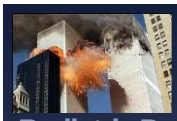
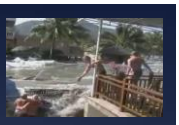
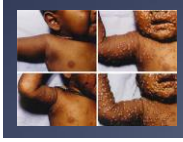



# Pediatric Decontamination

The smaller the patient, the bigger the problem

Dennis Heon, MD, FAAP
New York University Langone Medical Center
Bellevue Hospital Center



## Disclosure

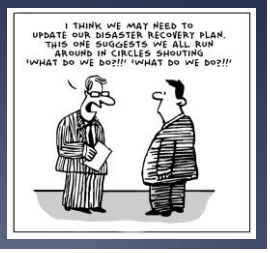
- Nothing to declare

## Learning Objectives

- Differences in children – physiological, behavioral
- Triage
- Pre Decon interventions - Antidote dosing
- Decon for children

## Why do we care?

- Easy, high value targets
- Labor intensive
- Equipment / training




## Chemical Incidents

## Radiation Incidents

## Your Neighborhood?

## Exposure

- Fail to recognize danger
- Unable to rescue themselves
- Unable to report exposures
- Often clustered

## Chemical

- Inhalation – increased resp rate, lower to ground
- Absorption – greater surface area to body mass ratio, skin more permeable, more susceptible to fluid losses

## Radiation

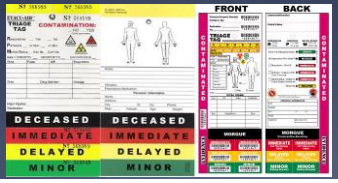
- Rapidly dividing cells
- Immature Immune System
- Increased uptake + longer life ➔ cancer

## Pre – Hospital Issues

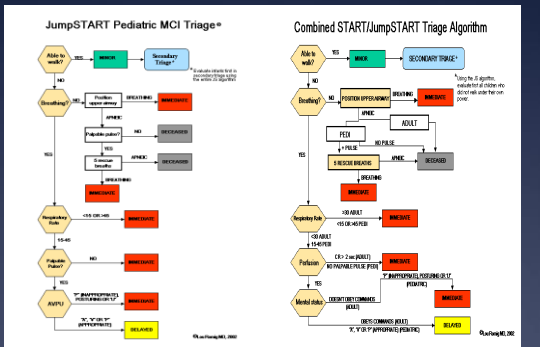
- Lack of training
  - Vital signs, normal behavior
- Poor or no preparation
  - Few peds drills, not realistic
- Limited peds equipment and medications
- Errors in triage

## Disaster Triage Categories

- Black – not expected to survive, DOA
- Red – emergent, life threatening injury
- Yellow – urgent, significant injury
- Green – walking wounded or worried well



## Disaster Triage Algorithms




## Risk Assessment

- Nature of the agent
- Extent of exposure
- Route of exposure
- Duration of exposure

If you know the agent, get information

- Call the Local Poison Center (1-800-222-1222)
- CDC/NIOSH website: www.cdc.gov/niosh/idih/
- 800-CDC-INFO

## Protective Wear

| Scenario | Gear |
|---|---|
| Nerve agent or wet liquid | PAPR<br>splash suit |
| Unknown agent (non-nerve agent) | N95 mask & goggles<br>splash suit |
| Known agent: bio or radioactive | N95 mask & goggles<br>standard trauma gear |

## General Rule

- Whatever exposure the patient had, the hospital staff will have far less
- Never assume patient properly decontaminated

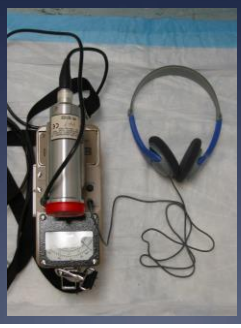
## Chemical Screening

- 'SLUDGE' is a convenient way to remember the signs and symptoms of nerve gas exposure.
- S= Salivation
- L= Lacrimation (tearing)
- U= Urination
- D= Defecation or Diarrhea
- G= GI Distress
- E= Emesis (vomiting)

## Chemical Antidotes

- Atropine
  - 0.05mg/kg IM or 0.02mg/kg IV
  - Toddler = 0.5mg, child 1mg, >90pounds=2mg
  - No max dose
- 2-PAM (Pralidoxime)
  - 15mg/kg IM or 20-50 mg/kg IV over 15 mins
  - Autoinjector conc = 300mg/ml
  - Max dose 600 mg, may give 3 times
- Duodote kit = 2-PAM 600mg, Atropine 2.1mg

## Radiation Screening



## Radioactive Iodine

- Potassium Iodide (KI) indications
  - Nuclear explosions
  - Nuclear reactor incidents

- KI **not indicated** for "dirty bombs"
  - No nuclear reaction
  - No radioactive Iodide present

## Potassium Iodide (KI) Dosing

- **Adults/Adolescents – 1 tab (130mg)**
- **Children 3-12 years – ½ tab (65mg)**
- **1 month – 3 years – ¼ tab (32.5 mg)**
- **Birth – 1 month – 1/8 tab (16.25mg)**
- **Dosage: take for 10 days**
- **65mg tabs and liquid may be available**
- **Do not ingest 'Tincture of Iodine' - Poison!**

## Strategic National Stockpile

- Federal push packs
  - Available within 12 hours
  - Limited liquid preparations

## Hospital Issues

- PROTECT YOUR FACILITY!!!
- EARLY ACTIVATION

## Hospital Issues

## Hospital Issues

- Limited expertise
  - PEM, PICU, burns, trauma, peds surgeons
- Lack of appropriate supplies
  - Wards, equipment, medications
  - Cribs, diapers, baby food, formula

## Pediatric Decon Problems

- Poor / regressive communication skills
- Inability to follow directions
- Unwilling to disrobe, separate from items
- Require supervision
- Afraid of shower
- Emotional involvement of caregiver and responders

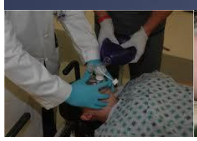
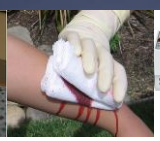
## Fear !!!

## Arrival

- EMS/Fire will decon patients at the scene
  - 60-80% of people will bypass EMS and self-present to hospitals
  - Closer hospital > risk
- Contaminated?
  - Keep non-contaminated patients separate
  - Most patients who are able to self-present have mild contamination and can self-decontaminate
  - Undressing is 90% of decon

## Arrival

- Life saving interventions pre-decon
  - Basic airway maneuvers
  - Control hemorrhage
  - IM Antidotes
- Order through decon – Red tags first


## Arrival

- Keep families together
  - Exception: red parent, green child
- Need more assistance
  - Fear of shower (hand held sprayers)
  - Inability to wash self
  - Modesty issues > 8 yrs old
- Hypothermia
  - Greater surface to body mass ratio
  - 98 degrees minimum

## Identification / Tracking

- Unaccompanied
  - ID band, pictures: face, entire child
  - Report to database NCMEC, HERDS
- Accompanied
  - Maternity ID bands: name/DOB of parent and child
- Pediatric safe area(s) in hospital
  - Well staffed
  - Decrease hazards, secure area
  - Age appropriate distractions

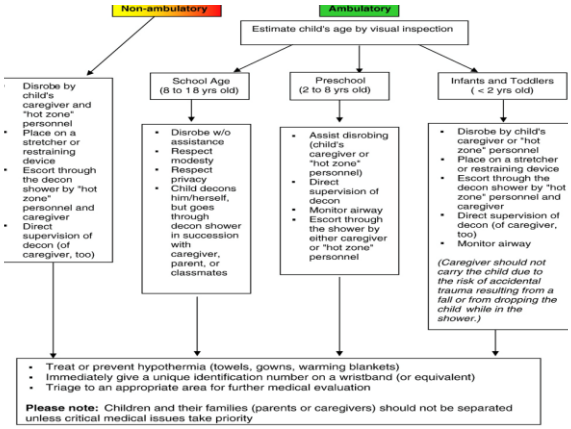
## Disrobing

- All clothing removed
  - Place in bag with unique ID number
- Jewelry and comfort items placed in different bag
- Protect modesty / ensure warmth between disrobing area and decon shower
  - Poncho
  - Sheets

## Disrobing

## Shower Basics

- Use warm water – 98.6° minimum
- Length of time unknown, variable
  - Entire body, no exceptions
  - Remove bandages / dressings
- Water – mild liquid soap OK
  - Do NOT use bleach / chemicals
- Long board / C-collar – hand held sprayers




## Non-Ambulatory Children

- Caregiver assistance when possible
- Stretcher +/- backboard, C-collar if trauma
- Hand held sprayers
- PROTECT AIRWAY!

## 8-18 Years Old

- Separate by gender
- Ensure modesty
- Need supervision for complete decon
  - Need both genders in hot zone

## 2-8 Years Old

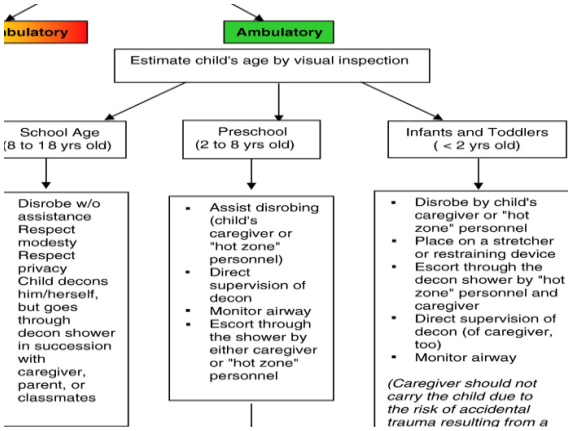
- Separate by gender if able
- Slowest group
  - Incomplete washing
  - Fear or shower or first responder
- Need extensive supervision
  - Need both genders in hot zone
- Allow caregiver to remain with child

## 0-2 Years Old

- Never carry infant through shower
  - Stretcher, basket
  - Remain in contact entire time
- Greatest risk
  - Airway and hypothermia
- Caregiver unable to decon self and infant

## Special Needs Children

- Increased risk - poor protoplasm
- Remove appliances if symptomatic
  - Trach, home ventilator, GT
  - Replace in cold zone
- Decon water resistant equipment
  - Non waterproof – keep in hot zone
- Caregiver to accompany if possible




## Post Shower

- Dry at once
- Covering for modesty and warmth
- Repeat triage
  - Separate peds red / yellow / green zones
- Ensure ID for tracking
  - Keep with caregiver

## Post Medical Evaluation

- Child friendly area
  - Age appropriate distractions
  - Safe and contained
  - Supervised
- Psych services
  - Event
  - Decon process
  - Future changes

## Take Home Points

- Advance planning
  - Train and retrain
  - Include children
- Children > risk morbidity / mortality
  - Increased surface area to body mass ratio
  - Faster respiratory rates
  - Rapidly dividing cells
  - Fail to recognize danger

## Take Home Points

- Children more labor intensive
  - Fear/regressive behavior prolong process
  - Use caregiver when possible
  - ID / tracking for reunification
- Pediatric Antidote dosing
  - Peds capable responder in hot zone

## Take Home Points

- Decon Shower
  - Everyone / everything
  - Keep warm
  - Separate by gender
  - Same gender personnel
  - Children slower
  - Never carry child

## References / Resources


- Children in Disasters: Hospital Guidelines for Pediatric Preparedness. 3rd Edition August 2008 Created by: Centers for Bioterrorism Preparedness Program Pediatric Task Force NYC DOHMH Pediatric Disaster Advisory Group NYC DOHMH Healthcare Emergency Preparedness Program
- "Pediatric Disaster Toolkit: Hospital Guidelines for Pediatrics in Disasters." 3nd Edition Aug 2008 Created by: Centers for Bioterrorism Preparedness Program Pediatric Task Force NYC DOHMH Pediatric Disaster Advisory Group NYC DOHMH Bioterrorism Hospital Preparedness Program
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## References / Resources


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- *The Decontamination of Children,* DVD, AHRQ, Children's Hospital Boston
- *OSHA Best Practices for Hospital First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances*, Jan 2005

  http://www.osha.gov/dts/osta/bestpractices

## Questions