Hospital Decontamination Response Teams

2023 V 6

STRAC

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!

STRAC
Southwest Texas Regional Advisory Council

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

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

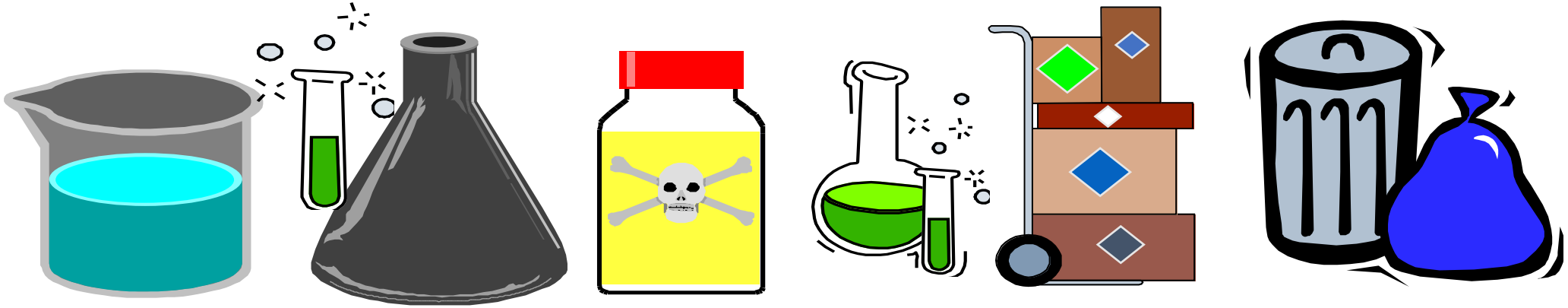
What is Decontamination?

- 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

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."** ***(1910.120)***



"United States Department of Labor." 1910.120 - Hazardous Waste Operations and Emergency Response. | Occupational Safety and Health Administration, https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.120.

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

HEALTH HAZARD	FLAME	EXCLAMATION MARK
		
• Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	• Flammables • Pyrophoric • Self-Heating • Emits Flammable Gas • Self reactive • Organic Peroxides	• Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
GAS CYLINDER	**CORROSION**	**EXPLODING BOMB**
		
• Gases under Pressure	• Skin Corrosion/ burns • Eye Damage • Corrosive to Metals	• Explosives • Self reactive • Organic Peroxides
FLAME OVER CIRCLE	**ENVIRONMENT *(NON-MANDATORY)**	**SKULL AND CROSSBONES**
		
• Oxidizers	• Aquatic Toxicity	• Acute Toxicity (fatal or toxic)

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

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

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

Bioagents – what to look for in 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

All Hazards Response

CBRNE:

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

Chemical Agents

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

Nerve 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)**

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

Irritants:

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

Opiates:

- Powders or liquids
- Treat emergently

Biological Agents

- Anthrax
- Botulism
- Plague
- Smallpox
- Tularemia
- Viral Hemorrhagic Fever (VHF)
- Infectious Respiratory Disease (SARS or Avian Flu)
- COVID-19

Signs and Symptoms of Exposure to Biological Agents

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

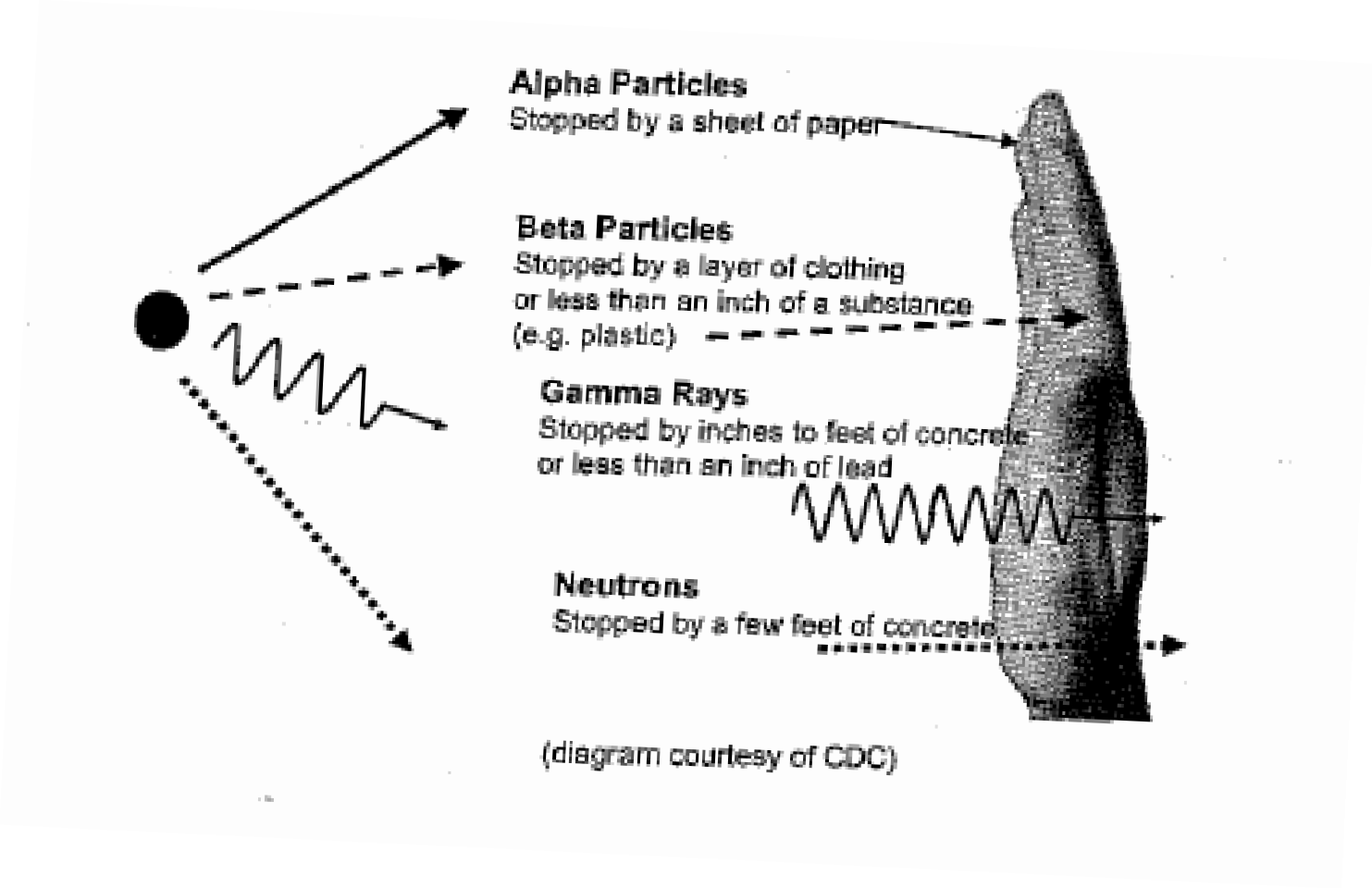
Where can Radiation be Found?

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

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



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 care giver. 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 = Shield

I = 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

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 calling MEDCOM

What is a Decontamination Response Team?

- **A trained group of personnel with resources to operate in a contaminated area and perform the following functions:**
  - **Maintain Safe Environment – Safety Officer and RSO**
  - **Site Access Control – Security**
  - **Doffer / Bagger**
  - **Dryer / Dresser / QC**
  - **Decon Set Up / Support – Team Leader**
  - **Triage – Nurse of Physician**
  - **Washer / Rinser**
  - **Hospital Gatekeeper**

Duties of DRT Members in the Hospital Decontamination Zone

- 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

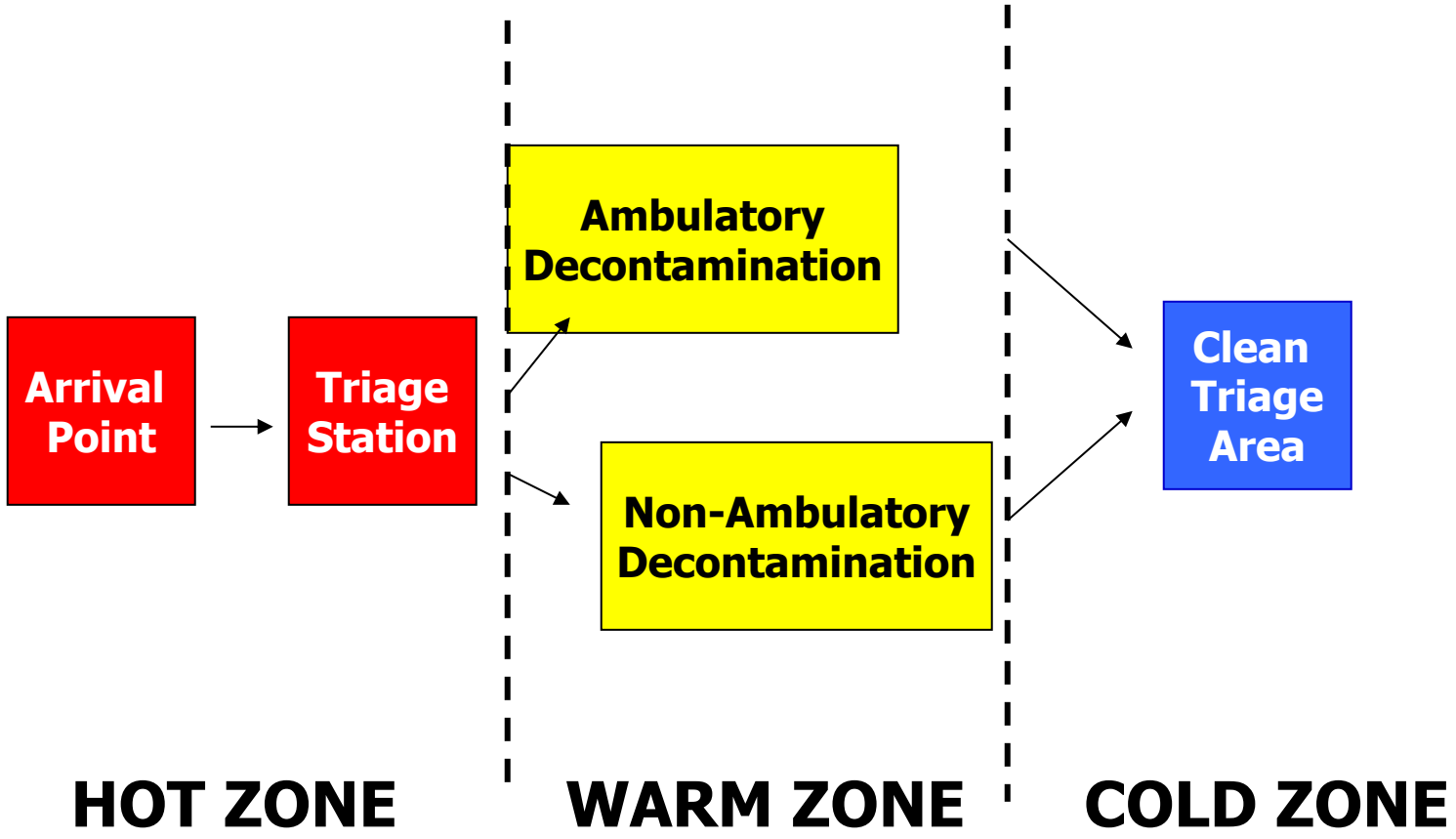
Hospital Decontamination Zone

- 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

Our Hospital's Decon - Set-Up



Hospital Decontamination Zone

Control Zones – Contamination Reduction Corridor

- 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

SMART Triage Tag

Collection of contaminated belongings

- Separate clothing and valuables
- Place in transparent and 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

STRAC
Southwest Texas Regional Advisory Council

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

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

Level B Protection

Level C PPE

*Level C PPE is used for First Receivers

- 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 oxygen-deprived 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

Level D Protection

Your every day work clothes!

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

Heat Stroke

- 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 fit-testing
- 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:**
  - **Inner Gloves**
  - **Tychem Suit**
  - **PVC Boot Covers or chemical resistant rubber boots**
  - **Outer Gloves**
  - **Duct Tape around glove and boot openings and suit zipper**
  - **Respirator**
  - **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”

The last patient has been decontaminated – now what?

- 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.

What do you do if one of the DRT Members goes down?

- 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

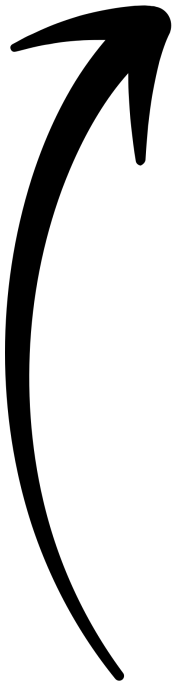
- Donning and Doffing PPE
  - Use of PAPRs
- Setup of Decon Equipment
  - Setting up the Shower System
  - Connecting the Water Supply
  - Connecting the Electrical Supply
- Patient Decontamination
  - Directed Decon
  - Ambulatory Patient Decon
  - Non-Ambulatory Patient Decon

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!

Please Scan and Fill out for Certification



SCAN ME

STRAC
Southwest Texas Regional Advisory Council