ABSTRACTS OF
SCIENTIFIC PAPERS
ORAL PRESENTATIONS

Disaster Medicine Issues 2nd Annual Symposium
University of New Mexico and the World Association
for Disaster and Emergency Medicine
Albuquerque, N.M., 14–15 October 1994

1. A Mass-Casualty Incident Involving Multiple
Patients with Penetrating Trauma in a High-Rise
Office Tower
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MD, Paul Hansen, MD
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tal, San Francisco, Calif., USA

Purpose: To describe the events that occurred on 1 July 1993
when a man entered a high-rise office tower in downtown San
Francisco armed with semi-automatic handguns. Traveling
through four floors of the 48-story building, the assailant shot
14 people before turning the gun on himself.

Methods: Debriefings and interviews were performed with pre-
hospital care providers, managers, dispatchers, trauma and
emergency department physicians and staff, and police and
fire personnel.

Results: This multiple casualty incident (MCI) avoided the
usual lack of central coordination that often impedes effective
dispersal of victims to definitive care in a timely manner. How-
ever, communications problems secondary to radio reception
voids as well as structural and logistical challenges related to
the vertically oriented tactical situation were identified and
reviewed.

Conclusion: This event and its management provided a real-life
test of the city’s prehospital MCI plan as well as a test of the
city’s sole trauma center’s and emergency department readi-
ness to handle a MCI. The implications for prehospital disaster
planning and trauma/emergency services was presented.

2. Analysis of Patient Satisfaction with One
DMAT’s Performance during Hurricane
Andrew Relief Efforts
Kelly Burkholder-Allen, RN, MEd, CEN, Paul Rega, MD, FACEP,
Churton Budd, RN, EMT-P
Toledo, Ohio, USA

Background: The Toledo Area DMAT (TADMAT), a National
Disaster Medical System (NDMS) Level-I DMAT, was deployed
to Dade County, Florida, to provide medical care following
Hurricane Andrew. The team provided care at three sites and
maintained a medical outreach program. This was the team’s
first deployment.

Purpose: Although patient satisfaction surveys are accepted
evaluation instruments in most medical practices, they have
not been utilized in disaster situations. The purpose of this
study was to develop and evaluate a disaster patient satisfaction
survey for victims of Hurricane Andrew treated by the Toledo
Area DMAT.

Methods: A retrospective review of treatment records from two
austere medical treatment sites was initiated. From these, 318
patients with complete demographic information were mailed
a cover letter and satisfaction survey.

Results: Seventy-six surveys were returned as undeliverable.
Forty-eight surveys were completed, returned and analyzed.
Responding patients ages ranged from 4–87 years, with a mean
of 44 years, 40% males and 60% females. Their diagnoses were
reviewed for severity with 97% nonurgent and 3% urgent.
Sixty-two percent of the respondents were treated for traumatic
injuries and 38% for medical illnesses. Eighty-four percent had
established medical care prior to the disaster. Ninety-eight per-
cent felt that they were treated courteously and received easily
understood discharge instructions. All were convinced that the
TADMAT had acted professionally, and had been satisfied with
their overall care. All of the respondents would want the team
or one similar to return again in the event of another disaster.
Two specific questions were made: 1) more bilingual staff; and
2) stress management assistance.

Conclusions: Patient satisfaction surveys can be an important
evaluation tool for any disaster agency providing medical care.
They should be distributed at the point-of-care to improve
response rate. They can serve as a morale booster when shared
with the team, as well as functioning as a catalyst for systems
modifications at all levels. The return rate was much higher
than had been anticipated and suggested a cathartic benefit to
the victims of the disaster. In spite of the team delivering
health care in an informal and austere fashion, they still were
perceived as professionals.

3. Three Hurricanes in Comparison
and Contrast
Robert Gougelet, MD
University of New Mexico

Purpose: Comparison of medical aspects of Hurricanes Hugo,
Andrew, and Iniki.

Methods: Retrospective review of medical records.

Results:
Total Number of Patients and Most Prominent Diagnoses—By far,
Hurricane Andrew was the most devastating of the three hurri-
canes. The total number of patients seen in the health-care sys-
tem was more than double those for both Hugo and Iniki. The
three most frequently encountered diagnoses were miscellaneous
medical, URI/OM/bronchitis, and lacerations accounted for 50.7%,
30.3%, and 20.2%, respectively. These were followed by tetanus
immunizations and medication refills at 20.1% and 12.9%, respec-

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Hurricane Hugo—Approx 500 patients. During Hurricane Hugo, 54 patients were seen at the Kalaheo Outreach. For both of these outreach programs, tetanus immunizations led the list of required care followed by hypertension blood pressure checks and medication refills (83.3%, 34.0%, and 18.0%, respectively). In contrast, strains, sprains, abrasions, and contusions accounted for 1.9% and 4.1% of the total number of outreach patients evaluated.

Hurricane Iniki—On 27 August 1992 for a total of 886 patients for both Andrew and Iniki. By comparison, for the same two hurricanes, 38 patients were classified into the Red Triage category.

Triage information—By far the greatest patient numbers were classified into the Green Triage category with a combined total of 886 patients for both Andrew and Iniki. By comparison, for the same two hurricanes, 38 patients were classified into the Red Triage category.

TRIAGE CATEGORY

<table>
<thead>
<tr>
<th>Hurricane</th>
<th>Green</th>
<th>Yellow</th>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew</td>
<td>507</td>
<td>128</td>
<td>32</td>
</tr>
<tr>
<td>Iniki</td>
<td>379</td>
<td>14</td>
<td>6</td>
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</tbody>
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Comparative Costs—Hurricane Andrew, at a cost of [US] $20 billion was the most costly. Accounts for Hurricane Hugo totaled $6.3 billion, and Iniki cost $1.8 billion.

Summary: Hurricane Hugo struck St. Croix on 18 September 1989. The 70-member DMAT team was activated on 28 September 1989 and remained on the island for 11 days. During that time, approximately 300 patients were seen. Hurricane Andrew touched down in Florida on 24 August 1992. A 71-member DMAT team was deployed on 27 August 1992 for a total of 10 days. A total of 1,182 patients were evaluated (includes those by the outreach program). Hurricane Iniki struck the Hawaiian Islands on 11 September 1992. A smaller DMAT team, consisting of 47 members, was deployed on 19 September 1992 and remained for eight days. A total of 453 patients were evaluated (including those contacted by the outreach program).

4. Development of a Disaster Emergency Medical Services (DEMS) Rotation at an Emergency Medicine Residency

David E. Hogan, DO
University of Oklahoma Health Sciences Center Emergency Medicine Residency Program.

This system is designed to introduce the resident to the field of Disaster Emergency Medical Services (DEMS), providing basic skills in disaster required for emergency medicine and exposure to other aspects of this growing field.

Methods: The Instructional Systems Design approach was used to create the disaster rotation. A brief educational survey taken to judge the basic DEMS knowledge of the residents. A nominal group technique was used to arrive at a core content for the one-month rotation stressing the elements of DEMS thought to be most useful for the practicing emergency physician. A self-paced, programmed educational module was developed with individual goals and objectives for each concept section. Two mentor discussion sessions are carried-out during the rotation for evaluation.

Results: Residents enrolled in the rotation have completed the requirements in an efficient manner. Several residents have extended participation in the rotation beyond the basic requirements to include research.

Conclusions: Development of a formal DEMS rotation in the framework of an Emergency Medicine Residency Program can serve to introduce residents to DEMS and strengthen local DEMS programs.

5. Requirements for Hazardous Materials Incidents: A Statewide Plan

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Purpose: Conflicting information from a number of federal and state agencies has led to a lack of uniform statewide standards for hazardous materials operating materials operating procedures, equipment, and training. An ad hoc committee consisting of emergency medical services (EMS) physicians and nurses, EMS hazardous materials experts, and state emergency planners addressed this problem.

Methods: The committee drew on sources including but not limited to: 1) OSHA Hazwoper 1910.120 ruling, the Superfund Amendment Title III, HHS publications "Managing Hazardous Materials Incidents," Volumes 1 and 2, NFPA Document No. 3473, and documents related to the chemical weapons stockpile elimination’s program (CSEPP). The committee than formulated a curriculum, operational standards, and equipment list that were both practical and affordable.

Results: The finished document addresses: 1) definition of hazardous materials; 2) classification of hazardous materials; 3) operating procedures for emergency medical services (EMS) and emergency department (ED) providers (analyzing the incident, planning and implementing the response, and terminating the incident); 4) a training curriculum for both groups; 5) a list of referenced publications; 6) recommended equipment lists (for personal protective equipment, decontamination equipment and facilities); 7) a respiratory program checklist (including fit-testing); 8) exposure logs; 9) guidelines for...