

life-saving procedures. The average values of the timetables were: (1) first ambulance: 4.6 minutes; (2) first injured evacuated: 11.5 minutes; and (3) last urgent injured evacuated: 28.3 minutes. In Israel, MDA plays a major role in the medical response to MCIs. The next step is to plan the medical response to mega-attacks by terrorists. To do so, a model terror event was estimated with 1,000 victims: 10% (100) killed, 25% (250) urgent injuries, and the rest (650) not urgent. The main issues dealt with were: (1) the role of EMS in the medical response to mega-attacks by terrorists; and (2) the mode of action of the EMS system.

To recruit national and military medical response to the site of a mega-terror event will take an hour or longer; meanwhile, the EMS personnel will be the only organized responders to this event. If the mega-terror event occurs in a central, urban part of Israel, MDA will be on-scene within one hour with 100 ambulances (15%—advanced life support (ALS)), and more than 200 emergency medical technicians (EMTs) (20%—ALS), and 180–200 urgent-injured will be evacuated from the scene. Major changes in the mode of action of the EMS system responding to such a mega-terror event will be needed, including: (1) On-scene triage and urgent medical procedures will be performed on the ALS level only (mass-casualty incident (MCI)—61% ALS) (ALS level providers will stay on-scene), and ambulance transportation of injured to a hospital will be performed on BLS level (MCI-40% ALS); (2) all the injured triaged as non-urgent (green tag) will not be treated or evacuated by ambulances; instead they will be transported by buses to general hospitals out of the region; (3) treatment will be delayed for those triaged as non-salvageable (expectants); and (4) the distribution of injured to the hospitals will be numerical. No triage to hospitals according to the type of injuries will be performed.

The MDA is now in the process of planning, writing the guidelines, and training the personnel for the medical response to mega-attacks by terrorists.

Keywords: emergency medical services (EMS); events; Israel; Magen David Adom (MDA); response; triage

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Dealing with a Terrorist Attack in Pakistan—A University Hospital Perspective

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Introduction: Terrorist attacks must be handled as a global epidemic, as they usually cause multiple injured patients. Pakistan is a target of such attacks. For example, an explosives-packed car blew up near a bus that was taking Chinese engineers going to work at Gawadar seaport. Aga Khan University Hospital (AKUH) has a disaster plan that is activated when multiple patients are received in the emergency department.

Objectives: To present an epidemiological description of the physical injuries of patients who survived the terrorist attack when limited medical resources were brought to the emergency department of a hospital.

Methods: Management of individual patients was reviewed from a pre-printed trauma form. Information on the nature of injuries, operative management, and hospital course was recorded and the data was analyzed using the Trauma registry.

Results: Six hours after the incident, 11 survivors were brought to the AKUH. Trauma teams arrived on time and support services performed well. All patients were male, and the median value of their ages was 35 years. Two patients were unstable and were rushed to the operating room after initial resuscitation. Nine had other injuries (lacerations and fractures). The mean length of stay in the emergency department was 135 minutes. All 11 patients were stabilized and discharged from the hospital after treatment.

Conclusions: All 11 patients transferred to the AKUH survived. The hospital's disaster plan was tested in real-time and worked well on a holiday during rush hours. The disaster plan needs to be tested to cope with bigger disasters.

Keywords: disaster plan; emergency department; hospital; Pakistan; terrorist attack

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National Medical Response to Mega-Attacks by Terrorists

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Introduction: During the last four years, Israel has suffered from hundreds of terrorist attacks—63 of which were defined as multi-casualty incidents (MCIs), with the numbers of casualties ranging from 25 to 136 injured per event. The Israeli National Emergency Medical Services is well-trained for the rapid transport of casualties to near-by using a “save and run” method. Unlike MCIs, a mega-attack by terrorists could produce hundreds of casualties and easily could overwhelm even an experienced medical system, both at the Emergency Medical Services (field) level and in the receiving hospitals.

Objective: To describe a method for analysis of the national preparedness to mega-attacks perpetrated by terrorists, the expected number and distribution of injuries were matched to the national healthcare capabilities in order to pinpoint the gaps and specify correct solutions.

Methods: A model of 500 casualties from a terrorist, closed-space attack was defined. The numbers of casualties from past MCIs were combined with the number of casualties expected from a closed-space attack. According to the proportions of the types of injuries sustained from past attacks in Israel, the injured people will be assigned as 425 live casualties and 75 dead (500 total). Thirty percent are expected to suffer moderate to severe injuries, and 70% will suffer mild injuries and stress reactions. Of the 425 casualties, 47% will be admitted into hospital wards, 32% into general medical care wards, and 15% will require beds in an intensive care unit (ICU). A total of 10% of the casualties

will need urgent surgery, and 8% will require non-urgent surgery. The relevant abilities of the Israeli public hospitals were calculated, including the number of emergency department beds, operating rooms, ICU beds, and hospital beds in order to better define the gaps between the needs of the injured patients expected from mega-attacks by terrorists and the abilities of the hospitals in each area of Israel. **Results:** Applying these numbers to an urban area in Israel, three potential bottlenecks are possible: (1) inadequate number of ambulances required for the rapid evacuation of the casualties from the site within the first hour; (2) lack of sufficient numbers of intensive care beds in the nearby (close-circle) hospitals; and (3) the lack of a complete picture of the system will not enable optimal coordination of this complex event.

Discussion: Because of the lack of EMS personnel and vehicles at the scene, there will be a need for advanced, pre-hospital life support and primary triage by experienced paramedics. There should be rapid transport of the moderately and severely injured casualties to the nearby hospitals (close circle), but mild and stress casualties must be delayed at the scene and transported by buses to hospitals outside of the region (second circle). The possible shortage of ICU beds necessitates the early recruitment of both ambulances and helicopters at the hospitals, so they can be ready for secondary evacuation of casualties to second-circle hospitals or to trauma centers. A medical operational center with a good knowledge of the field-level and hospital-level doctrines and a system for data collection and interpretation should assist the coordinator of such an event.

Conclusion: Such an exercise reveals potential bottlenecks in the flow of injured victims from a mega-attack by terrorists and solutions for the problems can be derived from the analysis.

Keywords: ambulances; bottlenecks; casualties; emergency departments; emergency medical services; exercise; helicopters; hospitals; intensive care units; multi-casualty incident; preparedness; surgery; terrorism; treatment

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The Strategic National Stockpile Program: Emergency Response Preparedness for Chemical, Biological, and Radiological Disasters through Present and Future Initiatives

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The United States Strategic National Stockpile (SNS) Program was established in 1999 as a national resource to deliver medical material to the site of a national emergency. The SNS Program ensures the availability of medicines, antidotes, medical supplies, vaccines, and medical equipment necessary for states and communities to counter the effects of biological pathogens, chemical nerve agents, radiological events, and explosive devices. The SNS Program is designed to deliver medical assets to the site of a national emergency within 12 hours of a federal decision to deploy medical assets. The purpose of this paper is to describe present and future initiatives, which have increased the SNS program's emergency response preparedness for disasters. The SNS Program formulary

undergoes continual review and is subject to modifications based on clinical recommendations, improvements in existing pharmaceuticals, or current threat information. A brief overview of formulary modifications will be presented. Recently, the SNS Program also has undertaken a national effort in augmenting state preparedness with forward placement of chemical nerve agent antidotes in cities and states. Through this effort, emergency medical services and hospitals will have access to chemical nerve agent antidotes for immediate use during an event. The SNS Program also continues to address the needs of the pediatric population during disasters. Recent initiatives include modification of 12-hour Push Packages containers, expanding pediatric-specific formulary items, and efforts to reduce medication errors. The SNS Program also has contributed to a review of mechanical ventilation requirements in mass-casualty situations. The basic characteristics of mechanical ventilators for use in mass-casualty situations may help define requirements for programs considering future stockpiling of mechanical ventilators. The SNS program continues to improve its readiness and capabilities to respond to mass-casualty events through current and future initiatives.

Keywords: initiatives; response; Strategic National Stockpile (SNS)

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Predictors of Suicidal Ideation in 1,138 of the 11 September World Trade Center Rescue and Recovery Workers

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A mental health, screening program was initiated together with a medical screening program to assess the physical and mental health of 11,000 workers involved in the World Trade Center rescue and recovery effort in New York City after the terrorist attacks of 11 September 2001. Analyses of predictors of suicidal ideation (SI) are presented on the 1,138 rescue and recovery workers who were evaluated between 16 July–31 December 2002.

Responders completed the following standardized, self-administered questionnaires: (1) the General Health Questionnaire (GHQ-28); (2) the Post-Traumatic Stress Disorder (PTSD) Symptom Checklist (PCL); (3) the Patient Health Questionnaire (PHQ) modules for Panic Disorder; (4) Generalized Anxiety Disorder; (5) Major Depression; and (6) the CAGE alcohol questionnaire. The questionnaires included five questions about the presence of suicidal ideation.

Results: Of the 1,138 respondents, 1,047 (91%) were male, 660 (58%) were white, 125 (11%) were African-American, and 170 (15%) were Latino. A total of 92 (8%) people endorsed at least one question about SI, and 227 (20%) had post-traumatic stress disorder.

Conclusion: Suicidal ideation was higher in people who met threshold criteria on standardized questionnaires for diagnosis with anxiety disorders. However, surprisingly, hours of exposure to the disaster site, race, alcohol problems, and marital status variables were not associated with increased incidences of SI.