Pediatric Critical Care Resource Algorithms, Worksheet, and Triage Team Guidelines. 5. Discuss lessons learned and future considerations regarding scarce resource allocation.

Background: In a disaster situation when resources are scarce, it's agreed that health care providers have a duty to care, but also a duty to steward resources within an ethical framework.[3] Operationalizing these ideals is challenging, especially when pediatric critical care itself is limited and specialized. The population of Washington state is 7.1 million, with 22.5% <18 years.[4] There are only 119 PICU beds in the state, and only 30% are open at any time. During an overwhelming disaster, the number of critically injured and ill children may exceed resources available in spite of conservation and surge strategies. The NWHRN established the DCAC in 2012 to bring regional clinical leaders together to discuss scarce resource allocation.

Methods: Using a modeling tool developed by the US CDC, we estimated the potential pediatric critical care needs during a pandemic. We then gathered data regarding regional pediatric critical care resources, reviewed current literature, discussed conservation and surge strategies, and developed the Pediatric Critical Care Algorithm, Worksheet, and Triage Team Guidelines.

Results: The King/Pierce County Pediatric Critical Care Triage Algorithm and accompanying Worksheet are to be used with the Triage Team Guidelines. These documents are part of a regional Concept of Operations for Scarce Resource Management Plan.

Conclusion: This presentation outlines our process and provides our regional recommendations for pediatric critical care triage, as well as lessons learned and future recommendations.

[1,3]IOM reports Crisis Standards of Care 2009. [2]Kissoon N. Deliberations and recommendations of the Pediatric Emergency Mass Critical Care Task Force: Executive summary. Pediatr Crit Care Med. 2011;12:S103-108. [4]USA Census. gov est 2015.

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Reunification Toolkit for Community Hospitals: Applying Education Principles to a Real World Problem

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Study/Objective: Our State Pediatric Disaster Coalition (PDC) was tasked with addressing community hospitals' concerns regarding reunification of children and parents/guardians in a disaster.

Background: Our PDC has representation from public agencies to hospitals. Many reunification tools currently exist on the internet. There were many new concepts to introduce to this audience of adult learners, the Cognitive Dimensions Chart (CDC) was applied during the creation of the toolkit.

Methods: A website was created to link key materials together. Regional hospital coordinators within our state could access materials for education and assist community hospitals to coordinate efforts with local agencies for reunification.

Results: Upon completion of this four component reunification toolkit, hospital emergency planners and safety personnel will have improved capability and capacity for pediatric patients that are separated from parents or guardians. A reunification plan is a vital part of a comprehensive hospital disaster. The first component creates awareness of facts and understanding of reunification for children and families through personal stories. The second component, a framework, explains a reunification plan and identifies key partners to conceptualize and apply to their unique situation. The third and cornerstone component, a checklist, with a step-by-step approach to creating a reunification plan. Included in this checklist are web linked resources to create procedures and detailed individualized analysis. Finally, a disaster drill narrative with a patient list and scenario are included to create either a live or simulated drill, to be able to test the new plan and create corrective actions to enhance the plan, and allows the learner to bring all the components together using metacognition.

Conclusion: This is a practical educational project, applied to a real-world problem, to benefit community hospital emergency management and safety personnel, in addition to children and families in our state to address the importance of reunification in disasters.

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Improving Disaster Preparedness for Children and Families: A National Curriculum for Pediatric Emergency Medicine Fellows

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Study/Objective: Disaster Preparedness (DP) training is limited within Pediatric Emergency Medicine (PEM) fellowships.

Background: A survey of PEM fellowship directors revealed that 70% did not incorporate a disaster preparedness curriculum. Disasters can occur in any region and pediatric emergency medicine physicians play a key role in the response. A standard disaster preparedness curriculum is a necessary component of any pediatric emergency medicine fellowship. A nationally-based curriculum has the advantage of providing a common knowledge base for physicians in training that can be expanded and elaborated for individuals and programs.

Methods: PEM experts in disaster preparedness reviewed the curriculum competencies proposed by National Center for Disaster Medicine and Public Health (June 2013), and Entrustable Professional Activities (EPA) for PEM physicians related to disaster preparedness. Comparison of these

competencies were the basis for creation of content to be included in the curriculum for PEM Fellows. A web-based version was created for access by any fellowship program.
Results: Ten modules were created in educational online program (Softchalk LLC, Richmond, VA) and hosted on a Learning Management (LMS) website. Topics included personal preparedness, triage, bioterrorism, biological, chemical, radiological, blast and natural events, hospital management, ethics and legal issues, and culminate them in a drill scenario for adaptation to individual programs. Review activities and questions were embedded to promote learning in multiple layers of Bloom's taxonomy. Preliminary data to complete all components from users was less than 10 hours.
Conclusion: PEM Physicians are ideally situated to be the experts to their hospitals, communities, and systems of care for pediatric disaster preparedness. The online and group activities provide multiple modes for learners to acquire knowledge and integrate into their practice using broad educational principles. Evaluation of the curriculum regarding more participation by individuals and programs to further research in pediatric disaster preparedness and mentor individuals to become experts in DP.

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Attitudes of Health Care Stakeholders Concerning Admitting and Treating Pediatric Trauma Casualties in Emergency Departments: A Qualitative Study

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Study/Objective: To examine the attitudes of policy makers, senior health care managers, and hospital medical administrators concerning admitting and treating pediatric trauma casualties in Emergency Departments (EDs).
Background: Pediatric trauma is a dominant cause of morbidity and mortality in children. A significant variability exists among health care systems concerning the ED designated to admit and treat pediatric trauma casualties. The medical staff appointed as case managers, or professional staff members, specific training and education programs.
Methods: Semi-structured interviews of 17 senior health care stakeholders from a variety of positions, including national, regional, and local organizations, to facilitate a wide variety of attitudes concerning the study. The analysis was made according to the Grounded Theory.
Results: All study participants emphasized the need for 24/7 availability of pediatric medical teams to admit and treat injured children. Varied views were presented concerning the preferred case manager and the required types of training. The pediatric emergency medicine system was defined as challenging, and often lacking in appropriate operating procedure. Ten of 17 respondents perceived the pediatric ED with trained medical staff as the optimal admitting and treating site. Furthermore, the majority believes that severe pediatric trauma casualties should be centralized solely in specific, pre-designated medical centers.
Conclusion: In order to optimize the treatment of pediatric trauma casualties, significant changes should be implemented concerning the ED sites assigned to admit and treat injured children. Designated legislation is recommended, concerning centralization of severe pediatric casualties in specific medical centers that are equipped with appropriate infrastructure, professional manpower, procedures, and protocols. Budget incentives to increase staff commitment for 24/7 availability should also be considered.

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Comparison of Formulas for Orotracheal Intubation Depth in the Pediatric Population

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Study/Objective: Depth of oral endotracheal tube placement in the pediatric population is commonly calculated using Broselow Tape, Endotracheal Tube (ETT) size x 3, and the age-based formula of age divided by 2, add 12. The objective was to determine the accuracy of the three methods across the age and weight groups.
Background: All intubations performed in the pediatric emergency unit of KK Women and Children's Hospital from January 1, 2009 to December 31, 2013 were selected for review in this retrospective observational study.
Methods: ETT position between T2 to T4 vertebral bodies was taken as the reference position. The depths of ETT placement based on the formulas were calculated from the actual depth of ETT on the chest X-ray. These were compared to the reference position for accuracy.
Results: ETT size x 3 has the highest accuracy of 76.5%, as compared to 63.6% for age-based formula and 63.5% for Broselow Tape. When the formulas are inaccurate, Broselow Tape often predicted a depth that was too shallow as compared to ETT size x 3 ($p = 0.013$) and age-based ($p = 0.004$). All three formulas performed better for older children, particularly ETT size x 3, and age-based ($p < 0.05$). The depth using the age-based formula was too deep in 65% of children less than 1 year old. For weight, the depths using ETT size x 3 and age-based formula was too deep for children of lower body weight ($p < 0.05$), and the depth using age-based formula was too shallow ($p < 0.001$) for patients of higher body weight.
Conclusion: ETT size x 3 was the superior formula for determining orotracheal intubation depth. Caution should be exercised when applying these formulas in patients less than 1 year old, or in patients with extremes of body weight as they are less reliable.

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