is secured to face shield
 - d. Headband/neckband: Elastic is pliable
2. Breathing tube:
 - a. Remove fabric outer cover then check for cracks in rubber, kinks, perforations; tube is securely attached to turbo pack with metal hose clamp
 - b. White plastic attachment at opposite end of hose is firmly secured by blue plastic hose clamp
3. Turbo pack:
 - a. Housing: free from cracks; with filters removed, check that gaskets are intact and not cracked
 - b. Battery cable: no frays; 3 prongs at end of cable are intact and straight
 - c. Filters: Three filters are present (FR-57 for actual event), in foil pouches with current expiration date
 - d. Belt: Without frays, clip intact and moves freely along belt
 - e. Batteries:
 - i. Disposable (Lithium ion): Present and stored with respirator; 10 year shelf life
 - ii. Rechargeable (Nickel metal hydride BP-15): Charge and maintain per manufacturers instructions
4. Cleaning:
 - a. Respirators are cleaned and disinfected after each use (soap and water, or other non petroleum cleaner)
5. Storage:
 - a. Respirators are protected from sunlight, dust, extreme temperatures, moisture, damaging chemicals, and stored to prevent deformation of the facepiece and exhalation valve. They are kept accessible to the work area and stored in compartments or covers that are clearly marked as containing emergency respirators.

Module Four

Patient Decontamination



It is feared that future terrorist incidents may include the release of chemical, radiological or biological agents. Such an event would probably occur without advanced warning, and could result in substantial numbers of contaminated civilians.

Mass decontamination is the process of reducing or removing contaminants from large groups of people. It is

performed when the sheer number of people in potentially life threatening situations overwhelms the resources available to decontaminate them by traditional methods.

As a part of their preparations for terrorism response, hospitals must train to set up and implement mass decontamination.

Objectives – Module Four

Following the successful completion of this section, seminar participants will be able to:

- Discuss how the decontamination area is established
- Explain in detail how patient decontamination is carried out
- Describe the differences between ambulatory and non-ambulatory decontamination procedures
- Explain how patient decontamination procedures might be modified in cases of contamination involving radiation
- Identify the need for and process of equipment decontamination

Student Resource

Hospital Decontamination Team Member Skills

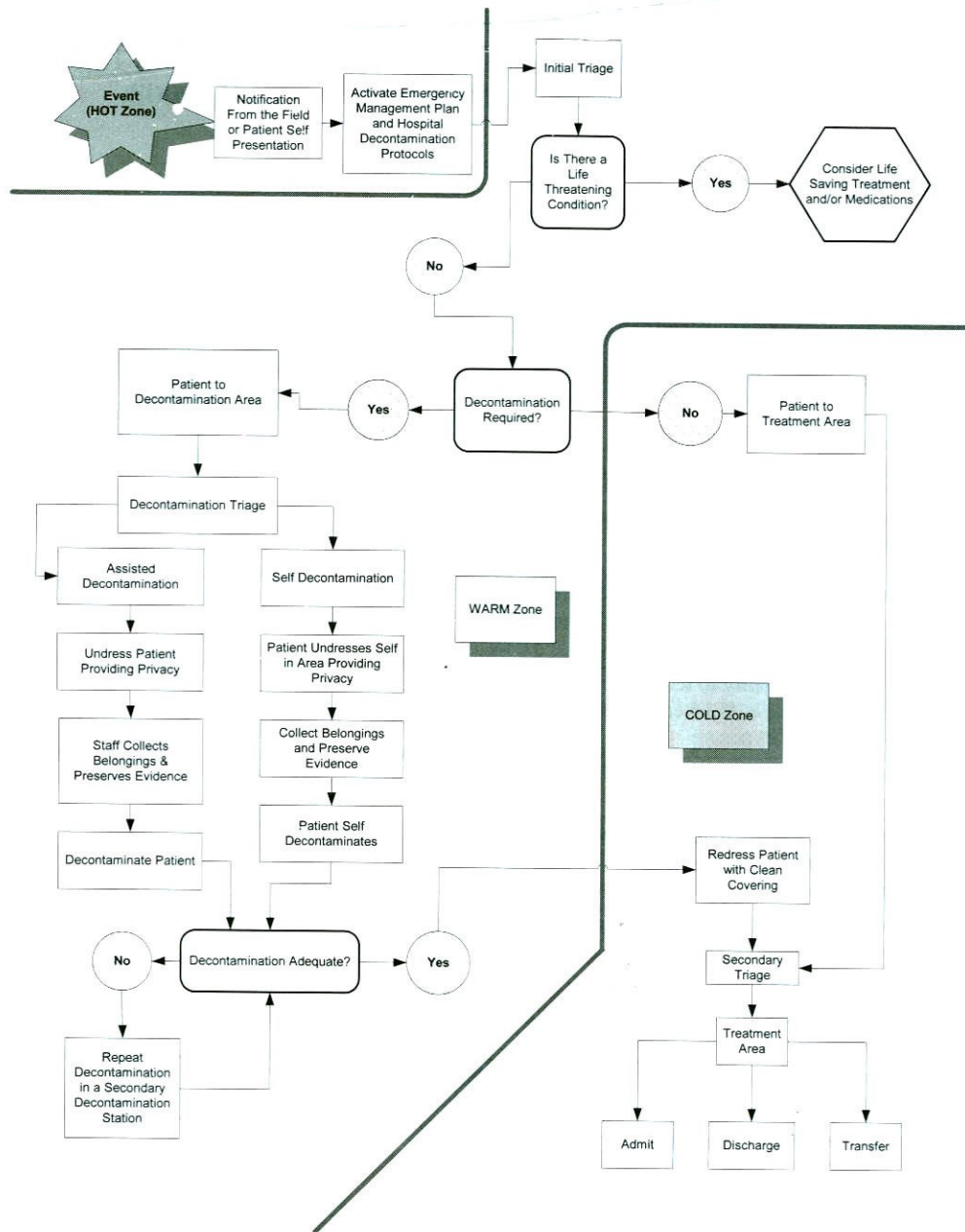
STUDENT CHECKLIST

General Competencies for First Responder Operations (FRO) Level Training Under the OSHA HAZWOPER Standard 1910.120(q)(6)(ii)

PERFORMANCE OBJECTIVES	PERFORMANCE CRITERIA
The examinee will demonstrate competency through either verbal or written means	100% accuracy on all items.

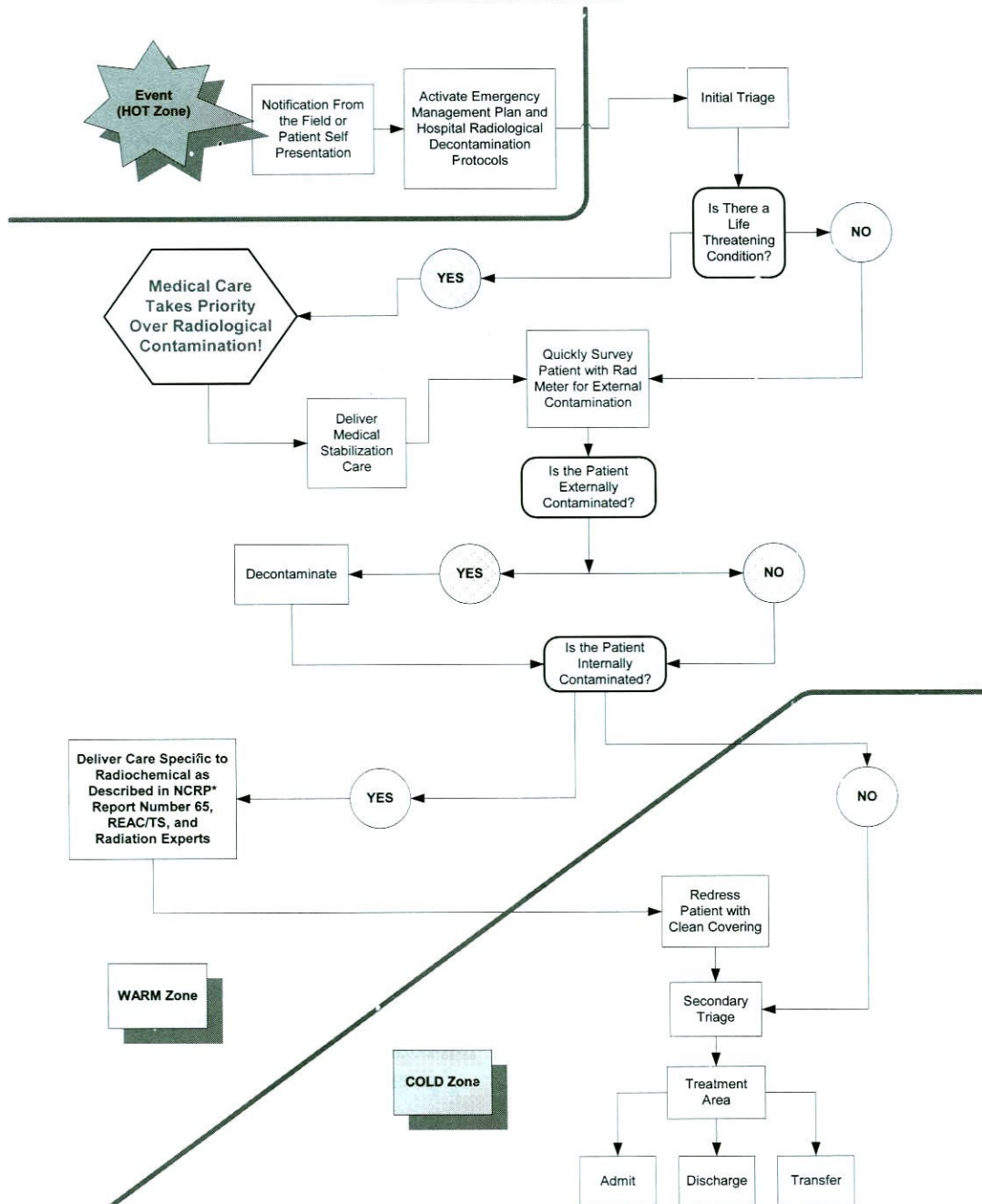
PROCEDURE			
Skill Component	Met Criteria	Did Not Meet Criteria	Reason
1) Demonstrate an understanding of what hazardous substances are, and the risks associated with them in an incident			
2) Demonstrate an understanding of the potential outcomes associated with an emergency when hazardous substances are present			
3) Demonstrate the ability to recognize the presence of hazardous substances in an emergency through signs and symptoms of exposure			
4) Demonstrate the ability to identify the hazardous substance, if possible			
5) Demonstrate an understanding of your role in the hospital's emergency response plan, including site security and control, and decontamination procedures			
6) Demonstrate the ability to realize the need for additional resources and to make appropriate notifications to the communication center			
7) Demonstrate knowledge of the basic hazard and risk assessment techniques			
8) Demonstrate and understanding of basic hazardous materials terms			
9) Demonstrate how to select and use proper PPE			
10) Demonstrate knowledge of how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and PPE available			
11) Demonstrate knowledge of how to implement basic decontamination procedures			
12) Demonstrate an understanding of the relevant standard operation procedures and termination procedures			

Algorithm for Chemical Decontamination in a Hospital Setting



Note: This document is not intended to stand alone but is part of an overall emergency management plan for decontamination. This algorithm is a general decontamination guide and should be customized to meet unique decontamination needs of the facility and the CBRNE event.

Algorithm for Treatment of Radioactive Contamination



Adapted from the University of California (Davis) Health System

Module Five

Exercises



There are a variety of different types of exercises that can be used as effective tools to help prepare hospitals and staff to handle large incidents. Discussion-based exercises such as seminars, workshops, and table-top exercises provide a forum for reviewing the adequacy of plans, policies, functions and interagency agreements. Operations-based exercises such as drills and full-scale exercises are designed to test personnel and equipment performance during a response.

A full-scale exercise is the most complex type of exercise, involving multiple agencies and multiple jurisdictions. Students participating in this seminar should don PPE and should participate at the Operations Level, putting into practice the skills and competencies for which they have been training.

Full-scale exercises are conducted in a real-time, stressful environment intended to mirror an actual event. There are no 'do-overs.' The exercise continues to run regardless of the problems encountered.

Although the planning of a full-scale exercise requires a large time commitment on the part of many people, the payoff is a community that is better protected in the event of a disaster.

Objectives – Module Five

In the course of a training exercise, students will demonstrate their ability to:

- Establish the HICS;
- Identify which patients may be contaminated;
- Communicate with other agencies to determine the identity of the agent(s) that were used;
- Set-up the hospital decontamination system;
- Select, don, work in and doff personal protective equipment;
- Conduct heat stress monitoring and prevention for personnel wearing PPE;
- Decontaminate ambulatory and non-ambulatory mock victims;
- Decontaminate personal who are wearing PPE;
- Carry out demobilization activities.

Scenarios

The skills that have been taught in the previous videos and drills will now be put into action, as you participate in an exercise that will test your competencies as well as the hospital's Emergency Plan.

The final video presents two scenarios. After viewing the program, the class will select one of the scenarios and use it to test their new skills.

Here is a summary of each scenario:

1. An explosion at a local shopping mall has left many people with injuries and may have involved a chemical agent.

- *Your hospital is one mile south of the scene*
- *Weather: temp. 57°f. Wind 5 mph from the south*
- *Hazmat team at the scene reports that detection devices*

indicate nerve agent contamination

2. An explosion at a political event the local convention center has left people with burns. Firefighters are using Geiger Counters and picking up readings of radiation.

- *Your hospital is six miles west of the scene*
- *Weather: temp. 67°f. Wind 10 mph from the north*
- *Ten (10) patients from the scene are now checking in to the emergency department*
- *BLS units are en route from scene with patients*

Post Seminar Test

In addition to competencies demonstrated in drills and exercises, a written test should be part of the certification process. The Post Seminar Test can help determine how much you have learned about the topic of decontamination.

All questions are multiple choice. Circle the correct answer. You should be able to complete this test within 20 minutes.

1. Which zone is not part of the hospital decontamination operation?
 - a. Hot Zone
 - b. Warm Zone
 - c. Cold Zone
 - d. Post-decontamination zone

2. Which action would not take place in the “safe refuge area”?
 - a. Observe victims for signs and symptoms of contamination
 - b. Give instructions to victims regarding decontamination
 - c. Provide clothing and blankets and refer victim to appropriate treatment area in the Cold Zone
 - d. Gather information from victims that may guide the decontamination process

3. Which is the most appropriate method for a hospital decontamination team member to determine if victim decontamination was adequate?
 - a. Scan victim with a chemical monitoring instrument
 - b. Observe for signs and symptoms upon exiting the shower
 - c. Observe victims during decontamination and supervise as necessary
 - d. Check the waste water for discoloration

4. A team member dressed in Level “C” PPE in the decontamination zone suspects a respirator filter is clogged or may be malfunctioning. What should be done first?
 - a. Change the filter immediately in the decontamination zone
 - b. Remove the respirator hood to get fresh air
 - c. Immediately proceed to the post decontamination zone, change the filter, then provide self-decontamination
 - d. Obtain decontamination from team members, then proceed to post-decontamination area for a replacement filter

Post-Seminar Test, cont.

5. What advantage does a Level “C” hooded PAPR have over a tight fitting face sealed respirator?
 - a. The hood can be worn by persons who require glasses
 - b. The hood has a higher efficiency rating than a mask type respirator
 - c. The hood requires annual fit testing to document adequate effectiveness
 - d. The hood can be used in immediate danger to life and health atmospheres

6. When donning Level “C” PPE, when should the safety check be done?
 - a. After the respirator is donned
 - b. After the battery has been turned on
 - c. Before any piece of chemical protective clothing has been donned
 - d. After donning the last piece of PPE, and before entering the decontamination zone

7. Communication is difficult while dressed in PPE and hand signals may be necessary. Which hand signals would be best to use during a mass decontamination event?
 - a. Only OSHA approved signals
 - b. Signals used by the local fire department
 - c. Hand signals approved by local regulatory agencies
 - d. Signals that were practiced by employees during drills

8. Heat stress is a very real problem when wearing PPE. Which person is at most risk from suffering harm from overheating?
 - a. Person who attended a big party the night before
 - b. Person who was raised in northern (colder) state
 - c. Someone who works independently and denies illness
 - d. Person with a history of diabetes and smoking

9. While dressed in PPE and performing decontamination, which one of the following persons is best able to determine if heat stress has occurred?
 - a. The safety officer for the decontamination operation
 - b. The team member in PPE who is feeling ill
 - c. The employee health physician in the support zone
 - d. The unit leader for the decontamination team

10. A wet victim arrives by ambulance and the attendant states that decontamination was performed in the field. What should be done before directing the victim to a treatment area?
 - a. Nothing, the victim was obviously already decontaminated
 - b. Have the victim proceed through the hospital decontamination process
 - c. Assess the adequacy and type of field decontamination to determine if additional decontamination is necessary

- d. Send the victim to be evaluated with monitoring and detection equipment

Post-Seminar Test, cont.

- 11. The “Warm Zone” in a hospital decontamination operation is the area where:
 - a. Decontamination is performed
 - b. Warming and comfort measures are provided
 - c. The terrorist weapon was initially released
 - d. Patients are stabilized
- 12. A Mark I kit is an antidote for which agent?
 - a. Cyanide
 - b. Nerve agent
 - c. Mustard agent
 - d. Phosgene
- 13. Effective hospital decontamination of hazardous substances is best done with tepid water and:
 - a. Bleach
 - b. Detergent soap
 - c. Hydrogen peroxide
 - d. Saline
- 14. Which of the following contaminants will likely be washed off a victim during decontamination prior to entering the hospital for treatment?
 - a. Chemicals
 - b. Biological agents
 - c. Bacteria
 - d. Viral agents
- 15. Expected to be released with a bomb blast, this type of terrorist contamination and exposure may not even be recognized until symptoms develop or unless specialized detectors are used:
 - a. Industrial chemicals
 - b. Military type weapons
 - c. Ionizing radiation
 - d. Inhaled small dust particles
- 16. Victims of a terrorist toxic release event will need to undress as part of the decontamination process. What happens to the clothing they have removed?
 - a. It is bagged and returned to the victims after it is cleaned
 - b. It is eventually destroyed by burning or burying at a specialized landfill
 - c. Can be sent through hospital laundry
 - d. It is bagged and held as evidence for law enforcement officers

Post-Seminar Test, cont.

17. Which of the following personal items could the patient wash and safely bring through the decontamination corridor?
 - a. Paper money
 - b. Eyeglasses
 - c. Purse
 - d. Family photos

18. To prevent secondary contamination of the facility, hospital personnel may have to do all of the following except:
 - a. Secure all entrances to keep people out
 - b. Set up a decontamination zone
 - c. Separate “everyday” patients from those who are contaminated
 - d. Provide victims with immediate in-hospital life saving treatment prior to decontamination

19. Who does not enter the decontamination zone during the decontamination process?
 - a. Decon unit leader
 - b. Contaminated victims
 - c. Safe refuge area officer
 - d. Team members dressed in Level “C” PPE

20. Regardless of any contamination that was received, all freshly decontaminated victims will need:
 - a. Extensive psychological counseling
 - b. Antidotes appropriate to the exposure
 - c. Dry clothing and foot protection
 - d. Admission to the hospital for overnight observation

21. Prior to wearing a respirator either for training or actual decontamination, what must first be done?
 - a. Fill out a medical questionnaire per OSHA regulations
 - b. Submit a note from a physician
 - c. Exercise by doing push-ups and jumping jacks
 - d. Demonstrate your physical fitness and agility

22. All of the following actions can be done while wearing PPE except:
 - a. Giving instructions to victims in the safe refuge area
 - b. Self assessment for heat stress
 - c. Hydration to prevent heat stress
 - d. Giving Mark-I nerve agent antidote injections

Post-Seminar Test, cont.

23. Just before each person enters any hazardous area in protective garments they must have:
 - a. A physical exam to detect health problems
 - b. An explanation of the job that is to be performed
 - c. Documentation of training to OSHA standards
 - d. A final safety check of equipment

24. Protective equipment worn by hospital staff is not the most protective type that can be worn by a person in a hazardous environment because:
 - a. Hospital decontamination workers are working close to the treatment zone
 - b. The most protective equipment is too costly to be used by hospital employees
 - c. Hospital employees are at no risk of being contaminated by victims
 - d. The hospital decontamination area will have lower levels of contamination than the release site

25. People exposed to nerve agents might be given an antidote (Mark I) before or during the decontamination process. This antidote comes in a:
 - a. Glass container that is inhaled
 - b. Syringe with a spring loaded needle
 - c. Pill that must be swallowed with water
 - d. Powder that is applied to the skin

26. Which is the one HICS position that is always filled for every incident?
 - a. Finance Chief
 - b. Incident Commander
 - c. Planning Chief
 - d. Operations Section Chief

Glossary

Atmosphere supplying respirator (ASR): A respirator that provides clean air from an uncontaminated source to the facepiece. Examples include supplied-air (airline) respirators, SCBA, and combination supplied-air/SCBA.

CBRN: Chemical, biological, radiological, or nuclear agent or substance.

Clinicians: Physicians, nurses, nurse practitioners, physicians' assistants, and others.

Doff: To take off or remove (e.g., PPE).

Don: To put on, in order to wear (e.g., PPE).

ED: Emergency Department.

EMP: Emergency Management Plan.

First Receiver: Employees at a hospital engaged in decontamination and treatment of victims who have been contaminated by a hazardous substance(s) during an emergency incident. The incident occurs at a site other than the hospital. These employees are a subset of first responders.

First Responder: Personnel who have responsibility to initially respond to emergencies. Some examples are firefighters, HAZMAT team members, law enforcement officers, lifeguards, forestry personnel, ambulance attendants, and other public service personnel. In the case of hazardous materials incidents, these personnel typically respond at the site where the incident occurred.

First Responder Awareness Level: Individuals who might reasonably be anticipated to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities.

First Responder Operations Level: Individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. These individuals shall have received at least 8 hours of training or have sufficient experience to objectively demonstrate competency in specific critical areas.

HAZCOM: OSHA's Hazard Communication Standard [29 CFR 1910.1200].

HAZMAT: Hazardous Material.

HAZWOPER: OSHA's Standard on Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120. In particular, paragraph (q) of this standard covers employers whose employees

are engaged in emergency response to hazardous substance releases.

Hazardous Substance: Any substance to which exposure may result in adverse effects on the health or safety of employees.

Hospital Incident Command System (HICS): An example of an optional NIMS-based ICS tailored specifically for use by hospitals and designed to function in conjunction with other common ICS used by emergency response organizations (e.g., Fire Service Incident Command System).

Hospital Decontamination Zone: The areas where the type and quantity of hazardous substance is unknown and where contaminated victims, contaminated equipment, or contaminated waste may be present. It is reasonably anticipated that employees in this zone might have exposure to contaminated victims, their belongings, equipment, or waste. This zone includes, but is not limited to, places where initial triage and/or medical stabilization of possibly contaminated victims occur, pre-decontamination waiting (staging) areas for victims, the actual decontamination area, and the post-decontamination victim inspection area. This area will typically end at the emergency department door. Also called the "Warm Zone," "contamination reduction zone," "yellow zone," or "limited access zone."

Hospital Post-decontamination Zone: An area considered uncontaminated. Equipment and personnel are not expected to become contaminated in this area. At a hospital receiving contaminated victims, the Hospital Post-decontamination Zone includes the emergency department (unless contaminated). Sometimes called the "Cold Zone" or "Clean Area."

IDLH: Immediately dangerous to life or health, an atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would interfere with an individual's ability to escape from a dangerous atmosphere. Incident Command System (ICS): A flexible organizational structure which provides a basic expandable system developed by Fire Services to mitigate an emergency situation of any size. Incident Commander (IC): The individual who holds overall responsibility for incident response and management.

Incident Command System (ICS): A flexible organizational structure which provides a basic expandable system developed by Fire Services to mitigate an emergency situation of any size.

Incident Commander (IC): The individual who holds overall responsibility for incident response and management.

JCAHO: Joint Commission on Accreditation of Healthcare Organizations.

Mass Casualty: "A combination of patient numbers and patient care requirements that challenge or exceed a community's ability to provide adequate patient care using day-to-day operations" (Barbera and MacIntyre, 2003).

NIMS: The National Incident Management System, established by the US Department of Homeland Security as a standardized management approach to incident response that all responders will use to coordinate and conduct response actions.

NFPA: National Fire Protection Association.

Personal Protective Equipment (PPE): Examples include protective suits, gloves, foot covering, respiratory protection, hoods, safety glasses, goggles, and face shields.

Powered Air-Purifying Respirator (PAPR): A respirator that uses a battery-powered blower to force air through a filter or purifying cartridge before blowing the cleaned air into the respirator facepiece.

Self-contained Breathing Apparatus (SCBA): A respirator that provides fresh air to the facepiece from a compressed air tank (usually worn on the worker's back).

Supplied-air Respirator (SAR): A respirator that provides breathing air through an airline hose from an uncontaminated compressed air source to the facepiece. The facepiece can be a hood, helmet, or tight fitting facepiece.

Triage: The process of screening and classifying sick, wounded, or injured persons to determine priority needs in order to ensure the efficient use of medical personnel, equipment, and hospitals.

WMD: Weapon of Mass Destruction.

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Notes

Notes

Notes

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