Pediatric Disaster Considerations and Blast Injuries

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Main Entrance
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Pharmacy & Marketplace
Radiology
Objectives

- Participant will be able to plan for patterns of injury and mortality that are to be expected from blast injuries.

- Participant will have a greater understanding of disaster preparedness and planning as related to the pediatric patient.

- Participant will have increased knowledge of the Incident Command System.

- Participant will be able to name 3 anatomic differences of the pediatric patient that could affect their outcomes in a disaster.
27%
50%
An assessment of Chemical, Biological, Radiologic, Nuclear, and Explosive preparedness among emergency department healthcare providers in an inner city emergency department

Joseph G. Kotora, DO, MPH

ABSTRACT

Introduction: Emergency healthcare providers are required to care for victims of Chemical, Biological, Radiologic, Nuclear, and Explosive (CBRNE) agents. However, US emergency departments are often ill prepared to manage CBRNE casualties. Most providers lack adequate knowledge or experience in the areas of patient decontamination, hospital-specific disaster protocols, interagency familiarization, and available supply of necessary medical equipment and medications. This study evaluated the CBRNE preparedness of physicians, nurses, and midlevel providers in an urban tertiary care emergency department.

Conclusions: Emergency care providers inadequately prepared to manage CBRNE incidents. Furthermore, a valid and precise instrument of measuring preparedness needs to be developed. Standardized educational curriculums that cover healthcare providers’ genders, occupations, experience levels may assist in closing the knowledge gap, providers and reinforce emergency preparedness.
A little history lesson.....
• Peshawar, Pakistan
• Beslan School Siege
First things first......
Pediatric Considerations
Antidotes for nerve agent poisoning: should we differentiate children from adults?

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Abstract
PURPOSE OF REVIEW: Chemical terrorism presents a threat to the civilian population, including children. Nerve agent antidotes are available in prepackaged autoinjectors that can be delivered rapidly following an exposure. The published evidence on the use of nerve agent antidotes consists of case reports, extrapolation from pediatric organophosphate poisonings, and expert opinion. This review examines the evidence supporting the use of nerve agent antidotes in children.

RECENT FINDINGS: The use of adult formulated atropine and pralidoxime autoinjectors will deliver doses above current recommendations for infants and children. Data demonstrate, however, that atropine overdose is generally well tolerated in young children. Children symptomatic of nerve agent poisoning will likely need both supraphysiologic doses and frequent re-dosing of atropine.

SUMMARY: Based on limited data, the Mark 1 autoinjector kit (Meridian Medical Technologies, Columbia, Maryland, USA) appears to be the most efficacious antidote delivery system following a nerve agent attack. Symptomatic children under 1 year of age should be given a full atropine dose from the AtroPen (Meridian Medical Technologies) (0.5 mg) or Mark 1 kits (2 mg), while children over 1 year of age should be given a full dose of both atropine and pralidoxime from the Mark 1 kit when more accurate weight-based dosing of antidotes is impossible.
What You See is NOT What You Get!
Blast Physics

- Blast front
- Blast wind
- Brisance
- Peak overpressure

![Diagram showing blast physics concepts](image)
## Types of Explosives

### High energy explosives:
- TNT
- C-4
- Semtex
- Nitroglycerine
- Dynamite
- Ammonium Nitrate Fuel Oil (ANFO)

### Low energy explosives:
- Pipe Bombs
- Gun Powder
- Pure Petroleum-Based Bombs
- “Molotov Cocktail”
Blast Pathophysiology

- Primary Blast Injury
- Secondary Blast Injury
- Tertiary Blast Injury
Primary Blast Injury

- Blast lung
- TM rupture
- Abdominal hemorrhage & perforation
- Globe rupture
- Concussion-TBI
- Traumatic amputations
Secondary Blast Injury

- Penetrating ballistic or blunt injuries
- Eye penetration
Tertiary Blast Injury

- Fractures
- Open/closed brain injury
Quaternary Blast Injury

- Burns-flash
  - Partial & full thickness
- Crush injuries
- Closed & open brain injury
- Breathing problems
- Angina
- Hyperglycemia/HTN
Two Leading Causes of Death

BLI- Blast Lung Injury

IAI- Intraabdominal Injuries
Tympanic Membrane
Incident Command
Key Characteristics

- Functional – not about titles
- Built around 5 major activities
- Span of control
- Structure always same
- Identify Incident Commander and key people - BEFORE
Pitfalls

• No plan
• Plan but key people in place just because of who they are!
• Failure to train
• Poor “span-of—control”
BREAKING NEWS
EVACUATIONS UNDERWAY AT NYU LANGONE MEDICAL CENTER

© Getty Images
“I don’t like to think about disasters.”
“I don’t have the time.”
“We aren’t in a high risk area.”
“Someone else is responsible.”
Soooooo....
Solution:
American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

The American Academy of Pediatrics (AAP) Disaster Preparedness Advisory Council (DPAC) is pleased to provide you with information on its activities. For more information on the DPAC, including a list of members and liaisons, see the AAP Disaster Preparedness Advisory Council. Also see the AAP DPAC Strategic Plan for Disaster Preparedness 2016–2020.

Announcements

New AAP Area of Pediatric Population Health
The AAP disaster preparedness initiatives are now housed administratively in an AAP Department of Healthy Resilient Children, Youth and Families, led by Debra Waldron, MD, MPH, FAAP, Senior Vice-President. Within this department there are 4 areas: Strategic Partnerships for Child and Family Health; Child Safety, Health, and Wellness; Systems of Services for Children and Youth with Special Health Care Needs; and a new area titled Pediatric Population Health. This new area serves as the home for AAP Disaster Preparedness and Recovery, Public Health Promotion, and Adolescent Health Promotion (a merge of the tobacco control and adolescent health efforts). Public Health Promotion also includes Extension for Community Healthcare Outcomes (ECHO) activities, the Pediatric Environmental Health Specialty Unit (PEHSU) program, epilepsy, telehealth care, and climate change work. This restructure provides opportunities for collaboration and connections with new stakeholder groups — natural disasters, environmental health, and climate change are related, and all impact children.

New Releases

CDC Updates Zika Travel Guidance for Pregnant Women and Couples
After a review of current data on the spread of Zika throughout the world, the Centers for Disease Control and Prevention (CDC) updated its Zika travel guidance for pregnant
### Other Courses From TEEX/NERRTC
- AWR-111-W
- AWR-136
- AWR-138-W
- AWR-139-W
- AWR-160
- AWR-160-F
- AWR-160-W
- AWR-167
- AWR-168-W
- AWR-169-W
- AWR-173-W
- AWR-174-W
- AWR-175-W
- AWR-176-W
- AWR-177-W
- AWR-178-W
- AWR-213
- AWR-314-W
- MGT-310
- MGT-312
- MGT-314
- MGT-315
- MGT-317
- MGT-318

### Course Details

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**Description**

This course prepares students to effectively, appropriately, and safely plan for and respond to a disaster incident involving children, addressing the specific needs of pediatric patients in the event of a community-based incident. Pediatric specific planning considerations include mass sheltering, pediatric delays, reunification planning and pediatric decontamination considerations. This is not a hands-on technical course, but instead a management resource course for stakeholders like pediatric physicians, emergency managers, emergency planners, and members of public emergency departments like EMS, Fire, Police, Public Health and Hospitals in the field of disaster response and preparedness work.

**Objectives**

At the end of this course, participants will be able to:
1. Recognize the issues likely to arise within the pediatric population during disaster events.
2. Describe relevant Emergency Management (EM) considerations when planning for the care and management of the pediatric population following a disaster event.
3. Describe considerations in a disaster event that are unique to the pediatric population, as well as the impact of those considerations on planning and response efforts.
4. Describe and discuss effective planning and preparation in addressing the requirements of the functional access needs of pediatric population in a disaster event.
5. Describe relevant mass sheltering considerations when planning for the care and management of the pediatric population following a disaster event.
6. Apply pediatric-based medical systems, recognize the limitations of each system, and recognize that disaster events may produce situations of scarce resources.
7. Describe aspects of reunification planning that may be applied in a disaster event, with emphasis on successfully reuniting the pediatric population with their families.
8. Describe considerations for the decontamination process that take into account the needs of the pediatric population.
9. Apply the information obtained in this course by assessing information provided in a tabletop exercise.

**NTED Prerequisites**

Note: Although familiarity with the National Incident Management System (NIMS) and the Incident Command System (ICS) is essential for completion of Federal Emergency Management Agency (FEMA) Independent Study (IS) courses IS-100, IS-700.a - Introduction to Incident Command System, IS-100, IS-200 is - ICS for Single Resources and Initial Action Incidents, and IS-700.a NIMS An Introduction (or their equivalents) is recommended.
Checklist

Essential Pediatric Domains and Considerations

for

Every Hospital’s Disaster Preparedness Policies
Any Questions?
• Federal Emergency Management Agency (FEMA), http://www.fema.gov
• Mass casualties and injuries from terrorism, CDC’s Emergency Preparedness and Response Website. http://emergency.cdc.gov