

(3.8%) were hospitalized in the field hospital for a duration range of 24 hours to one week. The spectrum of diseases included especially medical illnesses, and only a minority of the patients seen by the IDF field hospital had suffered earthquake-related trauma.

**Conclusion:** The activities of the field hospital enabled restoration of these abilities in the damaged city.

**Keywords:** clinic; earthquake; field hospital; illnesses; Israeli Defence Forces; mass casualties; operating theater; Turkey

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### Ambulance Technicians' Indications for Prehospital Interventions

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**Introduction:** Little evidence is available about ambulance personnel's actual indications for use of prehospital interventions. Prehospital interventions increase on-scene time. Little evidence is available on their effect on outcome. In this study, ambulance technicians' use of prehospital interventions were compared with the patients' symptoms.

**Method:** Prospective, observational, registry study including 56 ambulance technicians from two ambulance stations in a Danish county and 5,516 cases in which a patient was brought to a hospital in 1998. The ambulance technicians recorded their use of prehospital interventions and their assessments of the patients' circulation and breathing.

**Results:** Ambulance technicians administered oxygen to 2,630 patients, or 47.3% of the patients brought to hospital, of whom 1,872 (71.2%) showed no symptoms of impaired breathing. An ECG was performed on 1,237 patients (22.3%); 584 (47.2%) of these patients showed no symptoms or signs of compromised circulation.

**Conclusion:** The ambulance technicians' indications for use of prehospital interventions were relatively wide.

**Keywords:** ambulance personnel; assessments; breathing; circulation; interventions, use of; oxygen; symptoms/signs

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### Health Risks for Volunteer Flood Response Workers in the Flood Disaster, Germany 2002

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**Introduction:** During and after floods, short-term morbidity is known to increase because of infectious diseases and other reasons such as injury while cleaning or repairing property. This study examined the risk of (infectious) disease after contact with surface water, and the other nega-

tive health effects of flood response activities.

**Methods:** During the recent flood disaster in Germany, we examined the volunteer flood response workers of the German disaster relief organization (Technisches Hilfswerk), using a questionnaire and a stool specimen, which was tested for bacterial, viral, and parasitic pathogens. Of the 205 distributed questionnaires, 129 (62.9%) were returned. Out of 105 stool samples, 64 (61%) were submitted within one week, and were examined for salmonella, yersinia, shigella, campylobacter, EHEC, Norwalk-like virus, and parasites.

**Results:** Of the 129 volunteers, 105 (81.4%) had direct contact with surface water during work. A high percentage of volunteers (39.5%) reported health complaints. These included skin problems (14.0%), "flu-like" symptoms (7.8%), diarrhea (5.4%), fever/chills (1.6%), and "others" (24.0%). Ten (7.9%) volunteers contacted a physician. Stool examinations showed no pathogens. The risk for developing diarrhea and skin problems was increased (RR = 1.5,  $p > 0.05$ , n.s.) for volunteers who worked more than 10 days (75th percentile), and the development of "flu-like" symptoms was significantly increased (RR = 3.45,  $p < 0.05$ , 95% CI 1.07-11.1).

**Conclusions:** Infectious gastroenteritis seems to be no major problem during floods in developed countries. However, the risk of other health problems, such as skin irritation and injury should be considered.

**Keywords:** developed countries; diarrhea; fever; floods; "flu-like" symptoms; gastroenteritis; infectious diseases; morbidity; skin; stool; volunteers; workers

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### Management of Mass Casualties from Earthquake in China

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Some parts of China are geologically active, as they belong to the Earthquake Zone of the Pacific Rim. Statistics show that in the last 100 years (1900-2000), there were 25 serious earthquakes, which killed 1,200,000 people. Now we pay special attention to the provision of first aid for the wounded, following the most serious earthquake in the Tong-shan Area of northern China. On 28 July 1976, a formidable earthquake of 7.8 magnitude occurred, killing 242,000 inhabitants, and wounding 164,000. Almost all of the buildings, high and low, in the city were demolished. These buildings included water and electricity supply systems and medical organizations. There were 218 Emergency Medical Support Groups from all over the country with memberships of 19,772 medical practitioners. They received 145,800 wounded persons. Among them, 63,400 were serious, and 29,600 were in critical condition. They required emergency surgery. Ninety-two percent of the wounded were treated with debridement, and others were separated into different categories with different treatment as follows: 3.9% were treated with laparotomy; 0.13% required intestinal repair, 0.26% with splenectomy, 1.5% with reduction of fractures, 0.2% with amputation, 0.13% with laminectomy, and 1.14% required other operations.

From 28 July to 28 August 1976, a total of 15,351 wounded persons were transported to hospitals in other places by air, and 72,818 to other places by train.

**Keywords:** casualties; condition; damage; earthquake, Tong-shan Area of northern China; earthquakes; infrastructure; injuries; medical practitioners; procedures; surgery; transport; treatment

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### Survival in the Age of Bioterrorism: Is the Healthcare System Prepared?

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The concept of "hospital disaster planning" has evolved from preparation for natural disasters into "healthcare system disaster planning" for weapons of mass destruction. Preparation for critical events, which used to take place in a disjointed fashion, now requires maximal coordination of all available resources. Healthcare systems, a vital component of the nation's response effort, have a tremendous amount of resources, including elements such as hospitals; community healthcare facilities (clinics); home healthcare services; schools of medicine, nursing, and public health; undergraduate campuses; and advanced science facilities. Through a series of Johns Hopkins Applied Physics Lab Warfare Analysis Laboratory seminars designed to analyze the issue of resource collaboration, The Johns Hopkins Office of Critical Event Preparedness and Response (CEPAR) evolved. The primary mission of this office is to coordinate a comprehensive healthcare system disaster response, utilizing and unifying all components of the Hopkins Healthcare Enterprise. Furthermore, the office has been charged with coordinating this healthcare system's response with federal, state, and local disaster response agencies, through collaboration and the establishment of memoranda of understanding. Other major issues that the Office of CEPAR is analyzing include critical event risk assessment, healthcare system surge capacity, communications infrastructure and redundancy, procurement and distribution of accurate and timely information, establishment of alert levels with preparation effort standards, and education and training. The culmination of these efforts will result in a regional WMD disaster response template that then could be used as a national model.

**Keywords:** alert levels; communications; disaster; hospital; information; preparedness; surge capacity; weapons of mass destruction

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### Delayed Diagnosis of Appendicitis in the Elderly

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**Introduction:** An elderly patient with abdominal pain presents a difficult problem for the emergency physician, who must decide whether the patient can be sent home, should only be observed, or requires immediate referral. The aim of this study is to identify what can be done to avoid delayed diagnosis of appendicitis in the elderly.

**Method:** Records of patients whose ages were older than

65 years who had a final diagnosis of appendicitis within the year 2000 were reviewed retrospectively to identify what was missed in the assessment.

**Results:** There were 69 elderly patients with a final diagnosis of appendicitis in the year of 2000. The average age was 73 years. The average delayed time to arrive at the diagnosis of appendicitis was 40 hours. The average stay in the hospital was 14 days. Delayed diagnosed patients had a higher incidence of ruptured appendix, more extensive surgical procedures, longer stays in hospital, and higher complication rates, including readmission. Delayed cases usually had normal white blood cell counts, made fewer complaints of right lower quadrant pain, received fewer rectal examinations, and more often were discharged with a diagnosis of acute gastroenteritis or gastritis.

**Conclusions:** The solution to this problem begins with the first impression of diagnosis. One must avoid making a diagnosis at any level higher than the facts can support, and leave the door open to further development. The emergency physician must only record "Abdominal pain—cause undetermined." A repeated examination may be needed within a very short period of time.

**Keywords:** abdomen; appendicitis; diagnosis; elderly; impact; pain; signs; symptoms

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### Characteristics, Problems, and Suggestions for Evacuation of Mass Wounded and Sick

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During disasters or emergency events, there are always large numbers of wounded and sick to be evacuated and transported by air or by land vehicle to steady hospitals where they will be offered better treatment. People involved in the work should be familiar with the following characteristics: (1) characteristics of different cases of the wounded; (2) continuity of care during evacuation; (3) adaptability of care and the surroundings; and (4) complexity of organizing the process. The priority of evacuation is to minimize the likelihood of death for the wounded and for other patients; to prevent a worsening of their condition; and to protect from further wounding. The following suggestions are offered:

1. Formulating rules and regulations for evacuation;
2. Standardizing recording forms for affixing case histories and forms for transportation by air, land, or sea.
3. Standardizing technical standards for stretchers and international standards for stretcher supporting equipment, and mounting hardware on medevac planes, helicopters, trains, or ships.
4. Regulating the intensity of noise, vibration, and temperature in medical helicopters, and standards for the height of the empennage of medical helicopters.
5. Developing evacuation vehicles with a capability for decontamination of the cabins that meet the requirement for anti-epidemics.

**Keywords:** decontamination; epidemics; evacuation; helicopters; records; regulation; standards; vehicles

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