

# Emerging Pediatric Infectious Disease



MARY KING MD, MPH  
PEDIATRIC INTENSIVIST  
HARBORVIEW AND SEATTLE CHILDREN'S

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PEDIATRIC EMERGENCY RESPONSE  
WORKSHOP

# Outline



1. Pediatric Biomarkers in Ebola **EID**
2. Enterovirus D68 **MMWR**
3. Care of the Critically Ill and Injured During  
Pandemics and Disasters **CHEST**

# Pediatric Biomarkers in Ebola



## **1. Biomarker Correlates of Survival in Pediatric Patients with Ebola Virus Disease**

- McElroy, Anita et al
- Emerging Infectious Diseases, CDC
- Volume 20, No.10, October 2014

# Uganda 2000-2001 Ebola Outbreak

## Total patients in outbreak



- 425 total cases
  - 145 pediatric
    - ✦ 55 lab confirmed
      - 37 included in study

# Uganda 2000-2001 Ebola Outbreak

## Study patients



- Pediatric total n = 37
- Pediatric gender F 23 (62%) M 14 (38%)
- Peds hemorrhage n=15 (41%)
- Peds death n=14 (**38%**)
  
- Adult total n = 49
- Adult gender F 33 (67%) M 16 (33%)
- Adult hemorrhage n = 16 (33%)
- Adult death n= 27 (**55%**)

# Uganda 2000-2001 Ebola Outbreak

## Biomarker findings



- Children who survived had specific biomarker changes as compared to children who died
  - Higher levels of activated chemokines
  - Normal T-cell markers
  - Lower plasminogen activator inhibitor 1, soluble intracellular and vascular adhesion molecules
- Adults who survived vs. died were similar

### **Conclusion:**

- Children with Ebola may require different treatment regimens.

# Enterovirus D68



## **2. Severe Respiratory Illness Associated with Enterovirus D68 – Missouri and Illinois, 2014**

- Midgley C et al.
- Morbidity and Mortality Weekly Report (MMWR), CDC
- September 12, 2014

# Enterovirus D68



- **Children's Mercy, Kansas City, Missouri**
  - Aug 5-19: cluster of severe respiratory illness
  - rhino/entero+
  - notified CDC Aug 19
  - 19/22 specimens + for EV-D68
- **Comer Children's, University of Chicago**
  - notified CDC Aug 23 of a similar cluster
  - 11/14 specimens + for EV-D68



# Enterovirus-D68 Kansas City



## **19 EV-D68+ Kansas patients:**

- Median age: 4 yrs
- Prior asthma: 68%
- Resp distress and hypoxia: 100%
- Admit to PICU: 100%
- Febrile: 26%
- BIPAP: 4
- CXR: perihilar infiltrates, atelectasis

# Enterovirus-D68 Chicago



## **11 EV-D68+ Chicago patients:**

- Median age: 5 yrs
- Prior asthma: 73%
- Admit to PICU: 91%
- Febrile: 18%
- BIPAP: 2
- ETT: 2 → 1 went on to ECMO
- CXR: perihilar infiltrates, atelectasis

# Enterovirus-D68 Summary



- Refer to [cdc.gov](http://cdc.gov) website for enterovirus-D68
- Ensure asthma action plan and controller meds for asthmatics
- Consider EV-D68 if you encounter a cluster of pediatric patients with severe respiratory distress
- Refer to pediatric center that can provide pediatric bipap, aggressive bronchodilation if severely ill

# Care of the Critically Ill and Injured During Pandemics and Disasters



## **3. Introduction and Executive Summary: Care of the Critically Ill and Injured During Pandemics and Disasters: CHEST Consensus Statement**

- Christian M, Devereaux A, Dichter J, Rubinson L, Kisson N
- CHEST
- August 21, 2014

# Care of the Critically Ill and Injured During Pandemics and Disasters



- CHEST Task Force for Mass Critical Care
- >100 clinicians and experts with broad scope of clinical fields from > 9 countries
- Evidence-informed suggestions
- Rapid release given growing concern for Ebola
- To support bedside critical care providers, hospital administrators, public health officials and government planners

# Care of the Critically Ill and Injured During Pandemics and Disasters



## **13 manuscripts:**

- Surge capacity
- Evacuation of the ICU
- Triage
- Special populations
- System level planning, coordination, and communication
- Business and continuity of operations
- Engagement and education
- Ethical considerations
- Legal preparedness
- The developing world: infrastructure and capacity building
- The developing world: response, recovery, and research