pared. Therefore, a method mix was chosen. Narrative expert interviews were complemented by structured observations of large-scale trainings and a thorough literature review. Based on the results, a general scenario displaying current procedures, structures, and technical equipment was deducted.

In Germany, the triage process is paper-based, which has several limitations: easy removability of tags, poor usability during foul weather, unnoticed deterioration of patient conditions, and incomplete information about prior medication at the receiving hospital. Furthermore, hospitals do not have sufficient knowledge about the medical state of arriving patients. On-scene rescue workers lack an overview, whether additionally ordered resources will be available and when they can be expected. Currently, IT-support equipment is not used in routine practice, often, the systems are described as being too complex, difficult to use, and expensive.

The next steps include a summary of key questions using questionnaires combining open-ended, dichotomous, and multichotomous questions for structured interviews. Results from the questionnaires will provide a broad concept of the integrated service platform. Panic prevention plans and process optimizations will be described.

Keywords: communication; emergency; information technology; response; support; telemedicine
Prehosp Disaster Med

All-Hazards Approach

Regional Evacuation of Neonatal and Pediatric Patient Populations—Mutual Aid Planning

Scott Aronson
USA

In 2009, the Public Health Department of Seattle and King County, Washington USA, embarked on a project to plan for the evacuation of the neonatal and pediatric patient population due to an isolated, regional, or catastrophic disaster. The planning included identifying the precise levels of care provided across multiple states and British Columbia, Canada, and methods for the transport of High-Frequency Oscillator Ventillator Patients in a Level-III Neonatal Intensive Care Unit to special Pediatric Intensive Care Unit. Planning included patient distribution strategies using a Health and Medical Area Command in the event of a failure of multiple area hospitals, and focusing on turning certain acute care hospitals with current pediatric capabilities into Pediatric Disaster Surge Hospitals. A review of equipment, staffing, transportation resources, suppliers/vendors, and other special support entities was conducted with the resulting information being managed through the Health and Medical Area Command.

Keywords: cooperation; evacuation; neonatal; pediatric; planning; preparedness
Prehosp Disaster Med

Medical Student Team for Disaster Management in the Hospital

R. Miniati;[1] E. Bongini;[2] S. Boncinelli;[1] R. Corradino[2]
1. University of Florence, Florence, Italy
2. Protection and Prevention Service Department, AOU Careggi Florence Hospital, Florence, Italy

Introduction: During a disaster, a hospital faces a difficult situation in which the needs are much greater than the resources available. The goal of this study was to develop an organized "ready to intervene group" consisting of medical students in order to support the clinical staff in non-health activities during an emergency. The aim was to prepare the students to be used especially in university hospitals such as the AOU Careggi.

Methods: The first step was to train students to the multidisciplinary aspects that disaster management requires. The curriculum addressed aspects of health, technology (chemical hazards, analysis of emergency plans and practical tests such as fire extinguishing) and a psychosocial issues concerning the approach to a patient and the analysis of language-related problems within a health facility. This last step has provided the organizational process for the participation of volunteer students.

Results: A support team including all of the management protocols concerning the procedures for recruitment, alerting, and activation was developed.

The team's tasks are:

1. Approach to the patient (patients with sensory and/or cognitive deficits);
2. Evacuation techniques for people with motor and/or cognitive deficits; and
3. Logistical support (individuation and transport from the other departments or life support and positioning them in pre-determined collection areas).

Conclusions: The development of the team permits an increase of the resources available in hospitals with trained personnel who are familiar with the environment and the structure, and represent a population that always is present in the hospital. Further developments include the official insertion of the team in the AOU Careggi Hospital emergency plan in order to be formally used and tested using drills.

Keywords: disaster; disaster medicine; hospital; medicine
Prehosp Disaster Med

Excessive Formaldehyde Exposure to Displaced Persons Living in Temporary Housing Units following Hurricane Katrina

James P. Kornberg, MD, ScD; Stephen King, PhD, MPH
USA

Following the destruction caused by Hurricane Katrina that struck the Gulf Coast of the United States on 28-29 August 2005, the US Federal Emergency Management Agency (FEMA) provided temporary housing units (THUs) to thousands of displaced persons (DPs). Most THUs were recreational vehicles (RVs), not designed for housing DPs for more than a few weeks. Many DPs occupied THUs for 1–2 years or longer.

During occupancy, DPs complained of poor air quality and odors, along with the development of several symptoms

and illnesses. Notwithstanding the presence of mold in some THUs, the majority of the complaints were linked to the presence of formaldehyde in ambient air within THUs.

The scientific literature confirms that formaldehyde is capable of causing a variety of symptoms and problems, including skin and mucosal irritation, sensitization, decrements in pulmonary function, and the development and aggravation of asthma.

The US Agency for Toxic Substances and Disease Registry (ATSDR) has set a Minimum Risk Level (MRL) for formaldehyde of 8 parts per billion (ppb) for exposure beyond 365 days. The National Institute of Occupational Safety and Health (NIOSH) has established a Recommended Exposure Level (REL) of 16 ppb (time weighted average) for occupational exposure. Formaldehyde also is classified by the International Agency for Research on Cancer (IARC) as carcinogenic to humans (Group I).

Air quality studies of FEMA-supplied THUs measured formaldehyde concentrations between 3.0 to 4,480 ppb. Some occupants of THUs were probably exposed for many months to levels of formaldehyde exceeding 100 ppb, with excursions up to 500 ppb. Many medical symptoms and problems reported by DPs probably were related to formaldehyde exposure while living in THUs.

This unfortunate US experience should be a lesson to other countries that provide THUs to displaced persons following a disaster, or in non-emergency situations. Temporary housing units should be tested for formaldehyde before providing them for human inhabitation.

Keywords: displaced persons; formaldehyde; Hurricane Katrina; symptoms; temporary housing units; toxic
Prehosp Disaster Med

All-Hazards Approach to Emergency Preparedness

Bruria Adini MA, PhD;[1,2]
Avishay Goldberg MA, MPH, PhD;[2]
Daniel Laor MD, MHA;[1,2] *Robert Cohen PhD;*[3]
Yaron Bar-Dayan MD, MHA[2,4]

1. Emergency and Disaster Management Division, Ministry of Health, Israel
2. PReparED Research Center, Ben-Gurion University of the Negev, Israel
3. Center for Medical Education, Hebrew University, Jerusalem, Israel
4. Meir Medical Center, Israel

Introduction: Medical institutions are required to maintain preparedness to various emergency scenarios, including conventional mass-casualty events (MCEs), chemical or toxicological mass-casualty events (MTEs), and biological events. The aim of this study was to examine the relationship between preparedness to one emergency scenario to the level of preparedness to other emergency scenarios.

Methods: The emergency preparedness levels of all general hospitals were evaluated based on a structured tool that includes measurable parameters. The evaluation encompassed the various elements of emergency preparedness, including standard operating procedures (SOPs), infrastructure and equipment, training and drills, and levels of knowledge. The emergency preparedness levels for MCEs, MTEs, and biological events were evaluated and compared.

Results: Moderate correlations were found between the levels of overall preparedness to the various emergency scenarios: MCE; MTE (0.548; 0.006); MCE; biological event (0.541; 0.009); MTEs; biological event (0.458; 0.032). Significant correlations were found between SOPs of MCEs and MTEs (0.704, 0.001); between training and drills for all scenarios: MCEs; MTEs (0.626; 0.003), MCEs; biological event (0.658, 0.002), and MTE; biological event (0.586; 0.008); and between infrastructure and equipment for MCEs; MTEs (0.458; 0.032). No other significant correlations were found.

Conclusions: The emergency preparedness of hospitals positively correlates with the emergency preparedness to other scenarios, such as MTE and biological events. This relationship does not systematically characterize all elements of emergency preparedness, and is evident especially in the area of training and drills.

Keywords: all-hazards; emergency; preparedness
Prehosp Disaster Med

Confronting Large-Scale Sudden Disasters: Prehospital-In; Hospital-Out

Efraim Laor
University of Haifa, Haifa, Israel

Large-scale sudden disasters (LSSDs), due to both natural and technological hazards, are low probability, high-impact events that inflict injury or relocation upon hundreds of thousands or even several millions of people per incident. Many of the affected require medical, physical, and mental treatment.

"Hospitals" are institutions where the real medical treatment is administered. The ambulance services and community-care clinics nicknamed "prehospital" are tasked to provide prompt life-support, stabilization, and transfer of patients—"Scoop and Run"—to a hospital, to be released as soon as possible to "post-hospital", recovery care.

In contrast to ever-ready operational capacity that corresponds to daily emergencies, there is an unbridgeable gap between standing-ops capabilities and what is essential to be done during LSSDs to save lives and reduce damage to health. Instead of hospitals, to call patients for refrain from coming to hospitals—they should extend their proficiency, ethics, personnel, and materiel to "prehospital" systems. In responding to emergencies, laypeople play the decisive role and institutions a secondary one; in preparedness and mitigation, institutions play the decisive role.

As part of preparedness and mitigation measures, hospitals should enhance the participation of every individual, every group, and every community in the emergency management process by improving the methods of coping with perilous circumstances within the family unit and the community.

Hospitals are resourceful and privileged during the preparedness phase, but ineffective during the response phase when it is imperative to call for a shift of duties. Hospitals should contribute to trim Criteria and Standards for the Level of Medical Treatment, one of the realistic methods to augment operational capacity. Only hospitals are capable of granting professional legitimacy to such approach.

Large-scale sudden disasters specifically natural hazard and technological disasters, create dilemmas that crush tra-