Hospital Preparedness for Disasters: Handling Contaminated Patients

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Objectives

- Discuss the different types of PPE.
- Describe radiological decontamination.
- Describe chemical decontamination.
- Discuss the differences between different types of decontamination.
Steps to a Solution

• Each hospital should be able to handle 1 contaminated pt, with on-site staff, 24x7, safely

• Steps needed:
  – Select and acquire equipment
  – Develop local plan
  – Document local plan
  – Install equipment
  – Train to use equipment to match local plan
Choosing the type of PPE

- Can choose PPE necessary for respiratory protection separately from PPE needed for skin protection
- Should use at least the minimum level for each, as appropriate
Level A
Disadvantages of Level A Suits

- Oxygen source is limited.
- Needs a physically fit person.
- Heat stress.
- Heat stroke.
- Cumbersome.
- Lose manual dexterity.
Level B
Firefighters: Flame Retardant Suit
Level C
Decontamination

- Decontamination is the reduction or removal of hazardous materials such as chemical or radiological compounds.
- It can be done by physical removal or chemical neutralization.
General Principles

• Removal of all clothing can reduce contamination on the patient up to 90%.

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Chemical Decontamination

• Hazards to staff dictate decontamination prior to caring for victims with life threatening conditions.

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Physical State

- Victims contaminated with solids and liquids should receive decontamination.
- For gas and vapor exposures, removal from the source is sufficient—wet decon *not* needed.
Tokyo Sarin Attack

- Vapor exposure.
- And yet, 10-20% of health care workers at treating hospitals developed mild to moderate symptoms of cough and miosis.
Historical Incidents

- Goiania, Brazil (1985):
  - Health care workers caring for patients internally contaminated with cesium, were not secondarily exposed or contaminated.
Historical Incidents

- London, England
  - 26 health care workers who cared for Mr. Litvinenko did not get secondarily contaminated with polonium.
Wound Decontamination

• Wounds need to be assessed for foreign bodies as well as underlying injuries.
• Wound care needs to be balanced against contamination.
  ■ What is in there? How much is in there?
Methods

- Washing with soap and water.
- Oxidation/Hydrolysis (Dilute bleach) for inert objects only.
Disposal of Decon Rinse Water

- In a small event, collection into a separate drainage and storage system is feasible and desirable.
- In large mass casualty events, collection of waste effluent may not be easy.
- Control it to the best extent possible.

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Radiological Decontamination

- Decontamination should not delay or impede stabilization of any patient contaminated with radiological material.
A person who was irradiated, or exposed to radiation, is like having had an x-ray study.

Decontamination is unnecessary and will not reduce the exposure.
Secondary Radiological Contamination

- Can occur from:
  - Externally contaminated patients.
  - Internally contaminated patients
    - Can contaminate or expose others from the material inside their bodies.
- The body fluids (blood, sweat, urine) of an internally contaminated person can contain radioactive materials.
Potential Hazard

• May occur with highly radioactive shrapnel.

• In that case, apply principles of Time-Distance-Shielding-Forceps.
OSHA Recommendation for Hospital-Based Decon

• Level C
• Is it realistic in a mass casualty incident?
• Is it necessary?
Level C in Tokai Mura Japan
Cut Away from the Head
Roll Clothes Inwards
Remove Clothes by Rolling them into a Sheet
Survey the Back
Store Clothes in Bag and Store it Away from Patient
Remember

- Label bag with date, patient name, time, and name of staff.
- Store away from patient in a designated area.
- Work with your RSO.
Radiological Decontamination

- Paired with radiological survey.
- Draping.
- Soap and Water.
- Out to In.
- Targeted.
- Meticulous.
Draping
• Soap and water
• Decontamination should proceed in a centrifugal manner
Meticulous
Check the Radiation Counts

• Try to maintain the same location for the probe when reading the counts
Radiation detection

- Excreta or swabs from the victims should be collected and labeled.
When to Stop

- The activity is less than twice the average background activity.
- Decontamination efforts do not substantially reduce the activity.
- Skin is being abraded.
Survey Staff

- Perform staff survey and decontamination if necessary.
- Use step off pad.
Remember Commonly Ignored Areas During decontamination

- Scalp
- Genitalia
- Skin creases & folds
- Hands
- Feet
- Nails
Radioactive contamination is easy to detect.

Chemical contamination may be difficult to detect.

Provision of life-saving treatment should take priority over radiological decontamination.
Summary Points

- Provision of life-saving treatment does not take priority over chemical decontamination.
- Radiological decontamination is paired with a radiation survey.
- Soap and water are sufficient for decontamination.
Questions?