

Hospital Decontamination Response Teams

FRAC

Welcome and Introductions

- Class Schedule
- Breaks
- Refreshment availability
- Restrooms
- •And . . . please turn your cell phones and pagers off or to silent



SECTION 1 Introduction



Course Objectives

- Develop an understanding of hazardous substances
- Develop an understanding of the role of the First Receiver
- Develop an understanding of the selection and use of Personal Protective Equipment (PPE)
- Develop an understanding of detection devices and decontamination equipment
- Demonstrate the basic decontamination procedures



Why are we here?

- People who have been contaminated by hazardous agents may seek medical treatment at the hospital.
- We do not want to compromise the safety of our staff or our facility by exposing them to hazardous agents.



If a contaminated person is allowed inside our facility . . .

- What are the impacts:
 - To you?
 - To the emergency department?
 - To the hospital?
 - To the community?



Employee exposure and hospital closure is what we want to avoid!





Exposure vs. Contamination

- Exposure:
 A person has been in the area of a contaminate (generally a vapor)
- Contaminated:
 A person who comes in contact with a contaminate (generally a liquid or solid)



Ports of Entry to Body System

- Entry routes include:
 - Inhalation
 - Ingestion
 - Absorption
 - Injection
- Precautions, decontamination, and treatment options may vary based on exposure / contamination.



Sources of Exposure / Contamination

- Home Chemical Exposures
- Industrial Spills
- Transportation Spills
- Agricultural Exposures
- Weapons of Mass Destruction



What is Decontamination?



- While it has many definitions, it is a method for cleaning off contaminated patients
- Decontamination reduces and prevents the spread of hazardous agents to employees and within the facility

BREAK



Hazardous Agents



Hazardous Agents

• According to OSHA: Any substance to which exposure "results or may result in adverse affects on the health or safety of employees" or "any chemical which is a physical hazard or a health hazard." (1910.1200)



Hazardous Agents

- Class 1 Explosives
- Class 2 Compressed Gases
- Class 3 Flammable Liquids
- Class 4 Flammable Solids
- Class 5 Oxidizers and Organic Peroxide
- Class 6 Poisons or Infectious Materials
- Class 7 Radioactive Materials
- Class 8 Corrosive Materials
- Class 9 Miscellaneous







All Hazards Response

CBRNE:

- C = Chemical
- **B** = Biological
- R = Radiological
- N = Nuclear
- **E** = **Explosives**



Don't be deceived!

- Initial reports from the patient or EMS may not indicate exposure
- Ask questions complete a thorough and accurate assessment
- Patient may not understand that they have been exposed
 - Mixed chemicals at home or work (example)



C B R N E

Chemical Agents

- Nerve Agents
- Blister Agents
- Blood Agents
- Choking Agents
- Irritant Agents
- Opiate Agents



How do you know if a patient has been exposed/contaminated to a chemical agent?

- Signs of exposure and contamination
 - Liquids or powders on the patient
- Symptoms of Exposure may include
 - Odors emanating from the patient
 - Difficulty breathing
 - Burns, blisters
 - Foaming at the mouth or tearing
 - Emesis, defecation, urination



С

R

R

Ν

Ε

Chemical Agents

Nerve agents (pesticides/military agents):

- Affect the body's nervous system
- Signs and symptoms:
 - S Salivation (drooling)
 - L Lacrimation (tearing)
 - U Urination (loss of bladder control)
 - D Defecation (loss of bowel control)
 - G Gastrointestinal (abdominal pain)
 - E Emesis (vomiting)
 - M Miosis (pinpoint pupils)
- Treatment: Atropine (call MEDCOM)



С

B

R

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Chemical Agents

Blister Agents:

- Cause burns and blisters
- Examples include mustard gas and Lewisite

Blood Agents:

- Affect the body's ability to transport and use oxygen
- Examples include cyanide



Chemical Agents

Choking Agents:

- Damage lung tissue and mucous membranes
- Examples include phosgene and chlorine

Irritant Agents:

- Cause a person to become incapacitated
- Examples include tear gas, mace, and pepper spray

Opiate Agents:

- Powders or liquids
- Treat emergently



Biological Agents

- Anthrax
- Botulism
- Plague
- Smallpox
- Tularemia
- Viral Hemorrhagic Fever (VHF)
- High Consequence Infectious Disease (HCID)
 - Infectious Respiratory Disease (SARS or Avian Flu)



Signs and Symptoms of Exposure to Biological Agents

- Fever
- Headache
- Rash
- Neck stiffness
- Respiratory symptoms



<u>Bioagents – what to look for in</u> triage...

Patients who:

Have traveled out of the country

Exhibit unusual signs and symptoms

Are very sick

Several patients who present with similar symptoms

Patients who present from the same event or location



C B R N E

Radiological / Nuclear

- Alpha particles (common) most harmful if inhaled or ingested. These can be stopped by a sheet of paper.
- Beta particles smaller than alpha and stopped by regular PPE.
- Gamma/X-ray not a particle and can penetrate skin and tissue. Will penetrate most PPE.
- Neutrons found in nuclear reactions, can penetrate skin and tissue, cannot be stopped by PPE.



Radiation / Nuclear Exposure





Where can Radiation be Found?

- Found in:
 - Sunlight and natural elements
 - X-rays
 - Nuclear medicine procedures
 - Cancer-related radiation treatments
 - Industry



С

B

R

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Methods of detection: RADIOLOGICAL



Portals – Portable and Expandable



Pancake Probe (Ludlum) detects Alpha, Beta and Gama radiation



Personal Pocket Dosimeter detects Beta and Gamma Radiation



Radiological Contamination

- Internal contamination may result when particles are ingested or inhaled.
 - Acute radiation sickness
- External contamination occurs when particles come in contact with the skin and/or clothing.
- Minimal exposure risk to caregiver. Treat acute injury first!



Radiation Protection

- Time Limit exposure time
- Distance Increase distance from source
- Shielding Shield self from the hazard
- PPE Use Standard Precautions
 - Respiratory
 - Contact





SECTION 3 Response



If a contaminated person presents to the hospital, what do you do?

- S = ShieldI = Isolate
- N = Notify





SHIELD

Don't become part of the problem...

- Shield yourself by using at least standard precautions
- Limit physical contact with the patient



ISOLATE

- If someone has something on them, don't let them go away
- Get the contaminated patient out of the facility to a pre-designated location
- Isolate the exposed area and deny entry until hazard assessment is completed and area is cleaned, if needed


NOTIFY

- Notify your Supervisor that a contaminated patient has arrived at the facility
- If needed, call Security to secure the area
- Security should wear appropriate PPE while securing the area.
- Work with your Supervisor to determine your facility's need to activate the Decontamination Response Team (DRT) or initiate disaster response procedures



BREAK

Demonstration



Activation of the Decontamination Response Team ?

- A contaminated patient requiring additional staff
- More contaminated patients present to the facility than can be managed by staff on-site
- Notification of a Mass Casualty Incident (MCI) that has been declared in your community******
- Consider notifying MEDCOM



What is a Decontamination Response Team?



<u>Duties of DRT Members in the</u> <u>Hospital Decontamination Zone</u>

- Ensure the safety of the facility and personnel
- Setup of decon operations
- Triage, reassure and direct contaminated patients through the process
- Perform decontamination procedures
- Recovery operations:
 - Equipment cleaning
 - Management of wastewater
 - Team debriefing



Ensure the Safety of the Facility and Personnel

- Secure the area
- Establish a perimeter
- Establish control zones
- Initiate crowd control measures
- Ensure proper PPE is worn and safety procedures are followed



Hospital Decontamination Zone

- To ensure that the agent does not contaminate the 'clean' area, set-up decontamination activities so that they are:
 - Up Hill
 - Up Wind
 - Up Stream





Setup of Decon Operations

- Establish Decontamination Zone
- Access decontamination supplies
- Assemble the decontamination shelter and adjunct equipment
- Ensure access to contaminated waste for ease of removal during decon operations
- EPA requires run-off be contained if at all possible for proper disposal







Hospital Decontamination Zone





HOT Site Access Control START Triage

Doffer / Bagger

WARM

Washer / Rinser Dryer / Dresser

COLD Hospital Gatekeeper

<u>Control Zones – Contamination</u> <u>Reduction Corridor</u>

- Contaminated Area HOT
 - Area of isolation
 - MUST use appropriate hazardous agent PPE
- Hospital Decontamination Zone WARM
 - Area where decontamination activities take place
 - MUST use appropriate hazardous agent PPE
 - Retriage and Verify
- Hospital Post-Decontamination Zone COLD
 - Safe area
 - Use Standard Precautions



Triage, Reassure and Instruct Contaminated Patients

- Utilize START (Simple Triage and Rapid Treatment)
- Explain the decontamination process
- Collect contaminated belongings



Triage during a Mass Casualty Incident

- Focus on doing the most for the most
- Utilize START Triage method or your facility's triage method





Collection of contaminated belongings

- Separate clothing and valuables
- Place in sealable collection bags
- Label clothing and valuables for tracking, retrieval and investigation purposes





Directed Decon

- Appropriate for conscious and ambulatory patients
- Directed decon can be used for small numbers of contaminated patients
- Protect yourself first:
 - Use Standard Precautions
 - May require use of hazardous agent PPE
- Consider patient modesty



Process for Performing Directed

Decon

- Have patient remove all valuables and clothing
- Place contaminated valuables and clothing in a sealable bag
- Starting from the head down, have patient:
 - Wash body with soap and warm water for 5 minutes
 - Rinse body with warm water for 5 minutes
 - Or until product is removed
- Have patient dry their body
- Provide patient with a clean covering
- Re-evaluate patient



Decontamination of Non-Ambulatory Patients "Assisted Decon"







Special Populations

- Infants
- Children
- Disabled
- Service Animals
- Law Enforcement
- Deceased Individuals
- Other Special Needs



Special Population: Infants

- Take precautions against dropping infant (use baskets)
- Enter through non-ambulatory side
- Precautions against hypothermia
- Parental accommodations
- Ease fears
- Decon parent and child
- Extend rule of thumb time
- Additional assistance for parent



Special Population: Children

- Parents / Caregivers
- Ease fears
- Decon parent and child
- Extend rule of thumb time
- Additional assistance for parent





Special Population: Disabled

- Consider type of disability and associated equipment
- Wheelchair, walker, etc., is treated as personal property
- Casts (temporary or fixed) will require removal for decon
- Considerations for deaf and or blind population



Special Population: Service Animals

- Muzzles for all animals should be requirement
- Handler should be kept with the service animal when possible
- Animal: wash for 10, rinse for 10
- Consider vinyl collar or muzzle to ensure all areas rinsed
- Leather apparatus will be disposed of





Special Population: Service Animals

- Maintain safety of Decon staff and patient and refer to hospital policy for care and service of the animal.
- Once safety and care for the animal has been established, continue with the Decon process as appropriate.



Special Population: Law Enforcement

- Weapons must be rendered safe prior to decon and secured
- Inventory & secure weapon
- Weapons may be government property not personal





Special Population: Decedent

- Decedent handled last
- Move decedent through non-ambulatory line
- Treat decedent with reverence
- Ensure decedent is properly covered
- Secure personal effects





Special Population: Other Needs

- Language considerations: federal requirement to provide translation services
- Cultural considerations: nationality, religion, etc.
- Personal weapons will be inventoried and secured



Duties of DRT Members in the Hospital Post-Decon Zone

- Evaluate decontamination efforts
- Re-triage
- Begin patient tracking
- Transport to patient care areas





BREAK



SECTION 4 Personal Protective Equipment



PPE and why you need it?

- Contaminated patients will enter your facility putting you and your facility at risk.
- •Wearing proper PPE can protect you and your staff.



Personal Protective Equipment (PPE)

- Unfortunately, no one type of PPE will protect against all hazardous agents!
- Appropriate PPE is determined by the characteristics and amount of the hazardous agent present.
- PPE must be used correctly in order to reduce exposure.
- When the agent is unknown use the highest level of PPE available prior to starting any decon procedure.



Standard Precautions

- Hazardous agents may require, at a minimum, specific types of Standard Precautions to prevent exposure
- Examples include:
 - Face shield
 - Mask
 - Gown
 - Gloves
 - Booties
 - Bonnet



Hazardous Agent PPE

- Four levels:
 - Level A PPE
 - Level B PPE
 - Level C PPE
 - Level D PPE
- Each level provides for a certain amount of skin and respiratory protection against biological and chemical agents



Level A PPE

- Provides the highest level of skin and respiratory protection:
 - Vapor protective suit (fully encapsulating)
 - Self contained breathing apparatus (SCBA)
 - Chemical resistant gloves and boots
- Weakness: bulky, heavy, and increased potential for heat stress and slip, trip or fall injuries, requires a great deal of education for safety



Level A Protection





Level B PPE

- Provides a lower level of skin protection with the highest level of respiratory protection:
 - Liquid splash protection suit (chemical resistant)
 - Self contained breathing apparatus (SCBA)
 - Chemical resistant gloves and boots
- Weakness: bulky, heavy, increased potential for heat stress and slip, trip or fall injuries and may not reduce exposure to all agents, requires a great deal of education
<u>Level B</u> Protection



TRAC 73

*Level C PPE is used for First Receivers

Level C PPE

- Provides a lower level of skin and respiratory protection:
 - Liquid splash protection suit with or without a hood (chemical resistant)
 - Air-Purifying Respirator (filters vary)
 - Chemical resistant gloves and boots
- Weakness: bulky, heavy, increased potential for heat stress and slip, trip or fall injuries and may not reduce exposure to all agents, cannot be used in an oxygendeprived area.



Level C Protection





Level D PPE

- Provides the lowest level of skin and respiratory protection:
 - Clothes (uniform, scrubs, street clothes)
 - Standard Precautions
- Weakness: provides no chemical protection and limited respiratory protection



Your every day work clothes!



Level D Protection



PPE Precautions

- Incorrect use or improper selection
- Penetration into the PPE (holes/rips)
- Slips, trips and falls
- Loss of dexterity, limited vision, impaired communication
- Heat-related illness
 - Heat Cramps
 - Heat Exhaustion
 - Heat Stroke



Heat Cramps

- Signs and symptoms:
 - Muscle spasms
 - Dry skin
 - Fatigue
 - Dizziness
 - Dry mouth
 - Increased heart rate and breathing



Heat Exhaustion

- Signs and symptoms:
 - Headache
 - Heavy sweating. Intense thirst
 - Light-headedness
 - Feeling faint/weakness
 - Pale and cool, moist skin
 - Increased pulse (120-200)
 - Nausea and vomiting



<u>Heat Stroke</u>

- Signs and symptoms:
 - High body temperature (>103 degrees)
 - Absence of sweating
 - Skin is hot and red
 - Rapid pulse; difficulty breathing; constricted pupils
 - Severe symptoms of heat exhaustion
 - Advanced symptoms may include seizure, loss of consciousness or death
 - *Not all above may present at the same time



Be careful...

- If you recognize any of these signs and symptoms in yourself or another team member, NOTIFY the DRT Leader
- Immediately remove the DRT member from their post
- Doff the DRT member
- Perform decontamination procedures
- Treat accordingly



Medical Screen Pre - and Post - Decon

- DRT members must receive a pre- and post-decon medical screen:
 - Blood Pressure
 - Pulse
 - Respirations
 - Temperature
 - Weight
 - Recent medical history for diarrhea, vomiting, etc...
- Orally hydrate during this time
- Team leader needs to be aware of environmental factors that may limit time in suits. Maximum time in suits is 45 minutes (including self-decon)



What are we going to be using?

- Tychem suits with duct tape to seal
 - Cooling Vest optional
- Powered Air Purifying Respirators (PAPRs)
- Chemical resistant booties or rubber boots
- Chemical-resistant and nitrile gloves



PAPRs

- Does not require fittesting
- Requires batteries and appropriate filters





Respiratory Protection Program

Medical surveillance of DRT member



Maintenance

- Equipment must be properly maintained and checked
 - every month and documented
 - before and after each use



Donning PPE

Work with a Buddy!

- Put on:
 - **1.** Inner Gloves
 - 2. Tychem Suit
 - **3. PVC Boot Covers or chemical resistant rubber boots**
 - 4. Outer Gloves
 - 5. Duct Tape around glove and boot openings and ensure proper seal
 - 6. Respirator
 - 7. Duct Tape suit zipper and ensure proper seal
 - 8. Write identifier and don time on duct tape on suit



Communicating while using PPE

 It's important to be able to communicate with the other members of the Decon Response Team while wearing PPE







"I need help with this patient"



"I'm having trouble breathing"





"I'm OK"





<u>The last patient has been decontaminated –</u> <u>now what?</u>

- Decon Response Team must now decon themselves in their PPE and then the equipment
- Once in the Post-Decontamination Zone, DRT members can doff PPE
- Decon in pairs using the "buddy system"



Doffing PPE

- Work with a Buddy!
- For speed, cut with scissors and peel off or
- Take off:
 - Duct tape at suit and glove seals
 - Outer gloves
 - Respirator
 - Peel suit away from body
 - PVC boot covers
 - Inner gloves





REHAB

- Rehab includes: cooling, fluids and snacks
- OSHA requirements after rehab-
 - If team member has lost 10% or more of body weight, they are not allowed to re-enter the suit within 24 hours.





<u>What do you do if one of the DRT</u> <u>Members goes down?</u>

- If one of the team becomes a patient:
 - Remove them from their post
 - Remove their PPE suit and clothes
 - Perform assisted decon
 - Treat



Questions and Answers



Practice Activities

- Donning and Doffing PPE
 - Use of PAPRs
- Setup of Decon Equipment
 - Setting up the Shower System
 - Connecting the Water Supply
 - Connecting the Electrical Supply
- Patient Decontamination
 - Directed Decon
 - Ambulatory Patient Decon
 - Non-Ambulatory Patient Decon



Class Evaluation



Thank you for your time and your interest in being a member of your facility's Decon Response Team.

We hope that you found this informative and fun!



