

has been manually performed using paper cards, yet new digital technologies claim to be more efficient.

Methods: This prospective observational cross-over study was performed during a live disaster simulation at an urban level 1 trauma center. Healthcare providers (two doctors, two paramedics, and two nurses) each triaged a total of thirty simulated patients, half using paper-based (manual) and half using computer-based (electronic) triage. Speed and accuracy of triage using both methods was measured. Following the exercise, simulated patients and participating health care providers completed a feedback form.

Results: There were no significant differences in triage times (seconds) between manual and electronic methods by doctors (10.3 ± 7.2 vs 15.3 ± 8.0 , respectively) and nurses (12.8 ± 9.8 vs 11.2 ± 7.2), whereas the manual method was faster for paramedics (11.1 ± 7.2 vs 21.5 ± 7.6 , $p < 0.001$). However, after accounting for extra actions required using the manual method, adjusted triage times for doctors (21.4 ± 7.8) and nurses (24.0 ± 9.9) were significantly longer using manual compared to the electronic method ($p < 0.001$). Triage accuracy was similar ($p = 0.70$) between manual (72/90, 80%) and electronic (75/90, 83%). The electronic method was preferred by 4 out of 6 (67%) healthcare providers, while almost half (14/30, 47%) of patients had no preference. While patients commonly perceived the computer method as “less personal” they also perceived it as “better organized”.

Conclusion: This study suggests that computer triage may be the most efficient triage tool for healthcare providers familiar with the technology. Further studies are required to assess the performance of electronic hospital triage in the context of a rapid patient surge and limited computer availability. We present a framework for assessing the accuracy, efficiency and feasibility of digital technologies in live disaster simulations.

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Evaluation of Mass Casualty Triage Algorithms in a Pediatric Population

Nitya Reddy, Natalie Lane

Department Of Emergency Medicine & Hospitalist Services, Medical College of Georgia at Augusta University, Augusta/GA/United States of America

Study/Objective: This study compared the effectiveness and accuracy of five MCT algorithms in a surrogate pediatric trauma population at a tertiary care children’s hospital emergency department.

Background: In disasters, first responders use Mass Casualty Triage (MCT) algorithms to assess victims and direct efforts to provide the greatest good for the greatest number of victims. Several algorithms exist; few were designed for application in pediatric victims.

Methods: An observational, single cohort study with prospective and retrospective data collection was employed. Using a standard observation sheet, prospective data were collected on a convenience sample of pediatric patients with trauma activation levels from one to three, with one being identified as the most severely injured. Trained observers recorded physiologic and treatment observations on injured patients.

An MCT category was determined using each of the five algorithms. After the patient’s completed electronic medical record was available, a second reviewer retrospectively determined the patient’s MCT category based on a gold standard definition; a standard that uses clinical outcomes to assign a MCT category. The prospective and retrospective categories across the five algorithms were then compared.

Results: The results of this study demonstrate that when existing MCT algorithms are applied to a pediatric trauma population, as if they were disaster victims, they are inconsistent. The algorithms were more accurate for Priority 2 and 3 traumas. JumpSTART, CareFlight, and Triage Sieve assignments were similar and were more accurate than START and SALT. SALT was the least accurate algorithm overall.

Conclusion: A larger sample size is needed to potentially capture a more injured population and a greater variety of patients. Additional research is needed to increase the number of major traumas included, and to increase the sample size overall. The results of this study demonstrate a potential deficit in the algorithm’s effectiveness of categorizing pediatric patients in a mass-casualty event.

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Trilogie Pilot Study - Assessing the Efficacy of a Triage Sieve Educational Intervention using Non-medical Emergency Service Providers

Glen Cuttance

Paramedic Unit, Flinders University, Adelaide/SA/Australia

Study/Objective: The key objective of this pilot study was to determine if a standardised educational intervention would provide non-medical emergency service personnel with enough knowledge to accurately complete a triage sieve questionnaire. A secondary objective was to assess the suitability of a previously utilized triage sieve questionnaire for use with non-medical emergency services.

Background: Non-medical emergency services may be first on scene of a Mass-Casualty Incident (MCI); however, they are not currently trained to undertake primary triage (triage sieve).

Methods: Non-medical participants from the Country Fire Service were recruited for this study. All participants completed a triage sieve questionnaire prior to receiving the same standardised educational intervention. Participants were then divided into two groups to repeat the triage sieve questionnaire. One group was provided with an aide-memoire currently used by SA Ambulance Service while the other group received no decision making assistance.

Results: Current accepted triage accuracy rates are 5% under- and 50% over-triage. Pre-educational intervention results showed accuracy rates of 65.8% for under-triage and 50.7% for over-triage. Post-educational intervention achieved accuracy rates of 2.0% for under-triage (using an aide-memoir) and 9.2% (without an aide-memoir); conversely, the group without an aide-memoir achieved a lower over-triage accuracy rate than those who used an aide-memoir (8.4% versus 9.5%, respectively). As the improvement in under-triage rate from this study was similar,

Kilner suggests the educational intervention and triage sieve questionnaire are suitable for training non-medical emergency services. **Conclusion:** This pilot study supports the hypothesis that the provision of training and an aide-memoir to volunteer nonmedical fire service personnel in South Australia will enable them to perform a triage sieve as effectively as volunteer emergency ambulance service personnel. While it has identified methodological changes to the parent study, it also suggests that this approach has the clear potential to improve casualty outcomes at a MCI.

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Knowledge of the START Triage Method by Physicians and Nurses in a Tertiary Care Teaching Hospital

Nathalie Morissette¹, Nathalie Soucy²

1. Centre Hospitalier de l'Université de Montréal, Montréal/QC/Canada
2. Académie CHUM/Centre Hospitalier de l'Université de Montréal, Montréal/QC/Canada

Study/Objective: To evaluate knowledge of the START triage method by physicians and nurses in a tertiary care teaching hospital.

Background: The Centre Hospitalier de l'Université de Montréal is a large tertiary care teaching environment without the designation of “trauma center.” A recent online survey (PHARE project) conducted among the CHUM community, revealed that physicians are insufficiently trained in both basic and specific emergency measures.

Methods: In order to evaluate hospital disaster readiness, an online study was conducted among the entire CHUM community. Within this survey, we evaluated knowledge of the Simple Triage and Rapid Treatment (START) method, (11 questions) among physicians (ER and ICU) and nurses (ER) at our institution. The online survey was conducted on a volunteer basis between September 13 and October 2, 2016. Completed questionnaires were included in the analysis.

Results: Overall, 65% of ER physicians, 80% of ICU physicians and 29% of ER nurses participated in the study. The START method of triage was known by 30% of physicians and 47% of ER nurses; among them 50% of physicians compared to 89% of nurses received training to use this triage method. Among participants, 32% of ER physicians, 44% of ICU physicians and 46% of ER nurses received specific training in massive patient arrival (code orange), while 16% of ER physicians, 38% of ICU physicians and 14% of ER nurses had participated in a disaster simulation exercise. Overall, the level of knowledge (68% of correct answers on average) of the START triage method was not aligned with perception of knowledge among physicians and nurses.

Conclusion: The PHARE project revealed that ER physicians, ICU physicians and ER nurses at the CHUM are insufficiently trained to adequately use the START triage method in disaster situations. Efforts in the future will be directed toward developing disaster triage exercises for key personnel at our institution.

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Comparison of the Application Value of Three Evaluation Systems for Triage in Burned Patients

Peng Yao¹, Hai Hu², Yu Cao²

1. Emergency Department, West China hospital of Sichuan University, Chengdu/China
2. Emergency Department, West-China Hospital, Sichuan University, Chengdu/China

Study/Objective: To investigate the application value of Simple Triage and Rapid Treatment (START), Modified Baux Score (MBS) and Ryan model for triage in patients with burn injuries.

Background: Burn injury is common around the world. Simple and accurate triage methods or scores are certainly important for victims after a disaster, which also can be utilized to predict the mortality of patients with burn injuries.

Methods: Case notes of all patients with burn injuries admitted to emergency department of West China Hospital from March 2012 to July 2014 were retrospectively reviewed. START, MBS and Ryan models were computed for classification of the severity degree with related indexes (gender, age, length of stay, GCS score, blood pressure, heart rate, respiratory frequency, hemoglobin concentration, potassium concentration, burn surface area and inhalational injury, etc). The Receiver Operating Curves (ROC) were made for each evaluation system and analyzed for correlation with mortality, and Z-Test was utilized to distinct the area under curve (AUC) made respectively with START, MBS and Ryan model.

Results: There were 352 patients (median age 22.07 years, 66.19% males, 33.81% females) was included. There were 14 patients who died in hospital while 338 survived to discharge. The AUC of START, MBS and Ryan model were 0.557, 0.923 and 0.856 respectively. AUCs of MBS and Ryan model have significant differences with that of START ($P < 0.05$), while there was no significant differences between MBS and Ryan model ($P = 0.152$).

Conclusion: MBS and Ryan model performed better than START on burn injury triage. However, MBS might be used more widely because of its simpleness.

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Identifying Vulnerable Persons in the Community using Standard Clinical Assessment Data

Sandy Van Solm, John Hirdes

Public Health And Health Systems, University of Waterloo, Waterloo/Canada

Study/Objective: Development of decision support algorithms to identify highly vulnerable home care clients during emergencies and disasters by using the Resident Assessment Instrument for Home Care (RAI-HC).

Background: Several studies have shown the increased vulnerability and disproportionate mortality rate among frail, community-dwelling, older adults as a result of disasters. Parallel to an escalating number of disasters, Canada is faced with an aging demographic and a policy shift emphasizing aging at home. This results in a greater vulnerability of this group of high-needs, community-dwelling individuals to the effects of events that lead to interruption of home health care services and/or displacement.