Use of Clinical Algorithms for Evaluation and Management of Pediatric and Adult Sepsis Patients in Low-Resource Clinical Environments

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Introduction: Acute infection in post-disaster settings is associated with increased morbidity and mortality. Sepsis management in low resource settings is controversial with recent research suggesting that aggressive fluid resuscitation may cause greater harm than benefit. However, the vast majority of international sepsis guidelines still suggest large initial fluid boluses as part of sepsis algorithms.
Aim: To create an adult and pediatric sepsis algorithm to be applied in low resource clinical settings. This is part of a larger project to create clinical algorithms to provide standardization of emergency case management for low-resource clinical environments.
Methods: A literature search was performed through PubMed identifying and reviewing fluid resuscitation in adult and pediatric sepsis patients in high and low resource clinical environments. The pathways were created based on interpretation of the available evidence-based literature. Focus groups were conducted in Zambia in March 2018 for feedback from local practitioners regarding feasibility of pathways. The pathways were then modified, reviewed by experts peer-review and revised.
Results: Final pediatric and adult sepsis clinical algorithms were created and posted to the free web-based application AgileMD™. They will be available via app access, an online platform, or printable pathways for use in the clinical environment.
Discussion: The study is currently undergoing IRB approval with a plan for implementation of multiple clinical algorithms at a referral hospital site in Zambia in January 2019. Site direction at Ndola Hospital will be conducted under the leadership of an Emergency Medicine trained physician, who will assist in implementation of algorithms and collection of data. Initial data review will be conducted in May 2019. There will be incremental site visits by organizing researchers throughout the implementation and data collection period. Statistical analysis will examine sepsis associated processes and outcome indicators pre and post-intervention to further delineate sepsis management in low resource clinical environments.

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Using Clinically Based Vignettes to Further Develop a Mass Gathering Triage Tool

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Introduction: This research builds on a previously developed triage: Mass Gathering Triage Scale (MaGaTT) by Cannon, et al (2017). This tool was targeted towards non-health care professional first responders within mass-gathering events (MGEs). However, this tool had not been evaluated.
Aim: To further develop the previously designed MaGaTT using vignettes of clinical cases to: 1) determine variation in decision-making, and 2) inform further tool development prior to real-world testing.
Methods: Volunteer members of St. John Ambulance Australia were surveyed using 18 vignettes of de-identified real patient record forms from MGEs covered by St. John Ambulance Australia (NSW) in 2013-2014. Participants were given the MaGaTT and written instructions on its use. Participants triaged 18 patients, recording their decisions on the online survey. Responses against the vignettes were analyzed using Fleiss Kappa [p-bar] measure. A score of 0.61 – 0.8 represented substantial agreement and a score of between 0.41 and 0.6 represented moderate agreement between participants.
Results: There were 110 completed responses. The majority of participants were male (n =66, 60%), having completed a Bachelor's Degree (n =38, 34.5%), and holding the clinical skill level of "first responder" (n=42, 38.2%). The overall agreement [p-bar] for the 18 items was moderate at 0.55. When examined by triage category, the "Resuscitation" category had substantial agreement (0.69), when compared with moderate agreement for "Urgent" (0.52) and "Minor" (0.52) categories.
Discussion: This research demonstrates that the MaGaTT can be used with moderate agreement, and substantial agreement within the resuscitation category. This is similar to triage tools internationally, where high levels of agreement relate to triage categories for patients requiring resuscitation when compared to patients requiring lower levels of clinical care. Slight changes have been made to the original MaGaTT as a result of this research.

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Using Security Guards and Civil Volunteers as First Responders in Medical Emergency Response - Tasks, Needs, and Challenges

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Introduction: Public sector challenges have initiated new forms of collaboration between emergency response organizations, occupations from other societal sectors, and civil citizens, not the least in socio-economically vulnerable areas. As collaborations emerge, there is a need to explore the tasks, needs, and challenges of the new resources when providing medical emergency response.
Aim: To explore two cases of 1) security guards and 2) organized civil volunteers collaborating with the ambulance services and municipal rescue services, and identifying relevant tasks,

needs and challenges. The presentation will focus on their dispatch on medical alerts. A brief comparison of the two groups will also be performed.
Methods: A case study approach was applied involving interviews and workshops with security guards, civil volunteers, ambulance services, and rescue services personnel.
Results: The civil volunteers are dispatched on medical alerts concerning heart failures and accidents requiring first aid, including stopping major bleedings. The scope of tasks of security guards is broader since they are also dispatched on suicide and assault alerts. Needs in both cases include, e.g., proper training, joint exercises, equipment in terms of defibrillators, torquedos, and first aid kits, and proper ICT/GPS positioning support for dispatching. Challenges are mainly organizational and legal where security guards are somewhat protected by their own employer (e.g., through agreements, trauma support, and safety measures such as receiving a hepatitis vaccine) while civil volunteers do not have sufficient protection in any of these respects.
Discussion: Both groups are useful resources in future medical emergency response since they are often close to the incident site and can provide first response while waiting for the professional resources, thereby saving lives and reducing consequences of trauma. However, they need to be better integrated into the professional emergency response system.

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Using the Past to Prepare for the Future: A 2018 Pilot Study to Improve the Hospital Response for Mass Casualties via a Multi-Dimensional Approach

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Introduction: Recent mass shooting events remind us of the importance of hospitals' preparedness to manage a large number of patients in a short period of time. While prehospital systems triage for field interventions and priority of transport, they were not designed to triage for the scarce resources of a hospital. Therefore, upon arrival to hospital, clinicians must then quickly determine how to best assess and provide life-saving interventions based on their limited resources.
Methods: In collaboration with the Greater New York Hospital Association (GNYHA), the Center for Disaster Medicine at New York Medical College piloted an interactive and intensive eight-hour course at four New York State hospitals that covered critical areas such as: current literature on Mass Casualty Events and Triage, review of hospital emergency management, hospital-based triage principles, a MCI exercise in the emergency department, a surge capacity tabletop exercise, and use of ultrasound. While targeted towards physicians to foster team-based care and learning, nurses, physician assistants, and hospital administrators also participated in the pilot course.
Results: Sixty persons from four hospitals participated in the pilot phase. Preliminary findings post-training reveal the following: 58% of participants expressed greater confidence in distinguishing between emergency department triage and triage during disasters; 59% of participants expressed greater confidence in performing initial triage of victims; 49% of participants expressed greater confidence in describing the use of ultrasound-guided triage; and 95% of participants reported an enhancement in their ability to perform their clinical role.
Discussion: Preliminary findings reiterate the ongoing need for hospitals to provide training to their staff in the unique aspects of hospital triage and surge management using tools specifically designed in order to be prepared for the rapid influx of a large number of patients. A multipronged training model is a positive approach to help hospitals prepare for large-scale disasters.

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Using the Patient Data in the Hualien Earthquake to Analyze the Reasons of Visit, the Trauma Injury Sites and the Severity

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Introduction: On February 6, 2018, a magnitude 6.2 earthquake struck Hualien, the eastern part of Taiwan. The quake resulted in 17 deaths and more than 300 people injured. Four buildings completely collapsed and hundreds of houses were damaged.
Aim: The aim of this research was to use the patient data to analyze the reasons for visits, the trauma sites, and the severity.
Methods: We obtained the patient information from the Taiwan Eastern Medical Emergency Operation Center. Medical records were reviewed to analyze the primary diagnosis, the trauma mechanisms, and the sites of injury. Injury severity score (ISS) was used to assess trauma severity.
Results: Two hundred and eighty patients were included in the study, with 90.3% being traumatic patients. Among them, 18.2% was geriatric trauma, 4.7% was pediatric trauma, and 0.4% was obstetric trauma. The most common injury site was lower extremities (33.2%), followed by head (31.4%) and upper extremities (27.1%). The mean injury severity score (ISS) was 1.9. The geriatric population had an average ISS of 2.4, and the pediatric group had a mean ISS of 1.2.
Discussion: In our study, the majority of the patients had minor trauma. Lower extremities may be more vulnerable during the evacuation of an earthquake, and thus, became the most common injury site. The elderly patients had a higher ISS, which may be explained by their immobility and fragility of the body. In the future, it is critical to educate citizens about self-protection during earthquakes, focusing on protecting the head and the extremities. Healthcare providers and emergency medical technicians need to be well-trained to handle geriatric trauma since it poses unique challenges and is associated with increased mortality.

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