

and availability of resources. The STM incorporates estimates of time-dependent victim survival probabilities based on an initial assessment and expected deteriorations.

For the STM-Age application, an “RPM-Age” score (based on respiratory rate, pulse rate, best motor response, and coded age) was used to estimate survival probability. Logistic function-generated survival probability estimates for RPM-Age values were determined from 76,444 patients with blunt injuries from the Pennsylvania Trauma Outcome Study. The Delphi Method provided expert consensus on victim deterioration rates, and the model was solved using linear programming.

The STM-Age was compared to START and START-like methods with respect to process and to outcome, as measured by expected number of survivors, in simulated resource-constrained casualty incidents.

Results: The RPM-Age was a more accurate predictor of survivability for blunt trauma than RPM, as measured by calibration and discrimination statistics. In simulations, STM-Age exhibited substantially more expected survivors than START and START-like protocols.

Conclusions: Resource-constrained triage is modeled precisely as an evidence-based, outcome-driven method (STM-Age) that maximizes expected survivors in consideration of resources. The STM-Age offers life-saving and operational advantages over current methods.

Keywords: blunt injury; disaster; emergency health; evidence base; resource constrained; Sacco Triage Method; START triage; triage
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(K116) An Objective Comparison of the START Triage Protocols and the Sacco Triage Method

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Objective: The objective of this study was to compare the operational viability and performance of the Sacco Triage Method (STM) to that of the Simple Triage and Rapid Treatment (START) protocol.

Methods: Following a 20-minute review of the mandated START protocol and a 20-minute training session of STM, parallel disaster exercises were conducted. Emergency responders used START in the morning and STM in the afternoon on a simulated building collapse involving 99 victims. Data were collected on the accuracy of patient assessment (START) and scoring (STM), the timeliness in clearing the scene, and the prioritization of patients leaving the scene.

Results: The STM scoring was more accurate than START assessments at 91.7% and 71.0%, respectively. The time to clear the scene was 16% less using STM than START (53 minutes and 63 minutes, respectively). The 13 most seriously injured patients left the scene in the first seven ambulances using STM; while only two of the 13 most seriously injured patients left the scene in the first 13 ambulances under START, and the three most serious patients were transported by bus. Surveyed providers preferred START to STM and believed it to be more accurate, faster, and better able to identify the most serious patients.

Conclusions: Emergency responders did not implement START successfully. Despite refresher training and 12

years of using START as their statewide protocol, tagging was inaccurate and patient prioritization was poor. In comparison, STM was implemented after 20 minutes of introductory training, was shown to be operationally viable, and outperformed START in all objectives.

Keywords: emergency health; evidence based; prioritization; Sacco Triage Method; START triage; triage
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(K117) The Okaloosa Experience—Using Evidence-Based Triage to Save Lives

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Introduction: Okaloosa County, Florida is affected by disasters on an all too frequent basis. In an effort to become better prepared and decrease the possibility of preventable deaths, the Public Safety Department and the Emergency Medical Services (EMS) Division implemented evidence based methodologies as part of a comprehensive solution.

Methods: All EMS and Fire Department responders were trained in the Sacco Triage Method (STM) through a process of tabletop exercises and daily operational practice. Once the implementation began, all trauma patients were scored and prioritized. Patient transportation mode, urgency, and destination were aided by an objective process based on local and regional resources.

Results: During the ensuing 24 months, the STM was used on every trauma victim. Data were collected and resource allocation and management were evaluated relative to patient survival outcomes.

Conclusions: The effectiveness of the daily application exceeded expectations and was used as part of the validation process of resource management and disaster preparedness. During the duration of the evaluation period, no mass-casualty incident occurred, resulting in the need to research the application further.

Keywords: disaster; evidence-based; mass-casualty incident; resource allocation; triage
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(K118) Development of a Simulation Model for Evaluation and Comparison of Different Triage Methods

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Introduction: Currently, there is no international consensus with regard to the selection of method for triage during a mass-casualty incident. Many different models are used, with few attempts to objectively evaluate and compare their accuracy and efficiency. Such studies are difficult to perform during the response to a major incident, and require simulation models meeting special requirements including: (1) to give complete and accurate information needed for the triage process; and (2) to show the result of the triage with regard to outcome.

Methods: A model was created based on patient-cards giving: (1) “physiological data” sufficient as a base for different methods of physiological triage; and (2) “anatomical data”

as description of findings at exposure, providing a base for anatomical triage. The “patients” were taken from a real scenario. All parameters except the one studied (accuracy and efficiency of the triage) were strictly standardized. The outcome was given as preventable deaths and complications, based on given times within which certain measures had to be taken to avoid mortality and severe complications.

Results: With this model, it was possible to compare different methods of triage, and also triage performed by staff of different level of training and experience. The differences in methodology and experience were correlated to differences in outcome with regard to mortality and complications.

Conclusions: This model can be a useful tool not only for the evaluation and comparison of triage methods, but also for validation of training in triage for staff of different categories.

Keywords: mass-casualty incident; patients; research; simulation model; triage

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(K119) Priority Tags for Prioritizing Disaster Victims—The User’s View

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Introduction: Although priority tags are considered important in all training and education, there are few reports on their actual use in real incidents. The aim of this study was to compare attitudes on the use of a simple priority tags to the SMART Tag.

Methods: A questionnaire was answered by ambulance personnel and the medical teams from hospitals in Stockholm, Sweden, regarding when the priority tags were supposed to be used or were used in their organization. The second questionnaire was conducted during a large-scale disaster exercise at Stockholm Arlanda Airport. The second questionnaire focused on their experience of the use of SMART Tags during the exercise. Emergency ward personnel are going to be interviewed on how SMART Tag information is communicated when ambulance crew arrives at the hospital.

Results: In the first questionnaire, 211 out of 409 (51%) answered that they had used priority tags in training situations. Of all 409, only 36 (9%) answered that they had used tags in a real incidents and 142 (35%) replied that they never had used priority tags. The answers revealed some doubtfulness of when to use priority tags. In the second questionnaire, many of the participants stated that priority tags should be used in routine operations compared with how they are used today.

Conclusions: It is necessary that the field personnel applies the triage scheme and uses the priority tags, not only during a disaster, but also during smaller emergencies, to maintain familiarity. This secures that the tags are used correctly in real disasters.

Keywords: disaster health management; disaster; priority tags; Sweden; triage

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Oral Presentations—Disaster Reports

Disaster Relief when Access to the Disaster Area is Denied—Lessons Learned from Cyclone Nargis in Myanmar (Burma)

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Introduction: When Cyclone Nargis hit the Ayeyanwadi delta of Myanmar on 03 May 2008 at a speed of 190 km/h, nearly 140,000 people lost their lives and approximately two million were left homeless. As an additional challenge, the military regime of Myanmar denied any relief organizations or workers outside Southeast Asia access to the disaster site.

Methods: During a one-week mission to the former capital of Yangon beginning one month after the disaster, relief provided to the affected population was studied. The working methods and effectiveness of a small non-governmental organization (NGO) already established in Myanmar were evaluated.

Results: The long visa queues of relief workers gave organizations already working in Myanmar a great advantage. New strategies involved the rapid employment of personnel from Southeast Asia for fieldwork. Improved administrative procedures made the field teams work more effectively. The NGO studied 30 rapidly engaged, new, local, health workers, sufficient for five medical teams to work in the field.

Conclusions: In spite of denied access to the disaster field, United Nations organizations and NGOs were able to initiate an effective administration and support to the many teams including >80 medical teams sent to the disaster site. The restricted movement gave more time and resources to relief planning, which is of importance for future incidents. Smaller NGOs were able to benefit from the improved administrative procedures introduced in the process.

Keywords: Burma; Cyclone Nargis; disaster; disaster management; health; limited access; Myanmar

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Cyclone Nargis: A Unique Disaster Response

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In May 2008, Cyclone Nargis tore across the southern coastal regions of Myanmar, pushing a tidal surge through villages. The 12-foot wall of water and wind speeds of >200 km/hr killed tens of thousands of people and left hundreds of thousands homeless and vulnerable to injury and disease. Of the 7.35 million living in the impacted townships, 2.4 million were affected. The Delta region, Myanmar’s Rice Bowl, was severely damaged. The low lying villages were submerged with widespread destruction of homes, critical infrastructure of the villages, roads, ferries, water, and fuel and electricity supplies.

Team Singapore provided assistance to at least 10 different villages in Twante Township. The team operated mobile clinics from warehouses, temples, schools, or other makeshift buildings. The journey to the remote villages required between 1–2 hours by road or by boat. The team