

cation of EMTs; (4) moving the ambulance parking inside EMS stations; (5) using standby ambulances and EMS teams in crowded squares; (6) establishing an air ambulance (helicopter) in Tehran for rapid medical responses to highway scenes; (7) creating motorcycle teams for rapid medical response in crowded parts of the city; (8) setting up professional teams of nurses and general practitioners; and (9) having general practitioners inside dispatch room of EMS centers advise EMS teams.

By 2002, on-scene time for EMS teams from Tehran 115 center was almost 10–15 minutes (median = 10; mean = 15). This time was eight and five minutes for the standby ambulance and motorcycle routes, respectively. Also, the air ambulance had an on-scene time below eight minutes. Although there are still some problems and delays with EMS team duties, the critical on-scene time has dropped closer to the “golden time” of five to eight minutes.

**Keywords:** emergency medical services (EMS); Iran; on-scene time; traffic

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### Prospective, Cross-Sectional Analysis of Hospital Bed Surge Capacity in Selected San Diego Hospitals

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**Introduction:** Traditional strategies to determine hospital surge capacity have relied on cross-sectional, hospital census data. This likely underestimates the true surge capacity in the event of a mass-casualty incident.

**Objective:** To more accurately determine hospital bed surge capacity using physician and nurse manager assessments at multiple facilities.

**Methods:** Overnight and day shift nurse managers from each inpatient unit at four different hospitals were approached to make assessments on all patients under their care. Physicians at two academic institutions also were approached for comparison. Age, gender, ward type, and admission diagnosis were recorded. In addition, assessments were made for each patient as to their disposition at two, 24, and 72 hours following a mass-casualty incident. Transfers to a lower level of care, including a hypothetical “on-site nursing facility” or discharge to home were included. A physical assessment of each hospital also was made to determine whether enough space was available for patients transferred to the “on-site nursing facility.” Data were reported descriptively, and comparisons were made between overnight and day shift nurses and between physician and nurse manager assessments.

**Results:** A total of 1,745 assessments on 776 patients by 82 nurse managers and 25 physicians from the four institutions were included. Nurse managers assessed approximately one-third of all patients as dischargeable at 24 hours and approximately one-half at 72 hours; one-quarter of patients were assessed as being transferable to an “on-site nursing facility” at both time points. Physicians were more likely than nurse managers to send patients to such a facility or discharge them, but less likely to transfer patients out of the intensive care unit.

**Conclusions:** A large proportion of inpatients can be discharged within 24 and 72 hours. Additional beds can be made available if an “on-site nursing facility” is made available. Both physicians and nurse managers should be included on the team that makes patient dispositions in the event of a mass-casualty incident.

**Keywords:** assessments; California; hospital beds; inpatients; mass-casualty incident; nurse managers; on-site nursing facility; physicians; San Diego; surge capacity; transfer

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### Sensitivity and Specificity of Advanced Medical Priority Dispatch System (AMPDS) in Detecting Cardiac Arrests in Melbourne

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**Introduction:** To ensure that patients suffering from an out-of-hospital cardiac arrest receive maximal ambulance response, it must be identified as cardiac arrest by the emergency call taker. In Melbourne, the Metropolitan Ambulance Service uses the Advanced Medical Priority Dispatch System (AMPDS) to aid call taking.

**Objective:** This study aims to determine the sensitivity and specificity of the AMPDS in detecting cardiac arrest emergency calls in Melbourne and to analyze possible areas for improvement.

**Method:** Dispatch records for suspected cardiac arrests (priority zero) from January 2001 through March 2003 were compared with the Victorian Ambulance Cardiac Arrest Registry (VACAR). This identified those cardiac arrests that were identified correctly by AMPDS, the cardiac arrests not identified, and priority zero cases, which were not cardiac arrests. Where the dispatch code was inaccurate, further analysis was undertaken to identify possible areas for improvement.

**Results:** The sensitivity of the AMPDS in detecting cardiac arrest was 76.7% (95% Confidence Interval (CI) 73.6–79.8%), specificity was 99.2% (95% CI 99.1–99.3%). Cardiac arrests given lower priorities were allocated 58 different dispatch codes. No method for better identification of cardiac arrest was evident in the limited data available. Of the cases that were dispatched as priority zero, but which were not cardiac arrests, 37.2% had a Glasgow Coma Scale Score of 13 and normal or near normal ventilatory rate. Identifying this during emergency calls may reduce the dispatch of unnecessary maximal responses, reducing road hazards and allowing the more efficient resource use.

**Conclusion:** In Melbourne, AMPDS has a sensitivity of 76.7% in identifying cardiac arrest. Further research may detect improvements that can be used for cardiac arrest identification. Improving level of consciousness and ventilatory rate assessment may reduce unnecessary maximal responses.

**Keywords:** Advanced Medical Priority Dispatch System (AMPDS); cardiac arrest; detection; emergency medical services (EMS); response

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### **Theme 13: Disaster Planning**

*Chair: Mauricio Lynn*

### **Theme 14: Recent Disasters and Major Incidents—Sharing Our Experience**

*Chair: V. Anantharaman*

#### **Medical Relief during the Gujarat Earthquake in India**

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On 26 January 2001, an earthquake with a destructive force of 7.9 on the Richter scale struck near the city of Bhuj, in the state of Gujarat, India. This catastrophe was reported to have affected 350 million people, injured 100,000, and killed 10,000 persons.

The Singapore International Foundation (SIF), in collaboration with SingHealth Group and the Singapore Ministry of the Environment, responded by sending a medical relief mission. The mission was coordinated in partnership with the Indian Medical Association, Rajkot. The team was comprised of six doctors, five nurses, one public health official, and one emergency behavioral officer, and brought 1.8 metric tons of medical equipment and supplies into the city of Bhuj to provide medical relief. The scope of work included emergency medical care, critical and intensive care, critical care transport, primary health care, public health assessment, and interventions.

Experiences, and more importantly, lessons learned in mission planning, preparation, evaluation and needs assessment, emergency behavior and response, and integration with other non-governmental organizations will be discussed.

**Keywords:** earthquakes; India; mission

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#### **International Medical Response to a Natural Disaster: Lessons Learned from the Bam Earthquake**

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**Introduction:** On the morning of 26 December 2003, an earthquake, measuring 6.5 on the Richter scale, struck the city of Bam in the southeast region of Iran. The earthquake killed >40,000 people, and rendered 30,000 injured, and some 75,000 homeless.

While response to national-level disasters is primarily the responsibility of national authorities, due to the magnitude of the needs and the collapse of infrastructures caused by such events, the importance of international responses cannot be overemphasized. As reported in many similar instances, despite the adequacy of the amount of goods and services provided to the disaster zone, the efficacy of the international medical activities has been less than expected. Identification of the strengths and drawbacks of the recent international medical responses in Bam can improve the efficacy of such efforts in the next events.

**Methods:** Data were collected on the medical needs after the event and the international medical response through direct observations in the region, documents published by international organizations, and personal contacts with national authorities and the director of some of the international teams in Bam.

**Results:** Almost 40 international teams provided search and rescue (SAR) services in Bam, with five of them arriving within the first 24 hours, 10 teams in the first 48 hours, and a total of 34 urban, SAR teams consisting of 1,345 personnel arriving in Bam by 28 December. On 29 December, approximately 1,600 international rescue workers (SAR, health, and relief personnel) from 44 countries were present in the disaster zone. Twelve foreign field hospitals (FFH) and some field clinics were involved in the provision of medical assistance for affected people. Data related to the time of arrival and deployment, number and type of personnel, x-ray and laboratory facilities, number of patients treated, and number of operations performed are reported in this presentation. The possible problems and difficulties, which may have decreased the efficacy of the FFH, are discussed, and solutions for some of the problems are proposed. Also, a flowchart, which simplifies decision-making concerning deployment of international assistance in critical situations, is suggested.

**Keywords:** Bam; earthquake; field hospitals; international; Iran; medical; response; search and rescue

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#### **Assessment of Palestinian Emergency Health**

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Since the Al Aqsa intifada, the delivery of Palestinian emergency health has suffered an acute, chronic impairment. One facet of this persisting emergency is poor mobility within Jerusalem, the West Bank, and the Gaza Strip. Despite travel restrictions, leading emergency department (ED) staff and Palestinian Ministry of Health officials convened to identify the most pressing needs and obstacles to deliver emergency health.

Expatriate emergency clinicians with experience working in the Palestinian Territory developed a written survey. In June 2004, 17 questions were answered anonymously by staff working at EDs in Nablus, Jenin, Tulkarm, Qalqilya, Ramallah, Jerusalem, Hebron, Bethlehem, and Jericho, as well as in Gaza City and Khan Younis, separately due to