Hospital Management of Emergencies and Mass-Casualty Events

Implementation of In-Hospital, Mass-Casualty Incident Plan based on the Israeli Model: Challenges of Shifting to the Battlefield Mentality in the Civilian Setting

Jeffry L. Kashuk, MD; Ernest E. Moore, MD; Carlton Barnett, MD; C.C. Berlew, MD; Christopher Colwell, MD; Walter L. Biffl, MD; Jeffrey Johnson, MD; Aaron Brody, MD; Allison Sabel, MD, PhD
Denver Health Medical Center and University of Colorado, Denver Health Sciences Center, Denver, Colorado USA

Background: Despite eight years passing since 11 September 2001, most civilian trauma centers lack a workable mass-casualty incident (MCI) plan, have not established drills to test a plan, and doubt their ability to implement immediate surge capacity to accommodate the influx of many injured patients. A hospital-wide MCI plan could be developed and implemented in a regional, academic, Level-1 Trauma Center based on the Israeli MCI model.
Methods: Hospital staff completed post-exercise questionnaires that evaluated the hospital's MCI drill using Likert-scaled items measured on a 1–10 (worst to best) scale. Seventeen management algorithms from the Israeli model were assessed via 79 questions. Participants were instructed to only answer questions that applied to their experience during the MCI drill. Responses were aggregated using the median and inter-quartile range (IQR) and participants' comments were collated.
Results: The median results for most metrics showed less than satisfactory staff assessments, and the comments reflect discomfort with the chaotic nature of the drill. The highest score was in staff response (median = 7.0, IQR = 4.0–9.0).
Conclusions: The Israeli MCI model can be adapted to a US trauma center and tested in drills with reproducible performance metrics. Key implementation steps identified include clearing of the emergency department to create immediate surge capacity, rapid mobilization of personnel via reliable communication systems, and delegation of responsibility via surgical leadership. Survey results reflect the chaotic nature of an MCI and the difficulty for staff to shift from routine practice to "battlefield mentality" and "damage control psychology". Additional experience through periodic drills and awareness of this reality likely will improve hospital preparedness.
Keywords: drill; hospital; Israeli model; mass-casualty incident; planning; preparedness
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The Importance of Continuous Debriefing—Lessons Learned during the Second Lebanon War

G. Hyams;[1] M. Michaelson;[1] M. Barzelay;[1] S. Kradshtein;[1] E. Tal Or;[1] L. Otits[2]
1. Trauma Unit, Rambam Health Care Campus, Haifa, Israel
2. Nursing Administration, Rambam Health Care Campus, Haifa, Israel

Introduction: In July 2006, the Rambam Health Care Campus, a Level-I Trauma Center, treated casualties due to the Second Lebanon War under the continued rocket attacks on Haifa. This abstract will present the methods and the importance of immediate continues debriefing after every mass-casualty incident (MCI).
Methods: During the war, after every event causing the influx of a massive amount of casualties, the Trauma Team arranged logistical and medical debriefings. The debriefings took place at the emergency department with the specific teams involved in the treatment. The continuous MCIs allowed for implementation of the lessons of the debriefings for the next patients to arrive.
Results: Developing a mechanism of auditing the performance led to quality improvement by implementing the lessons learned during the MCIs. Examples of quality assurance changes divided into logistic administrative and clinical aspects include:
Logistic Aspects
1. The deployment of the emergency department for MCIs fitted to the special needs of the war. Establishing a separate Delayed Site permitted the treatment of injuries only in the emergency department.
2. Opening a site at the Imaging Department reduced the load at the emergency department and allowed a one-way movement.
3. Expanding the Shock Trauma Site from three beds to seven beds was needed.

Clinical Aspect
1. A team consisting of a Trauma Attending Surgeon and Trauma Coordinator confirms Damage Control Operation in the Operating Room and stopped operations to non-stable patients.
2. The establishment of a Multiple-Injured Admitting Department managed by representatives from all the surgical wards helped in pooling of resources.
3. Systematic visits of the Trauma Unit Team assisted in coordinating treatment.

Conclusions: Debriefing following MCI is the main tool of quality assurance. The debriefing is a learning process based on systematic reviews of what occurred, along with why and how, in order to draw conclusions. The implementation of learned is important for promoting the quality care.
Keywords: debriefing; emergency department; mass-casualty incident; quality assurance; Second Lebanon War
Prehosp Disaster Med

Multiple Injuries—A Medical and a Methodological Challenge

Limor Aharonson-Daniel
Ben Gurion University of the Negev, Israel

Introduction: The increased threat to life due to multiple injuries has been estimated by the Injury Severity Score (ISS) since 1974, yet uniform methods for presenting the particulars of such injuries are new. Knowing the detailed characteristics of the bodily harm beyond the one-digit estimate of severity enables improved preparedness through more suitable care.

This presentation will describe the multiple injury profile (MIP) methodology and demonstrate its useful application.
Methods: The Abbreviated Injury Scale (AIS) divides the human body into regions noted by the first digit in each

code. A vector comprised of six body regions, where a digit indicates the presence of an injury in that region and a hyphen denotes no injury in that region was created. This vector, called MIP, is used as a categorical patient characteristic that is analyzed as would any other variable. Data from the 2006 Lebanon war was used to demonstrate the benefits of the application of this approach.

Results: This method enables the association of morbidity and mortality more accurately to the exact profile of a complex injury, clarifying the obscured "multiple injury" diagnosis that resulted in loss of information.

Data on 689 soldiers injured or killed in the 2nd Lebanon War was used to demonstrate the application. The fatality rate among casualties with only head injuries was 10%, among isolated chest injuries, 12% yet, among combined head and chest, it was 71.4%. Previously, this information would have been lost.

Conclusions: The use of MIP enabled the production of a more comprehensive picture of injury due to the detailed recording of injuries that were previously concealed as part of "multiple". The MIP demonstrates that some combinations of injuries are more deadly, indicating causes of mortality previously masked due to the general category "multiple",or the association with one of the components.

Keywords: multiple injuries
Prehosp Disaster Med

Analysis of Preventable Deaths According to Post-Mortem Reports in Traumatic Deaths

Murat Durusu;[1] Mehmet Eryilmaz;[2] Mehmet Toygar;[3] Ersin Baysal[4]
1. Emergency Department, Diyarbakir Military Hospital, Diyarbakir, Turkey
2. Emergency Department, Gata Faculty of Medicine, Ankara, Turkey
3. Forensic Medicine Department, Gata Faculty of Medicine, Ankara, Turkey
4. Council Of Forensic Medicine, Diyarbakir, Turkey

The aim of this study was to investigate the preventable deaths due to trauma after autopsies and postmortem examinations were performed at the Diyarbakir Council of Forensic Medicine.

In this retrospective study, descriptive, demographic, type of injury, cause of injury, locations of injuries, cause of death, and scene of death data were examined using the reports of the deaths due to trauma at the Diyarbakir Council of Forensic Medicine between 01 January 2008 and 31 December 2008. Medical errors in these deaths and preventable deaths were analyzed using these data.

Of the 747 cases considered, 31 (4.15%) were preventable, 121 (16.20%) were potentially preventable, and 595 (79.65%) were unpreventable. Suboptimal care in 75 (49.34%), delay in treatment 63 (41.45%), missed diagnosis in 16 (10.53%), clinical judgment error in 16 (10.53), missed medical administration in 11 (7.23%), and other mistakes in 6 (3.95%) of the cases have been found.

When the results were compared with the other studies performed in areas where modern trauma care and trauma centers are located, the preventable death were high. As a result, forming modern trauma system and trauma centers have a significant role in decreasing the preventable death ratios.

Keywords: autopsy; forensic science; preventable death; trauma
Prehosp Disaster Med

Survey on Willingness of Emergency Department Staff to Work during Mass-Casualty Events

Dr. Juliana Poh; Dr. Seth Puneet
Singapore Health Services, Singapore

Introduction: The availability of healthcare staff is vital to effective disaster surge response. Factors likely to affect willingness of staff to work during disasters have been studied in the West. Having experienced high staff turnover during the 2003 severe acute respiratory syndrome (SARS) outbreak in Singapore, the aim of this study was to examine such factors in the Asian context.

Methods: Using a self-administered questionnaire, the aim of this study was to gauge the factors influencing willingness of emergency department staff to work during different disasters and possible incentives to improve turn-up rate. Responses were anonymous.

Results: Twenty-six questions were posed to 206 respondents. During a disaster, only 25 (12.1%) would consider resignation. Of these 25, likely triggers for resigning included long working hours for 16 (64%), use of uncomfortable equipment for 16 (64%), enforcement of compliance with protocol for 11 (44%), and communicable disease outbreak for 21 (84%). A total of 202 (98%) would be interested in receiving training for their role in a disaster. Factors affecting willingness to work included fear and concern for family (139; 67.4%), fear and concern for self (82; 39.8%), personal health problems (75; 36.4%) and childcare/eldercare issues (72; 34.9%). A total of 175 (84.9%) would be encouraged to work with a pay increment. The average increment expected was 46% (range = 5–300%). Participants were most willing to work after a building collapse and least willing to work during a chemical disaster or radiation accident. If incentives were offered, the most popular ones would be insurance for death/injury and extra payment per hour, followed by transport facilities, tax rebates, and volunteers for family care.

Conclusions: While most staff are likely to continue working during a disaster, willingness to work can be enhanced if barriers are removed and incentives offered. These findings have significant implications for community and organizational emergency planning and policymaking when resources are limited.

Keywords: emergency department; limited resources; mass-casualty incident; personnel; willingness to work
Prehosp Disaster Med

Glycemia: A Means of Triage during Emergencies

S. Abrassart; P. Hoffmeyer
Hopital Universitaire de Genève, Geneva, Switzerland

Introduction: Improved survival rates of patients with multiple injuries have increased the general interest in the quality of polytrauma management. A special and simple score is needed for the triage of the polytraumatized. The