

### How Academic Emergency Medicine Managed a Real Disaster—An Experience from the Bam Earthquake

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**Introduction:** Earthquakes are one of the most devastating disasters Iranians encounter, and the Bam earthquake was the worst during the past 100 years. Rasoul Akram Hospital, a general university hospital and trauma referral center, received the largest number of Bam earthquake victims of all capital university hospitals.

**Methods:** A checklist was prepared and data were gathered by direct contact with victims, medical staff, and managers, or indirectly by reviewing patients' charts. The data was processed and presented in a descriptive manner.

**Results:** The emergency department was evacuated as soon as the event was announced. Elective patients were discharged from other wards, emergency department physicians were doubled, and proper nursing and other staff were assigned to the emergency department.

Nearly four hours after preparation, the first group of victims arrived. A total of 259 patients were admitted. All patients were triaged twice by predetermined teams, received emergency department cocktail, and had samples taken. Based on triage, patients were classified into three groups. Those who had urgent life/limb threatening conditions were transferred immediately to the operating room, critical patients without operable problems were kept in monitored beds in the emergency department. And the third group consisted of non-urgent patients who, after primary stabilization, were transferred to regular floors. On the second day, the largest burden of patients arrived (150 patients <10 hours), so 2,600 square meters of unused space was prepared as a disaster area, and victims from all parts of the hospital gathered in this area, except for those needing special considerations. Emergency physicians visited all of these patients at least twice daily. Other specialties were summoned based on clinical needs. Overall, there were 42 severely injured patients and five mortalities, two of which were dead on arrival. In the first week, 96 major operations were performed.

In the recovery phase, the emergency department had to act as a shelter for many victims, which accounts for the increased average length of stay (13.1 days).

**Conclusion:** Although there was no pre-existing disaster plan, emergency physicians played a great role in providing better care, resulting in higher patient and other medical staff satisfaction, according to national comprehensive studies.

**Keywords:** Bam; emergency; emergency department; Iran; physicians; preparedness; response

*Prehosp Disast Med* 2005;20(2):s53

### Free Papers Theme 18: Education-1 Miscellaneous

### Survey of Student Attitudes Towards and Knowledge of Disaster Preparedness

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A total of 418 senior nursing, medical, and dental students were invited to participate in a survey concerning their knowledge of and attitudes toward disaster preparedness topics. There were 136 (33%) completed questionnaires. Two-thirds of the respondents were female, and 81% were <30 years of age. Factor analysis identified three major components underlying the non-didactic questions. Alphas for these factors averaged approximately 0.83 indicating a reliable assessment of the underlying factors. The factors appeared to map domains of classroom experience, confidence, and attitude. Thirty-seven percent had received instruction in bioterrorism preparedness, 24% in chemical preparedness, and 16% in nuclear preparedness. Nineteen percent received classroom training in all-hazard emergency planning. Few (9%) felt their educational experience prepared them to function during a disaster. While a high proportion (41%) of the respondents felt confident in their ability to work with other healthcare providers in providing disaster-related care, fewer (24%) felt comfortable working with their public health colleagues. Eighty percent of respondents felt that participating in a terrorism response either was extremely or slightly rewarding, but the majority (85%) was concerned about the risks involved.

The respondents did well on the knowledge-based questions. The majority of students could identify basic incident command structures, knew where to find polices on hazardous materials, and knew how to perform gross decontamination. They performed particularly well in the questions concerning biological agents, anthrax transmission (not by person-to-person contact), Category-A biological agents, and the indications and contraindications for smallpox vaccine. The results have implications for graduate-level disaster curriculum development.

**Keywords:** attitudes; biological agents; disaster response; education; knowledge; students; training

*Prehosp Disast Med* 2005;20(2):s53

### Development of a Concept of Prehospital Command and Control Training Using Performance Indicators as a Quality Measurement Tool

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**Introduction:** There are several concepts of training of medical first responders in command and control at the scene of a major incident. None of these have postulated measurable performance indicators which could be used as a template in training and examinations. If a standard set of such performance indicators could be agreed upon, this could serve as a template for developing a standard for training as well as performance of command and control.

**Methods:** A set of performance indicators relating to command and control at the scene of an incident was postulated.

These indicators were used in a new concept of training of prehospital command and control. The performance indicators were emphasized to students in lecture form and in different simulation sessions. In the practical exam, these indicators were used as a quality tool for passing or failing the students. In 15 months, this new concept of training of medical first responders has spread to over 750 users in Sweden. **Conclusion:** The postulated set of performance indicators could be used in any training of medical first responders at the scene of a major incident or disaster. Results can be presented numerically to serve as a quality measurement tool. **Keywords:** command and control; first responders; performance indicators; training

*Prehosp Disast Med* 2005;20(2):s53–s54

### **Bioterrorism Training and Curriculum Development Program**

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There is a compelling need for clinicians to be trained in recognizing and responding to a bioterrorist event, creating an urgency to revisit the planning and educational processes to address the necessary changes. This project demonstrates a model to bridge the curriculum gap of knowledge, skills, and experiences for bioterrorism preparedness in three graduate, healthcare, clinician groups: (1) pharmacy; (2) physician assistant (PA); and (3) advanced-practice nurses (APN). To ensure that an adequate supply of healthcare providers are trained in bioterrorism surveillance and monitoring, Shenandoah University faculty are committed to developing and implementing curricular materials to teach the fundamentals of bioterrorism event recognition, documentation, monitoring of events, and the therapeutic management of patients who are affected.

The curricular content required to address these gaps utilizes online technology, personal digital assistants (PDA), and experiential components that include a multi-tiered drill. The project involves a student cohort of approximately 160 students including: (1) 109 second-year pharmacists; (2) 37 PAs; and (3) 13 APNs. The cohort provides for a systems theory model approach, which is applied to curriculum design and evaluation, and which emphasizes input (knowledge and skills), process (experiential component), and output (performance-based, multi-tiered, multi-disciplinary, bioterrorism exercise).

Decision-making is the key element in training for a disaster. In order to develop information-tracking proficiencies and data-acquisition skills for patient management, students will be provided with a PDA programmed with preconfigured software. A database interface developed at Shenandoah University will be used, which consists of a computational algorithm that spawns e-mail if/when critical numbers of symptoms appear. This database will consolidate patient information from students to demonstrate epidemiological principles including recognition of increased incidence patterns of symptom/disease complexes. The clinical preceptors will be oriented to the

project and given access to the online bioterrorist course, thereby cascading the training of clinicians. Decision-making will be evaluated using the performance-based bioterrorism exercise with the Winchester Medical Center in Winchester, Virginia.

**Keywords:** advanced-practices nurse (APN); bioterrorism; curriculum; disaster; education; personal digital assistant; pharmacists; physician assistant (PA); preparedness; training

*Prehosp Disast Med* 2005;20(2):s54

### **Education and Training for Mass-Casualty Incidents: A One-Day Concept Combining Theoretical Background, Interactive Workshops, and Hands-On Training in a Real-Time Simulation**

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As the possibility of mass-casualty incidents (MCI) in modern industrial countries due to public transportation crashes and terrorist attacks has increased over recent years, we must ask whether we are prepared for these incidents. Emergency medical services (EMS), fire brigades, and local authorities need background information, detailed plans for action, and actual practice together to make sure their plans are efficient.

An educational concept was developed, combining these three aims to give an update on current strategies. The result was a one-day course on 11 September 2004 in Dachau. It consisted of: (1) presentations of the theoretical backgrounds by international specialists; (2) interactive workshops under the guidance of these specialists; and (3) a live scenario in which the participants were able to put the developed concepts to the test.

The theoretical presentations covered topics such as terrorist attacks on public buses in Israel, management of a major railway crash in Eschede/Germany, international programs for airplane crashes from the United States (US), and a presentation about an airplane collision over southern Germany. The presenters were international specialists from Germany, Israel, and the US, all of whom had not only the theoretical background, but also practical experience with these topics.

In the second part of the day, the participants were assigned to nine different workshops according to their actual function within the rescue system, e.g., fire chiefs, incident commanders, coordinating emergency physicians (CEP), members of the rescue coordination center (RCC), etc. These workshops were guided by international and local experts to develop modern concepts that fit into the actual local settings. The aim was that, by the end of the day, every workshop should be able to present a working strategy for a simulated mass-casualty incident.

The results of the workshops then were tested in simulated MCI in which a public bus with >50 passengers was hit by a car carrying a bomb inside. Together with the local EMS and fire brigade of Dachau, the participants tried to respond according to the plans developed in the workshops to manage this MCI.

With more than 250 participants from Germany, Austria, and Switzerland, this course was the source of a