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Oral Presentations—Topic 1: Civilian-Military Collaboration

Chair: M. Hoejenbos

Using Military Mobile Hospitals for Primary Care in Rural Areas of Saudi Arabia

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Introduction: This study examined the use of military mobile hospitals for the provision of primary care in rural areas during four years. The Military Medical Service Department was ordered to send mobile hospitals to many different rural areas to: (1) provide primary care and treat patients; (2) refer cases to a larger hospital if necessary, using air medical evacuation if needed; (3) search for diseases endemic in that area; (4) conduct medical research in the field; and (5) train the military medical staff to work in the mobile military hospitals.
Methods: Eight military missions took place at the mobile military hospitals from early 2003 to December, 2006. The average time in each mission was 14–21 days.
Results: The numbers, data, and analysis will be presented.
Conclusion: The advantages and disadvantages of using a military mobile hospitals in providing primary care services in the rural areas will be discussed. Whether these hospitals applied the principles of civilian-military cooperation in humitarian aid also will be examined.
Keywords: civilian-miliary cooperation; mobile hospital; primary care; rural hospital
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Aeromedical Evacuation in Greece: Flying Safely with Civil-Military Cooperation

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Introduction: Aeromedical evacuation is defined as air transport of a patient to/from one place to another place or medical unit, while under medical supervision. Flying safety is the main objective for a successful aeromedical evacuation system. Examples of safe flying in Greece will be presented.
Methods: An analysis of statistics from the National Center for Emergency Health Care (EKAB) and the computer database of the EKAB Air-Medical Transport Office was performed. Greek, international air medicine literature has been reviewed. Internet information has been processed.
Results: The history of civilian aeromedical evacuations in Greece began in 1954. Olympic Airlines Helicopters and Hellenic Air Force aircraft were used. The organization of a national air-medical transport network was established in 1991–1992. In 1994, the Air-Medical Transport Office of the EKAB was established. Olympic Airlines' helicopters and aircrafts were utilized until 2000. There after, evacuations were conducted exclusively through civil missions by EKAB helicopters (AGUSTA A-109E Power). However, use of this model was discontinued in 2003 due to three helicopter accidents with deaths (one in 2001, and two in 2002 over the Aegean sea). Since then, the aeromedical evacuation missions are operated by the EKAB, in cooperation with Hellenic Air Force. All subsequent missions have been completed safely.
Conclusions: Civil-military cooperation for aeromedical evacuation in Greece resulted in a 100% of transports performed safely.
Keywords: aeromedical evacuation; civil-military cooperation; Greece; safety
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Mechanism of Emergency Relief and Responses by Military Sectors in Taiwan from the 1999 Chi-Chi Earthquake

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Taiwan is located on the circum-Pacific earthquake belt, and one destructive earthquake might be expected every 10 years on average. In 1999, the Chi-Chi Earthquake (local magnitude (ML) = 7.3), was the most devastating earthquake in Taiwan during the 20th century. As a result, the central part of Taiwan experienced many casualties and heavy property damage. The death toll was >2,500, and there was [US] $10.7 billion of direct property damage and loss. The infrastructure destruction, such as lifeline systems, had a major impact on livelihood and economic activity. Immediately after the event occurred, the Ministry of National Defense issued an emergency mobilization order to deploy the supporting army troops and organize Commander Posts in the effected areas. At that moment, most of local governments were fully or partially paralyzed and telecommunications were interrupted. With efficient

mobilization and a variety of professional techniques, the military sectors made the main contributions to the affected areas at the primary stage. These contributions were in the areas of: (1) search-and-rescue; (2) medical treatment; (3) emergency sheltering; (4) emergency relief; (5) an information reporting system; and (6) basic restoration. The collaboration and cooperation with civil sectors like non-governmental organizations and non-profit organizations also sped up the procedure of recovery. This paper describes the process, plan, and deployment of military sectors in order to discuss the observations from the Chi-Chi Earthquake. The existing policy and plan of the Ministry of Defense for the emergency response to disasters also will be presented in order to depict the proactive participation in the preparedness for the next disaster.

Keywords: Chi-Chi Earthquake; emergency relief; military response; recovery effort; Taiwan
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Civilian/Military Joint Cooperation in Humanitarian Assistance and Disaster Relief: The Experience of the Czech Republic

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Since the end of the Cold War, military intervention for the purposes of humanitarian assistance and disaster-relief often have been requested by political authorities. From the late 1990s, the Czech Military Medical Service has been involved in providing humanitarian assistance to developing countries. Due to excellent cooperation between the Home Office, the Ministries of Defence, Foreign Affairs, and Health, a complex project known as MEDEVAC was developed. This project was designed primarily for pediatric patients who have little possibility of receiving treatment from local medical facilities. A total of 97 patients have received comprehensive treatment (mostly surgical) in Prague Hospitals. These include 38 children from Iraq, predominantly with congenital heart diseases, and 10 from Pakistan, following the earthquake of December 2005. The Czech government established a special budget for this project. Military medical personnel performed selection and diagnostic procedures according to their field hospital capabilities. In addition, transportation was organized by the military. While the Ministry of Health guaranteed the provision of highly specialized health care providers, the Home Office solved the most complicated problem of identifying the immigration status for the children and their accompanying adults by granting them temporary asylum-seeker status. This presentation prevides a detailed description of the point handling sequence and the coordination procedures.

Keywords: children; civilian/military; coordination; humanitarian; Prague; relief
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Poster Presentations—Topic 1: Civilian-Military Collaboration

(1) Civilian-Military Collaboration in Training for Disasters

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Introduction: The Swedish Armed Forces are continuously engaged in various international missions that involve medical personnel that should be properly trained prior to the mission.

In 2006, the National Board of Health and Welfare requested that the Swedish Armed Forces Medical Center create a course that would provide training in medical care for provisional circumstances abroad, including damage control surgery.

Methods: Participants were handpicked from a pool of well-qualified doctors and nurses. Half of the participants were civilians and were selected by the National Board of Health and Welfare; the other half had military affiliations and were selected by the Swedish Armed Forces Medical Center. The course was conducted on a small island off the West Coast of Sweden, which only can be accessed by boat or helicopter.

Results: The limitations resulting from the isolated location and the provisional circumstances soon became obvious. All resources were limited, including water, electricity, drugs, blood products, disposable items, and radiology and laboratory resources. The course emphasized the importance of environmental factors, such as climate and personal safety. Medical evacuation capacity was relied upon.

Conclusions: The need for civilian-military collaboration and a course of this kind became apparent in Sweden after the 2004 Tsunami disaster in Thailand. The participants of the course all were satisfied, and this training concept will be expanded. The goal is to create a pool of well-qualified, highly trained and motivated professionals, who may become extremely valuable in future national or international disasters.

Keywords: civilian; collaboration; military; training; Tsunami
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(2) Use of Medical-Grade, Activated Carbons in Protection of Civil Population against Terrorist Actions

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The long-term use of medical-grade, activated carbons in the treatment of various diseases and conditions will be shared. Activated carbon is a universal antidote; it (1) is nontoxic—neither adsorbed nor metabolized by the body; (2) is the first choice when the nature of poisoning is unknown, as

it adsorbs most drugs and chemicals; (3) has few serious adverse effects or complications; and (4) can be made in a variety of forms, shapes, and textures. In the aftermath of the Chernobyl accident, >150,000 liquidators were exposed to radioactivity within the 30 km zone and >3 million residents have stayed in contaminated areas. This resulted in accumulation of radionuclides in the bodies of both groups of people. Patients suffering from radiation exposure and accumulation of radioactivity were treated successfully using oral adsorbents or, in severe cases, hemoperfusion.

Keywords: antidote; activated carbon; Chernobyl; radiationexposure; radioactivity
Prehosp Disast Med 2007;22(2):s3

Oral Presentations—Topic 2: Education

Session 1: Competencies 1

Chairs: Geert Seynaeve; P. Hustinx

Comprehensive Field-Based Training Program for Humanitarian Responders

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The Humanitarian Studies Initiative (HIS) is a multidisciplinary program designed for graduate students from Harvard, the Massachusetts Institute of Technology, and Tufts University who have experience in humanitarian response. The program comprises weekly seminars that cover important topics pertaining to humanitarian operations, academic course work, a three-day simulation exercise, and a three-month field placement. The simulation exercise is an essential component of the HSI program. It consolidates students' knowledge and provides invaluable practical training that helps them to prepare for future work in a complex humanitarian emergency.

Humanitarian responders are faced with an overwhelming number of issues in the field. Although organizations involved in response conduct simulations to train and update their staff, most are restricted to the classroom and have narrow focus. This study presents a new, field-based training program in which participants encounter many of the issues they face as responders in a complex humanitarian emergency. Participants are grouped into non-governmental organization (NGO) teams and work together. They track the crisis on simulation websites prior to the three-day field mission. In the field, participants gather data and perform several tasks in a demanding environment, proceeding to the creation of their NGO final service delivery plan. The program provides participants with the opportunity to develop skills in planning, coordination, needs assessments, population counting, data analysis, report writing, media, public relations, conflict negotiation, international humanitarian law, human rights, disease control, nutrition, shelter, water, sanitation, and protection. By using this model for disaster simulations, organizations can provide cost-effective, broad-based field training to further develop and enhance disaster response skills of their field staff.

Keywords: education; field-based training; humanitarian; responders; training
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The "Harvard Humanitarian Studies Initiative for Residents" Effectively Trains Doctors in Humanitarian Topics Prior to Field Deployment

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Objective: To determine whether a two-week intensive course is effective in training doctors in humanitarian skills prior to field deployment.

Methods: Thirteen of 19 doctors enrolled in the course completed a multiple-choice test before (pre-test) and after (post-test) the course. The 23-question pre-test covered topics including tropical medicine, humanitarian and human rights law, Sphere standards, epidemiology, malnutrition, and international aid agencies. The post-test contained 70 questions, 23 of which were identical to the pre-test questions, although the order of multiple-choice answers was changed. Scores were stratified by specialty type, MPH degree held or not, and total months of international health fieldwork.

Results: Of the 23 questions, the average score was 15.3 correct answers (67% correct) for the pre-test and 19.3 (84% correct) for the post-test. Pre- and post-test scores did not vary significantly by specialty type or Masters of Public Health (MPH) degree. The average pre-test scores correlated with months of prior field experience were: (1) no experience; test score = 12.0; (2) 2 weeks to 6 months experience; test score = 15.7; and (3) 7-12 months; test score = 16.25. Average post-test scores of those with 7-12 months experience were slightly higher (20.25) than those with no (19) or 2 weeks to 6 months (18.9) experience. The scores of all groups increased from the pre- to the post-test.

Conclusions: A comprehensive two-week course is effective in training doctors of all specialties in humanitarian principles and significantly increases pre-deployment capacity even in those with substantial field experience.

Keywords: education; field deployment; humanitarian; post-test; pre-deployment; pre-test
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Humanitarian Studies Initiative for Residents: An Innovative Program for Doctors in Training

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A new, multi-disciplinary program, called the Human Studies Initiative for Residents (HSIR), is being coordinated through Harvard Humanitarian Initiative (HHI) at Harvard School of Public Health. The program is based on participation from the multi-institutional residency training

programs throughout Harvard, including Beth Israel Deaconess Medical Center, and the hospitals of Brigham and Boston Womens, Childrens hospital and Massachusetts General Hospital. This program strives to educate the resident-physicians on current humanitarian issues throughout their respective residencies, which includes emergency medicine, internal medicine, and pediatrics. The two-year program includes a two-week course, participation in a field simulation exercise, a month-long field placement in a humanitarian setting, mentorship by HHI faculty, and production of an academic work in humanitarian studies. Fifteen of the pilot class of 19 resident-physicians (79%) completed the inaugural September course. With so many resident-physicians and medical students interested in "international medicine", and so little information of this sort available in structured programs, the HSIR provides a valuable and useful set of skills to those who will become professional humanitarian responders.

Each of the partnering institutions has developed areas of expertise, talent, and a distinguished faculty in the evolving field of humanitarian studies. Students at each institution can obtain a robust education in humanitarian studies while completing the requirements of their individual programs. This initiative has created bridges linking these institutions, which students can traverse to meet the educational needs required in humanitarian studies: flexibility, diversity, excellence, and comprehensiveness. This model will be discussed in order to include other academic training institutions, mid-career professionals, and medical students.

Keywords: hospital; humanitarian; international medicine; residency; resident-physicians
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Effect on Quality of Chest Compressions and Exhaustion of a Compression:Ventilation Ratio of 30:2 Versus 15:2 during Cardiopulmonary Resuscitation—A Randomized Trial

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Background: Recent Cardio Pulmonary Resuscitation (CPR) guidelines changed the compression:ventilation ratio from 15:2 to 30:2 increasing the ork/effort of the CPR provider.
Objective: To compare the quality of chest compressions provided and the rate of exhaustion ot the provider between the two compression:ventillation ratios.
Methods: A prospective, randomized crossover design was used. Each participant performed 5 minutes (min) of CPR on a mannequin either in the ratio of 30:2 or 15:2, rested for 15 min then swithced to the other ratio. The assessed outcomes included exhaustion, as measured by a Visual Analogue Scale (VAS) score, depth of chest compressions, rates of chest compressions, total number of chest compressions, number of correct chest compressions, and incomplete release.
Results: The study was completed by 130 subjects. The exhaustion score, using the VAS, was 5.9 (IQR 2.25) for the ratio 30:2 and 4.5 (IQR 2.88) for the ratio 15:2 (p <0.001). The compression depth was 40.5 mm (IQR 15.75) for the 30:2 ratio and 41 mm (IQR 15.5) for the 15:2 ratio (p = 0.5). The compression rate was 118 beats/min (IQR 29) for the 30:2 ratio and 115 beats/min (IQR 32) for the 15:2 ratio (p = 0.02). The total number of compressions/5 min was 347(IQR 79) for the 30:2 ratio and 244 compressions/5 min (IQR 72.5) for the 15:2 ratio (p <0.001) The number of correct compression/5 min was 61.5 (IQR 211.75) for the 30:2 ratio and 55.5 (IQR 142.75) for the 15:2 ratio (p = 0.001). The relative risk (RR) for incomplete release in the 30:2 ratio vs. the 15:2 ratio was 1.087 (95% CI = 0.633–1.867).
Conclusions: Although the 30:2 compression:ventillation ratio is rated by the provider to be more exhausting, this method delivers more chest compressions and the quality of chest compressions remains unchanged.

Keywords: cardiopulmonary resuscitation; chest compression; education; training; ventilation; ventilation ration
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Primary Trauma Care: Training Hospital Staff in Trauma Management

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Trauma is a leading cause of death in adolescents and young adults worldwide, particularly in developing countries. Doctors in developed countries typically have access to trauma courses that facilitate the appropriate management of trauma patients. The expense of these courses often discourages enrollment in developing countries. The courses also lack adaptability and coordination with local organizations.

The Primary Trauma Care (PTC) foundation was established in 1995 with the goal of preventing death and disability in seriously injured patients. Primary Trauma Care is an affordable and adaptable system for training doctors and other healthcare staff in hospital trauma management. It is founded on basic clinical practice, which does not require high-tech facilities. Primary Trauma Care is propagated through PTC courses, which have been held in 25 countries. The strategy involves early devolution of teaching and organization to local professionals, and adaptation to the clinical situation in each country.

Contents of the PTC course are based on the Airway, Breathing, Circulation, Disability, Exposure (ABCDE) system of trauma management. Teaching methods used include lectures, skill stations, scenarios, and discussion groups. Primary Trauma Care materials have been published by the World Health Organization (WHO) and incorporated into its recently published handbook, *Surgical Care at the District Hospital, and Essential Trauma Care* resource list.

The two-day PTC course is usually followed by a one-day instructors' course, in which participants are familiarized with how adults learn, how to plan and present a lecture, how to give feedback, how to lead a discussion group, and how to teach a skill.

Keywords: hospitals; hospital staff; Primary Trauma Care; teaching; trauma
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Session 2: Competencies 2

Chairs: Geert Seynaeve; P. Hustinx

"Bombs, Blasts, and Bullets" (B3)—Using Knowledge to Arm the Innocent

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Australia has little experience in the medical management of multiple casualties from terrorist incidents. Because of strategic alliances in recent years, Australians at home and abroad increasingly have become a target of interest. Therefore, it is important to develop educational programs for medical and paramedical responders to address the lack of local knowledge in this arena.

The authors outline the development of the "Bombs, Blasts and Bullets" (B3) course, an Australian, one-day intensive course to introduce the participants to the considerations required in managing multiple victims of conventional weapons. Little pre-existing knowledge could be assumed, and little budget was available for the course. In addition, significant skepticism regarding the potential threat to Australia had to be addressed. These factors would be shared by many other countries that have never been directly threatened by terrorism.

To date, several courses have been taught at the state level over the last two years, culminating in the first federal B3 course last year. Feedback generally has been excellent, and has guided the formation of the curriculum.

In addition to the course itself, additional benefits have been reaped from the online presence of collaborating experts. This online presence permits access to the faculty, and further opportunity for collaboration via the Delphi Method.

Keywords: Australia; Bombs, Blasts and Bullets (B3) course; medical management training; multiple casualties; terrorist incidents
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Just-in-Time (JIT) Lectures: An Efficient Approach for Increasing of Disaster Risk Awareness

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The Global Health Network (GHN) for Disasters, including scientists mostly from the US, Iran and Russia, developed two "just-in-time" (JIT) lectures following the South Asia Tsunami in December 2004, **(http://www.pitt.edu/~super1/lecture/lec18071/index.htm)** to provide information about the science of Tsunamis, in general, and, specifically, the most recent disaster and to provide information on how the science can help the communities in primary and secondary prevention in the event of a Tsunami. The same approach had been used in the Bam earthquake, Hurricanes Katrina and Rita and the Pakistan earthquake. This article introduces the methodology and applications of the JIT lectures in disasters and its application in the framework of Disaster Risk Reduction.

The crude estimate showed that in a six-month period, over 255,000 people, worldwide, obtained information from the tsunami lectures. Also, the feedbacks showed that they included a wide spectrum of disciplines and education level, including public health scientists, oceanography and meteorology educators, librarians, international aid organizations and also high school teachers. The JIT lecture about the Bam earthquake had been used worldwide by thousands of educators and seen by a multitude of students.

Just-in-time education can be applicable in future disasters throughout the world as an efficient, educational approach for people and educators who seek information. Just-in-time education can provide an educational strategy to promote risk awareness in the context of disaster risk reduction (DRR) framework.

Keywords: disaster risk reduction; distance education; "just-in-time" education; e-learning, preparedness
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Analysis of Interdisciplinary, Simulation-Based Triage Training for Disaster Preparedness and Response

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Mass-casualty triage establishes the priority of care among casualties when the number of injured exceeds the available resources. Current training relies upon didactic sessions prior to live actor drills that require significant planning and coordination. Simulations can enhance the educational experience, effectively train personnel to employ triage methods, and preserve the knowledge associated with this perishable skill.

The Sim-Patient Triage program is based on prior training systems, including trauma, bioterrorism, and chemical agent casualties. Each synthetic character has its own: (1) injuries; (2) physiology; (3) behavioral model; and (4) signs and symptoms, which change dynamically. Animations such as vomiting, tearing, coughing, and convulsions relate to physiological status. The caregiver can assess and converse with each character, monitor data, and perform medical interventions.

This course of instruction was incorporated successfully with an interdisciplinary disaster preparedness program for students at Duke University. In June 2006, a sample of 262 advanced degree, health science students participated in a qualitative evaluation of the simulation platform and accompanying courseware. In July 2006, under a United States Agency for International Development project to enhance the continuing medical education infrastructure in-country, additional scenarios were developed for use in

physician training in Baghdad, Iraq. Thirty-one civilian physicians attended a two-day course to learn how to deliver the triage training program in their own facilities.

Qualitative and quantitative measurments from all of the students who encountered the simulation platform were collated and analyzed. The results are significant, and demonstrate that simulation can enhance the learning experience and improve application of the concepts learned.

Keywords: disaster; education; preparedness; response; simulation; simulation-based triage training; training; triage
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An Information Center in a Mass-Casualty Incident (MCI) in a Level-One Trauma Center: Lessons to be Learned from the First Israeli Nation-Wide Drill

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A mass-casualty incident (MCI) requires a medical response to referred casualties and attention to non-medical services, including assisting casualties in contacting their families and providing reliable information and psychosocial support to casualties and families. These services are provided by the hospital's Social Work Department.

Although the frequency of terrorist attacks has allowed the hospitals to become extremely experienced in care of MCI's, they are not experienced in reacting to a Mega MCI. During the first nation-wide Mega MCI drill practiced last year, the hospital admitted 200 simulated casualties within an extremely brief time span and operated an Information Center for the public. Casualties were moderately and mildly injured with approximately 20% critically injured. The information center was deluged by phone calls and visits by distressed "family members" seeking information. The presented report describes the special requirements and necessary organizational procedures to handle a mega MCI.

Characteristics of the events included: absorbing casualties beyond the hospital's capacity in a short period, necessitating additional treatment sites, brief hospital stays, referrals to other treatment centers, and discharge. Many people presented with stress related symptoms and there was an increased demand for information from the public. Due to the secondary evacuation of casualties, information changed rapidly and there was a high level of uncertainty.

Organization of the Information Center included: expanding teams to include paramedical and organizational personnel in addition to social workers; use of semi-autonomous information and treatment sites; group work with families in the acute stage; and application of techniques for providing partial information during an event characterized by continuous uncertainty.

Keywords: capacity; drills; information; Israel; mega mass-casualty incident (MCI)
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Measuring Competencies as Indicators for Trauma Care

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Introduction: With care of the trauma victim provided along a continuum, there is a growing need for knowledge of the performance of care providers at various stages. This study was performed to determine whether certain competencies of prehospital professionals are applicable.

Methods: Through the use of a Delphi process, consensus was achieved regarding the competencies of prehospital professionals. These included: (1) professional education; (2) participation in trauma courses for adults and children; (3) working experience of ≥18 months; and (4) annual experience with ≥10 multi-trauma patients. A structured literature search was performed on these competencies and data on the competencies were collected from ambulance services and the Mobile Medical Team (MMT) in Amsterdam over a 12-month period.

Results: Literature on the selected competency is scarce and supports the applicability of at least two out of five competencies as indicators: trauma courses for adults and experience with at least 10 multi-trauma patients each year. Data of competencies were collected from 14 MMT doctors, 8 MMT nurses, and 145 ambulance nurses. The median number of competencies of MMT doctors is 4, MMT nurses 5, and ambulance nurses 3. The average length of working experience and yearly experience with 10 or more multi-trauma patients each year was: 40 months, 7.6 patients/year for MMT doctors; 96 months, 13.4 patients/year for MMT nurses; and110 months, 3.2 patients/year for ambulance nurses. Except for one doctor, all MMT members finished their professional education, and all MMT members finished a trauma course for adults and children. Most ambulance nurses finished their professional education (98.6%), and the trauma course for adults (89.0%); only 6.2% completed the trauma course for children.

Conclusions: Literature shows limited evidential support for the competency indicators described in this study. The indicators are available and distinctive. Although these competencies are distinctive and can be determined readily, they must be assessed further to demonstrate the robustness of competencies as indicators of the practice of trauma care.

Keywords: competencies; indicators; multi-trauma experience; prehospital personnel; trauma care
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Training in Disaster Management: Enhancing Post-Graduate Clinical Preparedness through a Novel Curriculum

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Background: Disaster medicine is not a standard component of residency training programs in the United States. During recent disasters, the need for training physicans and hospital personnel in disaster management vulnerable and healthy populations has become apparent.
Hypothesis: Didactic education incresease the knowledge of medical practicioners in disaster preparedness, response, and recovery.
Methods: Three separate, complimentary courses were developed as a disaster management curriculum. These courses were: (1) Emergency Disaster Medical Management (EDMM); (2) Small Victims, Big Challenges: Paediatric Disaster Preparedness, Response and Recovery (SVBC); and (3) Geriatric Assessment, Treatment and Recovery in Disasters (GATRD). Each course was reviewed and conducted by subject matter experts (SME). Participants included medical students and post-graduate residents in emergency medicine, pediatrics, or internal medicine. A pre-/post-test consisting of 15 questions for each subject area was developed by disaster medicine SMEs/NDLS instructors and validated by an evaluation expert.
Results: Evaluation outcomes demonstrated an increased knowledge of disaster medicine among trainees. Participants in the EDMM course demonstrated a 56% increase in scores between pre-and post-course examinations with a confidence interval (CI) of 90% (two standard deviations), while SVBC course participants demonstrated a 61% increase in scores. Standard statistical evaluation methods were employed to ensure that the increase in scores is significant and not due to random flucuation.
Conclusions: This disaster management curriculum improves preparedness, response and recovery knowledge among post-graduate medical resident trainees. This curriculum may be utilized for increasing disaster medicine competency and credentialing and hosptial surge capacity capability. Future plans include multi-center implementation to establish national and international applicability of this model.
Keywords: curriculum; disaster management; education; preparedness; recovery; response
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Session 3: Credentialling 1

Chairs: Geer Seynaeve; P. Hustinx

Workshop Using Action Cards to Enhance Disaster Preparedness among Hospital Staff

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Background: The Cancer Institute Hospital was relocated in 2005 to the Tokyo Bay Area, which was designated as a disaster reduction park by the Japanese Government. Since ordinary Japanese hospital staff members generally do not have military backgrounds, and because the hospital specializes in cancer care and research, development of disaster preparedness is extremely challenging. Providing a ready-made disaster manual is not sufficient to promote preparedness. Repeated drills could be useful, but have not been realistic.
Methods: In order to implement a disaster preparedness system in the hospital, workshops have been concluded for hospital executives, who in the case of a disaster will become memberss of the Control Center. Accxording to a scenario (e.g., ferry fire, earthquake) given by a facilitator, the participants were encouraged as a team to discuss and to fill in their responses on a template, which represented an action card at each step if the scenario. A disaster manual was consulted and scrutinized during the discussions. After the workshop, a questionnaire survey was distributed on the perceptions of and attitudes toward disasters among the participants.
Results: The survey indicated that each participant could identify his/her own role as well as the roles of their colleagues through discussions. Writing action cards in their own words promoted active participation among the members. As a result, the disaster manual was revised and updated.
Conclusions: A workshop on disaster preparedness utilizing action cards was a practical and useful introduction to disaster response for non-specialists in disaster medicine.
Keywords: action cards; disaster preparednes; hospital; staff; workshop
Prehosp Disast Med 2007;22(2):s7

Are Healthcare Professionals Prepared for a Disaster with Regard to Their Knowledge, Attitudes, and Behaviors Toward Patients with Burn Injuries?

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Introduction: In all countries, burn care activities are dependent on legislation, attitudes of the general public and healthcare professionals, and levels of organization and coordination of burn units. The aim of this study was to assess the knowledge, attitudes, and behaviors of healthcare professionals as they relate to burn injuries.
Methods: A 26-item questionnaire was developed and adminstered.

Results: The study group (n = 223) was composed of 180 nurses (80.7%), six midwives (3.6%), and 29 paramedics (13%). The mean of the ages of the respondents was 25.6 ± 3.13 years, with a male-to-female ratio of 1:9.6. Forty-seven respondents (21.1%) had encountered at least one burn patient in the prior year. The mean of the scores for demonstrating correct knowledge was 47.4%, 42.6% for having a good attitude, and 49.2% for displaying good behavior. There were no differences among the respondents who had attended graduate programs, taken a postgraduate course on burn injuries, the number of burn cases encountered in the prior year, or the sex of the respondent with regards to demonstrating correct knowledge, good attitudes, or good behaviors. When the workplaces of the respondents were compared, healthcare professionals working in inpatient and outpatient clinics had significantly better knowledge and attitudes than did those working in operating departments or intensive care units; however, there were no differences concerning the behavior among the respondents.
Conclusions: These results indicate that even in tertiary care centers, the correct knowledge, attitudes, and behaviors of healthcare professionals toward the care of burn victims may be insufficient.
Keywords: attitudes; behavior; burn victims; health care; knowledge
Prehosp Disast Med 2007;22(2):s7–s8

University Training Course in Disaster Medicine for Medical Students

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Introduction: During the 2005–2006 academic year, the University of Eastern Piedmont offered an optional course in disaster medicine to the medical students. The students participated in frontal lessons, table-top exercises, and played victim roles in the simulations during the European Master in Disaster Medicine. The efficacy of the course was evaluated.
Methods: A total of 97 students enrolled, of which: 28 (29%) were in their fourth year of medical school; 34 (35%) in their fifth year; 20 (21%) in their sixth year; and 15 (15%) in their first, second, and third years combined. The general knowledge of disaster medicine was assessed using a pre- and post-course test and a computerized table-top triage exercise conducted prior to and following the specific lesson. The differences in knowledge were compared among the students according to their level of education.
Results: Fifty-five students completed the pre-course test and 61 completed the post-course test. There were 54 students that participated in the pre-course, table-top triage exercise and 61 in the post-course exercise. On average, 30.5% of the questions were answered correctly on the pre-course test, and 66% on the post-course test. The average percentage of questions answered correctly on the pre-course triage exercise was 33%, and 67% post-course.
Conclusions: This innovative course, especially the simulation exercises, increased the students' knowledge and interest in disaster medicine. Although improvement was observed among students of all educational levels, the students in their last three years of medical school performed the best (fourth, fifth, and sixth years). It is believed that a greater scientific and personal maturity among the students is desirable, before they are to engage in such a difficult subject as disaster medicine.
Keywords: course; disaster medicine; medical students; testing; university
Prehosp Disast Med 2007;22(2):s8

An Online Hospital Self-Assessment Tool: A Global Perspective

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Objective: The National Bioterrorism Civilian Medical Response Center (CIMERC) strives to develop enabling tools that produce an effective and integrated response to complex medical emergencies. As it continues to work to meet the needs of healthcare organizations, emergency managers, and disaster responders, CIMERC is challenged by inadequate capabilities and limited resources.
Methods: Based on research, user feedback, policy changes, and technology, CIMERC has developed simple, yet novel, products that enhance emergency response preparedness. One such product, Hospital Self-Assessment Tool (HSAT), allows users to evaluate the preparedness level of hospital emergency departments based on national, regional, and local standards using a web-based format. The tool consists of a series of emergency preparedness and response questions, and includes expert-validated answers, as well as country-specific resources and references.
Results: Hospitals and health care institutions repeatedly use the HSAT to evaluate their preparedness level based upon current education and training practices. User evaluation and demand has resulted in the tool's change in emphasis from a biological/chemical focus to an all-hazards approach. For example, policy-based questions addressing vulnerable populations (i.e., children and disabled or pregnant women) were added. The resulting tool is easy-to-use, available, effective, and adaptable.
Conclusions: "Lessons Learned" analyses and the incorporation of global perspectives strengthen preparedness at all levels and represent a critical piece of technological development. Adaptable and well-vetted tools are necessary to minimize the effects of disasters by enhancing knowledge and capacity building.
Keywords: hospital; international; online; self-assessment; training
Prehosp Disast Med 2007;22(2):s8

Training of Instructors in Disaster Medicine: A Pedagogic Model

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The teaching and training of instructors in disaster medicine varies greatly. To address this concern a pedagogic model for training instructors in disaster medicine was developed and tested. The model, tested in instructor courses for simulation

exercises focuses on the formulation of "aims", "goals", and "objectives" that can be measured. The instructors as students are urged to comply with set standards and to evaluate training sessions using these standards. The evaluation process is considered the most important component of the model. The value of relating results from training to the most critical performance indicator, patient outcome, is also emphasized. Patient outcome is defined as preventable death and preventable complication. A template for evaluating the instructor/students was developed and introduced stepwise including 13 different indicators.

Results are reported from 33 training sessions with more than 100 instructors as students (a session is defined as a small exercise developed and run by the instructor/students). The highest score was given to "evaluation" and "giving feedback" in relation to performance indicators; the most difficult component was making relevant and timely interventions in the simulation exercise.

This pedagogic model for training instructors could be useful in teaching instructors in disaster medicine. Weak points of instructors are demonstrated and can serve as a tool for improvement.

Keywords: disaster medicine; evaluation; instructors; pedagogic model; training
Prehosp Disast Med 2007;22(2):s8–s9

Session 4: Standards in Emergency and Disaster Medicine

Chairs: Geert Seynaeve; Marvin L. Birnbaum; Joost L.M. Bierens

Design and Evaluation of an Educational Program on the Core Components of Emergency Preparedness and Disaster Health for Health Professionals

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Background: The Education Committee of the World Association for Disaster and Emergency Medicine (WADEM) recommends that all health professional graduates should be educated and trained on the core competencies of emergency preparedness and disaster health. This presentation will report on the design and evaluation of an educational program on emergency preparedness and disaster health for health professionals at the graduate level by one Australian university.

Methods: The WADEM Education Committee framework for "Disaster Health" was used as the template. A literature review of reports of educational programs in this field was performed. Within the constraints of the time available, an educational program was designed, implemented, and evaluated.

Results: A four-unit, Graduate Certificate was designed, reflecting the WADEM Framework for Disaster Health and the World Health Organization (WHO) structure for "Health Action in Crises". The first unit provides an introduction, the remaining units address preparedness, response, and recovery respectively. The implementation of the first unit required full-time attendance for one week and was available either as an intensive short course or as an assessed unit. University-required graduate attributes were incorporated, and pedagogical issues were considered. The students reported favorably on the first unit and suggested amendments for consideration in next year's program.

Discussion: Graduate programs in Disaster Medicine are increasing in number, but without international standards to guide these developments.The WADEM template proved to be beneficial. The experience gained in this program may be useful for others designing similar programs for undergraduate, health professional students.

Keywords: disaster health; education; preparedness; training; World Association for Disaster and Emergency Medicine
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Designing Sustainable Hospital Preparedness Training: A Three-Phased Approach

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Healthcare systems are widely described throughout the literature as being under-prepared and under-equipped to handle a major disaster or public health emergency effectively. Many healthcare institutions fail to provide adequate training to staff in disaster-related emergency preparedness topics and hospital emergency plans.

Using numerous search engines and databases, we identified papers, policies and best-practices that described techniques, methodologies and strategies for training hospital workers in preparedness and emergency response functions. Additionally, over 30 hospitals in a major US metropolitan suburban area were surveyed on hospital-worker preparedness training and education.

Based on the needs assessed and the gaps described by hospital preparedness professionals and throughout the literature, a three-phased model for hospital worker preparedness training was created. The model is based on the need for long-term retention, short classroom time with an instructor, distributive and distance learning approaches, and a mechanism for practical skills demonstration and hands-on competency assessment.

The training model is comprised of three main phases or stages of learning:

1. Familiarization with the facility emergency plan;
2. Identification and recognition of an individual's functional role and responsibilities during an incident;
3. Demonstration of skills competency when performing their assigned role during mock disaster drills and exercises.

Presenting preparedness education and training in a three phased approach allows staff to receive repeated exposure to the educational material over a longer period of time, build better skill and knowledge retention through separate, distinct learning activities, and create a function-

al- and institution-specific foundation of knowledge in emergency preparedness and response.
Keywords: education; emergency response; hospital; preparedness; training
Prehosp Disast Med 2007;22(2):s9–s10

Importance of Disaster Medicine and the Significance of the Compendium

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During the past several years, disaster medicine has been increasing in importance due to the increased frequency and greater severity of disasters. The large number of casualties that have resulted is a global concern. Since the 11 September 2001 attacks on the United States, the establishment of systematic measuring and medical response systems has become an urgent need. However, there are many issues that must be resolved in the field of disaster medicine. In order to solve the various medical problems that occur during a disaster, it first is necessary to compile or systematize "disaster medicine. Over the last four years, the authors have compiled a 22-volume compendium of disaster medicine. This project almost has been completed and it deals with various viewpoints of disaster medicine as of the fiscal year 2005. The concept of the compendium and its details will be presented. Its use should be helpful for medical staff as well as for the general public or for education. Although most of it is written in Japanese, some of them have been translated into English.
Keywords: collection; compendium; disaster medicine;references; systematize
Prehosp Disast Med 2007;22(2):s10

Preparing Physicians for Military Expeditions by Using Adventure-Based Learning

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Physicians participating in military expeditions will increasingly be confronted with smaller and simpler medical facilities (such as field hospitals) in a variety of settings.

Interviews with several experienced military physicians and educators revealed that it is challenging to perform medical skills during current military expeditions. Physicians have to cope with extreme climates, with contradicting and incomplete information, and/ physical discomfort due to military transportation. This requires specific abilities and practice levels that cannot be acquired in regular, civilian hospitals.

Adventure-based learning (also known as experiential learning or action learning) may be useful in this context. A life adventure game is developed in which military physicians experience a military expedition. For approximately two hours they are at the mercy of the circumstances of the expedition. After about one hour they must perform their medical skills, accompanied by various surprises and distractions.

This adventure-based learning is built around a Human Patient Simulator, including climate rooms with temperature extremes, and a transportation simulator. The effects on self-efficacy, perceived mental and physical effort and medical skills are assessed. A pilot study of this type of learning with six physicians indicates that the adventure scenario is realistic and helpful for competence development and maintenance. The results of the pilot will be presented during the conference.
Keywords: adventure-based learning; expeditions; game; military; physicians; training
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Cultural Diversity: A Challenge for Emergency Health

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Introduction: In this presentation, cultural diversity training in emergency health will be challenged. Common rationales for teaching cultural diversity include: (1) globalization; (2) migration; and (3) improved health outcomes. Such rationalizations in the non-emergency, time-rich, health environment are admirable, but are at odds with the time-poor emergency setting where speed is of the essence and cultural diversity is too easily placed in the too-hard basket.
Methods: In order to determine whether cultural diversity challenges emergency health, focus groups that included metropolitan and rural paramedics, community groups, emergency medical responders, and trainers of health professionals were conducted. A computer-assisted, qualitative research tool was used to code transcriptions.
Results: The results demonstrate how cultural factors can adversely impact emergency care in unexpected ways. A discrepancy between patients and emergency healthcare workers about what is an acute health event exists. Communication, language barriers, and the use of interpreters could undermine emergency health care, and paramedic attitudes and organizational culture could potentially impact patient care.
Discussion: In an emergency setting, cultural diversity challenges emergency health care, creating additional levels of complexity. Patients and emergency healthcare workers would benefit from further education in the differing perceptions of an acute health event. Cultural diversity stimulates the need for a higher level of communication models, and the effective use of interpreters, as well as raises the potential risk of attitudes and organizational culture impacting patient care.
Conclusion: Instead of placing cultural diversity in the too-hard basket, the challenge is to make it easier and to champion an effective model to achieve improved health outcomes in emergency health.
Keywords: cultural diversity; education; emergency care; health care; training
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Session 5: Credentialling

Chairs: Geert Seynaeve; P. Patka

Creating a Medical Student Elective in Disaster Medicine

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Traditional elective opportunities for American medical students include international medicine, service to underserved populations, and wilderness medicine. In recent years, interest in disaster medicine has increased among medical students. The University of New Mexico Department of Emergency Medicine has a robust history of involvement in all of these areas. One year ago, a four-week curriculum was developed to introduce senior medical students to both the theory and practice of medicine under austere conditions, with an emphasis on disaster medicine.

Faculty members with experience in disaster, international, prehospital, and wilderness medicine participated. Lectures covered basic topics in their areas of expertise, and a supplementary reading list included seminal chapters and primary research articles addressing more detailed and specific information. Drills were created to give students training in airway management, patient evacuation and splinting, confined space medicine, canine search-and-rescue, and high-angle rescue. Students completed Advanced Cardiac Life Support, Advanced Disaster Life Support, and Incident Command System courses.

Providing an elective in disaster medicine creates a unique forum for exposing medical students to disaster medicine, and increases their interest, which may extend into their post-graduate careers. Students are introduced to current literature and research, gain experience through drills, and investigate areas that usually are not covered in standard medical school curricula. This type of course can be a powerful recruiting tool for Emergency Medicine programs and departments with a Disaster Medicine Fellowship.

Keywords: curricula; disaster medicine; education; medical students; university
Prehosp Disast Med 2007;22(2):s11

Preparing Nurses for Radiation Emergencies: An Evidence-Based Curriculum for Global Clinical and Health Systems Readiness

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The potential for a major radiation emergency, either accidental or the result of a terrorist attack is real and may occur at any time in any country. Historically, nurses have been asked to deal with patients who are contaminated with radioactivity or who have been exposed to damaging levels of radiation and may be again. The possibility of treating patients exposed to radiation creates significant fear and anxiety for most nurses, many of whom have insufficient knowledge about the true effects of radiation, how to recognize radiation injury, or what the appropriate clinical response should be for patients involved in radiological incidents.

A surge of patients presenting to accident and emergency departments as the result of a major radiation event is a terrifying prospect for any hospital or community. Yet we must be prepared for the occurrence of this scenario. Nurses must possess the knowledge and skill-sets required to respond to a radiation emergency in a timely and appropriate manner, and with confidence in their clinical competence and perception of personal safety.

This presentation reports data from an empirical study conducted regarding hospital-based nurses' knowledge and attitudes towards responding to radiation emergencies. It explores the concepts of baseline knowledge, clinical competence, perception of personal safety and willingness to respond. Finally, it provides an evidence-based framework for a comprehensive curriculum for nurses to manage the clinical and health systems' response to a major radiation disaster.

Keywords: curriculum; emergency; nurses; preparedness; radiation
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2006 Kocatepe Inferences on Triage and Trauma Suggested by Ankara Triage and Trauma Working Group

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The Ankara Triage Trauma Working Group (ATTCG) was established by a group of general surgeons following The First National Congress of Disaster Medicine with international participation which convened in 2004 in Antalya, Turkey. Surgeons work in trauma, triage, and evacuation systems especially in the prehospital field. The ATTCG questioned the practicability of the Congress' suggested theoretical approaches for medical care in the field and developed these suggestions for personnel serving this area particularly regarding the approach to the patient(s) with trauma. The group questioned the utility of some of the underlying medical concepts the Congress suggested, particularly under the circumstances existing in Turkey. In this presentation, the authors want to share their recommendations about a new kind of triage approach to the trauma patient. The authors named these recommendations as the "2006 Kocatepe Inferences".

Keywords: evacuation; inferences; trauma; triage; Turkey
Prehosp Disast Med 2007;22(2):s11

Session 6: Emergency Medical Services Education and Training

Chairs: Geert Seynaeve; G. Patka

TAS-Courses—Interdisciplinary Training for the Community-Based Prehospital Team

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The Norwegian Air Ambulance Foundation (NLA) was established in 1978, has 800,000 members, and is responsible for establishing modern HEMS-operations in Norway.

Since 1988 the government of Norway has financed the HEMS-operations. The aim of the Foundation is to improve emergency medicine in Norway.

Interdisciplinary Emergency Medical Cooperation—TAS is seminars in emergency medicine are designed to promote cooperation between municipality resources. From 1999 to 2003, a general, interdisciplinary course was provided and completed by all 190 applicants (municipalities).

Uncontrolled bleeding and hypoxia are main causes of morbidity and mortality in traffic crashes. Entrapment delays the transport to definitive care. In 1998-1999, two firefighters and one paramedic in Oslo developed a new extrication technique based on the idea of reversing the forces of the original crash: (1) By 2002-2003, a new concept was developed in cooperation with these professionals. By May 2007, a new, revised TAS course was created and has been completed by 170 municipalities. Refresher courses and new concepts regarding heavy vehicles and kinematics currently are being designed.

Participants of the TAS courses have demonstrated their sarisfaction with the course, with 90% giving a score of 4 or 5 on a scale from 1-5 (1 being "none and 5 being "very large" benefit).

Conclusion: Local resources handle the method adequately and are often able to extricate the victims within 10 minutes. Experiences from actual crashes indicate that the method is saving time on scene.

Keywords: courses; crashes; effects; extrication; training;
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Criteria for the Organization of a Mass-Casualty Exercise

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Introduction: Among all the possible educational paths for teaching disaster medicine, a real-sized exercise covers a primary and irreplaceable role. The possibility to structure functional, real-sized exercises that more and more applicable to real situations enables the operators to test both the adequacy of the available technical and logistical resources, and the emotional and operative action needed to cope with the condition.

Methods:

Scenario—Directly related to the simulation objective. Its complexity is not necessarily proportional to the exercise effectiveness. Very simple scenarios may have a strong educational impact.

Actors—Depending on the background and formative requirement of the protagonists of the exercise, it is necessary to shape the structure of the "drill."

Simulators—These persons have a fundamental role in the search for the adherence of the simulation to the reality.

Data Collection—The purpose of every functional exercise should be to supply data that can be assessed and used to draw precise indication to improve the protocols in use. To collect a series of useful key points to set up a real-size exercise can modify the educational impact of this kind of didactic pathway.

Conclusions: To make uniform the management issues in the phases of scenario, feedback can promote a standardization process aimed at providing invaluable and comparable exercises. This process is intended to search for a model applicable to any reality involved in this field, to standardize the development of assessment strategies for exercises in disaster medicine.

Keywords: development; disaster; effectiveness; exercises; simulations
Prehosp Disast Med 2007;22(2):s12

Power Exercise Creator and Evaluator (ECE): A New Tool for Planning, Organizing, and Evaluating a Virtual Disaster Simulation

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Introduction: Functional, full-scale exercises, although expensive, are mandatory to test a hospital's emergency department (ED) response to a disaster. Power Exercise Creator and Evaluator (ECE) is software capable of integrating all the information needed to simulate the ED response to a mass-casualty incident (MCI) (patient data, bed occupancy, laboratory and imaging facilities, and manpower availability) without stopping routine hospital activities.

Methods: This platform software is composed of a database containing casualty 'storyboards' (clinical findings according to timings and treatments performed) based on the expected injuries for any kind of event; virtual laboratory and radiology departments with pre-planned exam data sheets. Power ECE includes a multiple windows view that allows the caregiver to perform treatments on victims, request certain tests and exams, and admit or discharge patients. The software is fully equipped with a statistical tool, capable of analyzing the virtual drill according to preselected performance indicators and to perform evaluations at once.

Results: This platform was tested during a drill simulating a road traffic accident in a tunnel involving sham-victims. Fifty victims arrived at the ED where on-duty physicians used Power ECE for simulating technical lab and imaging procedures, and to dispatch and manage patient movements inside the simulated hospital. Notwithstanding the scenario complexity, there have been no technical problems running the simulation. Quantitative evaluation of the performance was provided by the participants at the end of the exercise.

Conclusions: This software is an inexpensive and user-friendly tool to organize and evaluate hospital ED disaster drills.

Keywords: drills; emergency department (ED); mass-casualty incident (MCI); Power Exercise Creator and Evaluator (ECE); simulation
Prehosp Disast Med 2007;22(2):s12

An Example of a Field Exercise with an Independent Evaluation System

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Medical field exercises are important ways to practice theory and take corrective measures from the lessons learned of the exercise. To accomplish this, independent evaluators are critical. "The National Medical Rescue Team (UMKE) of Turkey II. National Training and Exercise Camp" was an example of a field exercise using an independent evaluation system. The event took place in Kayseri, Turkey between 15 and 18 August 2006. Five hundrend fifty UMKE members from 11 cities and North Cyprus UMKE team participated in the event. An independent evaluation committee composed of three members from different fields of expertise observed and evaluated the exercise using an evaluation form. The form includes a total of 90 questions in three areas: (1) preparedness before the exercise; and (2) actions taken during the exercise and the triage. "Yes", "No, and "I do not know" were the response choices for each item. For "Yes" and "No" answers, a Likert-type instrument with five response alternatives was developed. There was also space for any comments regarding each item. Out of 90 evaluations, all evaluators gave seve negative, 59 positive and 24 not known comments. The results of the evaluation showed that the triage success level of UMKE teams was high whereas there is need to improve the training system.

Keywords: evaluation system; field exercise; National Medical Rescue Team; Turkey
Prehosp Disast Med 2007;22(2):s13

START Triage Exercise at the Gulhane Military Medical Academy, Turkey 2005

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Various triage systems have been developed all over the world. The objective of this study was to evaluate the success and experiences of health personnel as to the method of 'Simple Triage and Rapid Treatment'(START) that was practiced during the Gulhane Military Medical Academy Hospital Disaster Plan Exercise 2005. A total of 91 cases whose triage category was pre-determined, participated in the study. Eachok part according to the trauma scenario they were provided. Triage teams, while evaluating the cases, looked at brief the information written on the cards hung around the patients' necks that provided ventilatory rate, pulse rate and clinical status. They examined the make-up of each of the mock patients. Results of the triage performed in the field and in the hospital were compared and the applicability of the START method was discussed. The scenario was prepared with 11 black, 21 red, 25 yellow, and 34 green victims. The hospital triage team designated them as 13 black, 26 red, 26 yellow, 26 green. Some additional cases were triaged into a higher category. It was noted that the dramatic appearances of the patients resulted in triage errors. It was concluded that theoretical training might be inadequate for correct triage practices during mass-casualty situations and they should be supported and developed using future practical exercises.

Keywords: accuracy; exercise; START; training; triage
Prehosp Disast Med 2007;22(2):s13

Poster Presentations—Theme 2: Education

(3) Effect of Prehospital Trauma Life Support Course on Emergency Medicine Technician's Knowledge in Iran

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Objectives: The objective of this study was to determine the effectiveness of a prehospital trauma life support (PHTLS) course for emergency medicine technicians in Tehran (capital of Iran). The knowledge of 240 technicians was assessed before and three months after the course.
Methods: All of the technicians of the Tehran Emergency Medicine Service participated in the four-day PHTLS course taught by two emergency physicians, a surgeon, and an anaesthesiologist. A standardized questionnaire with 40 questions was administered prior to the course. Three months after the course was completed, another multiple-choice questionnaire that consisted of 40 questions of the same level of difficulty as did the first examination was administered.
Results: All of the 240 technicians were male with a mean value of their ages of 30.1 ±5.1 (SD) years old. The mean pre-course questionnaire score was 17.1 ±3.7 and conversely related to mean age of the technicians. The highest score attained was 26. The mean value for the post-course score was 28.3 ±4.3, and the highest score was 35.
Conclusions: The PHTLS course is an effective strategy to improve the performance of the EMS technicians. However, it is recommended that their trauma management skills and outcomes (patient mortality and morbidity) be evaluated.

Keywords: effectiveness; emergency medical services; Iran; knowledge; Prehospital Trauma Life Support Course; technicians
Prehosp Disast Med 2007;22(2):s13

(4) Organizing Activities of Undergraduates in Nigerian Universities and Polytechnical School toward the Prevention of Road Traffic Crashes

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Nigeria is classified among the least motorized nations in the world. Ironically, there is an unprecedented rise in mor-

bidity and mortality relating to road traffic crashes (RTCs), which has assumed the status of a disaster. The young are not spared. Students in tertiary institutions of learning fall within the high-risk group of inter-city travelers. They traverse the length and breadth of the nation in search of academic pursuits. Undergraduates in tertiary institutions of learning play an important role in ameliorating occurrence of RTCs through organized, student activities within and outside their campuses. Having been equipped with appropriate information on the prevention of RTCs, they could form safety clubs, organize workshops or seminars, and educate inter-city and intra-campus drivers and commuters as well as motorbike "Okada" riders on the importance of highway signs and codes, etc. Additionally, they could conduct rescue drills in preparedness for mass-casualty incidents. The many ways in which University/Polytechnic students can be useful in the reduction of RTCs are addressed.

Keywords: education; Nigeria; preparedness; road traffic crashes (RTCs); safety; students
Prehosp Disast Med 2007;22(2):s13-s14

(5) Quality Improvement of the Cardiopulmonary-Cerebral Resuscitation Process Based on Standards in the Medical Emergency Ward of Nemazee Hospital in Shiraz, Iran—2005

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Introduction: This interventional study was performed to determine and improve the quality of the Cardiopulmonary-Cerebral Resuscitation (CPCR) process according to standards in the Medical Emergency Ward of Nemazi Hospital in Shiraz, Iran.
Methods: One hundred twenty CPCR processes were observed and evaluated using three checklists that were designed according to standards. The first checklist was designed to evaluate the standard of essential equipment that was used for the performance of CPCR. The second checklist was designed to collect demographic data and evaluate the process of CPCR activities (intubations, chest compressions, electroshock, drug administration, and insertion of intravenous lines) according to "golden hour" standards. The third checklist was designed to evaluate the documentation of the process. In addition, to evaluate knowledge of the personnel about the CPCR process standards, a pre-test was administered to personnel two months before the intervention and a post-test was administered two months after the intervention.
Results: An analysis of the data and the comparisons of the two test periods indicates that the standard use of equipment and the knowledge of personnel significantly increased after the intervention. Also, the standard use of sodium bicarbonate according to golden hour standards was statistically significant. The speed of CPCR Team attendance at the patient's bedside procedures was increased statistically. The survival rate following the performance of CPCR had no change after the interventions, but there was a statistically significant increase of survival rates during morning shifts versus evening and night shifts.
Conclusion: Continuous evaluation and education can improve the quality of the CPCR process.

Keywords: Cardiopulmonary Cerebral Resuscitation (CPCR); golden hour; hospital procedures; hospital standards; survival rates
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(6) Images of International Health and Nursing in Japanese College Students

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Introduction: This study examined the concept of "international health" in college students in Japan.
Methods: Subjects were 96 nursing students, 41 physical therapist and occupational therapist students, and 91 other faculty and students who attended the lecture, "International Health" between April 2005 and September 2006. A self-administered questionnaire was distributed to the students to collect the data. The completion rate was 100%.
Results: Ninety-nine percent of the nursing students, 97.6% of the paramedical students, and 93.4% of the other faculty and students answered "hygiene in developing countries" as their percieved image of international health. About 92% of nursing students, 90.2% of paramedical students, and 71.1% of other faculty and students group indicated that they want to participate in disaster relief medical operations.
Conclusion: Nursing and paramedical students are interested in studying international health and disaster medicine. International health education is considered important.

Keywords: college students; developing countries; international health; Japan; nursing students; paramedics
Prehosp Disast Med 2007;22(2):s14

(7) Simulation Training

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Introduction: The aim of this study was to evaluate the Emergency Medical Care performance when a simulation of a major event that produced multiple victims was performed.
Methods: The prehospital Emergency Medical Services (EMS) received a call for 10 victims in a railway incident at the Oudhna Railway Station (about 19 km from SAMU location) about 25 minutes after the crash. No precise description of the victims' injuries was indicated. Three ambulances were dispatched within three minutes, as well as a rapid intervention vehicle with two physicians (an observer and a medical care director). Information about the crash was transmitted to the emergency unit of the Public Health Ministry and to all of the emergency services around the site of the event. Upon arrival to the site, the medical care director designated a Chief for the Advanced Medical Post (AMP) which was placed about 300 meters from the area in which the event occurred. All

victims were examined in the AMP (three were considered as an "absolute" emergency, five as a "relative" emergency, and two as a "psychiatric" emergency). All victims were transferred to hospital emergency services.
Results: The debriefing after this simulation identified some dysfunctions: (1) this exercise simulation was not well-prepared for all partners; (2) the presence of security personnel is essential for securing the accident area and all area maneuverings; (3) there is an absence of emergency plan preparation for a massive influx of victims in some hospitals.
Conclusion: Interactivity, problem solving, decision-making, immediate evaluation, and feedback are key elements to be used in simulation training. The responses of the prehospital EMS were mainly acceptable.
Keywords: emergency medical services; police; railway accident; simulation; victims
Prehosp Disast Med 2007;22(2):s14–s15

(8) Education and Training of Ambulance Personnel in the Rural Areas of Sweden, Scotland, and Iceland

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Introduction: Ambulance personnel frequently deliver initial care to patients with critical illnesses or severe injuries. Therefore, it is vital to have highly trained ambulance personnel in order to provide optimal services. The FSA University Hospital in Iceland, the Emergency and Disaster Medical Centre in Sweden, and the National Health Service-Western Isles in Scotland received a grant from the INTERREG III Northern Periphery Programme to work on the project, "Ambulance Transport and Services in the Rural Areas". An overview of the current status of the training of ambulance staff in the participating regions and some thoughts about future development will be presented.
Methods: Members of the working groups for each partner reviewed the current status of education of prehospital staff in their region. This included a web-based survey of attitudes and expectations of prehospital personnel concerning their education and training.
Results: There were significant differences between the three areas concerning the training of prehospital responders.
Conclusions: Further research is needed to define optimal training and composition of ambulance crews in order to improve patient outcomes and the utilization of resources in sparsely populated areas. This collaboration should foster improvements in the provision of relevant education in rural areas, and should have an impact on the quality of service.
Keywords: ambulance personnel; education; prehospital; rural areas; training
Prehosp Disast Med 2007;22(2):s15

(9) Continuing Medical Education in Disaster Medicine

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Introduction: Since 1988 in Belgium, education in disaster medicine usually has meant delivering basic and sporatic information specifically for doctors, nurses, and/or paramedics. Beyond these programs, it has been difficult to provide continuing education initiatives. Such an educational program for disaster medicine recently has been implemented.
Method: One month before the formation of the program, the student (a doctor, nurse, or paramedic) received a book with material that encompassed basic disaster management and introduced more in-depth concepts. During the two-day program, the students performed several practical exercises in groups of eight. Each group was tutored by two or three instructors. The exercises concerned: (1) on-site organization of a triage and care zone; (2) medical dispatch of the casualties; (3) media training; and (4) telecommunications. Moreover, the students were confronted with three table-top disaster exercises in urban, industrial, and countryside environments. They used magnets, figurine vehicles, characters, and other mobile structures on the map to illustrate their tactical approach under the control of the instructors. In last sequence, the students became actors in a life-like disaster exercise with the participation of the fire brigade, civil security, army, police, and media. More than 10 instructors monitored the sequence for 24 participants. The exercise was repeated twice, each time for a different group of participants.
Results: The two-day course allowed 48 people to be trained in an academic setting in cooperating with rescue facilities.
Keywords: Belgium; disaster medicine; education; educational programs; paramedics
Prehosp Disast Med 2007;22(2):s15

(10) The Mass-Casualty Drill at the National University Hospital: Simulating the Madrid Bombing Scenario in Singapore

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Singapore has an extensive public transport railway system that is operated by the Mass Rapid Transit (MRT). Using the experiences from the multiple-site, terrorist attacks in Madrid on 11 March 2004 in which explosives were placed in four commuter trains injuring >2,000 persons and resulting in 191 deaths, Singapore conducted an island-wide drill on 22 May 2006.

This successful, island-wide drill involved the hospitals, police force, public transport agency, media, Ministry of Health, Ministry of Home Affairs, and Ministry of Communication. By exercising the guidelines and standard operating procedures related to disaster management, the drill helped to identify ways in which all of the involved agencies could improve their disaster plans.

A post-event analysis was conducted, and follow up interventions were identified that should improve the response of hospitals.
Keywords: drills; Madrid Bombing; multiple-site incident; Singapore; transportation system
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(11) Survey of Knowledge and Attitudes of Students to Disaster Preparedness: A Study in Four Countries

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Introduction: Training is necessary for preparing personnel involved in managing disaster responses. Teaching and training in disaster management is non-existent in most medical and nursing schools around the world. The infrastructure for disaster responses is transforming, while at the same time medical education is changing. The conventional response system is expected to need many additional healthcare personnel—a.k.a. SURGE. Only recently, under the increased scrutiny of accelerated institutional and governmental preparedness efforts, have the emerging sciences of emergency preparedness and medical education converged. The United Kingdom, India, Australia, and Colombia are countries in four different continents, yet they are bound together by the common threat of natural and human-made disasters in the daily lives of their citizens. These countries have had widely differing infrastructure support for disaster planning and training of students with implications for disaster curriculum development.
Objective: This presentation seeks to assess the knowledge, attitude, and training of students (medical and nursing) regarding disaster management in four countries.
Methods: A questionnaire is being administered to a sample of medical and nursing students in four countries: UK, India, Australia, and Colombia. Their exposure to disaster training, knowledge, and attitudes will be explored through the questionnaire. The influence of disasters, the political situation in each country, and the medical curriculum will be addressed.
Results: The results will be presented.
Conclusions: In countries faced with the risk of disasters, training of healthcare professionals should be instituted from an under-graduate level, and there should be international cooperation in curriculum development activities.
Keywords: curriculum; international; knowledge; preparedness; response; training
Prehosp Disast Med 2007;22(2):s16

(12) Training Civilians for Preparedness for Mass-Casualty Incidents and Disasters

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Objective: To evaluate the effectiveness of a mass-casualty incident (MCI) and disaster training program for civilian volunteers.
Methods: A training program was developed that conformed to the following principles: (1) the action of volunteers is limited basically in the safe area; (2) volunteers can support logistics; and (3) in order to be effective volunteers should be well organized and trained.

An evaluation was performed before and after the 14 hours of theoretical training and 10 hours of practical training. Two doctors determined the performance on the evaluation with experience in emergency medical services (EMS) based on a scale from 0 to 20. The final grade was the mean value of the evaluation scores.

The pre- and post-training tests were used to examine the achievements in the following skills: (1) immobilization; (2) airway; and (3) minor injuries.
Results: A total of 58 volunteers participated in this training. Of these, 19 were healthcare personnel (HCP) (but not with the EMS), and 39 were laypersons (LP). The value for the mean ages of the participants was 27.9 years (range 19–44 years); there were 42 male and 16 female participants.

An improvement on tested skills for all of the participants was observed; the overall performance scores increased by 28.5% (from 12.2 to 15.6). The LPs demonstrated a greater improvement (from 9.33 to 14.71; 48.13%) than HCPs (14.42 to 16.59;15.05%). This difference probably is due to the very low pre-training capabilities of the LPs.
Conclusions: Training LP or HCPs can improve their skills and performance to be applied in MCI or disaster settings. Knowing that the first responders after an MCI or a disaster usually are LPs, specific training could improve the performance of the general public in such situations.
Keywords: civilian; evaluation; lay person; mass-casualty incident; training
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(13) The Impact of Two Different Educational Strategies

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Objective: To compare the impact of a participation-based educational strategy to a traditional educational strategy on the development of a position before the education of doctors with educational functions.
Methods: A quasi-experimental study, approved by the Investigation Committee, was conducted to evaluate the effects of the use of two different educational strategies. A validated instrument consisting of 72 statements had been used previously. This instrument excluded aspects of the educational task through the use of three indicators: (1) indiscriminate agreement; (2) more popular approach; and (3) consequence. The "natural groups" were composed of seven doctors who had graduated from the educational activities in which they had been enrolled, two were enrolled in teaching, one was boarded, and a participation-based approach was used for the others. The instruments were applied previous to consent. A non-parametric statistical analysis was conducted.
Results: The Mann-Whitney *U*-test did not show any statistically significant differences between the groups prior to the interventions. The same test was provided after the completion of interventions and identified statistically significant differences in favor of the participation-based group, mainly in the consequence indicator. The Wilcoxon

test showed that the entire participation-based group significantly improved in the evaluations of the three indicators. Further comparisons will be presented.
Conclusions: A participation-based educational approach is more effective in the development of a position before the education.
Keywords: doctors; education; participation-based; strategies
Prehosp Disast Med 2007;22(2):s16-s17

(14) Clinical Aptitudes of Emergency Medicine Residents in the Boarding of Stroke Victims

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Objectives: To construct, validate, and apply an instrument to evaluate the clinical aptitudes of the emergency medicine residents in the treatment of stroke patients.
Methods: An observational, cross-sectional study, authorized by the Local Committee of Investigation, was conducted in which the 31 residents evaluated themselves. The residents are a part of the three levels of the emergency medicine specialty of one of the seats of the Federal District. To develop the instrument, three real clinical cases of stroke patients were used. The content validity was obtained by the consensus of four out of four experts in emergency medicine and educative investigation. A pilot test of pre-degree, internal medicine doctors was conducted. The consistency was determined using the Kuder-Richardson test. The validated instrument was applied specifically in only one session, later determining the awaited answers by chance through the Perez-Padilla test. A non-parametric statistical analysis was conducted.
Results: The final version of the instrument consisted of 153 items distributed in 10 indicators. The consistency was 0.92. The maximum score was 124 and the minimum scorewas 44. Twenty-five answers were obtained by chance. The statistical analysis did not identify any differences between the academic degrees. The third-year residents obtained better qualifications for most of the indicators.
Conclusions: The constructed instrument is a suitable tool for use in evaluations. The educational process in this seat seems to promote a process of reflection and criticism for the residents.
Keywords: clinical aptitude; emergency room; instrument; residents; stroke patients
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(15) Evaluation of Just-In-Time Training Materials for "Dirty Bomb" Management

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Introduction: The purpose of this study is to determine how to train physicians for radiation emergencies.
Methods: Emergency medicine residency programs in New York City were selected for the study. The participants were given a scenario describing a patient who fled the scene of an explosion during which he was externally contaminated with radioactive material. They were asked to manage the patient with the help of training cards developed by the federal government, and then to comment on the cards through a survey.
Results: The participants were asked to critique the helpfulness of the training cards on a scale from 1 to 5 (1 = not helpful, 5 = very helpful). Overall, the participants rated the cards an average of 2.82. When asked in what format they would prefer to receive the radiation information, 98 of 244 (40%) participants responded that they preferred the Just-in-Time training card ("Quick Card") with a reference manual. Twenty-two percent preferred a poster, 20% preferred the Quick Cards alone, and 16% preferred a personal digital assistant format.

The participants then commented on what material should be found on the Quick Cards and in a manual. Concerning radiation emergency educational formats, 49% chose case scenarios, 36% preferred lectures, and 7% equally preferred online modules and video presentations. Finally, respondents reported receiving only one lecture on disaster preparedness (general) during the past two years.
Conclusions: The results of this study indicate the lack of formal education in the management of radiation emergencies that emergency medicine residents are receiving. It also shows that multiple, non-traditional formats can be used for effective training, such as Just-in-Time tools.
Keywords: education; emergency medicine; just-in-time; radiation; residents; training
Prehosp Disast Med 2007;22(2):s17

(16) General Medical and Welfare Measurement System for the Disabled/Elderly

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Widespread problems are common in the field of disaster medicine. This is true especially in providing support to disabled persons. This study examined these problems.

This study consists of three major components:
1. Operating an emergency medical and welfare support team for the medical/welfare facilities involved;
2. Establishing mobile and fixed support centers for people living in temporary housing; and
3. Improving software systems, including a new version of triage tag/disaster records for the disabled/elderly, and developing new tools to support those with visual and/or hearing disabilities.

The tool for assisting the blind is called "My Kane System" (TNK company, Japan). It is a system used to help the blind differentiate the color of tape using different vibration frequencies, by which they can select the safe route.

Establishing a systematic support system for the disabled to use during disasters is important. A new, supporting non-governmental organization, called the Japanese Welfare Supporting Network System against Large Scale Disaster (nicknamed Thunderbird) was established in 2005.

Although these aids are useful, there still are many problems, including a lack of financial support, problems with the educational system, and keeping people motivated. Moreover, the establishment of a coordinating system between official organizations, medical facilities, the welfare system, and volunteer groups, also remains a big issue.
Keywords: disabled; disaster; education; Japan; plan
Prehosp Disast Med 2007;22(2):s17–s18

(17) Training Medical Students in Bag-Valve-Mask Technique as an Alternative to Mechanical Ventilation in a Disaster Surge Setting

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With the recent disasters that have occurred and the increasing threat of pandemic influenza, hospitals are assessing their ability to address surge capacity. During a disaster in which victims require advanced ventilatory support, alternative means for ventilation will be necessary. Mechanical ventilators are a finite resource. Respiratory therapists properly trained to provide proper bag-valve-mask (BVM) ventilation also are a limited resource. Many other healthcare professionals will be over-extended in emergency disaster situations. In the academic hospital setting, medical students are a large, potentially underutilized resource. They often are eager to help, but they are not licensed to practice and can often feel superfluous in emergency settings. While medical students cannot perform medical decision-making or unsupervised invasive procedures, they can be trained to do important essential tasks. Teaching and assessing the ability of medical students to adequately provide manual ventilation support can utilize an invaluable medical resource to provide a necessary life-saving duty.

In this study, the rapid training of medical students and their ability to provide effective manual ventilation using bag-valve-mask technique was evaluated.

A rapid training session highlighting essential aspects on if the correct BVM technique was provided to 40 medical students. The training session was developed with consultation from respiratory therapists and anesthesiologists. Following the session, the students participated in a simulated experience, monitored according to a checklist of essential BVM competency requirements. Pre-test and post-test surveys were administered to assess the medical students' knowledge and ability to provide adequate BVM technique.

The results illustrate that medical student effectiveness in learning proper BVM technique could be used in a disaster surge situation.
Keywords: disaster; ventilatory support; bag-valve-mask; medical students; training
Prehosp Disast Med 2007;22(2):s18

(18) Need for Emergency Medicine in Nepal

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Nepal is a country that is developing in every aspect. Because of its difficult geographical conditions and low economical status, mortality rates are increasing. There still is a lack of a proper healthcare system, and there are a minimum number of available personnel from the health posts to modern tertiary hospitals. Additionally, there is no Emergency Healthcare System and no Emergency Medicine Specialty. Every hospital emergency is managed general practitioners who are trained as doctors (GP), by the Institute of Medicine at Tribhuvan University. They provide all emergency medicine, emergency surgery and orthopedics, emergency obstetrics and gynecology, and more. They practice in every part of the country from District Hospitals to Tertiary-Level Hospitals.

It is necessary that further academic training and recognition be established for emergency medicine. In addition, academic Emergency Medicine courses must be developed and the upgraded training must be administered to the existing General Practitioners and new comers. The management of emergency medicine is very poor, and there is no training available for prehospital emergency management. The poor management and minimal hospital emergency services can be attributed to a lack of proper infrastructure, equipment, and insufficiently trained personnel. Therefore, it is essential to develop an academic Emergency Medicine and Emergency Healthcare System by well-trained persons in Nepal. Hopefully, these endeavors will receive worldwide support.
Keywords: emergency medicine; health care; management; Nepal; personnel
Prehosp Disast Med 2007;22(2):s18

(19) Evaluation of a Continuing Education Program for EMS Personnel on the Island of Crete

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Introduction: This study evaluated the effectiveness of a novel program of continuing education for EMS personnel serving in Heraklion, Crete, Greece during a two-year period.
Methods: First, EMS personnel participated in a pre-educational test consisting of 20 multiple-choice questions. Next, participants (in groups of 20–25) engaged in a two-day, 16-hour seminar consisting of a 6-hour theoretic session and a 10-hour 'hands-on workshop' focusing on: (1) the use of artificial airways (naso- and oro-pharyngeal airways, laryngeal masks); (2) basic life support and use of Automatic External Defibrillators; and (3) trauma victim extrication and immobilization. The participants then took a post-educational test consisting of the same 20 multiple-choice questions as the pre-educational test, one week after seminar completion. Pre- and post-educational test results were compared. A test result of <60% was regarded as test failure.

Results: From February 2005 to October 2006, 217 participants completed the program; 117 and 100 in the years 2005 and 2006 respectively. Pre- and post-educational test results were as follows: 19 out of 117(16.3%) and 27 out of 100 (27%) participants failed the pre-educational test in the years 2005 and 2006 respectively, while the corresponding post-educational test failure results were 3.5% and 0% respectively ($p < 0.05$).
Conclusions: A significant proportion of the participants (16.3% in 2005 and 27% in 2006) failed the pre-educational test, while the post-educational test failure rate improved significantly by dropping to less than 5%. Implementation of a continuing education program for EMS personnel on a regular basis may serve as a useful tool in facilitating skill and knowledge improvement.
Keywords: continuing education; EMS personnel; post-educational testing
Prehosp Disast Med 2007;22(2):s18–s19

(20) Efforts Toward Increasing the Awareness of Disaster Training and Research at a University in Turkey

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A disaster due to natural, technological, or human-made hazards is destructive to people and their communities and sharply reduces social and economic well-being. Therefore, the strategy for improving disaster response should emphasize repairing and improving the social and economic status of those affected. There already are many successful programs and applications opperating in Turkey. Unfortunately, trained healthcare providers equipped with appropriate knowledge, attitude, and behavioral skills regarding disaster management are lacking.

In 2006, Baskent University established a Center for Disaster Training, Research, and Implementation according to the legal regulations of the High Education Council in Turkey. The Mithat Coruh Quality Management Center collaborated with the University's Burn and Fire Disaster Institute on the establishment of this Center. The Center for Disaster Training, Research, and Implementation will train and integrate selected healthcare staff from the seven existing healthcare facilities at Baskent University. The staff will learn about disaster management topics; specifically, the preparation and dissemination of training guidelines and protocol for disaster-specific problems at the national level. The Center will collaborate with national and international disaster management centers. The successful training activities will be recommended to the University for integration into the pre-graduation program of certain educational tracks.
Keywords: disaster management; disaster training and research; education; Turkey; university programs
Prehosp Disast Med 2007;22(2):s19

(21) One Center's Experience in First-Aid Training: A Case Study in Turkey

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Introduction: After the 1999 Marmara Earthquake in Turkey, the civil initiative in first aid resulted in many incidents of severe malpractice and insufficient care. In 2002, the Turkish Government published legislation on first aid that required all first-aid responders to be certified by governmentally-approved first-aid training centers. In response to this legislation, Baskent University established a First-aid Training Center in 2004.
Methods: This Center is staffed by first-aid trainers that have certified 47 people over the duration of six courses. The eight-day, nationally-standardized course program covers topics of first aid and training, with a focus on skill improvement. Both topics, first-aid and training skills, were assessed by a pre-test that determined the baseline knowledge-level of attendees. After the course, a post-test was administered, which measured the knowledge-level and skill development of attendees.
Results: The mean value of the pretest first aid scores of the students was 80.1 ±1.0, while post test score were 93.4 ±0.7 ($p < 0.05$). Of the students, a minimum of 89% were at a proficient level in 20 BLS steps. Regarding training skills, the mean value for the pretest scores was 74.4 ±1.2, while post-test score was 90.7 ±0.7 ($p < 0.05$). Of the attendees, a minimum of 61% were at the proficient level in 16 presentation skill steps.
Conclusions: Given that 96% of Turkey's population lives in potential disaster areas, the importance of training first-aid responders is obvious. Turkey will persist on this well-planned and successful project until the needs of the country are satisfied.
Keywords: education; first-aid training; Marmara Earthquake; Turkey
Prehosp Disast Med 2007;22(2):s19

(22) Post-Graduate Fellowship in Emergency Medicine Disaster Preparedness: Providing Physicians with Special Training in Hospital-Based Planning and Public Health

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The significance of preparing a medical response to a disaster in the United States has become more apparent in light of a number of domestic events that have occurred in the past decade. Keeping with this trend of recent awareness, SUNY Downstate Medical Center, a large teaching hospital and medical school, and Kings County Hospital Center, a Level-1 trauma center in Brooklyn, New York have joined with the New York City Department of Health and Mental Hygiene to create a disaster preparedness fellowship for physicians. This particular program is unique because it prepares physicians to be a leading force in hospital-based planning and planning within public health agencies.

The program is designed to span either one or two years when it is combined with a Masters Program in Public Health. During that time, the fellow acquires expertise in numerous disaster-related topics. This is accomplished through participation in a variety of activities, ranging from acting as a physician and educator in the emergency department to working on disaster management and planning within local and national public health agencies.

The effectiveness of the fellow-designed, hospital-based plans are tested periodically using drills that have included several area hospitals as well as the New York City Fire Department Emergency Medical Service. In addition to obtaining this advanced level of training, individual fellows also focus on specific areas of interest, such as planning for radiological events or pediatric patients during a disaster.

Keywords: disaster management; disaster preparedness; fellowship; public health
Prehosp Disast Med 2007;22(2):s19–s20

(23) Effects of Different Educational Modalities on 5th and 6th Grade Children: Earthquake Personal Protection Behavior Knowledge in Israel

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The goal of this study is to assess how effectively child education modality improves the knowledge of fifth and sixth grade children regarding personal protection behavior during and immediately after an earthquake.

A questionnaire was distributed to 2,648 pupils from the fifth and sixth grades of 120 different schools in a nation-wide geographic distribution across Israel. The questionnaire included three multiple choice questions concerning personal protection behavior after an earthquake, five theoretical questions on earthquakes, and three questions on exposure to posters and attendance at earthquake drills or lectures. The effect of each education modality on the children's knowledge was analyzed.

Attending a drill improved the knowledge of the children by 20% (p <0.05). Attending a lecture improved the knowledge by 10% (p <0.05). Exposure to posters did not significantly change the knowledge. The age factor improved the knowledge of the children by 10% (p <0.05), which was unrelated to the educational modality used.

Earthquake drill attendance improves the personal life-saving behavior of fifth and sixth grade children. More of these educational programs should be conducted in order to improve the personal protection knowledge of fifth and sixth grade children following earthquake.

Keywords: child education; children; earthquakes; personal protection; questionaire
Prehosp Disast Med 2007;22(2):s20

(24) Evaluation of Emergency Procedures Applied by EMS Teams in Simulated Mass-Casualty Events: Analysis of Experiences of International Polish Championships in EMS Procedures

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The Campionships in Emergency Medical Services (EMS) Procedures, an annual international competition, has taken place in Poland since 2002. Every year, almost 80 advanced standard EMS teams (including one physician or paramedic) take part in the event. Aside from Poland, the competitors also come from Slovakia, Germany, Ukraine, Belarus, Serbia, Hungary, Turkey, Greece, and Israel.

During a three-day event, the teams perform about 10 simulated emergency scenarios. Their performances are evaluated according to international standard procedures by a team of judges. In both the 2004 and 2005 competitions, one of the scenarios involved a mass-casualty event. In 2004, the 56 teams were faced with a shooting incident at a disco, where about 15 people sustained various types of injuries. In 2005, the task was to rescue 11 children involved in a school bus accident. The judges considered the following: (1) ensurance of safety; (2) communication with the dispatch center; (3) assessment of the incident site; (4) organization of procedures on location; (5) triage; (6) cooperation with other emergency services and with other EMS teams; and (7) preliminary medical procedures. The average number of points scored by teams was similar in both scenarios and amounted to 50.6%, ranging between 0.0–80.8%, which was lower than the average for other the other simulations (60.2%).

This study indicates that even in simulated circumstances, the emotional burden on the teams is greater, and they are more prone to errors than during routine EMS simulations.

Keywords: competition; emergency medical services; mass-casualty incident; Poland; simulation
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(25) Beyond Cultural Competence: Culturally Responsive Emergency Care

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Introduction: Many health agencies use cultural competence to deliver appropriate care to patients from culturally and linguistically diverse (CALD) backgrounds. The aim of this paper is to challenge this definitional model and recommend a timely move beyond cultural competence.

Methods: A systematic literature review was conducted to identify models used for teaching cross-cultural care to healthcare professionals.

Results: Although the review identified various models for providing care across cultures, cultural competence was featured as an internationally prevailing model, which was adopted by the Australian National Health and Medical Research Council in 2006 for use in the Australian context.

Discussion: Cultural competence is a model that gives the impression that healthcare professionals can develop culturally competent care; however, it masks the impossibility of achieving such an advance. This over-presumptuous model promotes the idea that Western emergency healthcare professionals can learn CALD health beliefs, yet it belies a lifetime of cultural learning which constructs and confirms culturally nuanced perspectives about health.
Conclusion: The usefulness of cultural competence is seen best as part of a developmental continuum. Now is the time to move beyond cultural competence and to develop a more contemporary model that affirms the need for Western emergency healthcare professionals to unpack their own cultural heritage and healthcare beliefs before encountering other cultures. Such a development moves caring across cultures from the myth of competence to an undertaking of responsiveness.
Keywords: cultural competence; cross-cultural care; health care; Australia
Prehosp Disast Med 2007;22(2):s20–s21

(26) Pioneer of Disaster Medicine and Hospital Disaster Planning Education in Turkey: Emergency Medicine Association of Turkey (EMAT)

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The First Emergency Medicine Residency programme in Turkey was established in 1993, and the Emergency Medicine Association of Turkey (EMAT) was founded in 1995.

The Marmara earthquakes of 1999 were a milestone for EMATs disaster organization and education. After experiencing these two earthquakes, the EMAT delivered limited health care and had the opportunity to observe a real disaster area. The first studies conducted by EMAT on disaster medicine after these earthquakes were on field triage drills.

In 2000, EMAT and Dokuz Eylul University cooperated to design a course for hospital disaster planning. Experts from the US were involved in this process and a well-known hospital disaster plan (HEICS) was adapted for Turkey.

Between 2000 and 2003, the EMAT organized 15, one-day courses on the hospital disaster plan with >1500 attendees. In 2005, the EMAT developed a new, two-day course for hospital disaster planning that included information about the process of building a disaster plan, such as risk analysis, evacuation, and mitigation. The EMAT, with local authorities, decided to open disaster meeting centers in six major districts of Izmir, in order to deliver first-aid and health care with its volunteers.

Overall, two disaster meeting drills and five field triage drills were organized between 1999 and 2003. A one-day seminar in 2003 on nuclear, biological, or chemical disasters also took place. Furthermore, the EMAT organized short briefings and printed materials with infromation about disasters for distribution in the schools and to the public. Now, EMAT is working on a standardized disaster plan for the whole country, while continuing to conduct courses on disaster medicine.
Keywords: disaster courses; emergency medicine; Marmara earthquakes; preparedness; Turkey
Prehosp Disast Med 2007;22(2):s21

(27) Hospital Structural and Functional Assessments after Earthquakes: A Training Module for Hospital Administrators and Emergency Managers

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Background: Hospitals should remain functional during disasters. A group of experts composed of engineers, administrators, and clinicians from Asia came together to develop a teaching module to prepare hospital staff for disasters. The objective of this study is to review a locally developed disaster course used to train non-engineers on the use of simple tools for the assessment of structural damage and functional collapse.
Methods: The methodology employed was to review the curriculum development and implementation, as well as the hospital preparedness for emergencies, and/or the Hospital Emergency Preparedness and Response Course.
Results: In the aftermath of past earthquakes, most hospitals were unduly evacuated, and that this made care giving very difficult for both the patients and the healthcare staff. After being taught how to use the assessment tools including several instructional models, hospital administrators realized that hospital evacuation is not always the correct response during a disaster. Also, several aspects of the functional status of a hospital can be cause for an evacuation. It is recommended that engineers and clinicians undertake more collaboration and cooperation to help improve health care after earthquakes and disasters.
Keywords: assessments; damage; functional status; hospitals; training
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(28) PLESCAMAC (INTERREG III B)

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Objective: The purpose of this project is to train and coordinate the development and management of plans for health emergencies and/or disasters in the Macaronesia region. It also promotes the development of contingency plans for accidents that result in multiple victims. Another of its goals is to create of a support network that is capable of deploying persons and equipment for a disaster response. Also, this training could be used to support other regions and countries that lack the necessary resources, personnel, and infrastructures
Methods: This project consists of a series of carefully planned actions: (1) participation in an international forum; (2) holding four work meetings with all of the project partners; (3) holding of a final meeting to draw conclusions and identify results of the project; (4) accomplishing of research and development (studying and designing health models in case of catastrophes, and studying the locations best adapted for the deployment of material); (5) the accomplishment of a plan for multi-level education; and (6) the buy of four tows of assistance to multiple victims.

Conclusion: Disasters require policies which optimize resources in the event of a disaster, as well as multidisciplinary teams that are properly trained, and specific material for use in the immediate interventions.
Prehosp Disast Med 2007;22(2):s21–s22

(29) Emergency Medical Technician/Paramedic Training in Europe: An Integrated Level of Training is Yet to be Seen

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Introduction: Currently, there are many different systems of ambulance services in Europe; there is no integrated level of training for the paramedical specialist staff. In countries with an emergency doctor system, most levels of training of these staff members are bad or insufficient. In comparison, the level of training with paramedic systems seems good or excellent.
Methods: Lectures were presented on the subject of ambulance services during several conferences in Europe. Trainers and members of professional associations were questioned in person or by telephone communication about their respective level of training during these conferences. Furthermore, ambulance trainings have been evaluated and analyzed during the licensing processes. The development of special lessons for ambulance staff in several European countries was compiled in this study.
Results: The professional guidelines of the different countries have developed rapidly in the last years; however, the extent of training provided has not always met the requirements. This often obstructs the possibilities in developing special professions. In countries with large numbers of volunteers in the public ambulance service, the training level often is low.
Conclusions: In Europe, there is no integrated regulation of emergency medical support by paramedical specialist staff. External influences are guiding the development of training and skill levels. This may result in problems for the European licensing processes and may make the realization of European guidelines to mutual acceptance of diplomas more difficult.
Keywords: ambulance; emergency medicine; Europe; paramedic; training
Prehosp Disast Med 2007;22(2):s22

(30) Disaster Plan Exercise in a Military Medical Academy in Turkey, 2005

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The greatest potential causes of disasters in Turkey are earthquakes. Due to the massive numbers of injured persons that occur after earthquakes, a large number of injured are taken to the hospitals at the same time. Triage is performed in line with the prepared "Hospital Disaster Plans": urgent patients are admitted to the hospital with priority, which helps to decrease mortality and morbidity.

In June 2005, a Hospital Disaster Plan (HDP) Exercise was organized in Gulhane Military Medical Academy Training Hospital, Ankara. The subjects for the simulation were students from the Military Faculty of Medicine, Nursing High School, and Vocational High School of Health. Make-up for the injuries was done using a moulage kit and make-up kit. A triage team and area officials were selected from the volunteer hospital personnel. According to the scenario, after the earthquake, 1,000 injured persons were transported to the hospital via land and air ambulances. The HDP was activated. According to the scenario, 30 injured with the suspicion of chemical contamination were subjected to the decontamination procedure. The decisions of the triage team were evaluated after the exercise through an examination. After the exercise, a feedback meeting was convened and the lessons learned were assessed. It has been suggested that such exercises will enhance the success of the organizations in hospitals receiving mass injuries.
Keywords: drills; earthquakes; hospital; preparedness; triage
Prehosp Disast Med 2007;22(2):s22

(31) Training Course for the Iraq Management System for Emergency Medical Services

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Introduction: In Iraq, number of injured patients are increasing due to the aggravated security. In addition, the emergency medical services system that collapsed during the war, still does not function. There is a deficiency of emergency medical specialists and paramedics. Above all, improving the management of the emergency medical services system, training emergency medical specialists and paramedics is urgent.
Objective: The purpose of this study was to establish guidelines and create an effective management system for prehospital care, hospital care, and disaster medicine in each Iraqi prefecture. Therefore, 24 emergency physicians were invited to provide emergency medical services management system training.
Methods: In order to understand the present conditions/problems of the Iraqi system, participants learned about the emergency medical services management system in Japan, and established a plan of action to build a basic emergency care system in each prefecture of Iraq. Two four-week classes were provided in Japan (2006 September, December).
Results: Based on the results of the training, an action plan for a basic emergency medical services system was established at the Ministry of Health and at each prefecture level.
Discussion: A follow-up of the results of the training should be conduced in the future. In addition, the means to perform an action plan while the security problem is not resolved, remains an issue.
Keywords: emergency medical services; Iraq; management; plan; security; training
Prehosp Disast Med 2007;22(2):s22

(32) Pediatricians Training System for Operation in Emergencies

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The Pediatric Department of the All-Russian Centre for Disaster Medicine ("Zaschita") has been operating since 2001. Besides the permanent staff members of this Department, volunteers also are involved in emergency operations.

A system of selecting and training pediatricians consists of preliminary selection and three basic levels of emergency operation training. The preliminary selection of volunteers includes a complex evaluation of professional qualifications, references, and computerized testing. A special test program provides an evaluation of mental ability, physiological stability, and self-concentration under increasing pressure.

The first level is a theoretical course of covering problems of disaster medicine and special sections for different groups of specialists. The second level consists of field training where various mock emergencies are peformed. Important elements of field training include arranging telecommunication channels and evacuating the injured. The third level is performing the plan during a real emergency. The operation of evacuation teams in the Moscow region presents the everyday, routine model.

The highest level of training is provided working at the Children's Field Hospital "Zaschita" and the aeromobile hospital, EMERCOM. Therefore, 65 pediatricians from different Russian cities participated in the work of Children's Field Hospital in the Chechen Republic in 2001–2002, and in Beslan (2004).

The system of selection and training of disaster medicine service specialists has been successfuy and those completing the training are prepared for field conditions in the situations and countries where necessary.

Keywords: All-Russian Centre for Disaster Medicine; disaster medicine; emergencies; pediatrics; training; Zaschita
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(33) Analysis of Effectiveness of Current Education and Training Methods for Mass-Casualty Incident Management

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The terrorist incident of 11 September 2001 fundamentally changed the United States' perception of safety for prehospital emergency responders. This study is a comparison of the US and the UK prehospital ambulance service safety preparedness for mass-casualty incidents. This is pursuant to a US Fulbright Scholarship.

The danger to responders does not have to be the result of a large-scale, terrorist incident. Natural or technological disasters create hazards as well. This paper considers the safety preparedness of ambulance personnel during mass-casualty incidents. The rationale and objectives of this research are to determine the usefulness of major incident preparation when responders are involved in mass-casualty incidents.

Theoretical and actual safety preparedness and response may differ significantly, as with many prehospital responder issues. This research considers: (1) the UK and US training standards for ambulance personnel; (2) the training provided in each country; (3) the variability of its application throughout ambulance services; and (4) the confidence of responders within the training programs.

Methods will include: (1) rigorous quantitative data acquisition through the use of questionnaires; and (2) observation of paramedics and emergency medical technicians during mass-casualty incident responses (actual or simulation conditions). This paper will present the preliminary analysis of the data.

Keywords: ambulance personnel; current education; management; mass-casualty incidents; preparedness
Prehosp Disast Med 2007;22(2):s23

(34) Pre-Disaster Stress Exposure and Stress Inoculation Training for First Responders

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Introduction: Acute stress reactions can occur when novice first responders treat severely injured individuals or people in cardiac arrest. Sympathetic nervous system acute stress reactions cause predictable biochemical cardiovascular changes seconds after adrenaline enters the rescuer's bloodstream. Field treatment sites with rapidly changing conditions can foster diagnostic and treatment ambiguity. These stressors strain a first responder's cognitive, technical, physiological, and psychological abilities.

Purpose: Normal physiological reactions become task distractions where novel bodily sensations are sensed as unnatural responses. When task distractions receive cognitive processing, patient assessment cues may not be fully processed. Thus, relevant treatment information may not be accessed because of human information processing overload. Consequently, despite their training, novice rescue personnel may display suboptimal patient assessments and treatments.

Methods: Meichenbaum's (1985) stress inoculation training (SIT) model has showed efficacy in lessening cognitive attention to adrenaline-induced physiological responses and the psychological misinterpretations of these responses. Pre-event preparatory stress information, skill acquisition and rehearsal for criterion environments, and application and practice in simulated, acute stress emergency response conditions will be discussed. Classroom training for skill acquisition and retention and stress exposure training for effective performance in the responder's environment will be explained.

Results: The meta-analysis of 37 studies in Saunders et al (1996) found conditions where SIT reduced anxiety and improved performance in stressful situations.

Conclusion: Stress Inoculation Training (SIT) and stress exposure training instructional programs for first responders can lessen the acute stress of emergency response and ideally reduce post-event stress reactions.

Keywords: acute stress reactions; first responders; novices; stress inoculation training; stressors
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(35) Knowledge of Advanced Trauma Life Support Guidelines among Trauma Team Members at a UK Hospital Trust

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Introduction: The aim of a hospital trauma team is to safely and efficiently evaluate and manage emergency patients. The Advanced Trauma Life Support (ATLS) Guidelines represent an accepted foundation for practice. This study investigated the levels of knowledge of these Guidelines among junior doctors at one UK hospital trust.
Methods: An ATLS knowledge-based test was administered to junior doctors who routinely comprise the trauma team.
Results: A total of 43 trauma team members (consisting of 16 foundation year (FY) doctors, 14 senior house officers (SHO) and 13 registrars) completed the test. Seventy-nine percent reported that they felt confident with their role during a trauma call. The mean score in the test was 48%. Across specialities, the mean score of the FYs was 32%; SHOs 60%; and registrars 52%. At SHO and registrar grade, general and orthopaedic surgeons mean score was 72% and 62% respectively, while the mean score for anesthetists and emergency physicians was 48%.
Conclusions: Most junior doctors involved in trauma calls were confident of their roles during a trauma call. Knowledge of ATLS guidelines was dependent on the grade of doctor and their speciality. Senior house officers in all specialities scored higher than registrars, perhaps reflecting their recent preparation for postgraduate examinations. Advanced Trauma Life Support knowledge scores were significantly higher for surgical and orthopedic SHOs and registrars, when compared with anesthetists and emergency physicians. These results reveal a deficiency in ATLS knowledge in the latter two specialities. Senior house officers scored higher than registrars, questioning the necessity of an on-site registrar trauma team cover.
Keywords: Advanced Trauma Life Support, education; hospital; training; trauma team
Prehosp Disast Med 2007;22(2):s24

(36) Triage Exercise Organizing and Make-Up and Moulage Kit Application Course

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One of the important issues concerning triage preparedness is the practical preparedness applications, as theoretical methods may not be enough. The Triage Exercise Organizing and Moulage Kit Application Course, which was organized for the first time in Turkey, was an example of a preparedness activity including both theory and practice. The course was organized as a training course for trainers for the National Medical Rescue Team (UMKE) of Turkey 27–29 July 2006. Twenty-seven UMKE personal from three cities participated. Triage techniques and usage of the moluage kit were taught during the theoretical lectures. These techniques were examined in the field during the last day. The participants worked in four groups: (1) moulage kit usage team; (2) triage medical team; (3) field first aid-tent preparation team; and (4) the causalities. The participants had a chance to work in all four teams. The timing and the correct categorization results of the triage team and the field first-aid tent preparation timing were evaluated.

This course was shown to be the best learning method for triage lectures. The need to practice these techniques in the field was demonstrated where there are many wounded causalities who were prepared with moulage kits. A country's National Medical Rescue Teams should have triage training supported with simulations and organized triage drill lessons. This would allow them to learn more and better organize their triage drills.
Keywords: education; moulage kits; training; triage; triage drills
Prehosp Disast Med 2007;22(2):s24

(37) 2006 Training Exercise of the Second Turkish National Medical Rescue Teams in Kayseri

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To mark the anniversary of the Marmara Earthquake of 1999, a training exercise was conducted in the Erciyes Mountain Region in Kayseri, Turkey 15–19 August 2006. The goal of the exercise was to improve the coordination of the National Medical Rescue Teams (NMRTs) with other governmental and non-governmental organizations. A different format was used for the planning and preparation of the exercise camp. Logistical support was provided from Ankara and Kayseri Provinces. The contact information of the teams was obtained, and the basic needs for the arrival day were provided. The teams were required to be self-sufficient during the five days of the exercise. Civilian volunteers from the region were moulaged and acted as victims. The NMRT units from 11 districts, as well as a team from a neighboring country participated in the exercise. A total of 700 personnel participated in the overall exercise. The exercise was open to the public and the media. There were 12 separate incident sites in which the teams operated according to different scenarios. The NMRT worked in collaboration with the regular Search-and-Rescue Teams. This exercise was the first of its kind in Turkey.
Keywords: drills; exercise; National Medical Service Teams; scenarios; Turkey
Prehosp Disast Med 2007;22(2):s24

(38) Disaster Medicine Should Be a Separate Medical Specialty

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Disaster medicine is a medical specialty. It should not be considered a sub-specialty. With this as a goal, countries

around the world should work toward scientific achievements in this particular field. Considering the enormous disaster potential in Turkey, Turkey should lead the way in contributing to the specialty of disaster medicine. This should be an institutional, social, national, and global responsibility. Worldwide efforts also should serve this need with similar intentions. Disaster specialists should be certified, because that could result in an increase in the number of articles published in international journals. If disaster medicine was considered a separate specialty, global academic advancement could be made in the field. Today, academicians do not seem to be interested in disaster medicine because there is not much they can contribute to the field. But if the specialty could be established, there would be more comprehensive goals in the field of disaster medicine. In this study, the idea that more scientific studies relating to human lives could be performed if the disaster medicine is set as a separate specialty of medicine.

Keywords: disaster medicine; education; international; medical specialty; medicine; Turkey
Prehosp Disast Med 2007;22(2):s24–s25

(39) First Responders First: A Model for Prophylaxing First Responders during an Epidemic

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In the United States, the national plan for population-based emergency vaccinations or prophylaxis calls for protecting first responders (e.g., fire, police, emergency medical services (EMS), public health, and hospital staff) first. The Nassau County Department of Health (NC-DOH) developed a plan to operate first-responder point-of-distribution clinics (FR-PODs) through the county's 71 local volunteer fire/EMS departments and police departments.

The NC-DOH collaborated with these agencies to develop a FR-POD plan. In this plan, the majority of the staffing came from a variety of volunteer groups, including firefighters, emergency medical technicians, Medical Reserve Corps (MRC), and Community Emergency Response Team (CERT) members. Over the course of one year, this diverse group of volunteers received training on the incident command system, basic POD operations, the role of MRC and CERT volunteers imbedded in a FR-POD, and the role of public health during an epidemic. At each training program, pre-/post-tests and a course evaluation were administered. In June 2006, the ability of the volunteers to perform in the FR-PODs was tested during a large scale, county-wide drill that included the police, nine fire/EMS departments, and 12 hospitals. Paid and volunteer workers (n = 674) who received FR-POD training processed 4,246 recipients over 4–6 hours. The plan and the training were successful. Volunteers were able to perform their emergency response functional roles, problems or issues were rapidly identified and addressed, the average thru-put time for recipients was approximately 20 minutes, and 99% of recipients would have received the correct medication as per the established protocol.

Keywords: education; epidemic; first responders; prophylaxis; training
Prehosp Disast Med 2007;22(2):s25

(40) University Students Triage Training (A Preventive Program)

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Introduction: As societies are developing, the necessity for professional interventions in order to protect the health of the people is becoming clear. The increasing population and lack of professional personnel are among the factors increasing the risk coefficient. In addition to reinforcement troops, there are other human resources that can provide suitable support. If medical triage courses are successful in educating students, they may provide potential support for triage. The aim of this research is studying the need for the medical education in triage from the students' perspective.
Methods: The perspectives of 100 students (46 female, 54 male) of various fields in the University of Tehran were assessed using a self-reporting questionnaire.
Results: Of these students, 95% expressed that triage education should be a requirement, 95% believed this education is not merely for reinforcement troops, and 90% believed that an experimental (practical) credit should be added to the university course. Ninety percent declared that education in triage helped increase family members' sense of security.
Discussion: Students from every society can act as a logistic force during a disaster response. Thus, the implementation of a practical credit in the university can help familiarize triage fundamentals and must be considered as a preventive program.

Keywords: education; Iran; personnel; students; triage; university
Prehosp Disast Med 2007;22(2):s25

(41) Use of a Highly-Equipped Manikin in Cardiopulmonary Resuitation Classes Could Improve the Efficacy of Training

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Objectives: Medical students are expected to be able to perform basic life support. A prospective study to assess the level of cardiopulmonary resuscitation (CPR) skills of medical students after completion of a manikin-assisted CPR classes was performed.
Methods: One hour after attending a CPR class, 68 medical students participated in a prospective, observational study. A full-torso manikin was connected to a computer. The students performed CPR for two minutes, and the number of ventilations, average tidal volume, rhythm of compressions, and compression depth were recorded.
Results: The compression rate was between 90–110/min in 82% (56/68) of trials, while 18% (12/68) were >110/min. The compression depth was 40–50 mm in 47% (32/68), <40 mm in 12% (8/68), and >50 mm in 41% (28/68). Four students (6%) managed to perform two rescue breaths, 12 (18%) succeeded in four attempts, 16 (24%) in five attempts, 20 (28%) in six attempts, and 16 (24%) in eight

attempts. Eight students (12%) ventilated the manikin with 500–600 ml air, six (18%) with <400 ml air, and 24 (70%) with >600 ml.

Conclusions: The ability to perform effective cardiac compressions and artificial ventilation was satisfactory. The use of the highly-equipped manikin improved the efficacy of the CPR courses.

Keywords: basic life support; cardiopulmonary resuscitation; manikin; medical students; training
Prehosp Disast Med 2007;22(2):s25–s26

(42) Mouth-to-Mouth Ventilation Restrains Rescuers from Performing Compressions-Only Cardiopulmonary Resuscitation

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Hyphothesis: Proper teaching during cardiopulmonary resuscitation (CPR) training improves the willingness of the rescuers to perform CPR.

Methods: The questionnaire used was constructed by a team of CPR experts. A total of 46 healthcare providers (HCPs) were evaluated.

Results: The age of the subjects ranged from 21–48 years. The sample consisted of nine males and 37 females, 33 of whom were nurses and 13 were medical doctors. Nineteen HCPs (42%) had not attended basic life support courses during the last three years. Twenty-one (45.6%) believed that they had sufficient knowledge of CPR. Three (71.7%) would not perform CPR on a stranger (out-of-hospital), mainly due to their unwillingness to perform mouth-to-mouth ventilations. When they were informed that they could perform compressions-only CPR without being accused of malpractice, 30 out of the 33 HCPs (91%), who earlier stated that they would not perform CPR, now confirmed that they actually would perform CPR.

Conclusions: The knowledge of CPR was not satisfactory. Results from this study indicate that mouth-to-mouth ventilation restrains rescuers from performing compressions-only CPR. The fact that proper information-sharing during CPR training changed the attitude of the rescuers towards the cardiorespiratory arrest victim, illustrates the need for improvement in CPR training.

Keywords: cardiopulmonary resuscitation (CPR); compressions-only cardiopulmonary resuscitation; education; knowledge; mouth-to-mouth ventilation; rescuers; training
Prehosp Disast Med 2007;22(2):s26

(43) Evaluation of Competency-Based, Online Learning Modules for Nurses

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Introduction: Several grants have been received to develop an online curriculum for nurses in emergency preparedness using the competencies developed by the International Nursing Coalition for Mass Casualty Education (INCMCE). A unique aspect of the development of these modules is that they reflect the "How People Learn" Cycle (HPL).

Methods: Five proposed modules were completed on 01 November 2006. This presentation will provide data to determine the effectiveness and efficiency of learning programs designed to educate nurses volunteering for service.

Results: Data analysis is currently ongoing at the writing of this abstract. One initial finding is that learners did not complete all modules in sequence, but rather individual modules. Faculty members have reported that they found the modules to be most useful for stimulating seminar discussions. Additionally, the modules provided a variety of international resources that could be used alone or in combination with other resources in a rich multimedia experience. Overall confidence scores also have increased from pre- to post-module completion. The comparison of face-to-face to online learning was not possible due to the fact that the majority of learners chose the online method. Perhaps, this selection may be a reflection of today's society, in which computer-accessed learning is becoming more of a norm.

Conclusions: The modules currently are being translated into other languages in conjunction with the Pan-American Health Organization. The long-term objective of this study is to provide quality educational materials for volunteer nurses, thereby improving the quality of health following emergency public health events worldwide.

Keywords: computer-based module; educational materials; emergency nursing; emergency preparedness; online learning
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(44) Challenges and Opportunities for Chemical, Biological, Radiological, Nuclear First Responder Training

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The objectives of the European Union-funded research project Innovative Measures for Protection Against Chemical, Biological, Radiological, and Nuclear (CBRN) Terrorism (IMPACT) are: (1) to establish the foundation for an integrated European CBRN counter-terrorism research and acquisition program; and (2) to validate, assess, and demonstrate innovative technological capabilities, operational concepts, and procedures to assist in developing preventive and suppressive crisis management. Current European capabilities to detect and respond to CBRN threats are modest, and are spread among many organizations. This lack of coordination stresses the need to unify the current response capability and establish standards and guidelines for European nations.

Training is an important factor in this context. The objective of a training system is to ensure that units/people involved in the response to CBRN events acquire and maintain an adequate readiness levels to perform assigned mission(s) in accordance with doctrine/strategy. However, this is complex. Tasks must be performed in a variety of environments and scenarios, and several doctrines must be considered. The competencies vary from the individual level to the team and organizational level, from mono-disciplinary

to multidisciplinary, and from theoretical knowledge to complex decision-making in teams.

The available training programs, learning environments, and research programs with respect to CBRN training have been inventoried in order to support formulating the requirements a CBRN training system should meet. It appears that technologically more sophisticated learning environments, such as virtual reality, hardly are available, although these immersive and interactive worlds can be powerful.

The presentation describes the functional requirements a CBRN training system should meet and its various functional components.

Keywords: chemical, biological, radiological, nuclear; education; European Union; first responder; training
Prehosp Disast Med 2007;22(2):s26–s27

Oral Presentations—Theme 3: Emergency Medical Services (EMS) Systems

Session 1: System Design

Chairs: Jerry Overton; Andrew Marsden; J. Luitse

Planning for Prehospital Emergency System Improvements in Iran

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Introduction: In Iran, emergency medical services (EMS) are responsible for responding to medical emergencies. This system employs well-trained and well-experienced personnel, and has been effective. However, due to the rapid population growth and the development of urban regions in recent decades, this system has become increasingly incompetent in its responses.

Methods: Operational research was applied to effect system improvement. This study was performed in 2000–2003. A committee consisting of senior managers and experts was formed. The current situation of the system was evaluated. Essential measures to improve the situation were determined, and it was decided to execute the resulting plan in a timely fashion.

Results: Based on a system evaluation, the most important suggestions included:

1. Increasing the number of ambulances and decreasing the average age of ambulances;
2. Equipping and standardizing the ambulances;
3. Designing ambulances with special functions such as mobile intensive care units;
4. Developing a motorcycle and air ambulance system in some of the larger cities;
5. Increasing the number of emergency stations;
6. Defining a close relationship between the fire and police departments;
7. Employing experts with higher levels of education;
8. Connecting staff at the scene of the incident to the consultant physician in the dispatch center; and
9. Publishing training materials and conducting regular training course for emergency medical technicians.

Discussion: Two decades after an EMS system was established in Iran, the system must be restructured. This applied study, based on scientific programming, has led to an increase the in number of duties, an optimized duty time, and the improvement in the quality of care provided.

Keywords: emergency medical services; improvement; Iran; planning; prehospital
Prehosp Disast Med 2007;22(2):s27

Four Years in Uzbekistan: An Emergency Medical Service Success Story

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The Medical Teams International (MTI)-Uzbekistan Emergency Medical Services (EMS) training program began in 2002. More than 7,000 students have been trained throughout Uzbekistan using a "train-the-trainer" paradigm. In cooperation with Medical Teams International (MTI), local health and education ministry officials provide oversight and support to seven regional training centers throughout Uzbekistan.

In the spring of 2006, a MTI evaluation team visited Uzbekistan to review the status of this ongoing program and examine its progress. The goals of this project were to upgrade EMS training and to increase the effectiveness of EMS in serving Uzbekistanis. The outcome of this project was to reduce premature mortality, morbidity, and disability from emergencies by increasing the knowledge base of first responders and medical providers. The project provides training for medical providers and emergency responders in prehospital emergency care for victims of disasters and traffic crashes.

The evaluation process consisted of two parts. Part One involved a site visit and survey of training equipment at the training centers. Part Two contained a series of focus groups held throughout Uzbekistan. The separate focus groups were comprised of students, Ministry of Health and Defense officials, and staff, respectively. Medical Teams International has built upon the successes of the Uzbekistan program to launch >10 other EMS training programs around the world.

The findings of this evaluation demonstrate the effectiveness of the EMS focused train-the-trainer modality in a developing country.

Keywords: emergency medical services (EMS); Medical Teams International (MTI); prehospital emergency care; training; Uzbekistan
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Impact Assessment of Emergency Response Service in Eight Cities in Andhra Pradesh, India

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Introduction: The Emergency Response Service (ERS) was launched in the state of Andhra Pradesh, India on 15 August 2005. The objective of the launch was to respond to emergency calls of the Medical, Police, and Fire Departments.

Currently, the ERS provides service to a population of 2.5 million people.

Objectives:

1. To profile the patients who have used ERS;
2. To measure the impact of the ERS in terms of ambulance transportation time, prehospital care, and quality of service; and
3. To identify the types of emergencies and the management of the response.

Methods: The study was conducted in eight cities of Andhra Pradesh. Two groups were evaluated: (1) An experimental group was defined as those patients who have used the ERS; and (2) a control group was defined as those patients who have not used the ERS. Approximately 1,000 patients comprised the experimental group, and 500 were in the control group. The sample size for each of the eight cities was based on probability proportionate to size (PPS). The patients in the experimental group were selected randomly, and the patients in the control group were selected randomly from local hospitals. A structured data collection was used to elicit the information. The reference period was four months from the date of the survey. All data were analyzed using SPSS.

Results: The initial results indicate that: (1) mean ambulance transportation time from the site of the incident to the hospital was 13 minutes; (2) 87% of the patients in the experimental group received prehospital care; (3) 90.6% of the patients in the experimental group rated the quality of care as good; and (4) the survival status of the patients was 93.7%. Qualitative data of ambulance services also were collected and will be reported in the results.

Conclusions: These initial results indicate an overall positive impact of the ERS in Andhra Pradesh, India.

Keywords: ambulance; Emergency Response Service; India; prehospital
Prehosp Disast Med 2007;22(2):s27–s28

Ambulance Transport and Services in the Rural Areas of Sweden, Scotland, and Iceland

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Ambulance personnel frequently deliver initial care to patients with critical illnesses or severe injuries. Therefore, it seems intuitive that it would be beneficial to have highly trained ambulance personnel in order to provide optimal care. However, skill maintenance of personnel often is difficult in rural ambulance stations. Geography and weather provide challenges to the ambulance service providers in northern European rural areas.

FSA University Hospital in Iceland, the Centre for Emergency and Disaster Medicine (AKMC) in Sweden, and the National Health Service (NHS)-Western Isles in Scotland received a grant from the INTERREG III Northern Periphery Programme to work on the "Ambulance Transport and Services in the Rural Areas" project. The objective of this project was to provide an overview of the present status of ambulance transport and services in the three participating regions.

Members of the working groups reviewed the current status of prehospital services in their country. The authors reviewed pertinent literature on this subject as well as the reports from each partner.

The main finding of the project is that the emergency medical services (EMS) systems in the three northern rural areas have many similarities. However, there are significant differences in several areas, e.g., the number and distribution of ambulances, service operation, education of ambulance personnel, and first responder schemes. The authors believe that this collaborative project will foster improvements in the provision of ambulance transport and services by partners of each region. It is important to increase the number and quality studies of in this field, with emphasis on patient outcome and utilization or resources.

Keywords: hazards; infectious disease; isolation facilities; nuclear, biological, chemical; training; viral hemorrhagic fever
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Traffic Crashes in Crete (1996–2006): The Role of EKAB-Crete

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The decline in traffic accidents that has been noted throughout Europe is not present in Crete, a favorite holiday destination. The extent of the problem and interventions made by the Emergency Coordination Center of Crete (EKAB-Crete) are presented.

Demographic, topological, and qualitative data from 1996-2005 have been analyzed. The primary data source was 315,000 emergency calls recorded in the EKAB-Crete database. Data analysis revealed that 60% of traffic accidents involved people of 20–50 years of age, who were primarily male (72% of dead, 80% of injured), and Greek (79% of dead, 85% of injured). The EKAB-Crete intervened with: (1) a unified emergency coordination center (ECC); (2) new sectors in areas with high accident rates; (3) advanced equipment in BLS and ALS-MICU ambulances; and (4) continuing education. The ECC employs Global Information System and Global Positioning System technology and telemetry for biosignals in ambulances, as well as online recording of emergency calls, and up-to-date triage protocols.

Despite the prevalence of accidents in Crete, the EKAB-Crete has succeeded in reducing: (1) the mean dispatch time; (2) the mean time to the accident scene from 10–12 minutes to 5 minutes in metropolitan areas; and (3) the mean time spent in the emergency ward by increasing the therapeutic interventions on-site. Other methods of reducing the number of accidents and deaths include: (1) continuing education on traffic safety starting in primary school; (2) information to visitors who are accostumed to driving on the left side of the road; (3) the creation of a Prehospital Trauma Life Support center; (4) better road supervision; (5) the use of separating bars on national roads; and (6) an improved road infrastructure.

Keywords: Crete; Emergency Coordinataion Center of Crete; emergency medical services; traffic crashes
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Session 2: Prehospital Triage and Networking

Chairs: Jerry Overton; J. Luitse

Prehospital-Hospital System Network: A Model for Improving Health System Efficiency in Disaster Management

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Introduction: Hospitals and prehospital organizations are a part of a disaster management system. An effective response to any disaster requires appropriate incident data. Hospital and prehospital communication plays an important role in directing and controlling the incident and in the proper distribution of victims to the receiving hospitals. Since there is no definite communication and direction center between hospitals and prehospital systems in Iran, this study was intended to develop a model for these centers.
Methods: A team consisting of telecommunications, computer science, information technology, emergency management, and health experts was organized. Indicators were defined for information and communication networks. Then the organization of the network was implemented and the tasks of the participants were defined.
Results: Organizations selected for work in this network consisted of hospitals, emergency medical services (115), police (110), fire services (125), the Red Crescent, military health centers, and a regional disaster task force. The most important indicators used were the: (1) exact location of the incident; (2) number of victims; (3) condition of the victims based on triage data; (4) estimated arrival time; (5) number of transferred victims; (6) equipment required; (7) number of active ambulances; and (8) traffic conditions. Based on these indicators, appropriate software and a database were developed.
Discussion: The health support function is defined as a part of the Iran Disaster Management System. However, the lack of a unique health information and communication network was a main cause of discord and for the inappropriate use of resources during a disaster or emergency situation. Developing and establishing this network can improve the disaster response of the health system in Iran.
Keywords: communication; disasters; hospital; management; prehospital
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The Dutch Victim Traffic and Tracing System

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Obtaining real-time information on the location of victims of major incidents being treated on-scene or in transit to a hospital always has been a major challenge. A national online Victim Tracking and Tracing System is being introduced in the Netherlands as a possible solution to this problem. The online victim tracking and tracing system was evaluated during an exercise involving 40 traffic victims. An independent research institute, the Netherlands Organisation for Applied Scientific Research, scanned the communication during the exercise and afterwards received the databases of the information systems involved, and used the communications log files could be used to determine whether data was communicated in time.

Analyses indicated that the network in ambulances with mobile routers worked well, and no systematic errors were observed by the evaluating body. Three additions to the network layer were proposed to make the Victim Traffic and Tracing System more robust: (1) better reciprocal data communication between ambulances; (2) an additional satellite gateway; and (3) agreements with mobile operators (Quality of Service agreements) in the event of a disaster (priority guarantee).
Keywords: ambulance; online tracking; rescue; satellite communication; victim tracking
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Prehospital Physiological Scoring: An Aid to Emergency Medical Services?

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Introduction: Admissions to at United Kingdom emergency departments (EDs) have increased by almost two million (>16%) in the last 10 years. Paramedics have demonstrated enthusiasm for "treat and street"/"treat and refer" policies allowing alternative dispositions to transfer to the emergency department, provided that a robust safety system supporting their decision-making process exists. Use of physiology-based triage systems have been demonstrated to have value in the emergency department, but the authors are not aware of any physiologic scoring system available to emergency medical services (EMS) to support decisions to not transport patients to the ED.
Methods: Patients complaining of shortness of breath and transported by EMS to the urban ED between 12 July 2006 and 11 September 2006 were identified, and a version of the Medical Early Warning Score (MEWS) incorporating spot oxygen saturation (SpO_2) levels, self-care status, and social circumstances was used to calculate their physiologic score. Emergency department admission were considered "appropriate" when a patient was subsequently admitted to hospital or underwent physiologically stabilizing treatment.
Results: Of the 3,157 patients transported by EMS, 242 complained of shortness of breath. Twenty-seven EMS report forms were missing. Of the remaining 215 patients with report forms, 133 (62%) were admitted, and 139 (65%) were judged as "appropriate" ED admission. No patient with a MEWS <2 was admitted to the hospital or received stabilizing treatment. The area under the Receiver Operating Curve (ROC) curve for "appropriate" ED admission was 0.710 (95% confidence interval (CI) 0.639–0.78).
Conclusions: This preliminary study demonstrates the value of physiologic scoring system to support EMS decision-making and identify physiologically stable patients who could be directed to alternative sources of care. As a safety net, there is over-triage the eliminate the possibility of under-triage. Using the MEWS criteria, approximately one third of the patients in this study could safely have been diverted to other healthcare providers.
Keywords: emergency department; emergency medical services; Medical Early Warning Score; prehospital physiological scoring; patient transport
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Services and Transportation

Public Pressure and a Scientific Approach to Evaluate the Potential Benefits of a Full-Scale Paramedic Program

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Problem: In the province of Quebec, Canada, primary care paramedics (PCP) provide basic life support, administer a limited number of medications, and supply semi-automatic external defibrillation. The system does not provide advanced prehospital paramedical care. Following PCP union and media pressure, the health minister mandated the "Agence d'évaluation des technologies et des modes d'intervention en santé" to provide official scientific advice on the added value of introducing paramedic-administered, full advanced life support.
Methods: The effectiveness and safety of advanced emergency care was analyzed through a comprehensive scientific literature review.
Results: Examination of the scientific data on the efficacy and safety of advanced life support led to four major findings: (1) there is not enough solid evidence to support the introduction of a generalized advanced-care program; (2) preliminary data show that advanced care could be beneficial for respiratory distress and cardiac chest pain; (3) limited evidence indicates that it is neither beneficial nor detrimental for non-traumatic cardiopulmonary arrest; and (4) advanced care is associated with adverse effects in the case of endotracheal intubation in young children and in the on-scene treatment of trauma in general.
Conclusion: Despite media pressure in favour of the introduction of a full scale paramedic program, the official scientific report recommended to increase basic training of PCP and to introduce a limited number of advanced procedures. The advice was well received and is currently incorporated into an official policy by the Quebec ministry of health.
Keywords: Canada; emergency medical services; evaluation; paramedic; science
Prehosp Disast Med 2007;22(2):s30

Ergonomics of Inter-Hospital Transfers of Critically Ill Patients: A Qualitative Study Using Grounded Theory

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Introduction: Inter-hospital transfer of critically ill patients is an integral part of healthcare systems. Ambulance services are a key element of these transfers. Within the seemingly straightforward clinical scenario exsist a variety of organizational pitfalls and equipment, health, and safety dilemmas. Most ambulance services in the UK do not have dedicated critical care transfer trolleys available to provide a smooth transfer for the patient. Current trolleys are often small for the patients and lack manoeuvrability. There are no dedicated panels to accomodate the numerous monitoring equipment, ventilators, and drug infusion devices. The resulting hazards to patients and medical personnel are manifold. Ambulance staff, doctors, and nurses would benefit from better interface design and ergonomics. In order to achieve this, multi-agency working groups with wide representation of experts in biomedical engineering are required.
Methods: A qualitative review based on interviews and observations is being conducted using a grounded theory approach to assess the present state of critical care transfer ergonomics in the pre-hospital environment, specifically refering to transfer trolleys in the UK. This review will address the problems faced by medical staff during such transfers, and the potential and prevalence of critical incidents. A set of recommendations will be constructed using information derived from the study.
Conclusions: Close cooperation with the ambulance service and equipment engineers can result in high quality, ergonomically desirable transfer systems which comply with regulations. This should reduce injury to patients, transfer teams, and ambulance staff.
Keywords: ambulance; equipment; ergonomics; grounded theory; reccommendations; transfer trolleys
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Session 3: Transportation Including Hospital EMS Operations

Chairs: Andrew Marsden; Darren Walter; D. Wulterkens

All Over the World

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Introduction: A retrospective, descriptive analysis was performed for all of the medical-emergency air transports carried out by the Hellenic National Emergency Medical Service (HNEMS) during 2005 (just one year later from the three fatal crashes of medical-Helicopters in the area of Greece.
Methods: All calls received by HNEMS concerning a medical-emergency air transport (medevac) and all medevac operations made by the HNEMS in 2005 were abstracted.

	Minimum	Maximum	Mean	95% CI
distance (km)	43	1,930	470	261–1,824
time of flight (min)	0	1,197	1,185	70–34,419
Total distance covered	>330,000 km (>8 time Ecuador)			

Table 1—Distance that patients fly

Results: A total of 2,339 were transferred by air-ambulance: 1,343 by the Greek Navy: 991 from mainland, and 321 from islands.

In those cases in which the patient was transfer by Navy, are gone to flight for more than 160,000 kms (>4 times Ecuador).
Conclusions: The steady improvement and expansion of the HNEMS, has been marked by the continuing rise of the number of the medevac operations, as well as the continuing improvement of the primary medical and nursing care. Air transportation of the patient is not always the best option globally speaking. The right patient, to the right medical-infrastructure, the right way, and the right time: safer, faster, proper way.

Keywords: air-medical; evacuations; Greek Ambulance Service; helicopter
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Evolving Physician-Staffed Helicopter Emergency Medical Services System (Doctor-Heli) in Japan

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Although thousands of people were killed or injured in the Great Hanshin-Awaji Earthquake that occurred in 1995, only 17 patients were transported by helicopter within 72 hours from the onset. However, a huge number of helicopters flew over the disaster site. The catchphrase, "There is no effective disaster medical relief without daily Helicopter Emergency Medical Service System (HEMS)" was widely accepted and systems started 20–30 years ago in European countries. Therefore, present status and future perspectives of HEMS in Japan was evaluated by comparing the impact with that of the pioneering countries. Physician-staffed HEMS (Doctor-Heli) was started in Japan in 2001. By 2006, 11 base hospitals have committed resources to this program. In the fiscal year 2005, the total number of patients who were treated and transported by Doctor-Heli was 4,098. Chiba Doctor-Heli is the most active—2,791 patients were treated from Oct. 2001 till Sep. 2006. Trauma (49%), Cerebrovascular accidents (15%), and Cardiovascular disease (12%) occupied one fourth of total number of missions and 88% (2,458) of the patients were direct transports from the scene to the hospital compared with 11%(301) was inter-hospital transport. Of the patients 59% (16,459) were transported to base hospital and 38% (1,052) to the other hospitals.

The Emergency Medical Network of Helicopter and Hospital (HEM-Net) stressed that in order to diminish "preventable deaths", it is critical to expand the Doctor-Heli service nationwide as early as possible. Finally, it is concluded that the flight cost of Doctor-Heli should be covered by medical insurance in order to distribute the cost burden and that the law concerning Doctor-Heli System should be established quickly.

Keywords: costs; demography; doctors; helicopter EMS systems; Japan
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Comparison between Helicopter Emergency Medical Services and Ambulance Transportation to Rescue People Injured by Traffic Crashes in Japan

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Background: The use of helicopters for the provision of emergency medical services (EMS) has become common especially in Western developed countries; however, this system has not been widely implemented in Japan. The main reason for this is financial difficulty. There have been only a few studies that have assessed which measure the cost and cost-effectiveness of helicopter EMS.
Purpose: Transportation by EMS helicopters was compared to ambulance transportation when rescuing people injured in traffic crashes in Japan.
Subject: Data from the Japan Trauma Data Bank (JTDB) were used. Seventy people, of whom 26 were transported by helicopter and 44 by ambulance to the Nippon Medical School Chiba-Hokusoh Hospital, were analyzed.
Method: Because the distributions of background factors and important prognostic factors were different between the two transportation groups, an inverse-probability-of-treatment-weighted method was used to adjust confounding factors. The endpoints were physiological severity (RTS), predicted probability of survival (TRISS), number of days in the hospital, and the cost of hospitalization.
Results: Male patients comprised 69% in the helicopter group and 75% in the ambulance group; the mean ages were 43 and 41 years for the helicopter and ambulence groups, respectively. The mean ISS scores were 20 for the helicopter group and 22 for the ambulence group. With the adjustment of several confounding factors, the average number of days in the hospital was 17 days shorter in the helicopter group ($p = 0.032$), and the cost of the hospitalization was lower in the helicopter group by about 1,100,000 yen on average ($p = 0.027$).
Conclusion: The usefulness of the helicopter EMS system is suggested.

Keywords: ambulance; cost-effectiveness; emergency medical services helicopter; traffic crashes; transportation
Prehosp Disast Med 2007;22(2):s31

Using Medical Helicopters to Evacuate Children with Severe Trauma

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Timely transportation (during the so called "golden hour") to specialized hospitals is an actual problem of rendering emergency medical care to children who have been injured

in different emergencies (including car accidents). The dense traffic situations pose a considerable obstacle in modern societies.

A total of 104 children (age from 2 months to 15 years) injured in Moscow and Moscow region were evacuated by medical helicopters to specialized hospitals of Moscow within the period (01 January 2001–31 January 2006). Evacuation was held from the place of accident in Moscow (64) and Moscow region (23), as well as from medical preventive institutions of Moscow region (17). Two patients were evacuated simultaneously in 11 cases.

The main causes of the injuries were car and road crashes (95); in 9 cases every day and street traumas were responsible. The majority of evacuated children had concomitant (49), multiple (7), or combined (6) traumas. The state of 49% of children was considered as "severe" and "extremely severe" and required infusion support in up to 28% of the children. Evacuation distance of varied from 3 to 135 km, evacuation duration lasted from 2 to 49 minutes. No patients died during air evacuation.

Using of medical helicopters in modern, big cities improves the quality of medical assistance by the rapid delivery of injured children to specialized hospitals. That fact is the leading role of survival.

Keywords: children, etiology; helicopters; trauma
Prehosp Disast Med 2007;22(2):s31–s32

Session 4: System Developments: New Horizons and Evaluation

Chairs: Darren Walter; D. Wulterkens

Fire Service Medical and Prehospital Care Training in the United Kingdom

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Introduction: Fire and Rescue Services (FRSs) in the United Kingdom (UK) generally do not provide Emergency Medical Services (EMS). However, required response times for FRS often are shorter than are those for EMS, and firefighters frequently are in a position of needing to provide unsupported, immediate, medical assistance to casualties at the incidents to which they have responded to. The current level and nature of prehospital medical training delivered to UK firefighters was assessed in this study.
Methods: Questionnaires were mailed to individuals that have received firefighter, medical training at each of the 62 FRSs in the UK. Telephone follow-up was conducted 1–2 weeks after the questionnaires were sent. Investigator analysis of course syllabi were conducted.
Results: A total of 49 (79%) questionnaires were returned. Of these, 61% (30) FRSs train all firefighters in advanced prehospital care beyond statutory requirements (three FRSs to a nationally agreed standard: "First Person on Scene"); 13 train to statutory first aid requirements; and six train to different levels depending on employment status. Thirty-five FRSs train firefighters in the administration of supplemental oxygen and six provide training in the use of automated external defibrillators. Standard training lasts a mean of 4.5 days (range 2–8). No FRS could guarantee that each appliance attending an incident would have a member of the crew trained in prehospital medical care.
Conclusions: The medical training and, therefore, the medical competencies of firefighters vary considerably across the UK. An adequate and appropriate level of medical training must be designated for all UK FRSs. In partnership with the Chief Fire Officer's Association, a national standard should be established so that UK firefighters acquire standard medical competencies.

Keywords: emergency medical services (EMS); Fire and Rescue Services (FRSs); prehospital; standards; training
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Difficult Intubation on the Street or in Operation Rooms: Does it make a Difference for Experienced Anesthesiologists?

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Introduction: This study investigates the management of a difficult airway in a group of six experienced anesthesiologists in the operation room setting (ORS) and in the out-of-hospital setting as part of the Helicopter Mobile Medical Team (OHS-HMMT).
Methods: From 15 April to 31 July 2006, the anesthesiologists recorded on a validated registration form (RF) the number of intubation attempts, Cormack and Lehane score (C&L), subjective view of the difficulty of each intubation, aids and techniques used to facilitate intubation and the application of the Dutch difficult airway algorithm (DDAA). A difficult intubation was defined as a C&L score >3 score.
Results: Data from intubations of 67 (ORS) and 15 (OHS) patients were collected. In the ORS, 98.5% of intubations (n = 66) were successful, 91% at the first attempt. Six patients (9%) had a C&L score >3; two intubations (3%) were subjectively assessed as difficult. In the OHS, 100% of intubations were successful, of which 73% (n = 11) at the first attempt. Five patients (33%) had a C&L score >3; two (13%) were subjectively difficult. When the first intubation attempt was not successful, the anesthesiologist used cricoid pressure in 23% (n = 7), improved sniffing position in 20% (n = 6), increased elevator force in 16% (n = 5), or a gum elastic boogie in 13% (n = 4) of the cases. These techniques decreased the C&L scores for three patients. In all difficult airway situations, the DDAA was followed.
Conclusion: Experienced anesthesiologists perform similarly during intubations performed inside and outside the OR. The percentage of DDAA application in the OHS is greater than in the ORS.

Keywords: anesthesiologists; intubation; operation room; out-of-hospital setting
Prehosp Disast Med 2007;22(2):s32

Wireless Distribution and Use of Biosensor Data

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During emergency response, use of wired bio-sensors creates problems for the response workers. It is difficult to transport patients and checking of data requires that you to be next to the patient.

This presentation reports on a work in progress regarding the development of a wireless bio-monitor system that supports distribution and use of biosensor data by all involved parties during emergency response.

The system is being developed in close cooperation between doctors, paramedics and information technology specialists using qualitative methods including ethnographically inspired field work and simulations of future work.

The system consists of small bio-monitors with sensors and a unique identifier which is placed onto the victims. The bio-monitors communicate wirelessly with one or more base-stations, which distribute the signals locally at the incident site and to remote coordination centers and emergency departments. Ongoing evaluations already have demonstrated the usefulness of being able to move patients without having to take care of wires and being able to inspect bio-sensor data without being next to the patient.

However, new problems also have emerged when no wires connect a patient to a display, e.g., how do you know whose data you are looking at? And, when an alarm goes off because the bio-sensor data of a patient reaches a critical threshold, how do you find the patient?

In order to support medical responders on site and at coordination centers/emergency departments, the biosensor data is being supplemented with photographs and descriptions of the injury, injury mechanisms, and geographical position information.

Keywords: biosensors; disasters; information; technology; wireless
Prehosp Disast Med 2007;22(2):s33

Challenges of a Global Level Playing Field for Emergency Medical Systems Transport Safety—A System Safety Emergency?

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Introduction: Ambulance transport safety is a complex and multidisciplinary field involving acute and emergency healthcare delivery, automotive transportation safety, occupational health and safety, driver training, public health, and public safety. As such, it has been shown to be hazardous. This project's objective is to identify global spectrum in Emergency Medical Services (EMS) transportation safety systems standards.

Methods: A comparative analysis of general automotive, ambulance vehicle, driver training, and transport-related occupational safety standards for the US, Canada, Australia, UK, Sweden, Norway, and Germany was conducted by a multidisciplinary team.

Results: Non-EMS passenger vehicles had more stringent safety standards than did EMS vehicles in each region, except for Australia. EMS vehicle safety standards differed markedly across the nations (0–24 G testing requirements). Formal ambulance safety performance standards did not predate 1999.

Emergency Medical Services transport-related occupational safety standards ranged from no EMS standards in the US to the stringent standards in the European and Australian areas of scene visibility, vehicle interior and stretcher ergonomics, head protection, and protective clothing. Regarding driver training, the US ranged from nothing to a 2-day course and no specific licensure required; Australia, Canada, and the UK have structured, comprehensive driver training programs; Norway has a three-month driver training program with special licensure.

Conclusions: There is a large disparity in EMS transport safety standards globally. Emergency Medical Services transport system safety standards generally lag behind the principles of accepted automotive and occupational transportation safety. In a setting of well-described EMS safety hazards, the disparity between EMS safety and general automotive safety, and between occupational health and safety standards, is unacceptable.

Keywords: automotive safety; emergency medical services transportation; global standards; occupational safety
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Where is the "State of the Art"? New Initiatives and Innovations in Ambulance Transport Safety in the Developed and Developing Countries

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Emergency medical services transport safety bridges the disciplines of EMS health care, ergonomics, automotive safety engineering, occupational and systems safety, and public safety.

Globally, the nature of EMS systems is diverse. The spectrum of challenges includes limited funds or resources and hostile environments (urban congestion/violence, politics/warfare and treacherous geography). Also many safety initiatives never reach the published literature; rather, they are applied to a specific service or region, and quality assurance remains internal if evaluated at all.

This study identifies a spectrum of new initiatives that have been developed, or are being developed, to advance EMS transport safety, globally, over the past 5 years.

Emergeny Medical Services transportation safety initiatives were identified via a literature search, (engineering and medical), internet search engines and a multidisciplinary expert panel.

Automotive and transportation safety engineering, system design and policy initiatives were identified in both developed and under-developed worlds. Engineering approaches included: ambulance crash testing, occupant restraint and protective equipment design; new intelligent vehicle technologies (driver monitoring and feedback devices, vehicle-environment technologies) in both developed and under-developed worlds, and novel vehicle design initiatives. System design focus included a safety task force, a safety seminar development, risk benefit awareness, and new policies (revised ASA, CEN standards and KKK specifications and Z15 standard.)

Emergency medical services transport safety has become an increased focus in both developed and underdeveloped worlds with new innovations and developments. Identifying new initiatives and advances is complex. There is a need for communication between EMS research and development teams across environments and a need for enhanced communication with automotive safety and systems safety engineering.

Keywords: ambulance transport; emergency medical services; developed countries, developing countries; innovations
Prehosp Disast Med 2007;22(2):ss33–34

Session 5: Resusciation

Chairs: Darren Walter; R. Koster

Strategies for Rescuing Patients from Building Collapses

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Introduction: A large number of different tools to extricate victims out of difficult positions after accidents or disasters is available. Therefore, sufficient instruction and training are necessary. Furthermore, the strategic use of these tools and the physical and psychological stress to victims and rescuers are important factors.
Methods: Different rescue team members who participated in international missions were interviewed. Reports from medical and rescue teams involved in urban search-and-rescue (USAR) activities were collected and analyzed. Further experience was gained during exercises and training courses.
Results: A structured approach is necessary in order to rescue injured persons or persons trapped after a building collapse. Safety issues are crucial because many victims and rescuers have been killed during USAR operations. Furthermore, the psychological stress to the rescuers is high, since in international disaster operations, the number of victims rescued alive is low. In many cases, when persons were rescued alive, an insufficient medical infrastructure to meet their needs finally resulting in their deaths.
Conclusions: These observations must have a bearing on the composition of rescue teams. To reduce the risks to victims and rescuers, specialized safety advisors are necessary. Standard procedures not always are sufficient. Flexible solutions and an accurate reconnaissance of the situation are vital for a safe operation. Cultural empathy is necessary, especially during disaster operations, when persons with different cultural background are affected. The medical treatment of the extricated victims must be organized in advance. The collaboration of USAR teams and medical teams must be standardized.

Keywords: building collapse; extrication; humanitarian crisis; rescue teams; search-and-rescue
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Evaluation Strategy in the Prehospital Emergency Care Coordination Centre in Crete

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Introduction: In addition to accepting calls, the coordination dispatch centre (DC) of the Emergency Care Department in Crete dispatches available recourses and evaluates calls according to severity for efficient management. In Greece, the Crete DC is unique in using computerized information systems (IS) for triage, coordination and call management. The IS has been operational since 1997 replacing the use of handwritten cards.
Objective: The aim of this study was to evaluate the effectiveness and efficiency of the Crete DC regarding the quality of call management and triage. The questions investigated were: (1) how does the severity score of an incident evaluated by the DC correlate with the onsite physician's diagnosis?; and (2) how do the computerized triage protocols contribute to effective triage?
Methods: The severity color-coding of incidents (red, orange, yellow, green) was correlated with the Hector Emergency Score (HES), and the physician diagnosis. The HES is calculated based on the Glasgow scale, vital signs, arterial pressure, oxygen saturation, and cardiac and respiratory frequency.
Results: In a preliminary analysis of 1,052 incidents, >55% of the severity scores given by the DC agree with those calculated onsite. Categorizing calls using both the HES and physician diagnosis increases the specificity of evaluation taking into account severe incidents with normal vital signs.
Conclusions: In Crete, the quality of incident triage can be attributed to a variety of factors including computerized triage protocols, intensive continuing education, leadership and skills. Evaluation results contribute to the continuous improvement of the dispatch centre of the emergency care department in Crete and the application of similar methods in Greece and abroad.

Keywords: coordination; Crete; dispatch centre; emergency medical services (EMS); severity
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Multi-Disciplinary Special Teams Provide Emergency Medical Services Systems with the Capability to Handle Disaster Situations in a Reliable, Safe, and Economical Manner

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The formation of special teams within emergency medical services (EMS) and its allied agencies provides a solid foundation for responding to disaster situations. By focus-

ing resources on a group of highly motivated, cross-trained individuals, responding agencies can reap rewards not typically seen in pre-hospital response.

Few EMS systems have the necessary funding to equip and continuously train all of their staff in the specialized response to large-scale events. A Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Response team, Heavy Urban Search-and-Rescue (HUSAR) team, and Tactical Response team, which includes tactically trained paramedics (TEMS), can quickly send an expertly trained and equipped team of individuals into an austere environment.

The continuous, multi-agency training within these teams provides strong communication channels that are far superior to typical day-to-day responses. Yearly, on a rotating basis, and in conjunction with the local teaching hospitals, each special team participates in a mass casualty training exercise to simulate patient care from onset of injury to definitive care within the hospital setting. A website is created to incorporate the benefit of online education into the pre-exercise portion of these events. Each agency has input into the educational content so as to maximize the training potential of everyone involved.

The use of special teams in hot and warm zones should minimize the unnecessary exposure of front-line workers to events that are beyond their level of training.

Keywords: chemical, biological, radiological, nuclear, and explosive (CBRNE); disaster; emergency medical services (EMS) systems; special training; teams
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Case Study of Issues Related to Emergency Rescue Efforts in Engineering Disasters under Low Temperature Conditions Based on Experience from the Chorzow Disaster

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On 28 January 2006, an engineering disaster occurred at the exhibition hall of the International Katowice Fair. The roof of the exhibition hall buckled under the weight snow accumulated on top it. More than 700 participants in a pigeon racing exhibition were inside the hall, and upon the collapse of the room more than half were trapped and immobilized. Furthermore, there was a sudden change in the victims' thermal exposure, from about 20°C to as low as -19°C. Many of those victims suffered crush-types of trauma. The toll of the incident came to a total of 65 dead (including two deaths in the hospital) and 173 injured who were hospitalised. Autopsy results characterised the injuries suffered by the victims as severe trauma and suffocation caused by the inability to breathe due to being crushed under the structure. Most of the wounded suffered from various degrees of hypothermia. Those trapped under the rubble were evacuated within between 15 and 330 minutes.

The consequences of the low temperature's impact on the victims were characterized, as well as the specific problems related to carrying out rescue operations under extreme temperature conditions. The main conclusions drawn from the almost 31-hour rescue effort have been analysed. The rescue efforts involved elements of Urban Search and Rescue and emergency medicine in mass-casualty incidents under extreme weather conditions. The rescue was exceptionally technical and challenging, since it was necessary to search for people confined by the collapsed metal and glass structure blanketed by snow.

Keywords: collapse; crush syndrome; extreme weather rescue; hypothermia; Poland
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The Okaloosa Experience: Developing an Evidence-Based Emergency Medical Services System, Based on Common Sense

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As a major tourist destination and an area that routinely entertains mass gatherings and often is hit by hurricanes and floods, the Okaloosa County Florida Department of Public Safety and the Division of Emergency Medical Services (OCEMS) began looking for functional solutions to their disaster risks. They sought solutions that brought forth tangible, long-term methods that facilitated greater EMS system development as well as disaster preparedness and response.

In doing so, the OCEMS implemented the first 100% evidence-based, casualty and disaster triage methodology and resource management process in the world. This award winning EMS service piloted the methodology as part of its ongoing efforts to continually improve the value of EMS provided to their residents and guests.

The pros and cons the OCEMS encountered in implementing measures beyond routine chaos reduction, currently called "disaster triage" will be discussed. The OCEMS looks towards a national standard for patient outcome-driven triage and disaster resource management.

At the end of this presentation, the participants will be able to: (1) identify two or more issues related to advancing EMS, especially when it goes against the national psyche; (2) contrast current EMS practices with evidence-based EMS practices; and (3) demonstrate how validated operational protocols eliminate many of the subjective variables common in the provision of emergency care.

Keywords: emergency medical services; evidence-based system; floods; hurricanes; tourism
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Pandemics: Planning—Emergency Medical Services Perspective

Chairs: Frank Archer; R. Coutinho

Pandemic Influenza: Australian Paramedic Risk Perception Study

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As front-line health professionals, paramedics will be among the first members of the health community to face exposure during a pandemic event. In Australia, the prehospital workforce has had little experience in working in infectious environments such as an influenza pandemic. Currently, there are limited published studies on the perceptions of the prehospital workforce on pre-event risk, in particular, of paramedics and their partners. A collaborative national and international team led by the Australian Centre for Pre-hospital Research commenced a national study of paramedics and their partners to examine these perceptions. The results of this research will be directed toward the development of responsive health and infection control messages for paramedics and their families. Preliminary analyses highlight some important messages for the prehospital community These messages include that among paramedics, high risk perception is associated with less confidence in the provision of adequate strategies by employers to protect them from exposure, and higher likelihood of being unwilling to work during pandemic conditions. However, knowledge about avian influenza and/or human pandemic influenza does not appear to be associated with employer confidence, levels of concern, or willingness to work in pandemic conditions (OR = 1.91; 95% CI = 1.1–3.3). Paramedics report that the information most likely to mitigate their level of perceived risk relates to the confidence in their Personal Protective Equipment and intra/inter-organization communications and alert systems. The results of this study will be described in detail and an analysis will be provided of the strategies that are in place in the Australian emergency prehospital services to respond to these messages.

Keywords: Australia; pandemic; paramedics; perceived risks; prehospital
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Ambulance Call-Taking and Dispatch Data: New Approaches to Population-Based, Infectious Disease Surveillance and Triage

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In Australia, traditional strategies for infectious disease surveillance are based on data reported from Emergency Departments and General Practice and Locum Services. To date, little attention has been paid to the potential utility of emergency prehospital call taking and dispatch data to contribute to infectious disease surveillance. In early 2006, a collaborative national and international team led by the Australian Centre for Pre-hospital Research, commenced a national study of paramedics and their partners to examine the perceptions and expectations of these groups to working and living in pandemic conditions and to examine the utility of ambulance call taking and dispatch data to inform population-based models for surveillance and triage. Using data secured from the Melbourne Ambulance Service and the Queensland Ambulance Service, researchers mapped the ability of these data to mirror data provided by the Victorian Infectious Disease Reference Laboratory on influenza-like illness (ILI). The results demonstrate the potential utility of using emergency prehospital data to complement existing infectious disease surveillance systems. In addition, these results provide a platform for the development and testing of a model of syndromic surveillance at the point of call-taking. The results from this study will be described and the importance of emergency prehospital data to public health applications will be demonstrated.

Keywords: call system; dispatch; pandemic; paramedic; prehospital; surveillance
Prehosp Disast Med 2007;22(2):s36

Session 6: New Horizons and Evaluation

Chairs: TBA

Two-Year Experience (2005–2006) in Improving Clinical Services in West Aceh after the 2004 Tsunami

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On the fifth day after the Tsunami struck Aceh Province, a medical rescue team formed as a joint collaboration between Gadjah Mada University and Sardjito Hospital arrived in Meulaboh, the second largest city in Aceh Province. Their mission was to restore services at the Cut

Nyak Dhien Hospital in Meulaboh city, which had functionally collapsed. In the following weeks, a technical team from the Department of Public Health at Gadjah Mada University arrived in Banda Aceh and supported Zainul Arifin Hospital in management assistance. Based on the plan proposed by those two teams, a recovery and development programs were arranged.

Observational evaluation of one component of the Clinical Services Program, i.e establishing better Disaster and Medical Emergency Services was performed during 2005–2006.

Observed results of the Clinical Services Program include (1) recovery of emergency services in the Emergency Department and Operating theatre within the first week after the Tsunami; (2) improvement of response time and an increase in the number of emergency patients served; (3) establishment of an Emergency System in the form of a day-to-day ambulance services network; and (4) development of capability of setting up a Medical Rescue Team for Disaster relief.

The recovery and development program was effective and its goals were achieved, although it continues to depend on external aid. The program should be continued with the goal of achieving reliance on local resources rather than external aid.

Keywords: Aceh Health Reconstruction; Disaster Relief Program; emergency system; Gadjah Mada University; Sardjito Hospital; hospital management
Prehosp Disast Med 2007;22(2):s36–s37

Poster Presentations—Theme 3: Emergency Medical Services (EMS) Systems

(45) 2005 Belleview and Sosoliso Air-Crash in Nigeria

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Introduction: Aviation history in Nigeria began in 1925 when the first airplane was said to have landed in Lagos, Nigeria. The growth of the aviation industry in Nigeria has led to a concomitant rise in aviation catastrophes. Since 20 November 1969, when the first fatal aviation mishap occurred, Nigeria has experienced 48 serious air crashes. Of notable memory are the ADC Boeing 727 plane crash (07 November 1996) at Ejinrin in Lagos and, more recently, the October 2005 Bellview air crash that took place in Ogun State and the December 2005 Sosoliso air crash at Port-Harcourt.

Methods: The various aviation crashes in Nigeria and repeated lapses in the management of each event are analyzed. Documented lapses from this investigation include: (1) obsolete communication equipment; (2) epileptic or non-functional radar; (3) and old and poorly maintained aircrafts with prolonged delays in responding to distress calls.

Results: The results confirmed that air crashes in Nigeria are characterized by similar lapses with no evidence of lessons learned or innovation to either mitigate against damage from such events or to improve rescue of such victims.

There is clear evidence of buck-passing from one agency to another responsible for the management of such events.

Conclusions: This presentation highlights the deficiencies in the Nigerian aviation sector with particular emphasis on the most recent air crashes and provides positive suggestions to remedy these abnormalities, with the intent of making air travel safer for all.

Keywords: aviation crashes; disaster; lessons learned; Nigeria; responses
Prehosp Disast Med 2007;22(2):s37

(46) Lessons from the Peripheries: The Role of Small Mobile Medical Teams in the Pakistan and Indonesian Earthquakes

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Nations affected by the Pakistan and Indonesian Earthquakes sought international assistance to help with the overwhelming number of casualties. Medical communities responded world-wide, resulting in the rapid proliferation and influx of medical relief teams during the acute (<72 hours) and post-acute phases. Most medical teams were deployed in centralized medical clinics or hospitals. The experiences of a Singaporean medical relief team during the post-acute phase of the Earthquakes are described in this presentation. The Singaporean team was deployed in the more inaccessible mountainous regions in Pakistan and rural villages in Indonesia. The team was comprised of small, highly mobile medical units consisting of 1–2 doctors assisted by a small number of paramedical and ancillary staff. Patients requiring medical attention were found during household visits. The patients treated had the following characteristics: (1) incapacitated by recent injuries or loss of care-givers, preventing access to more centralized medical facilities for treatment and follow-up; (2) incomplete recovery with early discharge due to lack of tertiary-care or hospital overcrowding; and (3) prior treatment by passing international medical teams with no follow-up care. Patients who required urgent or more advanced medical care were referred to appropriate medical centers. To allow for continuity of care, patients who required follow-up treatment were introduced to other healthcare groups and local administrators. Such mobile medical units could also perform outfield reviews of known patients if circumstances prevented their access to medical facilities. Coordination between the local and international, the centralized and mobile medical groups was of paramount importance.

Keywords: coordination; earthquakes; international medical response; Singapore
Prehosp Disast Med 2007;22(2):s37

(47) A Retrospective Analysis of Cancelled Helicopter Emergency Medical Services Missions in Nijmegen

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Introduction: In 2005, 40% of all Helicopter Emergency Medical Services (HEMS) Nijmegen dispatches were cancelled. The background for cancellation is poorly understood and little is known about the condition of the patients involved. This study was designed to elucidate the background of the HEMS dispatch cancellations.
Methods: All of the HEMS Nijmegen dispatches in 2005 were reviewed. The cancellations were traced through a chain for the HEMS database, the ambulance services, and the emergency department of the receiving hospitals. Data were collected on the reasons of dispatch, the timeframes of the cancellations, the conditions of the patients, and the treatment provided.
Results: There were a total of 599 dispatches, of which 240 were cancelled (40.1%). For 205 of the cancellations, grounded ambulance data were found. The reasons for canceling were very diverse. For 135 cases, one or more vital signs were recorded. Twenty-three of the patients had a suboptimal revised trauma score (RTS). The majority of patients were treated by paramedics according to the national ambulance protocol. Five patients were intubated and 11 patients had an Injury Severity Scale (ISS) score ≥16. There were a total of 151 patients that were transported to a hospital and 62 hospital records were found. Thirty-four patients were admitted with an average length of stay of 7.3 days. Five patients (3.3%) were admitted to intensive care unit and no emergency surgery was performed. Thirty-three patients (22.2%) died at the scene, two died in emergency department, and seven died at an unspecified time following the event.
Conclusions: Data collected throughout the chain is far from complete. Therefore, registration of cases and communication between the HEMS and hospitals must to be improved. An option could be the use of an online registration system.
Keywords: ambulance; dispatch cancellation; helicopter emergency medical services (HEMS); hospital data
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(48) Primary Care Referrals to the Emergency Department of the Regional Hospital of Kébili

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Introduction: Primary care referrals to the emergency department of the regional hospital are a current practice. The goal of this study is to determine the frequency and to evaluate the appropriateness of primary care referrals to the emergency department of the regional hospital in Kebili.
Method: This retrospective study concerned 380 patients referred and admitted to the emergency department between 01 February 2005 and 31 March 2005. Data were collected for each patient that included various epidemiologic and clinical characteristics. The evaluation of the appropriation of medical referrals was judged according to a model based on the level of the care provided in the emergency department.
Results: The referrals rate was 14% (1/5th followed-up for chronic diseases). Of the cases, 83.4% (317) were considered appropriate according to the model, with an admission rate of 31.3% (119). Emergency department doctors overestimated the appropriation of these referrals. This is shown by a facility in the indication of the complementary examinations (82.1%), calls of the specialist (83.4%), and a low rate of feedback (6%).
Conclusion: Over-estimation of the appropriation of these primary care referrals reflects a lack of emergency medical training among doctors at the emergency and primary care levels.
Keywords: appropriateness; emergency department; Kebili; primary care referrals; regional hospital; training; triage
Prehosp Disast Med 2007;22(2):s38

(49) System Development in the Izmir 112 Command Control Center and Hospital Coordination

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Introduction: Izmir 112 Prehospital Emergency Medical Services serves 3,370,886 people with 40 ambulance stations. Police and firefighting departments have their own telephone numbers. Izmir 112 ambulances responded to 55,165 cases in 2005. Izmir 112 ambulances responded to 90.2% of cases in <10 minutes. This is important because time is a key factor in proper treatment for injuries and illness. While important, ambulance response times are not the only predictive criterion for efficient treatment of patients.
Method: The Izmir 112 Command Control Center (CCC) was renovated in August 2006. Before this date, call responders answered approximately 20,000 calls per day. After the renovation, robots answered these calls, making the number of calls/day decline 50%. Caller waiting time also declined. The hospital coordination system was improved to show available intensive care unit/ventilator capacities and specialized physicians working certain shifts online. This was done in an effort to prevent time delays.
Results: Twenty-six hospitals, including two university hospitals, were introduced to the system immediately. Every hospital updated their available intensive care unit/ventilator capacities every two hours between 07:00 h and 13:00 h, and indicated what specialized physicians were working the shifts. While time-intervals are not available to determine the effects of the newly developed system, healthcare providers provided positive feedback.
Conclusion: The Izmir 112 CCC was renovated to provide coordinated prehospital emergency services, emergency services, and intensive care units in Izmir. Time to definitive treatment of injured and medically ill patients decreased.
Keywords: ambulance response time; Command Control Center; hospital coordination; treatment; Turkey
Prehosp Disast Med 2007;22(2):s38

(50) Creating a New Generation of Leaders in Emergency Preparedness and Response

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In the fall of 2005, the George Washington University School of Medicine (Washington, DC) introduced a new educational opportunity for medical students. The "Track Program" encourages students to pursue an area of interest outside of the standard clinical curriculum, such as disaster preparedness, global health, healthcare policy, community/urban health, healthcare research, and medical education. During the four years, the "Emergency Preparedness Track" has integrated didactic and experiential components to teach students to meet current and emerging threats and public health crises. Mentorship and instruction is provided by nationally recognized leaders in: (1) healthcare system preparedness and response; (2) first responder training and education; and (3) homeland security policy. Additionally, students are placed into internships and electives with regional and national disaster response agencies. The Emergency Preparedness Track Program assists students in developing a broader perspective for their careers in medicine and encourages them to pursue paths of leadership in the disaster preparedness and response arena.

Keywords: disaster preparedness; education; Emergency Preparedness Track Program; health care; medical students
Prehosp Disast Med 2007;22(2):s39

(52) Determination of Life or Death Belgrade Emergency Medical Services (EMS) Experience 94

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Belgrade emergency medical services (EMS) doctors witness approximately 3,000 deaths each year. People primarily call EMS when someone: (1) experiences a sudden loss of consciousness and the caller cannot identify whether this person is dead or alive; (2) appears dead despite not having suffered recent unconsciousness; and (3) someone who suffered from terminal, malignant, or chronic systemic illness has died or is displaying apparent signs of being dead.

Classification of incoming emergency calls in congruence with the Emergency Medical (EM) Index improves the emergency response times and the degree of intervention efficiency. For a prompt resuscitation start, timely emergency classification is major factor and probably is conducted more accurately when the EM Index is used than an informal method.

Doctors reports confirmed that in all cases involving resuscitation, the success rate is significantly higher when the medical emergency is classified using the EM Index (12.5–8.2%).

In summary, many more lives could be saved if the standard procedure for classifying medical emergencies always is used instead of individual evaluation methods, which are still dominant in the average EM triage.

Keywords: classification; deaths; Emergency Medicine Index; emergency medical services; resuscitation
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(53) Mass Casualties: Belgrade Emergency Medical Service Response Method

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Rescue personnel help to search for and evacuate some of the most critical casualties from an event, i.e., traumatized and fatally injured people. To prevent casualties with potentially fatal injuries from being left behind, all casualties initially must be triaged to their current state of health. The use of the four established classification categories may minimize the likelihood of making errors (Former YU Military doctrine). It also is vital that blood banks and other organizations are provided with timely, factual information from the place of the accident regarding the number of casualties. Today, it is possible to communicate such information via radio transmitter to all surgery departments. However, the actual practice is to transport casualties to the biggest and/or nearest hospital. Emergency Medical Service (EMS) could prevent overcrowding hospital departments with potentially inaccurate admittance of casualties by using the selected radio channel and receiving feedback accordingly.

During the chemical explosion in Baric, EMS teams were the first to respond, despite the risk at the scene. The police force eventually assumed responsibility for managing the scene and directed the medical teams back to safety in order to coordinate and oversee the rescue operation. The scenario above could serve as a model on how to utilize a makeshift, mobile triage management unit at the place of the accident in order to save valuable time for those injured, prevent potential loss of life, and improve the overall prognosis of the emergency response outcome.

Keywords: communication; information; radio transmitter; rescue operation; rescue personnel; triage
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(54) Incident Management on Dutch Motorways: First Aid Can Save Lives

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Incident Management (IM) is the entire set of measures aimed at clearing the road as quickly and safely as possible when a crash occurs on a Dutch motorway. Crucial aspects involved in IM are traffic safety, protecting the interests of possible casualties, and damage control.

Road traffic crashes are responsible for a substantial part of the delays in the Dutch motorway system. This loss has been estimated to be about 20% of all lost vehicle hours. This percentage is expected to rise in the coming years as a result of the continuous increase in traffic. Calculations indicate that without IM, this loss could be 50% higher than at present.

Despite a successful implementation of the IM program a couple of years ago, there still are possibilities for further improvement. One possibility is the provision of first aid by the immediate bystander to assist critically injured casualties of traffic crashes. The function and role of bystander first aid in the emergency support chain often is neglected.

Detailed forensic research is needed to establish the immediate cause of death. From this, adequate first aid practices can be deducted to ensure efficient and effective bystander first aid immediately after an road traffic crash.

Keywords: bystander; first aid; incident management (IM); the Netherlands; road traffic crashes; traffic
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(55) Rural Emergency Medicine in Nigeria: A Need for Change

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At the turn of the Century, the status of rural emergency medicine in Nigeria virtually was non-existent. This significantly contributed to the high mortality and morbidity rates on Nigerian roads. What existed at best, was a scoop-and-run policy with its own peculiar problems. Within the last decade, the growing need to restructure the organized trauma sector has become more evident. This has led to the establishment of governmental and non-governmental organizations to address these problems.

This paper reviews the status of rural emergency medicine in Nigeria. It highlights some of the problems and peculiarities in this area of trauma care and propose how these problems can be resolved.

Keywords: morbidity; mortality; Nigeria; non-governmental organizations; rural emergency medicine
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(56) Systematic Review of Biphasic Versus Monophasic Waveforms for Transthoracic Defibrillation in Out-of-Hospital Cardiac Arrest

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Introduction: Transthoracic defibrillation is a potential life-saving treatment for patients with ventricular fibrillation (VF) and hemodynamically unstable ventricular tachycardia (VT). In recent years, the use of biphasic waveforms for defibrillation has become more common than the use of monophasic waveforms for defibrillation. Biphasic waveforms are characterized by an initial positive current flow followed by a reversal to a negative current flow. Clinical trials of internal defibrillation and transthoracic defibrillation of short-duration arrhythmias have demonstrated the superiority of biphasic waveforms over monophasic. Biphasic waveforms are increasingly being used for transthoracic defibrillation of long-duration, out-of-hospital cardiac arrest.

Objective: The objective of this study is to assess the effects of biphasic waveforms compared to monophasic waveforms for defibrillation of patients experiencing out-of-hospital cardiac arrest.

Methods: A search of the Cochrane Central Register of Controlled Trials (The Cochrane Library Issue 4, 2006), MEDLINE (January 1990 to July 2006), and EMBASE (January 1990 to July 2006) will be conducted. Additional papers will be sought through hand-searching of relevant conference procedings and reference lists of articles. The selection criteria will be based on randomized, controlled trials comparing biphasic and monophasic waveforms in out-of-hospital cardiac arrest. The primary outcome is the return of spontaneous circulation. Secondary outcomes include: (1) first shock efficacy; (2) efficacy of up to three shocks; (3) delivered current; (4) adverse outcomes; and (5) survival to hospital discharge. Two reviewers will independently assess the study quality and abstract data using a standardized data collection form. Disagreement will be resolved by consensus. Data abstraction will include information on adverse outcomes.

Results: The work is ongoing and results will be presented at the World Congress on Disaster and Emergency Medicine (WCDEM) 2007.

Keywords: biphasic waveforms; cardiac arrest; monophasic waveforms; out-of-hospital; transthoracic defibrillation
Prehosp Disast Med 2007;22(2):s40

(57) Carotid-Pulse-Check Performance by Soldiers: Effects of Cardiopulmonary Resuscitation Training and Effects of Physical or Combined Physical/Psychological Stress

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Background: Currently, the carotid-pulse-check is restricted by the International Liason Committee on Resuscitation/ERC Guidelines for health professionals, mainly due to the poor performance by non-health professionals.[1] It remains controversial whether soldiers undergoing cardiopulmonary resusciation (CPR) training should apply carotid-pulse-check, but this decision may be affected by the trainability and performance of the soldiers. Therefore, the impact of CPR training and stress (physical and psychological) on the carotid-pulse-check performance of soldiers was tested.

Methods: Soldiers (n = 86) received standardized, theoretical, CPR instructions, including a demonstration of the carotid-pulse-check technique. Later, the soldiers performed carotid-pulse-check on a supine, normotensive, normofrequent, person under each of five conditions (A-E): Before (A) and after (B) practical ("hands-on") CPR-training; before (C) and after (D) defined physical exercise; and (E) under combined physical/psychological stress. Data are provided as means ±em, with significance set at $p < 0.05$.

Results: The time required for carotid-pulse-check significantly decreased from solely theoretical training (A, 9.7 ±1.0 seconds) to practical training (B, 7.7 ±0.7 seconds). In contrast, the carotid-pulse-check-time significantly increased from rest-condition (C) to physical exercise condition (D, 9.3 ±1.2 seconds). Surprisingly, the shortest time required for carotid-pulse-check was achieved under combined physical/psychological stress (E, 5.0 ±0.4 seconds).

Conclusions: Standardized resuscitation training significantly improved practical resuscitation skills, (e.g., the carotid-pulse-check to accepted performance levels).[1,2] Although

significant improvement from theoretical to practical training was demonstrated, this benefit is lost under conditions causing physical stress. Interestingly, the best performance occurred under the conditions of combined physical/psychological stress.

Acknowledgements: The authors thank the Sanittsdienst/ Bundeswehr for supporting this project.

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Keywords: cardiopulmonary resuscitation; carotid-pulse-check; emergency medical services; soldiers; stress; training

Prehosp Disast Med 2007;22(2):s40–s41

(58) Survey of Local Emergency Medical Services Missions in Kashan during the Six-Month Period from 21 March–22 September 2006

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Introduction: Kashan is a city located in the province of Esfahan, Iran located between the city of Esfahan and Tehran, the capital. It has an area of 9,617 km2, and a population of 270,000 persons. The 115 emergency medical services (EMS) systems in Kashan have three urban (six ambulances) and six road (seven ambulances) stations. Ambulances are staffed by two crew members trained in rescue, stabilization, transport, and basic care of traumatic and medical emergencies.

Objective: The objective of this study was to describe the current state of EMS in Kashan.

Methods: In a retrospective descriptive study, patients treated by the 115 EMS during a six-month period were surveyed using a review of command center records. Data included: (1) total missions performed (urban and road); (2) type of mission (trauma or medical emergency); and (3) response time (RT), interval between call receipt and arrival on-scene. Descriptive statistics were used to analyze the results.

Results: Of the 5,616 missions during the study period, 4,619 (82.2%) were urban and 997(17.8%) were road missions. Among urban missions, 2,603 cases (56.3%) were due to trauma, and 2,016 (43.7) were medical emergencies. A total of 57.1% of urban trauma emergencies and 86.7% of road missions were due to motor vehicle crashes. The mean RT for urban and road missions were 4.412.16 min and 10.446.37 min respectively.

Conclusions: The results of this study indicate motor vehicle crashes are a major problem in Kashan. The EMS response time is acceptable in urban and road area but unfortunately we have no any rural services and must improve our services in rural area.

Keywords: emergency medical services (EMS); Iran

Prehosp Disast Med 2007;22(2):s41

(59) Outcome of Prehospital Cardiac Arrest Cases Treated by the National Center for Emergency Medical Services (EKAV) during 2006 in Heraklion, Crete, Greece

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Objectives: The aim o this study was to review of all of the cases of prehospital cardiac arrest treated by a hospital's emergency medical services (EMS) personnel during a 10-month period from January through October 2006.

Methods: Retrospective analysis was conducted of prospectively collected data, including: (1) patient demographics; (2) arrest rhythm; (3) duration of arrest; (4) time to cardiopulmonary resuscitation (CPR) initiation; (5) time to first defibrillation; (6) time to Return of Spontaneous Circulation (ROSC); (7) status at hospital admission; and (8) status at hospital discharge.

Results: From January through October 2006, 67 cases of prehospital cardiac arrest were treated by the EMS personnel. The mean value for the age was 59 ±12 years, 67% were male. Of the arrest rhythms: (1) 62.7% were asystole; (2) 23.9% were ventricular fibrillation; (3) 13.4% ventricular tachycardia. Of the 67 cases of prehospital cardiac arrest, 23 (34.3%) patients were alive at hospital admission (survivors). For these survivors, the mean time to CPR initiation and mean time to first defibrillation were 6 ±4 minutes and 15 ±12 minutes respectively, whereas the corresponding values for non-survivors were 9 ±5 and 1,914 minutes. For the survivors, the mean time to ROSC was 17 minutes (range: 1–62 minutes). Only 30.4% of patients alive at hospital admission were discharged alive, with a mean time to CPR initiation and mean time to first defibrillation of 3 ±4 minutes and 4 ±4 minutes respectively.

Conclusions: During this 10-month period, approximately one out of three cases of prehospital cardiac arrest arrived at the hospital alive; however, only one of 10 cases was still alive at hospital discharge. Timely initiation of effective CPR and defibrillation (whenever indicated) are the main aspects that must be targeted in order to improve survival rates in pre-hospital cardiac arrest.

Keywords: cardiac arrest; cardiopulmonary resuscitation (CPR); emergency medicine services; personnel; prehospital

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(60) Aeromedical Transportation in Japan—Recent Progress

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The efficacy of air medical transport for saving the lives of injured soldiers first was realized during the Korean War in the 1950s. Therefore, it is interesting that the development of a national air medical transport service in Japan only occurred in 1999. Since then, the Dr-Heli system has been used to transport experienced emergency physicians and nurses from advanced emergency medical centers to the

sites of accidents. Using a double-engine helicopter, the service is the first dedicated aeromedical transport service in Japan. Currently, there are only 10 stations in Japan, but >35 are envisioned for the future. The system is a national project funded by equal contributions from the national and local governments. Unfortunately, the financial burden confronting many local governments means that their funding has become a bottleneck for expansion. However, the economic benefits associated with preventing "preventable deaths" have been demonstrated through the Dr-Heli system. Additional problems with deploying aeromedical facilities in Japan include difficulties with landing on major transportation routes. In addition, while communication between aeromedical facilities and the police has improved markedly, further cooperation with fire departments, police services, and road management bodies is necessary. The effectiveness and advantages of medical transport by helicopters in urban areas also must be assessed. While these aspects have been demonstrated in suburban areas and areas with insufficient medical services, they have yet to be considered and assessed in major cities.

Keywords: aeromedical; development; emergency medical services; funding; helicopters; Japan; transport
Prehosp Disast Med 2007;22(2):s41–s42

(61) Return of Spontaneous Circulation and Neurologic Outcome after Administering LUCAS-CPR for In-Hospital Cardiac Arrest

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Introduction: Recently, LUCAS-CPR was introduced at H. Hart Hospital in Belgium.
Methods: From February until June 2006, LUCAS-CPR was used for all cases of adult in-hospital cardiac arrest after the arrival of the in-hospital emergency team. The Glasgow Coma Scale (GCS) Score was used to determine the neurological outcome 24 hours after discontinuing sedative drugs. At three months, the outcome was determined by the Cerebral Performance Categories (CPC). Results are presented as mean ±standard deviaton.
Results: Thirty-five patients received in-hospital LUCAS-CPR. Thirteen were female. The mean value for the age was 72.6 ±10.6 years. In 16 cases, the arrest occurred in a monitored department (emergency department, coronary care unit, intensive care unit), and a 19 occurred in a general ward. All but one of the arrests were witnessed. The mean duration of manual, closed-chest compression before LUCAS-CPR was 6.6 ±4.91 min. The first rhythm was asystol in eight patients (22.8%), PEA in 19 (54.3%), and VT/VF in eight (22.8%). Return of spontaneous circulation was obtained in 22 of 35 patients (62.9%). Twenty-four hours after discontinuing sedative drugs, the GCS was favorable (14 or 15/15) in 15 cases (42.8%). At three months, the CPC was 1 in 4 (11.4%) and of 2 in 5 patients (14.3%). One patient had a CPC of 3 and one had a CPC of 4.
Conclusion: LUCAS-CPR is a good alternative for manual closed-chest compression for patients with in-hospital cardiac arrest. ROSC ratio (62.9%) and early neurologic outcome determined by the GCS (42.8%) are high. Long-term follow up by CPC supported a positive outcome (CPC 1 or 2) in 25.7%.

Keywords: cardiac arrest; circulation; hospital; LUCAS-CPR; return of spontaneous circulation
Prehosp Disast Med 2007;22(2):s42

(62) Role of the Greek Aeromedical Evacuation Office during Early Reperfusion of Patients with ST-Elevation Myocardial Injury

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Introduction: In Europe, coronary artery disease is responsible for 40% of deaths of persons ≤75 years age. About 1:3 of acute myocardial infarctions (AMI) are fatal before treatment, mostly within the first hour after symptoms appear. Aeromedical transport of cardiac patients quickly is developing internationally. In-flight coronary thrombolysis, temporary pacing, and defibrillations have been documented as safe and improve morbidity and mortality rates.

The Aeromedical Evacuation Office of the National Center for Emergency Health Care (EKAB) has been the official governmental institution for providing prehospital emergency medical care in Greece since 1994. The EKAB provides high standards of aeromedical services.
Methods: An international bibliography review, statistical analysis of the EKAB database, review of the protocol of in-flight coronary thrombolysis, and the scientific estimation of Greek Aeromedical Evacuation Office practices has been elaborated.
Results: A meta-analysis of six trial studies, which included 6,000 patients, documented that the average time to treatment from AMI symptoms setting decreased by 58 minutes after prehospital thrombolysis, resulting in 17% decrease of in-hospital mortality. Decreasing one hour to treatment with prehospital thrombolysis application saved 21 lives/1,000 patients that were treated within in the time frame of three hours from onset of symptoms.
Conclusions: A pilot study of in-flight coronary thrombolysis and aeromedical transportation for primary Percutanerous Transluminal Coronary Angioplasty, in collaboration with the Greek Cardiological Society and Greek Task Force for Invasive Cardiology, provides an opportunity to compare international and Greek results with the aim of further development of this practice in Greece.

Keywords: aeromedical; emergency medicine; evacuation; Greece; myocardial infarction
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(63) Functions of Hyogo Emergency Medical Center

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The Hyogo Emergency Medical Center (HEMC) was established in 2003, and is intended to save lives by adjusting care between each organization during disasters.

First, there are several training courses for medical staff and medical volunteers in Hyogo Prefecture, disaster medical assistance teams (DMATs), and well-trained and well-

equipped medical teams activated during the first 48 hours after the onset of a disaster. Training courses also exist for overseas medical staff, including a disaster medical management course for Andean countries (Bolivia, Columbia, Ecuador, Peru, Venezuela), a training course in the reinforcement of mitigation and preparedness in disaster medicine (the Philippines), and the Hyogo overseas technical trainees program (Indonesia, Nepal).

Secondly, the HEMC regularly holds a meeting with the core hospitals and government organizations, such as the firefighteres, the police, and the Self-Defense Force, to prepare for a disaster.

There also is an alliance called the DRA (Disaster Reduction Alliance), which is composed of the 15 organizations (WHO, JICA, ORCHA, UNCRD, etc.) in Kobe that share information in order to reduce the risk of the disasters.

Finally, relief workers are sent to the scene of disasters as a part of the government organizations, where they cooperate with the non-governmental organizations.

Relief workers have been dispatched to domestic and foreign disasters, such as Typhoon Tokage, the Niigata Chuets Earthquake, the train derailment in Amagasaki, the Bam Earthquake, the Sumatra Earthquake and Tsunami, the earthquake in Pakistan, and the Java Earthquake.

Keywords: disaster; disaster management assistance team; government organizations; Hyogo; Japan
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(64) Utilization of a Nurse-Operated Call Center in Clalit HMO in Israel during the Israel-Lebanon War, July–August 2006

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Introduction: Clalit Health Services (CHS) is one of the world's largest Health Maintenance Organizations (HMOs). Clalit runs a nurse-based Call Center (NCC) that provides medical consulting on various medical issues. All calls are documented.

During the Israel–Lebanon war in 2006, the northern part of Israel experienced heavy bombardments. The supply of health services was limited. The NCC continued to be active during the conflict.

Methods: An analysis of NCC data comparing utilization by CHS members in the north during war and pre-war periods was conducted. The NCC utilization ratio during four time periods (pre-war, war 1, war 2 and post-war) was then compared, in the affected areas and in the rest of the country. Data were analyzed considering the main causes for the calls.

Results: The average of daily calls in affected areas during wartime was 186 compared to 126 during the previous six months. Significant differences were noted in abdominal pain (4.66 vs 3.35, $p = 0.02$), issues of pregnancy (13.8 vs 7.07, $p < 0.001$), and instructions for the use of medications (9.60 vs 7.46, $p = 0.004$). Call rates in affected districts were 142, 239, 256, and 148 calls per 100,000 in pre-war, war 1, war 2, and post-war time periods respectively. These results compared to 278, 250, 264, and 271 per 100,000 in the non-affected districts.

Conclusions: A significant increase in the number of calls processed in war-affected areas. Calls returned to baseline numbers immediately after war. There was a decline in the number of calls from people in other parts of the country. The NCC was an important source of medical information during the war, partly filling the lack of regular health services during this period of crisis.

Keywords: health services; Israel; medical consultation; nurse-operated call center; war-affected areas
Prehosp Disast Med 2007;22(2):s43

(65) Too Late and Too Long for Babies! The Role of Emergency Transportation and Trained Paramedics in Preventing Infant Mortality in Rural North India

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Objective: To study the role of emergency transportation and the lack of timely paramedic resuscitation on fetal outcome in labor patients in rural Uttar Pradesh.

Methods: A retrospective analysis of 1,480 babies born to 1,422 pregnant mothers from May 2003 to April 2006 in a secondary-level center in rural India was done. There was one triplet and 56 twin pregnancies. The distance traveled and the time from the onset of labor was analyzed in relation to fetal outcomes.

Results: There were 105 fetal deaths (7%) out of 1,480 deliveries. It was found that the risk of fetal death is 2.89 times greater when the mother in labor was brought from a distance of >10 km (CI = 1.89–4.44 km). It also was found that mothers who delayed arrival to the hospital for >6 hours after the onset of labor were 2.75 times (CI = 1.56–4.92) more likely to have fetal death occur.

Conclusions: With an infant mortality rate (IMR) of 83/1,000 live births, the state of Uttar Pradesh has one of the highest infant mortality rates in the world. Uttar Pradesh alone contributes 25% of all infant mortalities in India. The provision of emergency transportation systems and trained paramedics will help India to achieve the Millennium Development Goal of IMR <27 per 1,000 by 2015. This will be the contribution of emergency medicine in preventing the fetal death, which often is a tragic consequence of a normal physiological occurrence.

Keywords: emergency transportation; India; infant mortality rate; mothers in labor; paramedics
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(66) Role of Emergency Medical Services Agencies during Hospital Evacuation or Need for Mass-Patient Transfer

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Introduction: Many studies detail the lack of surge capacity among hospitals during a disaster or public health

emergency. The idea of using emergency medical services (EMS) agencies to rapidly transfer patients from one facility to another in order to increase a hospital's ability to care for a large influx of patients has been postulated. Additionally, questions concerning how to evacuate a hospital and send patients in rapid fashion to nearby medical centers during an emergency have been raised.

Methods: A compilation of all licensed ambulance providers in the seven counties of the greater New York City Metropolitan-Hudson Valley region was gathered. A simple, random sample of the transporting EMS providers from each county was obtained, and these agencies were contacted to complete the survey tool.

Results: Of those responding, 15.1% stated they would not be able to provide staffed ambulances to area hospitals or medical centers to assist in transferring patients to other facilities or rapidly discharging patients to make room for disaster victims. Of respondents, 12.1% stated that they had formal agreements with acute or non-acute care hospitals to provide dedicated ambulances in the setting of a natural or man-made disaster, terrorist event, mass-casualty incident, or public health emergency. All of the agencies that had agreements were private, for-profit ambulance services.

Conclusion: Hospitals must begin to draft agreements with private ambulance companies to provide dedicated, staffed ambulances for the purpose of hospital evacuation or mass-patient transfer. Hospitals should not rely upon municipal "9-1-1" emergency telephone system activated EMS systems to contribute ambulances for these purposes.

Keywords: ambulance services; emergency medical services; evacuation; hospitals; mass-patient transfers
Prehosp Disast Med 2007;22(2):s43–s44

(67) Altered Standards of Care for Emergency Medical Services Personnel during Public Health Emergency

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The emergency medical services (EMS) system is one of the key components in disaster, terrorism, and public health emergency preparedness and response. During the past 30 years, the EMS system has developed into an effective means of delivering prehospital medical care. Public health agencies typically provide regulatory oversight of EMS. Recent studies have demonstrated the value of an EMS/public health partnership in increasing a community's preparedness for disasters and other public health emergencies.

In this session, participants will be presented with the potential roles of prehospital medical providers (emergency medical technicians (EMTs) and paramedics) in augmenting the traditional public health and medical response to disasters and public health emergencies. Current and proposed expanded scope of practice models will be presented along with suggested educational modules for altered standards of care. Additionally, model protocols for utilizing EMTs and paramedics for skills, including, but not limited to, vaccine administration, antibiotic/antiviral dispensing, case and contact tracing, surveillance, and healthcare facility evacuation and mass-patient transportation, will be presented.

Keywords: emergency medical services (EMS); emergency medical technicians (EMTs); paramedics; public health emergencies; standards of care
Prehosp Disast Med 2007;22(2):s44

(68) Preliminary Report of Chest Pain Triage System with an Electrocardiogram Time of 10 Minutes

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Introduction: The Emergency Department (ED) of Hospital Quinta D' Or has experienced an increase in patient visits during the past decade. Many of these cases have involved chest pain. The correct identification of patients with acute cardiac ischemia remains challenging. Diagnostic strategies for the evaluation of the patient with chest pain have basically two aims: (1) the prompt identification of an acute myocardial injury (AMI) eligible for reperfusion; and (2) the exclusion of an acute coronary syndrome in an accurate and timely manner to allow the patients to be discharged appropriately.

Objective: To present a preliminary report on the implementation of a chest pain triage system that includes a quick clinical examination complemented by an electrocardiogram (ECG) in all patients presenting to the ED with chest pain.

Methods: From 17 October to 30 November 2006, all patients with chest pain were evaluated using a standard ECG. The target was a maximum 10-minute interval between the admission to the ED and completion of the ECG (ECG time).

Results: During this period, 92 patients with chest pain were registered. The mean values for the ECG time and the length of stay in the ED were 26.05 and 185 minutes respectively. Before the new triage system was implemented, the mean value for the ECG time and the length of stay in the ED were 31 and 225 minutes respectively.

Conclusion: After the implementation of a chest pain triage system, the time for the reperfusion treatment of patients with AMI with ST elevation can be reduced, and the patient flow through the ED setting can be optimized.

Keywords: Brazil; chest pain triage system; emergency department; electrocardiogram; time to ECG
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(69) What Infrastructure Exists for Global Emergency Medical Services Practice and Information Sharing?

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Global forums for sharing current information, practice, policy, and research have been established for many healthcare disciplines. The objective of this study is to identify existing forums for global sharing of Emergency Medical Services (EMS) information, practice, and policy.

Websites were searched for international EMS, ambulance, and pre-hospital forums and associations or for EMS sections/subcommittees of related organizations. International EMS-specific publications were searched through general and academic online search engines.

Four international associations were identified for Emergency Medicine which promote EMS in addition to seven national EMS-specific associations with an international section and a number of regional EM organizations with international and/or EMS interest groups. There appeared to be limited, if any, structure bridging these groups globally. EMS publications were identified in a number of languages. One specifically international EMS journal and two international journals with an EMS aspect were identified in English (both also had a "disaster" focus). Other EMS-specific publications were supported by national organizations; these were in English and in a number of other languages including Spanish, Japanese, Czech, French, German, Norwegian, Swedish, and Hebrew. The identification of publications, organizations, and associations was restricted to to electronic searches.

Comprehensive cataloguing of international EMS associations and publications is challenging. A structured forum specifically for sharing global EMS information and practice has yet to be established. In this current geopolitical climate such a global EMS forum would be most valuable to facilitate the sharing ideas, policy, and best practices for EMS stakeholders.

Keywords: emergency medical services; forum; policy; practice; cataloguing
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(70) An Approach to Development of a Global Emergency Medical Services Forum: A New Perspective on International EMS Networking and Information Sharing

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Given the recent increase in the accessibility of global electronic communications technology and infrastructure, establishment of a structured electronic portal for global emergency medical services (EMS) dialogue now is possible. Although internationally, EMS has national and regional forums, and is represented by the global Emergency Medicine infrastructure, there appears to be an unmet need for a unique global EMS forum to share ideas, practice, policy, challenges and achievements—an adjunct to existing infrastructure—across formal, well-established EMS systems to informal, rudimentary EMS systems.

The Global EMS Forum concept was formulated with the shared perspective of a multi-national group of EMS professionals, to enhance global dialogue in prehospital care and practice. This is a multidisciplinary and operational (rather than research-based) forum, focusing on enhancing EMS care through shared global experience, knowledge, and practice. Additionally, given the realities of participation for low-income individuals and nations—a focus on a communication forum optimizing the use of inexpensive global electronic communications technology was selected.

Currently, the Global EMS Forum is designed to be a "virtual" forum for dialogue, through a website and interactive "Webinar" seminars to facilitate accessible global sharing of practice and experience. A goal is to benefit from diverse solutions to core issues and from critical mass information regarding low-frequency, high-cost events. A Development Group has been established, a Website has been launched **(www.GlobalEMSForum.org)**, and initial, cross-cutting themes have been identified that address multi-disciplinary systems issues such as patient, provider, and public safety, vehicle type/design, training, and certification. Currently, the forum is recruiting and expanding global participation.

Keywords: communication; development; emergency medical services (EMS); information-sharing; international; Website
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(71) Out-of-Hospital Surface Cooling With a Cooling-Blanket to Induce Mild Hypothermia in Humans after Cardiac Arrest: A Feasibility Trial

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Introduction: Animal studies suggest that early and fast induction of mild hypothermia is crucial for beneficial outcomes after cardiac arrest. The aim of the study was to evaluate the feasibility and safety of out-of-hospital surface cooling with a novel cooling-blanket (EMCOOLSpad®), independent of any energy source during use) in patients successfully resuscitated from cardiac arrest.
Methods: This study included patients after out-of-hospital cardiac arrest with an esophageal temperature (Tes) >34˚C. The EMCOOLSpad® consists of multiple cooling units, filled with a graphite/water mixture, stored at -3˚C in a cooling box in the ambulance. The cooling-blanket was applied as soon as it was feasible by the ambulance crew, and removed at Tes = 34˚C. The target-temperature, Tes = 33˚C, was maintained for 24 hours. Data are presented as median and interquartile range (25–75%).
Results: From September 2006 to December 2006, 10 patients, with an average weight of 70 (64–93) kg, were included in the study. Cooling was initiated an average 14 (7–20) min after resuscitation. Use of the cooling-blanket decreased Tes from 36.5 (36.2–36.7)˚C, at start of cooling, to 34.0˚C within an average of 61 (47–93) min, and to target temperature, Tes 33˚C, within 83 (61–119) min. The cooling rate was 2.6 (1.6-3.6) ˚C/h. Hospital admission was an average of 45 (40–53) min after Return of Spontaneous Circulation (ROSC), Tes 33˚C, was achieved at an average of 78 (32–107) min after admission. No skin lesions from use of the cooling blanket were observed.
Conclusions: Non-invasive, out-of-hospital surface cooling with EMCOOLSpad®, immediately after resuscitation from cardiac arrest, demonstrated that its use is feasible and safe. It must be determined if early cooling, as compared to delayed cooling in the hospital, will improve neurological outcome in a prospective randomized trial.
Keywords: cardiac arrest; cooling blanket; esophageal temperature; hypothermia; surface cooling
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(73) Prehospital Risk Factors for Iatrogenic Tracheal Stenosis

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Introduction: Three patients received surgical treatment in one hospital for iatrogenic stenosis of the trachea. All of them developed severe stridor after detubation while in the intensive care ward. These patients sustained major, traumatic injuries that required field intubation. They were admitted to the hospital by a Helicopter Medical Team (HMT). The present study is a consequence of these case reports. The aim was to identify risk factors for iatrogenic tracheal stenosis during prehospital treatment.
Methods: This study examined all the patients who were intubated in the field by the HMT using a cuffed endotracheal tube within a period of six months in 2006. Patient data collected included: (1) prevalence of shock; (2) use of alpha-agonists; and (3) endotracheal cuff pressure (recommended upper limit 25 cm H_2O).

Endotracheal cuff pressure was measured only after the standard prehospital routine for intubation and insufflation of the cuff had been performed. Medical personnel charged with the insufflation were not informed regarding the purpose of the study.
Results: Ninety-three patients were included in the study; indications for prehospital intubation were brain injury, major trauma, and cardiac resuscitation. One or several causes of iatrogenic tracheal stenosis could be identified in 81 patients: 80 patients had a cuff pressure above the 25 cm H_2O limit, the mean cuff pressure of all patients was 57 ±33 cm H_20. Eleven patients were in hypovolemic shock, and 4 patients were administered with alpha-agonists.
Conclusions: Inappropriately high cuff pressures frequently are measured after prehospital intubation in the Netherlands. Training of all personnel involved in field intubation is urgently required.
Keywords: cuff pressure; field intubation; Helicopter Medical Team; hypovolemic shock; tracheal stenosis
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(74) Emergency Transport of Acute Drug Poisoning Cases in Athens, Greece

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Introduction: This study analyzed the drug poisoning-related calls received by the Dispatch Center of the Hellenic National Centre for Emergency Care (EKAB) in Athens, Greece.
Methods: Among the 317,388 calls received by the Athens Operations Centre of EKAB in 2005, all acute drug poisoning-related calls were analyzed. Statistical analysis was performed using STATA 8.0 statistical software.
Results: A total of 1,806 calls due to acute drug poisoning (0.6%) were recorded in 2005. The majority of cases pertained to female patients (68.2%). A total of 24% of the cases originated within the municipality of Athens. January was the month with the highest number of calls (12% of all calls), and 38% of calls were recorded during the 18:00–00:00 hour interval, and the within-day variability was statistically significant (p <0.001). The within-week variability was not statistically significant.

The median time for arrival of the ambulance at the scene was 19 minutes; the median time at the scene was 12 minutes, and the median time for transport to the hospital was 26 minutes. The majority of cases were transported by BLS ambulances (82%), followed by mobile intensive care

units (18%). Specially equipped motorcycles or super-mini city cars provided initial care in 1% of the cases. The observed cancellation rate was 20%.

Conclusions: The center of Athens was particularly aggravated, probably due to the lower socioeconomic level of the inhabitants. Women are more vulnerable than men, probably due to the underlying intentional poisoning that in turn may reflect the social pressure imposed upon them. Shorter daylight duration during winter may account for the observed peak in January.

Keywords: Athens; dispatch center; drug poisoning; emergency transport
Prehosp Disast Med 2007;22(2):s46–s47

(75) The Australian Emergency Prehospital Pandemic Influenza Project: A Methodology for Operational Evidence

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In early 2006, a collaborative, national and international team led by the Australian Centre for Pre-hospital Research and Monash University Centre for Ambulance and Paramedic Studies was funded by a National Health and Medical Research Council Urgent Research Grant to study risk perception.

The study examined the perception of risk of Australian paramedics and their families to working and living in pandemic conditions. The study also assessed the utility of ambulance call-taking and dispatch data in constructing population-based models of surveillance and triage. This project secured early support from the National Council of Ambulance Authorities and the eight individual Ambulance Service jurisdictions across the country. The consultative approach and methodology applied for this project have provided an important platform for the development of evidence-based approaches to issues of national significance for Ambulance Authorities in Australia. This paper will describe the methodology applied to this project and emphasize the opportunities the project presented to facilitate national engagement, as well as to develop a governance structure to ensure good practice in the transition of research into operational policy.

Keywords: ambulance; Australia; pandemic conditions; paramedic; risk perception
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(76) Air Ambulance Emergency Medical Services in the Greek Island Complex of Dodekanisos

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Introduction: The Emergency Medical Services (EMS) of an island complex may face many difficulties with emergency evacuations. The Dodekanisos island complex of southern Greece solved these problems through the implementation of a well-organized system of physician and paramedic-staffed helicopters. The Rhodes helicopter EMS (HEMS) model is under the direct supervision of a nationwide air ambulance service based in Athens (EKAV—Department of Air Ambulance EMS).

Methods: The Rhodes HEMS model conducts air ambulance evacuations between smaller islands of the complex and Rhodes Hospital. Only few evacuations are directed to Crete or Athens. The statistical analysis results of Rhodes HEMS reports and EKAV air ambulance EMS reports were evaluated.

Results: A total of 1,071 cases were evacuated by air ambulance in Dodekanisos during 2003–2005. There were no significant differences in the rates of Rhodes EMS model evacuations through this period. In 2003, a total of 331 cases were evacuated. Rhodes HEMS model serviced 108 of these cases (32.6%). Respectively, in 2004, 151 of a total 390 (38.7%) cases were covered by the HEMS model and in 2005, 135 cases of a total 350 (38.6%). The rest of the evacuations were managed through aircrafts from the Athens Central Department of Air Ambulance EMS.

Conclusions: Air ambulance EMS systems are challenged all over the world. Rhodes HEMS model covers more than one-third of the evacuations yearly, representing an efficient local air ambulance model appropriate for an island complex.

Keywords: air ambulance; air evacuation; emergency medical services; Greece; island complex
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(77) Expanding the Scope of Paramedic Practice in Rural, Remote, and Isolated Communities

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The Queensland Ambulance Service (QAS) is the fourth largest Ambulance Service in the world. The QAS provides state-wide coverage to an area of 1.77 million km^2 from 282 service locations serviced by 2,800 clinically active staff. Due to the vast area of Queensland and the number of remote, rural, and isolated communities—including many island communities—Queensland is expanding the role of paramedics in these communities to increase their ability to support primary health care as part of a wider healthcare team including rural doctors and nurses.

Since 2004, QAS has worked with James Cook University, Mount Isa Centre for Rural and Remote Health, and Queensland Health to develop the Graduate Certificate in Rural and Remote Paramedic Practice. The Graduate Certificate in Rural and Remote Paramedic Practice aims to produce graduates who are able to provide expanded support services to medical, nursing, and allied health professionals. The certificate students will be prepared to integrate and acquire skills and knowledge relevant to the context of practice for their communities in the area of ambulance service operations, primary health care, and public health. The students will have an understanding of the context in which rural and remote health services are delivered. The program has a primary and public health focus that enhances skills in patient assessment, decision-

making, consultation, and clinical practice. It is the first step in enabling paramedics to play a more integrated role in health service delivery and to contribute significantly to building capacity in Queensland's isolated communities.

Keywords: isolated communities; paramedics; Queensland Ambulance Service; rural health services
Prehosp Disast Med 2007;22(2):s47–s48

(78) Improving the Safety and Capability of Aeromedical Services in Queensland, Australia

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Aeromedical services are an integral part of emergency medical services in Queensland, Australia. Following a series of accidents resulting in the deaths of eight people, much has been done to improve the safety and capacity of rotary wing operations. A series of aero-medical reviews have been conducted, that resulted in the implementation of a number of operational improvements to safety and capability for rotary wing aircraft. These reviews highlighted the importance of participating in a state-wide, multifunctional partnership, delivering best-practice prehospital and inter-hospital services to the Queensland community through the combined efforts of staff and resources of Queensland Ambulance Service (QAS), Queensland Health, and the Community Helicopter Providers (CHPs). Consequently, Queensland employs best-practice frameworks for training, audit, safety, and operations of aeromedical services. Improvements have been made through: (1) the revision of service agreements with CHPs; (2) the revision of clinical crewing on helicopters (e.g., dedicated appointment of paramedics to rotary wing services resulting in opportunities for reduced risk through increased access to training, experience, personal protective equipment, and an understanding of CRM, safety, operations, and clinical practice); (3) establishment of minimum guidelines for CHPs (e.g., minimum twin engine turbine instrument flight rule (IFR) helicopter); (4) implementation of a fatigue management system for all aircrew; and (5) an audit of existing helipads with establishment of a minimum standard.

Keywords: aero-medical; Australia; capability; Community Helicopter Providers; safety; standards
Prehosp Disast Med 2007;22(2):s48

(79) "Prehospital Urgent Medicine in Space": Reality or Science Fiction?

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In concideration that some developed countries already have started to commercialize space flight, it is necessary to develop prehospital Emergency Medical Services (EMS) in space. Future space ships should have 10–15 seats. If a need for medical care arises, a space shuttle should be deployed to the space ship so that a qualification person can help the afflicted person. Of course, a person's health is under greater risk during space flight, but maximum precautions still should be taken. All possible ways of making diagnostic and medication judgements should be identified. The presense of EMS in space should not be precluded simply because EMS on Earth has not been frimly established.

We still hope that this vision may goes with the words of Neil Armstrong: "this is one small step for a man, one giant leap for mankind", and we will say it is a big step for prehospital EMS and of course for all emergency personnel!

Keywords: commercialized space flight; Emergency Medical Services; space
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(80) Analysis of Emergency Aeromedical Transport in a University-Affiliated Hospital of Taiwan

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The purpose of this study was to analyze and evaluate the early definitive outcomes of the comprehensive emergency medical services and helicopter aeromedical transport systems for those patients in isolated or rural areas.

A total of 351 cases from July 1998 to June 2006 were collected from emergency service records. Each patient was evaluated according to the data from the registration sheet and computerized database. Information such as age, sex, diagnosis, transport place, and helicopter provider were analyzed.

The age range was 0–93 years with a median age of 50 years. The ratio between genders was 1.79:1 (225 men vs. 126 women). Children (<14 years of age) comprised 16.2% of the total study group. The number of trauma and non-trauma surgical patients were nearly equal, at ratio of 1.1:1. The frequency of helicopter transport decreased by 50% after 2002. All transport cases received satisfactory management and evaluation before being transferring to the ward or intensive care unit, except for the four victims that were dead on arrival (no vital signs or had CPR performed on them before being transported). The majority of trauma patients suffered from compound bone fractures and intracranial hemorrhaging. However, non-trauma patients experienced cardiopulmonary compromise and other diseases associated with respiratory failure. No complications occurred during transport.

Aeromedical helicopter transport plays an important role for critically ill patients, whether they suffer from traumatic or non-traumatic injuries, especially if the victims live in a rural area.

Keywords: aeromedical; emergency care; rural; Taiwan; transport
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(81)Reform of the Emergency Medical Services System in Serbia

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The project of Emergency Medical Services system reform in the Republic of Serbia has been financed by the

Norwegian government and implemented by Norwegian Red Cross through a state-to-state agreement.

The first part of the project was directed at 12 cities in Serbia. An assessment revealed a low level of EMS staff skills and a lack of equipment and equipment maintenance. Therefore, the project focused on EMS training, purchasing equipment, and developing the medical software needed for the dispatch centers. The latter included the development of a call center in the capital of Serbia; this project is presented as a case study at Microsoft.com.

The positive changes as a result of these activities were immediate, but short-lived, because they were not supported with new regulations. This points to the importance of systemic changes and new policies to address both the management and content of EMS. These findings resulted in a 2006 project with the main focus of determining a new set of rules and standards for the EMS system to be introduced throughout Serbia.

The presentation will cover following topics: (1) EMS system development (topic no. 3); (2) education and training (topic no 2); and (3) miscellaneous (topic no. 9). It will discuss the means used in order to achieve the project's objectives, the results of the reform, and challenges the team faced with during the process.

Keywords: assessment; Emergency Medical Services; policy; Serbia; training
Prehosp Disast Med 2007;22(2):s48–s49

(82) Which System Should Be Used in Prehospital Health Services: "Scoop and Run" or "Stay and Play"?

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The most important factor for survival is the efficiency and the speed of the prehospital health services. The discussions on whether to use the "scoop and run" approach or the "stay and play" approach have progressed, and now the topic of discussion is the SAVER method.

Over the last 15 years, dramatic progress has been made in Turkey in the field of prehospital health services. Contrary to many other countries, doctors are on duty in Turkish ambulances. Regarding the approach to the patient/injured in the field, life-saving interventions are applied first (SAVE), and then, very swiftly (RUN), the patient/injured is transported to a center where the most effective treatment can be applied. In penetrating injuries, every possible medical intervention is realized within the ambulance during transport. In blunt traumas, a stabilization procedure also is applied, and vital interventions and transportation is ensured.

	September 2005	September 2006	October 2005	October 2006
NDT1	7.9	5.3	6.3	4.9
NDT2	14.8	14.0	14.4	14.0
NDT3	12.5	13.0	12.7	13.1
NDT4	26.3	26.9	26.2	26.8
NDT5	15.8	16.9	16.2	16.7

Table 1—Mean per month

Turkey provided a successful example in terms of emergency health services in the prehospital field.

Keywords: prehospital health services; "scoop and run" approach; "stay and play" approach; Turkey
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(83) More Personnel is Not Enough

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4. EKAB NCEM, Athens, Greece

Objective: The objective of this study was to prove that even if personnel are hired, the performance of a nationwide emergency medical services (EMS) system is multifactorial, and all the factors must be improved in order to be effective.
Methods: All the calls that the EKAB handlde and were analyzd ndt1:call - transmit, ndt2: transmit -arrival, ndt3: time on the scene, ndt4: scene - delivery, ndt5. These factors during months: September 2005 to October 2006 were compared. A multi-way ANOVA was conducted to see if there was an improvement in times.
Results: In September 2006, the EKAB hired 400 personel (20% of the existing personel). Data prove that the new personnel was responsible for 7–9% of the workload of the EKAB. No improvement in the times was found.
Conclusions: New personnel improves the pre-scene performance of an EMS system. The time after-scene must be improved in order for the entire system to improve. Emergency medical services facilities must be used correctly.

Keywords: emergency medical services; Greece; improvement; institution; personnel;
Prehosp Disast Med 2007;22(2):s49

(84) Where There Is No Emergency Medical Services: Prehospital Care in India

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Objective: The objective is to determine the prehospital care currently available to the accident victims in the city of Mumbai, in the absence of a formal Emergency Medical Services (EMS) system.
Methods: One hundred and seventy narratives were collected from randomly selected victims (AIS>2) in their native languages. These narratives focused on costs, transport times, the role of facilitators/informal care takers, and the route taken to reach the Level-One Trauma Care center.

Results: The most frequently identified people who first cared for the victims were the police (22.4%), passerbyers (21.7 %), accompanying persons (18.9 %), and the accused (5.6%). The police were involved at some point in 71.3% of the cases and were the first to notify the family in 89 .7% of the cases. Of those interviewed, 52.6% of cases received no first aid at all, and 41.5% received elementary first aid. Casualties reached the trauma center by taxi in 24.8% of cases, government ambulance in 21. 4% of cases, private ambulance in 19.3% of cases, and by police pick up van in 19.3% of cases. Additionally, 2.1% arrived on foot. One fifth of the patients traveled more than 50 kms, and 5% of the cases traveled from more than 300kms away.
Discussion: There are poor guidelines and weak licensing requirements for ambulances. No one waits for the EMS to arrive, as there is none. Contrary to popular belief, the police usually were present.
Conclusions: Prehospital services in India are inequitable, with different services provided to urban versus rural, and paying versus non-paying patients. However, the lack of an EMS system in India did not significantly delay arrival of patients to the hospital. With this in mind, though, the responsibility for prehospital care should not fall on uninvolved citizens.
Keywords: ambulances; Emergency Medical Services; first aid; India; prehospital care
Prehosp Disast Med 2007;22(2):s50

(85) Implementation of Automated External Defibrillation in the Belgian Emergency Medical Services System and Introduction of Public Access Defibrillation

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Introduction: Every year, 10,000 people die due to sudden cardiac arrest. This is the major cause of death in prehospital care. Ventricular Fibrillation (VF) and Pulseless Ventricular Tachycardia (VT) are the most frequent initial rhythms documented in witnessed cardiac arrest. Defibrillation is the most effective treatment for VF/Pulseless VT. If performed in time, this is an intervention with a high rate of success.
Mission–Organization–Training: In 2003 and 2005, the government of Belgium interviewed all prehospital EMS. With this enquiry, the number and type of Automatic Electronic Defibrillators (AEDs) in use, their frequency of application, and the percentage of ambulance people familiar with the use of AEDs could be identified.

During 2003 and 2004, instructor sessions (ERC Guidelines) were organized to implement uniform AED use. One hundredsixty instructors were trained by a pyramid system of teaching 9,000 ambulance men in the EMS system. Practical problems were discussed, such as uniformity and compatibility of AED devices and training equipment for education.

The total cost of equipping the ambulances that did not have an AED was estimated at 1,000,000 euros. In the 2006, the government distributed semi-automatic defibrillators to equip all ambulances in the EMS system. A change in the law in 2006 allowed PAD (Public Access Defibrillation) for everybody. The Red Cross is now starting to train lay people.
Conclusion: Much progress has been made; however, Basic Life Support Defibrillation should be promoted because cerebral damage after ROSC is a major problem.
Keywords: automated external defibrillators; Belgium; costs; efficacy; emergency medical services; public access defibrillation; research training
Prehosp Disast Med 2007;22(2):s50

(86) Ruptured Ectopic Pregnancy: Risk Factors for a Life-Threatening Condition

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Objective: To determine the risk factors for the rupture of an ectopic pregnancy in order to help physicians identify women who are at greatest risk.
Methods: The total of number of cases of ectopic pregnancy that were treated in the Gynecology Department of the General Hospital George Genimatas in Athens, Greece, between January 1988 and December 2006 was identified. The following parameters were examined retrospectively: (1) rupture status; (2) past history of pelvic infection or ectopic pregnancy; (3) use of intrauterine contraceptive device (IUCD); (4) operations for infertility treatment/tubal surgery; (5) parity; and (6) gestational age. The study group was assigned into two subgroups: (1) ruptured ectopic pregnancies (Group A); and (2) unruptured ectopic pregnancies (Group B). Where appropriate, Pearson's Chi-Square test was applied. Statistical analysis was performed using STATA 8.0 statistical software.
Results: Two-hundred and twenty-three cases of ectopic pregnancy were retrieved for the studied period. Of these, 144 (65%) were ruptured ectopic pregnancies (Group A) and 79 (35%) were unruptured ectopic pregnancies (Group B). Past history of ectopic pregnancy was present in 55 patients from Group A and 18 patients from Group B (38% vs 23% respectively, $p = 0.019$). Moreover, there was a statistically significant positive association between rupture and parity. No statistical significance was found concerning past history of pelvic infection, use of IUCD, operations for infertility treatment or tubal surgery, and gestational age.
Conclusions: Previous history of ectopic pregnancy and parity seem to be significant risk factors for the rupture of an ectopic pregnancy.
Keywords: ectopic pregnancy; gynecology; parity; pelvic infection; rupture
Prehosp Disast Med 2007;22(2):s50

(87) Prehospital Use of the HemCon Bandage by Paramedics of Magen David Adom, the Israeli National Emergency Medical Services System

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Introduction: Magen David Adom (MDA) is the Israeli national emergency medical services (EMS) system that

treats 50,000 trauma cases annually. The HemCon Bandage is a hemostatic dressing made of chitosan, a natural substance that adheres when in contact with blood. This is a preliminary report to determine the hemostatic effectiveness of HemCon Bandages used in a civilian EMS system.
Methods: HemCon Bandages were added to 65 advanced life support (ALS) ambulances in August 2006. Paramedics received written and multimedia instructions for use. The dressing was indicated in all trauma cases of moderate to severe bleeding. Hospital emergency rooms were notified and provided removal instructions. Data collection and analysis was done by the Medical Division.
Results: HemCon Bandages were used on five males and three females, average age 30 years (ranged 4–75 years). Of the eight cases, three were penetrating injuries and 5 were blunt injuries: gunshot (1), knife stab (1), shrapnel (1), road accidents (4), and falls (1). Three wounds were arterial, four massive venous and one laceration. Location of the bleeding was on the skull (2), neck (1), groin (1) and lower extremities (4).

In all eight cases, HemCon Bandages were effective and provided control of the bleeding within 3–5 minutes. In two cases, direct pressure and tourniquets were used and failed; the HemCon Bandage stopped the bleeding in both cases.
Conclusions: This data indicates that the use of the HemCon Bandage may be a useful tool to stop massive external bleedings by EMS teams.
Keywords: emergency medical services; HemCon® bandage; Israel; prehospital
Prehosp Disast Med 2007;22(2):s50–s51

(88) New Horizons in Ventilatory Support for Disasters

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One of the characteristics of mass-casualty incidents is that an insufficient number of personnel available to provide medical care to a large number of victims. Recommendations of the Society of Critical Care Medicine for mass ventilatory support include the provision of ventilation, cardiac, and pulse oxymetry monitoring, and medical documentation. Plans for mass ventilatory support must be versatile and cost-effective.

"Disaster ventilators" must be promoted for daily use in intensive care units and, at the same time, be portable for use at alternate sites of care, as well as during transport; yet, duplication may be associated with prohibitive costs. Another important feature of a disaster ventilator is its simplicity, so that personnel without critical care training can operate it.

A variety of available ventilators provide adequate ventilatory support. Nevertheless, additional equipment, which must be operated by expert personnel, is required to provide monitoring.

A new ventilator is now available. It is a complete, intensive-care ventilator, but at the same time, it may be operated by non-expert personnel; it is portable and can be used at alternate sites and during transport; it includes pulse oxymetry and capnography, and can therefore, provide continuous patient monitoring. It also provides documentation due to its capability for storing physiologic data. These features make this ventilator a versatile and cost-effective solution for mass ventilatory support.
Keywords: disaster ventilators; mass-casualty incident; medical documentation; oxymetry monitoring; ventilation
Prehosp Disast Med 2007;22(2):s51

(89) Recent Plane Crashes and Other Mishaps in the Federal Capital Territory

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Air travel is the fastest means of transportation. However, it also can be dangerous if the necessary precautions and air traffic regulations are not taken into consideration.

The Sosoliso-Airline crash that killed 108 persons resulted into a doomsday in Nigeria. Factors that contributed to the crash included poor visibility, poor airline management, wind sheer, and problems resulting from the age of the aircraft.

Sosoliso Airline is planning to phase out its DC-9 aircraft and replace them with MD-805 aircrafts. It also is preparing for an international operating safety audit of aircrafts.

This paper provides the information about the recent plane crashes in the Federal Capital Territory (Nigeria), including: (1) how the events affected the economy of the country; (2) the need for management to access information; and (3) the need for analysis and dissemination, policy development, problem-solving, and commerce development of the various airlines in the country.
Keywords: airlines; disaster; airplane crash; Nigeria; policy
Prehosp Disast Med 2007;22(2):s51

(90) Belgrade Emergency Medical Services Experience with Triage

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There are three stages involved in the triage process: (1) call is made to the "9-4" emergency phone line; (2) the call is transferred to the dispatch center; and (3) personnel are sent to the place of the emergency. Good triage parameters established at Belgrade EMS include: (1) response time; (2) intervention time; (3) ratio of the number of definite interventions and the number of patients recovered on-scene; (4) ratio of the number of patients transported to hospital and the number of patients hospitalized; (5) concordance between the initial and final diagnoses; (6) number of interventions performed in response to the diagnosis; and (7) ratio of the number of successful resuscitations to the total number of resuscitations performed.

In comparison with the results from the 2005 Annual Belgrade Emergency Medical Services (EMS) Performance Report, in 2006, the EMS response time is significantly faster and the intervention time is shorter, while the quality of interventions as well as other parameters improved. A larger number of patients were stablized on-scene and a larger number of patients were hospitalized compared to the total number transported to hospital. There also was a higher degree of concordance between initial and final (hospital) diagnosis. The number of successfully performed resuscitations compared to the total number of commenced resuscitations also was significantly higher in 2006.

In conclusion, it is evident that good triage in all of its operational stages results in an improved quality of prehospital medical care.

Keywords: triage, emergency; parameters; ratio; prehospital
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(91) Outcome after Out-of-Hospital Cardiac Arrest in a Physician-Staffed Emergency Medical System According to the Utstein Style

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Introduction: Despite a large amount of data focusing on the outcome of out-of-hospital cardiac arrests (OHCA), little information is available about physician-staffed emergency medical service (EMS) systems. The aim of this study was to test the effects of a physician's presence on patient outcomes following OHCA.
Methods: In this January 2000–2006 observational study, all consecutive patients with OHCA in the community of Dachau in which resuscitation was attempted were included and followed-up to discharge from hospital, using the Utstein style.
Results: Of 135,000 inhabitants, in 539 patients (63.9 ±19.1years, 349 males) cardiopulmonary resuscitation attempts were initiated. Of 412 patients with cardiac etiology, 180 (43.7%) were admitted to a hospital and 47 (11.4%) were discharged alive. In 105 patients with bystander-witnessed OHCA of cardiac origin with shockable rhythm, the discharged-alive rate was 32.4% (n = 34). Resuscitation was started by a physician in 117 (28.4%), by laymen in 118 (28.6%), or by EMS personnel in 177 (43.0%) patients. Eighteen patients (18.6%) treated by physicians, 13 patients (8.0%) treated by EMS personnel (p = 0.02), and 16 patients (16.5%) resuscitated by laymen were discharged from the hospital (p = 0.8; versus treatment by physician). In a multivariate analysis, the unit of first resuscitation attempt did not appear to be an independent predictor of survival.
Conclusion: The present data suggest that ventricular fibrillation for first ECG, observed OHCA and short response time intervals reduces mortality in patients suffering from an OHCA of cardiac etiology. The fact that a physician is on board of the ALS unit could not be identified as an independent determinant for improved survival rates.

Keywords: out-of-hospital cardiac arrest; physician-staffed EMS system; resuscitation; survival rate; ventricular fibrillation
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(92) Emergency Transport of Burn Injuries: The Case of Athens, Greece

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4. Vostanion General Hospital, Mytilini, Greece

Introduction: This study analyzed the burn-related calls received by the Operational Center of the Hellenic National Centre for Emergency Care (EKAB) in the capital area of Athens, Greece.
Methods: All of the burn-related calls managed in 2005 by the Athens Dispatch Center of EKAB were abstracted. Statistical analysis was performed with STATA 8.0 statistical software.
Results: 461 emergency burn-related calls were recorded during 2005. Nearly 20% of the cases came from regions outside the metropolitan area of Athens. Another 10% corresponded to inter-hospital transports. The male patients (58%) comprised a majority. A significant 14% of cases were financial immigrants. The peak incidence occurred in July (13% of all cases). The 12:00–18:00 hour time interval was particularly aggravated; 37.8% of burn-related calls occurred therein, and the observed within-day variability was significant statistically ($p < 0.001$). The median time for arrival of the ambulance at the scene was 20 minutes; the median time at the scene was 10 minutes, and the median time for transport to the hospital was 15 minutes. Of the total number of cases, 17.6% were transported to the tertiary pediatric hospitals. The majority of cases was transported by BLS ambulances (80%), followed by mobile intensive care units (20%). The observed cancellation rate was 18.7%.
Conclusions: There is a significant burden on the Greek Province due to lack of specialized burn centers. The peak of cases in July might reflect the well-established role of light clothing in summer. The significant proportion of financial immigrants and children points to the need for prevention strategies focusing on these subpopulations.

Keywords: ambulance arrival time; Athens; burn victims; dispatch; emergency transport
Prehosp Disast Med 2007;22(2):s52

(93) Distribution of Competencies within Prehospital Emergency Care in The Netherlands

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Objectives: Prehospital emergency care in The Netherlands consists of two systems: (1) ambulances with highly qualified registered nurses (RN); and (2) mobile medical teams (MMT) with an anesthesiologist or trauma surgeon and a RN. In case of severe trauma or otherwise severely compromised patients, the MMT provides specialist, medical care in addition to ambulance care. The objective of this study is to provide information on the distribution of applied competencies when both systems collaborate. This

information can be used for educational, operational, and organizational purposes.

Methods: This study has two parts: (1) an analysis of the competencies of the ambulance crew and MMT based on current protocols and professional requirements; and (2) an analysis the distribution of competencies based on joint interventions. For four months, all joint interventions of ambulances and MMTs will be recorded consecutively by observers. This study focuses on technical interventions and clinical decision-making. Based on the observations, the applied competencies will be allotted to a predefined set of competency-profiles. The outcome of the study will provide insight in the distribution of competencies between ambulance and MMT.

Results and Conclusions: Preliminary results will be presented and discussed at the Congress.

Keywords: collaboration; mobile medical teams; prehospital emergency care; registered nurses; The Netherlands
Prehosp Disast Med 2007;22(2):s52–s53

(94) Disasters Don't Have to Be a Disaster

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The basic triage method used by the most organizations was developed in 1797 and has changed little in the past 200 years. The patient—the most important aspect of the process—is often forgotten. Since 11 September 2001, including the recent US Institute of Medicine report on Emergency Services, drastic changes are being made to make our world safer and our daily operations efficient and scientifically valid. This report focuses on current operational research that will improve how we respond to and care for victims of trauma.

From this presentation, the participants will be able to: (1) identify two or more common myths in current trauma assessments, especially during mass-casualty events; (2) contrast their current practices against evidence-based practices; and (3) demonstrate how operational protocols can be objective, consistent, and validated.

Keywords: assessment; emergency services; evidence-based practices; protocol; triage
Prehosp Disast Med 2007;22(2):s53

(95) Work Safety at the Place of an Accident

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Safe-speed driving time efficiency demonstrates the utility of recent Emergency Medical Service (EMS) technology. Global Positioning System (GPS) satellite surveillance makes it possible to spot the location of the closest EMS vehicle. This system also enables autopilot navigation of EMS vehicles with the use of a specific program. Video surveillance of main road intersections enables the dispatcher to efficiently direct EMS teams according to the actual traffic conditions. Remote controlling of traffic lights is the most promising safety parameter.

Additionally, fencing-off the accident site with yellow tape and signaling the alarm siren increases the safety of the medical team and other personnel present at the place of the accident. Compulsory police attendance during medical emergency situations in public places helps to ensure safety during the performance of the entire emergency response protocol and during the interventions provided. Having the police escort the medical team to the place of the accident currently is the safest and most timely method. Police security at the place of the accident guarantees the safety of the intervening medical team; blocking-off oncoming traffic is a precautionary step to ensuring safe working conditions for the medical team. Setting off an alarm siren from cellular phones is a safety aid that may be developed for the intervening medic team, in case of emergencies where police assistance is not available or not yet present.

Keywords: accident; emergency response; safety; technology; traffic
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Oral Presentations—Theme 4: Ethics and International Law

Chair: Ahmed Ammar

Triage, Ethics, and International Laws

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Each discipline within the fields of disaster and emergency management highlights the necessity of a universal ethical code. Members of a triage team must be sure that they are professional and qualified. Preferably, the members should have experience in mass-casualty incidents and in managing critically injured patients.

Modern triage is based on an on-scene assessment, in conjunction with the judgment of the actual and possible severity and prognosis of each victim. During a disaster, triage teams must decide who to treat first, knowing that withdrawal of medical treatment is more difficult than withholding treatment.

A computer-generated prediction of death is an objective statement concerning the patient's inability to overcome the initial trauma, despite treatment and therapy. Nevertheless, prediction rules may represent an advanced form of audit when used appropriately. They can confirm early decisions on the relevance of continuing treatment.

This presentation also discusses the remaining considerations linked with the problem of triage in the context of medical ethics and international laws.

Keywords: disaster; emergency management; ethics; international; triage
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Conducting Research Ethically is Possible in Disaster and Combat Situations

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Background: Conducting research in combat and disaster environments share many of the same fundamental principles and regulations that govern civilian biomedical research.

Despite some similarities, research in these environments has additional requirements designed to preserve the informed consent rights of servicemembers, ethical standards, and classified information. Studies approved for conducting research in current combat operations were reviewed.
Methods: This is a descriptive, retrospective study of protocols that currently have been approved for conducting research in Operation Iraqi Freedom and Operation Enduring Freedom.
Results: During the period of July 2005 through October 2006, seven retrospective chart review protocols and six prospective, observational studies were submitted to the Research Committee in Iraq for review and approval at the Brooke Army Medical Center Institutional Review Board (IRB). All protocols were approved by the IRB for implementation in Iraq. Most of these protocols involved trauma care treatment. One prospective study investigating the effects of blast-concussive injuries on US soldiers in Iraq that required informed consent was reviewed and approved.
Conclusions: The conduct of military medical research will continue to make an important contribution to the civilian and military medical communities. Although policies and regulations to conduct research and release associated findings often seem cumbersome and stringent, these added hurdles serve to ensure protection of human subjects, and to prevent unintentional aid to unfriendly forces.
Keywords: combat; ethics; institutional review board (IRB); Iraq; research
Prehosp Disast Med 2007;22(2):s53–s54

Medical Ethics in Mass-Casualty Incidents and Disasters: The Tel Aviv Medical Center Experience

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Healthcare providers face ethical dilemmas nearly on a daily basis and follow codes that lead them in their daily functions. Because health providers deal with critical issues, the code of ethics should be clear and easily understood.

During a mass-casualty incident (MCI), many ethical dilemmas present. The aim of this paper is to provide an overview of the attitudes and beliefs of nurses and physicians during a MCI caused by a terrorist attack and to expose them to the ethical dilemmas that may be encountered. These dilemmas were presented to the medical staff in the Emergency Department, Intensive Care Unit, and Trauma Department of the Tel-Aviv Sourasky Medical Center (TASMC).

More than 100 nurses and physicians from five departments in the TASMC were interviewed. The questions included:

1. Are there any differences between ethical dilemmas during "regular" time and ethical dilemmas during MCIs or following wartime?
2. How will we continue and keep our professionalism while treating a terrorist that was admitted into the department after he or she killed children in the attack?

Keywords: ethics; healthcare providers; mass-casualty incident (MCI); professionalism; terrorism
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The Need for a World Association for Disaster and Emergency Medicine Ethical Code

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The number and magnitude of disasters, both human-made and those caused by natural hazards, have increased in recent years. Unfortunately, disasters will never cease to exist. The modern revolution in information management and communications has turned the world to a small village. Therefore, it is common to see many governmental and non-governmental humanitarian aid organizations, and sometimes military forces, responding to a disaster with the intention to rescue and help victims. These groups may find themselves in a different country with a different language and culture. Previous experiences have demonstrated that despite good intentions the time has come to develop an internationally recognized and agreed upon Ethical Code for the World Association for Disaster and Emergency Medicine (WADEM). This code should define the following:

1. The duties of the different groups;
2. The relationship between different groups and hosting countries;
3. The rights of the victims; and
4. The relationship between the different humintarian, non-governmental aid groups.

Keywords: disasters; ethical code; humanitarian aid groups; non-governmental organizations; World Association for Disaster and Emergency Medicine (WADEM)
Prehosp Disast Med 2007;22(2):s54

Poster Presentations—Theme 4: Ethics and International Law

(96) Organization of Surgical Hospital in Case of Ethnical Distrust

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In June 1999, after bombing stopped in Serbia and Montenegro, 1,463 medical staff members of non-Albanian origin were dismissed from the clinical center in Pristina. There are areas in Kosovo that are primarily inhabited by Serbs who did not have access to medical care after the bombing. To meet this need, a small hospital was built in the village of Gracanica, several kilometers from the Clinical Center in Pristina. The hospital was built with help from Greece and staffed by Albanians. It contained two operating theaters and a four-bed intensive care unit two ventilators and invasive monitoring capability. General, pediatric and orthopedic surgeries were performed at the hospital, as well as obstetrics.

This small hospital was technically and professionally equipped to perform all urgent interventions. The hospital was surrounded by villages with an Albanian majority. Frequent power and water outages, attacks by terrorists, and limited movements were just a few of the challenges the staff of the hospital faced. Under difficult conditions,

500 surgeries, 3,000 minor surgical interventions, and 15,000 check-ups by specialists were performed annually. Patients requiring more advanced care are transferred to a hospital in Kosovska Mitrovica, located 40 kilometers north.

Ethnical intolerance and a lack trust between the Albanian and Serb populations have necessitated the development of parallel medical institutions in a relatively small area.

Keywords: ethical distrust; ethnical intolerance; hospitals; Kosovo; medical staff
Prehosp Disast Med 2007;22(2):s54–s55

(97) Triage Decisions of Prehospital and Hospital Emergency Healthcare Providers, Using a Multiple Casualty Scenario in Kocaeli, Turkey

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Objective: This study was planned to examine the accuracy of triage decision-making among emergency physicians and to determine whether triage training was necessary.
Methods: A self-administered questionnaire, including a multiple-casualty scenario that required each casualty to be prioritized for treatment, was administered to 110 emergency physicians working for prehospital and hospital emergency services in Kocaeli, where an earthquake occurred in 1999. The scenario has been adapted to START from another study using the SIEVE algorithm (with permission). Seventeen case scenarios found to be appropriate for START algorithm were studied. The differences between personal/professional characteristics and triage decisions were analyzed using a Chi-Square Test.
Results: Accurate triage decision rates of the emergency physicians were between 83.6 and 90.0% for four immediate casualties, 26.4 and 78.2% for seven urgent casualties, 70.9 and 91.8% for four delayed casualties, and 82.7 and 97.3% for two dead cases. The triage rates with the highest accuracy and inaccuracy were obtained for dead and urgent cases, respectively. Personal and professional characteristics (age, professional, pre-hospital, and hospital emergency experience) were found to be related statistically for five cases (p <0.05).
Conclusions: Emergency physicians tend to "under triage" patients. The discrepancy of the accuracy rates in urgent casualties indicates the necessity of improving decision-making in training programs. This improvement will be helpful in reducing violations of important duties of "justice" and of "do not harm" among the emergency physicians. Consequently, triage training programs should be periodically updated.

Keywords: physicians; prehospital; training; triage; Turkey
Prehosp Disast Med 2007;22(2):s55

Oral Presentations—Theme 5: Hot Topics

Session 1

Chairs: TBA

Informatics Solutions for Emergency Planning and Response

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Early informatics contributions to the emergency planning and response agenda have focused largely on surveillance and detection of threats. A broader assessment of possible informatics contributions reveals that informatics also can contribute to increasing efficiency during a disaster response, as well as provide a tele-presence for remote medical caregivers. This presentation will explore current and future roles of informatics in emergency preparedness and response.

Data management has long been the focus of informatics, but never with the special challenges brought about during disaster situations. Tracking of victims, electronic health records, and supply inventory are only a few of the contributions that informatics can provide during disasters. Modeling of response resources can provide the parameters for more effective decision-making. Public reporting can be provided more accurately if the information is received in a timely fashion. Databases provide the infrastructure for the reporting of data that can later be mined to determine the effectiveness of planning and response efforts.

Some disaster situations require medical expertise that is not readily available in the field. Having a telemedicine infrastructure would link the needed expertise to those in the field who require referral advice. Being able to link to the patient's medication history and records would further extend the provision of better health care.

Informatics also can play a strong role in the design of databases for volunteers. Having volunteers registered and credentialed prior to an emergency event would allow for expedient care. The intersection of informatics and emergency response provides the most effective available response.

Keywords: data reporting; databases; emergency planning and response; informatics; tracking
Prehosp Disast Med 2007;22(2):s55

Emergency Telecommunications for European Citizens

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Emergency Telecommunications cover communications from citizens to authorities, between authorities, from authorities to citizens and between affected citizens in cases of emergencies or disasters.

The presentation covers the existing situation in all these areas from a citizen's perspective. More specifically, it covers the situation concerning the single European emergency call number (112), the ongoing projects in the field of communications between authorities and the future of early warning and alarm for citizens in distress.

The presentation also contains proposals for action in view of ensuring further developments in this field.
Keywords: citizens; disaster; emergency; Europe; telecommunications
Prehosp Disast Med 2007;22(2):s55–s56

Evidence-Based Triage—Increasing Survivability without Playing God

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Session Description: This presentation will take an in-depth look at disaster and multiple casualty triage systems. Historical models have subquent failures failure to heed poor resource allocation and ignoring the Prime Directive of emergency medical services (EMS): Do no hard! New research has demonstrated simple methods to overcome these and other challenges which will reduce the chaos, maximize the number of survivors, and minimize or prevent wasted resources.
Learning Objectives: The objectives of this study: (1) contrast current triage methodology against current practice; (2) define the immediate, intermediate, and long term goals of triage; (3) establish the correlation between triage response and public health concerns; (4) describe an evidence-based triage system; and (5) explain the benefits of this model versus other models; and (6) discuss the benefits to the EMS system, including increased numbers of lives saved.
Keywords: evidence; evidence-based; survivability
Prehosp Disast Med 2007;22(2):s56

Rationing Resources: Ethical Issues in Disaster and Epidemic Situations

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In an epidemic situation or large scale disaster, medical and human resources may be stretched to the point of exhaustion. The current concern over a pandemic influenza crisis has every country in the world reviewing plans of action that would minimize public health morbidity and mortality as well as maximize the appropriate use of medical and human healthcare resources.

A major medical resource concern is the limited number of mechanical ventilators believed to be needed, should a pandemic influenza occur. Recent reported cases of avian influenza suggest that mechanical ventilation will be required for successful recovery of individuals ill with this strain of virus. However, should the need for ventilators exceed the available machines, how will care providers make the difficult, ethical decisions as to who should be placed, or remain, on these machines as more influenza patients arrive in need of help? Is there an ethical decision-making model that can assist providers in making the difficult choices they will most surely be called upon to make as limited resources must be used in ways that will be most beneficial?

We will present a decision-making model for clinicians that is based upon the bioethical principles of beneficence and justice. Our model begins with the basic assumptions of triage and progresses into a useful algorithm based upon utilitarian principles. Without such a model to guide clinicians, allocation of scarce recourses may not be done in a just manner.
Keywords: epidemic; morbidity;mortality; resource; ventilators
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A Roadmap for Protection of Participants Mental Health during Disaster Research after the 2001 World Trade Center Event

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4. Columbia Universtiy, New York USA

Post-disaster research has the potential to re-victimize survivors. A roadmap was developed and tested to assure the protection of participants during the qualitative phase of a multi-phase study of World Trade Center (WTC) evacuees on 11 September 2001.

To develop the model, the basic tenets of ethical human research conduct (autonomy, beneficence, non-malfeasance, and distributive justice) were used as a foundation to assure the protection of study participants. Then, expanded areas of human subject protection were identified in the literature and mapped to these tenets. Finally, specific procedures and strategies were identified to address each of the tenets and expanded areas. Strategies included: (1) the use of legal counsel and the IRB to develop consent procedures including information about psychological risk; (2) interagency coordination for WTC research to assure a worthwhile study and eliminate over-recruitment of participants; (3) use of a Data Safety Monitoring Board; (4) strict delimitations to exclude the psychologically fragile; (5) the inclusion of mental health clinicians on the study team; (6) rigorous study team training; (7) pre-establishment of mental health support for participants including an on-call psychiatrist and psychiatric emergency department referral agreement; (8) pre/post study participation post-traumatic stress screening (PTSS); (9) researcher debriefing; and (10) a Community Advisory Board for the study.

To test the model, pre/post study PTSS screening scores were compared (possible range of 1–5) . The mean pre-PTSS score was 2.05 (SD = 0.84). It was 1.97 (SD = 0.82) directly following participation, and 1.80 (SD = 0.79) two weeks after participation. A paired samples t-test indicates significantly lower PTSS scores after participation ($t(46) = -2.82, p < 0.01$).
Keywords: human research; post-traumatic stress; psychology; research model; World Trade Center
Prehosp Disast Med 2007;22(2):s56

Poster Presentations—Theme 5: Hot Topics

(98) Epinephrine for In-Hospital LUCAS-CPR: A Predictor of Outcome?

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2. Belgium

Introduction: The role of epinephrine in cardiac arrest still is debated. This study compares the doses of epinephrine administered to patients who had good outcomes after in-hospital LUCAS-CPR as opposed to those with bad outcomes.
Methods: From February until June 2006, LUCAS-CPR was used for all cases of adult in-hospital cardiac arrest, after the arrival of the in-hospital emergency team. Outcome parameters such as return of spontaneous circulation (ROSC) and Cerebral Performance Categories (CPC) at three months and administered doses of epinephrine were recorded. Cerebral Performance Catagories one or two after three months were considered good outcomes. Epinephrine (1 mg) was administered to all patients during CPR every three to five minutes, according to the 2005 Guidelines, and at the discretion of the attending physician.
Results: Thirty-five patients received in hospital LUCAS-CPR. In one patient with no ROSC, the dose of epinephrine remains unknown. In the 22 patients with ROSC, a dose of 1.25 ±1.25 mg of epinephrine was used. In the 12 patients with no ROSC, the average dose was 6.08 ±3.63 mg. In the nine patients with CPC one or two after three months, the dose of epinephrine was 1.11 ±0.78 mg. None of these patients received more than 2 mg of epinephrine. In the 25 patients with CPC three, four, or five, the dose of epinephrine was 3.62 ±3.61mg.
Conclusion: The total dose of epinephrine used is inversely related to outcome. There were no good outcomes achieved in patients who needed more than 2 mg of epinephrine during in-hospital LUCAS-CPR.
Keywords: cardiac arrest; Cerebral Performance Categories; cardiopulmonary resuscitation (CPR); epinephrine; outcomes
Prehosp Disast Med 2007;22(2):s57

(99) Drug Abuse and Emergency Medical Service Ambulance Mobilization in the Metropolitan Context

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3. Athens General Hospital G. Gennimatas, Athens, Greece

Objective: The aim of this study was to analyze the profile of drug abuse-related emergency medical services (EMS) response in a metropolitan district.
Methods: The total number of drug abuse-related emergency calls during the year 2005 that were received by the Operational Center of the Hellenic National Centre for Emergency Care (EKAB) in Athens, Greece, was analyzed retrospectively. A step-by-step approach was applied that focused on the operational scheme: ambulance mobilization, arrival at scene, and transportation to the hospital. The performance of the four available means of response (basic life support ambulances, mobile intensive care units (MICUs), motorcycles, and super mini city cars) was evaluated.
Results: Within the study period, 5,836 cases were recorded (2% of all emergency calls) and 3,899 calls occurred within the municipality center of Athens.

Only one-third of these cases were transported to the hospitals; 10% of calls were cancelled before the arrival of the ambulance on scene; 20% could not be found on the site, and 36% refused transport to the hospital. Super mini city cars and motorcycles seemed to have better performance in comparison to conventional ambulances. The cancellation rate was significantly higher in the evening (70%) and at night (67%), as well as in the summer (69%) and autumn (70%).
Conclusions: Drug abuse-related calls represent a large part of the workload for the EMS of Athens. This study revealed that the major burden is imposed upon the center of the capital, possibly due to the socioeconomic factors that affect the residents of this area. A considerable proportion of the responses do not result in the patient being transported to a hospital.
Keywords: ambulance; drug abuse; emergency medical services; hospital transportation; metropolitan
Prehosp Disast Med 2007;22(2):s57

(100) Study of Antagonism in Disaster Management Plans with Emphasize on the Reconstruction Period

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Disaster management plans provide insight into many probable situations after the occurrence of a disaster. The post-disaster situation is a function of specifications of both the environment and the disaster. Due to the nature of disasters and the uncertainty of unusual conditions, many factors can impact the situation after disasters.

Antagonism is a usual specification in the nature of disasters, which originates from environmental conditions. At least two parameters can cause antagonism in disasters—spatial and time dimensions of space.

The object of this study is to analyze unusual conditions in order to recognize the main parameters in dimensions of space that can cause antagonism in disasters. Therefore by classifying the main object of research to three groups, specifications of them was studied. This research selects a cross-sectional period of time of management after disasters (reconstruction) and studies its specifications.

The results of this research indicate that antagonism in all phases in disaster management plans is a consequence of the nature of disasters, so that, in the reconstruction management plan, antagonism has an important role in the plan efficiency and can change the outcome of the use of disaster plans in the same conditions.
Keywords: antagonism; disaster;disaster management; plan; reconstruction
Prehosp Disast Med 2007;22(2):s57

(101) Political Determinants of Disaster: Kosovo

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The contemporary pattern of disease in the Balkans is a complex blend of a repetitious past, rising chronic disease, the consequences of socio-economic upheaval, sanctions, and war. Nowhere are conditions worse than in Kosovo where demography has played a significant role in shaping the shifts in the mix and current make-up of the population as well as politics. The basic elements of everyday life are missing, such as sanitation and water. The number of sick and amount of diseases are increasing. Kosovo's infant mortality is the highest in Europe. Elderly people lack everything. Acute diarrhea is a latent problem, hepatitis is serious, tuberculosis is on the rise, and new diseases have appeared. Positive outcomes include a gain in crude mortality rate reduction, falling perinatal and maternal mortality, with life expectancy edging upwards. Vaccine preventable diseases are under control; no polio cases, and measles has been absent for seven years. One challenge is to shift the system from a disease-oriented model towards prevention. The current threat to human security is highly complex and includes vulnerability to man-made hazards and corruption. Stability, reconciliation, appropriate development, and good governance are prerequisites to threat reduction. One threat is a potential creeping disaster that will result in increased mortality, another is the current unsettling polarity that can spiral out of control. Kosovo provides an opportunity to evaluate the political determinants of health, and it is a policy challenge to the international community.

Keywords: disease; Kosovo; politics; public health; policy
Prehosp Disast Med 2007;22(2):s58

Oral Presentations—Theme 6: Humanitarian Crises

Session 1

Chairs: Jennifer Leaning; C. Breederveld

Experiences in Establishing a National Unit for Rapid Medical Needs Assessments of Disasters Involving Swedes Abroad

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As a direct result of the 2004 Tsunami, 543 Swedish citizens died and thousands were injured. At that time there was no formal Swedish governmental agency responsible for providing medical assistance to injured Swedes abroad. The Swedish Government requested that the National Board of Health and Welfare propose a response system to assess medical needs and, if necessary, provide medical assistance to Swedes during disasters abroad. As a part of this system, a Rapid Needs Assessment Team was formed consisting of medical doctors with experience from humanitarian emergencies, and specialized in infectious diseases, nuclear or chemical injuries, disaster medicine, and air transports. This group can be assembled within two hours to conduct initial Remote Magnitude Assessments (RMAs) using media, internet, and telephone. If necessary, two team members will depart within six hours of notification to conduct a more detailed assessment in the affected area.

Since 2006, the assessment Team has gathered three times. Twice, it was concluded in the RMA that no Swedish assistance was needed. The third time, following the escalation of war activity between Israel and Hezbollah in July 2006, the RMA resulted in the dispatch of two team members for further assessment. During the weeks following their assessment, 9,282 persons were evacuated by the Swedish authorities.

The creation of a national unit for medical rapid needs assessment to conduct a RMA within two hours of incident notification or to be deployed to the disaster area soon after the onset enhances the medical and rescue response to the event.

Keywords: disasters; needs assessments; Remote Magnitude Assessment; response; Swedes
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The Psychosomatic and Medical Problems Observed during the Evacuation of Swedish Citizens from Lebanon, July 2006

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The rapid escalation of the July 2006 conflict between Israel and Hezbollah in Lebanon resulted in the evacuation of thousands of people. Medical support teams assisted the Swedish foreign ministry teams in Lebanon, Cyprus, Turkey, and Syria to facilitate the evacuation.

During the period of 17– 22 July 2006, >5,000 people with connections to Sweden were evacuated from Lebanon. Somatic medical complaints were limited and usually minor. Of the medical problems treated, chronic diseases among the elderly accounted for a majority of consultations. One cardiac death occurred at the airport in Cyprus. Other medical problems observed were post-operative discomfort from cosmetic surgery performed in Beirut and one soft tissue injury caused by the fighting.

Psychosomatic complaints, however, were frequent, particularly during the early period when the possibility of evacuation was still uncertain. The reactions included simple anxiety, crying, aggressiveness, and cardiovascular and digestive psychosomatic problems. These reactions were exacerbated by lack of sleep. The presence of a physician offered stability and relief to the patients and the personnel involved with the evacuation. In addition, the physicians' role of being responsible for the health situation of each team member had a securing effect on the whole operation.

The presence of physicians in the evacuation of Swedish citizens from Lebanon became a valuable asset, despite the absence of serious physical injuries or diseases normally observed in a conflict zone.

Keywords: citizens; conflict; evacuation; psychosomatic; Sweden
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Dutch Surgical Team Sent to the Yogyakarta Earthquake Disaster

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The earthquake that occurred in Yogyakarta, 2006, resulted in many casualties. The Bethesda Hospital in Yogyakarta received >3,000 casualties during the first 48 hours. Four international surgical teams came to support this hospital. A team from Amsterdam team was formed after a private request for help and worked there for 5-days. The circumstances in the hospital, the procedures performed by this team, and the logistical problems associated with these kinds of missions are described in this report.

The hospital was minimally damaged, but overloaded with patients and international support was appreciated. Expertise for very complex trauma patients with musculoskeletal injuries was needed. The team consisted of by a trauma surgeon, an anesthetist, a scrub-nurse, and an anesthetist-nurse ad was able to work as a complete operating room (OR) team. The international teams worked in the OR, where the Indonesian doctors coordinated the wards. The tem from Amsterdam performed internal fixation of fractures (lower extremity and pelvic) in 18 patients and the other international teams conducted operations for the rest of the fractures. The mean operating time was 112 minutes and 61% was performed under regional anesthesia. The mean age of the patients operated on by this team was 55 years (21 standard deviation).

The team was limited by local resources, such as the initial absence of a C-arm and extension table, while 129 patients with femoral fractures were admitted. Coordination between various international teams and between the teams and the local hospital staff sometimes was difficult. Despite these problems, after a 14-day period the majority of the patients were treated.

Keywords: coordination; earthquake; international response; operating room (OR); surgical team
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Using Baseline Data to Address the Lack of Hospital Beds during Mass-Casualty Incidents

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The management of victims during mass-casualty incidents (MCI) is improving. Physicians and paramedics are well-trained to manage these incidents. A problem that has been encountered during MCIs is the lack of adequate numbers of hospital beds to accommodate the injured. In Europe, hospitals are crowded. One solution to for the lack of beds is the creation of baseline data systems that could be consulted by medical personnel in three countries. A MCI never has occurred in northeastern Europe, but such an event remains a possibility. This paper describes how the use of baseline information concerning available of beds should help these three countries respond to a MCI by dispatching each patient to an appropriate hospital and informing their families and physicians in their own language.

The authors collected baseline data for all of the hospitals of Germany, Switzerland, and Strasbourg, France. Information about the number of beds and their availability hour-by-hour was included. In the case of MCIs, the baseline data program is opened and automatically connects to all of the countries. In the case of a necessary hospital evacuation, the required beds immediately are occupied in one of the three countries. Questions and conversations among medical staff or family members can be accomplished between hospitals through computer chatting that automatically is translated in to the appropriate language.

During patient evacuation phase of an MCI, respondents acknowledged that a combination of local, state, and private resources and international cooperation eventually would be needed to meet the demand. Patient evacuation is optimized through the use of this baseline data.

Keywords: baseline data; Europe; evacuation; hospital beds; mass-casualty incident
Prehosp Disast Med 2007;22(2):s59

Session 2

Chairs: P. Gregg Greenough; C. Mills

Methods for Tracking and Identifying Displaced Persons and Evacuees in a Post-Disaster Environment

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Introduction: In the post-event phase of a disaster, it becomes difficult to track persons who are forced from their homes or geographic regions. Although humanitarian organizations attempt to gather personal information and demographic data from displaced persons for reunification and relocation processes, follow-up and real-time tracking are often impractical. Additionally, recent experience with the evacuees from Hurricane Katrina in the United States points to other problems with the identification of displaced persons residing in a shelter.

Methods: Field assessment and evaluation of shelters housing evacuees and displaced persons from the 2005 Hurricane Katrina was performed. Methods for the registration of shelter occupants, identification of shelter residents and collection of evacuee information were assessed. Public services in communities with shelters (including schools, mental health services, and public safety agencies) were surveyed to evaluate if there were any issues with the identification of displaced persons.

Results: No standard for the registration or identification of evacuees or shelter inhabitants existed in the communities studied. In the shelters evaluated during this investigation, occupants were issued wrist-bands to identify and distinguish them from the general public. Schools and public safety agencies reported that this may have actually contributed to specific incidents of violence towards the displaced persons and may have placed evacuees in danger.

Conclusion: New methods for the identification and tracking of displaced persons and emergency shelter occupants

must be developed. Sensitivity to real-time tracking, and discrete methods of identification should be considered. Use of smart technologies including biometrics and photo identification should be investigated.
Keywords: disaster; displaced persons; humanitarian crises; identification; tracking
Prehosp Disast Med 2007;22(2):s60

Developing Health Indicators in Forgotten, Protracted Refugee and Internally Displaced Populations

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Objectives: Refugee health program indicators were designed for short-term emergencies yet 7 of 12 million refugees live in protracted circumstances (>10yrs). We developed indicators to evaluate long-term refugee health programs (LTRHP).
Methods: Five, protracted refugee settings were studied in Kenya, Colombia, Pakistan, Tanzania, and Thai/Burma. Diverse stakeholder focus group and key informant interviews yielded triangulated data on three indicator domains: contextual (factors external to the program that directly influence the ability of the health system to deliver care); process (the way health system goods and services are delivered); and outcome indicators (end measures and impacts of a health system/program).
Results: Long-term refugee health programs lack continuous quality improvement including the supervision of refugee health care providers, community health workers, and health educators and measures of effectiveness to evaluate the health system's impact; focus on human resource development—continuing medical education, equitable benefits for local staff, and quality feedback—improves morale. Long-term refugee health programs also lack surveillance and curative services for chronic diseases (hypertension, diabetes, mental health, nutritional deficiencies, palliative care, terminal illness); mechanisms for horizontal coordination and data sharing between sectors on linked indicators (e.g. food distribution linked with nutritional status of youngest children, water/sanitation data with diarrhea incidence); and equitable access between groups. Aditionally, educational programs do not expand as health problems emerge (nutritional counseling for non-breast-feeding HIV-positive mothers, family planning, occupational integration of the disabled).
Conclusions: Current emergency indicators are not adequate for protracted refugee populations. Implementing agencies of LTRHPs require validated and standardized, long-term indicators across three domains to be effective.
Keywords: disease; displaced population; health; indicators; refugee;
Prehosp Disast Med 2007;22(2):s60

Disasters, Women's Health, and Conservative Society: Working in Pakistan With the Turkish Red Crescent Following the South Asian Earthquake

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Background: Analysis of the health disparities that women face following disasters has prompted organizations to adjust their efforts at targeting vulnerable populations such as women, children, and minority groups.
Objective: The aim of this research was to analyze and provide practical solutions for the barriers of women's health encountered in Pakistan following the 7.6 magnitude earthquake of October 2005.
Discussion: Recent disasters in Iran, Pakistan, and Indonesia have presented challenges to the international health community in providing effective, gender-balanced relief in culturally conservative societies. Assessment teams must be gender-balanced, composed of relevant specialists, and should engage the population in a culturally acceptable manner. Response strategies should be compliant with community meetings conducted in the local language to foster local participation and feedback. Gender balanced outreach groups should include local civilians. Camp geography should foster both the privacy and security of patients. Men's and women's treatment areas should be geographically separated, and camps should seek to employ women to assist in the care of women. If the physician is a male, a female nurse or translator should be present during the examination. Women's health supplies must include an appropriate exam table, basic obstetric and midwifery supplies, and sanitary and reproductive health supplies. A system of referral must be established for patients requiring a higher level of care.
Conclusion: The lessons learned in Pakistan show that simple adjustments in community outreach, camp geography, staff distribution, and supplies can greatly enhance the quality, delivery, and effectiveness of the care provided to women during international relief efforts.
Keywords: cultural respect; disasters; response; treatment; women's health
Prehosp Disast Med 2007;22(2):s60

Evaluation and Rebuilding of Health Care After Population Displacement

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Introduction: Numerous up-rootings and resettlements have caused the culture and infrastructure of the three million 1 Kurdish population of Northern Iraq to deteriorate considerably, including its healthcare facilities. During the "Anfal" in 1988, 4,000 villages were destroyed, and up to 100,000 people were killed.
Methods: During a four month stay in the Governorate of Erbil, Northern Iraq, in 1998, a survey of the healthcare facilities was performed while working with United Nations Children's Fund (UNICEF) as a health advisor, in

cooperation with the local health authorities. A total of 27 health facilities were evaluated against the World Health Organization's (WHO) standard of Primary Health Care.
Results: Of 134 health facilities with an average staff number of 42, serving a population of 1.2 million, 125 were functioning. Thirteen of the 27 healthcare facilities evaluated offered vaccinations and 13 offered antenatal care. Growth monitoring of children was performed in 24, of which 13 had a feeding center, and 14 had laboratories. The survey revealed severe insufficiencies in expertise, logistics, and administrative procedures.
Conclusions: The survey was to be a useful tool in the evaluation and improvement of health care in Northern Iraq. Local health authorities used the survey as a guide for their further investments into health care, and for the development of procedures to improve the sustainability of health care, logistics, and administration. The same method may be used through internationally deployed forces to provide support for rebuilding health care after population displacement.
Keywords: health care; hospital evaluation; population displacement; rebuilding; survey
Prehosp Disast Med 2007;22(2):s60–s61

Landmines

Chair: Berndt Michael Schneider

Injuries and Deaths from Landmines and Unexploded Ordnance in Chechnya—1994–2005

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Introduction: For more than a decade of armed conflict and civil unrest, the civilian population of Chechnya has been among those most affected by landmines and unexploded ordnance worldwide.
Methods: An analysis of surveillance data on civilian casualties from landmines and unexploded ordnance in Chechnya was conducted. The analysis included 3,021 civilian non-combatants injured by landmines and unexploded ordnance in Chechnya during 1994–2005.
Results: The largest number of injuries occurred in 2000 (716, injury rate 6.6 per 10,000 per year) and 2001 (640, injury rate 5.9/10,000/year). One quarter of all victims were <18 years, and 19% were females. The case-fatality rate was 23%. Approximately 40% of victims were injured by landmines, 30% by unexploded ordnance, and 7% by booby traps. A large proportion of both children and adults were injured while travelling or performing activities of economic necessity. Of children, 29% were injured while tampering with explosives or playing in a contaminated area. Children were more likely to be injured by unexploded ordnance and to sustain upper body injury and upper limb amputations when compared to adults.
Conclusions: The civilian population of Chechnya experienced rates of injury from landmines and unexploded ordnance that were 10 times higher than injury rates reported from other highly affected countries, such as Afghanistan, Angola, and Cambodia. Prevention programs that focus on mine risk education, survivor assistance, and advocacy must continue and be fully supported. To prevent further civilian injuries and deaths, urgent efforts to identify, mark, and clear areas mined and/or contaminated with unexploded ordnance are needed.
Keywords: civil populations; Chechnya; injury; landmines; unexploded ordnance
Prehosp Disast Med 2007;22(2):s61

Poster Presentations—Theme 6: Humanitarian Crises

(102) Organization of Work in the Department of Anesthesia and Intensive Care Units during Wartime Bombing

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The bombings of Serbia and Montenegro from March to June 1999 provided professional and living experience for doctors and medical staff from the Surgical Clinic in Pristina, Kosovo. At the onset of the bombings, there was confusion, lack of experience in war situations, uncertainty, and concern for family members. Going to a shelter during the bombings was not possible for the patients and the medical staff of the Intensive Care Unit. Working under such circumstances was made even more difficult for the staff and patients due to power outages, water and food shortages, and the disruption of the central gas networks. To prevent patient injury from broke glass due to bomb detonation, beds and ventilators were moved away from windows. The windows also were covered by scotch tape. Thoracostomy tubes and the central gas supply lines had to be extended in order to move the patients away from the windows. Although there were sufficient supplies of medications and disposable equipment during the war, and that humanitarian help was provided, some of the received medications were outdated and unusable. Transfusion also was a problem.

Working during a period of bombing requires effective organization and poses a number of technical and professional problems.
Keywords: bombing; department of anesthesia; hospitals; intensive care unit; operations; Serbia
Prehosp Disast Med 2007;22(2):s61

(103) Medical Response from the UK to the Kashmir Earthquake

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Introduction: Scattered responses to humanitarian crises can waste resources and impose additional logistical problems. It has been estimated that small-scale donations to Bosnia in the early 1990s cost (US)$34 million for disposal. The World Health Organization (WHO) warned of similar problems in the early stages of the Kashmiri earthquake response. The aim of this study was to establish the

number, type, and scale of individual and small group altruistic medical responses to the October 2005 Kashmir earthquake from the United Kingdom (UK).
Methods: A search was conducted of the UK Lexis-Nexus newspaper database from October 2005 to April 2006 using the search strategy: (Pakistan AND earthquake AND (medic* OR nurs* or health)). Reports purely relating to fundraising or to professionals working with international organizations such as Medecins Sans Frontieres (MSF) or the Red Cross/Crescent were excluded.
Results: A total of 460 articles were located, of which 33 were duplicates within the database. Most articles related to fundraising, however, 21 directly reported UK health professionals traveling to or sending medical supplies independently to Kashmir without invitation. Doctors traveling included anesthetists burns, general, orthopedic and plastic surgeons, emergency physicians, general practitioners and rheumatologists, of all grades from trainee to retired. Nurses, theatre technicians, and therapists also traveled. Reports were found from 14 different regions of the UK.
Conclusions: Despite international pleas to the contrary, the Kashmir disaster resulted in multiple uncoordinated, individual relief efforts from the UK. There is a need for international registration and credentialing of healthcare professionals traveling to disaster zones and more direct management and oversight of their activity.
Keywords: donations; international response; Kashmir earthquake; United Kingdom; wasted resources
Prehosp Disast Med 2007;22(2):s61–s62

(104) Greek Mission in South East Asia (Thailand-Sri Lanka) after the Tsunami (Operational Drawing "ARGONAFTIS")

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This presentation describes the organization and operation of the Greek mission in South East Asia, after the South East Asia Tsunami in 2004.

The duration of the Greek mission during first response phase, was from 28 December 2004 until 03 January 2005. The distribution of humanitarian help took place in Maldives, Sri Lanka (Kolombo), and Thailand (Bang-Kong). From February through April, 2005, the mission followed the sanitary operational plan "Argonaftis" in Sri Lanka (Trinkomaale), with the aim of distributing humanitarian help and providing sanitary coverage for the population of this region.

The distribution of the humanitarian help was successful. In 29 days, the total number of patients examined was 1,947. The majority of the incidents (>90%) concerned patients with chronic health problems. Seven cases of urgent transfers were recorded with the hospitalization of the patients at the local hospital. The overall assessment of the mission concluded that it was successful.
Keywords: Greece; humanitarian assistance; sanitation; South East Asia Tsunami; Sri Lanka
Prehosp Disast Med 2007;22(2):s62

(105) Plans for the Management of the Infiltration of Illegal Immigrants—"Poseidonio", "Valkanio"

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Objective: To organize and coordinate the actions of the involved institutions and propose the means and processes needed to manage the illegal immigration.

To meet these objectives, the following steps must be taken: (1) the convenient localization and the dislocation that facilitates the trafficking of illegal immigrants, as well as the means that are used for their transport must be contained; (2) the borders of the country must be monitored and controlled; and (3) the entry of illegal immigrants must be prevented.
Results: The processes must be contained by the development and enactment of a

1. Legal framework at the Greek and international levels; and
2. Means, processes, and assessments used by the involved institutions must be standardized.

Conclusion: The effort of illegal immigrants to infiltrate the country and the forces working against them operate on a daily basis. An excellent knowledge of the existing plans from the involved institutions is essential for preventing illegal immigration. Explicit discriptions of the roles of the involved institutions should exist prior to the occurrence of an event. The involved institutions and infrastructures must be coordinated.
Keywords: borders; illegal immigrants; trafficking; management; plans; roles
Prehosp Disast Med 2007;22(2):s62

(106) Medical Relief Work in the Gujarat Earthquake, 2001

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On behalf of the Indian Society of Critical Care Medicine, Calcutta Branch, and the Rotary Club dist-3290, the authors traveled to the earthquake-affected areas of Gujarat in 2001 to provide relief and aid to the victims. A 10 member team, including doctors and paramedics, started their relief work, making Bhachau (68 km from Bhuj) the main focus of their relief work. Bhachau was the worst affected area following the earthquake. Out of 45,000 people living in Bhachau, approximately 10,000 died due to this disaster. The team arrived with adequate types and amounts of drugs, surgical instruments, and resuscitation facilities. The team observed the city of Bhachau and 72 villages of the Bhacahu taluka, within an area of 140 km x 50 km, completely razed off of the ground. The team worked with the NGOs in this area. The team also worked with military medical units, where members performed many life-saving emergency operations, such as fractures: (1) fractures of the humerus, neck femur, and mandible; (2)

nailing; (3) plating; (4) amputation; (5) skin grafting; (7) malunion; and (8) treating the wound infections. The team also worked with Relief International of the US in different villages, such as Dudhai, Rappar, Baliari, and Chowbari. The team examined many pediatric patients—30% of them suffered from respiratory tract infection. The team examined about 3,000 patients within 10 days; 60% were trauma victims. The team also identified cases of anxiety, depression, and fear psychosis. Members felt that in the future, the team should prepare for better management in order to face such a disaster if they were to arrive suddenly with proper backup facilities, as are found developed countries.

Keywords: Gujarat earthquake; India; medical relief work; medical teams
Prehosp Disast Med 2007;22(2):s62–s63

(107) Lessons from the Banda Aceh and Kashmir Disaster Relief Efforts

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Introduction: On 26 December 2004, an earthquake measuring 9.0 on the Richter scale buckled the Indian Ocean floor. More than 275,000 people perished in the Tsunami that followed. On 08 October 2005, the same tectonic plates were involved in an earthquake measuring 7.6 on the Richter scale in Pakistan and India, killing tens of thousands of people.
Methods: The Belgian Association of Pediatricians sent a medical mitigation team (BMT) to the tsunami-engulfed General Hospital of Banda Aceh (Northern Sumatra). Ten months later, the Belgian government sent a disaster relief team (B-FAST) to Kashmir.
Results: The BMT started a pediatric intensive care unit at Banda Aceh, which ultimately led to ethical discussions among international partners, as well as among team members. The most critical patients suffered and died from systemic Burkholderia Pseudomallei infection (melioidosis) caused by the aspiration of murky ocean water. In Kashmir, B-FAST dealt with severely infected wounds and fractures as a consequence of local folk medicine practice.
Conclusion: To avoid ethical issues with the disaster relief site becoming a terminal instead of a transit zone, critical pediatric patients should be fully supported medically, stabilized, and then transferred immediately to Western civilian and/or military-controlled intensive care facilities.

Keywords: Banda Aceh; disaster relief efforts; earthquakes; Kashmir; Tsunami
Prehosp Disast Med 2007;22(2):s63

(108) Youth Awareness in Disaster Reduction

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This presentation will seek to explain how young people can contribute to disaster reduction. It has been proven that when there is a war, destruction, and other negative outcomes, young people are prominent. These young people are the future. Many people do not realize that young people also are able to use the same effort and potential energy in reconstruction and rehabilitation. For example, young people can use this effort and energy to address disasters caused by climate change. This is an innovative way to explore this force in contributing to disaster reduction. For young people, it involves them in the decision-making so that they can become players instead watchers in disaster-related issues.

Keywords: disaster reduction; young people; youth awareness
Prehosp Disast Med 2007;22(2):s63

Oral Presentations—Theme 7: Mass-Gatherings

Session 1

Chairs: Paul Arbon; M. Sabbe

Medical Planning for a Major Event: The Pope's Visit to Krakow on 26–28 May 2006

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Introduction: The Pope's three-day visit in Krakow between 26–28 May 2006 required a major exercise in medical planning. The largest gathering, at the Holy Mass participated by the Pope on Krakowskie Blonia, occurred on 28 May 2006 and attracted a crowd of 1,000,000 people. The medical coverage was organized on two levels. Basic first aid was provided on the first level by the scouts, the Polish Red Cross, and the Medical Services of the Order of Malta. The second level was responsible for basic life support/advanced life support (BLS/ALS) standards of care and was provided by the emergency medical services (EMS), which included the staffs of 46 ambulances and by personnel from seven field hospitals.
Methods: The analysis involved 939 medical interventions at the field hospitals and information was collected on the following: (1) age and sex of the patients; (2) type of intervention; (3) scope of assistance: first aid, BLS, or ALS; (4) time of intervention; (5) treatment received; and (6) transportation to the hospital.
Results: Most of the ailments experienced were: (1) headaches; (2) effects of heat; (3) blisters; and (4) and abdominal symptoms. The field hospital treated a wide range of conditions including: (1) cardiac conditions; (2) fractures; (3) premature labor; and (4) acute abdominal emergencies. There was a large age difference among the patients and the majority of those receiving treatment were women.
Conclusions: The Pope's visits required medical preparation for mass-gathering. An inventory of incidence of conditions was collected.

Keywords: crowding; mass gathering; medical intervention; planning; treatment
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Medical Support for the International Monetary Fund/World Bank Group Boards of Governors Annual Meetings: Issues, Challenges, and Lessons Learned

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The 10-day International Monetary Fund/World Bank Meeting was held in September 2006 in Singapore. A total of 16,000 delegates attended the meeting, and 10,000 local staff members were involved. The large number of delegates and staff, the multiple venue sites, and the duration of the meeting stretched local medical support resources. Since the meeting was classified as a high-security threat level meeting, a heightened state of alert was activated. This involved the pre-positioning of medical and other contingency forces on the ground to respond to any mass-casualty incident. The threat of a bird flu outbreak and the possibility of haze caused by forest fires in Indonesia complicated medical support preparations. The medical support concept adopted was called "Total Medical Coverage". This included medical coverage from the time the delegates arrived in Singapore until their departure. Lessons learned from this event include: (1) the concept of Total Medical Coverage must be validated; (2) coverage at the airport should be provided by mobile teams; (3) the medical center providing care to the delegates should adopt a flexible plan to efficiently distribute medical plaster and analgesics and check blood pressure, rather than performing a long consultation process; (4) the various groups involved in planning medical support for off-site events should be rationalized to maximize event planning/medical support; (5) a hospital liaison desk to coordinate all referrals to he hospital is required; and (6) a medical operations cell and an operations hub are essential for the command, control, and monitoring of medical support.

Keywords: mass-casualty incident; medical support; planning; Total Medical Coverage; venue sites
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A Sample for Mass Gathering Planning: Universiade 2005 Summer Games, in Turkey

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In order to make an efficient plan for mass gatherings, essential information about the activity type, crowd size, and venue of activity is needed. The Universiade is the biggest sporting event in the world after the Olympic Games. The Universiade 2005 Summer Games were held in Izmir, Turkey. Athletes from 131 different countries competed in 14 different sporting events.

The Health Commission formed the following subcommissions: (1) education; (2) emergency and ambulance; (3) hospitals; (4) health units in venues (both training and competition); (5) doping control; (6) food, water, and environment health; (7) logistics; and (8) data recording. During the 2005 summer games, the International University Sports Federation (FISU) delegation made plans to provide health services to all the athletes, coaches, managers, employees, volunteers, press members, and spectators. A total of 5,342 athletes from 131 countries, 2,732 FISU managers and delegation members, 1,149 referees, and 18,536 employees and volunteers attended the games. The games were attended by an audience of 357,000. A total of 854 healthcare personnel served during the games.

Continuous, high standard health services were provided during the 2005 Izmir Universiade Games. These services were provided in 59 facilities, accommodation units, and the Games Village. Besides the health services provided to athletes according to FISU rules and standards, the health of the spectators and other participants also was served. The experiences from the 2005 Izmir Universiade Games will help in the organization of future mass gatherings.

Keywords: athletes; mass gatherings; preparedness; Turkey; Universiade Games
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Jamarat Ritual: Emerging Critical Cornerstone of Hajj

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Hajj is an annual religious event when >2,500,000 Muslims from >140 countries gather in the holy shrine of Mecca (Earth Umbilicus) to perform this cornerstone ritual of Islam. The activity of Jamarat symbolizes the stoning of the devil as done by the prophet Abraham (God's Peace be upon all prophets).

The Jamarat Bridge is a pedestrian bridge in Mina near Mecca used during the stoning ritual. The Jamarat Bridge originally was constructed in 1963, and has been expanded since then. The purpose of the bridge is to enable pilgrims to throw stones at the three Jamarat pillars from either the ground or the bridge. The pillars extend up through the openings in the bridge.

At certain times, more than a million people may gather in the area of the bridge, which has led to mass-causality incidents caused by stampedes.

Until 2006, the bridge had a single tier. Following the January 2006 Hajj, construction began on a multi-level bridge with major construction work in and around the Jamarat area.

This paper discusses the issues related to Jamarat such as: (1) the bridge area layout; (2) the violation of the Ministry of Hajj's regulations; (3) the annual pilgrim census allowed; (4) the level of religious education; and (5) the psychological impact.

In addition, an overview isprovided of current efforts aimed at the prevention of hazards and the safety of the pilgrims through improved crowd dynamics, new designs suggested for the Jamarat area, and planned evacuation strategy.

Keywords: construction; crowds; Hajj; Jamarat Bridge; mass-casualty incidents (MCIs); pilgrims
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Validation of the Maurer's Formula to Type and Size the Rescue Resources and Healthcare Needs for Mass Gatherings: The Case of Three Consecutive, Major Air Shows in Western Switzerland

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Three major air shows took place in western Switzerland between 2004 and 2005. Judging by the number of attendees, the site, accessibility and type of gathering, the very important persons' participation, and the police risk analysis, a model of risk evaluation for mass gatherings proposed by K. Maurer was used to determine the type and size of rescue resources and healthcare needs.

The air shows were comprised of: (1) the Swiss Air 04, a three-day, military meeting with 270,000 attendees, 514 medical contacts, and 11 medical evacuations; (2) the Yv'Air 05, a two-day, civilian meeting with 27,000 attendees, 75 medical contacts, and two medical evacuations; and (3) the Centenary meeting of the IAF, a three-day, civilian meeting with 65,000 attendees, 59 medical contacts, and four medical evacuations.

Preparedness for each of these three air shows was planned 4–6 months before their occurrence and called for all partners (police, firefighters, medical and public health services, army, and organizers) to meet the requests of Maurer's model.

According to international statistics for mass gatherings, these three air shows reflected the total number of patient contacts of 1.79/1,000 attendees (range: 0.91–2.78; worldwide average: 0.9–2.6), the total number of medical evacuations of 0.047/1,000 attendees (range: 0.041–0.074; worldwide average: 0.07; range: 0.01–0.55) and no cardiac arrests (worldwide average: 0.25–1/500,000 attendees). No major accidents occurred.

In conclusion, the use of Maurer's model to decide what size and type of rescue resources and healthcare needs were necessary to face these air shows was adequate. The number of medical encounters and evacuations were in accordance with those reported worldwide.

Keywords: air show; evacuation; mass gathering; preparedness; Switzerland
Prehosp Disast Med 2007;22(2):s65

Session 2

Chairs: Paul Arbon; M. Sabbe

Three Hundred Heat Casualties during a Walking Trip

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During the Annual International Four Days Marches Event, 45,000 participants walk for four days. Each day they walk thirty, forty, or fifty kilometers (km). Traditionally the marches take place during the third week of July. Many of the participants are well over fifty. In 2006, the marches were terminated after one day because >300 participants were not feeling well due to the extreme heat. A total of 50 participants were transported to the hospital, and two participants died.

In the presentation the following questions will be discussed:
1. Was there sufficient preparation and awareness for and during the event?
2. Was the weather adequate?
3. What were the consequences for the hospitals involved, and did the "Zirop" work?
4. The decision-making process: why a complete cancellation?
5. How did the participants feel about the incident and what were the results of the evaluation?
6. How should the responsibility be shared: should the government, the organization, or the participants take the appropriate precautions and are adequately prepared?

Finally, an explanation will be provided regarding the lessons learned and how the 2006 experiences will be incorporated into the preparations for 2007. This not only includes the International Four Days Marches Event but also the way in which preparations are made for other events.

Keywords: heat injuries; mass-casualty incident; preparedness; responsibility; weather
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Prehospital Management of Mass Gatherings in Rome: A Review from the Funeral of Pope John Paul II to the Celebration of the World Football Cup 2006

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Introduction: The City of Rome and Vatican State frequently require implementation of the local Emergency Medical Services plan (ARES 118) for events that present a high risk due to high numbers of people attending.
Objective: To evaluate a prehospital emergency plan during mass-gathering events.
Methods: A specific protocol for health protection was planned for Pope John Paul II funeral (attendance 3,000,000) and other relevant events such as "The White Night" (attendance 1,000,000) and FIFA Football Cup 2006 Celebration (attendance 1,500,000). The activities planned included: preparedness according to other emergencies organizations including the Fire Brigade; command and control; logistic support including the provision of adequate supplies of water, food, and distribution of blankets; setting CCS (Casualties Clearing Station) for patients triaged as levels T1-T2; emergencies special vehicles (motor bike, van, etc.) that were used to implement health facilities on the scene; rescue teams trained to operate in specific sites like ancient Roman ruins or the subway.
Results: The results of the application of the protocols for 5,509 casualties includes: (1) an Early Care Response on the scene (89%); (2) pre-hospital, first treatment of patients on the scene (71%); (3) Inappropriate hospital admission (2.3 %); (4) a contamination of health care services for citizen living in the restricted areas (no significant difference in response times).

Conclusion: A combination of preparedness activities and application of protocols was useful for providing prehospital medical care during mass gatherings.
Keywords: continuity; mass gathering; prehospital protocols; on-scene treatment; prepardedness
Prehosp Disast Med 2007;22(2):s65–s66

Subway Accident in Rome, October 2006

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Introduction: On 17 October 2006, two trains carrying 1,400 passengers crashed into each other in downtown Rome, near Piazza Vittorio. The accident caused the death of one woman and injuried 266 people.
Objective: To evaluate the pre-hospital emergency plan of Rome for managing a mass casualty situation.
Methods: A prehospital emergency plan specifically for Rome's subway stations was prepared. To evaluate the application of the plan on-scene, a major incident method was applied.
Results: The evaluation of the results demonstrated that:

1. safety measures directed at CBRNE situations were successfully applied;
2. Gold Strategic Command and Silver Tactical Command structures were used and included Government Authorities (Emergency General Director—Regional Command);
3. Bronze Command and Communication at the scene were difficult because the accident occurred three floors under street level;
4. good assessments were conducted at the scene according prepared protocols (22 ambulances, Logistic support, and a Casualties Clearing Station (CCS) were operational within 20 minutes; 44 ambulances, two CCS, and six buses were at the scene within the first hour; and 90% of the resources were well-located at the scene);
5. a START Triage method was applied on 116 patients (five red; 19 yellow; 91 green; one black);
6. patients were admitted into 17 hospitals;
7. 150 patients were not transported by the health services and went by themselves to one of two hospitals.

Conclusion: The use of a combination of preparedness activities, such as protocols, integration with other organizations, and a regional strategic command, are useful during a mass casualty situation.
Keywords: preparedness; regional strategic command; train crash; plans; protocols; START triage
Prehosp Disast Med 2007;22(2):s66

Managing Mass-Casualty Incidents: Protocols or Principles?

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Introduction: Mass-casualty incidents (MCIs) require management under conditions of uncertainty. The dynamic nature of the situation—the erratic flow of information and the large number of variables—dictates incident management. Preparing solutions ahead of time and thus, is complicated by the uncertainty of a future event; its timing, location, characteristics, consequences, magnitude, and response required. For this reason, MCI planning, preparation, and training that is based on rigid, orthodox assumptions may be ineffective or even counterproductive.
Methods: The details of 93 terror bombings that occurred in Israel in the past five years were assembled. The range of casualties involved in these MCIs illustrates how difficult it is to draw conclusions for planning based on prior events.
Results: The mean number of casualties was 52; the median was 43. The range was between 12 and 160 victims, respectively. The results show that the percentage of severely injured (ISS = 16) was far from constant and ranged from 0 and 100%. Likewise the fatality rate ranged from 0 to 53%.
Conclusion: The medical manager of a MCI must approach the event with a high degree of flexibility in order to use all available resources in a manner that will lead to the most successful outcome. Training for the management of MCIs should stress these capabilities and skills.
Keywords: Israel; mass-casualty incident; mass-casualty incident planning; percentage of severely injured
Prehosp Disast Med 2007;22(2):s66

Poster Presentations—Theme 7: Mass Gatherings

(109) Emergency Care Services in Prehospital Intervention for an Uncertain Gas Leak

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Background: The impact of a gas leak in Ankara, Turkey, on 10 February 2005, in terms of epidemiologic outcomes, resource utilization, and the time course of emergency needs was estimated.
Objectives: The aim was to standardize interventions against chemicals.
Methods: All of the events that occurred following notification of the gas leak are presented a case report.
Results: At 11:15 hours (h), the Dispatch Center received a call from Esenboga Airport reporting that two laborers working in the airport had become sick and were transported to Diskapi Hospital, and that a package in the same area would need to be removed. At 11:40 h, the Civilian Defense Team took measures to block entrance into the incident place. The Incident Place Management Team tried to detect the number of people affected and prepared them to change their clothes and be decontaminated. The Domestic Lines Chief offered to remove the contaminated plane away from the others, if not to take away other planes and personnel and control them continuously. It was found that 138 passengers along with cargo had been on the plane. The name and address lists of all passengers were obtained.
Conclusions: Incident place management should be conducted by the 112 Emergency Health Service teams. It should be decided ahead of time where and how to make personnel and area measurements. It also was concluded that communication networks should be guided centrally. Warning and quarantine stages, as well as hospital trans-

portation and local evacuation plans should be designated and medical teams must be full equipped.
Keywords: chemicals; decontamination; gas leak; incident place management; Turkey
Prehosp Disast Med 2007;22(2):s66–s67

(110) Medical Preparedness for Mass-Gathering Situations at Major Baseball Stadium in Japan: Renovation Planning for Hanshin Koshien Stadium

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Introduction: Hanshin Koshien Stadium, Japan's oldest major baseball stadium with a capacity of 50,000 spectators, is under renovation planning. Built in 1924, it only has a small, old-fashioned clinic for the provision of first aid, it lacks a policy and equipment to cope with a multi-casualty incident. The hospital, located one km from the stadium, is expected to be the most active medical facility during major incidents, but the hospital's relationship with the stadium management has been superficial. After receiving a press report in November 2005 about the stadium's renovation plan, the authors contacted with the stadium management.
Methods: Meetings among the stadium management, city fire department, and the hospitals were initiated. The topics discussed were: (1) renewal of the stadium clinic; (2) elevators that would accommodate stretchers; (3) public access defibrillators; (4) approach and parking space for emergency vehicles; (5) evacuation route for spectators; (6) backup electricity; (7) emergency communication equipment; (8) open space for a triage post and a casualty clearing station; (9) stockpile of supplies; and (10) a Helipad.
Results: Stadium management was too slow to accomplish an agreement with the hospital within one year due to: (1) management's ignorance of the stadium's medical hazards; (2) a lack of administrative control on medical preparedness in mass-gathering situations; (3) the poor relationship between the management and the local medical community; and (4) absence of nationwide statistics about medical preparedness and responses for mass-gathering situations.
Conclusions: In order to promote preparedness for mass-gathering situations, the medical community should negotiate with venue managements or event organizers about: (1) hazards and potential incidents; (2) lessons learned from domestic and foreign incidents; and (3) national laws and local regulations.
Keywords: baseball stadiums; hospitals; Japan; management; relationships
Prehosp Disast Med 2007;22(2):s67

(111) Medical Assistance in 2006 World Roller Speed Skating Championship

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Introduction: The World Roller Speed Skating Championship was held from 01–09 September 2006 in Anyang City, South Korea. An on-site, medical-aid station was set up and, when necessary, patients were transferred to the emergency department of the appointed hospital. The objective of this study was to examine the characteristics specific to both injury patterns and mass-gathering support of inline roller skating.
Methods: Patient data were collected from special medical records at the medical aid station and from electronic hospital records. Collected variables were analyzed.
Results: A total of 215 patients visited during the 10 days. Of the total number of patients, 78% visited the facility for the first time and 56% were foreigners. There was no serial increase in the numbers or rate of patients except for revisiting patients. Except for teenagers, the number of male patients was greater than of females, especially for patients >60 years of age. Minor injury was the most common complaint of patients, especially for the players. Rate of injury among all visits was 62%. Twenty-four patients (11.2%) were transferred to the hospital. Provisions of medication and dressing were the first and second most comon treatments, respectively.
Conclusion: Medical assistance for the inline roller skate game has the specific characteristics of inline roller skate injuries and the mass-gathering sports events. Preparedness should be suited to the specific patterns of patients. It will be necessary to study more cases every year for characterizing various patterns of patients in inline roller skate games.
Keywords: emergency department; injury patterns; medical aid station; preparedness; roller skating
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(112) Club Drugs and their Abuse: A Hospital Case Series and Experiences in a Prehospital Music Festival Environment

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A series of six gamma-hydroxybutyrate (GHB) overdoses during a 12-hour period presented to the emergency department following a local music festival. Two patients who presented to the emergency department simultaneously required intubation and ventilation.

Recent analyses of target populations have identified a rise in the recreational use of so called "club drugs", namely GHB, ketamine, and methamphetamine (MDMA) in some parts of the world. Following ingestion, patients may present in various states, ranging from mild intoxication to coma. Presentations have the capacity to utilize significant medical resources, which may be limited in a prehospital setting. Studies of GHB have demonstrated a high variability of sedative potential across volunteers, suggesting an

increased likelihood of accidental over dosage. Deaths have been reported as a result of all of these drugs.

The current literature, guidelines, and trends of use of these drugs were reviewed, and recent research identifying their pharmaco-dynamics, as well as potential novel methods of treatment, will be discussed. Experiences in providing prehospital medical support at music festivals and the morbidity associated with the use of such drugs at these events will be reported.

The aim of this report is to guide hospital and prehospital healthcare providers in managing such patients, informing their clinical decisions, and enabling the best use of limited resources.

Keywords: club drugs; gamma-hydroxybutyrate; hospital; music festivals; prehospital
Prehosp Disast Med 2007;22(2):s67–s68

(113) Planning for Waves: Is It the Same as Preparing for a Disaster?

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The World Life Saving Championships were held on the Coast of Victoria, Australia in February 2006. Four thousand competitors representing 29 nations competed at three different venues over 16 days. The primary location of the beach events was Lorne, a rural, beachside community of approximately 1,200 residents. A small community hospital offers basic radiology and pathology services during business hours and staffs a volunteer ambulance. The different levels of vulnerability associated with such an event creates the need for proper planning and preparedness.

Limited health services in combination with security, transport and logistics, shelter, water, and medical supplies—not to mention temporary structures supporting an expected 20,000 spectators—were just a few of the potential emergency. In total, 350 patients were managed with only three patients transferred out of the event.

This presentation will review the planning and preparation that went into running the medical and water safety teams, with particular focus on the unpredictable variations in meteorlogic conditions, satellite event locations, and limited routine health resources. Risk assessment of potential emergencies from sporting injuries, mass water casualties, and drug- or alcohol-affected patrons attending evening functions also are discussed.

The use of a generic scoring system to assess the health risks at such a mass gathering will be illustrated. The integration of statistics and experience allowed for the implementation of strategies that reduced the impact of the event on the local health services.

Keywords: local health services; mass gathering; planning; preparedness; strategies; World Life-Saving Championships
Prehosp Disast Med 2007;22(2):s68

(114) Plans for Management of Mass Losses from Airplane Show: Air Demonstrations "Archangel" and "Red Arrows"

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The Military Aviation undertook the organization of an International Air Demonstration called "Archangel" in the Airport of Tanagra from 16–18 September 2005. Planes from many countries participated in the event, with dynamic (acrobatic) and static exhibitions. There was a large attendance.

On 09 June 2005 and 06 January 2006, the British air demonstration "Red Arrows" took place in the region of P.Faliron, also drawing a large attendance. According to the international definition (>1000 individuals), the event constituted a mass gathering, which required the application of special sanitary support rules. However, the development of a plan that covered all of the possible emergency situation of sanitary support was impossible due to the lack of previous experience.

Mass-gathering in open-air locations have shown that the most common medical problems mainly are pathological (69%) and surgical (31%). The medical personnel will recognize immediately the health status of every patient and mobilize the services of sanitary support. No serious problem occurred and the preparedness and collaboration of all involved institutions was very good. The existence of a common coordinative center was absolutely essential.

Keywords: air demonstrations; airplanes; mass-gathering; preparedness; sanitary support
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(115) Emergency Medical Services Personnel Training in Weapons of Mass Destruction Casualties Management

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The aim of this study was to identify difficulties regarding the training of emergency medical service (EMS) personnel in non-conventional trauma.

This training was part of the special training for the Athens 2004 Olympic Games for the doctors, nurses, and paramedics, who were members of the weapons of mass destruction (WMD) response team of the Hellenic National System for Emergency Care. The training was organized by EKAB and provided to 225 participants.

There were no differences observed between physicians, nurses, and paramedics, regarding the specialized knowledge in nuclear, biological, and chemical (NBC) environments. Only 37.6% of the participants had no basic knowledge of mass-casualty incident management. The vast majority of

the participants had severe lack of knowledge regarding the basics in management of nuclear (69.3%), biological (72.4%), or chemical (98.7%) incidents. Training difficulties were experienced in the areas of radiation damages (by 93.3% of participants) and the differences in the effects of contamination (90.7%) between radiation exposure and of other agents, weaponization (99.1%), the ability to differentiate between biological warfare agents and common biological agents (86.7%), and the different chemical warfare agents (100%) and their effects (80.5%) in combination with treatment (84.0%) and contamination/decontamination (87.6%). The potential number of mass casualties following the use of NBC warfare agents could not be estimated by 182 participants (80.9%).

Near the end of each course, different tabletop exercises were practiced. The average results of these exercises revealed: (1) 3.3% of the participants of each course were unable to launch correct early warning for the warfare agent used; (2) 4.1 % could not apply the proper treatment for a given warfare agent; (3) 2.7% were unable to decontaminate accordingly; and (4) procedures and algorithms regarding management and safety were not followed by 53% and 2.1%, respectively.

Keywords: emergency medical services (EMS); mass-casualty incident; nuclear, biological, and chemical (NBC) warfare; training; weapons of mass destruction (WMD)
Prehosp Disast Med 2007;22(2):s68–s69

(116) Mass-Casualty Triage in the Chemical, Biological, Radiological, or Nuclear Environment

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Field trauma triage systems currently used by emergency responders during mass-casualty incidents and during disasters do not account adequately for the possibility of patients contaminated with chemical, biological, radiological, or nuclear (CBRN) material. A system is needed that can help healthcare personnel assess whether there has been exposure to or involvement of CBRN agents (detection), protect themselves from secondary contamination, account for the clinical implications of the contamination in the triage algorithms, and still provide accurate, rapid, and reproducible triage of large numbers of patients using minimal resources.

The objective of this study was to propose CBRN-compatible trauma triage algorithms based on a review of the literature and the input of recognized content experts. It is presupposed that this system will be applied to a disaster with a single discrete scene (e.g., a building collapse due to a bombing with a large radiation dispersal device) or multiple discrete scenes (e.g., several, simultaneous, chemical weapons releases in a city), and not to an event with widely dispersed patients and no specific scene (e.g., multiple smallpox patients scattered around country).

The primary focus of the system shall be on the triage of physically injured patients, with less emphasis on those whose sole source of injury is a CBRN agent. It is recognized that work is needed in the latter area. Emphasis will be placed primarily on the actual triage of victims and less on detection and provision of protection from contamination.

Keywords: algorithms; chemical, biological, radiological, or nuclear (CBRN) agents; emergency responders; mass-casualty incident; triage
Prehosp Disast Med 2007;22(2):s69

(117) Emergency Physician-Managed Triage at a Rock Concert Avoids Overload at the Local Emergency Department

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Introduction: The organization of an on-site medical care system at music festivals aims to provide emergency medical care and treatment (EMCT) according to the principles of Basic Life Support, Advanced Life Support, and timely evacuation. In the case of a mass-casualty incident (MCI), EMCT also must prevent disruption of the local EMS system.

Methods: The composition of patient cases presenting during four-day outdoor summer concert, Rock Werchter, during the 10-year period, 1995–2004 was identified. The mean daily attendance at this event was 80,000, primarily teens and young adults.

Results: The overall patient presentation rate (PPR) was 220/10,000 attendees (2%). Emergency physician involvement at first aid stations (60/10,000) occurred in 27% of presentations. Only 12% of patients triaged by an emergency physician (EP) required transport to a hospital. The hospital transfer was 7/10,000. Patients transported to a hospital consisted of 80% trauma, 13% internal pathology, and 7% intoxication. Medical imaging was used in 70% of the patients transported to hospitals. Although PPR and the hospital transfer rate might be high compared to relevant literature (12/10,000 compared to 4/10,000), the systematic triage by an on-scene emergency physician reduced the eventual patient load to the local ED to 3.2%.

Conclusion: The benefit of a prehospital medical team at the scene of the event is illustrated by the effectiveness of triage of the on-site population and adequate regulation of patients transport to a hospital. A prehospital medical team is especially beneficial in situations likely to involve a high patient load, as may occur at a rock concert with a large young audience that is likely to use drugs and alcohol.

Keywords: emergency physician; music festival; on-site medical care; patient presentation rate; triage
Prehosp Disast Med 2007;22(2):s69

(118) Azienda Sanitaria Locale 10 Medical Services at the Olympic Village Polyclinic of Sestrires during the Torino 2006 XX Olympic Winter Games and IX Paralympic Winter Games

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ASL10-Ospedale Civile "E. Agnelli", Pinerolo (Torino), Italy

Introduction: The Azienda Sanitaria Locale (ASL) 10, in agreement with the TOROCs Medical Service, coordinated the basic and emergency medical assistance at the alpine venue of Sestrires. This represented the integration between

the Torino 2006 Olympic Medical Service and the Public Health System of the Piedmont Region.
Methods: We conducted a retrospective review of medical care provided to athletes, officials, workforce, and members of the 'Olympic family' at one of the three polyclinics inside the Olympic Villages. This polyclinic was located in Sestriers during the XX Olympic Winter Games and IX Paralympic Winter Games Turin 2006.
Results: Descriptive statistics were used to characterize data from the Olympic medical care database.
Conclusion: This review evaluated the level of preparedness and the level of services available during the XX Olympic Winter Games and IX Paralympic Winter Games in Torino, Italy in 2006.
Keywords: basic and emergency medical care; Olympic Winter Games 2006; Paralympic Winter Games; polyclinic; preparedness
Prehosp Disast Med 2007;22(2):s69–s70

Oral Presentations—Theme 8: Life-Threatening Situations in Dailiy Emergencies and Disasters

Session 1

Chairs: TBA

Emergency Medical Evacuation of Patients with Severe Lung Failure using Miniaturized Extracorporeal Assistance Devices

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Objective: An experience with two new miniaturized extracorporeal assistance devices (EADs) for emergency, interhospital transfer for adult patients experiencing severe lung failure was analyzed. The utilization, efficiency, and safety of the new assistance devices were characterized. Patient preparation, including cannulation were described, and the care and precautions en route were reported.
Methods: Between March 2001 and February 2007, EADs were used to facilitate medical emergency evacuation for 19 adult patients with severe hypoxemic/hypercarbic respiratory failure (n = 15), or combined respiratory and cardiac failure (n=4). Extracorporeal assistance devices were used to access the percutaneous vessels. The technique included pumpless extracorporeal lung assist (PECLA) in 15 patients. Closed-loop, extracorporeal circulation with a centrifugal pump unit for arterio-venous life support (n = 3) and veno-venous extracorporeal membrane oxygenation (n = 1) was assessed with the new Emergency Life Support System (ELS). The ELS and PECLA systems are small enough to be placed on a standard gurney.
Results: None of the patients died en route. Air medical evacuation was used for 13 patients, and six patients were transported via ground ambulance. Survival was 40% in the PECLA group and 75% for the ELS patients. During extracorporeal assistance, no technical complication occurred. The patient-related complication was two cases of limb ischemia due to the arterial cannula.
Conclusions: The application of miniaturized extracorporeal assistance devices enables the secure transportation of critically ill patients without technical or personnel support. Oxygen delivery can be restored rapidly and blood-flow can be ensured en route.
Keywords: emergency medical services; evacuation; extracorporeal assistance devices; lung failure; transport
Prehosp Disast Med 2007;22(2):s70

Diagnostic Accuracy of Capillary Refill Time for Victims of Trauma and Gastrointestinal Bleeding

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Introduction: Capillary Refill Time (CRT) is an important component of START, the rapid triage tool used to evaluate the circulatory status of casualties.
Objectives: The objective of this study was to evaluate the predictive rate of shock by use of the CRT.
Methods: An observational study was conducted to assess out-of hospital trauma and gastrointestinal (GI) bleeding patients transported to the tertiary emergency center from 2001 to 2005. Upon admission, the CRT, pulse rate, respiratory rate, and Glascow Coma Scale (GCS) were recorded. Shock was defined based on the Shock Index and clinical findings. Cases of CRT that lasted >2 seconds or were incalculable were predicted as shock, and the predictive rate was analyzed statistically. Patients <15-years-old and those experiencing out-of-hospital cardiopulmonary arrest were excluded from the analysis.
Results: A total of 572 trauma and 42 GI bleeding patients were enrolled in this study. One-hundred sixty-two patients (26.4%) were diagnosed as experiencing shock among the 614 total patients. The sensitivity of CRT for shock status was 74.1%, specificity was 92.0%, positive predictive value was 76.9%, and the negative predictive value was 90.8%.
Discussion: Considering CRT is one of the triage tools for mass-casualty incidents that must have a low incidence of false negative cases, the sensitivity of CRT seems to be unacceptable. In order to improve the diagnostic accuracy of CRT, additional physiological parameters are needed. However, an increase in the evaluation items may deteriorate the assessment speed, which is crucial for the evaluation of victims during a mass-casualty incidents. In the future, a prospective study must compare the accuracy of a set of assessments.
Keywords: Capillary Refill Time (RFT); gastrointestinal bleeding; mass-casualty incident; shock; trauma; triage
Prehosp Disast Med 2007;22(2):s70

Putting Triage Theory into Practice at the Scene of Multiple Casualty Vehicular Accidents: The Reality of Multiple Casualty Triage

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Research Funding: *This project was funded by a research grant from the NRMA-ACT Road Safety Trust.*

Objectives: The aim of this research project was to investigate the experiences of ambulance paramedics in applying the principles and protocols of prehospital, multiple casualty triage at the scene of a motor vehicle accident. Key objectives included the investigation of situational cues and other contextual factors influencing triage practice and the development of recommendations for the future education of ambulance paramedicsinvolved with the practice of multiple casualty triage.
Methods: A triangulated approach was used incorporating demographic data, focus groups, and in-depth interviews. Two focus groups canvassed the issues and concerns of the participants in applying multiple casualty triage principles to motor vehicle accident situations. Additionally, focus groups assisted in creating an interview schedule for in-depth interviews. The in-depth interviews were conducted with five participants involved in the earlier focus group discussion, and reflected on their experiences in a detailed way. A thematic analysis of the interviews was conducted using well-established research practices of human science research.
Conclusions: Described in this research is an extended and broadened interpretation of the triage process returning to a more authentic definition of triage: the process of the sorting of casualties to determine priority. There is a need to consider triage as an extended and complex process that incorporates evidence-based physiological cues to assist decision-making and the management of the process of triage from call-out to conclusion, including assessment of contextual and situational variables.
Keywords: Australia; motor vehicle accidents; multiple casualties; paramedics; triage
Prehosp Disast Med 2007;22(2):s71

Indicators for Trauma Systems

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Introduction: There is an ongoing debate what trauma system (TS) is best while there is a lack of valid research instruments to evaluate a TS. Indicators can possibly be used to measure the quality of TS care.
Objective: The objective of this study is to develop a consensus-based set of indicators to monitor the performance of dispatch centers (DC), ambulance services (AS) and emergency departments (ED) providing care to multitrauma patients (MTP).
Methods: In a 4-round Delphi procedure, the opinion of 141 experts (experienced managers, doctors and nurses from DC, AS and EDs) were questioned regarding indicators of trauma system performance. Likert scales were used to rank indicators. Consensus was defined when ≥70% of the panel agreed.
Results: Response rates to questionnaires 1 through 4 was 86%, 75%, 71%, and 60% respectively. Experts reached consensus on 5 competence indicators (professional education, trauma courses for adults and children, working experience >18 months and yearly exposure ≥10 MTP); 10 result indicators (related to diagnoses, stabilization of vital functions in AS and ED, level of care, trauma team and radiology); three chain indicators (cooperation, communication and feedback); and eight time intervals, but not on the definition of the intervals.
Conclusions: Expert consensus was reached on 26 indicators for MTP No consensus could be reached on definitions of time indicators. A nominal group technique meeting will address this issue. A Delphi procedure was successful in reaching consensus on indicators that monitor performance of the TS for MTP. This is the first step in developing a valid research instrument.
Keywords: Delphi procedure; dispatch centers; emergency; indicators; trauma system
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Tailoring the Medical Response for the Management of Burn Disasters

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Introduction: The aim of this review was to analyze past burn disasters and mass-casualty incidents (MCIs) involving burns since the 1942 Cocoanut Grove fire, in order to identify common problems arising during the response to such incidents. The study also intended to assess recommendations relating to these problems and whether or not changes were implemented based on these reccommendations.
Methods: A comprehensive review of the literature from 1996 to September 2006 was performed using the on-line database Medline. Articles were selected based on thei inclusion prehospital or in-hospital responses to burn disasters and MCIs that consisted of fires, accidental and terrorist explosions, and transportation accidents, where a large proportion of the injuries was burn-related. Articles were read, abstracted, and analyzed for death-and-injury toll, burn-and-non-burn injuries sustained, major problems experienced, and recommendations made.
Results: A review of recommendations from past disasters found that current disaster responders continue to experience similar problems in communication, triage, surge capacity, documentation, staff planning and experience, and transport. A comprehensive literature review enables recommendations from many past disasters to be incorporated into future planning. It also allows for the formulation of future strategies, including increased education in the

management of burns and mass casualties to healthcare providers (and the general public) at undergraduate and postgraduate levels, the expansion of specialty burns teams, incorporation of burn injuries into triage standards, and the development of prospective, centralized burn-center databases.
Conclusion: Vulnerability can be reduced by analyzing lessons from previous disasters. This potentially could diminish the effect disasters have on lives and local infrastructure.
Keywords: burn; disaster; literature review; mass-casualty incident; recommendations
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Teleconsultation for Deployed Healthcare Professionals in Current Combat and Disaster Operations

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Background: In April 2004, the United States Army approved the use of the Army Knowledge Online (AKO) email system as a teleconsultation service for remote consultations from healthcare providers in combat to medical subspecialists in the US. The success of the system resulted in its expansion to include 12 additional clinical specialty services including teletrauma (trauma-burn) consultation. The goal of the program is to provide a mechanism for enhanced diagnosis of remote trauma cases, resulting in an improved evacuation system.
Methods: Consults are generated using AKO routed through a contact group composed of volunteer on-call consultants. The project manager receives and monitors all teleconsultations to ensure Health Insurance Portability and Accountability and Accountability Act of 1996 (HIPAA) compliance and the recommendations of the consultants are transmitted within a mandated, 24-hour time period. A trauma "clinical champion" is responsible for recruiting consultants to answer the consultations.
Results: Over 2,050 consults were performed, with an average reply time of five hours from receipt of the teleconsultation until a recommendation is sent to the referring physician. Trauma-burn had 48 consultations since its inception, resulting in the prevention of three evacuations. A total of 51 known evacuations were prevented from use of the program, while 50 known evacuations have resulted following receipt of the consultants' recommendation.
Conclusion: The teleconsultation program has proven to be a valuable resource for physicians deployed in austere and remote locations. Furthermore, use of such a system for austere physicians may prevent unnecessary evacuations and/or result in appropriate evacuations when patients are underdiagnosed.
Keywords: combat; consultation; evacuation; teleconsultation
Prehosp Disast Med 2007;22(2):s72

Session 2

Chairs: TBA

Successful Transtracheal Lung Ventilation using a Venturi Pump: A Combined In-Vitro and In-Vivo Study

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Lung ventilation through a thin, transtracheal cannula may be attempted in patients with laryngeal stenosis or in "cannot intubate cannot ventilate" situations. It may be impossible to achieve adequate ventilation if the lungs are emptying spontaneously through the thin transtracheal cannula that imposes high resistance to airflow, resulting in dangerous hyperinflation.

A Venturi pump that may be used as a bi-directional valve that, if supplied with a pressurized gas source, could provide active inflation and deflation of the lungs was constructed. The capacity of such a device was tested in-vitro using mechanical lungs in combination with two different cannula sizes and various gas flows. The device was tested on five pigs using a transtracheal 16 G cannula with different predefined inspiratory/expiratory times and gas flow modes.

In the mechanical lungs, the device permitted remarkably higher minute volumes compared to spontaneous lung emptying. Used in-vivo, the arterial oxygen and carbon dioxide partial pressures increased initially to remain then stable over one hour (PaO_2 470.886.8; $PaCO_2$ 63.07.2 mm Hg). The peak inspiratory pressures measured in the trachea remained below 10 cm H_2O and did not substantially influence central venous and pulmonary artery pressures. Mean arterial pressure and cardiac output were unaffected by the Venturi ventilation.

The present study demonstrated in vitro and in vivo in adult pigs, that satisfactory lung ventilation can be assured with transtracheal ventilation through a 16 G cannula for a prolonged period of time if combined with a bi-directional Venturi pump.
Keywords: in-vitro; in-vivo; transtracheal lung ventilation; Venturi pump
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Emergency Service Evacuation Plans in Unusual Situations

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Emergency services perform health services in a fast, unlimited, and intensive way in ordinary circumstances. This tempo increases in unusual situations. The number of the victims waiting for care, the seriousness of their medical problems, their method of presenting to emergency services, and timing cause stress on the quality of the emergency health services.

Upon the suspicion that an nuclear, biological, chemical agent was found in one of the cargo packages at Ankara

Esenboga Airport on 10 February 2005, 43 workers were contaminated. These workers were transferred to SSK Diskapi Hospital Emergency service. During the management of the event, SSK Diskapi Hospital was quarantined and the entrance and exit of the other patients was stopped. The patients whose tests and treatments were continuing, and who also were kept under observation in SSK Diskapi Hospital Emergency service, were referred to the emergency services of the other hospitals by the Ankara 112 Emergency Health Services ambulance teams, due to the concern that they would not be able to receive sufficient care during the quarantine. As was the case duiring Esenboga Event, in unusual conditions, there is a necessity for "Unusual Situation Support Protocols" among the emergency services servicing within the same garrison/metropol. Provincial Inter-Emergency Services Coordination Commissions (ASKOM), to which the emergency services within the same responsibility area are affiliated should establish these protocols for their cooperation in unusual situations.

Keywords: emergency; emergency medical services; evacuation; hospital; planning
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Triage is Broken

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At the Medical Readiness Conference, Former Air Force Surgeon General PK Carlton declared, "Triage is broken". Triage is an effective protocol to organize the chaos of a disaster, but has little to no scientifically valid impact on the medical aspects situation: maximizing the patient's survival! With over 35 years of expertise, including developing the Revised Trauma Score, the Injury Severity Score, and the Trauma Injury Severity Score, Dr. Bill Sacco now has introduced an evidence-based triage method which maximizes life saving and is used everyday on every trauma call. This presentation will demonstrate the research, evaluation, operational aspects, and life-saving capabilities of evidence-based triage.

At the end of this presentation the participants will be able to:

1. contrast current triage practices with the Sacco Triage Methodology (STM);
2. identify failures in commonly used triage practices relative to patient survivability;
3. describe why the "moving patients" versus maximizing survival approach to triage is ineffective; and
4. demonstrate the proper method of assessing for all patients of a mass-casualty incident or disaster

Keywords: disaster; evidence-based triage; life saving; survival; triage
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International Life-Saving Federation: Position Statement—Aquatic Disasters

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The International Life Saving Federation (ILS) is the world authority on the reduction of drownings and aquatic injuries, and uses traditional methods such as education, prevention, and rescue training to prevent such injuries. There are 66 full member countries and even more associate and corresponding member countries participating in the Federation.

Throughout history, many tragic aquatic disasters have occurred. They include floods, cyclones, typhoons, hurricanes, shipwrecks, aircraft crashes, oil rig disasters, and tsunamis. The largest global aquatic disaster of the past century is the December 2004 Indian Ocean Tsunami, when an estimated 280,000 people lost their lives. There is a role for the ILS member organizations to reduce morbitiy and mortality in international aquatic disasters.

International tragedy can be lessened by international effort. That international effort may include: (1) assisting in planning and implementing preventative and rescue strategies; (2) health management; and (3) post-event debriefing. The ILS has helpful recommendations to assist government planners as well as lifesaving and disaster managers to reduce the morbidity and mortality from aquatic events. These recommendations are in the areas of prevention, rescue, health management, and debriefing education.

Keywords: aquatic event; disaster; education; international collaboration; International Life Saving Federation
Prehosp Disast Med 2007;22(2):s73

Poster Presentations—Theme 8: Life-Threatening Situations in Daily Emergencies and Disasters

(119) Air in the Carotid Canal as a Predictor of Distal Internal Carotid Artery Laceration 10

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The medical care of a patient, 25 years of age, with blunt trauma-induced bilateral, distal segment internal carotid artery (ICA) lacerations, resulting in a left-sided direct carotid-cavernous sinus fistula (CCF), and presenting with massive oronasal bleeding is described. Computerized tomography images showed free air in both carotid canals. The combination of severe oronasal bleeding, with air in the carotid canal should alert the treating physician to the presence of a distal internal carotid artery laceration.

Keywords: carotid canal; computerized tomography; distal internal carotid artery laceration; trauma
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(120) Hydroxocobalamin in the Prehospital Treatment of Smoke Inhalation

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Introduction: It has been estimated that 35% of victims rescued from fires have hydrogen cyanide poisoning. Hydroxocobalamin is a specific, non-toxic antidote for cyanide poisoning. It has been administered by Helsinki Emergency Medical Services (EMS) to fire victims presenting with symptoms of acute cyanide poisoning (altered state of consciousness, low blood pressure) since 1999. Randomized, controlled trials are no longer possible due to legislation necessitating informed consent. A retrospective case-control study was conducted to estimate the benefit of hydroxocobalamin use in fire victims.
Methods: A sample of 17 patients rescued from residential fires was studied. In the treatment group (n = 9), patients received 5 g of hydroxocobalamin. Historical controls (n = 8) from the time before hydroxocobalamin was implemented in the prehospital setting were used. Data were collected from EMS and hospital records.
Results: The patients in the hydroxocobalamin group were more severely exposed to smoke (higher carboxyhaemoglobin level, $p = 0.082$). On arrival to the hospital, these patients had higher systolic blood pressure (mean ±standard deviation, 140 ±21 mmHg vs.118 ±39, $p = 0.128$) and more patients were in lower lactate group (lactate <4.0 mmol/l) than in the control group ($p = 0.059$). The hydroxocobalamin group also did not need vasopressors during the first eight hours ($p = 0.110$). All patients survived. Hydroxocobalamin had no serious adverse effects on the patients.
Conclusion: The results may indicate successful treatment of cyanide poisoning with hydroxocobalamin. This study was limited by its small sample size and its retrospective setting. The use of hydroxocobalamin could be considered in smoke inhalation patients with an altered state of consciousness, low blood pressure, or lactic acidosis.
Keywords: cyanide poisoning; Finland; fire victims; hydroxocobalamin; smoke inhalation patients
Prehosp Disast Med 2007;22(2):s74

(121) Infectious Disease Control with the Use of Impregnated Wash Gloves and Vomit and Urine Bags

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Infectious diseases pose a risk in disaster management. Patients and rescue staff are in danger of exposure through fluids, such as urine, vomit, and contaminated water. Research has indicated that there is a need for products that safeguard disaster victims and healthcare workers against the hazards of infectious diseases. Specifically, the focus on health awareness calls for ways to limit the spread of diseases associated with body fluids such as urine, vomit, and blood.

Vitmo has developed antibacterial, impregnated care gloves, and a vomit and urine bag, using an antibacterial super absorber that turns fluids into a gel within seconds. The polymer used consists of antibacterial agents that inhibit bacterial and fungus growth, including E.Coli, PS Auroginosa, and other urinary bacteria. The products allow easy handling and transport of contaminated materials at a disaster scene.

The use of impregnated wash gloves promotes safe handling of contaminated fluids according to the DIN EN ISO 20645. Studies show that effective labor increases to 96%, the hygiene factor to 85%, and the convenience factor to 98% with the use of such a urine and vomit bag. Cleaning time is reduced by 50% with the use of the wash glove, with less waste in wound care.
Keywords: body fluids; contamination; impregnated wash gloves; infectious diseases; vomit and urine bag
Prehosp Disast Med 2007;22(2):s74

(122) Prehospital Hypertonic Saline in Trauma: A Systematic Review

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Introduction: For the majority of the 20th century, restoration of lost intravascular fluid volume has been the objective of resuscitating a patient with post-traumatic hypotension. With the advent of prehospital Emergency Medical Services and the ever-present threat of global warfare, infusion of a smaller volume of an equally effective, or even superior replacement fluid, would be desirable. Preclinical resuscitation studies conducted with the infusion of hypertonic saline were encouraging. Clinical studies indicated that the use of hypertonic saline was safe, volume sparing, and increased the survival of trauma patients with head injury or blunt/penetrating trauma who were in hemorrhagic, hypovolemic shock.
Methods: A comprehensive search of the Cochrane Central Register of Controlled Trials, MEDLINE, and EMBASE was conducted. The primary outcome of mortality and the secondary outcomes of morbidity, adverse outcomes, and length of follow-up were assessed.
Results: Six clinical trials compared the use of hypertonic saline versus Ringer's Lactate in trauma victims. The pooled relative risk for death among trauma patients was 0.84 (95% confidence interval (CI) = 0.69–1.04) for hypertonic saline compared to Ringer's lactate. Most of the trials were small and varied in the type of participants and the length of follow-up. There was little standardization in the fluid administration regimes. Eight trials involving 1,283 randomized trauma patients, compared the outcomes following the administration of dextran in hypertonic crystalloid with isotonic crystalloid. The pooled relative risk for death was 0.88 (95% CI = 0.74–1.05) for dextran and hypertonic crystalloid. The trials were heterogeneous and with many design shortcomings. There was no significant improvement in survival.
Conclusions: Until well designed, multi-center, prehospital, randomized, controlled trials are conducted; hypertonic/hypertonic-hyperoncotic solutions should be used with

caution for resuscitation of patients in traumatic hypovolemic shock with or without head injury.

Keywords: hypertonic saline; isotonic; prehospital; Ringer's Lactate; traumatic shock
Prehosp Disast Med 2007;22(2):s74–s75

(123) Case Report of Survival in a Patient with 90% of their Total Body Surface Area Burned

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Background: During the last 10 years, there has been a decrease in the mortality rate of burned patients. Despite this improvement, mortality is still high in the presence of inhalational injury, or patients with large total burn size and >60 years of age.

Case Report: A healthy, 17-year-old man was burned by ignition of his clothing in an enclosed space. He was taken to the local hospital where his burn area was evaluated as 90% of his total body surface area (mainly 3rd degree burns with 7–10% of 2nd degree burns). After initial treatment and stabilization, the patient was transferred to the Burn Unit of Santa Maria University Hospital. He was mechanically ventilated for 43 days, and was treated successfully for pneumopathy, various infections, and acute cholecystitis. The patient underwent 11 surgeries, and early skin graft was done successfully for all the burned area. After 80 days of treatment in the Burn Unit, he was discharged to the plastic surgery ward of his local hospital, where he continued specific physical therapy and antidepressant treatment. At the time of discharge, he was able to communicate, feed himself, and ambulate with help.

Conclusions: There are few multi-center, prospective, clinical burn trials, leading to divergent methods of practice. Survival of patients with 90% of total body surface area burned in their first hours is rare. Proper treatment in this period is crucial. To the authors' knowledge, this is a unique case of survival of such a patient in Portugal.

Keywords: burn injury; burn patient; survival of burn victims; total body surface area
Prehosp Disast Med 2007;22(2):s75

(124) Emergency Transport for Acute Chest Pain Patients: Does it Affect Hospital Treatment?

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Introduction: Emergency transport of patients to the hospital for acute chest pain is critical for timely access to medical treatment. Transport management decisions may affect transitions between first responders and emergency department (ED) personnel. This study investigates whether patient characteristics factor into decision algorithms regarding emergency transport and whether these characteristics affect in-hospital treatment times.

Methods: Emergency medical transport decisions such as circumstances leading to use of lights and sirens (LAS) were analyzed to determine whether any patient characteristics were related to the decision to use LAS and whether LAS affected the time interval between arrival to the hospital and patient treatment.

Results: Patients transported by ambulance were older and had a higher prevalence of previous cardiac event. The median interval between symptom onset and ED arrival was 121 minutes (range 5 to 590 minutes). Transport by emergency medical services (adjusted hazard ratio 0.28 [95% confidence interval 0.19 to 0.41]), increasing age (hazard ratio 0.99 [95% CI 0.98 to 0.99]), and symptoms considered urgent were the factors most strongly associated with a shorter out-of-hospital interval. LAS were used 87% to the scene and 26% to the hospital. Hospital staff responded more quickly to ambulances coming in with LAS; ER physicians evaluated patients in 9.8 minutes versus 17.2 minutes without LAS.

Conclusions: Patients who receive emergency transport with LAS for acute chest pain to the ED will be evaluated sooner and the interval between symptom onset and time to ED arrival are decreased. Potential rationale for this result is discussed.

Keywords: acute chest pain; cardiac event; emergency department; emergency transport; lights and sirens
Prehosp Disast Med 2007;22(2):s75

(125) Amatoxin Intoxication After Wild Mushroom Ingestion

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The case of three patients with gastrointestinal symptoms and hepatitis after ingestion of Amanita phalloides (Deathcap or Death angel) mushrooms will be presented. Patient A, a 54-year-old Chinese man, and Patients B and C, a 51 and 55-year-old Chinese woman respectively, presented with stomach pain, nausea, vomiting, and diarrhea after eating home-made soup with wild mushrooms. Patient A looked ill, with RR 132/78, pulse 55/minute, a temperature of 37°C, and active peristaltics. Liver enzymes were elevated slightly. Patients B and C presented similarly. The suspicion of amatoxin intoxication was confirmed by measuring urinary a-amanitin concentration. The patients received fluid infusion, activated charcoal, high dose IV benzylpenicilline, N-acetylcysteine (NAC), and silibinin, an experimental antidote. After 3–4 days, their liver enzymes reached maximum elevation and then decreased. All patients recovered fully and were discharged after eight days.

Amanita phalloides is a highly toxic mushroom. One specimen can contain enough poison (amatoxin) to kill a healthy adult. Amatoxin inhibits RNA polymerase II, leading to cell death, with mortality rates of >90%. The intoxication is divided into four phases: (1) the latent phase; (2) the gastrointestinal phase; (3) the second latent phase; and (4) the hepatic phase, leading to hepatic-renal failure and death. The classic treatment is supportive. However, an experimental drug silibinin has shown to be effective against amatoxin by decreasing drug conversion, but it is

not available in The Netherlands. The described three patients received high-dose penicillin, NAC, and silibinin in addition to classical supportive treatment, which may account for their full recoveries.

Keywords: amanita phalloides; amatoxin intoxication; ingestion; silibinin; wild mushrooms
Prehosp Disast Med 2007;22(2):s75–s76

(126) Mass Envenomation by Africanized Bees in a 90-Year-Old Woman

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Introduction: Patients presenting to the ED with a history of insect stings usually show a local reaction of swelling, pain, and erythema at the site of the stinging. In 0.3 to 0.5 percent of stings, an IgE-mediated anaphylactic reaction occurs, possibly after a single sting and can lead to an emergency requiring prompt recognition and treatment. Mass envenomation, sometimes involving hundreds of stings are less common, but can cause severe systemic toxic reactions that also require recognition and initiation of aggressive treatment. The syndrome is difficult to distinguish from systemic allergic reactions and maybe fatal.
Discussion: The patient received more than the mean lethal dose of honeybee venom and did not reach the hospital within the first hour after the stinging incident. Hemodynamic instability, rhabdomyolysis, and acute renal failure developed shortly and proved fatal, despite aggressive treatment at the Intensive Care Unit (ICU). It is unclear whether immediate hemodialysis or plasmapheresis would have saved this patients life, but it remains a treatment option to consider if a patient with a toxic dose of honeybee venom is admitted. The dilution and faster removal of the toxin could prevent a more severe course of the condition. These higher risk patients should be transferred to the hospital without delay and immediately admitted to an ICU to be monitored more closely, so that the first signs of imminent collapse can provoke further action.

Keywords: anaphylactic reaction; envenomation; honeybee venom; IgE-mediated; insect stings; intensive care unit
Prehosp Disast Med 2007;22(2):s76

(127) Pheochromocytoma: A Rare Cause of Dyspnea and Hypertensive Emergency in the Emergency Department

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Pheochromocytoma rarely is seen in the emergency department (ED), and may present in uncommon ways. A case of pheochromocytoma in a young, severely dyspneic patient is reported in this presentation. A 21-year-old male was brought into the ED with symptoms of sudden-onset dyspnea and hemoptysis. He had experienced cough and headaches for several months. Weight loss was reported, with no night sweating. The patient denied taking medications, drugs and alcohol, or having any allergies. Past medical history included pharyngitis two months earlier, and asthmatic bronchitis.

On examination, the patient was in respiratory distress with O_2 saturation of 60% on room air, and 85% on 15 liters of 100%O_2 non-rebreathing mask. Vitals were: respiratory rate: 24, blood pressure: 235/139, pulse: 125, temperature: 35.4. Lung sounds: bilateral rates; cardiac tachycardia, without murmurs. There were no sweating or extremity abnormalities.

Laboratory results included: Creatinine: 128umol/l; K+:4.1, BUN:3.8mmol/l; LDH:915U/l, lactate:5mmol/l; and respiratory acidosis. Chest x-rays demonstrated diffuse, bilateral pulmonary edema. The electrocardiogram showed sinus tachycardia with LVH; there were no signs of ischemia.

Antihypertensive treatment started and the patient was admitted to the intensive care unit for mechanical ventilation. Differential diagnoses included post-streptococcal glomerulonephritis, renal artery stenosis, pheochromocytoma, and other causes of kidney failure. A swelling of the right adrenal gland (6.5 x 5 x 4 cm) was seen on abdominal ultrasound and magnetic resonance imaging (MRI). Meta-Iodobenzylguanidine (MIBG) testing and SMS testing confirmed the diagnosis of pheochromocytoma. The adrenal tumor was excised surgically.

This report has presented a rare cause of hypertensive crises and highlights the importance of considering the diagnosis of pheochromocytoma in dyspneic patients and in hypertensive emergencies in order to avoid delays in treatment of this potentially life-threatening condition.

Keywords: dyspnea; emergency department; hemoptysis; hypertensive emergency; pheoctromocytoma
Prehosp Disast Med 2007;22(2):s76

(128) Collaboration between Indonesian and Japanese Emergency Medical Teams during the Sumatra Earthquake in 2004

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Introduction: In February 2004, the earthquake in Papua Province, Indonesia, resulted in severe damage to infrastructure and injuries to residents. Concerning this disaster, Japanese and Indonesian disaster relief teams shared information on management tactics.
Methods: Japan International Cooperation Agency (JICA) dispatched a team of five registered medical personnel and two recorders of the Japanese Disaster Relief Team to Indonesia to hold the joint seminar and exchange information. The JICA team also discussed the possibility of cooperation with Indonesian authorities in the sector of emergency response.

Furthermore, the JICA mission invited Indonesian counterparts to the subsequent meeting involving Japan, Malaysia, and The Philippines. The purpose of the next meeting was to share the output of the seminar and meet with key persons of Japan, Malaysia and The Philippines. On 12 October 2004, the joint seminar between Indonesia and Japan emergency medical teams on emergency medical care in sudden-onset events was held in Jakarta sponsored by JICA. Coordination between Indonesia, Malaysia, and The Philippines via a communication satellite was discussed.
Result: This discussion occurred two months after the Sumatra earthquake. The early medical mission was welcomed in Indonesia and coordinated with Indonesian medical staff.

Conclusion: Collaboration between Asian countries and Japanese emergency medical teams on emergency medical care in sudden-onset events are very important and should be promoted.

Keywords: emergency medical team; Indonesia; Japan; management strategies; Sumatra earthquake
Prehosp Disast Med 2007;22(2):s76–s77

(129) If I Get Trapped under Debris after an Earthquake, What Should I do while Waiting for Help?

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Many studies have been conducted on the mass injuries that occurred as a result of the 1999 Marmara Great Earthquake, and the protection measures that have been identified. The number of scientific studies has increased constantly, especially those concerning mitigation measures and health care services provided after an earthquake. Most of the studies are conducted for the pre- and post-disaster period. However, the issue of "what people should do when they are trapped under concrete blocks" has been ignored in Turkey where earthquakes are the most common cause of disasters. In this study, opinions are presented that have been compiled from the remarks shared within various national and international e-mail groups related to the field.

Keywords: earthquake; entrapment; injuries; Turkey; victims; waiting
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(130) Methoxyflurane is a Safe, Easy, Effective Analgesic for Prehospital Pain Relief

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Introduction: Methoxyflurane analgesia has been used since 1961, and has been used in Australian ambulances since 1978. Little is published on its effectiveness. Two years of data from St. John Western Australian Ambulance Service was examined.

Methods: Ambulance data from the metropolitian Perth area fro 01 July 2004–30 June 2006 were reviewed. Of the 13,313 methoxyflurane administrations, complete data were available for 10,706. The most Common indications were trauma and musculoskeletal injury. Data for effectiveness was compareed with 3,257 administrations of intranasal fentanyl administrations. A simple three-point score was used, which correlates well with verbal pain scoring.

Results: Overall, 54.3% (5,814) of patients reported good/excellent relief; 38.4% (4,112) partial relief; and 7.3% (780) no relief. Of the children >12 years of age, 67.8% (173) experienced good/excellent relief; 24.3% (62) partial; and 7.8% (20) no relief. For those >12 years of age, 54.5% (5,641) reported good/excellent analgesia; 38.1% (3,950) partial; 7.1% (760) no relief.

The results for fentanyl were similar—overall, good/excellent relief 52.9%(1722), partial 39.8%(1295), no relief 7.4%(240). In each group, >90% of the patients received good or partial relief.

Discussion: In Australia, methoxyflurane is used widely in ambulances, defence forces, sports injuries, industry, and increasingly in hospital, dentistry, interventional radiology and short, painful surgical procedures. The history of renal damage as an anesthetic is irrelevant, as renal toxicity has been shown to be completely dose related (Mazze et al). The method of administering methoxyflurane analgesia does not allow toxic doses. In 28 years of use in this ambulance service, no significant safety issue was reported.

Conclusions: Methoxyflurane is a safe, convenient, effective analgesic agent for use in prehospital care.

Keywords: Australia; methoxyflurane; pain; pain relief; prehospital
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(131) Elderly Patients in Prehospital Medicine

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Introduction: The elderly represent a high proportion of the population who require emergency medical care. The aim of this study was to evaluate the epidemiological characteristics and the common diseases affecting the elderly who required emergency care from the prehospital emergency medical system.

Methods: In this study, 252 patients, ≥70 years of age, were included. There were more female patients (52.3%) than males and the mean age of the retrospectively examined patients was 75.3 years.

Results: The following causes for the use of the prehospital medical system by the elderly were identified: (1) 72 patients had cardiovascular problems; (2) 65 patients had respiratory problems; (3) 45 patients were victims of trauma incidents; and (4) 32 patients had electrolyte, metabolic; and/or endocrine disorders. For the remaining 38 patients, the main problem was an altered level of consciousness.

Conclusion: The elderly represent a high percentage of patients who use the prehospital emergency medical system. The medical staff often must treat more than one medical problem experienced by the elderly. Supportive care of the respiratory and cardiovascular system remains the primary strategy in the majority of the cases, while a diagnostic work-up and a definitive treatment also are considered very important for the treatable cases.

Keywords: cardiovascular; elderly; emergency care; prehospital; respiratory
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(132) Metabolic Encephalopathy in Prehospital Medicine

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Introduction: Metabolic encephalopathy describes any process affecting global brain function by altering its biochemical function.
Objectives: The purpose of this study was to investigate the cases of metabolic encephalopathy in prehospital medicine that are focused on epidemiological characteristics of the patients, on the etiology of mental status deterioration, and on emergency stabilization.
Methods: The medical records of 150 patients with metabolic encephalopathy were examined retrospectively.
Results: Of the patients examined, there were two different age groups. In the group of the young patients (18–37 years of age), 57 patients were examined (41 men and 16 women). The mean value of the ages was 22.5 years, and the leading cause was an overdose of narcotics (56 cases). One case victim had hypoglycemia. In the group of older patients, (42–87 years of age), 93 patients were examed. In this group, there were 32 women and 26 men with a mean values for the ages of 68.7 years. In 26 cases, a hypnotic agent overdose was suspected. In 23 cases, hypoglycemia was detected, in 18 cases hyperglycemia, in eight cases hepatic failure, in five cases renal insufficiency, and 13 cases, implicated electrolyte abnormalities.
Conclusions: Metabolic encephalopathy should be suspected when an altered mental status is seen in the absence of focal neurologic signs or an obvious anatomic lesion is present. High index of suspicion is required in the treatable or in the life-threatening cases in the prehospital medicine in order to reverse the action of the responsible factor.
Keywords: metabolic encephalopathy; prehospital
Prehosp Disast Med 2007;22(2):s78

(133) Oncologic Emergencies in Prehospital Medicine

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Introduction: Prehospital medical staff must confront oncological patients with various medical problems. A small percentage of them may represent a medical emergency. The aim of this study was to analyze the cases of oncological emergencies focusing on the epidemiological characteristics of the patients, the etiology, and the emergency management in the prehospital phase.
Methods: The records of 62 patients with oncologic emergencies who were encountered initially in a medical mobile unit were analyzed retrospectively.
Results: In 45 cases, the main symptom was an acute episode of severe dyspnea, tachypnea, and shortness of breath or respiratory insufficiency that could be due to neoplasms affecting the lungs. Possible pleural effusions were detected in nine cases. In two cases, superior vena cava syndrome was detected. Seizures were detected in five patients with neoplasms affecting the brain and in six patients elevated intracranial pressure with the main sign the decreased level of consciousness was suspected. In five patients, the clinical evaluation revealed ascites producing a state of low peripheral perfusion due to elevated intra-abdominal pressure.
Conclusion: Oncological emergencies generally require prompt treatment not always feasible in the ambulance. Monitoring of the cardiac and respiratory function, and generally supportive measures such as IV volume expansion and supplemental oxygen, should be provided as needed while transporting patients to the hospital for definitive therapy. Only a small percentage of oncological patients received the application of specific therapeutic modality during the prehospital stage.
Keywords: emergency medicine; oncological emergency; prehospital; symptoms
Prehosp Disast Med 2007;22(2):s78

(134) Poisoning in Prehospital Medicine

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Introduction: The medical staff in the prehospital setting often is faced with poisoned victims. The aim of this study is to present the epidemiological characteristics of such patients, the clinical presentations, and the specific management in a mobile medical unit.
Methods: A total of 165 patients with poisoning were evaluated. There were two age groups with the most poisoning incidents: infants and young persons. In infants, all the cases represented accidental events, while the second age group consisted mainly of suicide attempts.
Results: Of accidental pediatric poisonings, there were 36 children with a mean age of 2.7 years, and a range of 1.2–4.8 years. Of adult poisonings, there were 129 cases of drug intoxication. 115 were female with a mean age of 28.7 years and a range of 15–68 years. While single-agent intoxication was noticed in children, the adult overdoses often involved several agents.

The main management steps of drug intoxication victims in the prehospital phase are resuscitation and stabilization. This involves ensuring adequate airway, breathing, and circulation control before instituting gastrointestinal tract decontamination, hastening elimination of poisons from blood and tissues, and specific antidotal therapies. The drugs involved generally are the broadly utilized drugs, such as cardiological, and antimicrobial agents, analgesics, and sedative drugs.
Conclusion: Supportive care remains the primary strategy for most poisoned patients, which includes monitoring, respiratory care, and cardiovascular therapy. Prophylactic intubation may be required in the prehospital setting.
Keywords: adult poisoning; drug intoxication; pediatric poisoning; poisoning victims; single-agent intoxication
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(135) Anaphylactic Reactions in Prehospital Medicine

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Introduction: Anaphylactic reactions are quite frequent in the field of prehospital medicine and represent a potentially life-threatening condition. This study is a retrospective examination of patients with anaphylactic reactions, focusing on the etiologic agent, clinical evaluation, and therapeutic strategy.
Methods: The needs of 135 cases with anaphylactic reactions were reviewed retrospectively. There were 76 men and 59 women with mean age of 48.8 years.
Results: Severe anaphylactic reactions were detected in 32 cases, so designated by the presence of respiratory compromise. Cricothyroidotomy was not required in any of the cases. In 63 cases, the element responsible for the anaphylactic reaction were foods, in 42 cases a drug, and in 32 cases insect venoms. Oxygen saturation, blood pressure, and cardiac rhythm should be monitored closely. Supplemental oxygen should be administered. The pharmacologic therapy of anaphylactic reactions consists of the administration ß-adrenergic agents, antihistamines, and corticosteroids.
Conclusion: Anaphylactic reactions represent a medical emergency and the severe cases are challenging for physicians of prehospital medicine. The treatment consists of supporting cardiopulmonary function, including the aggressive use of pressors, fluid replacement, and medications to counteract the release of chemical medicators. The maintenance of an adequate airway and ventilation is essential.
Keywords: anaphylactic reaction; antihistamines; ß-adrenergic agents; cricothyroidotomy; prehospital
Prehosp Disast Med 2007;22(2):s79

(136) Atypical Coronary Ischemia in Prehospital Medicine

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Introduction: The silent or atypical presentation of myocardial infarction is recognized as an important manifestation of coronary heart disease and it is associated with an unfavorable prognosis. The purpose of the study was to assess the cases with an atypical episode of coronary ischemia and define the epidemiological characteristics, the clinical presentation, and the previous medical history of the patients.
Methods: A total of 285 cases with an acute coronary syndrome (ACS) during the prehospital phase were examined. All the patients had electrocardiography (ECG) changes consistent with ACS.
Results: An episode was characterized as atypical when it was not accompanied by chest pain. From the 285 examined cases, 27 (9.5%) patients presented with atypical symptoms. There were 16 men and 11 women. The mean age of the patients with the atypical symptoms was 71.1 ±3.4 years. For 11 (40.4%) cases, the main symptom was shortness of breath, for 9 (33.3%) of the cases, a sync opal episode or fainting were the main presenting symptoms, and for the remaining 7 (25.92%) cases, a gastrointestinal disturbance such as nausea and vomiting or abdominal pain were the main symptoms. Diabetes was detected in 12 (44.4%) cases.
Conclusions: Frequently, atypical symptoms were not recognized as being caused by coronary ischemia. In the prehospital medicine a high index of suspicion is considered important, especially of older patients with diabetes or neurological dysfunctions that may affect the way they perceive the symptoms of ACS.
Keywords: acute coronary syndrome (ACS);coronary ischemia; epidemiologic characteristics; ; prehospital; symptoms
Prehosp Disast Med 2007;22(2):s79

(137) Non-Traumatic Coma in Prehospital Medicine

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Introduction: A coma is a sign of brain failure and must be treated emergently in an effort to prevent and minimize irreversible central nervous system injury. The aim of this study was to investigate the cases of acute onset coma in patients in the prehospital setting, focusing on the epidemiological characteristics of the patients and on emergency stabilization.
Methods: In this retrospective study the records of 278 patients presenting acute-onset, non-traumatic comas were reviewed. There were 156 males. The mean age of the patients was 47.8 years.
Results: The initial GCS of the patients was 11 ±2. The causes of the coma were: 76 drug intoxication, 62 cerebrovascular disease, 32 post-seizure, 15 suspected electrolyte abnormalities, 18 hypercapnia, 18 hypoglycemia, 12 diabetic ketoacidosis, nine infection, and eight uremia. In the remaining 28 cases, the cause of the coma remained unknown in the prehospital setting. A history of previous episodes was evident in 56 cases. Emergency intubation was required in 12 cases.
Conclusion: In the emergency care setting, any acute alteration in consciousness represents significant neurologic dysfunction and must be regarded as a life-threatening emergency, especially in young patients. The goals of management of the acute alterations of consciousness in the prehospital medicine are threefold: (1) prevent secondary hypoxic ischemic brain injury; (2) prevent herniation; (3) diagnose and treat, if possible, the underlying cause of coma.
Keywords: coma; emergency stabilization; neurological dysfunction; non-traumatic coma
Prehosp Disast Med 2007;22(2):s79

(138) Serial Ultrasonography for Trauma—Its Potential during Mass-Casualty Incidents

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Background: Focused Abdominal Sonography for Trauma (FAST) is an established modality of investigation to detect hemo-peritoneum in hemodynamically unstable patients. In Singapore, FAST largely has replaced diagnostic peritoneal lavage as the modality of choice in such patients. Patients who have blunt abdominal injury and are haemodynamically stable are subjected to computerized tomography (CT) of the abdomen and pelvis to rule out significant injuries. However, this is time consuming, expensive, invasive, and has limited application during mass-casualty incidents.
Objective: To establish the potential role of emergent ultrasonography (US) in haemodynamically stable patients with blunt abdominal injury presenting to the emergency department.
Methods: Two case reports demonstrating the usefulness of serial emergent ultrasonography on patients with blunt abdominal injuries are presented. One report was a multi-casualty incident with three critically injured patients. One required emergent laparotomy following demonstration of increasing hemoperitoneum on serial US examination.
Results: Both case reports demonstrate patients with initial negative studies, followed by serial ultrasonographic and CT documentation of increased bleeding into the peritoneum, requiring laparotomy. The second case report showed that use of serial US on all three patients during a mass-casualty incident can help clinicians assess the need for laparotomy without the need for using CT. Serial US pictures will be used to illustrate all the cases.
Conclusion: This report highlights the potential use of serial US in identifying haemodynamically stable patients who may require emergent laparotomy later and its application during mass-casualty incidents.

Keywords: abdominal trauma; computerized tomography; Focused Abdominal Sonography for Trauma (FAST); mass-casualty incident; serial ultrasonography
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Oral Presentations—Theme 9: Miscellaneous

Chair: Shinichi Nayayama

Session 1

Chairs: TBA

From Disaster to Journal Publication: Where is Disaster Literature being Published, and What is the Time Lag?

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As recorded early in history, disasters originally were attributed to the wrath of God and focused predominantly on hazard rather than outcome. Recently, there has been a shift in focus from hazard to outcome, and a recognition of the importance of preparedness, and response. In addition, the range of disasters is growing, and now includes terrorism, bioterrorism, and the threat of emerging new infectious diseases. As disasters continue to increase in frequency, affecting billions of people worldwide, the demand for an evidence-based approach to disaster preparedness and response has never been greater. A prerequisite to adopting any evidence-based approach in healthcare is the need to assemble a body of evidence derived from the results of relevant studies. This study was designed to identify the current evidence-base for disaster medicine. What has been found? Where has it been published? What was the time-lag between the disaster and publication of related information? Searching the electronically indexed databases MEDLINE and CINAHL, the authors searched for peer-reviewed publications following seven "disasters": (1) Chernobyl; (2) the 1993 World Trade Center bombing; (3) the 2001 World Trade Center bombing; (4) the 2002 Bali Bombings; (5) the SARS outbreak of 2003; (6) the 2004 Tsunami; and (7) the 2005 London Bombings. This paper will report on the findings of this literature search, including the number of peer-reviewed publications following each of these disasters, the journals of publication, and the time-lag between the disaster and publication of related information. This information will be important for identifying the current evidence-base for disaster medicine, specifically, what is being learned from each new disaster?

Keywords: disaster; literature; peer review; publication
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The Leaping Tag: Smooth and Safe Collection with Automated Classification of Triage Results During a Major Disaster

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In a major disaster, it may become necessary to establish many triage points. Therefore, it is important that patient medical records and triage data be arranged in a manner that allow them to be easily integrated from multiple points. The development of a triage system with the use of information tags and tags is presented below.

The patient's medical data, written on the tag, are transmitted simultaneously by radio (using Bluetooth, mobile phones, and/or e-mail) to the main computer system at the emergency headquarters. All the described and transmitted data are automatically classified. This system is called "leaping/flying triage tag".

After repeated testing under mock disaster conditions for one year, this system was put to actual use after the flood and landslide disaster in Okaya, Japan in July 2006. Merits of the system include the immediate and accurate collection/management of essential patient data regardless of the number of patients, or the diversity and severity of the conditions. In addition, in the event of contamination during a nuclear, biological, and chemical hazard (NBC),

contamination to the medical/rescue staff is minimized without spreading the dangerous materials.

In conclusion, this system is still in the field trial stage. Although there are some minor problems, as was revealed after the Hanshin-Awaji earthquake and Tokyo subway sarin incident, these will be able to be resolved with minimal changes.

Keywords: evacuation; leaping tags;rescue; triage; triage tags
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Help the Helpers during Disasters: Keeping Team Resilience

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Tel Aviv Sourasky Medical Center (TASMC) is a Level-One Trauma Center located in the center of Tel Aviv. During the last six years, the Medical Center has experienced >23 mass-casualty incidents (MCI) caused by terrorist attacks and has treated about 1,300 injured persons.

Following the exposure to terrorist attacks and treatment of victims of terrorism, health providers are considered the "secondary circle of trauma". Health provides are normal people facing abnormal situations. They have not been prepared to see and treat shattered bodies, especially for the sight of mutilated bodies of infants and children. How can health providers deal with their feelings and fears? How can a medical center preserve team resilience while coping with MCIs over and over again?

The accumulated experience in supporting system uses at TASMC will be presented. It will focus on the emotional functioning of team members who took care of MCI casualties. Also the use of emergency leadership workshops in order to establish personnel who are leaders in the field of disaster management will be discussed.

Recommendation of "Return to Routine" in a way that can "Help the Helpers" to continue their work while they are functioning well and are able to preserve their resilience also will be presented.

Keywords: health providers; Israel; mass-casualty incidents; team resilience; terrorist attacks
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Impact of Lightning Strikes on Hospital Function

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Two regional hospitals were struck by lightening within a period of one month. The first hospital, with a capacity of 236 beds, experienced a direct strike to the building. This resulted in a spread of the power peak with temporary failure of the standard power supply. The principle problems that occurred after the standard power supply was restored were with the fire alarm system and the peripheral network connections in the digital radiology systems. No direct impact on the hardware was found. Restarting the servers resolved all of the problems. The second hospital (436 bed capacity) was struck on the premises with the main problem of induction. All the affected installations had a cable connection from outside. The power supplies never were endangered. The primary problem that resulted was a failure of different communication systems (telephone, radio, intercom, fire alarm system). Also, the electronic entrance control was not functioning. During the following days, multiple software problems became apparent, as well as a failure of the network connections controlling the technical support systems. There almost are no means to prepare for induction problems; however, the use of fiber-optic networks could limit further damage.

Keywords: function; hospitals; lightening; power supply; preparedness
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Potential Use of an Award Scheme for Rescuing Drowning Victims to Study Prevention, Rescue, and Resuscitation

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Introduction: Since 1767, the Maatschappij tot Redding van Drenkelingen (MRD) rewards bystanders who save a person from drowning. These awards are based on data from different sources. This study investigates if the award scheme can be a potential source for research on prevention, bystander rescue, and resuscitation in non-fatal drowning.
Methods: A total of 289 reports in the period 1999–2004 were studied. A total of 133 relevant variables were used. Variables only were included in the analysis whether data were available in at least 60% of the reports. This set of data was compared with the recommended Utstein criteria for drowning registration.
Results: A total of 26 (20%) of 133 parameters are available in >60% of cases. The data are consistent with existing international and national data. New data about drowning victims, causes of drowning, and bystander rescue and resuscitation also were discovered. A total of 12 of the variables are included in the Utstein registration for drowning studies.
Discussion: These data correspond well with previous reports. This suggests that the database on awarding rescues is robust and potentially is suitable for analysis. If the quality of the information in the data sources is improved, unique information about drownings can be collected and analyzed, specifically regarding on the role of bystanders in the rescue and resuscitation of drowning victims.
Conclusions: The current MRD reports to reward bystanders are of limited use for analysis. If the data-set is re-defined and the registration becomes more uniform and goal-oriented, structured data collection and analysis seems possible.

Keywords: award; structured data collection; drowning; Netherlands; rescue; Utstein
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Session 2

Chairs: TBA

Barriers and Facilitators of Health Care Services at Natural Disasters in Iran

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Introduction: Iran has a long history in coping with disasters from natural hazards. In recent years, there has been an average of one earthquake with extremely high human and property losses every five years. The 2003 Bam, the 2004 Baladeh, and the 2005 Zarand earthquakes are the most prominent recent earthquakes. Assessing obstacles and facilitators of health care services during natural disasters is very important. The aim of this study is to assess the mentioned factors of health care services at the time of disaster based on the experiences of healthcare providers.

Methods: The present study was conducted using grounded theory at Bam just after earthquake. The study participants included 17 individuals of multidisciplinary team and three Bam residents. Semi-structural interviews were used for data gathering. The interviews were transcribed verbatim and an analysis was conducted according to the Strauss and Corbin method.

Results: The study participants identified several primary factors as barriers including (1) coordination; (2) management; (3) human factors; (4) information; and (5) culture. The participants identified the following as facilitators: (1) management services; (2) cultural and educational factors; (3) management unity; (4) necessity of coordination and cultural issues; and (5) human needs meeting based on culture.

Conclusions: In spite of the other studies that introduced lack of resources as main obstacle, this study has shown that, lack of coordination in management, human resources, and information broadcasting is the most significant barrier for delivering health care services at disasters in Iran specially at Bam earthquake. Researchers have mentioned other contrary findings in paper.

Keywords: barriers; facilitators; grounded theory; health services; natural disasters

Prehosp Disast Med 2007;22(2):s82

Management of the Dead in Mass Disasters: South Asian Perspectives

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During the past two decades, management of the dead in mass-casualty incidents has become an issue of serious concern in the management of mass disasters during the past two decades. Although natural and manmade disasters of large magnitude are familiar to south Asian countries, they did not have a collective vision or standard strategy for the management of mass fatalities. However, with the frequent occurrence of major disasters during the recent few years, many countries in the south Asian region have realized the importance of disaster victim identification (DVI) and have set up DVI centers, developed management capacity and adopted DVI protocols with modifications particular to the local context.

However, more effort must be directed towards raising standards of DVI in regard to transport and temporary storage facilities, identification procedures, documentation methods, and training of necessary personnel. Management of mass fatalities is essentially a multidisciplinary, multistage process that requires extensive preplanning and rapid activation. It is a highly skilled, integrated task and a sensitive issue from the point of public opinion that requires meticulous coordination of the political hierarchy of the affected community. Therefore, there must exist a well-established policy and strategy at the governmental level that disseminates multi disciplinary services at the bottom level with regard to the management of the dead in a disaster situation.

Keywords: dead; disaster victim identifification; management; policy; process; standards

Prehosp Disast Med 2007;22(2):s82

A New Definition of Disaster

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It has always been difficult to define "disaster". Each profession involved in emergency preparedness and response has tried to make a definition according to its own criteria; however, they could not attain a definition that generally was approved by other professions and interest groups.

From the most comprehensive perspective, a disaster is a chain of events that terminates human life or results in destructive and devastating effects that will cause disabilities. The events that lead to a disaster are part of the routine life cycle and time cycle. The event has the power to terminate human life individually or collectively, starts with the activation of any kind of hazard, occurs due to inadequacy of human beings to eliminate the created effect though using all within their individual and/or collective capacities of physics, technology, psychology, and sociology. A short definition of a disaster is the loss of life (lives) as a result of responsive inadequacy in the "Impact-Response Dynamic" occurs under supra/extraordinary situations. In order to define an event as a disaster or for a potential to cause a disaster, two major criteria are required, "inadequacy" and "mortality". All cases in which both of these criteria are definitely present are regarded as "Extraordinary Situations (EOS)". When the human beings are not inadequate to respond to the event and the event does not result in mortality or injury, the EOSs should not be defined as a disaster.

Keywords: chain of events; definition; disaster; preparedness; response

Prehosp Disast Med 2007;22(2):s82

Poster Presentations—Theme 9: Miscellaneous

(139) Vehicular Traffic Volume Versus Road Traffic Accident on a Major Nigerian Highway: A Case Study with SAVAN

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Introduction: For a low motorized country (LMC), Nigeria has a record high number of road traffic accidents (RTAs) compared to other similar countries. Generating data on traffic volume is the focus of this research, since it is a first stage to planning and developing road safety and emergency medical services in Nigeria. Our field work revealed the daily variation in vehicular traffic volume. This study identifies peak periods of vehicular traffic with associated RTAs. The medical emergency response preparedness of the rural community also was evaluated.
Methods: A physical count of vehicular movement was recorded for 14 hours daily for 30 days by a Save Accident Victims Nigeria (SAVAN) volunteer. Police records of RTAs in 12 calendar months also were examined. Accident records of health facilities located along the highway also were examined.
Results: An average of 3,522 motor vehicles traveled eastwards daily, while 3,420 traveled westwards daily on the Benin-Asaba dual carriage way. Vehicular traffic movements in both directions were at their levels on Fridays. The number of RTAs peaked on Tuesdays, Wednesdays, and Fridays. The RTAs occurred during peak vehicular traffic movement on the Benin-Asaba dual carriage way.
Conclusions: There is a positive relationship between vehicular traffic volume and RTAs. Hospital records show high admission rates during peaks of RTAs. Most deaths from RTAs occur due to delay in rescue operations. Emergency medical services are absent even on very busy Nigerian highways.
Keywords: emergency medical services; low motorized country; Nigeria; road traffic accidents; vehicles
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(140) Pilot Study Describing Use of Ultrasound to Assess Acute Fracture Reduction for Future Application in the Austere Environment

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Introduction: Recent studies have addressed the ability of the use of ultrasound in the emergency department to diagnose fractures. The purpose of this pilot study is to assess the ability of the uuse of ltrasound to assess in "real-time", the success of fracture reduction, and to address the possibility of extending the use of ultrasound into austere, remote environments.
Methods: A convenience sample of five people with acute fractures (three radial, one phalanx, and one metacarpal) presenting to an emergency department was used. A Sonosite Titan was used to assess post-reduction angulation and alignment. Alignment was reconfirmed with the use of a C-arm and plain radiography.
Results: The use of ultrasound confirmed proper reduction and realignment in all five cases.
Conclusion: The use of ultrasound allowed for "real-time" visualization of fracture fragments and realignment. The application of ultrasound in fracture reduction could serve as a valuable tool for fracture reduction in both the emergency department and in austere prehospital locations lacking radiographic capabilities.
Keywords: convenience sample; emergency department; fracture; remote environments; ultrasound
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(141) Unusual Cause of Difficult Ventilation and Intubation

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A sharp foreign body lodged in the tracheobronchial region is a challenging job for anesthesiologists. Subglottic foreign bodies are common; a common difficulty encountered is a delay in diagnosis. Irregular foreign bodies may produce a partial obstruction, allowing for adequate air movement around the obstruction. The clinical features of a laryngeal foreign body may simulate those of an acute asthma attack in an adult. The differentiation is necessary in the initial stages, as the subglottic foreign body can lead to sudden death due to airway obstruction. Sudden onset of wheezing in a non-asthmatic patient should arouse suspicion.

In this case report, the patient described was transferred to the respiratory intensive care unit for respiratory distress with a diagnosis of asthma, and later, the cause of distress was found to a denture (single prosthetic tooth) in the larynx.
Keywords: difficulty breathing; foreign body; intubation; obstruction; ventilation
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(142) Hybrid Neural Network/Expert System Environment Using Fuzzy Cognitive Maps in Prehospital and Disaster Medicine

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Introduction: Objective, clinical, or logistic decision-making is paramount for optimal disaster and prehospital response. Critical decisions often are made within the "golden hour" of an incident based on cognitive bias and often incorrect interpretation of information.

The fuzzy cognitive map, a neural network approach to knowledge representation, has several characteristics that make it highly attractive for use in planning and control tasks. These characteristics include: (1) the ease of combining knowledge acquired from various sources; (2) a capacity for adaptive refinement through supervised and unsupervised learning; and (3) an ability to make very quick inferences in both routine and novel situations. The integration of both artificial neural networks (ANNs) and knowledge-

based expert systems is ideal for the development of intelligent systems in prehospital and disaster medicine.The two methods complement each other—ANNs perform nonlinear functions, pattern recognition, fault tolerance, and parallel processing, while expert systems involve language processing, formal logic, and rule interpretation.
Methods: The potential of the fuzzy cognitive map as a principal form of knowledge representation in disaster and prehospital planning and control systems will be assessed in this project. In such systems, fuzzy cognitive maps could assume some of the functions currently handled by human experts, ensuring a faster, more consistent response. A proof-of-concept demonstration centered on a selected problem area will be presented as well.
Conclusions: The hybrid combination of ANNs and expert systems will facilitate the automation of various decision support systems in prehospital and disaster medicine, while providing adaptability and real-time functionality.
Keywords: artificial neural networks; decision-making; expert systems; fuzzy cognitive maps; prehospital
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(143) City Expansion, Squatter Settlements, and Policy Implications in Addis Ababa: The Case of Kolfe Keranio Sub-City

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Currently, the city of Addis Ababa, Ethiopia, is expanding at a rapid rate. Throughout its history, the city has been undergoing horizontal expansion as the major form of development. Responsibility for this physical expansion has been attributed to legal landowners, land developers, and squatter settlements. This study focuses on the squatter settlements that are found in the sub-city of Kolfe Keranio. The principal objective of the study is to assess the causes and consequences of squatter settlements in light of the unplanned expansion of the built-up region of the city.

The results of the study indicate that the emergence of squatter settlements in the study area is a phenomenon that has been occurring since 1994. High building standards of the legal housing structures, delayed responses, procedural problems of the legal land provision, and high housing rents in the city center were identified by the respondents as the causes of squatting. In addition, less government control of open spaces, the limited capacity of the code enforcement service to control illegal house construction, lack of a comprehensive legal response towards the problem of squatting, and the practice of land sale by land speculators as a means of making profit are other factors that have contributed to the emergence and proliferation of squatter settlements.
Keywords: housing; policy; regulation; squatters; urban expansion
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(144) Team Approach in Foreign Medical System after the Java Earthquake in May 2006

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On Saturday morning, 27 May 2006, an earthquake occurred in Java, near Jogjakarta. After the initial chaos triggered by the event, the regional hospitals were overwhelmed with patients. The local medical teams worked 24 hours a day, 7 days a week. On Tuesday, a hospital from The Netherlands received a request to send a relief operating room (OR) team. After internal communication, a well-trained team was formed to work on a daily basis. The team consisted of one orthopedic surgeon, one anesthesiologist, two surgical nurses, one anesthetic nurse, and a recovery nurse. They left for Java the next day. The experiences of this team will be presented and the lessons that were learned for preparation and actual deployment will be discussed.

There was an agreement within the group that the Major Incident Medical Management and Support (MIMMS) principle of command and control, safety, communications, assessment, triage, treatment, and transport (CSCATTT) would be used as a guideline. Lessons learned from the team's experiences included:

1. Help must be provided as asked for by the local staff and support must be provided where needed;
2. The team members must be fully vaccinated a priori (in this case, everyone was);
3. Cordless drills are convenient and safe for routine surgery (easy to use in a sterile way);
4. Walkie talkies are useful communication devices in an unfamiliar environment;
5. Teams must use their own small monitoring systems; and
6. Adequate communication with the home front provides valuable information for relief teams.

Keywords: earthquake; international assistance; medical management; operating team; relief
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(145) Comparative Survey of Iran Disaster Management System Performance for Response to Natural Disasters Based on Directors and Experts Experiences during the Past 15 Years

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Introduction: Iran is a country that is one of the most vulnerable to natural hazards. In previous years, it has been affected by many disasters. Fifteen years ago, the development of regulations for a disaster management structure in Iran took a scientific and applicable direction. The objective of this study is to present a survey of system performance for response to disasters due to natural hazards.
Methods: After reviewing the related documents, a questionnaire with the purpose to define the state of response to disasters was designed. The questionnaire was distributed to 30 directors and 50 experts of the disaster management system. The most important indicators were type of disaster, the extent of response actions, how the directors were informed, time the response started, direction and command model used, and other related indicators.
Results: The average age of population survey was 37 years and average related work experience was 15 years. Most of surveyed individuals have been working in operational and management fields. The average time for notification of an incident was eight hours, and most were informed from a dis-

aster management taskforce. The average time to reach the incident scene was under 24 hours, but the command system implemented was not satisfactory. Overall performance of the responses was acceptable.

Discussion: Although disaster management has been formed legally in Iran, inappropriate planning and lack of desired coordination between main parts of this system caused a series of problems in the response to disasters to emerge. An evaluation of responses to disasters can provide a lesson learned from disasters that can be used to improve the system performance.

Keywords: disaster; disaster management system performance; expert experience; Iran; lessons learned
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(146) Management of a Drug Packer in Emergencies

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Police referred a 40-year-old male to the hospital because they suspected he consumed balls of cocaine. The patient stated that he is not a drug abuser. Upon his arrival to the hospital, he presented in a good general state, and he spontaneously defecated 27 balls of cocaine. During his stay in the hospital, he presented with psychomotor agitation, with tonic movements. The patient's condition was upgraded to critical following the intravenous administration of midazolam to control his seizures. The results of his analytic tests were normal, except his urine tested positive for cocaine. A TAC was performed and no pathological findings were identified.

Two hours later, the patient presented with a new tonic-clonic crisis and relaxation of his sphincters. Benzodiacepines were administered intravenously, and anti-hypertensive treatment was provided. He was intubated, and an urgent laparotomy was performed to remove more cocaine balls—42 additional foreign bodies were extracted.

The patient was transferred to the intensive care unit for constant observation, since the electrocardiogram was marked by elevation of the ST segments, a right bundle branch bock, and supraventreicular tachycardia. These conditions improved following the administration of phentolamine, and sedation. The positive levels of cocaine in his urine persisted.

Due to the patient's progress, sedation was ceased, and the endotracheal tube was removed, which presented new episode of psychomotor agitation that again required sedation. After experiencing a few seconds of intense bradycardia and asystole that did not respond to advanced cardiopulmonary reanimation, he died.

Keywords: cocaine; drug packer; emergency; illegal drugs
Prehosp Disast Med 2007;22(2):s85

(147) One Decade of Acute Poisonings in Emergencies

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Objectives: The objective of this study was to examine the profile of patients presenting to the emergency department in the last ten years, after having been in contact with a toxic substance.

Methods: An observational, descriptive, prospective study of patients cared for in the emergency department with a pathology related to toxics was performed.

Results: A total of 9,321 patients (1% of the total number presenting to the emergency department) were examined. A total of 66% were men, and 34% were women. The average patient age was 33 years. The most frequent type of poisoning was overdose (58%), autoltica (22%), and domestic (10%). The implied causes were medicines (29%), drugs (64%), and the other toxic substances (13%). Drugs were associated in 8%, with alcohol (57%) and benzodiazepines (15%), the most frequently seen. The toxin was administered orally in 77%, inhaledin 6%, administered parenterally in 3%, and administered cutaneously in 1%. Samples were gathered in 67'% of the cases. They presented/displayed clinically in 71% (neurological with more frequency). An evacuator treatment was used in 19%, and an eliminator in 0.4%. A total of 0.4% of the patients passed away.

Conclusions: Acute poisonings in are infrequent. An average poisoning victims is a 33-year-old man, usually with alcohol posioning, with neurological clinic. Outcomes usually are favorable. A total of 10% of the patients are poisoned by drugs.

Keywords: acute poisoning; emergency
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(148) Glass Foreign Body in Soft Tissue: Possibility of High Morbidity due to Delayed Migration

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Introduction: Some embedded foreign bodies (FBs) cause complications, whereas others remain asymptomatic and undetected.

Case Report: A 32-year-old man presented to the emergency department complaining of back pain in the area of a subcutaneous lump that had migrated toward the midline during the previous two weeks—nearly 25 cm from its former location. Twelve years earlier, after falling onto a glass door which shattered, he had gone to a local emergency department and had his wound sutured (no x-rays were taken). Within a few months, he noticed a lump near his scapula, but he did not relate it to the fall and it was not bothersome. A physical examination revealed a normal neurological examination and a palpable mass in the right paraspinal area at the level of the 10th thoracic vertebra. An x-ray showed a 34 mm long sharp

density in the vicinity of the spinal canal near T10. For nearly two hours, efforts were made to identify and remove the FB. These efforts were unsuccessful. The following day, a 4 x 6 x 34 mm sharp glass fragment was removed under fluoroscopy in the operating room.

Conclusions: Patients with glass FBs in soft tissues that are missed in the emergency department have a high risk of mortality and morbidity related to migration in the late period according to their location and form. Widespread use of ultrasound by emergency physicians and training programs have the potential to reduce the significant morbidity, costs, and risk to be exposed to radiation, and they provide the possibility to determine and remove missed FBs in early stages.

Keywords: emergency department; foreign body; glass; hospital; soft tissue injuries
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(149) How to Improve Assessment of Tetanus Immunity in the Emergency Room: A Prospective Cost-Effectiveness, Double Blind Study

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Background: In case of injury, the choice of prophylaxis against tetanus depends on the patient's vaccination history, which may be unreliable. In order to improve the evaluation of tetanus immunity, the use of a rapid immunoassay (Tetanos Quick Stick®, (TQS)) as well as some demographic characteristics are helpful to avoid inadequate prophylaxis and cost.

Objective: The objective is to evaluate the contribution of TQS to the choice of prophylaxis, and to perform a cost-effectiveness analysis. The final purpose is to define the place of TQS in a modified algorithm for emergency room (ER) assessment of tetanus immunity.

Method: In a Belgian multicentric, prospective, double-blind study, 611 adult patients with injuries were included in five centers; 507 (83%) of the records were valid. The TQS was performed by a nurse before the vaccination history and the choice of prophylaxis was made according the official algorithm by a doctor who was unaware of the TQS result.

Results: Overall, seroprotection was 74.1%, but this varied significantly among centers from 58.2 to 84.0% (χ^2 <0.001). Immunity decreased with females and with increasing age. Protection according vaccination history was negative or unknown in 33.9% of patients and positive in 66.1%, with 57.9% and 82.1% positive TQS, respectively. Cost-effectiveness analysis suggests a 25% economy by using the test in patients <60 years of age, with injuries at risk and negative or unknown vaccination history.

Conclusion: In selected patients, TQS is a cost-effective tool to evaluate tetanus immunity. An algorithm is proposed for ER assessment of tetanus immunity which integrates age and TQS result.

Keywords: algorithm; cost-effectiveness; prophylaxistetanus; vaccination
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(150) Are Initial pH Levels and Sodium Bicarbonate Administration Related in the First Return of Spontaneous Circulation in Out-of-Hospital Cardiac Arrest Patients?

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Objective: The relationship between initial pH levels and sodium bicarbonate administration with first return of spontaneous circulation (ROSC) in out-of-hospital cardiac arrest (OHCA) patients in the emergency department (ED) was assessed.

Methods: A one-year, retrospective, cohort study was conducted. Patients with OHCA were recruited from 01 January 2005–31 December 2005. All eligible subjects in the ED were stratified into two groups if there was ROSC. Baseline characteristics were registered before ROSC; these included: age; gender; medical history; initial electrocardiographic rhythm; beginning time of cardiopulmonary resuscitation (CPR); and advanced cardiac life support (ACLS); beginning time of first dose of epinephrine and bicarbonate; total doses of epinephrine and sodium bicarbonate; and initial pH value. Analysis of the differences between groups were tested using an independent *t*-test on continuous data or a Chi-Square test in categorical data.

Results: A total of 90 eligible subjects (48 men and 42 women, mean age: 67.1 ±18.2 years) were recruited. The gender, percentages of sodium bicarbonate administration, initial rhythm of cardiac arrest, beginning time of CPR and ACLS, beginning time of first epinephrine, and total doses of epinephrine, were similar between groups. The initial pH value of the ROSC group was higher than those without: 6.990 ±0.224 vs. 6.87 ±0.253. The total dose of sodium bicarbonate administration was higher in the ROSC group compared to those without: 1.84 ±3.11 vs. 0.8 ±1.98.

Conclusions: A high initial pH level in the ED is an important predictor of ROSC in patients with OHCA.

Keywords: cardiac arrest; emergency department; epinephrine; pH levels; sodium bicarbonate; spontaneous circulation
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(151) Management of the Airplane Crash in Marathona (Helios Airlines)

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Objective: Present of the management of a major accident with mass injuries.

Conditions: On the 14 August 2005, a Cypriot airlines "Helios" passenger airplane crashed in the region of Marathonas. The NCHS received a briefing on the incident and was called to manage a sudden-onset incident, which consisted of an unknown number of heavily injured or dead people. It also was called on to coordinate the involved institutions, with the objective of treating the most injured people, the management of the dead, and the psychological support of relatives and friends of the victims.

Conclusions: Coordination of all involved institutions is essential, as is the existence of Coordinating Center in the region and a Center of Information and Psychological Support for the relatives and friends of victims. The existence of plans and the training of special teams for coping with mass destructions also is important, as is rapid decision-making and activation of corresponding infrastructures.

Keywords: airplane crash; Greece; injury; mass casualties; psychology; sudden-onset incident
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(152) Escape from a Skyscraper during a Disaster

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Introduction: Recently, there has been an increasing trend in the worldwide construction of skyscrapers. After the 2001 World Trade Center terrorist event, the disaster or safety-related problems associated with skyscrapers have become important issues in several countries. Research on the escape, transport, and emergency medical support of victims in skyscrapers is lacking. This study was conducted on the conditions of victims that escaped from a 63-story building.
Methods: After medical check up, 33 volunteers participated in the study. Each was assigned into one of six groups. These groups were categorized as the following: Group 1—splint application; Group 2—stretcher; Group 3—vision loss; Group 4—piggyback; Group 5—free personal escape; and Group 6—group escape. The escape was made from the 54th floor to the ground and various times were checked. During the escape, video was recorded at several important places and the recording was analyzed after the experiment. Every participant responded to a questionnaire after the experiment.
Results: The average escape time was 13 minutes and 55 seconds. The vertical escape velocity shows group 5, 6, 1, 2, 3, 4 in the order of the fastest velocity. The velocity in 40th floor was faster than 20th floor. The questionnaire results indicated the many differences from the routine escape patterns.
Conclusion: Escape from a disaster in a skyscraper has different patterns from other disaster conditions. Victims feel more difficulties and the escape velocities depend on the various conditions.

Keywords: disaster; escape; skyscrapers; velocity; vertical
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(153) Vision-Restoring Project in an Area of Natural Hazards and Political Instability

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Introduction: The Japanese Red Cross Society (JRCS) coordinated with the Sri Lanka Red Cross Society (SLRCS) to launch a vision-restoring project in Trincomalee, Sri Lanka after the Sumatra Earthquake and Tsunami in 2004. However, security in the northeast area of Sri Lanka has destabilized from 2005. This presentation reports on the activities of this project and the challenges of operating in an area of natural hazards and political instability.
Methods: The local staff of the SLRCS (two administrators and four caretakers) and volunteers (one ophthalmologist and one optician) were involved in the project since the planning stage, while the JRCS functioned primarily for coordination. Activities included vision screening, providing glasses, and referring appropriate patients for cataract operations. Data from September 2005 to June 2006 were analyzed and key issues in the successful operation of the project were identified.
Results: A total of 5,634 people (male 2810, female 2,824) visited the vision screening camp. Of these, 857 (15%) were diagnosed with cataracts and 410 were referred for cataract surgery. By emphasizing the involvement of the SLRCS, the project was able to continue even after security became unstable.
Conclusion: During a disaster caused by natural hazards, vision impairment deprives people of a chance to reconstruct their lives. Because treatable diseases cause most visual problems in developing countries, it is important to conduct a vision restoration project as a health relief activity. Coordination and cooperation with local structures from the planning stage increased the chance for the continuation of the project, even when the situation unexpectedly changes.

Keywords: cataract; disasters; natural hazards; political instability; vision restoration
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(154) Comparison between the Public and Private Ambulance Systems in Bucharest

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Introduction: Bucharest is the largest city in Romania and has 2.5 million permanent inhabitants plus students and temporary national and international workers. The demands of such a big city are difficult to fulfill and the task of rescuing people in an emergency are difficult. Ambulances and emergency teams can be found in both public and private systems. The aim of this study was to make an objective comparison between public and private systems in Bucharest.
Methods: The Ambulance Unit of Bucharest (SAMB) represents the public system and the PULS Ambulance is the oldest private ambulance station (1990).
Results: The Ambulance Unit of Bucharest (SAMB) has 30 emergency crews and 20 standard crews, while PULS has five emergency crews and six standard crews. Emergencies (grade 0 and 1) represent 35% of the total cases for the public ambulance and 10% for the private one. The average arrival time during an emergency is 20 minutes for public ambulance and 10 minutes for the private one. During 2005, the public ambulance registered 350,000 cases and the private ambulance registered 25,000 cases.
Conclusions: Although the public ambulance is paid from national funds and provides medical care to all persons irrespective of their nationality and/or payment of health

insurance, the paid for medical care from the private sector individuals demonstrates a higher level of efficiency.

Keywords: ambulance; efficiency; public sector; private sector; Romania
Prehosp Disast Med 2007;22(2):s87–s88

(155) Suicide Attempts and Prehospital Medicine

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Introduction: Prehospital personnel often confront suicide. The aim of this study was to examine the epidemiological characteristics of the patients who committed suicide and the emergency management of the patients.
Methods: A total of 108 suicide cases were examined retrospectively. The mean value for the age of the patients were 36.7 years; 52 of the victims (48%) were female.
Results: The majority of the patients (72 cases), chose to attempt suicide by poisoning themselves with drugs or chemicals. Falling from heights represented the second most common method of commiting suicide (15 cases). Five victims hung themselves, and five attempted suicide by self-inflicted stab wounds to the chest, neck, and other major vascular structures. The rest of the victims chose drowning and gunshot to commit suicide. All of the hanged victims were dead when the emergency personnel arrived. A total of 55 victims reported a history of previous suicide attempts; 32 of the victims had psychotic disorders.
Conclusions: Supportive care remains the primary management for most poisoning victims. All of the hanging victims were dead by the time the prehospital team arrived. Among the suicide victims, interpersonal relationship disorders seemed to be more frequent.

Keywords: attempted suicide; emergency; epidemiology; prehospital; suicide
Prehosp Disast Med 2007;22(2):s88

(156) Near Drowning and Prehospital Medicine

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Introduction: In Greece, near drowning is a common accident during the summer. Children and the elderly are more susceptible to drowning. Prehospital physicians should be prepared to treat victims of near drowning, especially in areas near the sea. The purpose of this study was to examine the epidemiology; characteristics, clinical presentation, and emergency management of near-drowning victims.
Methods: A total of 25 cases of near drowning were analyzed retrospectively.
Results: Among the near-drowning victims, there were three children with a mean value of the ages of 6.3 years. The mean value of the age of the adult patients was 64.6 ±9.80 years. There were 10 men and 15 women. All of the cases occurred in salt water during the summer months. Profound hypothermia was not detected. All of the cases demonstrated mild or severe respiratory insufficiency. Tracheal intubation was required for four cases during the prehospital phase. Pre-existing medical illnesses were detected in 19 cases. Eight patients had previously consumed food and drinks. A total of 20 patients were stuporous, four patients were awake and alert, and four patients were comatose. Pulmonary edema was detected in six patients. Cardiac abnormalities were detected in 15 patients.
Conclusions: There were two age-peaks for the near drowning victims; children and the elderly. The majority of the near-drowning patients were elderly with underlying disease. Common findings were tachypnia and tachycardea. Tracheal intubation may be required during the transportation of the patient to the hospital.

Keywords: children; elderly; emergency; Greece; near drowning; presentation
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(157) Complicated Myocardial Infarction in Prehospital Medicine

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Introduction: Cardiac arrhythmias, left ventricular dysfunction, cardiogenic shock, and thromboembolism represent the main complications of myocardial infarction (MI) that may be confronted by a physician in prehospital medicine. The purpose of this study was to examine the frequency and the kind and the severity of complications among patients with MI during the prehospital phase of their management.
Methods: The medical records of 285 patients with suspected MI were examined retrospectively. All the patients enrolled in the registry had electrocardiograhic (ECG) changes consistent with acute ischemia. The patients' demographic and medical history characteristics, the frequency and the kind of complications, and the emergency management were examined.
Results: A total of 62 patients with suspected MI presented complications during the prehospital phase. Of these, 38 were male (61.3%) and the mean age of the patients was 62 ±7.9 years. Arrhythmic episodes were detected in 45 patients (72.6%). There were 17 cases of supraventricular tachyarrhythmias (27.4%), 15 cases (24.2%) of ventricular tachyarrhythmias (ventricular premature beats were included), and 13 cases of bradyarrhythmias and conduction disturbancies (20.9%). Electrical cardioversion was required in six cases (9.7%). Twelve patients (19.47%) presented congestive heart failure resulting from systolic dysfunction and four patients (6.4%) presented cardiogenic shock, and one patient brain thromboembolism.
Conclusions: Arrhythmias represent the most important complication during the acute MI. During the prehospital phase, ventricular tachycardia and fibrillation probably account for the majority of sudden deaths. The physician of

prehospital medicine should be acquainted with the complications of the MI and their management.

Keywords: arrhythmias; emergency; myocardial infarcation; prehospital medicine
Prehosp Disast Med 2007;22(2):s88–s89

(158) Modeling Multidimensional Networking as a Braided Cascade for Medical Capacity Sharing during Disasters

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Introduction: The "chain concept" in medical treatment resembles an automobile assembly line. It improves overall coordination and bottleneck management. In emergency and disaster medicine, however, this concept lacks both efficiency and flexibility. For obvious reasons, demand can only be forecasted and met here in terms of probability. Modern logistics provide the "network concept" in which passengers, containers, information packets, etc. are being routed using the online fastest path calculation. Is this concept feasible in emergency and disaster medicine as well?
Methods: Amsterdam hospitals started simulation modeling, for trauma department routing and inter-hospital routing in 2002. This year, students from the Amsterdam School of Technology modeled a combination of inter- and intra-hospital networking, using ED graphical simulation software for fastest path calculation.
Results: The study showed a significant improvement in both speed and efficiency, under three conditions: (1) online capacity information availability; (2) sufficient transport capacity; and (3) cooperative attitude.
Conclusions: The development and testing of network simulation models, such as the cascade model, will contribute to the understanding, and hence improvements of patient flow in emergency and disaster medicine. Development towards professional gaming can reduce disaster drill costs. Discussion is needed to learn more about views on the socio-organizational aspects.

Keywords: hospital; management; model; multidimensional network; simulation
Prehosp Disast Med 2007;22(2):s89

Oral Presentations—Theme 10: Nursing and Paramedic Issues

Session 1

Chairs: TBA

The Global Status of Nursing Research in Emergency Planning and Response

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Issues of nursing/midwifery research in emergency planning and response often lag behind exploration of other, more easily identifiable concerns. The purpose of this presentation is to describe the global status of nursing research in the area of emergency planning and response.

An increased emphasis on mass-casualty education led to the development of the International Nursing Coalition for Mass Casualty Education (INCMCE). Hosted by Vanderbilt University, the INCMCE has met annually with funding from the US Department of Health and Human Services. This presentation is based on reports from the research subgroup of the INCMCE over the last three years, as well as an invitational consultation at the World Health Organization (WHO) held in November of 2006 at their Geneva headquarters.

Recommendations for nursing research include the: (1) design and implementation of a knowledge repository available through the Internet; (2) identification of focused research areas; (3) development of a tool for use in the field during and following emergencies; (4) promotion of funding for research in the priority areas; (5) support of a network for nurses who research emergency planning and response; (6) development of policy guidelines that would influence the nursing and midwifery research globally; and (7) consideration of the Utstein Style (as endorsed by the World Association of Disaster and Emergency Medicine (WADEM)) as a standardized framework for evaluation and research.

Nurses play an important role in successful emergency planning and response. Their contributions can be strengthened through an implementation of a global research agenda.

Keywords: global research; midwives; nurses; nursing research; planning and response
Prehosp Disast Med 2007;22(2):s89

Ambulance Crew Work: An International, Qualitative Examination of Work Flow and Patient Care

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Popular conceptions of prehospital emergency medical response conjure up images of ambulances with sirens screaming, speeding to patients with acute, life-threatening conditions. Once at the patient's side, ambulance staff perform heroic, life-saving procedures. This research looks behind such popular images and examines the day-to-day work of ambulance crews.

The first phase of this research project examines the delivery of prehospital emergency medical care of several ambulance services in the United States and United Kingdom. A social science researcher accompanied ambulance crews throughout their shifts, paying close attention to work activities, work flow, the needs and expectations of patients, and the place of prehospital care within a larger healthcare infrastructure. Ambulance crews are providing patients with chronic conditions, multiple conditions, and limited access to health care with care and entry into the healthcare system. There is a growing disconnect between the traditional focus of ambulance services (life-saving, acute care need) and the current needs of patients and care-

givers. A long-term goal of this research is to contribute to the continuing development of prehospital care systems.

Keywords: ambulance crews; health care; misconceptions; patient care; prehospital care
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Airport Emergency Medical Assistance: The Experience from Stockholm Airport

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In August 2004, the Stockholm Airport Emergency Medical Assistance in cooperation with the Swedish Airports and Air Navigation Services and the Karolinska Hospital. It consists of an emergency medical center providing emergency medical care to all passengers and airport staff daily from 08:00 hours to 17:00 hours.

Registered nurses with special competence in emergency and disaster medicine staff the center, which has all the necessary equipment for first aid. The nurses can be dispatched quickly using a kick bike and bring the equipment and drugs needed to respond to the different medical alerts. Although the nurses work independently, but if they need medical advice, a physician always is available by phone. The center also plays a role in the airports disaster plan.

Between January 2005 and November 2006, a total of 1,709 patients received medical care at the center. Among these, 706 patients (41%) were medical emergencies. Among the 353 medical alerts in 2006, 140 (40%) were sent by ambulance to hospital for further treatment.
The six most common medical problems observed were; wounds (n = 200), dizziness or loss of consciousness (n = 186), bone or soft tissue injuries (n = 151), cardiac (n = 120), abdominal (n = 102), and ear, nose and throat (n = 93).

The specially trained nurses that staff the Stockholm Airport Emergency Medical Center offer a sufficient response to the majority of the medical emergencies observed in the airport. They can rapidly evaluate and triage patients in need of further hospital care and also offer valuable advice and care to passengers with less severe medical problems.

Keywords: airport; assistance; emergency medical services; Stockholm
Prehosp Disast Med 2007;22(2):s90

Developing the Nursing Role in Emergency Nursing and Disaster Management to Address the Needs of Diverse Populations

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This presentation describes the development of an emergency nursing disaster management program utilizing a multi-disciplinary approach. This program focuses on leadership development and use of a multi-disciplinary approach to emergency and disaster management on diverse populations.

Objectives of the program are to clarify:

1. The roles of the nurse in a multi-disciplinary approach to emergency and disaster management;
2. The need for preparing emergency nurses in disaster management leadership skills; and
3. The impact of the multi-disciplinary approach to leadership training in addressing the needs of diverse and special populations during an emergency or disaster.
4. The target audience of the program consists of hospital and public health nurses and administrators, emergency preparedness planners, and coordinators.

Keywords: disaster management; diverse populations; emergency nursing; leadership; multi-disciplinary approach
Prehosp Disast Med 2007;22(2):s90

Forensic Emergency Nursing: A Potential Response to the Growing Need of Victims of Violence and Disasters

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Forensic nursing is a new professional concept in the Netherlands, although has been long established in the United States, England, Canada, and Australia. The roots of forensic nursing go back to clinical forensic medicine which focuses on the investigation of traumatic injury or patient treatment with legal issues. However, unlike forensic medicine, in which the pathologist is concerned with the deceased and the investigation of death, forensic nurses work in the field of the living, identifying and collecting evidence from living patients. Moving out the morgue and into the emergency department or clinical area paves the way for nursing involvement.

There is an increasing awareness of the importance of forensic evidence collection, and appropriate storage and disposal of materials in victims of violence and disasters. These actions are necessary not only for legal implications, but also for the psychological outcomes of the victims of traumatic events. The increasing emphasis placed on the proper collection of forensic evidence is a logical step in the development of holistic healthcare.

Currently, there is a void in healthcare system in the treatment of victims of violence and disasters. The introduction and development of fornesic nursing will be an improvement to total patient care. Forensic emergency nursing should be recognized by law and by hospitals as an official, authorized, professional status in the Netherlands.

Keywords: forensics; law; nursing; victims; violence
Prehosp Disast Med 2007;22(2):s90

Poster Presentations—Theme 10: Nursing and Paramedic Issues

(159) Education of Iranian Undergraduate Nursing Students About Disasters: Viewpoints of Students and their Teachers

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Introduction: The occurrence of disasters and the resulting casualties have increased during the past 10 years. Nurses

play an integral role in the healthcare system during disasters. The educational status of Iranian undergraduate nursing students concerning disaster response was assessed in this study.
Method: A 41-item questionnaire was administered to 135 undergraduate nursing students and 45 nursing teachers. The questionnaire was used to evaluate the educational level, the learning level, and the level of readiness for disasters.
Results: The average score for 68.6% of the students was 15–17.5 (on a scale of 1–20) on questions about disasters. The average score of the student's self-educational level was 37.4 ±14.9%; and their learning level was 39.5 ±31.9%. Nursing teachers evaluated their educational level at 21.1 ±7.7% and its necessity at 94.6 ±6.0%. Students estimated their level of self-readiness in disasters as 50.3 ±22.4% in the scientific aspect, 48.1 ±26.5% in the practical aspect, and 57.3 ±29.9% in the emotional aspect. Nursing teachers stated that the scientific preparedness of students is 28.6 ±12.1%, their practical readiness is 34.3 ±15.1%, and their emotional readiness is 41.4 ±26.7%. Male students evaluated their practical and emotional readiness to be greater than female students. Of the students, 80% believed that theoretical education is not enough to prepare them for disasters, and 88.6% believed that practical disaster education is not enough. A multiple regression coefficient test for assessing the related factors with the level of readiness of students showed that the learning level in faculty classes, participation in extracurricular classes about disasters, and disaster experience have a significant and positive correlation with the level of readiness in students.
Conclusions: It may be necessary to revise the undergraduate nursing curriculum, add practical courses, and adopt efficient teaching methods.
Keywords: disaster readiness; education; nursing; preparedness; students; teaching
Prehosp Disast Med 2007;22(2):s90–s91

(160) Intervention to Increase HIV/AIDS Knowledge and Compliance with Universal Precautions among Nurses

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Introduction: This study was designed to test the impact of an intervention on nurses' Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency syndrome (AIDS) knowledge and compliance with universal precautions (UPs) procedures in the emergency department between March and May 2006 in Shiraz, Iran.
Methods: A quasi-experimental survey was performed using 120 nurses. The intervention consisted of a one-day training workshop that consisted of a lecture and focus group discussion. Each participant was asked to answer pre- and post-session knowledge questions during three periods of time (before, immediately after training, and three months later). Compliance with UPs consisted of using 11 items, and data were collected from observations. Paired *t*-tests were used to compare differences between the pre- and post-session knowledge scores and compliance with UP.
Results: Knowledge significantly increased immediately after and at three months after the intervention compared to before the intervention (p <0.0001). The nurses' knowledge scores increased from 68.9% before training to 100% immediately after and 95% three months after training program (p <0.0001).

A statistically significant difference was found in the knowledge of HIV and the implementation of UPs (p <0.0001). Observed compliance with UP procedures before and after the training workshop ranged from 71.7% to 98% for glove use, 75.5% to 99% for hand washing after glove removal, 53.8% to 83% for wearing a mask, and 78.3 to 87.7% for not using a needle cutter. The results also indicated that some nurses (37.7%) still recapped needles. Compliance strongly correlated with several key factors, including: (1) unavailable supplies; (2) insufficient time; and (3) discomfort.
Conclusion: The education and training resulted in enhanced knowledge and performance of nurses working in the emergency departments.
Keywords: acquired immune deficiency syndrome (AIDS); human immunodeficiency virus (HIV); Iran; nurses; universal precautions
Prehosp Disast Med 2007;22(2):s91

(161) Emergency Cricothyrotomy: A Comparison of Three Techniques in Human Cadavers

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Introduction: Cricothyrotomy is the final, lifesaving option when neither ventilation nor endotracheal intubation is possible.[1] Efficient management is indispensable to reestablish oxygenation, and thus is the quickest and safest method should be used. The aim of this study was to compare three cricothyrotomy techniques.
Methods: Cricothyrotomy was performed in 61 human cadavers by 61 participants (57 medical students, 4 anesthesiology residents). After theoretical instruction, the participants were assigned to one of the following techniques: (1) surgical technique (n = 21, modified ATLS® approach); (2) catheter-over-needle technique (n = 20, Quicktrach, VBM-Medizintechnik); and (3) wire guided cricothyrotomy (Seldinger technique (n = 20, Melker Cricothyrotomy Set, Cook)). The times to the insertion of the cannula as well as success rate and complication rate were recorded. The statistics are reported in mean ±SD, using ANOVA and Chi-square tests, Bonferroni.
Results: Cricothyrotomy was successful in 95% of the surgical group, in 85% of the Quicktrach group, and in 75% of the Seldinger group (not significant). Speed was similar between the surgical (106 ±65 sec) and the Quicktrach technique (114 ±94 sec). Seldinger-cricothyrotomy took significantly longer (180 ±111 sec, p < 0.05). No complications were observed in the surgical group. One or more complications were found in 55% of cadavers of the Seldinger group, and in 65% of the Quicktrach group (both groups, p < 0.001 vs. surgical).

Conclusions: Surgical cricothyrotomy had the lowest complication rate and tended to be quicker and more successful than the other techniques.

Reference:
1. Henderson *et al*: *Anaesthesia* 2004;59:675–694.

Keywords: cadavers; cricothyrotomy; efficiency; oxygenation; techniques
Prehosp Disast Med 2007;22(2):s91–s92

(162) Considerations About a Symposium on Nursing Services in Disasters

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It is of great importance to minimize the number of disaster casualties while at the same time maximizing the quality of saved lives. That is why potential disaster threats should be eliminated if possible. To achieve this goal, personal, organizational, national, and global awareness and preparedness levels should be developed. In this study, 529 participants of "Nursing Services in Disasters Symposium" were asked what they thought of the symposium and what they thought about the disaster studies made in Turkey. The answers from 231 participants are discussed based on scientific criteria.

Keywords: awareness; casualties; disaster; preparedness; survey; Turkey
Prehosp Disast Med 2007;22(2):s92

(163) Improving the Performance of Triage Nurses

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The chief concept of an emergency ward is triage. The initial objective of an effective triage system is to identify severe emergencies and perform the necessary actions to allow the victims to survive the situation. Due to these special characteristics, triage nurses must have three main qualities: (1) speed; (2) accuracy; and (4) skill.

The performance of triage usually is stressful. Therefore, it is critical to choose and process the appropriate data. Therefore, the nurse must have concentration skills, thoughtfulness, and a good memory, because the consequences of errors during the process could be irretrievable. To prevent such occurrences, the nurses' cognitive skills such as: (1) attention; (2) concentration; (3) data processing; (4) decision-making; and (5) ability to use information technology should be improved.

The concept of data processing in triage contains six stages: (1) collecting data; (2) collecting signs; (3) collecting symptoms; (4) ranking the information; (5) defining the probable diagnosis; and (6) formulating the nursing diagnosis.

The data can be organized according to: (1) conditions; and (2) occurrences. Some diagnostic errors concerning daily occurrences can include: predicting errors. Constant training of triage nurses is important, five different qualities compared to a new triage nurse including: (1) smoothness; (2) automatcity; (3) mental effort; (4) being stress free and (5) points of view.

Selecting effective and efficient triage nurses is of ultimate importance. Experience shows that high self-monitoring people have priority over low self-monitoring people.

Keywords: education; improvement; nursing; training; triage
Prehosp Disast Med 2007;22(2):s92

(164) Disaster Education and Training of Emergency Nurses in South Australia

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South Australia has a population of 1.1 million people, the majority of whom reside in metropolitan Adelaide. South Australia has been fortunate to avoid a major incident that has involved mass casualties or a large-scale response from the healthcare system.

Currently, there is no structured disaster education for emergency nurses in South Australia. The only formal training is the Major Incident Medical Management and Support (MIMMS) three-day course, which six emergency nurses have now completed. This implies a significant gap in disaster education and awareness among the emergency nurses of South Australia.

As the largest group in the multidisciplinary team, nurses in the emergency department play an important role in carrying out the department's disaster plan and potentially can be deployed to disaster sites. Combined with the potential threat of mass-casualty incidents, it is imperative that all emergency nurses, particularly on a senior clinical level, have disaster education. For this to occur, it is essential to increase awareness and to introduce disaster education.

The plan is to implement a standardized approach to disaster education within the state. Initially, this could be approached by circulating a questionnaire and creating a database of emergency nurses, including any disaster education/experience they have. Introducing and increasing nurse participation in the one-day MIMMS course also would be beneficial. In the future, the introduction of more formalized education statewide or through the university system would be appropriate.

Keywords: Australia; disaster training; nurses; preparedness; response
Prehosp Disast Med 2007;22(2):s92

Oral Presentations—Theme 11: Pediatrics

Session 1

Chairs: Leonid Roshal; Arthur Cooper; J. Peper

Problems of Rendering Medical Aid to Children in Disasters, Wars, and Terrorist Events

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Children's hospitals where various pediatric specialists work are common. However, while providing medical help to children in disasters, wars, and terrorist events, this fact is not taken into account. That is why children often do not

receive satisfactory treatment in disaster situations. Experience has shown that mortality and disabilities in children are much less if they are treated by pediatric specialists. In the world, there currently is only one specialized team (in Russia) that provides the medical aid to children in disasters, wars, and terrorist events. Similar teams must be created for regional and national needs under the World Health Organization aegis in various countries. In regions, that often are exposed to various disasters, training courses should be organized to teach rescuers, adult general surgeons, and traumatologists how to provide medical aid to children.

Keywords: children; pediatric specialists; preparedness; terrorism; training
Prehosp Disast Med 2007;22(2):s92–s93

Hospital-Based Pediatric Disaster Triage Algorithm: A Collaborative Effort from New York City's Pediatric Disaster Advisory Group

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6. New York City Dept of Health and Mental Hygiene, New York, New York USA

Objective: Recognizing that children become high-risk patients during disasters, a committee was formed to develop a hospital-based, pediatric triage algorithm.
Methods: Local healthcare providers with expertise in pediatric emergency medicine, emergency medicine, public health and planning, infectious diseases, and social work corroborated in a Delphi-like process to develop recommendations.
Results: Two salient elements of care emerged from this process: (1) clinical criteria to determine triage priorities; and (2) patient flow process. This model was presented in a regional disaster-planning meeting for public comments and recommendations.

This is multi-tiered triage process that separates patients initially, using a visual assessment. An iterative second assessment is made from a more detailed history and a physical examination. Patient care and management is provided at each tier. If decontamination is needed, it will be performed prior to definitive identification and the separation of patients. In addition, the algorithm provides a triage process for hospitals that routinely care for children, as well as those that do not. Concise supplemental information is provided to bridge the pediatric knowledge of the providers.
Conclusion: This is one of the first known hospital-based triage algorithms for pediatric disasters and serves as a framework for identifying patients based on their level of acuity. It includes basic pediatric, physiological, and developmental guidelines for staff who are unfamiliar with caring for pediatric patients.

Keywords: algorithm; disaster; hospital; pediatric; triage
Prehosp Disast Med 2007;22(2):s93

Surgical Treatment of Soft Tissues and Bones Complicated with Surgical Infection in Children in Case of Mass Casualties

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Objective: The purpose of this study was to increase the effectiveness of treatment of soft tissue and bone wounds that are complicated by infection in children in case of mass casualties by applying primary and early reconstructive or plastic surgery.
Methods: A total of 477 child victims of earthquakes were treated at various sites. The children were admitted to the nearest medical institution and were treated by a mobile, pediatric, multifunctional team made up of highly qualified specialists. All children had large, soft tissue wounds at various locations on their bodies.
Results: In 175 children (36.7%), crush syndrome was diagnosed. In 43 children (9.0%), there were open fractures of long bones. Mistakes typical for the first stage of surgical treatment have been outlined. Steps for complex wound treatment include: (1) radical surgical wound treatment; (2) intensive therapy; (3) extracorporal detoxication; (4) topical wound treatment with multicomponent ointments; (5) osteosythesis with outer fixation; and (6) early reconstructive and plastic surgeries. Healing with primary intension was seen in 96.6% cases. In 40 patients (8.4%) there was consolidation of long bone fractures. In three cases, Ilizarov technique was applied successfully.
Conclusion: Complex treatment of wounds of soft tissues and bones in child victims of earthquakes must be conducted by pediatric, multifunctional teams at hospitals. Primary and early reconstructive and plastic surgeries minimize the rate of disability and restore anatomical and functional integrity of the damaged areas.

Keywords: children; earthquake; pediatrics; reconstructive surgery; soft tissues
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Three Years of Experience in the Children Referral System in Georgia

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Introduction: The Georgian Center of Disaster Medicine provides transportation for critically ill patients of all ages. Since 2001, thousands of patients have been transported from hospitals in nearly every region in Georgia. Medical teams are specially trained in current standards of basic life support, advanced life support, trauma management, and pediatric advanced life support. Six ambulances are supplied with all the required equipment and medications.

This presentation reports on three years (2003–2005) of experience of the system's experience with the pediatric population and emphasizes the importance and significance of such a referral system. The pediatric population in Georgia includes children from ages one month to 14 years.

Results: The total number of children cared for by the Georgian Center of Disaster Medicine during the three years was 1,126. In 2003, the total number was 264 (23.4%); in 2004, the total number was 448 (39.8%); and in 2005, the total was 414 (36.7%).

The age distribution during the three years was divided into three age groups: (1) 311 patients (27.6%) were <1 year old; (2) 248 patients (22.0%) were 1–3 years old; and (3) 567 patients (50.3%) were 3–14 years old.

There was a total of 1,009 discharges (89.6%) and 117 deaths (10.4%). Of these deaths, 38 (14.3%) occurred in 2003, 45 (10.0%) in 2004, and 34 (8.2%) in 2005. Of the 1,126 children attended to during the three-year period 963 (85.5%) were transported. A total of 163 (14.4%) underwent observation, management, and stabilization without requiring transportation.

Conclusions: Medical teams are providing safe transportation of critically ill patients due to the skilled medical staff and necessary equipment resulting in improved patient outcomes. Since 2003, there has been a dramatic extension of this activity and considerable reduction in deaths during transportation. Of the deaths that occurred soon after the arrival of transport team, 52.0% were due to the terminal conditions of the patients caused by major trauma, head trauma, poisoning, sepsis, and burns.

Keywords: Georgia; hospitals; medical teams; pediatric; transportation
Prehosp Disast Med 2007;22(2):s93–s94

Neurotrauma Structure: Its Diagnostic Peculiarities, and Medical Aid to Children in Various Earthquakes

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Introduction: The quality of treatment in children with neurotrauma depends on timely diagnostics and qualified medical aid. The purpose of this study was to determine the role of professional and timely applied medical aid to child victims of earthquakes suffering from neurotrauma.

Methods: A total of 486 children with neurotrauma (one month to 16 years of age) who survived earthquakes in Algeria (2003), Pakistan (2005), and Indonesia (2006) were examined. Of these, 35 were operated on for depressed skull fractures, eight were operated on for intracranial hematomas, and 24 were operated on for spine fractures and spinal cord trauma.

Results: In 61% of hospitalized children, light brain injury (BI) was observed. Many simply received a dressing on their heads, and then were sent home due to mass casualties. Children with intracranial hematomas were operated on within the first hours or days after the trauma for the most part—about 50% died. During daily rounds in the hospitals, a few children with subacute intracranial hematoma were taken for treatment.

Conclusions: To have better results in children with neurotrauma, hospitals must timely invite neurotraumatologists to participate in the care delivered. It is essential to early identify depression skull fractures and to provide adequate surgical treatment. Specialists must repeatedly examine all of the children with head traumas within 1–2 days after the event. Unsatisfactory results in children with neurotrauma were due to late diagnosis, late surgery, lack of specialists or equipment, and inadequate transportation.

Keywords: children; earthquakes; hospital; neurotrauma; surgery
Prehosp Disast Med 2007;22(2):s94

Responding to Biological and Radiological Events: Pediatric Simulation Using the US Strategic National Stockpile Ventilators for Resuscitation

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In response to a demonstrated lack of training in pediatric ventilator care, a training program for physicians, nurses, and respiratory therapists in Chicago, Illinois, was developed by the Children's Memorial Hospital to integrate pediatric simulators and ventilators into a mock biological event. Federal preparedness funds for the program were provided by the Chicago Department of Public Health. Ninety clinicians from fifteen Chicago hospitals attended one of seven three-hour training sessions in August and September, 2006.

Objectives of the simulation program were to discuss pediatric specific issues related to biological and radiological casualties, list the category A bioterrorism agents, identify patients with potential for respiratory failure and initiate mechanical ventilation in children using LP-10 and UniVent Eagle SNS ventilators. Didactic lectures included pediatric issues in biological and radiological agents & ventilator specific content. Psychomotor training included small group sessions with a "hands on" simulation of a botulinum toxin attack with subsequent need for ventilation. Participants responded to the changes in the simulated patient's condition and prepared ventilators with appropriate pediatric settings.

Hospitals were encouraged to register for the sessions in groups to enhance "team training" and the opportuntiy to simulate a biologic event with co-workers in a non- stressful environment was very valuable.

Pediatric emergency physicians and a respiratory therapist intructed and provided ventilator manuals, a Bio-Terry Quick-Vu II reference card (MASCAP, Inc.) and an Emergency Management Pocket Guide on Radiological Terrorism, (CDC, 2005).

Of the participants, 90% rated the program's achievement of objectives as "Strongly Agree" with the remaining 10% rating it as "Agree".

Keywords: biological; pediatrics; radiological; resuscitation; Strategic National Stockpile; United States; ventilator
Prehosp Disast Med 2007;22(2):s94

Session 2

Chairs: Leonid Roshal; Arthur Cooper; J. Peper

Experience of Anesthesiology Team in Disaster Medicine

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Objective: The aim of this study was to analyze the experience of an anesthesiology team working in disaster sites for use in increasing the efficiency of the provision medical aid.
Methods: During 1999–2006, a mobile, pediatric traumato-surgical team was sent to Turkey, India, Algeria, Pakistan, and Indonesia within 3–5 days after the onset of these disasters. The team provided specialized aid to children in these regions for 7–25 days. Ninety percent of the patients were children aged 2–17 years. The team worked in multi-profile hospitals equipped with necessary tools and personnel.
Results: Of the total treatments provided, 83% were intubation narcoses: 92% inhalation narcoses, and 8% intravenous. The remaining 7% were mask breathing with an oxygen and oxygen-nitrogen mixture—of these, 7% had spinal anesthesia. The range of surgical pathology was the following: (1) 80% were traumatological interventions; (2) 15% were combined (traumato-surgical); and (3) 5% were neurotrauma. Two periods of anesthesiologic needs were identified: (1) 2–10 days after the event; and (2) >10 days after the event.
Conclusions: For disaster medicine, early, specialized traumato-surgical help is a priority. A mobile, pediatric traumato-surgical team must be invited to the disaster site within the first 1–3 days. This period is a critical time to improve the outcomes of the treatments provided. The specificity of anesthesiologic supply is in the following: patients within the first 14 days after the trauma must have anti-shock treatment and general multi-component anesthesia. All extended dressings in children must be conducted under short-time mask anesthesia.

Keywords: anesthesiology; disaster response; pediatrics; supply; timing
Prehosp Disast Med 2007;22(2):s95

Closing the Gap: An Audit of Medical Management in Severe Pediatric Trauma

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Funded by the Flemish Fund for Scientific Research FWO "Levenslijn Kinderfonds"

Background: Severe pediatric trauma is uncommon and complex, which places hospitals and emergency personnel at risk of being poorly prepared for such events. A considerable variability in trauma care has been reported.
Methods: An audit of current practices in Flanders, Belgium was performed. The PENTA network prospectively collected detailed data on pediatric trauma patients in a representative sample of Flemish emergency departments in 2005. A total of 95 cases with an Injury Severity Scale Score of ≥13 were withheld for further evaluation. Two trained experts reviewed all cases for audit filters, based on the available literature. Filters only were withheld if there was 100% consensus. A total of 25% of the already studied cases were reviewed again at random by two other experts in order to assess inter-observer variability.
Results: In the 95 cases studied, 129 filters were identified as being 'suboptimal care", and 135 were classified as "definitely inadequate" care. A total of 25% of all identified filters were thought to have a direct impact on the patient. Specific difficulties were observed with cervical spine management (18/82 relevant cases), pCO2 and global respiratory management (38/95), fluid management (29/95), and analgesia (27/95). The agreement between the two panels was excellent for filters identified, yet only fair for the level of adequacy (suboptimal vs. definitely inadequate).
Conclusions: An audit was performed on medical care of pediatric trauma victims in Flemish emergency departments. Several problem areas were identified. Defining the barriers to "optimal" care and more performance-based teaching might have positive impact on the results.

Keywords: audit; Belgium; emergency department; medical care; pediatric trauma
Prehosp Disast Med 2007;22(2):s95

Pediatric Trauma Mortality by Type of Designated Hospital in a Mature Integrated Trauma System

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Introduction: The objective of the study is to compare in-hospital mortality for pediatric patients (age < 16 years) treated in four levels of trauma centers: pediatric trauma centers (PTC), regional secondary trauma centers (RSTC), secondary trauma centers (STC), and primary trauma centers (PRTC).
Methods: A retrospective analysis included 10,722 injured children treated between 1998 and 2005 in 59 trauma-designated hospitals. The Quebec Trauma Registry supplied sociodemographics, clinical data, and outcome. Multiple imputation was applied to handle missing physiological data. Logistic regression was used to compare mortality by type of trauma center, adjusting for age, Glasgow Coma Scale, systolic blood pressure, respiratory rhythm, and New Injury Severity Score.
Results: Pediatric trauma centers treated 53.8% of the children. Patients treated at this type of center were more often transferred from another hospital (73%) and were more severely injured. Primary trauma centers treated 4.4%, 16.7%, and 25.1 % of the children respectively. Using a logistic regression model, the risk of mortality was substantially higher for children treated at PRTC (odds ratio = 13.3; p = 0.0036), STC (odds ratio = 9.3; p <0.0001), and RSTC (odds ratio = 2.5; p = 0.012) as compared with children treated at PTC. Except for RSTC, better outcomes at PTC were also observed among the sub-group of children who were more severely injured and those with traumatic brain injuries.

Conclusions: The improved outcome for children treated at PTC suggests that the most seriously injured pediatric trauma patients should be rapidly transferred to PTC.

Keywords: hospital; mortality; pediatric; trauma
Prehosp Disast Med 2007;22(2):s95–s96

Transportation of Critically Ill Neonates: Experience, Training, and Participation

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Objective: The objective of this study was to survey the experience, training, and confidence in the transportation of critically ill neonates among nurses, interns, residents, and fellows in three main pediatric training centers in Tehran, Iran.
Methods: Questionnaires consisting of eight questions regarding the transportation and resuscitation of critically ill neonates were completed by nurses from the emergency ward, pediatric ward, neonatal intensive care unit, and pediatric intensive care unit. Surveys also were completed by pediatric ward interns, residents, and fellows of the three main pediatric training centers of Tehran between 2005 and 2006. Additional questions obtained participant demographics.
Results: Between 63% and 69% of the survey participants were involved in the transport of neonates. Approximately half of the survey participants reported passing the resuscitation functional training course. Only 50% of participants received training in neonatal and pediatric emergencies. The majority of the study participants assessed their ability to transport ill neonates and children and resuscitate children in cardiopulmonary arrest and pediatric emergencies as good or very good. Pediatric ward interns had the least self-confidence in their abilities. Of the interns surveyed, 53.3% evaluated their skills in transporting and handling critically ill neonates and children as unsuitable or very unsuitable.
Conclusions: Training in emergency transport and management of critically ill neonates and children with emergency issues is necessary for all medical personnel involved in their care.

Keywords: children; education; neonates; training; transportation
Prehosp Disast Med 2007;22(2):s96

Pediatrics and Persons with Disabilities Emergency Preparedness Guidelines and Recommendations: Findings from an Evidenced-Based Consensus Process

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A cadre of experts and stakeholders from government agencies, professional organizations, emergency medicine and response, pediatrics, mental health, and disaster preparedness were gathered to review and summarize the existing data on emergency preparedness. Specifically, they looked into the needs of two vulnerable populations, children and persons with disabilities, in the planning, preparation, and response to disasters, public health emergencies, and terrorism. This review was followed by the development of evidence-based consensus guidelines and recommendations.

An evidence-based consensus process was used in conjunction with a modified Delphi approach for selection of topic areas and discussion points. These recommendations and guidelines represent the first national, evidence-based standards for emergency preparedness for these two vulnerable populations. There were four goals of this process: (1) To build a collaboration among individuals with expertise in pediatrics, pediatric emergency medicine, pediatric critical care, pediatric surgery, and emergency management (including disaster planning, management, and response) and collaboration among individuals with expertise in person with disabilities and emergency management; (2) To review and summarize the existing data on the needs of these two populations in emergency planning, preparation, and response; (3) To develop evidence-based guidelines and recommendations, as well as an evidenced-based consensus guidelines for dealing with gaps in the evidence on the needs of these two populations; and (4) To create a research agenda to address knowledge gaps based on the limited data that exist on the needs of these two populations.

The final recommendations developed focused on eight major areas.

Keywords: collaboration; evidence-based guidelines; pediatrics; persons with disabilities; planning
Prehosp Disast Med 2007;22(2):s96

Poster Presentations—Theme 11: Pediatrics

(165) Iraqi Children and Trauma

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In recent decades, Iraqi children have experienced multiple traumatic events. These traumatic experiences can have terrifying effects on mental health. Children have experienced emotional, physical, and sexual abuse, neglect, separation and loss, and serious illnesses. They have witnessed extreme violence, and the illnesses and deaths of their loved ones. In spite of the difficult situation, a non-governmental organization called the Iraqi Association for Child and Adolescent Mental Health was established.

Keywords: children; Iraq; mental health; psychosocial; trauma
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(166) Deciding Factors for Mortality in Children with Gastroschisis and Omphalocele, Underlying Transportation

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Children with gastroschisis and omphalocele are delivered to the Regional Children's Hospital by first-aid aircraft from very remote villages, and by ambulance from the city

of Arkhangelsk. The mortality rate for this group of patients is very high.

The objective of the study was to identify the reasons for the death of children with gastroschisis and omphalocele, and to find ways to decrease it. The charts of 33 patients with gastroschisis and omphalocele, who were delivered to the Arkhangelsk Regional Children's Hospital from 1994 to 2006, were analyzed retrospectively. The results of the treatment were evaluated according to risk factors of transportation, technique of abdominal closure, and anesthetic management.

The children were transported on average 28.8 hours (range: 1–168 hours) after their birth. Eighteen children (54.5%) were delivered by air transport, 15 children (45.5%) using ground transport. Seventeen (51.5%) of the newborns died. In 8 newborns the cause of death was too tight a closure of the abdominal wall; in 4, it was intestinal inflammation; in 3, it was related to anesthetic problems, and in 2, it was associated with other anomalies. Only 5 of the patients that died were exposed to long transportation times. Sixteen newborns (48.5%) survived, of which 14 also experienced difficult transport conditions.

The defining factor of the high death rate proved to be the applied operative technique. Connected associated anomalies and anesthetic defects also played fatal role. The difficulties of transportation did not contribute decisively to the death rate of this group of patients.

Keywords: children; gastroschisis; mortality; omphalocele; transport
Prehosp Disast Med 2007;22(2):s96–s97

(167) Rendering Medical Care to Children in Emergencies Abroad

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Introduction: Since 1995, the airmobile hospital participated in seven operations in emergency response abroad.
Methods: The hospital consists of 20 pneumo-modules, equipped with technical supply systems. The personnel includes 38 medical specialists and 17 engineers. The airmobile hospital is equipped with modern medical equipment.
Results: Data from five countries since 2001 were analyzed. In Afghanistan, from December 2001 through January 2002, medical assistance was provided to 10,061 injured persons, among them, 1,046 (10%) children. In Iran in 2003, medical assistance was provided to 430 injured persons, among them, 146 (34%) children. After the 2005 Tsunami in Sri Lanka, medical care was provided to 3,500 injured victims, among them, 1,008 (29%) children. In the hospital, 113 injured persons were treated, including 33 children (29%); in the resuscitation department, of the 76 injured, 25 were children (33%). In March 2005, the hospital was deployed to Nias, Indonesia. In total, 729 injured victims, including 333 children (46%) received medical care. After the 2005 earthquake in Muzaffarabad, Pakistan medical care was provided to 2,469 injured persons, among them 892 children (36%). Children requiring specialized treatment were evacuated.
Conclusions: Considering the large number of children (10.4–45.7%) injured in emergencies, the Russian EMERCOM airmobile hospital has adequate equipment, personnel, and experience to work in the field.

Keywords: children; field hospital; international; medical care; pediatrics
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(168) Experience of Treating Long-Bone Fractures in Mass-Admission of Children after Disasters

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Purpose: The purpose of this study was to optimize treatment techniques of long tubular bone fractures in children who were victims of earthquakes.
Methods: A specialized pediatric team that included pediatric traumatologists, worked at various disaster sites. The team usually started its activity 3–7 days after the onset of the disaster. More than 600 children were examined and consulted; 200 children (six months-16 years of age) were treated. Most skeletal system injuries were isolated or were combined fractures of the low extremities and pelvis. Upper extremity fractures were rare. The most common combined traumas were brain injuries of various severity, injuries of the thorax and the abdomen, and crush syndrome. Conservative methods (e.g., skeletal traction, reposition with the plaster immobilization) and other invasive techniques.
Results: In case of massive numbers of admission, of patients with acute traumatic injuries, the most optimal approaches are low-invasive osteosynthesis techniques, intraosseous transcutaneous osteosynthesis with TENs, pins, and apparatus for outer fixation of various constructions. Supraosseous and intramedular-blocked osteosyntheses also are possible, however, they take more time, and in the case of massive numbers of admission, one can have a deficit of fixators. Plaser immobilization is rather limited because of inadequate stability and is indicated only in simple cases. Skeletal traction is indicated only if a qualified team is absent.

Keywords: children; disasters; earthquake; long-bone fractures; mass-admission
Prehosp Disast Med 2007;22(2):s97

Oral Presentations—Theme 12: Preparedness

Session 1: Safe Hospitals 1

Chairs: TBA

Quality Indicators to Self-Assess the Level of Disaster Preparedness

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Introduction: It impossible to predict when or where a disaster will happen next, or what its cause will be. This presentation describes an instrument that was developed to allow hospitals to self-assess their level of disaster preparedness and to prioritize areas for improvement for future disaster response.
Methods: An instrument of quality indicators of preparedness was developed from a telephone survey (n = 134) and seven focus group discussions with experts in emergency and disaster management. The resulted initial long list of quality indicators of preparedness was then consolidated and organized by consulting experts and representatives of umbrella organizations. The resulting indicators comprised two of the three quality dimensions as defined by Donabedian:

1. Structure—Human and material resources, procedures; and
2. Process—Education, training, practice, and cooperation within the hospital and with other disciplines.

The quality indicators were evaluated as to their content validity, and usefulness in a 19-hospital pilot study conducted in the fall of 2006 in the Netherlands.
Results: The pilot test resulted in further improvements of the instrument. Most of the participants acknowledged the usefulness of the instrument for self-assessment of their current level of disaster preparedness. It also was determined to be useful for prioritizing areas for improvement. Respondents supported repeated use of the instrument to assess any progress in preparedness levels.
Conclusions: The current instrument consists mainly of generic quality indicators of preparedness. The instrument could be extended and modified to assess specific indicators disaster preparedness.
Keywords: hospital; instrument; preparedness; quality indicators; self-assessment
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Electrical Blackouts in Hospitals and the Need for Reassessment of the Electrical Infrastructure and More Powerful Standby Generation

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Background: Most modern hospitals have standby electrical generators, but there are no national guidelines regarding the capacity and duration of backup power generation. In light of current medical technology that requires increased power consumption, a national review of all healthcare facilities and their methods of generating standby electricity should be conducted.
Discussion: Due to problems with power grids, many hospitals in Europe and the United States recently have experienced power outages. Patient safety in a hospital is highly dependent on a functioning power supply. Areas such as operating rooms, intensive care units, and diagnostic areas use electrical power for operation essential medical devices around-the-clock. Technologic advances have created new diagnostic and therapeutic devices that continue to consume energy. During disasters, hospitals need a reliable energy supply in order to operate devices such as computed tomography machines or ventilators, which are essential for the care of critically ill patients. The electrical infrastructure of hospitals, including standby generation, often is antiquated and has not kept pace with the latest technical developments. A review of the essential electrical equipment and maximum emergency energy consumption of every hospital is needed. The electrical infrastructure, including hospital wiring should be reassessed on a national basis. The standby electical generation of each hospital must be adjusted and expanded to meet the immediate and future needs during power grid failures.
Conclusion: National technical standards should be developed and implemented for the electrical infrastructure and standby generation of electricity in all hospitals and healthcare.
Keywords: blackout; electricity; energy; power; standby gerneration
Prehosp Disast Med 2007;22(2):s98

Benchmarking Hospitals for Hurricane Evacuation

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The 2005 hurricane season on the Gulf Coast of the United States underscored how quickly hospitals can shift from being care providers during a disaster to being victims in need of assistance themselves. Four weeks after Hurricane Katrina, seven system hospitals in southeast Louisiana and southwest Texas that were serving the population surge of the New Orleans patients and evacuees, were either partially or fully evacuated as a result of Hurricane Rita. This study builds on the Northridge hospital benchmarking tool for evacuations during an earthquake (Schultz, *et al* 2005), and enhances its design for benchmarking hospitals for hurricane evacuation. Study areas include: (1) hospital demographics; (2) disaster plan characteristics; (3) planning lessons for individual hospitals; (4) hospital decision making and incident command; (5) movement of patients within the facility; and (6) movement of patients to other facilities. Lessons learned from multiple communities across the region will be discussed in the results, and key planning areas that strengthen hospital evacuation planning will be identified.
Keywords: benchmarking; evacuation; hospital; Hurricane Katrina; Hurricane Rita
Prehosp Disast Med 2007;22(2):s98

Improving Hospital Preparedness for Radiological Terrorism: Perspectives from Emergency Department Physicians and Nurses

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In any large-scale terrorist event involving radioactive materials, hospital emergency departments will play a pivotal role in providing care. In light of this, numerous efforts currently are in process to improve hospital preparedness. However, for such initiatives to be effective, there must be an understanding of the practical concerns, needs, and views of frontline hospital staff. This presentation will report findings from study of emergency department physicians' and nurses' perspectives on radiological terrorism issues. It was funded by the United States Centers for Disease Control and Prevention and performed in 2005 and 2006 in the Northeastern, Southern, and Western regions of the US involving a series of 10 focus groups. The issues examined were the: (1) the principal preparedness challenges for hospitals, emergency departments, and staff; (2) critical information needs and preferred information sources; (3) views of current training and future training needs; (4) views of current response plans and protocols; and (5) perspectives on potential difficulties and impediments that could affect readiness. Key findings from the study will be reviewed in this presentation, and the implications for hospital preparedness and response will be explored.

Keywords: hospitals; nurses; physicians; preparedness; radiological terrorism
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Do Hospitals in Iran Have an Emergency Department Incident Command System for the Management of Hazardous Materials Victims?

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Introduction: After a disaster caused by industrial, terrorism, or natural events, victims exposed to hazardous materials may need to be admitted to an emergency department. Preparedness plays an important role in the appropriate management of these victims. Preventing the spread of contamination is a principal concern in the management of contaminated victims and requires a definite plan for all medical responses to hazmat incidents. This study provides preparedness guidelines for the management of Hazmat victims in hospital emergency departments.
Methods: This study was conducted in 2006. Select hospitals were surveyed to determine if they had a specific plan for medical response to hazmat victims. An expert team prepared an "Emergency Department Incident Command System (ICS) for the Medical Response to Hazmat Patients" as a preparedness plan for hospitals within the vicinity of industrialized areas.
Results: Responses to the survey indicated that none of the responding hospitals had specific plans for a medical response to hazmat victims in the emergency department. The current standards of ICS were used to design a system for the selected hospitals. The current standards noted for the developed ICS included: (1) communication with related centers; (2) training modules; (3) personnel protection equipments; (4) procedures; and (5) prevention of contamination spreading.
Conclusion: Although hazardous materials often are used in industrialized areas and hazmat incidents may lead to morbidities and contamination, general hospitals are insufficiently prepared for the management of contaminated victims. An Incident Command System designed to manage contaminated victims can be used as a model for other hospitals in Iran.

Keywords: hazardous material; hazmat incidents; Incident Command System; Iran; preparedness
Prehosp Disast Med 2007;22(2):s99

Session 2: Safe Hospitals 2

Chairs: TBA

Assessment of Disaster Preparedness and the Feasibility of Prehospital Care in a Rural Guatemala Clinic

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Introduction: As a developing nation in Central America, Guatemala is vulnerable to certain naturally-occurring hazards. In October 2005, Hurricane Stan destroyed large areas of rural San Marcos, Guatemala. While Guatemala City is becoming highly urbanized, a majority of the people still live in rural areas with limited access to health care. Rural clinics provide access to primary healthcare services for people who are unable to travel to large cities that often are >2 hours distant. After an event like Hurricane Stan, a rural clinic could serve a vital role in the relief efforts, however, it rapidly could become overwhelmed with people needing medical assistance. Disaster preparedness and the capabilities of a rural clinic in San Marcos in the event of a disaster were assessed.
Methods: Data were obtained using a convenience sample of clinic patients. Data collected included demographics, needs of the community, existing resources, barriers inhibiting residents from accessing these resources or services, and community awareness. A focus group discussion with clinic staff and community health promoters/leaders was conducted to determine the major successes and obstacles facing the community and clinic during and after the hurricane. A survey was administered to assess available resources and infrastructure.
Conclusions: Prehospital care is difficult without the necessary resources, infrastructure, or governmental support. However, certain actions can be taken to better prepare for disasters. Strategies that could improve the clinics preparedness will be dicussed, and a list of needs and priorities of a small rural medical facility that could be used as a guide for planning will be generated.

Keywords: disaster; Guatemala; prehospital; preparedness; rural
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Project ER One: Designing Emergency Rooms for All Hazards

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The findings from Project ER One, commissioned by the United States government to design and build a new type of emergency care center is presented. It is optimized to manage the medical consequences of terrorism and emerging infectious diseases, while maintaining its fundamental mission to provide emergency care to the community it serves.

ER One is optimized along three dimensions: (1) capacity; (2) capability; and (3) protection. Capacity is the ability to scale up 1–5 times the normal number of patients without encountering gridlock. Specialized capability provides an enhanced ability to manage conditions not ordinarily encountered, but can occur from a planned attack or an emerging infectious disease, chemical contamination, radioactive contamination, or highly and purposefully contagious illnesses. Protection ensures that the facility can continue to function despite being a target of a direct attack or suffering collateral damage from an attack nearby.

More than 300 design concepts for an all-risks emergency care center were identified by multiple national task forces. Key concepts, such as concourse vehicular access, screening portals at entrances, universal isolation, multi-modal decontamination, and rooms large enogugh to handle multiple patients simultaneously, will be discussed. Schematic design has been completed for an actual facility to be built that would be able to handle 100,000 emergency patients/year in routine operations and scale up to 1,500 patients/day during a mass-casualty incident. Design features and practical applications for renovation and/or building new emergency rooms also will be presented.

Keywords: all-hazards; capability; capacity; emergency room; protection
Prehosp Disast Med 2007;22(2):s100

An Integrated Plan to Augment Surge Capacity

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Objectives: The New York City Department of Health and Mental Hygiene has requested that area hospitals take inventory of available beds and ensure a minimum 20% surge capacity availability for a mass-casualty incident or infectious disease outbreak. Member facilities of the Central Brooklyn Centers for Bioterrorism and Preparedness Planning (CBPP) have chosen to cooperate in merging resources to address potential public health incidents affecting Central Brooklyn, New York. Together, CBPP hospitals have endeavored to meet the aforementioned requests.
Methods: The staff of the CBPP facilities were required to perform parallel inventories of the capacity of the units, that were or had the potential to become inpatient units. Concurrently, an inspection to identify negative pressure isolation bed surge and ventilator capacity was performed. Steps to prepare potential surge capacity for rapid mobilization, including the retrofitting of decommissioned units were taken and policies for its activation were determined.
Results: After performing preparatory steps, the final census identified a bed surge capacity of 30% within the CBPP. The surge capacity plan of each facility was communicated and integrated with that of the other CBPP facilities.
Conclusions: The CBPP hospitals have demonstrated the process of performing an inventory, recognizing potential space for supplementing surge capacity, and preparing the space and policy for its activation. An integrated plan has been formulated to engage increased demand to physical infrastructure by partnering multiple, unaffiliated healthcare facilities. This process provides an example of the creation and execution of plans within and between facilities that augment their ability to respond to a public health incident.

Keywords: hospital; inventory; planning; policy; public health; surge capacity
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Preparedness of Hospital Physicians for a Mass-Casualty Incident: An Ongoing Survey in Germany

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Objectives: The goal of this study was to evaluate the preparedness of hospital physicians for a mass-casualty incident.
Methods: An online survey containing 16 questions was e-mailed to the head of the Departments of Surgery, Internal Medicine and Anaesthesia in all Level 1–3 Trauma Centers in Germany. Preliminary results of the first two months of data are collected and presented. Participants included 65 physicans working in internal medicine, 126 in surgery and 190 in anesthesia. Replies were analyzed statistically using the one-way Analysis of Variance (ANOVA) and the Turkey-Kramer Multiple Comparisons test.
Results: The questionnaire was completed by 381 physicians. Of these, 127 (33%) were unaware of the particular details of their hospital's disaster management plan, while 38 (10%) were unaware of the plan itself. A total of 48% of the responding physicians did not know their area of responsibility in case of an internal emergency (fire, burst pipe, power failure). Surgical residents and specialists had less training in nuclear, biological, or chemical agents compared to the other physicians (p >0.01).
Conclusions: The preparedness level of physicians in hospitals for mass-causualty incident is inadequate. Surgeons have significantly less formal training in chemical, biological and nuclear exposures than do other specialists. The emergency medical training of physicians must be adapted to respond to the increase in catastrophes and terrorist threats.

Keywords: education; Gernany; hospital; phyiscians; preparedness; training
Prehosp Disast Med 2007;22(2):s100

Hospital Preparedness for Emergencies in Nepal

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The Hospital Preparedness for Emergencies (HOPE) Course is a four-day course developed by a team of leading experts from throughout the Asia Pacific region. The course

has been tested and delivered in South East Asian countries. It addresses the structural, non-structural, on-site and inpatient management of disasters, including hospital evacuation.

The three priorities of HOPE are to: (1) produce local instructors; (2) institutionalize the course; and (3) to prepare the hospitals for disasters.

Twenty-nine instructors have been developed from this course. In the process of institutionalization, many sensitization programs have been conducted for high officials within the government. The result is that the Nepalese government has allocated a budget for HOPE. The sensitization also showed extra benefits; it helped us select proper, various organizations financed HOPE and also the course got known to other hospitals and they have requested for more courses.

The most important objective of HOPE is to help hospitals in Nepal prepare for emergencies. Previously, only some hospitals had non-implemented disaster plans and only one hospital held regular dispatch drills. Now, with 95 HOPE graduates from 10 hospitals, four hospitals have developed disaster plans and have performed disaster drills. Seven hospitals, including one private hospital, are preparing their disaster plans including one private hospital, after which they are planning to do a disaster drill.

Our future goal is to provide training to all the large hospitals in Nepal and to help them develop their disaster plan and drills so that when disaster occurs, hospitals will effectively be prepared because of HOPE.

Keywords: education; finance; hospitals; Nepal; preparedness; training
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Hospital Preparedness for a Mass-Casualty Incident: A National Pilot Drill

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Terrorists strike all over the world without prior notice. Unfortunately, it is not a question of "will it happen", but rather "when will it happen", and if so, "are we ready?" The health system in Israel is on constant alert for mass-casualty incidents (MCI) and disasters.

In April 2006, the Tel Aviv Sourasky Medical Center, a Level-1 Trauma Center, practiced a national pilot drill, the Rapid Response System for Mega Mass Casualty Incidents, for the first time. The drill was carried out in cooperation with the Israeli Defense Force (IDF) Home Front Command (HFC), Magen David Adom (the National Israeli Emergency Medical Service), the Israeli Police Force, and the National Railway System.

The drill was performed without interrupting the regular work of the hospital. Due to the continuation of the regular work, not all of the designated personnel took part in the drill. The drill was evaluated by colleagues from other hospitals, HFC, and the Ministry of Health.

Two hundred "casualties" were brought to the hospital within three hours. There were 120 minimally injured, 30 moderately injured, and 30 critically injured casualties.

The drill was performed in order to evaluate the hospital and the national response system to a major ("Mega") MCI. It also evaluated the cooperation and collaboration among all agencies related to the MCI response.

This paper will present the outcome of the drill as well as the recommendations to health authorities that followed the drill.

Keywords: drills; hospitals; mass-casualty incidents; preparedness; terrorist attacks
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The Impact of Three Super Typhoons in the Philippines within One Year: Climate Change Experience

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Introduction: Several typhoons from the Pacific Ocean impact the Philippine archipelago each year. Category 4 typhoons strike this region every five to seven years. In 2006, three super typhoons devastated the Philippines. The experiences of dealing with the effects of these three successive typhoons damaging communities including the capital, Manila, are presented.
Methods: A review was conducted of the experiences in the Philippine regions affected by Typhoons Milenyo, Reming, and Seniang.
Results: Typhoon Milenyo directly impacted metropolitan Manila. Power lines were downed by the >180 kph winds and the damage to several billboards resulted in deaths. Typhoon Reming caused the flow of lava from the Mayon Volcano burying several towns despite excellent early warning systems. Typhoon Seniang caused the devastation of several islands as the country still was in the recovery process from the impact of the two previous typhoons.
Conclusions: As global changes in weather continue to occur, valuable lessons can be learned from the resilience demonstrated by the Filipino community in dealing with climate change.

Keywords: community; Philippines; recovery; typhoons; weather change
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National Centres of Research and Development in Medical Emergency Preparedness in Sweden

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In 1999, Swedish National Board of Health and Welfare established National Centres of Research and Development in medical emergency preparedness. The centers have been linked to already existing, university institutions and other corresponding bodies. Today, five centers have been established, with an annual budget of US$3.3 million.

These centers have been established in the following areas: Microbiological Preparedness, Radiation Medicine in Disasters, Disaster Toxicology, Disaster Medicine and Disaster Psychiatry. The centers have different tasks within their respective area of expertise—from research in psychosocial support and traumatic stress, classical disaster

medicine, development of tools for education and training, and management of accidents involving heavy vehicles (buses and high speed trains) to the different cemical, biological, and radiation/nuclear areas.

The centers have served as important expert bodies for the National Board of Health and Welfare and have produced scientific reports on items within their respective area of expertise, such as depleted uranium, evacuation of victims in bus accidents, quality assurance in command and control, and follow-up studies on psychosocial support.

The Swedish National Board of Health and Welfare has, in this way, promoted research in the area of emergency medicine that would not otherwise have been performed due to lack of foundation and support from traditional Swedish funds for research.

Keywords: disaster medicine; preparedness; research; Sweden; training
Prehosp Disast Med 2007;22(2):s101–s102

Analyzing Factors Affecting Mitigation and Preparedness for an Earthquake at the Individual Level in Istanbul

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This study is aimed at investigating the process of taking action regarding earthquake preparedness and the mitigation of the effects of earthquakes at the individual level, and identifing factors that influence this process. This paper is based on the first part of an ongoing project. It was conducted in Istanbul using Focus Group Discussions (FGDs) and in-depth interviews. To maintain comparability, the FGDs were conducted in two areas of Istanbul that have different levels of earthquake risk. Within these areas, three socioeconomic levels were considered. A total of 13 FGDs were conducted. Eleven in-depth interviews with key informants also were conducted. A Maxqda software program was used to assist in data analysis. The discussions and interviews indicate that the 1999 Marmara earthquake, which resulted in the deaths of >30,000 people, has affected people in both positive and negative ways regarding preparation and mitigation activities. The analysis confirmed that better socioeconomic status and a higher level of education are important factors for undertaking mitigation and preparedness activities; however, these factors do not automatically guarantee better preparedness or mitigation at the individual level. Other factors such as: (1) direct experience with the consequences of the 1999 earthquake; (2) social interaction; (3) social acceptance of preparation measures; (4) risk perception for the individual; (5) outcome expectancy; (6) cultural issues; (7) normalisation bias; (8) onset time; and (9) others may have substantial influence on individuals. Also, fatalism and some religious beliefs do not advocate for the importance of disaster preparedness. The results of this study will provide key points for better preparedness programs.

Keywords: determinning factors; earthquake; individuals; Marmara earthquake (1999); preparedness; Turkey
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Introduction of a Model for a Village Disaster Task Force in Iran, Based on a Community Intervention Trial on a Flood Early Warning System

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Introduction: This study has proposed a Village Disaster Task Force (VDT) as complementary part of Iran's national law for disaster management. The effectiveness of the VDT was evaluated using a flash flood Early Warning System in Golestan Province.

Methods: A community interventional trial was implemented during the summer 2006. Using a systematic random sampling selection process, 4,732 subjects were studied in both of the areas. The composition of the VDTs included representatives of the community, government, Ministry of Health, Iranian Red Crescent Society (IRCS), and Basij (a community-based military organization). The VDTs trained the population on flash flood preparedness, established a local communication system, and conducted the safe-zone drill. The statistical software used was STATA 8.0 and the interaction of the study area and assessment time in logistic or linear regression models was used to evaluate the effectiveness of the intervention.

Results: Pre- and post-assessments estimated that 20.4% and 80.6% of people had prepared an emergency kit in intervention area, respectively, and it was estimated that 11.6% and 19.3% had an emergency kit in the control area (Adjusted ß = 3.27, confidence interval (CI) 95%: 3.24–3.50, p <0.001). The result were same for the flood hazard map, participation in the safe-zone drill, and other outcome measures (P <0.001). A case study on the communication system of VDTs during a flood threat on 13 September due to a heavy rain demonstrated the system's effectiveness.

Conclusions: The VDT task force is an effective integrated model that is based on community capacity and government legislation, and can be a basis for extending to other rural parts of the country and other hazards.

Keywords: disaster risk management; early warning system; emergency preparedness kit; floods; Iran; people-centered disaster management
Prehosp Disast Med 2007;22(2):s102

Session 3

Chair: Mauricio Lynn

SAFE: Satellite Communication for Health Early Warning

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The risk of epidemics and emerging or re-emerging diseases such as avian flu, tuberculosis, as well as malaria and other vector-borne diseases, is rising. These risks can be contained with prevention, early warning, and prompt management. Despite progress in information technology, communication remains a bottleneck for health early warning and response systems. Satellite Communication for Health Early Warning (SAFE) is a component-based system for health early warning that employs satellite and wireless networks, geographic information systems, integration technology, and data mining to promptly identify and respond to disease outbreaks or epidemics.

The added value of the SAFE approach will be demonstrated in the context of readiness exercises conducted throughout Europe. In a post-disaster health management scenario, a mobile health emergency coordination center is established and integrated into public health services for health monitoring. The role of SAFE in post-disaster health management will be assessed in an earthquake-readiness exercise, in which the outbreak of a typhoid fever epidemic will be simulated. Other envisaged scenarios relate to tuberculoses and influenza.

Satellite communication services including low and high bandwidth access to the Internet, cooperative working, and geolocalization in SAFE will be validated for all phases of managing a biological crisis including prevention, early warning, and response. Healthcare systems and civil protection are expected to benefit from promptly restoring access to information and communication.

Advanced communication and data mining techniques in SAFE offer new tools to the "Epidemic Intelligence" and contribute to advanced preparedness and prompt response by removing communication barriers, promoting collaboration, and reducing the isolation of affected areas.

Keywords: coordination; epidemics; infection; prevention; risk; Satellite Communication for Health Early Warning (SAFE); warning
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Information Network System for Nuclear Disasters in Japan

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Medical management of radiation injuries requires special knowledge and resources, and can be difficult for ordinary emergency medical systems to manage. In order to utilize medical resources effectively, the national government of Japan has developed a radiation emergency medical network, which involves a wide range of organizations and specialists in. When a nuclear disaster occurs, it is imperative that these organizations and specialists are provided accurate information as quickly as possible.

To facilitate this, an information network system was developed using the existing telecommunication system and the Internet. With this system, relevant information can be disseminated at once. The system comprises ordinary fax machines that have the F-code function, a computer server, and Internet. After the original message containing the relevant information is faxed, it is automatically delivered by the F-code function to all the pre-registered organizations and individuals. At the same time, the fax message is digitalized as an image file and disseminated via the Internet to mobile phones and computer servers. Also, the message can be viewed on a Website.

This system was used and evaluated during the national nuclear disaster drill in September and the prefecture drill in November 2006. The relevant information was delivered smoothly without any delay to all the organizations and individuals who participated in the drills. Although some modifications are required, this system should function as an effective method for disseminating information during a nuclear disaster.

Keywords: information network system; Japan; medical management; nuclear disaster; radiation injuries
Prehosp Disast Med 2007;22(2):s103

The Interface of Regional Coordination within Louisiana Hospitals during Hurricanes Katrina and Rita

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In 2002, the National Hospital Bioterrorism Preparedness Program, Health Resources and Services Administration (HRSA) Grant program initiated funding for hospitals to improve their overall bioterrorism response capabilities. Under this program, and given the natural disaster risks in the Gulf Coast area, the Louisiana HRSA efforts emphasized an all-hazards planning approach. Since the inception of the grant, the regional coordination emergency response infrastructure had been activated for five state-declared emergencies, including Hurricanes Katrina and Rita.

This presentation outlines how the federal funds were utilized to develop a coordinated response infrastructure from the state to the local hospital level and how Louisiana hospital's collaborated during one of the nation's largest natural disasters. The Louisiana State University-Health Sciences Center in New Orleans (known as "Big Charity") is highlighted to demonstrate one hospital's experience in both disaster planning and response. The Hurricane Pam Planning exercise is contrasted with the actual events of Hurricane Katrina. Personal, local, and statewide "lessons learned" are summarized. Disaster planning efforts since Katrina will be discussed and recommendations for future planning activities will be offered.

Keywords: bioterrorism; coordination; finance; hospitals; regional; response
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Managing Health Information during Disasters: A Survey of Current, Specialized, Health Information Systems for Disasters

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During a disaster, a substantial number of patients will seek medical care, inluding those injured during the acute phase of the event, those injured in recovery and evacuation attempts, and the chronically ill who have limited or no access to medical supplies. This surge in demand will result in an increased strain on hospital resources. In the first instance, the surge capacity of the emergency department will be tested, with a subsequent surge in demand on the resources and services of the Health Information Service (HIS), namely an increased demand for new medical records, and identification and retrieval of existing records. Recent international experience has highlighted the fact that regardless of the type of disaster, all patients presenting to hospitals during these events will require identification (raising the issue of how hospitals and healthcare facilities will cope with unidentifiable patients), the allocation of new medical records or retrieval of existing records, and appropriate patient tracking throughout the healthcare facility. This sudden increase in demand obviously will impact the ability of the HIS, and consequently the hospital, to appropriately identify patients and document individual patient care. It also raises the question as to whether existing health information systems can cope with a disaster, or whether specialized health information systems are required. This study investigates whether hospitals in Victoria, Australia have specialized health information systems that would be activated in times of disasters, the type of specialized system used, how the systems would be activated, and who would activate them.

Keywords: Australia; disaster; health information; hospital; surge capacity
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Ontario CritiCall Program and Provincial Disaster Management

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Current practice in preventive environmental health action includes chemical analysis of land, water, and air for known (controlled), toxic chemicals and comparisons against standards for identification of breaches of regulatory limits. This methodology also is followed after an event or disaster to ensure air, water, and food safety. Some problems, not easily addressed by this methodology include: (1) unidentified toxic chemicals; (2) non-conventional uses of toxic materials; (3) unexpected synergetic effects of toxic mixtures; and (4) human health consequences of exposure to toxic materials with unusual and unidentified pathways of exposures. In Bhopal, the citizens were faced with a mixture of approximately 27 toxic substances, a variety of exposures related to activities of the persons, for example, remaining in their homes or running in the toxic cloud, and a variety of perceived injuries, of which not all would have been predicted simply by analyzing the chemicals involved.

The benefits of combining different approaches, such as examining the health, social, and cultural environments, and the economic situation of the victims in Bhopal, and the effects of each on health is presented. This more broad analysis provides a clearer, overall picture of the problems in the aftermath of exposure, and also provides clues to effective treatment and alleviation of future problems. Two effective strategies for connecting health problems ten years after the exposure to the original event, and understanding the biochemical reactions in the body when invaded by a mixture of toxic substances, as well as how such an understanding will, in turn, affect public policy planning, emergency preparedness, and emergency medicine will be presented.

Keywords: Canada; Criticall; databases; patient referrals; severe acute respiratory syndrome
Prehosp Disast Med 2007;22(2):s104

Session 4: Systems 1

Chairs: Mauricio Lynn; C. Breederveld

Designing and Using a Databank as a Method for Improving Disaster Management

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Introduction: In recent decades, Iran has sustained a great loss of life as a result of disasters from earthquakes and droughts. Preparedness for appropriate responses to these disasters requires scientific and functional planning based on valid information.

Methods: A databank of information was prepared by an expert team and scientific planning group. Brain storming sessions concordant with information from resource studies helped to identify national patterns of hazardous events and form the appropriate structure for this data bank. Inquiries were made to the provincial Disaster Task Force and other related organizations, while a search was con-

ducted of informational and electronic resources to identify the functional requirements and precise definitions of essential variables. Subsequently, the variables were classified and the specification of each of variable was defined.
Results: Important indexes considered in this study included disasters that had occurred previously; public, geographical, population, economical, social and regional characteristics, infrastructure specifications, and information from related agencies in disaster management; information from assistant provinces; information from related organization and workgroups in mitigation, preparedness and disaster management, training, warning and information, relief and rescue, health, transportation, sheltering, telecommunication, energy, agriculture, water, industry, and recovery.
Conclusions: Iran is a jeopardized country and has sustained substantial loss of life and economic loss related to disasters. In 2003, disaster management program was compiled for disaster responses although there was no accessible, classified and comprehensive information available. The creation of this data bank of disaster-related information is an attempt to solve one of the important defects in disaster management in Iran.
Keywords: databank; disaster management; information; Iran; response
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Urban Search-and-Rescue in Western Australia

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The city of Perth, located in Western Australia (WA), is one of the most isolated cities in the world and requires strong partnerships with emergency service organizations. In order to provide effective emergency response in this isolated region, WA is prepared to be self-sufficient for up to 72 hours before expecting to receive assistance from other states and overseas.

The Department of Health's Disaster Preparedness and Management Unit (DPMU) has been working closely with key areas within the Department and external agencies including the WA Country Health Service (WACHS), Fire and Emergency Service Authority (FESA), WA General Practice Network, and St. John Ambulance (SJA) to enhance the capabilities of disaster response.

The DPMU, in partnership with the FESA, recently has trained four doctors in urban search and rescue (USAR) activities. In order to put this training into practice, these newly recruited USAR-trained doctors participated in a National Counter Terrorism Exercise (Western Explorer) held in June 2006. The initial exercise, Exercise Western Explorer, was the first of its kind to showcase WA's urban search and rescue capabilities.

Recommendations from this exercise are currently being implemented, including the identified need for immediate access to medical equipment during activation and the need for the USAR-trained doctors to be familiar with the tools and equipment used by the USAR Taskforce.
Keywords: Australia; geographic isolation; search and rescue; training; urban
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Developing Disaster Medical Assistance Teams in Australia

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Western Australia (WA) was one of the first Australian states to deploy medical teams to work in the Tsunami-stricken regions of the Maldives and Banda Aceh. Historically, Australia has relied upon the Australian Defence Force to provide overseas medical assistance. However, in this instance, the volunteers were civilians, predominantly from tertiary hospitals. The deployment of civilian-based medical teams has been questioned, mainly due to the lack of pre-deployment arrangements. In this instance, Australia's civilian medical response to the Tsunami was appropriate and effective. Subsequently, at the post-Tsunami debriefings, it was proposed that pre-selected, state-based Disaster Medical Assistance Teams (DMAT) should be established.

Western Australia is researching and developing a model for a state-based DMAT. This presentation will examine the progress made in the development of such teams. These teams will have the ability to be developed intra-state, interstate, and internationally, if required. For a state like WA, where much of the industrial areas are located near hospitals with few resources, a designated DMAT would be a great benefit. The capability to provide assistance, coupled with the ever-present natural threats, particularly cyclones in the North West and bushfires in the South, will be enhanced. These processes were evaluated during a recent 12-person deployment to Yogyakarta. Further development will be available following the Australian Symposium focusing on Workforce Modelling for DMAT, which was held in Perth, Western Australia 27–28th November 2006.
Keywords: disaster; disaster medical assistance team; government; medical aid; Western Australia
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Comparing Risk and Disaster Preparedness of Two University Hospitals Using the Utstein Guidelines

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Introduction: The Utstein Guidelines provide common terminology to disaster management and thus it is preferred for its structured approach to disaster preparedness and evaluation. The concepts and guidelines provide a baseline for different healthcare systems to be assessed and compared.
Methods: National University Hospital in Singapore and Yongdong Severance Hospital in Seoul function under two different systems. The Utstein template was used to illustrate the risk and needs assessment of these two hospitals during a disaster. Using Utstein disaster terminology and concepts, both of the hospitals identified the hazards each faced that may escalate into events and possibly lead to damages and function change.

The Basic Societal Function (BSF) was defined for both Singapore and Seoul, and it was determined how each

component of the BSF contributes to the preparedness and vulnerability of each region.
Results: The results of this evaluation demonstrate that the risks faced by both Singapore and Seoul are similar, however, the risk modification of the potential events arising from the identified hazards was more emphasized in Singapore. This is due to the high involvement of governmental groups, the Ministry of Health, and other self-help group.
Conclusions: The Utstein Guidelines provide a way for multiple hospitals with different healthcare systems to compare risks and examine the level of preparedness to manage mass-casualty incidents.
Keywords: comparison; healthcare system; risks; terminology; Utstein Guidelines
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Evaluation of Disaster Preparedness System in Japan

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More than 5,000 lives were lost due to damages caused by the Hansin-Awaji Earthquake. From a medical standpoint, the biggest problem was the delay in setting up local emergency medical facilities. In the year following the earthquake, the Japanese Ministry of Health and Welfare (MHW) listed nine priority areas and instructed the heads of the local municipalities to focus on these nine areas.

1. Citizens should participate in disaster planning. Medical personnel should be included in the development of such plans;
2. Mutual support plans should be established among municipalities;
3. A mobile, local response medical team should be introduced;
4. Disaster base hospitals intended to treat the most severely affected individuals should be established;
5. The functions of the local Health Center to serve as coordinators should be enhanced;
6. Disaster medical training should occur;
7. Operational manuals should be written;
8. Rescue teams should be introduced quickly; and
9. Autopsy facilities for major catastrophes should be established.

The purpose of this study is to evaluate these aspects. Japan established a system of base hospitals for disasters, Disaster Medical Assistance Teams (DMATs), and the Emergency Medical Information System for extended disasters (EMIS). The response to recent events, such as the Chuetsu earthquake, the train accident in Amagasaki, and the Miyagi earthquake, as well as disaster drills provide evidence of the progress of medical responses for disasters in Japan. On the other hand, problems such as the utility of EMIS or DMAT dispatch system are made clear through these disasters and drills.

Following implementation of the results of these evaluations, the disaster response system should improved further.
Keywords: disaster; planning; preparedness; prioritization
Prehosp Disast Med 2007;22(2):s106

Session 5: Systems 2

Chairs: Mauricio Lynn; C. Breederveld

Past, Present, and Future of National Medical Rescue Teams—The Turkish Experience

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Following the Marmara Earthquake in 1999, major accomplishments have been acheived in Turkish disaster response missions. One of these accomplishments was the establishment of National Medical Rescue Teams (NMRTs). In 2003, the Turkish Ministry of Health initiated the "Health Organization in Disasters Project", in order to respond effectively to all types of disasters that may occur worldwide, and provide medical care to people in need. Currently, there are approximately 2,000 providers that have been trained. Training has been provided by a group of qualified trainers who were chosen from 11 different districts and have completed an instructor training program. The NMRT members have participated in nationwide exercises as well as real-time missions in places such as Pakistan, Indonesia, and Sudan. The organization, structure, personnel selection and training of NMRTs formed within the Turkish Ministry of Health was studied and will be presented as "The Past, Present and the Future of National Medical Rescue Teams in the Light of Turkish Experience".
Keywords: disaster; disaster response; preparedness; rescue teams; training; Turkey
Prehosp Disast Med 2007;22(2):s106

Swedish National Support Team in the Event of a Serious Overseas Emergency or Disaster

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Disaster preparedness for international disasters involving Swedish citizens was heavily criticised after the Tsunami, December 2004. In response to this, the Swedish Rescue Services Agency (SRSA), the Swedish National Board of Health and Welfare (NBHW), the Swedish National Police Board (NPB) and the Swedish Ministry for Foreign Affairs together have created a National Support Team to handle similar situations in the future. The National Support Team will support the Swedish embassy and consulate and people in distress in the event of a serious overseas emergency or disaster.

The National Support Team consists of a unit for "Rapid Needs Assessment" and a "Joint Task Force" staffed by specifically recruited and trained personnel from the SRSA, health personnel from the Swedish County Councils and police personnel from the NPB.

The National Support Team will provide command and coordination staff, health care, logistics, IT and telecommunications, information, and, if needed, perform medical evacuation. In addition, psychosocial support will be provided by representatives from the Swedish Red Cross, Save the Children Sweden and the Church of Sweden.

The National Support Team can provide early, remote, rapid needs assessment within two hours after an alarm is activated and a departure for further assessment on site within six hours. The Joint Task Force should be prepared for departure within 12 hours.

A National Support Team has been educated and trained, and was used during the Lebanon evacuation of Swedes this last summer.

Keywords: disaster; emergency; international; preparedness; support; Sweden
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Importance of Establishing Partnership Abroad for Efficient Disaster Relief

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Introduction: MH Thamrin Healthcare Group (Thamrin) in Jakarta requested the Japanese non-profit organization (NPO) Humanitarian Medical Assistance (HuMA) provide medical support in YogYakarta, an area affected by the Java tectonic earthquake on 27 May 2006. This medical collaboration sprang from a long personal relationship between the President of Thamrin and several core members of HuMA. Humanitarian Medical Assistance offered medical services, and Thamrin managed the logistics.

Medical and Logistic Collaboration: Thamrin already had made the following arrangements by the time HuMA arrived in Jakarta: (1) location for the basic clinic and the disaster field mobile site; (2) transportation to disaster area from Jakarta; (3) transportation of overweight medical equipment to YogYakarta; (4) accommodation for HuMA volunteers; (5) availability of communication tools; (6) accurate estimation of the total budget to reduce total time spent exchanging money; (7) establishment of local staff; and (8) sites for severe injured patients. With these logistics in place, HuMA was able to begin activity immediately.

Preparedness for Future: This Java relief mission proved the importance of having established partnerships abroad for efficient disaster relief. After this disaster relief collaboration, we, HuMA and Thamrin had exchanged Memorandum of Understanding for disasters in future. Regularly collaborating and exchanging information with medical counterparts native to an area and understanding the local system enables quick medical care rescue operation when disasters strike that area.

Keywords: collaboration; disaster relief; Japan; medical services; partnerships
Prehosp Disast Med 2007;22(2):s107

Just-in-Time Training for Medical Reserve Corps Unit Volunteers in a Point of Distribution Clinic Operation: Does it Work?

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The Nassau County Department of Health (NC-DOH) developed a public health Medical Reserve Corps Unit (MRC) to assure adequate surge capacity during public health crises, such as epidemics. With >300 members from diverse backgrounds, including physicians, nurses, pharmacists, veterinarians, dentists, and social workers, the challenge was to develop a program that rapidly would train the MRC to operate cohesively during public heath emergencies. The decision was made to utilize a "just-in-time training" (JIT) methodology.

A program for JIT for Point of Distribution (POD) Clinics was developed and implemented. To prepare for JIT, all members received basic training on the incident command system and its utilization by public health. The training emphasized the importance of following the chain of command and using emergency response functional roles. Participants were provided examples of job action sheets and shown how to use them.

The effectiveness of the training was tested when the NC-DOH initiated a massive POD clinic for senior citizens. Over two days, 7,628 seniors reported to one POD location for influenza vaccination. MRC members were utilized to augment POD staffing. At the POD site, each member received a job action sheet and a brief tutorial on his/her emergency response functional role. The operation was evaluated on multiple levels, including the ability of MRC volunteers to function in the POD. All MRC members were fully able to perform their functional POD roles. All MRC members (and the senior citizens) rated the experience as positive.

Keywords: clinics; incident command system; just-in-time training; medical reserve corps; public health; roles
Prehosp Disast Med 2007;22(2):s107

Comparison of Hospital Incident Command Systems (HICS) in Hospitals of Four Different Countries: Does HICS Mean the Same Everywhere?

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Introduction: Hospital Emergency Incident Command System (HEICS) was developed in California following the 1970 earthquake there. The system has been widely recommended within the medical community across the world. Today, it is known as Hospital Incident Command System (HICS). The aim of this study was to determine the similarities, differences, and the originality of HICS in Turkey, South Korea, Greece, and the US.

Methods: The applicability, modifications, as well as the usefulness of the U.S.-originated HICS system in Turkish, South Korean, and Greek hospitals were studied. The response of hospital staff in exercises when >20 patients arrive at the emergency department at the same time also was studied. The experiences of providers, medical response provided for the injured following a terrorist attack, scenarios used in different exercises, and overall response systems in these three countries also were evaluated. The presence of similar responses given for similar threats were documented. Within the three nations, the areas studied included: (1) medical response systems against terrorism; (2) scenarios and/or systems about the medical response to a chemical accident or terrorist attack; and (3) medical response systems for nuclear accidents or terrorism.
Results: After comparing the results, the differences in response and possible gains following studies that could be done by study groups were identified.
Conclusion: Synergistic messages about our observations of disaster medical response experiences in hospitals in Turkey, South Korea, Greece, and the US also have been identified.
Keywords: disaster medical response; Greece; Hospital Incident Command System terrorism; South Korea; Turkey
Prehosp Disast Med 2007;22(2):s107–s108

Experiences with Frozen Blood Products in the Netherlands Military

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Introduction: During peace-keeping and peace-enforcing missions abroad, the Netherlands Armed Forces uses deep frozen blood products stored at -80°C. This study was initiated to validate the quality of the frozen and subsequently thawed products both in the Netherlands and at the site of administration, with special attention to quality control and compliance with (inter)national regulations and guidelines.
Methods: Leukodepleted red cell concentrates were glycerolized using the automated cell processor, ACP215, and frozen to -80°C. After thawing, the units were deglycerolized both in the Netherlands and in Iraq using the ACP215, and stored in Nutricel rejuvenating (AS-3) solution for two weeks at 4°C. Leukodepleted fresh frozen plasma units were thawed after release from quarantine, repacked, and frozen to -80°C. Prior to and after the -80°C freezing, concentration of factors V and VIII was determined. Dimethyl Sulfoxide (DMSO) was added to leukodepleted, plateletpheresis units to a final concentration of approximately 5%. The platelets were concentrated and frozen to -80°C. After thawing, the platelets were suspended in thawed deep frozen plasma (DFP) and the platelet count and pH were determined.
Results: The quality of blood products, frozen and thawed in the manner described, is in compliance with the European and US guidelines for standard red cell concentrates, plasma, and platelets.
Conclusions: A frozen blood bank facility with a stock of frozen, universal, donor blood products can easily, effectively, and safely be used in remote areas, to compensate for periods when few or no donors are available, when the resupply of blood is impaired and/or when many patients are suddenly in need of blood products.
Keywords: armed forces; frozen blood products; The Netherlands; product standards; quality control
Prehosp Disast Med 2007;22(2):s108

Session 6: Planning 1

Chairs: TBA

Relationship between Transformational Leadership and the Organizational Performance of Hospital-Based Disaster Coordinators Using the Multifactor Leadership Questionnaire

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Objectives: The United States National Response Plan is rooted in the perspective that disaster preparedness is the responsibility of all jurisdictional levels, from federal to local. The purpose of this study was to assess the leadership styles of the local hospital disaster coordinators in Louisiana who activated their response system and interfaced with other jurisdictional systems during Hurricanes Katrina and Rita.
Methods: Hospital performance was assessed to explore its relation to leadership style. Index cases were identified under the National Hospital Bioterrorism Preparedness Program. The analysis included three groups: (1) Designated Regional Coordinators (n = 22); (2) Designated Hospital Coordinators at acute-care facilities (n = 73); and (3) Designated Hospital Coordinators at non-acute care facilities (n = 40). The survey tools were: (1) the Multifactor Leadership Questionnaire; and (2) the Emergency Preparedness Indicator survey. Hospital contexts (i.e., profit structure and licensed bed size) were assessed to explore the potential moderating effects of the relationship of leadership style to performance scores.
Results: Transformational leadership had a positive association with hospital performance scores. No significant moderating effects were found, which indicated that the coordinators had similar leadership styles not only between hospitals, but across the statewide hospital response system.
Conclusion: The results of this study offers the field of hospital disaster preparedness a benchmark for other programs that support the development of leadership skills at the local level. Implications, limitations, and future studies for leadership research in disaster planning are discussed.
Keywords: disaster coordinators; hospital; leadership; organization; preparedness; relationship; questionnaire
Prehosp Disast Med 2007;22(2):s108

Surge Capacity: A Conceptual Framework for Disaster Preparedness and the Need for Reassessment and Research to Develop Readiness Benchmarks

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Background: Surge capacity is defined as the ability of a healthcare system to respond to a sudden increase in

patient care demands. Conceptually, a surge system consists of three components: (1) "stuff" (supplies and equipment); (2) staff (personnel); and (3) structure (physical space and management infrastructure). Additional research is needed to quantify the "science of surge".

Discussion: Disaster planning for situations in which the number of patients exceeds the maximum capacity of the existing operational systems at a given point in time often is geared toward the acquisition of more "stuff", such as like pharmaceuticals or ventilators. While "stuff" is one important component of surge capacity, planners also should assess the availability of appropriately skilled personnel. In industrialized societies, the necessary materials and physical space usually are available readily. However, the management infrastructure (incident management system) required to coordinate these resources and apply them in an effective manner to mitigate a disaster and optimize patient outcomes often is lacking. The goal of surge capacity research is to develop benchmarks that measure preparedness, evaluate current protocols, and create new, improved protocols. Disaster preparedness models intended to increase surge capacity should use an all-hazard approach. Various models should be compared in order to optimize patient care outcomes and financial feasibility.

Conclusion: Surge capacity is a concept and a system intended to increase patient treatment capabilities and improve health outcomes during and after a disaster. Adequate "stuff", staff, and a structure comprise an effective surge system that coordinates essential elements in order to increase patient care capacity in a disaster.

Keywords: all-hazards; benchmarks; framework; preparedness; supplies; surge capacity
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Surge Capacity Planning in Western Australia

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Perth, Western Australia (WA) has had a coordinated hospital disaster plan since 1999. This plan included coordinating all of the resources of both private and public hospitals. However, the Madrid bombings in 2004 and the London bombings in 2005 prompted that plan to be reviewed, and significant progress has been made toward reaching the required goal of being able to care for 1,000 casualties.

Although much emphasis has been placed on bed capacity, it is unrealistic to expect to have significant number of beds empty at any given time. Not only is this not financially viable, it is anticipated that available beds would soon be filled by well-meaning clinicians wanting to care for their patients. Consequently, WA has developed a number of alternate arrangements as part of their surge capacity plan. These arrangements include: (1) formalizing agreements with private hospitals; (2) working with the community nursing and medical services; (3) developing a stock of critical care equipment; (4) identifying alternate areas within hospitals for care of critically ill patients; and (5) developing uniform decanting protocols for the hospitals to use.

The revised plan has been developed for mass-casualty incidents, and also has been modified to enable relevant aspects of the plan to be activated in the event of infrastructure failure at a major hospital in Perth requiring hospital evacuation.

Obviously, it is difficult to evaluate this plan in real time. However, a recent 500 patient surge capacity exercise in Perth utilizing the Emergotrain System positively reinforced the revised plan.

Keywords: hospital; planning; preparedness; surge capacity; Western Australia
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Disaster Management and Hospital Preparedness: "The Krefeld Model"

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Fire, earthquakes, floods, or a mere disruption of electricity may be sources of hospital disasters whose management requires careful preparation and planning.

After an evacuation exercise in 1998, the disaster preparedness plan of Klinikum Krefeld, a 1,100-bed hospital in Germany, was evaluated. The basic requirements for a new, or updated plan included: (1) having successful leadership and communication in the hospital during an incident; (2) having elevator-independent patient transport capability; and (3) having a continuous education program for all staff.

The Krefeld disaster preparedness model contains a coordinating physician from one of the hospital's anaesthesia stand-by services. The coordinating physician works together with coordinating executive nurses and executive technicians to provide knowledge, and answer questions and provide leadership during critical incidents. This addresses the first basic requirement of the preparedness plan.

During the 1998 evacuation exercise, an elevator-independent patient transport system using a rescue carry sheet with four to five carriers was estimated to take approximately one minute per floor to transport patients from the hospital; the time to evacuate an entire building could take hours. Using an evacuation drag sheet (Järven, Sweden), it is possible to transport many patients personnel-free; the system can be disposed by the incident commanding staff to those locations with minimal staff.

These new concepts of hospital incident leadership, patient transportation, and staff education are intended to improve the management of a critical incident in a hospital.

Keywords: disaster management; evactuation Germany; hospital preparedness; leadership
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Session 7: Planning 2

Chairs: TBA

Emergency Health System Evaluation Using Combined Simulation and Global Information System Methodology

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When a major incident occurs, transportation and hospital capacities become critical resources. Their availability has a crucial impact on the number of casualties and the severity of injuries. It is necessary to test the response tactics and assess the efficiency of the rescue efforts using the resources available and number of victims. Due to the high cost of real-life exercises, the use of a computer simulation seems appropriate. A methodology combining simulation approaches and the visualization capabilities of geographical information systems is suggested.

The primary input parameter of a running simulation is the number of casualties that can be separated into individual priority classes. Estimated times are assigned to all of the activities within the chain of care. Based on the input parameters, defined circumstances, and tested procedures, the simulation deterministically computes the total time required for the complete response to the situation. The simulation is rerun for all the n km map squares of the area of interest—this way, a map with the estimated response times for the defined territory is obtained. The map is colored-coded according to chosen criteria, (e.g., time scale or number of casualties). High risk areas, such as highways, railways, and industrial zones are projected onto the map. Areas chosen can be evaluated in more detail.

The suggested simulation methodology is flexible and allows the users to efficiently test standard operational procedures and assess the preparedness of emergency services.

Keywords: computer simulation; global information systems; healthcare; preparedness; simulation
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Mass-Casualty Incident Contingency Plan: Hospital Preparedness and Medical Protocols

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Between September 2000 and September 2006, 8,000 casualties resulting from terrorist attacks were treated in Israel. Of these casualties, there were around 650 severe injured civilians, around 950 moderately injured civilians, and >5,100 minimally injured civilians, including those with Acute Stress Reactions (ASR). There were 1,115 deaths recorded. Most of these casualties were treated in the Israeli hospitals that were operating in a Mass-Casualty Incident (MCI) Mode.

By definition, a MCI involves at least a temporary imbalance of resources. Staff involved in patient care may have little experience. The most experienced caregivers may be absent or devoting their attention to the logistics of the event, making them unable to devote their time to casualties. In order to save many lives as possible during a MCI, medical personnel should follow clear and predetermined orders, with the ability to be flexible as needed ad-hoc. The national doctrine related to management was developed by national committees including key personnel from hospitals, prehospital, and the Medical Corps of the Home Front Command (HFC) of the Israeli Defense Forces (IDF). The doctrine included topics related to: (1) the training of personnel for immediate response; (2) medical equipment maintenance; (3) manpower control; and (4) a nationwide information system.

This paper will present the national contingency plan and hospital preparedness for a MCI, including medical protocols developed in order to provide the best care during a MCI.

Keywords: contingency plan; injured civilians; Israel; mass-casualty incidents; terrorist attacks
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Disaster Response Plan of Iranian Blood Transfusion Organization

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Blood transfusion can be a major health need in the aftermath of disasters. The availability of units of blood in the disaster zone could affect the outcome of the emergency care of victims. The potential destruction of the health infrastructures along with the large number of victims as a result of a disaster necessitate preparedness of the national transfusion system. Important considerations of blood transfusion in disasters include the availability of blood units, the need for emergent donation, a large number of first-time donors and over collection, the safety of blood, and finding new, regular donors.

Iran is one of the most disaster-prone countries in the world. Learning from the previous experiences, particularly the Bam earthquake, the Iranian Blood Transfusion Organization has prepared a disaster response plan. This presentation provides the experience of the Iranian Blood Transfusion Organization in the Bam earthquake, lessons learned from the experience, and blood transfusion data during the event including the number of blood units used, the number of blood units donated, the Provinces that provided blood units, etc. The current disaster response plan of the Iranian Blood Transfusion Organization, based on previous experiences, is explained.

Keywords: earthquakes; disasters; Iran; transfusions; response plan
Prehosp Disast Med 2007;22(2):s110

Tangible User Interfaces in Order to Improve Collaborative Interactions and Decision-Making during Disaster Management

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Often times, people must cooperate and interact in teams or discussion groups to achieve a common purpose, such as decision-making, analyzing a problem, or developing an

idea. Providing and sharing geo-information for a group of participants can be achieved with different traditional methods. This can include a map laid on the table, data projected on a wall, or computer monitors. A new approach to improve collaborative interactions focuses on two main aspects: (1) an advanced visualization of the information; and (2) a new approach in the human-computer interaction.

The traditional way of displaying geographical datasets is replaced by tangible interfaces in which data are displayed on a table and used as central point for the discussion. The data presented on the table also can be accompanied by other devices, such as liquid crystal display (LCD) or plasma screens, where it can be displayed in different environments, such as two-dimensional, augmented reality, or three-dimensional virtual environments, providing a different visual approach to the same dataset.

Users interact with the system directly on the surface with their hands, drawing pens, or special colored patterns. The system reacts to the movements on the table and displays the requested information on the table. The new interaction is intuitive, attracts people to the table, and invites them to interact with the table itself. It will be tested during disaster exercises.

Keywords: collaborative interactions; decision-making; disaster management; human-computer interaction; user interfaces
Prehosp Disast Med 2007;22(2):s110–s111

Poster Presentations—Theme 12: Preparedness

(170) Factors Affecting Disaster Volunteer Retention

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Recruitment of new disaster volunteers is an ongoing and expensive process, with frequent turnover in the volunteer pool. The purpose of this project is to identify what factors contribute to this turnover, and to make recommendations for improving retention. A review of the literature regarding successful volunteer retention will be presented.

In this research project, volunteers in the disaster services of the American Red Cross were surveyed as to their reasons for volunteering, the areas in which their expectations were satisfied or not, and why they have stayed involved, or why they have become inactive.

Subjects will be four groups: (1) active national disaster response team members; (2) inactive national disaster response team members; (3) active disaster mental health team members (local or national); and (4) inactive disaster mental health team members (local or national). All subjects were active since 11 September 2001 and for a minimum of six months prior to data collection.

For this presentation, surveys will be conducted over the telephone by volunteers. Names will be chosen randomly from lists of active and inactive Disaster Services Human Resources and Disaster Mental Health Teams in the Greater Rochester Chapter of the Red Cross in Rochester, New York.

Keywords: American Red Cross; disaster volunteers; mental health teams; response teams; volunteer retention
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(171) Role of National Poisons Information Centre in the Response to Nuclear Accidents in the Netherlands

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The Dutch National Poisons Information Centre (NPIC) of the National Institute for Public Health and the Environment (RIVM) is officially involved in the response network for radiological incidents, called the Unit Planning and Advice nuclear (EPAn). The EPAn consists of a front office and two back offices, one for radiological measurement and one for medical assessment (Ministry of Health) of radiological incidents. The back offices present their information to the front office, which integrates the information in order to advise the policy team and ministers concerned. Each back office receives specific information from several support centers. The network shares information and knowledge via a secure website. In case of emergencies, the NPIC advises the Ministry of Health on the measures "Iodine prophylaxis", "Evacuation" and "Sheltering in Place", and "Patient Management" based on available radiological information of the incident. The NPIC provides protocols on decontamination and radionuclide-specific treatments. In May 2005, the EPAn was tested in a national nuclear accident exercise. More than 1,100 administrators, officials, and relief workers from municipalities, provinces, ministries, and emergency services were involved in managing a simulated accident at the Dutch nuclear power plant. The exercise provided an estimate of the feasibility of the various measures and time needed for implementation. Alertness training continues through smaller exercises. In 2007, the NPIC will start an educational program for healthcare personnel with the goal of increasing radiological incident preparedness in triage, decontamination, and management of patients.

Keywords: decontamination; network; radiological incident; radionuclide-specific treatments; simulated accident
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(172) The "Hospital Preparedness for Contaminated Patients" Score (HPCPS) as a Proposed Tool for a More Objective Assessment of Hospital NBC Readiness

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A survey of all 118 acute-care hospitals in Austria was conducted in order to determine the ability of the hospitals to admit and treat contaminated patients safely. No such

study has been published on this topic in a German-language area. Additionally, there are no universally accepted evaluation criteria available.

The available 15 related survey studies from the UK and the US were reviewed for the methods medical personnel used in reaching their judgment. Additionally, 30 papers with recommendations for NBC-treatment, as well as general hospital disaster planning, were scanned for the measures regarded appropriate.

From this base of literature, the criteria "decontamination facilities", "PPE", "planning and organization", "training and exercises", and "implementation" were chosen for this study. The proposed "HPCP-Score" gave 40% of the score's weight to "facilities and PPE" and 20% to each of the other factors.

For each category, corresponding items in the questionnaire were selected and the coded numerical values multiplied with a factor to achieve the intended weighing. The maximum achievable value was 250; the actual value was divided by 25 and rounded to produce a score on a scale of 0 to 10. The respondents were asked to self-assess their readiness on a scale from 0–10; both values were compared. The "HPCP-Score" concurred in many cases with the self-assessment of respondents (in 58% within one point), but also revealed high deviations of self-assessment by introducing some objectivity in evaluation. It is an imperfect, but perhaps useful tool.

Keywords: contaminated patient; disaster planning; preparedness; safety; self-assessment
Prehosp Disast Med 2007;22(2):s111–s112

(173) Support Mechanisms for Healthcare Workers in Institutional Emergency Planning: Gap Analysis of Three Hospital Emergency Plans

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Background: In response to the 2003 global outbreak of Severe Acute Respiratory Syndrome (SARS) and the threat of pandemic influenza, hospitals have been actively developing and revising emergency plans. Healthcare workers are a particularly vulnerable group at risk for occupational exposure during infectious disease outbreaks, as witnessed during the SARS outbreak. This paper presents a gap analysis of three hospital pandemic plans in the context of identified organizational support for health care workers.
Methods: Hospital pandemic plans were obtained from institutional representatives in three Ontario cities. Using Nvivo7 software, a qualitative gap analysis of these plans was conducted using a checklist of 12 items, developed from a review of existing literature and findings from a previous study that involved focus groups with emergency and critical nurses.
Results: Many support mechanisms were identified in the plans. However, some gaps were evident in planning for personal protective equipment (PPE), education and informational support, and support during quarantine. Additional areas in which supports could be enhanced include: emotional/psychological support services, delineating management responsibilities, human resources, vaccine/anti-viral planning, recognition/compensation, media strategies, and professional development.
Conclusions: Extensive support mechanisms for healthcare workers are included in these hospital plans; however, the identified gaps may have serious implications for employee health and safety, as well as for overall response during a large-scale infectious disease outbreak. In order to support healthcare workers in their role as first responders, a number of "good practice" recommendations are provided for consideration in emergency plan development.

Keywords: gap analysis; healthcare workers; infectious disease outbreak; pandemic; preparedness
Prehosp Disast Med 2007;22(2):s112

(174) Specialized Kit Development by Donor Governments for Influenza Pandemic Preparedness

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Three pandemics from influenza A were experienced during the last century. Currently, a highly pathogenic avian influenza H5N1, a panzootic, is affecting 58 countries and is a recurring human epidemic in 11 countries. It is considered to be a future pandemic threat. The objective of this study is to examine the avian influenza (AI) international stockpile developed by the United States Agency for International Development to provide essential commodities for AI outbreak investigation and cluster management in animals or humans. The stockpile is comprised of three kinds of standardized kits: personal protection kits, decontamination kits, and laboratory sample kits. The recommendations of the US and the United Nations' technical lead agencies for health are incorporated into the three kits and the kits are funded to (US)$56,000,000. These kits are intended primarily for initial field response by technical teams from host nation authorities supported by UN agency technical leads (WHO, FAO/OIE). The personal protection kit is designed to provide disposable respiratory, skin, and eye protection to a range of professionals. The decontamination kit is designed to decontaminate personnel, equipment, vehicles, poultry farms, etc. The lab specimen kit is designed to provide the host nation's outbreak investigators with the appropriate equipment in the field for specimen collection and specimen shipment to national and international reference laboratories. Selection criteria for kit contents included utility, simplicity, portability, versatility, durability, availability through government bulk ordering procedures, and low cost. Technical foundations, contents description, distribution mechanisms, and field use of the kits are discussed in this study. A key issue is the suitability of the kits to a future hazard-scape encompassing a broad array of emerging infectious diseases.

Keywords: avian influenza; donor government; kits; pandemic; stockpile
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(175) Effects of Seasonal Variation on Hazardous Chemical Releases

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Background: Accidental and intentional chemical release incidents are an increasing threat to our society. These events occur year round under different seasonal circumstances. This study evaluates the impact of seasonal variation on hazardous chemical releases (HCRs) throughout the Hazadous Substance Emergency Events Surveillance (HSEES) database.

Methods: The HSEES database was used to test if there is an association between seasons and HCRs. Logistic regression was used to assess the type of HCR, the type of chemical substance, the first contributing factor, and the geographic region and the season of the year.

Results: In the USA, more HCRs occur during spring and summer than during fall or winter. In the spring and summer, more transportation-related releases occur. In the summer, there are more incidents involving acids, ammonia, chlorine, pesticides, paints, and dyes. There also is seasonal variation among the HCR incidents with respect to different areas of the country. In the Midwestern states, there are significantly more incidents in the spring and summer. However, in the Northeast, there are significantly fewer events in spring, and in the west, fewer events occur in summer. Overall, more events occur in the South, but in the South there are significantly fewer incidents in the fall. No association was found between the number of victims or the number of victims requiring hospital treatment and the seasonal variation.

Conclusion: Because a clear association is found in the seasonal attributes of some types of HCRs, more mitigation and preparedness activities are needed to reduce the occurrence of HCRs and to increase the effectiveness of the response.

Keywords: chemical releases; geography; hazardous substance; response; seasons

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(176) Preparedness for Mass-Casualty Incidents

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An Accident and Emergency Department (A&E) or Emergency Department has some special functions other than diagnosing and treating daily cases. Events with >3–4 injured or sick patients can occur. Do hospitals have plans for managing such cases?

A special exercise to explore the possible lack of management during mass-casualty incidents (MCIs). There were problems at the scene, including: (1) local communication; (2) identification of injured people; (3) documentation of on-scene triage; (4) communication between the on-scene command post and the place of first treatment; and (5) a difference in attitude between an exercise and (later) a real MCI.

During an actual MCI located in an urban environment, imperfect communication with the ambulance service, long reaction times, slow patient-processing, and the difficulties encountered with the administrative aspects of patient-uptake demonstrated the negative effects of MCIs.

Since the first exercise involved multinational players, the problems may not have been unique. Future research should describe the experience with such events, ways to bypass the hiatus between the on-scene and hospital-based groups, and prepare A&E or Emergency Departments for MCIs.

Keywords: disaster; disaster planning; emergency department; mass-casualty incidents (MCIs); preparedness

Prehosp Disast Med 2007;22(2):s113

(177) Acceptation, Evaluation, and Risk Acuity Classification Based on Andorra and Canadian Models: A Pilot Project in a Private, Tertiary Hospital in Rio de Janeiro, Brazil

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2. Brazil

The objective of this study was to evaluate the impact of a triage scale design based on the Andorran Model of Triage Scale Design and the Canadian Risk Acuity System. It was designed to estimate the immediate risk, reduce waiting time to see a doctor, avoid patients leaving without being seen by a doctor, and reduce the return of patients.

This was an observational study and was carried out in The Hospital Quinta D'Or Emergency Department, Rio de Janeiro, Brazil. About 4,000 patients are evaluated per month and there is a 60–90 minutes waiting period to see a doctor at this hospital.

Patients were evaluated from 11–26 October 2006, considering a 24 h of 7 shifts per week by the Triage Team (TT). The TT consisted of: (1) one Social Assistant; (2) seven doctors and nurses; (3) seven emergency technicians; and (4) one triage-educated doctor, using an instrument based on the National Triage Scale. Overall, 996 patients were evaluated and grouped in a five-level triage assessment: 1 patient (0.1%) was a Level 5 (Emergent); (2) 50 patients (5.0 %) were Level 4 (Less Emergent); (3) 59 patients (5.9%) Level 3 (Urgent); (4) 281 patients (28.2%) Level 2 (Less Urgent); and (5) 590 patients (59.2%) Level 4 (Not Urgent). The medium triage period of time was 5.02 minute (st. 3–5 minutes).

This conclusion shows a similarity and confirms the predictive validity of the scale used in the Andorran model for judgment of the urgency of a patient's condition.

Keywords: Andorra model; Brazil; Canadian model; patient condition; urgency

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(178) Preparing for a Pandemic: The Need to Connect Rhetoric and Resources

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Substantial, worldwide attention has been focused on the need to prepare for the possibility of a severe pandemic, possibly involving a variant of the H5N1 influenza virus. While much discussion has focused on the need for a range of critical strategies, including enhanced surveillance, the development of containment protocols, vaccine research, anti-viral stockpiling, non-pharmaceutical interventions, and hospital readiness, neither the global community, nor any individual nation has developed adequate levels of preparedness to manage the consequences of a major pandemic. In the United States, more than US$7 billion has been designated for pandemic readiness with >90% of these resources directed toward developing vaccines and antiviral pharmaceuticals. Local public health and health services systems remain substantially underfunded, even though they will need to function at a high level, particularly if a pandemic were to occur prior to the availability of appropriate vaccine. Public health and health systems needs in facing a pandemic will be reviewed, accompanied by an analysis of an important gap between the projected need and current, available resources in the US. Additional resources for global early warning and rapid response also are needed. In addition to funding shortfalls, there are serious gaps in the planning process, itself, with respect to the non-medical, economic, educational, societal, and psychological consequences of pandemics.

Keywords: influenza; pandemic; preparedness; public health; resources; vaccinations
Prehosp Disast Med 2007;22(2):s114

(179) Coordinating the Capacity in Disaster Prevention and Response: A Demonstration Case

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Five types of natural disasters occur in Taiwan: (1) typhoon; (2) flood; (3) earthquake; (4) landslide; and (5) debris flow. Each disaster has the potential to cause huge social, economic, and environmental disturbances. The National Science and Technology Center (NCDR) was established in 2003 to combine effectively the research momentum, enhance the research results, and integrate inter-disciplinary resources, as well as to coordinate central ministries advancing disaster prevention, response, and recovery. Since the NCDR has undertaken the role of disaster coordination and began issuing early warning to hazard-potential areas, the number of casualties has decreased from >200 persons per typhoon event to 15 persons per event. With the goal of promoting the development of research and technology for the implementation and application of disaster management, the NCDR supports: (1) research and development; (2) technical support; and (3) application and implementation activities. Participating in disaster recovery activities is one of the important missions of the NCDR. Adopting appropriate community-based strategies into the decision-making process and constructing a unique plan for each community have proven to be effective ways to enhance recovery from a disaster. Recent natural hazard events have demonstrated the success of NCDR in disaster prevention and recovery.

Keywords: coordination; disaster prevention; National Science and Technology Center (NCDR); preparedness; response
Prehosp Disast Med 2007;22(2):s114

(180) Hospital Workers: Who are the Essential Personnel during a Disaster?

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Introduction: Hospital plans often vary in defining the functions that are included in emergency and incident management positions. There is no guideline that describes what roles within a hospital must be fulfilled to effectively respond to and recover from a disaster or public health emergency.
Methods: In this study, 31 hospitals in the 7-county northern metropolitan New York City region were surveyed to determine which specific functional roles were considered essential to their hospital's emergency and disaster plan. Furthermore, hospitals were asked to estimate the percentage of their "essential" staff that was trained to perform the critical duties identified in their hospital plans.
Results: Only three categories of hospital personnel were consistently reported to be "essential" to all hospitals' emergency preparedness plans: ED physicians, ED support staff, and ED nurses. Some hospitals reported that staff members received no training in their anticipated role based on the hospital emergency response plan. Allied health professionals and EMTs/Paramedics had the least amount of training for their role in the hospital preparedness/response plan (33.3% and 22.2% respectively).
Conclusions: Although there may be general consensus that staff in emergency departments are considered essential during a disaster or public health emergency, training to perform their critical functional roles may not be provided. Sustainable training programs must be designed that involve all staff, to increase the knowledge of their individual roles and responsibilities during a disaster.

Keywords: emergency department; essential staff; preparedness; roles; training
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(181) Referral Patterns of Patients in Disasters—Who is Coming through Your Emergency Department Doors?

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Introduction: The emergency medical services (EMS) system is one of the key components in public health emergency preparedness and response. The EMS system has developed over the past 30 years into an effective means of delivering prehospital medical care. However, case reports in the literature and after-action reports from major inci-

dents have demonstrated that most patients who present at a healthcare facility during a disaster or other major emergency do not necessarily arrive via ambulance. If these reports are accurate, then hospitals and EMS systems should plan differently to prepare for a mass convergence of patients at the healthcare system and consider alternative patterns of patient referral including self-referral when performing major incident planning.

Methods: Using numerous search engines and databases, reports of patient care during or after disasters or major emergency incidents were identified. These reports were queried for specific information on how the patients presented to, or were referred to the healthcare location.

Results: Almost all case reports identified discuss the importance of the prehospital emergency care system. However, many suggest that only a fraction of the treated patients arrive via ambulance, particularly in the early post-event stages of a disaster.

Conclusions: Hospitals should develop emergency plans that consider the alternative referral patterns of patients during a disaster or major emergency. Hospital staff should be proficient in triage, decontamination, and safety and security procedures, in the event that they encounter a patient surge in their facility immediately following the onset of a disaster.

Keywords: ambulance; emergency medical services; hospital; patient surge; prehospital
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(182) Attitudes of the Israeli Population on Coping with Epidemic Outbreaks

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Background: Successful epidemic planning and preparation ensure that, in the case of an epidemic, there will be minimal panic, the most efficient treatment will be provided, and the population will return quickly to its pre-epidemic status.

Purpose: The purpose of this study was to determine the attitude of the Israeli population regarding epidemic outbreaks.

Methods: A questionnaire was sent to the public; information from a sample of 801 individuals representing the Israeli population; and telephone survey including every area code in Israel was performed.

Results: Of those surveyed, 82% agreed that fear causes panic, and 72% agreed to be quarantined during an epidemic, and to follow all instructions. Women were more likely than men to follow instructions.

Of those surveyed, 75% of the public believed that the media encourage anxiety and fear among the population. A total of 87% preferred that information regarding the epidemic be presented to them directly by the Ministry of Health and infectious disease experts. Of those surveyed, 94% agreed that the public health system must prepare the population before an epidemic outbreak. A total of 93% believed that there is a need to strengthen international connections for oversight and control of infectious diseases.

Conclusions: The health system must prepare the public prior to an outbreak. Information regarding epidemic outbreaks and the safety precautions that must be followed during these outbreaks should be presented to the public directly by the Ministry of Health and infectious disease experts. Women represent important communications targets. The sample population agreed to be quarantined during an epidemic and to follow all instructions. An epidemic outbreak preparedness plan using this information should be implemented.

Keywords: attitude; communications; epidemic; Israel; preparedness; quarantine
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(183) Pharmaceutical Services and Preparedness in Brazil

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The Millennium Goals of the World Health Organization (WHO) include the protection of vulnerable persons. The Hyogo Declaration of the United Nations presents the need for the dissemination of information regarding disaster prevention, enhancing preparedness, and emergency response. It is imperative that governments develop and implement policies related to response for disasters such as epidemics. Brazil has a broad health system, which includes pharmaceutical services, but it does not have any established organization for dealing with disasters. The pharmaceutical services and possible areas within those services should be involved in disaster preparedness will be described, by analyzing policies and health structures that may play a role in augmenting the local response to an epidemic.

Pharmaceutical services will be characterized by reviewing official documents and legislation, and by interviewing key stakeholders. Epidemic response guidelines for pharmaceutical services will be developed based on international standards and the logical framework for pharmaceutical services in Brazil. Validation of the guidelines will be achieved by gaining consensus technique. When faced with disasters caused by natural or human interventions, this study may be critical for furnishing crucial information to decision-makers on the development and implementation of policies regarding the preparedness and response of pharmaceutical services.

Keywords: Brazil; epidemic; guidelines; pharmaceuticals; preparedness
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(184) Information-Sharing Environment in Disaster and Emergency Situations

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An effective Information-Sharing Environment (ISE) is a key factor for the successful accomplishment of sensitive

missions in which there is an extreme risk for mass casualities (e.g., situations such as battles, disasters, and emergencies). In the present work, a Disaster and Emergency ISE is analyzed as a multidimensional problem. The dimensions of the environment include: (1) disciplines; (2) processes; (3) means; (4) players; (5) time; and (6) resources. Special attention is focused on the content and quality of information, standards, and formats of presentations that are aimed at knowledge enhancement rather than just data exchange. The authors assess time as a crucial parameter that should be taken into account within ISE.

This approach has been the basis of the Supercourse, a library that contains >2,800 free lectures on disaster prevention issues. With the distribution of hurricane lectures in 2005, the use of the Supercourse demonstrated that "Just-In-Time" knowledge can be distributed rapidly and virtually free-of-charge throughout the secure network.

The next step to satisfy time requirements of a modern ISE, is to organize the Supercourse into fast reaction units. The non-commercial scope of the Supercourse is based on the fact that there are numerous experts that are eager to share their knowledge and while the actors on the battlefield lack of time to solve commercial problems. This approach also has been implemented in the Italian Disaster Data Base (IDDB)—a collection of information shared by government institutions, professionals from different fields, non-governmental organizations, and volunteers. The Supercourse and IDDB experience potentially could serve as a model for ISE construction.

Keywords: data sharing; disasters; emergencies; Information Sharing Environment; network
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(185) A Disaster Exercise Is a Useful Environment to Test Scientific Instruments for Disaster Research

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Introduction: Evaluation of medical care during disasters is difficult. During a national disaster exercise (DE), three research instruments (RI) were tested.
Objectives: The main objectives were to investigate the possibility to use a DE as a scientific instrument and to evaluate the DE. Part 1 tested an existing quantitative evaluation tool (ET) of the Health Incident Management System (HIMS). Part 2 tested a triage registration format (TRF) for victim distribution planning (VDP). Part 3 assessed the Casualty Distribution Plan (CDP) and hospital treatment capability (HTC).
Method: The ET was translated, adapted to the national structure, and presented as a questionnaire using a 5-point Likert scale. Data on VDP were gathered from registrations of Mobile Medical Teams, casualty collection points, ambulances, trauma center (TC), and mock victims. Registrations from ambulance services and TC were used for CDP and HTC.
Results: Of all participants, 90% (n = 217) could be contacted about the HIMS; >95% of all questions were answered. The effects of the HIMS were noted as positive except for multidisciplinary cooperation. The VDP of 52 (51%) patients who reached the TC could be traced. Data from triage charts (87%), ambulance charts (57%), TC charts (100%), and MV forms (95%) were retrieved. The TRF could be used to evaluate patient flow; triage decisions could not be evaluated. At one location, patient flow exceeded the established HTC during one hour.
Conclusions: Existing and new disaster RI can be tested during a DE. Improvements, like validation of the RI, have been identified and can be tested during future DE.

Keywords: disaster exercise; disaster research; evaluation tool; Health Incident Management System; research instrument
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(187) Main Factors in Estimating Travel Time after Disasters

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Traveling after events caused by manmade or naturally occuring hazards is an important factor to consider when managing such events. Naturally-caused events such as earthquakes, tsunamis, and floods can impact transportation networks and human behaviors.

By recognizing main factors that can impact the performance of a transportation network, a conceptional method for estimating travel time during events is presented. The methods of this research include observing the human behaviors and physical damage after disasters and classifying them into different groups. By using this method, the main problems after the occurrence of events are recognized, and the associated time delay is evaluated. The results of this research provide a procedure for estimating the travel time for emergency and other types of vehicles after disasters.

Keywords: disaster; event; preparedness; transportation; travel time
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(188) Primary Healthcare System in Small Islands

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Introduction: The primary healthcare system has a crucial role in communities located on small islands and archipelagos stricken by an emergency or disaster. The main purpose of the study was to evaluate the level of emergency preparedness of the primary care system in the Archipelago of the Azores in Portugal.
Methods: A questionnaire was distributed to all 16 Primary Health Care Centres (PHCCs) on the Archipelago: (1) 12 Type 1 PHHCs in those that provide emergency care and in-patient admission services; and (2) four Type 2 PHCCs, those that do not provide in-patient services. The survey responses of Type 1 PHCCs were grouped into six main groups based on criteria and analyzed in "benchmarking categories". Scores for each group were proposed. A final score also was established for

each Centre, with a maximum score of 40 points, which corresponded with the highest level of emergency preparedness.
Results: A total of 15 replies were returned (93.8%). Results from each group applied to Type 1 PHCCs will be presented. The final scores indicate a global low level in terms of health emergency preparedness for this type of health units.
Conclusions: An adequate level of preparedness is mandatory for the PHCCs of small islands and archipelagos. Objective analyses are needed to define weaknesses and consequent measures to correct or diminish them. The proposed criteria to evaluate health emergency preparedness in PHCCs can be used as a practical guidance for other small islands around the world.
Keywords: healthcare system; island; isolated; preparedness; primary health care
Prehosp Disast Med 2007;22(2):s116–s117

(189) Global Standardization and Organized Deployment to Medical Emergencies and Disasters

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It is the intent of this session to address the importance and necessity of standardization to Global Medical Emergencies and disasters. This objective can be accomplished by standardizing competency profiles of individual responders, equipment, and the alignment of non-governmental organizations and militaries.

This session will address the possibility of organizing for domestic, neighboring, and international responses. By relying on systems and methods already in place around the world, this process may reduce morbidity, mortality, and increase resources stored and deployed around the globe.
Recent events around the world have reinforced the need to respond more quickly, more effectively, and with "appropriate" resources.
Keywords: deployment; disasters; global standardization; global medical emergencies; organization
Prehosp Disast Med 2007;22(2):s117

(190) Introduction of a Minor Injury Clinic to Improve Patient Flow

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Objectives: The aim of this study was to facilitate patient flow, reduce waiting times and Emergency Department (ED) length of stay (EDLOS), and to meet established key performance indicators through the introduction of a minor injury clinic (MIC) at Casey Hospital.
Methods: It was determined that a large number of patients present to the Casey ED with minor injuries (up to 45% of category 4 and 5 patients). This workload created long waiting times for such patients. An MIC was established by securing a specific geographical site within the ED, committing nursing and medical staff, and identifying patients (triaged category 4 and 5, with minor injuries). Nurse initiated x-ray was established (NIX) and data were collected pre- and post-implementation of the MIC. This observational study relied on the retrospective chart review of triage waiting times, EDLOS (all patients), and patient and satisfaction surveys (still to be completed).
Results: The data that have been analyzed to date indicate that triage waiting time and EDLOS for all-comers have improved in the face of increasing demand on this new ED at Casey Hospital.
Conclusions: The introduction of a dedicated MIC stream to this ED has successfully improved triage waiting times and EDLOS. Patient flow has improved, and it can be anticipated that patient and staff satisfaction surveys will indicate that the implementation of a MIC can assist in augmenting the streaming of patients in the ED.
Keywords: emergency department; emergency department length of stay; minor injury clinic (MIC); patient flow; surge
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(191) Improving Disaster Response Tools: A Case for Considering Vulnerable Populations and Persons with Disabilities

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Objective: The National Bioterrorism Civilian Medical Response Center (CIMERC) develops enabling tools aimed at producing an effective, integrated response to complex medical emergencies. The CIMERC continues to work to meet the needs of healthcare organizations, emergency managers, and disaster responders challenged by disparate capabilities and limited resources.
Methods: The CIMERC employs consensus-driven methods to develop novel work products and to further enhance existing tools. One example is the Strategies for Incident Preparedness (SIP), a collection of disaster scenarios designed as a training workbook for use by hospitals and healthcare professionals. The workbook presents a series of incidents ranging from naturally occurring to manmade events, and is designed to allow users to tailor the exercises to their specific demographics, geography and regional needs. The SIP presents thought provoking planning and response questions, as well as country specific reference documents to assist with policy development.
Results: The evolution of SIP and its expansion into the international arena has resulted in the incorporation of local knowledge resulting in substantial enrichment of the tool and increased applicability on a global scale. This process has not only led to the inclusion of planning considerations for the disabled, but to a dedicated consensus effort on emergency preparedness and unique planning essentials for vulnerable and disabled populations.
Conclusion: The purposeful inclusion of the disabled community in all stages of disaster planning positively impacts general preparedness and bolsters the ability to address the needs of the disabled. Such a focus presents an opportunity for significant advances along the preparedness continuum.
Keywords: bioterrorism; disability; disaster response tools; National Bioterrorism Civilian Medical Response Center; prepardness; vulnerable population
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(192) Preparing for the Pandemic Challenge: The United States Government

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Pandemic influenza is a global threat that must be faced with a united purpose and action. The ability to safeguard the world population in the event of a devastating global pandemic only can be assured through cooperation between the stakeholders.

On 01 November 2005, President George W. Bush announced the National Strategy for Pandemic Influenza, a comprehensive approach to addressing the threat of pandemic influenza. This Strategy outlines how to prepare for, detect, and responded to a potential pandemic will be.

This session will describe the series of historic steps taken by the US Government and the Department of Homeland Security to address the pandemic threat. Major initiatives that are in process, include: (1) an Implementation Plan for the National Strategy for Pandemic Influenza and its five guiding principles; (2) an International Partnership for an Avian Influenza Pandemic; (3) tools developed to assist the private sector during such an event like Pandemic Influenza *Preparedness, Response, and Recovery Guide for Critical Infrastructure and Key Resources*; as well as (4) efforts to enhance individual and family levels of preparedness.

Efforts to prevent or contain the disease will require the participation of, and coordination by, all levels of governments and segments of society to be successful.

Keywords: influenza; pandemic; preparedness; United States
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(193) Safe Hospitals, the Mexican Experience

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The Pan-American Health Organization (PAHO) defines a Safe Hospital as, "a health facility whose services remain accessible and functioning at maximum capacity, and in the same structure, during and immediately following the impact of a natural hazard". In this regard, it is understood that for a hospital to adequately protect patients' lives and workers' health, it must have a physical structure that withstands the effects of a natural hazard, while remaining functional and offering vital services.

A safe hospital is not a health facility that is 100% resistant to an earthquake or hurricane, but a structure that, in spite of damages, can continue its operations.

This initiative was endorsed in January 2005 at the World Conference on Disaster Reduction, held in Kobe, Japan, and incorporated into the 2005–2015 Work Plan. It called for states to "integrate disaster risk reduction planning into the health sector and implement mitigation measures to reinforce existing health facilities".

In Mexico, the Civil Protection System is charged with establishing the diagnosis of safety in hospitals in new and existing health facilities, according to PAHO standards. There already is a "Multidisciplinary Group" that is evaluating the hospitals starting with those located in high-risk zones. After completion of the evaluation process, each can be classified. A Certification Process of nearly 1,085 hospitals will begin.

Keywords: accreditation; hospial; Mexico; preparedness; safe hospitals; safety
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(194) Delivering Remote Prehospital Emergency Care Education to Primary Care Facilities in Crete

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The need for the continuing education of emergency care in primary care physicians has been recognized internationally. Despite this need, providing on-site education to remote and isolated areas is difficult, due to a lack of personnel, travel expenses, limited resources, and a lack of time. Health professionals in rural Greek areas have little training in emergency care, despite the fact that emergencies occur daily. The use of information and communication technologies for the remote delivery of medical courses addresses the need and high demand for emergency education, and helps overcome the difficulties of resource scarcity. The Foundation for Research and Technology-Hellas operates a hybrid network for tele-education consisting of wifi, satellite, and terrestrial networks. Several pilot courses have been delivered successfully by the Emergency Medical Service of Crete. The objective of the network is to provide tele-education courses to isolated areas in the South Aegean Islands and Crete. Diversity of expertise increases the interdisciplinarity of the course and expands the target audience. In the East Mediterranean region, it is the first such course to be delivered through tele-education. The quality is monitored through the continuous evaluation of user satisfaction, knowledge retention, and technical quality. The course introduces several innovations in tele-education. Users receive real-time video and audio of all participants, simulating a feeling of a classroom environment. The courses address medical staff, nurses, and ambulance personnel. A preliminary evaluation has shown that emergency education is a high priority for all healthcare providers, and tele-education an acceptable method for its delivery.

Keywords: Crete; distance learning; education; emergency; hospital; prehospial; preparedness
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(196) Hospital Preparedness for Contaminated Patients in Austria: A Survey

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This study is a cross-sectional questionnaire survey of all 118 acute care hospitals in Austria, using the newly devised Hospital Preparedness for Contaminated Patients (HPCP) Score.

In today's world, the risk of contamination incidents is discussed as terrorism-related, but much more it is an occupational safety problem. The relatively scarce epidemiolog-

ical data suggest that contamination is not a rare event. Currently, contamination response is shaped by the responders' experience with hazardous materials and focuses primarily on ensuring responder safety.

Hospitals must not rely on on-site decontamination, as this always will be incomplete and there always will be some patients who bypass the emergency medical services. Well-documented risks for hospitals include secondary contamination of staff and disruption of hospital services. The selection of the hospitals and performance on the survey were guided by previous survey studies. The response rate was 40%. Similar to previous surveys, it was found that in most cases, hospital preparedness for contaminated patients is low. Decontamination facilities and Personal Protective Equipment (PPE) are absent in many hospitals. Plans appear almost ubiquitous, but include the contamination topic only in about one third of the cases. The ability to implement the plans frequently is doubtful. Contamination-related training and exercises are the exception, not the rule. Awareness of PPE in hospitals is especially low.

The issues associated with "contaminated patients" frequently are not perceived by hospital administration or staff. A coherent responsibility for the management of contamination almost is absent and the spectrum of radioactive, biological, or chemical contaminations is not fully covered by any of the hospitals that participated. Also, there is a lack of authoritative guidance and legislative regulation.

Keywords: contamination; hazardous materials; preparedness; survey; terrorism
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(197) Disaster Readiness of a Singapore Teaching Hospital: The Training of General Ward and Outpatient Clinic Nurses in Disaster Preparedness

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Singapore has a population of four million people and is vulnerable to disasters caused by both man-made and industrialized incidents. The National University Hospital is located near Jurong Island that contains heavy petroleum refinery plants and the Tuas Industrial Park in which chemical plants are located. Being the closest hospital to Jurong Island, the National University Hospital must be prepared to manage casualties from incidents occurring at these sites.

Nurses are an integral part of the response to any mass casualty incident. Preparedness training of emergency department nurses in the National University Hospital, a tertiary-level hospital in western Singapore, had been conducted over the years. However, in response to a mass-casualty-incident, the demand for nurses in the emergency department resulted in a revised plan that brought in nurses from the general wards, outpatient clinics, and educational facilities for assistance.

Emergency department nurses and nurses from other facilities are not only being trained to support the prehospital field team, but also are being trained in intensive care skills to assist in intensive care units. The training includes: (1) an Advanced Cardiac Life Support course; (2) a Basic Trauma Course for nurses; (3) a Hazmat course; (4) a Pediatric Advanced Life Support course; and (5) a Basic Critical Care course. The training also includes a competency assessment and a one-week of instruction in the emergency department and the intensive care unit.

This plan has been tested with frequent drills and few recalls.

Keywords: industrial accident; mass-casualty incident; nurses; preparedness; training
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(198) Crisis Center Quality Management

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A Crisis Management Center was implemented at the county level in Namur, Belgium in the 1990s. It requires a permanent team that is in charge of maintenance and alerting the appropriate staff members in case of major emergencies.

The recruited staff members originate from cooperating agencies and services. These services are: (1) fire brigades; (2) health emergency services and public health authorities; (3) police, civil, and armed forces for logistics; and (4) a specialized cell in communication (media, public, and authorities).

Recently, the general organization and management of this Crisis Management Center were reviewed by an external audit company. The Center was labeled International Organization of Standardization (ISO) 9001 in 2005.

The aims, functions, and emergency procedures of the Center will be presented. The decision-making process of each professional group within the Center and the use of communication channels also will be described. Strengths and weakness will be identified in this analysis.

Keywords: Belgium; communication channels; crisis center; health professionals; management
Prehosp Disast Med 2007;22(2):s119

(199) Disaster Medicine: The Enigma of Development in Afghanistan

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Afghanistan, a disaster-prone country emerging from more than 25 years of war and turmoil, continues to lag behind in various aspects of disaster and emergency management. Disaster medicine is a core competence in any preparedness, prevention, response, and recovery systems. However, it remains a neglected priority within the country's health systems. Lack of statutory approaches, prioritization, capacity, and development of awareness among both the government of the day and its partners in development, chief amongst them world-wide emergency health agencies, continues to contribute to the rising potential of disaster conditions. This paper seeks to marshal support for

the inclusion of disaster medicine in the core, health-based initiatives in Afghanistan and developing countries within the South East Asia Region.

Keywords: Afghanistan; coordination; disaster; emergency health; neglect; preparedness
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(200) Thessaloniki EMS Mass-Casualty Preparedness System: Resources and Structure

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Introduction: The Emergency Medical Services (EMS) of Thessaloniki serves a population of 1,000,000 on a daily basis for routine emergency circumstances. In cases of mass-casualty incidents (MCI), there is an emerging need of larger scale planning to meet the requirements of the expanded area of Northern Greece.
Aim: To present the Mass-Casualty Preparedness System (MCPS) of the Thessaloniki EMS.
Methods: All emergency physicians (10–15) and 50 paramedics are involved on a voluntary basis under a plan of rapid response with the use of a waterfall pattern of activation, where each member must activate two others using a checklist.

A sufficient number, depending on the severity of the MCI, of basic life support (BLS) ambulances, Mobile Emergency Care Units, and five special vehicles are available. These include: (1) one Mobile Dispatch Vehicle (with three very high frequency and one Ultra High Frequency receivers, two cell phones, one satellite phone, six telephone lines, one Television-Video set, two laptop-scanner-printer-cameras, and one diesel generator); (2) one Radiation, Biological, Chemical (RBC) Vehicle (with 15 sets of personal protective equipment (PPE) Type B, one chemical agent monitor, 60 paper chemical detectors, four victims isolation boxes, 60 kits for garment and skin decontamination, one decontamination device, and 2 portable showers); (3) one High Capacity Mobile Emergency Care Unit (with five ventilators, advanced life support (ALS) equipment for 20 victims, triage kits, and one diesel generator); and (4) two trucks for general transportation purposes.

Full-scale exercises with the participation of the fire department and civil protection authorities take place at regular intervals.
Conclusion: The Mass-Casualty Preparedness System (MCPS) of the Thessaloniki EMS is a promising new tool, but is in need of further validation.

Keywords: emergency medical services (EMS); emergency vehicles; mass-casualty incidents; Mass-Casualty Preparedness System; resources
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(121) Selling Disaster Preparedness to the Public: Why Are They Not Buying?

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Annual surveys conducted by the National Center for Disaster Preparedness and the Marist College, both in New York, have established a low level of disaster preparedness activities among US citizens, despite aggressive messaging from authorities and a climate of fear that should promote this type of activity. The authors will present an overview of the types of preparedness messaging that exists in the US, as well as a summary of the longitudinal data. To encourage citizens to make a behavioral change towards greater preparedness, it may be beneficial to explore the problem using a similar approach as other lifestyle modifications, such as smoking cessation or weight loss. Through the application of the established Stages of Change (Transtheoretical) Model, the barriers that likely are preventing higher levels of citizen preparedness can be described and understood better. More effective messaging also can be developed. The Stages of Change Model suggests that individuals who are contemplating a behavioral change (in this case, to take steps toward emergency preparedness for themselves and their family) would fall into one of five "stages", namely: (1) precontemplation; (2) contemplation; (3) preparation; (4) action; and (5) maintenance. Moving individuals from one stage to the next towards a goal of preparedness likely requires a specific approach to be most effective. The current plan of "one size fits all" messaging may be missing an opportunity to motivate as many citizens as possible to develop a family preparedness plan.

Keywords: disaster preparedness; family preparedness plan; messaging; public awareness
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(202) Hospital Disaster Planning—Critical Elements for Success

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Implementing a comprehensive disaster plan is essential in order to ensure the safety and best outcomes for patients and staff in unexpected and unusual circumstances, when resources and capability are stretched beyond normal operations. Public awareness and expectations dictate the necessity of such a plan for all hospitals, and help to evaluate the effectiveness of implementation of the plan after the event.

Incident response can be described in three phases: (1) stand-by; (2) activation; and (3) stand-down. Action cards outlining staff roles in each phase are beneficial. Developing a clear understanding of an almost militaristic chain of command structure is essential for hospital staff, as it enhances the communication and reporting processes.

A Hospital Management Team must be established. Nominated members allow for appropriate authority to be available at all times. Liaison with external agencies such as

local government or emergency services should be delegated to a member of this team to ensure resource coordination and approach integration where necessary. The location of this team also requires significant planning, and requirements like communications, space, signage, and equipment are addressed.

In addition, plans should include processes for incident notification and activation, staff management, casualty registration and management, media and resource/supply management, crowd control and perimeter security, documentation, and evidentiary care expectations.

Developing a hospital disaster plan is a challenging task that relies on the use of a strategic framework for success. This presentation will highlight critical elements to be considered in hospital disaster planning identified within the Western Health Service in Melbourne, Australia.

Keywords: disaster; effectiveness; hospital; planning; process; team
Prehosp Disast Med 2007;22(2):s120–s121

(203) Development of the Local Disaster Medical Assistance Team System in a Local Government and the Tohoku Region of Japan

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Ever since the Kobe earthquake, Japan has authorized hospitals that treat disaster victims; presently 550 hospitals are authorized. However, the level of preparedness of each individual hospital differs. Some authorized hospitals do not even train for disasters. In addition, only a few local governments mandates require evaluation of the disaster medical system. Disaster Medical Assistance Teams (DMATS) are based at the disaster hospitals, but the role of DMATs (except for the Tokyo DMAT) mainly is focused on nationwide aircraft evacuation—no local DMAT system copes with local accidents or disasters. The local disaster management system is not sufficient in Japan, the disaster hospitals and DMATs are not able to function in actual disasters. In view of this situation, the local government has organized "Yamagata Prefectural Disaster Medical Hospital Communication Coordination Conference (YDMC)", and developed a communication and coordination system, an education system, and a local DMAT system that copes with local accidents or disasters (Yamagata DMAT). The same system will be developed in the Tohoku Region to improve the relationship of the the inter-local DMATs.

Keywords: disaster medical assistance team; hospital; Japan; government; preparedness
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(204) Orthopedic Preparedness vis-a-vis Capacity Development: Observations from a Tsunami Medical Relief Camp in India

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Introduction: The 26 December 2004 Asian Tsunami impacted the world in many ways.

Over 220,000 lives were lost and properties and infrastructure worth billions of dollars were destroyed in 12 countries.

Methods: After obtaining mandatory governmental approvals, a Tsunami Medical Relief Camp became operational on 07 January 2005 at the Bishop Peter Teachers Training Institute at Devenampattinam, Cuddalore district, Tamilnadu, India. International, interdenominational Christian donor agencies partnered with the Christian Medical College & Hospital (Ludhiana), National Lutheran Health & Medical Board (Chennai), Christoffel Blinden Mission International, CSI Somervel Medical College (Karakonam), Joseph's Eye Hospital (Trichy), Bethesda Hospital (Ambur), Academy of Disaster Management—Education, Planning, and Training (ADEPT, Chennai), and Martin Luther Christian University (Shillong) India.

Results: Data from patients undergoing orthopedic surgery and other procedures performed at the Camp will be presented.

Conclusion: Although the partners/volunteers had varied prior experiences in working during various disasters and mass casualty incidents, observations and the analysis of the data collected from the Tsunami Medical Relief Camp led to the conclusion that further research on orthopedic preparedness and other aspects of capacity development is necessary.

Keywords: capacity development; disaster; donors; medical relief camp; orthopedic; preparedness; Tsunami
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(205) Importance of Population Self-Sustainability in Crisis Situations

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In the current age of fast technological advancement and globalization, there is an increasing awareness of the disasters occurring around the world. The increasing world population, changes in the environment caused by the exhaustion of natural resources, and the increasing imbalance in the distribution of assets are either direct or indirect results of humanity.

For the most part, disaster and crisis management, especially in the developed world, have mostly been adressedthrough crisis-prevention programs by the government and supporting governmental bodies. These programs have been entrusted with the task of protecting the

population, especially in times of emergencies. However, it is questionabe whether this is a realstic approach.

From various, recent international reports, it appears that sea levels may rise between a 0.5–7 meters in the coming decades. In such case, the government, essentially, may become powerless or ineffective, as demonstrated following the recent disaster from hurricane Katrina (US, 2005).

The question, therefore, is: what can the population do to prepare itself and increase sustainability in the face of possible future disasters? This presentation will delve into these issues and provide practical guidelines and advice that can help increase self-sustainability.

Keywords: climate; crisis-management; disaster; population; preparedness; sustainability
Prehosp Disast Med 2007;22(2):s121–s122

(206) Preparing Citizens for Emergencies by Using Ubiquitous Learning Methods

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During the first minutes of an emergency, prior to the arrival of professional rescue workers, citizens must take care of themselves and their family mainly on their own. As a result, their self-management capabilities directly influence the health outcomes of terrorist attacks or disasters caused by natural hazards.

While governments acknowledge the importance of citizen self-management during emergencies, however, traditional information campaigns to motivate citizens to prepare themselves often seem to fail. One of the potential causes for this failure might be that these campaigns seldom are adapted to the specific knowledge, skills, and motivational needs of the individual citizens.

Ubiquitous learning principles may be useful in this context. The definition of ubiquitous learning is learning whenever and wherever it is desired or needed and is facilitated by use of a flexible mix of mobile technologies (personal digital assistants (PDAs), smart phones, game consoles) and interactive, adaptive didactical strategies.

Rather than providing everyone with the same information, this approach offers essential content using a range of content varying from games and simulations, and checklists. Citizens are encouraged to actively search information or entertainment that matches their interest. Once downloaded to a mobile device, the information is available even when networks go down during an emergency, and can be used to access information during an emergency.

Keywords: citizens; disasters; emergencies; preparedness; ubiquitous learning principles
Prehosp Disast Med 2007;22(2):s122

(207) Implementation of Emergency Medical Service during the Primary Stage of a Disaster: The Emergency Response Plan of the National Museum of Natural Science

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With the growth of exhibitions, exposition, sports and live converts, the capacity of auditoriums, stadiums, exhibition halls and convention centers will become larger to accommodate more crowds. However characteristics and complexity of the above structures generate the demand of emergency response far beyond the traditional plans for the ordinary structures like office buildings and schools. In museums, the remodeling for new exhibition could change the route of evacuation, modify utilization of the space and even add some inappropriate materials by decorations. All these factors will produce impacts on emergency. The plan for mass-rally space such as museum will require a specific strategy to cope with the large amount of causalities and evacuation. The National Museum of Natural Science, attracting 3,505,495 visitors in 2005, is the most popular one in Taiwan and the pupils of elementary schools contribute to the main part of visitors. As the consequence, the necessity of emergency plan will become a major concern from the general public. This article will describe the seismic emergency plan for museum on the issues of modeling to estimate the number and category of causality and establishing the response plan and standard procedures for medical deployment. Furthermore, the cooperation and collaboration with EMS of fire department and DMAT of local hospitals will advance the practical application under emergency and improve the safety of audiences.

Keywords: disaster; emergency medical services; planning; preparedness
Prehosp Disast Med 2007;22(2):s122

(208) Health Issues of Women Refugees in Canada: A View from Kosovar Women and Sponsor Groups Involved in Settlement

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Introduction: After the 1999 Kosovo crisis, approximately 500 refugees from Kosovo arrived in the city of Hamilton, Canada. Volunteer sponsor groups affiliated with a local settlement agency assisted the families with settlement. This study describes experiences and issues identified pertaining to the women's health after their arrival.

Methods: Both quantitative and qualitative methods were used. Women from 50 randomly selected families self-completed questionnaires about their health, the Harvard Trauma Questionnaire, and use of preventive health services. Sponsor groups participated in focus groups regarding the issues faced when assisting the Kosovars. Three analysts coded transcripts for themes to reach consensus.

Results: The average age of the 84 women from 50 families surveyed was 38.2 years. Of the participants, 25.9% scored above the cut-off for post-traumatic stress disorder. History of having a previous Pap smear and mammography was low (34.1% and 5.3%, respectively). Sponsor groups identified issues of dental and prenatal care needs, missing medical records, finding family physicians accepting new patients, language barriers in receiving healthcare services, cultural differences in the role of women in their healthcare decisions, mental health issues relating to traumatic experiences, and confusion and delays concerning government reimbursement to dentists, optometrists, and pharmacists.
Conclusions: Physicians providing care to refugee women in host countries should be aware that standard preventive screening rates are low and mental health issues are prevalent. Most host countries have some sort of sponsorship program that provides a valuable source of information for understanding the health needs of new refugees.
Keywords: Canada; health issues; Kosovo refugees; sponsor groups; women refugees
Prehosp Disast Med 2007;22(2):s122–s123

(209) Securing Safety—Leadership in Pandemic Preparedness for the Prehospital Environment

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Introduction: Queensland Ambulance Service (QAS) is the fourth largest ambulance service in the world. The QAS provides statewide coverage to an area of 1.77 million km^2 from 282 service locations serviced by 2,800 clinically active staff. Queensland's northern border is geographically close to areas of Southeast Asia affected by Avian Influenza, a concern given Queensland's high tourist population.
Methods: Since early 2006, the Australian Centre for Prehospital Research has been leading a national collaborative research consortium examining risk perception among paramedics. The research group also is examining new opportunities for the emergency prehospital sector to contribute to early warning and surveillance systems for infectious disease, particularly pandemic influenza.
Results: Preliminary results from focus groups and the national paramedic surveys emphasize that paramedics place the most emphasis on ensuring that personal protective equipment, new operational standards, and communications strategies for working in infectious disease environments ensure the highest possible levels of safety and information exchange.
Conclusion: This work complements proactive strategies being implemented in Queensland to secure the safety of paramedics who may be required to work in these and other biohazardous conditions. This includes the introduction of the Scott M98 Air Purifying Respirator into service for operational staff on a personal need basis. A state-wide fit testing program has commenced and the development of other safety strategies will be guided by the results of the national survey. The survey results also will better inform staff as it builds on the QAS State Chemical, Biological and Radiological Awareness package implemented in 2005.
Keywords: infectious disease; paramedics; preparedness; Queensland Ambulance Service; risk perception
Prehosp Disast Med 2007;22(2):s123

Oral Presentations—Topic 13: Public Health

Session 1

Chairs: M. Hoejenbos; Knut-Ole Sundnes

Outsourcing Public Health Emergency Drills and Exercises

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In the wake of 11 September 2001, the United States Department of Health and Human Services (DHHS), through the Centers for Disease Control and Prevention (CDC) and the Health Resources Services Administration (HRSA), provided millions of dollars to assist state, local, and territorial health departments to increase their respective capacities to respond to bioterrorism and other public health emergencies. This funding has allowed public health agencies across the country to develop and test emergency preparedness and response plans. Although the development of these plans has occurred within health departments, the testing of the plans has, on occasion, been outsourced to private contractors. The authors provide guidance to public health organizations by assessing the capacity of contractors to develop and implement emergency preparedness exercises. This presentation will illustrate key points about the need for or use of a consultant, and the use of available resources when planning an emergency exercise. An outcome evaluation on the utility of the guide in state and local public health agencies also is discussed.

Key issues that will be addressed include: (1) identification of the needs of a local agency for a consultant when planning an emergency exercise; (2) recognition of the key public health agency decision-making points in contracting for an exercise; and (3) identification of available resources in public health emergency response exercises that might inform contractor decision-making.
Keywords: drills; emergency; exercises; outsourcing; public health
Prehosp Disast Med 2007;22(2):s123

Role of the Emergency Medical Services System as Part of Public Health Emergency Response

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Introduction: The emergency medical services (EMS) system is one of the key components in disaster, terrorism and public health emergency preparedness and response. Public health agencies typically provide regulatory oversight of emergency medical services. Recent studies have demonstrated the value of a EMS/public health partnership in

increasing a community's preparedness to disasters and other public health emergencies.
Methods: A nationally representative sample of the 203,465 basic and paramedic emergency medical service providers in the United States was surveyed to assess training in core areas of public health emergency preparedness. Additionally, a representative sample of all EMS agencies in the northern metropolitan New York City region were surveyed to determine their capacity to provide staffed ambulances to area hospitals during a disaster or pubic health emergency.
Results: A total of 62.5% of EMS providers surveyed stated they would be able to perform disease reporting while on-duty, in addition to their current job duties. 42.6% and 47.6% stated they would be able to perform symptom cluster recognition and reporting, and public health education, respectively.
Conclusions: There is good evidence that an EMS-public health partnership can enhance the overall effectiveness of the public health system during many types of disasters and emergencies. Emergency medical services providers could provide services and critical functions including vaccine administration, case and contact tracing, emergency communications surveillance, and increased surge capacity through health care facility evacuation and mass patient transportation.
Keywords: emergency medical services; partnership; public health; response; survey
Prehosp Disast Med 2007;22(2):s123–s124

Health Emergency Preparedness in Small Islands and Archipelagos—Recommendations and Minimum Standards

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Introduction: Health emergency preparedness is a complex matter that demands a particular effort and attention, especially when considering certain geographical contexts, such as the case of small islands and archipelagos. The main purpose of the study was to develop an international expert consensus on recommendations and minimum standards of emergency preparedness in these areas.
Methods: An accelerated Delphi technique was planned to be run in two, or a maximum of three rounds. A predesigned questionnaire consisting of 111 statements grouped into eight main issues was presented to a selected panel of representative experts from different geographical areas of the world. A seven-point Likert scale was employed to score their opinions. Two additional options included in the questionnaire were: (1) null for any statement considered to be absolutely inappropriate; and (2) pertinent statements and/or comments for further evaluation. Immediate consensus was also predefined.
Results: Immediate consensus was obtained for 53 (47.7%) of the statements at the end of the first round. Those statements achieving higher scores are presented by groups of main issues, as well those new ones that the international experts had considered important to be included in the process for further evaluation.
Conclusions: Specific consideration should be given to health emergency preparedness, due to the multiple vulnerabilities and constraints in small islands and archipelagos. The findings of this study can be translated into an initial practical guide for use in such regions, in order to improve their levels of preparedness. Some areas were identified where further studies are required.
Keywords: archipelagos; Delphi technique; emergency health; preparedness; small islands; standards
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Self-Presenting Patients Attending an Emergency Department: Perceptions of Healthcare Needs

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Introduction: Over the last decade, patient attendance in Emergency Departments (EDs) in the United Kingdom has increased by nearly two million visitors. New methods of working to improve access to health care and reduce the demand placed on EDs have been introduced. Despite these initiatives, there is little evidence that they have impacted on attendance for non-urgent health problems. The consulting behavior of patients was assessed in order to investigate this phenomenom.
Methods: An anonymous patient questionnaire was distributed in June 2006to all adult patients who were categorized in a green/blue Manchester triage category. The questionnaire addressed previous contact with healthcare services (during that illness), awareness of other, walk-in care facilities, and perceived barriers to access to these services.
Results: A total of 561 (24%) questionnaires were returned. Thirty-nine percent of respondents had contact with another health professional or facility before going to the ED. A total of 132 patients (24%) perceived that they had been advised to attend the ED. Two-hundred eighty-nine (51.5%) did not know where their local walk-in center was located. A total of 239 patients (42.6%) stated they would consider seeing their general practicioner with their medical problem. Of these, 86 of the problems perceived involved the availability of primary care services, 29 stated that the ED was convenient, 29 that they had been advised to go to the ED by a health professional, and 27 perceived a need for services provided in the ED. One-hundred fifty-eight patients (28.2%) reported problems scheduling a primary care appointment.
Conclusions: Patients attend to the ED for a variety of reasons, including a: (1) perceived need for specialist services; (2) lack of awareness about other facilities; and (3) lack of access to other unscheduled care services. Any attempt to divert patients from ED will require a multi-faceted approach.
Keywords: demand; emergency department; health care; hospital; self-presenting patients
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Vulnerability and Adaptive Behavior of Low Income Communities in Flood Management and Planning Regimes in Kampala City, Uganda

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The rapid expansion of populations in cities and worsening economic inequality has shifted the balance of disaster risk from rural to urban areas. People must survive in a money economy and must contend everyday with many socio-economic and environmental hazards. This paper addresses three specific issues: (1) quantifying the vulnerability to flood stresses in low income areas; (2) identifying energies and synergies that exist among poor communities to reduce vulnerability to floods; and (3) what flood governance regimes and initiatives exist to make Kampala a livable city.

Results indicate that people living in the poor areas of Kampala are exposed to multiple stresses and vulnerabilities coming from a combination of heavy rainfall and poor planning systems especially housing, infrastructure, and drainage management. In their poor state, small weather events have serious consequences. All infrastructure systems have reached their full capacity. Small downpours have led to massive disruption of the lives of the poor and subsequently the whole urban economy due to the poor maintenance, inadequate income, few assets, inadequate shelters, lack of early warning systems, and total absence of safety nets. City authorities should not wait for the next disaster to happen, and yet, local communities are not flexible enough to cope with the frequent "closures" of their livelihoods. A better understanding and recognition of the multiple deprivations that contribute to increasing exposure of local communities to such threats must be considered in the development of city strategies and hazard/disaster management regimes.

Keywords: floods; infrastructure; low-income; urban planning; vulnerability
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Session 2

Chairs: M. Hoejenbos; Knut-Ole Sundnes

Epidemiological Evidence for the 2005 Niger Nutritional Crisis

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Background: Niger faces recurrent food shortages. Prevalence of global acute malnutrition (GAM) among children under five years of age remains >10%. Since 2001, Médecins Sans Frontières (MSF) has operated a nutritional program in the Maradi region (2,500,000 inhabitants). In April 2005, MSF documented a significant increase in admissions and sounded an alarm. Difficulties in interpreting existing data led to a debate among all of the involved agencies as to the scale and severity of the crisis. A retrospective description of all available data for 2005 was conducted.

Methods: Admissions of children under five years of age with severe, acute malnutrition (SAM) in 74 nutritional centers supported by MSF/Ministry of Health (MOH) by week and by district were described. Also, the United Nations Children's Fund (UNICEF) compilations of yearly admissions from 18 relief agencies were reviewed by the UNICEF, along with the results of 10 nutritional surveys estimating the GAM and SAM prevalence among children under five years of age. A child with GAM is defined as one having weight-for-height ratio > 2Z scores (SAM: 3Z scores) below the reference population median and/or the presence of bilateral edema.

Results: In January, the prevalence of GAM reported from World-Food-Programme for Maradi and Zinder was 13% (SAM: 2–3%). During April–October, 5 surveys in these regions indicated GAM of 15–20% (SAM: 2.4–5.4%). In Maradi, the MSF admitted 39,200 children with an episode of SAM (6–10 times more than previous years).

Conclusions: The 2005 nutritional crisis was extremely severe and particularly impacted the regions of Maradi and Zinder, which are considered to be the most fertile and populated regions of Niger. The use of nutritional surveys helped to assess the situation; however, the conduct of the surveys are limited to region and time. Establishing surveillance and alert thresholds is essential for early detection and timely delivery of aid.

Keywords: food aid; food shortages; malnutrition; Niger; nutritional crisis
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Pre-Existing Health Conditions, Injuries Sustained, and Ongoing Health Problems in Evacuees Participating in the 11 September 2001 World Trade Center Evacuation Study

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Introduction: Modern engineering has enabled the construction of larger and taller buildings. However, these high-rise structures present a challenge in terms of security and safety. Such was the case on 11 September 2001 when the World Trade Center (WTC) was destroyed. On this day, more than 20,000 persons were successfully evacuated; however, in the process, many were injured. The pre-existing health conditions, injuries sustained, and on-going health problems of evacuees participating in the larger Columbia University WTC Evacuation study were identified.

Methods: A convenience sample of 1,444 WTC evacuees from Towers 1 and 2 completed a survey.

Results: The prevalence of reported pre-existing health conditions was 37%. These included respiratory (27%), mental health (16%), cardiac conditions (12%), vision/hearing problems (8%), and other problems (7%). Injury during the evacuation was reported by 531 (37%) of the study participants. The most common injury reported was psychological injury (24.7%), followed by surface trauma (11.9%), inhalation injury (11.4%), orthopedic injury (7.2%), and eye

injury (2.5%). Evacuees with a pre-existing health condition were more than twice as likely to report sustaining an injury (OR = 2.16, 95%, CI 1.70–2.74).

Most evacuees received their post-evacuation medical care in a non-hospital setting (the majority went to their own personal physicians' offices); only 44 individuals in this sample were hospitalized. Nearly 17% of the evacuees reported ongoing, long-term health problems two years after the event, the most common being related to mental health, followed by respiratory diagnoses.

Conclusions: These findings reinforce the need to view high-rise building evacuation as a public health concern.

Keywords: 11 September 2001; evacuation; health problems; high-rise buildings
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Anti-Microbial Resistant Gram Negative Bacilli in Water in Banda Aceh: For Rational Antibiotic Use for Traumatic Wounds Caused by Tsunami

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Introduction: In January 2005, three researchers from the Japan Disaster Relief (JDR) were engaged in medical activities in Banda Aceh. The team treated 1,891 patients. Of the 367 traumatic injury cases treated by this group, 215 required antibiotic therapy. Subsequently, medical services were taken over and continued by the Japan Self-Defence Medical Team until mid-March 2005. Of the original 215 trauma cases who were initially treated by JDR, 82 received prolonged antibiotic therapy for persistent symptoms, in spite of repeated debridement. Although 20 months had elapsed since the tsumami event, researchers investigated the cause of the persistent symptoms of infection by examining bacteria from the water and soil that were flooded by the Tsunami water.

Methods: In August 2006, 49 samples from various water sources (the sea, rivers, sewage, wells, and swamps), in 11 areas that were flooded during the tsunami, were collected and microbiological tests were performed in Banda Aceh. According to an inhabitant of the inundation areas, well water became brackish after the Tsunami and has remained that way since then.

Results and Discussion: Of the 49 water samples obtainted, Aeromonas sp., Klebsiela sp., Vibrio sp., and Proteus sp. were isolated from 24, 14, 16, and six samples, respectively. Regardless of genus, almost all of the isolated Gram negative bacilli were resistant to ampicillin and amoxicillin, while they were sensitive to ciprofloxacin and gentamicin. Based on the results of this study and further analysis of the medical records, the researchers recommend ciprofloxacin (and other relevant quinolones) and/or gentamicin for the initial antibiotic therapy of traumatic wounds that are exposed to a water-soil mixture, such as occurs with a tsunami or flood, when clinical microbiological tests are not available.

Keywords: anti-microbial; Indonesia; tsunami; water; wounds
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Local Implementation of International and National Recommendations for Pandemic Flu Preparedness in a Swiss Western State

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The need for worldwide pandemic flu preparedness recently overwhelmed public health authorities who were requested to adapt and operationalize the World Health Organization (WHO) and national guidelines at a subnational level. Since June 2005, an Expert Group nominated by the Executive Council has brought together health specialists in infectious diseases, public health, emergency and disaster medicine, travel medicine, geriatrics, and hospital management, as well as non-medical partners (i.e., the Head Veterinarian, or the Chief of Disaster Coordination) in a Swiss western state (650,000 inhabitants). This group implemented a strategic plan based on five principles:

1. Early treatment with anti-viral drugs within 6–12 hours after the onset of symptoms;
2. Separation of patients with and without flu symptoms by creating a pandemic channel that avoids usual health facilities;
3. Controlled distribution of healthcare resources;
4. Continuity of urgent care for non-pandemic patients;
5. Real-time epidemiological and crisis follow-up.

Ten thematic working groups involved partners from: (1) public hospitals; (2) private hospitals; (3) rehabilitation centers; (4) nursing homes; (5) social institutions; (6) private practitioners; (7) pharmacies; (8) epidemiological units; (9) the emergency call center; and (10) public health specialists. Special attention focused on pediatric issues. Continuity plans for public and private institutions were treated separately from the health contingency plan. Political support at each phase was pivotal.

This ongoing work has allowed input from a broad range of health and non-health professionals and a consensual development of new and sometimes contradicting priorities, which are closer to scientific and epidemiological views than those recommended by the WHO and national guidelines. It provides new and useful ways of responding in case of a future public health threat.

Keywords: guidelines; health; public health; recommendations; World Health Organization
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Chronic Renal Insufficiency and Diabetes Mellitus following Disasters: A Model For Reform

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Background: Chronic diseases result in significant morbidity and mortality following disasters, but traditionally their incidence and treatment have been under-recognized.
Objective: To formulate a model for responding to post-disaster diabetic needs based on the nephrology community's response to post-disaster dialysis needs.
Discussion: In the wake of natural disasters such as the recent earthquakes in Pakistan, Iran, Japan, and Indonesia, the south Asian tsunami, as well as the hurricanes affecting the US gulf-coast, much attention has been focused on the care and prevention of primary illnesses such as traumatic injuries. However, while the exacerbation of secondary illness such as chronic disease, comprise a sizable health burden, the literature provides little information regarding the treatment of large numbers of chronically ill patients in post-disaster scenarios. Surveys estimate that 25–40% of persons living in the regions affected by Hurricanes Katrina and Rita had at least one chronic disease. In response to the 1989 Armenia earthquake, the International Society of Nephrologists and United States National Kidney Foundation worked together to form a disaster relief task force that has proven effective in responding to the dialysis needs of victims following the 1999 Turkey and 2005 Pakistan earthquakes. Recent data suggest the need for a similar effort for responding to post-disaster diabetic care needs.
Conclusions: By recognizing and addressing the impediments to proper glycemic control, creating supply stockpiles, educating patients and caregivers, and incorporating diabetes specialists into planning and relief efforts, we can greatly enhance the quality, delivery, and effectiveness of the care provided to diabetic patients during relief efforts.
Keywords: diabetes; disaster; kidney; public health
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Do Healthcare Providers Responding to Disasters Have Public Health Awareness and Preparedness?

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Introduction: Both Hurricane Katrina and Hurricane Rita caused major population displacements. This forced the American Red Cross to manage the largest shelter operation in their history. Response efforts identified the importance of increased public health awareness.
Methods: A collaborative partnership among Johns Hopkins University, the Harvard Humanitarian Initiative, and the American Red Cross (ARC) was formed to conduct a rapid assessment of public health needs. Trained team members traveled to five ARC-identified regions in Texas. A survey focusing on shelter demographics, basic public health knowledge, shelter healthcare training prior to deployment, and the referral system was distributed. Data were collected through observations and informal discussions with healthcare providers in the shelters.

The public health awareness of staff members was ascertained by scenarios based on infectious case definitions. Respondents needed to make decisions regarding treatment and next steps of care. Convenience sampling was conducted.
Results: Forty-three shelters were surveyed. Of these, 82% utilized resident nurses and emergency medical technicians as healthcare providers, and 60% of the shelters included medical doctors. Of the shelter managers, 75% reported having prior shelter training. Of the respondents, 33% had public health training, and 56% felt that prior public health training would have been helpful in the management of shelter populations.

Respondents felt that pre-deployment orientation on public health and immediate public health consultations would be extremely valuable.
Conclusions: Public health awareness and training is a necessity for staff members who run shelters. Additional training and educational interventions should be provided for any staff members interested in shelter care management.
Keywords: American Red Cross; evacuee management; hurricanes; population displacement; public health
Prehosp Disast Med 2007;22(2):s127

Session 3: Flooding

Chairs: M. Hoejenbos; Knut-Ole Sundnes

A Population-Based Cluster Survey of Vulnerability and Disease Burden for Hurricane Katrina Evacuees Displaced to Shelters

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Introduction: The burden of disease and vulnerability level of the population displaced to shelters by Hurricane Katrina was unknown. The purpose of this study was to define the demographics and health profiles of these evacuees in order to guide the humanitarian response.
Methods: We performed a two-stage, 30 by 21 cluster sample survey of the shelter population (38,804) residing in Louisiana Red Cross shelters two weeks after Hurricane Katrina. Shelter clusters were randomly selected using probability proportional to size methodology. Heads of households were then randomly selected to yield 551 households representing 1,597 individuals.
Results: Nearly half of the sample was single, widowed or divorced; the majority was female (57.7%) and African-American (68.8%). Underemployment (54.3%), dependency on assistance (42.6%), lack of home ownership (61.7%), and lack of health insurance (43.6) suggested vulnerability. Of the sample population, 56.3% arrived with at least one chronic disease. The prevalence of hypertension (33.9%),

hypercholesterolemia (17.1%), diabetes (13.4%), psychiatric illness (13.4%) and pulmonary disease (13.3%) suggested significant chronic disease burden. Substance abuse, HIV, and TB were rare. Of the evacuees with chronic disease, 42.4% lacked their medications upon arrival; 34.5% arrived at the shelter with symptoms warranting immediate medical intervention including dehydration (12.3%), dyspnea (12.0%), injury (10.0%), chest pain (9.3%), and fever (8.5%). Infected wounds, suicidal ideation, and recent sexual assault were rare. Known history of chronic disease and lacking medication upon arrival were the greatest risk factors for presenting with acute symptoms (OR 3.24; CI 1.96, 5.35).

Conclusions: The displaced, sheltered Katrina population was vulnerable and carried a significant acute and chronic disease burden; population-based knowledge guides relief preparation and response.

Keywords: disease burden; evacuees; Hurricane Katrina; shelter; vulnerability
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Public Health Issues Associated with a Radiological Medical Emergency Involving Mass Casualties

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The public health community will play a number of key roles in the event of a nuclear or radiological emergency such as a terrorist attack involving a radiological dispersal device. These activities include: (1) treating immediately life-threatening injuries; (2) developing and implementing criteria for entry into and operations at the incident site; (3) monitoring the health and safety of workers reporting to the event; (4) field investigations and monitoring of people for radiation exposure and contamination; (5) assuring the safety of shelters for people displaced by the event, as well as assuring the availability of healthy food and water supplies; (6) coordinating the gathering of biological samples and laboratory analysis of these samples; (7) implementing a wide range of disease control and prevention measures; (8) developing medical intervention recommendations; (9) treating impacted citizens; (10) dealing with contaminated decedents; and (11) establishing a registry and evaluating the long-term health and medical impacts on the public and emergency personnel. The Centers for Disease Control and Prevention (CDC) is developing guidance, training, and information materials that may be useful to the public health community. Some of these materials are currently available on the Internet at **http://www.bt.cdc.gov**, and others are in various stages of development. This presentation will highlight some of these materials, and the audience will be encouraged to comment on current CDC activities.

Keywords: disease; mass casualties; preparedness; public health; radiological dispersal device
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Combined Clinical and Public Health Response in the Aftermath of Hurricane Katrina: Operation Assists and Utilization of Mobile Medical Units

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In the immediate aftermath of Hurricane Katrina, the Children's Health Fund (CHF) and the National Center for Disaster Preparedness (NCDP) at the Columbia University Mailman School of Public Health combined resources to create Operation Assist (OA). The CHF is a non-profit organization that provides comprehensive medical care to underserved children in rural and urban sites across the US using fully equipped, mobile medical units (MMU). Initially, deploying MMUs and medical teams from five of its national sites, OA was able to provide health services in Mississippi and Louisiana. Venues were coordinated with state emergency response officials, but the MMUs were able to follow displaced populations who moved en masse from one shelter to another. Units were able to provide a wide range of services including vaccinations, wound care, acute and chronic care, and mental health support. The staff include experienced, physician-led health care teams, and are equipped with a computerized patient database and satellite communications capability. Operation Assist coordinated services through the New York headquarters of the CHF, rotating teams through sites in the affected areas. More than 12,000 medical encounters were provided within the first three months. Services have been provided continuously, and now are supported by newly raised funds. Through the coordination with NCDP, OA also conducted extensive field surveys of health and mental health needs among displaced children and families living in a variety of shelter settings. Data and analyses collected in these surveys have helped to drive program development and ongoing advocacy on behalf of displaced persons.

Keywords: advocacy; children's health; displaced population; healthcare; Hurricane Katrina
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Hurricane Relief Efforts Outside of an Overcrowded and Overworked Hospital

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National Disaster Medical Assistance Teams (DMATs) established an aid station outside of West Jefferson Hospital, the only operating hospital on the West Bank of New Orleans. There was a pressing need for both routine and emergency medical care. The Georgia-3 DMAT took over operation of a three tent facility on the lawn of the hospital from the Oregon DMAT team on October 26. Treatment tents were set-up as Red for Emergent and or

Complex, Yellow for Urgent, and Green for stable. Problems ranged from simple prescription refills to dangerous falls and pulmonary embolism and heart failure. Numerous patients with lacerations, sprains, minor fractures, and/or abscesses and infections that needed both incision and drainage as well as IV antibiotic administration were encountered. Oxygen and nebulized treatments were made available using a multiple patient manifold connected to a single Oxygen tank. Simple chemistries and a hematocrit measurements were available. The hospital was able to augment diagnostics with advanced laboratory studies and X-ray and Computerized Axial Tomography Scanning (CT) as needed. Direct radiologic-viewing was available by laptop computer, and final reading interpretations were provided by radiologists from the hospital. A total of 1,067 patients were seen during the 9 days of 10 to 12 hour shifts. The number of hours were gradually decreased with the intention to phase out of services November 15 when two other hospitals were scheduled to come online.

Keywords: hospital; hurricane; overcrowding; overstaffing; public health; relief
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Poster Presentations—Theme 13: Public Health

(210) Model for Medical Records for International Disaster Relief Operations

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The ability to triage a large number of patients during an international disaster relief operation (IDR) is important. In order to ensure effective triage and treatment, useful and practical medical records are necessary. In 2003, the Shinchi's Medical Record (SMR) for IDRs was proposed. The SMR is contained on only one sheet of paper that includes the medical record, laboratory data, and prescribed drug sheet. Use of SMR also registers the urgency class and primary diagnosis. Use of the SMR was simple, inexpensive, and easy to prepare for many patients. After the publication of the SMR,1 the instrument was revised according to the advice of 61 doctors and nurses who had participated in IDRs. The laboratory data sheet was deleted, because few medical teams were able to use laboratories in field medical facilities. The authors referenced the same kind of medical records used by the Japan Medical Team for Disaster Relief, the International Committee of the Red Cross, and other non-governmental medical teams. According to this medical record information, the SMR was revised and renamed the "IDR Medical Record". The IDR Medical Record is more useful because it is easier to record the chief complaints and symptoms. This Medical Record should enhance effective medical relief activities in IDRs.

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Keywords: international disaster relief operations; medical records; model; relief
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(211) Assessment of Major and Minor Events that Occurred in the Kingdom of Bahrain during the Last Century Using a Disaster Severity Scale Score

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Introduction: Epidemiological research about disasters is difficult to perform, since data collection may not be possible during the disaster.
Objectives: The objectives are to enumerate and assess the severity of the disasters that occurred in the Kingdom of Bahrain during the last century using a Disaster Severity Scale (DSS), to set a standard method for the classification of previous disasters, and to improve disaster management and planning.
Methods: Data will be collected from reports of the Civil Defence Directorate and the Ministry of Interior of the Kingdom of Bahrain and will be used to calculate the DSS Score. Disasters will be classified into major and minor disasters according to the number of deaths and severity of the damage. The number of deaths will be compared with the obtained DSS Score. A seasonal trend for different types of events will be obtained to assess if there is a relationship between the type of event and the time of the year in which it occurred, as related to the weather conditions existing at that time.

Keywords: Bahrain; deaths; Disaster Severity Scale; major events; minor events
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(213) Tehran Residents' Knowledge, Attitude, and Practice Regarding Earthquake Preparedness

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Introduction: Earthquakes are the most prevalent natural hazard to result in a disaster in Iran. More than 70% of all Iranian cities—including the capital, Tehran—have been built over zones of geological weakness (faults). Preparedness in disaster management can minimize the loss of life and property, and one of the most basic elements of any disaster preparedness program is public education. Assessing the public knowledge, attitude, and practice (KAP) is a crucial first step in designing successful educational initiatives.
Methods: This research comprised a succession of qualitative and quantitative studies that together produced the input necessary for devising recommendations for educational interventions.

Results: Out of a sample of 1,211 Tehran residents, 31.4% demonstrated "poor" knowledge of disaster preparedness. For 31.4% of the sample, the knowledge assessed "moderate", and the remaining 37.2% had an "acceptable" level of knowledge. The relative frequencies of people with poor, moderate, and acceptable attitude were 25.6%, 32.5%, and 41.9%, respectively. Regarding practice, the percentage of the subjects that were determined to be at a "poor" level was 25.7%, while 29% fell into the "moderate" category, and 45.3% were classified as having "acceptable" practice in terms of disaster preparedness. Statistical analysis of the KAP scores was used to identify the following groups as being at "high risk" for adverse consequences in the event of an earthquake: women, housewives, residents of eastern districts, senior citizens, pensioners, those living alone, poorly educated people, and people living in a rented accommodation or in crowded families.

Keywords: earthquake; knowledge, attitude, and practice (KAP); preparedness; public education; residents
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(214) Handling Crisis or Risks

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A disaster occurs when routine disruption becomes a precise instant in which a hazard reveals itself. Some disaster examples from Argentina include the 2003 Santa Fe floods and the Cromagnon nightclub fire in 2004. Crisis management mechanisms must be improved. This includes setting out organizational priorities to deal with mental health, continuing launched programs, training activities for farm workers, introducing psychosocial aid measures for the assistance of victims and other parties, and lowering risk so that stress does not leave irreparable harm.

A comprehensive risk reduction approach must be promoted. This mitigates impacts by calling on all of the members of a society to make agreements through a strategic plan on the integral measures taken against risks, including responses.

The plan requires the collaboration of different professionals, response groups for emergency and disaster prevention, the involvement of governmental and non-governmental actors, and the participation of the population affected by or vulnerable to tragedies that have occurred in Argentina during the last 25 years. Direct observation of human behaviour in rescue missions, training activities, tests on rescuers, and statistical data must be considered and reviewed.

In this sense, an emergency or disaster is the degree of risk in a society. For this reason, the implementation of a comprehensive risk reduction approach is essential.

Keywords: Argentina; disasters; disaster planning; mental health; risks
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(215) Sickle Cell Patients in the Emergency Department: Report of a Multidisciplinary, Quality Improvement Initiative at an Urban, Academic Hospital

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Sickle cell disease (SCD) is one of the most prevalent genetic diseases worldwide. It affects an estimated 70,000 Americans and healthcare expenditures total (US)$475 million annually.[1–3] Pain is the most common cause for adult patient hospitalization, accounting for >90% of emergency department visits.[1,2] It is hypothesized that combining the standardization of SCD care in the emergency department with a multidisciplinary, clinical approach will improve patient satisfaction and reduce the cost of care at the emergency department.

Developments include: (1) a standardized emergency department, SCD pain protocol; (2) brief motivational interviewing; and (3) a new multidisciplinary SCD clinic. Clinic referrals will be mediated by social workers, and the clinic team will assist both emergency department patient management and follow-up care.

Statistical process control charts that track monthly intervals will be used in the ongoing evaluation of quality improvement initiatives. Data will be collected on the following: (1) the number of emergency department visits; (2) the number of emergency department patients admitted; (3) length of stay prior to discharge from emergency department; (4) patient satisfaction with emergency department care; and (5) the number of times patients returned to the emergency department within seven days of first admittance. Financial outcomes measured will include: (1) total emergency department charges; (2) reimbursement; (3) cost of care; and (4) net loss.

Baseline emergency department data from January 2005 to August 2006 was collected. There were 341 SCD presentations by 55 patients with a 14.4% admission rate and 20.5% return-rate to the emergency department. Approximate emergency department billing data for pain crisis (excluding admitted patients) totalled $600,000, with $145,000 for cost-of-care and a >$90,000 net loss.

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Keywords: emergency department; financial outcomes; hospitals; quality improvement; sickle cell disease (SCD)
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(216) Patient Advocates: Linking Emergency Department Patients to Medical Homes

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Introduction: The 14 neighborhoods surrounding the University of Chicago Hospitals (UCH) have Chicago's highest rates of "ambulatory-care-sensitive condition" hos-

pitalization, and a lack of community-based care.1 To address these concerns, the Southside Medical Homes (SMH) network began linking emergency department-patients with 18 community providers in 2004. The emergency department-based patient navigator is an integral component of this network. This study will illustrate the current and developing role of the emergency department-based patient navigatorr.

Methods: Six navigators at the UCH Emergency Department approached eligible patients flagged by the emergency department electronic tracking system. Patients were offered primary-care referral and treatment at appropriate dental, mental health, and substance abuse facilities. Appointments were scheduled, and pertinent emergency department medical data were faxed to the outlying sites. Navigator roles are expanding with SMH to include: (1) a focus on frequent user/chronic disease populations, such as sickle cell disease where advocates will expedite multidisciplinary clinical referral; (2) training to better inform patients about the specific benefits a "medical home" provides for preventive and psychosocial care; and (3) improvements to navigator and patient knowledge of community resources, such as health-education sites, vocational programs, advocacy agencies, and support groups.

Results: During the first eight months of 2006, 30% (11,612) of the emergency department patients were without a medical home, 2,279 appointments were made, and 816 were kept at the emergency department. The SMH network data demonstrate that patients return to their referred providers (38% of the patients have been seen ≥2 times).

Conclusions: The role of an emergency department-based patient navigatorr is evolving with the expansion of SMH to include: frequent-user population referrals, preventive health education, and utilization of community resources.

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Keywords: advocate; Chicago; emergency departments; medical homes; patient navigators
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(217) Health and Welfare for Emergency Personnel in Major Disasters

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This presentation will define the requirements of an aid operation after an analysis of the principal characteristics of disasters. The conditions of emergency personnel and assistance teams will be described through practical experiences (tsunamis, forest fires, and earthquakes). The skills of the personnel and managerial staff will be analyzed, along with problems with security and safety. The physical, psychological, medical, and material aspects of security and safety have declined. In this presentation, the conditions resulting from conserving an operational workforce, action capacity, and mission target will be explained. The responsibilities of the team leader, risk manager, and chief medical officer will be defined. The principal conditions of a successful mission are: (1) sanitation; (2) medical support; (3) housing; (4) restoration and catering; (5) camp hygiene; and (6) lifestyle. The goal of an effective assistance program (physical and psychosocial) and the economic cost of not caring for personnel who provide services during and after disasters will be demonstrated.

Keywords: care programs; disasters; emergency assistance; emergency personnel; safety
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(218) Are Belgian Hospitals Prepared for a H5N1-Pandemic?

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Objective: Virulent airborne diseases can be a real burden to a nation's health system. The most recent threat is that of a mutation-induced H5N1-influenza pandemic. We studied whether Belgian hospitals are able to deal with H5N1-influenza infected patients in the case of a pandemic. Many patients, including children, may require artificial ventilation within 48 hours of admission.

Methods: A survey aimed at determining availability and preparedness was sent by e-mail to the different Belgian Emergency Departments (EDs).

Results and Discussion: Sixty-five hospitals were included. The number of patients being potentially admitted is limited by the reduced number of intensive-care beds equipped with automatic ventilators. Furthermore, the number of available intensive-care beds for children is still lower than for adult patients.

The number of mortuary places, in the case of a catastrophe, also is insufficient. Although most hospitals set up a disaster plan for H5N1, there are only limited stocks of antiviral medication to protect the hospital staff during the acute phase. A separate triage area only is available in a limited number of hospitals.

Conclusions: Belgian hospitals and EDs are not equipped sufficiently to deal with potential pandemic situations.

Keywords: Belgium; pandemic; preparedness; hospitals; emergency department; limitations
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(219) Improving Public Health Emergency Response and Preparedness in India

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This paper discusses some of the strategies and challenges for successfully implementing the public health emergency response plan and preparedness in India. For disasters caused by natural and man-made hazards, the public health emergency response requires an innovative, trained, and committed workforce. Without adequate training, the response capacity of health agencies and communities in India, and their ability to respond effectively to a disaster is

unpredictable. Over the years, preparedness has gained recognition as a critical component of overall public health management for public health emergencies triggered by infectious disease outbreaks, natural hazards, terrorism, and other causes. *Front-line preparedness* means that public health leaders and administrators must be able to communicate information, roles, capacities, and legal authority to all emergency response partners during planning, drills, and actual emergencies. The recent increased threat of terrorism, coupled with the ever-present dangers posed by disasters caused by natural hazards and public health emergencies, clearly support the need to incorporate preparedness and emergency response into the Indian system. Various programs focusing on different aspects of health emergency preparedness and response have been conducted in India, but there are clear gaps during the response phase of public health emergencies. Public health becomes an indispensable pillar of the national security framework, and to respond to the challenges, planners must think in the broader context of causes as well as symptoms. An attempt is made to identify the gaps and challenges in developing a comprehensive approach to improving public health emergency management in India.

Keywords: emergency response; India; planning; preparedness; public health
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(220) Hospital Template Tool Kit for the Effective Evaluation and Management of Victims of a Botulism Mass-Casualty Incident

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Botulinum is known as the most poisonous toxin. A recent mathematical model has indicated that 1 gram of botulinum toxin in commercially distributed milk consumed by 568,000 people would generate 100,000 casualties. Whether the exposure is caused intentionally or naturally, multiple botulinum patients will present with a unique set of recognition and management imperatives. These imperatives will stress a medical infrastructure that currently is understaffed, inexperienced, and lacking in immediate resources needed to deal with such a threat. While strategic discussions involving anti-toxin caches, ventilator supply deficits, and surge capacity continue, there has been a noticeable lack in the literature regarding the tactical aspects associated with the management of large numbers of botulism victims. This is compounded by the fact that, often times, initial manifestations may be subtle, overlooked, or dismissed easily, and can lead to sudden deterioration of the patient. Therefore, a tool-kit of templates has been created to assist healthcare providers in the recognition, evaluation, and management of botulism victims. This tool-kit contains botulism-specific physician orders, nursing documentation, evaluation templates, patient monitoring forms, anti-toxin administration forms, and discharge instructions. These templates are meant to supplement or be incorporated into the existing management protocols of a hospital. The templates are internet-based so they can be downloaded as needed should an incident arise. There is no cost to end-users. They also may be utilized for training purposes. With this tool-kit, the initial and ongoing management of multiple botulism victims will be enhanced regardless of the level of experience or training of the healthcare provider.

Keywords: botulism toxin; hospitals; management; mass-casualty incident; patients
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(222) Characterization of Acute Watery Diarrhea Outbreak in Ethiopia's Oromia Region

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Introduction: In late June 2006, Ethiopia's Oromia Region was affected by an outbreak of acute watery diarrhea (AWD), subsequently confirmed to be Vibrio cholerae 01. Despite control efforts, the outbreak quickly spread from the original zone of West Arsi to four neighboring zones within the Oromia Region.
Methods: The current assessment, conducted during the last two weeks of September, addressed the zones of Guji, Bale, and East Shoa. Surveys were administered to health bureau staff, case treatment center (CTC) staff, and community members. A convenience sample was used to assess both CTCs and community members.
Results: Geographically, the AWD cases occurred along the Ganale River. There was a trend observed of adult males being disproportionately affected. Overall, the infection rates were low (0.03% to 4.12%), although the CTC data likely underestimate the true values. The CTC case fatality rates ranged from zero to 6.4%, but again these data likely underestimates the true case fatality rates since community deaths were not included. The community response depended on the village chairmen and the strength of community mobilization varied according to the zone. Medical management generally was appropriate and was based largely on Médecins Sans Frontières (MSF) cholera treatment guidelines.
Conclusions: This outbreak primarily resulted from insufficient access to clean water and from poor sanitation. Future epidemics undoubtedly will occur unless these basic deficiencies are addressed properly. In this particular instance, the outbreak was brought under control by a prompt and effective response at the community level.

Keywords: Cholera; community-level response; Ethiopia; mortality; outbreak
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(223) Health Disaster Management: Balkan and Mediteranean Network

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In the past decades, the hazards and risks associated with disasters threatening civilian populations in the Balkans and Eastern Mediterranean have worsened. This presentation reports on the collaboration between Greece, Egypt, and Turkey. This collaboration features activities in public health

and disaster management as a means to develop appropriate training and networks with neighbors with additional aims to deploy "health diplomacy" as part of the process to improve human security, tolerance, and reconciliation as well as to ascertain disaster risk. The process is ongoing and is being conducted with the respective Ministries of Health and the international community. Public health and disaster response management was conceptualized as a single unitary instrument in foreign policy development as well as an integral part of the understanding of and response to unwelcome events. A tentative health disturbance model was employed utilizing the Utstein Template (UT), which also was being examined as a basis for training of health disaster managers and public health professionals. From such collaboration and related activities, socio-economic development can be promoted and health systems strengthened. A case will be made for more specific application in the sensitive region of the Balkans, as an operational aid in terms of societal preparedness. It stresses the management function within the context of organized society and the harmonization of disaster response. A tentative declaration awaiting ratification has been drafted between Greece and Turkey. Acknowledgements to Knut Ole Sundnes and Marvin Birnbaum.

Keywords: coordination; disaster management; public health; response

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(224) Urban Solid Wastes as a Major Public Health Disaster in Nigeria

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Currently in Nigeria, most urban cities are experiencing an increased rate of environmental degradation, with solid wastes of various dimensions dumped along the streets, market places, behind houses, and along drainage channels— all arising from increasing population, urbanization, and uncoordinated industrialization. Apart from destroying the aesthetic appeal of these urban cities, these wastes constitute a disastrous public health nuisance, as they contribute to the transmission of parasitic infections. An investigation of all the stages of integrated solid waste management in Nigeria (which includes sorting, collection, storage, and transportation) indicated serious public health implications. In addition to the various communicable infections and upper respiratory tract infections, there are other emerging threats: Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) can be contracted from sharp healthcare wastes and problems of avian flu and other zootic infections can be transmitted through poor hygiene and disposal practices. Some of the recommended disposal methods, such as incineration, have public health consequences through the emission of dioxins and other toxic/carcinogenic substances. The current challenge calls for all stakeholders (governments, indigenous and non-indigenous private sector actors, civil society organizations, and all people) to harmonize their activities towards promotion of sustainable waste management procedures. Some of the technologies being applied must be reviewed and improved for better wastes management and wealth creation. International concerns involved in Ecopreneurship also should capitalize on the wonderful and attractive investment climate provided by Nigerian Government and consider investing in this sector to help arrest the disaster.

Keywords: disease; management;Nigeria; public health;sustainable; waste

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(225) Road Safety Investigation, a New Perspective?

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Road safety has been considered an intrinsic aspect of road traffic, in which accidents are an unwanted but inevitable byproduct of the system. Due to mechanisms of diminishing returns, policy-making strategies consider present safety performance levels as outstanding, without much perspective for drastic reduction of the present fatality and injury rates. Changes in the road system consequently focus on environmental and congestion issues.

However, in extrapolating trends in motorization and traffic volumes, the World Health Organization (WHO) forecasts road accidents to be the third highest cause of death in the next two decades worldwide. The WHO and the United Nations propose a paradigm shift towards road safety as a public health issue. Focusing on the public health aspects of road safety may promote societal awareness of high-risk activities.

In order to improve knowledge about accident and injury causation, this contribution advocates safety investigations in road traffic on a similar methodological basis as in aviation, shipping, and railways. This advocacy is based on experiences with several in-depth analyses of road accidents conducted for the Dutch Road Victim Organization VVS.

In addition to this practical approach, a more theoretical approach is explored by applying Paul Slovic's Dual Process Theory. This theory is used to examine the relationships between the notions of "ratio" and "affect", with the hope that it will help to clarify the difficulties associated with the introduction of a new perspective for road safety policy-making.

Finally, suggestions are made to improve the quality of road accident investigations and to reassess the role and involvement of organizations of road victims and their relatives.

Keywords: Dual Process Theory; public health;road safety; road traffic crashes; World Health Organization

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(226) Pandemic Influenza: An Integrated Approach to Health Service Planning in the Avon Area

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Background: In the UK, there has been much national publicity and government interest in the potential for the emergence of a new pandemic strain of influenza virus and its potential impact on the health of the population, industry, and commerce.[1,2] The Department of Health (UK) recently

has required all National Health Services (NHS) organizations to prepare contingency plans for pandemic flu.[3]

Presentation: The presentation will describe the steps taken to improve preparedness across organizations in the Avon area, including issues such as the availability of anti-virals, face masks, and protective equipment. New integrated command and control arrangements will be described alongside the likely challenges to service continuity and new processes developed to assist in managing the consequences of pandemic flu.

The presentation will highlight the utility of service continuity planning as a foundation for robust emergency management arrangements for pandemic flu and other emergencies.

Principle Messages: Pandemic Influenza presents considerable business continuity challenges for the NHS. Planning and Preparedness for pandemic flu will provide a robust platform for the NHS response to other emergencies, including bio-terrorism. Everyone must take part in preparedness for pandemic influenza and business continuity planning.

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Keywords: health service planning; National Health Services; pandemic influenza; preparedness

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(227) Potential Avian Flu Pandemic: National Understanding of Paramedic Attitudes and Concerns, and Innovative EMS-based Surveillance and Triage Stategies

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3. USA

The Australian National Health and Medical Research Council funded this project to study and inform national policy-makers on avian flu. An experienced team of investigators from three universities, one international expert and associate investigators from each Australian state ambulance authority, led the project.

A national survey the attitudes and concerns of Australian paramedics comprised a stratified sample of 3,000 paramedics and their life partners, and included focus groups/interviews in each state.

The next component examined the use of the Medical Priority Dispatch system as a surveillance tool at the point of call-taking. Investigators compared these data with existing surveillance data on influenza-like-illness (ILI) in medical locum services, sentinel general practices, and emergency departments, hospital inpatients, and laboratory results, in two Australian states.

The community-based triage for ILI in the EMS component adapted the population-based triage model for community bio-events, developed by Skip Burkle, for use as a triage tool in a potential avian flu pandemic. This study's implications for national and state "pandemic flu" planning will be discussed.

Keywords: attitudes; Medical Priority Dispatch; model surveillance; pandemic flu; paramedics

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(228) Urbanization: Threats and Opportunity—Ankara, Athens, and Istanbul

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Urban population continues to grow at a faster rate than the world population. Three billion people, or about one half of all human beings, live in urban settlements, of which about 5% live in mega-cities. This trend is expected to continue (five billion by 2030). Athens, Istanbul, and Ankara demonstrate a different evolution to their current state. While urbanization and industrialization in Athens (four million) and the southern part of in Istanbul (11 million) have had a negative effect on regional cooling, Ankara (four million) does not show any warming trend in spite of its urban geometry. All three systems produce considerable pollution from the heating of buildings, transportation and factories, and present significant health challenges. There is a significant potential for progress with opportunity as well as threats resulting from poor governance, organizational dysfunction, and creeping or sudden disasters. The problem space designated "urbanization" of all three cities will be treated as a system with an emphasis on attributes of failure and the need to offset it, as well as the potential for calamity and its health consequences. This preliminary work is conducted within the framework of Greek-Turkish collaboration funded by the Greek authorities.

Keywords: Ankara; Athens; Istanbul; threats; urbanization

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(229) Simulating the Effect of Pandemic Influenza on the Healthcare System Using Desktop Technology

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This presentation describes a simulation system that models the healthcare system's response to pandemic influenza. It assists public health decision-makers to develop response plans and procedures, and to optimize resource placement.

The simulation combines a geospatial epidemiology model with public health and healthcare system resources. It is run on a high-powered, desk top computer by a user with basic computing skills and analytical capabilities. Someone who is comfortable with Excel has the level of analytical capabilities required.

Using this system, public health personnel can determine which resource acquisition and deployment decisions will maximize the percentage of patients who receive the appropriate level of care within an appropriate timeframe. The system focuses on regional management of healthcare resources.

Reports at the end of each run of the simulation identify which resources ran out and which were plentiful, as well as the "outcomes" of the patients. The system delivers a what-if capability that allows a user to test the effect of substitutions for resources likely to be in short supply. The system thereby facilitates the development, in advance, of alternative care standards.

Keywords: model; pandemic influenza; regional management; resources; simulation
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(230) Respiratory Hazards: Enhanced Protection for Exposure to Airborne Viruses

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Introduction: There are impending threats of viral respiratory infections for healthcare workers worldwide—SARS, influenza, smallpox. Respiratory protection of healthcare workers is of the utmost importance and requires the highest possible level of protection, provided by such devices as the self-contained breathing apparatus (SCBA) and powered air purifying respirator (PAPR). However, this type of equipment does not allow easy stockpiling, and its use might not be realistic in all situations.

Thus, most occupational health authorities recommend the use of NIOSH (N95, N99) or CE (FFP2, FFP3) certified respirators in situations suspected to involve an airborne infectious hazard. Such certifications require particulate filtration efficiencies of 94%–99% against an aerosol of inert particles with a mean particle size of 0.3 μm and 0.6 μm. Considering that most viruses of pathogenic concern are smaller than 0.3 μm in size, and that the most penetrating particle size through charged fibers shifts towards the nano-sized range = 0.1 μm, this represents insufficient protection.

Methods: N95, N99, FFP2 and FFP3 respirators were evaluated for their powered air purifying respirator (VRE) in parallel with a P95 or FFP2 iodinated polymer-containing (IPC) respirator. Full-scale devices were tested against a viral surrogate, MS2 coliphage, and an animal virus, human influenza A/H1N1.

Results: The IPCs showed VRE results 100 to 1,000 times higher than same class respirators. Additional benefits include a carbon layer for nuisance levels of organic vapors and resistance to oil-containing aerosols.

Keywords: airborne viruses; iodinated polymer-containing respirator; powered air purifying respirator; Self Contained Breathing Apparatus; respiratory hazards; viral respiratory infections
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(231) European Front-Line Health Professionals and the New Public Health Threats: Assessment of Training Needs

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European training for health professionals on Rapid Response to Health Threats (ETHREAT) is a project co-funded by the European Commission (EC). The program consortium is comprised of institutes from Greece, Germany, Poland, Bulgaria, and the UK, and is coordinated by the University of Athens School of Medicine. The 36-month project aims to develop an educational package for front-line health professionals (FLHP) that will help to improve their ability to recognize and respond to new public health threats. Before designing the training package, members of the project team explored the opinions of their target audience and of European experts on the existence and appropriateness of currently available programmes, as well as on the desired content of an educational package.

The project team designed two questionnaires addressed to FLHPs and to Chemical, Biological, Radiological, and Nuclear (CBRN) experts in the European Union (EU) member states (MS) and other European countries. Both questionnaires were administered in hard-copy form and via the project website from March to September 2006.

The FLHP questionnaire was comprised of 47 questions. The total number of valid questionnaires returned was 231 from 23 European countries. Of this total, 106 (45.5%) were answered by physicians and 109 (47.2%) by other healthcare personnel, including 62 (27%) by public health officers.

More than 50% of the responding FLHPs felt that they currently are "poorly" or "very poorly" prepared to deal with a chemical, biological, or radiological incident. Similar numbers of FLHPs are not confident (mean: 57.7%) that they could discriminate a natural versus man-made incident. Nevertheless, 67% of FLHPs stated they know where to report a suspicious, deliberate incident, but 55% stated they do not have access to Personal Protective Equipment (PPE) in their workplace, and 49.6% were not aware of a plan for responding to a CBRN incident or their role in the plan.

The CBRN expert questionnaire included 40 questions. A total of 63 valid questionnaires were returned from 16 EUMS, of which 32 (50.8%) were answered by physicians and 31 (49.2%) by other healthcare personnel, including 14 (22.2%) by public health officers. Six (37.5%) EUMS have courses on CBRN threats for health professionals at all educational levels. Despite the available training courses, the majority of the responding experts believe that <25% of FLHPs in their country could recognize and manage a biological, chemical or radiological incident, to the extent that their role requires. The majority of experts also believe that

<25% of FLHPs in their country could discriminate between a man-made versus a natural incident involving CBRN agents. Sixty percent of the responding experts (38) believe that FLHPs in their country are better trained for natural incidents.

All responding experts report that they are aware of an operational plan to manage CBRN incidents in their country, and experts from 10 MS report that they are aware of such preparedness plans at all administrative levels (national/federal, regional and local).

When comparing the answers received from the two questionnaires, the experts tend to underestimate the proportion of FLHPs in their country who are able to deal with a chemical, biological, or radiological incident. At the same time they are aware of the fact that FLHPs do not have knowledge of the existing plans in their country and administrative level.

Keywords: biological; chemical; knowledge; nuclear; preparedness; public health; rapid response; threats; training
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(232) Epidemiology: The Essential Tool of Disaster Risk Management in the Health Sector

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Introduction: This article introduces the national and international evidences of the application of epidemiology, as an essential tool of health risk management in disasters.
Needs of Disaster Risk Reduction Information: Regarding ISDR, a disaster is a function of the risk process. The success of an integrated disaster risk reduction (DRR) approach implementing the fields of actions depends on the accurate information on hazards, vulnerability and capacity.
Applications of Epidemiology in DRR: Epidemiological researches can provide needed information in health sector, both population and system-based, on risk awareness and assessment, hazard analysis and vulnerability/capacity analysis, knowledge development; public commitment and actions, partnership, networking and early warning systems.
Disaster Epidemiology: As a developing branch of health science, disaster epidemiology needs more theoretical work and standardization of methods and tools. Translating the results of epidemiologic research into practice is the integral part of the disaster epidemiologists' efforts in the future. Based on lesson learned from Bam earthquake, Iran 2003, Health Emergency & Disaster Department (HE&DD) has been established as the first academic department in Eastern Mediterranean Region (EMR) focusing on DRR in health system.
Conclusions: In the context of disasters, epidemiology goes beyond the issues of diseases alone; it not only covers all aspects of health outcomes in humans, but also the process of disaster risk management. Regarding effective decision making in disasters, training and application of Disaster Epidemiology should be integrated into disaster risk management of health sector.

Keywords: epidemiology; information system; risk reduction; disaster
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(233) International Athens Airport (IAA) and the Use of Automated External Defibrillation (AEDs) by the Workers

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Introduction: The use of automated external defibrilators (AED) is a new link in the chain of survival for victims of out-of-hospital cardiac arrest. With basic life support, AED can be used by individuals other than medical officers. Early defibrillation can and should be performed by specially trained bystanders.
Case Report: A 55-year-old man presented with sudden cardiac arrest in the International Athens Airport (IAA). Basic life support was performed by trained bystanders and IAA personnel. Defibrillation was delivered using an AED <5 minutes from the arrest with successful conversion to spontaneous circulation. The patient then was cared for by the Emergency Physicians of the IAA Medical Service six minutes after the first call, and admitted to a cardiology intensive care unit. An AMI was treated by angiography-angioplasty. The patients' outcome was favorable, as the patient was discharged 11 days after the occurrence of the cardiac arrest. Three other similar cases occurred with favorable outcome.
Conclusions: The time interval before the delivery of the first shock clearly is a determinant for survival after prehospital cardiac arrest. Use of an automated external defibrillator by individuals other than physicians, can contribute to an earlier defibrillation.

Keywords: airport; automated external defibrillation; defibrilation; Greece
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(234) Clinical Profile of Patients Presenting with Dengue Fever in an Emergency Department at an Urban, Tertiary-Care Hospital during the Outbreak in 2005

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Objective: To study the clinical profile of patients with dengue fever (DF) presenting to the emergency ward of an urban, tertiary-care hospital during the outbreak in 2005.
Methods: The study was conducted in the Emergency Department at the All India Institute of Medical Sciences, New Delhi from August to October 2005. All patients testing positive for IgM and/or IgG antibodies were included.
Results: Of the 119 cases included, DF was diagnosed in 58 (48.7%), DHF in 53 (44.5%), and DSS in 8 (6.75%) cases. The predominant presentations were fever (100%), rash (24.3%), abdominal pain (16.8%), seizures (1.6%), and retrorbital pain (0.8%). Bleeding manifestations were observed in 56 (47%) cases. Petichiae (13%), hemetemesis (10.9%), gum bleeding (10.1%), subconjunctival hemor-

rhage (9.2%), and multiple sites bleeding (11.7%) were noted frequently. The mean platelet count noticed in DF, DHF, and DSS were [50 ±27.4, 46 ±31.1, 42 ±26.0 * 103/mm^3] respectively. In DF, DHF, and DSS, the mean serum bilirubin was recorded as the mean values for 0.8 ±0.27, 0.9 ±0.3, 0.9 ±0.5 mg/dl (p = 0.9) respectively were 123 ±88.5, 120 ±93, 112 ±37 IU, ALT was 108 ±48, 109 ±70, 107 ±36 IU (p = 0.01), and for serum alkaline phosphatase (SAP) mean values were 138 ±53, 124 ±52, 153 ±26 IU (p = 1.7). All patients recovered, except one who succumbed due to an intracranial hemorrhage.

Conclusions: Fever, rash, abdominal pain, bleeding manifestation, and thrombocytopenia were the predominant features. Significant elevations in transaminases along with normal serum bilirubin and SAP values were observed. Prompt diagnosis and judicious therapy is the key in managing an outbreak in an emergency department.

Keywords: dengue fever; hospital; India; outbreaks; clinical presentations
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(235) Ultrasonography as a Diagnostic Marker in Dengue and Other Viral Febrile Illnesses Presenting with Thrombocytopenia

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Purpose: This study assessed sonographic findings and evaluated its diagnostic efficacy in dengue and other viral febrile illnesses with thrombocytopenia.

Methods: The study was conducted in the Department of Radiology at Yashoda Hospital, a 250 bed healthcare center in the city of Ghaziabad, India between September and October 2006 during the outbreak of dengue in the region. Patients with short febrile illness with thrombocytopenia undergoing sonography were included. Those with known hematological disorders or systemic illnesses causing thrombocytopenia were excluded.

Results: Of the 169 patients, 56 (33.1%) were IgM positive, 51 (30.2%) for IgG, and 34 (20.1%) were positive for both antibodies. The mean platelet count was 53,000/mm^3. Gallbladder edema was seen in 122 (72.2%), hepatomegaly in 78 (46.2%), ascites in 126 (74.6%), splenomegaly in 66 (39.1%), right pleural effusions in 48 (28.4%), pericholecystic fluid in 63 (37.3%), pericardial fluid in four (2.3%) and perinephric fluid collection in 24 (14.2%) patients. Mean platelet counts were significantly lower in sonographically positive than in negative patients (51,510 and 66,280/mm^3, respectively; p = 0.000). A poor correlation was observed between sonographic evidence of disease and serological markers of dengue and the platelet counts (Pearson's correlation coefficient 0.365, and 0.064 respectively). Sonographic findings appeared as early as three days of pyrexia and complete resolution of the findings was the rule.

Conclusions: This study reiterates the fact that ultrasound is an important diagnostic marker for dengue and other viral febrile illnesses with thrombocytopenia. Since it is inexpensive and noninvasive, it may reduce the diagnostic utility of serological tests.

Keywords: dengue; diagnostic marker; thrombocytopenia; ultrasonography, viral febrile illnesses
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(236) Laboratory Profile of Patients Presenting with Dengue Fever in an Emergency Department at an Urban Tertiary Care Hospital during the Outbreak in 2006

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Objective: The aim of this study was to assess the clinical profile of patients presenting to the emergency ward of an urban tertiary care hospital with dengue fever during the 2006 outbreak.

Methods: The study was conducted in the Emergency Department at the All India Institute of Medical Sciences in New Delhi between August and October 2006. Information from all patients presenting with a short febrile illness and found to have thrombocytopenia were included in the study.

Results: Of the 3,707 cases assessed, 2,834 (76.4%) were males; there was a similar distribution of other parameters between both sexes. The mean (±SD) age was 25.5 ±12.83 years; the mean hemoglobin concentration was 12.5 ±3 g/dL, the mean hematocrit was 36.9 ±8.3) the mean platelet count was 50,875 ±22,090/cmm; and the mean total leukocyte count was 6,392 ±3,778/cmm. During the outbreak, 15 (1%) patients died due to dengue hemorrhagic fever and shock. The mean age of the patients who succumbed to the illness was 33.6 ±16.13 years compared to 25.48 ±12.8 years in those who recovered; (p = 0.072). The platelet counts of the patients who died were significantly lower (39,571 ± 18,923/cmm) than those who recovered (50,918 ± 22,093/cmm) (p = 0.043).

Conclusions: Young males were noted to be more susceptible to dengue fever during the recent outbreak of this disease in parts of northern India, but the illness was more severe among older individuals. Lower platelet counts may pre-empt mortality.

Keywords: dengue fever; emergency department; India; mortality; thrombocytopenia
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(237) Possible Disaster from Industrial Emissions and How to Control Them

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Objectives: To establish risk assessment for organic solvents in a printing industry, and to develop control measures for a possible environmental pollution disaster.

Methods: The study was conducted in a printing industry with about 400 employees in a highly populated community. Monitoring of ambient air for various organic solvents was conducted. The industry as the target area uses solvents such as ethyl acetate (EAC), methyl ethyl ketone (MEK), ethanol, and isopropyl alcohol (IPA) for printing and laminating plastics.

Results: Workers were exposed to high concentrations of solvents that may cause damage, such as cancer or repro-

ductive health problems. Therefore, there is a need to develop a control device to clean the ambient air, both indoors and outdoors. To do this, an experiment was conducted using adsorbents, activated alumna, and activated carbon. The results were as follows: after including the activated carbon, the effectiveness of cleaning the polluted air with organic solvents was 91.9% for EAC, 99.6% for IPA, and 99.98% for MEK. For the activated alumina, it was 93.2% effective for MEK, 92% for IPA, and 93.2% for EAC. **Conclusion:** The results showed that both adsorbent tubes were effective in reducing concentrations of solvent fumes. Environmental damage from solvents in factories can be reduced by using adsorbents in the ducting system as an air control device.

Keywords: absorbents; ducting systems; factories; industrial emissions; organic solvents
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Oral Presentations—Theme 14: Psychosocial Aspects

Session 1: Prevention

Chairs: Gloria Leon; Carol Amaratunga

Children at Risk

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Helping children who are victims of violence is a challenge for health providers. Children who have had violent experiences are prone to develop intense or immediate personality disorders. It is possible for those who use the appropriate techniques for handling such situations to provide these children with effective help.

The aim of psychosocial support is to promote mental health and human rights protection with strategies that contain and increase the existing psychosocial protection factors.

Achieving an understanding of traumatic situations depends not only on accurate and on-the-spot scientific work, but also on the child's experience, resilience, and capacity for tolerance to frustration, complementary series, and the current environment.

When children are encouraged to participate in puppet plays, they may be able to deal with their own tragedy and overcome their own suffering. Additionally, cultural understanding of the situation and the child's feeling are needed in order to provide assistance. This may be achieved through the use of local songs and children's stories.

Both the child and patient receiving bio-psychosocial help and the healthcare provider should both be part of the endeavour to overcome the impact of violence.

Keywords: children; mental health; personality disorders; psychosocial stress; violence
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The Israel Trauma Coalition (ITC): Turning Distress and Despair into Hope—Cooperation and Preparedness in the Face of Trauma

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The Israel Trauma Coalition (ITC) was founded in 2002, in partnership with the United Jewish Federation of New York. The ITC is a collaborative network, including >50 trauma service providers/organizations, key government ministries, and funding bodies. The ITC and its partners are committed to the development of a continuum of trauma services, and provide direct services, training and supervision of mental health professionals/volunteers in the health, education, and welfare system, and development of trauma policy. Collective knowledge, training, and expertise have been used to develop both protocols and evidence-based data. Through collaborative efforts with specialists in both Israel and abroad, the ITC has established an integrated community preparedness model. This model was used to enhance community recovery capabilities when responding to disasters. The model was used when the ITC worked with the United Nations Children's Fund (UNICEF) and local service providers in Beslan, Chechnia, Sri Lanka, Turkey and the US. The ITC has been working in Sderot since 2004, providing community resilience programs that ensure levels of knowledge, training, and networks are in place. During the disengagement from the Gaza Strip, the ITC developed partnerships between the evacuees, government ministries, and non-government organizations (NGOs). In the recent Lebanon War, 1.5 million residents north of Israel suffered significant trauma. However, four years of coalition building, cooperation, and preparedness ensured that the ITC and its partner agencies were ready to provide cutting-edge trauma care.

Keywords: community preparedness model; Israel; Israel Trauma Coalition (ITC); training; trauma care
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Reporting as a Source of Trauma after the Armavia Jet Crash in May 2006

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The aim of this presentation is to demonstrate the influence of trauma on the psychological well-being of the general population after mass media reporting following the Armavian jet crash in Sochi in May 2006.

To assist families and the public in the grieving process, the following steps were undertaken: creation of a "Hot Line" to provide psychological services for the families of the victims as well as the general population; public education; professional education; and the publication of materials dealing with grief issues.

The following manifestations of the different stages of post-traumatic stress reactions were observed: a 40th Day memorial mass was held; family members came to accept

the reality of their loss; the tragedy of the event was re-experienced; and the feelings of anger as a psychological reaction after the traumatic loss were expressed. Those families who were not able to find the remains of their loved ones had longer denial and mourning processes. News coverage consisted of daily, detailed and repetitive visual coverage of the jet crash as well as in-depth reporting of details of the private lives of the families who had lost a member or members. Data and statistical analysis of the calls to the "Hot Line" indicated that less then 10% of the calls were from the families of the victims while the remaining 90% were from the general population.

Mass media, and in most of the cases, television reporting, can have a powerful influence on the development of post-traumatic reactions, not necessarily disorders.

Keywords: airplane; Armenia; media; reporting; trauma
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Developing, Implementing, and Evaluating a Comprehensive, Statewide Disaster Mental Health Training Program

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The terrorist attacks on 11 September 2001 and the catastrophic aftermath of Hurricane Katrina in the Gulf region of the United States have raised considerable concern about the country's readiness to respond and recover from disasters of a large magnitude. More recently, the growing threat of a pandemic influenza caused the federal government to strongly encourage, and in some cases mandate, a higher level of public health preparedness.

While sophisticated surveillance and detection equipment and metropolitan disaster evacuation plans are being developed, the psychological and psychosocial consequences of disasters often are overlooked or marginalized. Communities across the US are unprepared to face the significant public mental health crisis resulting from large-scale human and naturally caused events.

The state of New York has made tremendous strides in preparing mental health and spiritual providers to address myriad reactions experienced by disaster victims, their families, and relief personnel, and to provide individual and community-based resilience interventions. A statewide training curriculum and dissemination model has been developed and initiated over the past 16 months, resulting in >1,200 trained professionals to-date.

This presentation will describe the processes involved in developing a statewide disaster mental health training program with implications for other states and countries. Issues to be discussed include: (1) how to foster collaborations with state and local stakeholders to develop and sustain a training program; (2) constructing evidence-based training curricula and competencies; and (3) methods for evaluating the satisfaction and efficacy of training.

Keywords: disasters; public health; mental health; preparedness; United States
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Session 2: First Aid

Chairs: Carol Amaratunga; Gloria Leon

Psychosocial Assistance during Emergencies: The Current Situation in the Czech Republic

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With the increasing number of emergencies (floods, traffic accidents with a large number of casualties, and fires) and potential threats (terrorist attacks, natural, and industrial accidents), the need to provide psychosocial support to its citizens has grown during the last few years in the Czech Republic.

This presentation will discuss the main principles, stages, and forms of psychosocial assistance as well as the development of psychosocial assistance in the Czech Republic. This includes the systematic development of psychosocial assistance by the Ministry of the Interior of the Czech Republic, non-governmental organizations, Czech Airlines, the Ministry of Health, the Ministry of Foreign Affairs, and the Medical Rescue Service. The networking of psychosocial assistance providers during large-scale emergences, disasters, and acts of terrorism abroad, a central system of management of psychosocial assistance, and the exercises of the Integrated Rescue system also will be discussed.

This presentation also will review psychology in crisis management and the myths and realities of situations as related to the affected population and the principles of providing valid information to the public.

This discussion will conclude with the objectives for psychosocial assistance in the Czech Republic in view of new threats. Intermediate objectives include: (1) developing standards; (2) improving cooperation; (3) creating and implementing intermediate and long-term assistance-oriented policies; (4) developing psychosocial assistance systems; (5) focusing on the specifics of mass-casualty incidents and chemical, biological, radiological, nuclear, and explosive-related incidents; (6) creating and implementing culture-sensitive programs and policy; (7) developing cooperation with the media; and (8) creating an umbrella organization for disaster and crisis psychology.

Long-term objectives include: (1) creating and implementing a public awareness campaign; (2) creating community development; (3) working with schools; (4) enhancing international cooperation; (5) conducting research in the field of emergency situations and crisis management; and (6) making efforts to unify terminology.

Keywords: crisis management; Czech Republic; disasters; emergencies; psychosocial assistance
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Psychological First Aid

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Psychological First Aid is an intervention that has been embraced by the Red Cross movement, the Institute of

Medicine, and the National Center for Post Traumatic Stress Disorder.

> *In the past decade, there has been a growing movement in the world to develop a concept similar to physical first aid for coping with stressful an traumatic events in life. This strategy has been known by a number of names but is commonly referred to as psychological first aid (PFA).*—Institute of Medicine, 2003.

Psychological First Aid is an approach for providing assistance to victims, family members, and first responders in the immediate aftermath of disaster. It has been designed to reduce the initial distress caused by traumatic events and to foster short- and long-term adaptive functioning.

The basic objectives of PFA are to: (1) establish a human connection in a non-intrusive manner; (2) enhance safety and provide comfort; (3) calm and orient emotionally distraught survivors; (4) offer practical assistance and information to help survivors address their immediate needs; (5) connect survivors as soon as possible to social support networks; (6) support positive coping efforts; (7) empower survivors to take an active role in their recovery; and (8) provide information that may help survivors to cope effectively with the psychological impact of disasters.

Psychological First Aid can be provided by a variety of disciplines including: (1) mental health specialists; (2) first responders; (3) emergency medical providers; (4) school personnel; and (5) faith-based providers.

This presentation is designed to give Congress attendees a basic overview of PFA.

Keywords: disaster; mental health; Psychological First Aid; psychology
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Beliefs and Attitudes to Family-Witnessed Resuscitation among Doctors, Nurses, and Paramedics in Emergency Departments

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Background: The tragedy of the sudden or unexplained death of a patient in the Emergency Department (ED) can leave the surviving loved ones with many unanswered questions. Giving the family the option to be present during resuscitation offers a more compassionate and family-centred approach to this crisis.
Objective: To provide an insight into the attitudes and beliefs of UK-ED staff about family witnessed resuscitation (FWR).
Methods: A survey was conducted among the doctors, nurses, and paramedics who work in two UK EDs. Experience, life support training, years in practice, consent issues, as well as ethical factors and concerns regarding medico-legal implications were sought. A 5-point Likert Scale was used and mean scores were analyzed.
Results: Of the 129 staff members surveyed, 34% of doctors, 29% of nurses, and 35% of paramedics believed in the concept of trauma FWR. In cardiac arrest patients, 55% of staff members were in favour of FWR, 28% opposed, and 17% were undecided. In addition, 62% of respondents believed that litigation was possible with FWR (mean 1.9; SD 0.8), and 83% thought that critical incident debriefing would be of benefit to assist staff dealing with stress (mean 1.5; SD 0.4). Fewer doctors believed in FWR in cardiac arrest patients compared to nurses (p =0.004) and paramedics (p =0.006). In trauma, these differences were non-significant.
Conclusions: Healthcare professionals caring for families in the EDs must recognize the need for compassionate, family-centred care using a well-trained and motivated team, equipped with effective, well thought-out guidelines.

Keywords: attitude; belief; emergency department; family; psychosocial; resuscitation
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Effective Disaster Mental Health Policy is Integral to Preparedness

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Studies show that the impact of the terrorist attacks of 11 September 2001 was widespread and long-lasting. A study of children in grades 4–12 found that 28.6% of the children showed symptoms of depression and/or anxiety six months after the attacks. Data from a 2003 survey show that two years after the attack, 30% of city adults continued to feel depressed, and 26% continued to show multiple emotional reactions to 11 September 2001. For children, 24% showed signs of anxiety, depression (12%), sleep disturbances (11%), and 16% complained of somatic problems. That same year, crisis counseling services ("Project Liberty") lost their funding despite documented need. The crisis counseling model was and still remains limited in the degree to which it diagnoses and treats mental health problems. While crisis counseling focuses on services provided during a disaster, data show that one year after 11 September 2001, only 13% of New York children who were affected by the attacks received professional services. More than (US)$150 million in federal funds were allocated for crisis counseling. However, Project Liberty was cancelled so abruptly that funds were returned while people in need went unserved. Currently, similar problems now are occurring in the aftermath of Hurricane Katrina. Providers in New Orleans are expected to screen children for mental health needs and refer them for services, but there is a grossly inadequate supply of places to which referrals can be made. Evidence on which effective disaster mental health policy may be based with reference to baseline service capacity, applicable law (the Stafford Act), and regulations will be presented.

Keywords: disaster; emotional reactions; mental health; preparedness; symptoms
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Impact of the Chernobyl Disaster Perceptions on the Reproductive Health of Ukrainian Women

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Background: This study examines perceptions of the Chernobyl nuclear accident and reproductive health decisions among two populations in Ukraine: women who lived in the relatively non-contaminated city of Lviv (Control Group) and women relocated to Lviv from the contamination zone surrounding Chernobyl (Evacuee Group). The association between the women's exposure to the accident and their psychological and physical health also was investigated.
Methods: A survey was administered to the Control Group (n = 69) and the Evacuee Group (n = 28), and included measures of: background and socioeconomic status, knowledge and attitudes of the Chernobyl disaster, reproductive-making factors, psychological and physical health, and reproductive history. The surveys contained investigator-created questions and well-established scales (e.g., Brief Symptom Inventory etc.).
Results: Overall, the Evacuee Group exhibited greater levels of stress reactions after Chernobyl, less trust in the information provided by the authorities and greater health anxiety than exhibited by the Control Group. The psychological and perceived physical health measures of the Evacuee Group also were lower than those of the Control Group. Evacuees reported that Chornobyl had a significant impact on their reproductive decisions. This was supported by a greater decrease in live births and an increase in the number of abortions after the accident in comparison to the Control Group.
Conclusions: These findings reveal that over nineteen years later, women evacuated from Chernobyl following the nuclear disaster, reported significantly poorer psychological and physical health. Evacuees also continued to manifest health anxiety and stress reactions. The impact of the event and subsequent evacuation documented in this study on life course decisions and psychological status suggests that additional attention should be paid to the socio-psychological aftermath of major disasters.
Keywords: Chernobyl; disaster; reproductive health; Ukraine; women
Prehosp Disast Med 2007;22(2):s141

Session 3: After Care

Chairs: Paula Madrid; M. Rooze

Establishing Permanent Mental Health Programs Post-Hurricane Katrina: Lessons Learned and Recommendations for Practice in Underserved Communities Impacted by Mass Trauma

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Operation Assist, a joint initiative of Columbia University's National Center for Disaster Preparedness and the Children's Health Fund was formed after Hurricane Katrina hit the Gulf Coast of the United States in August 2005. Mental health, medical, and public health professionals have spent one year addressing the needs of victims through direct work and research programs, which have resulted in findings relevant to disaster preparedness, resilience, and the creation of child-focused mental health programs post-disaster. While the immediate impact of a disaster is ubiquitous and widespread, children are most likely to require mental health intervention following a disaster. It also is important to care for families and service providers who also are at risk. Operation Assist staff have worked closely with local community leaders as well as with key health and mental health officials to develop relevant programs to meet the mental health needs of children and families. The proposed presentation will describe one year's work with children and families affected by Hurricane Katrina. Program findings, recommendations for future work and implications for policy, delivery and practice that are applicable to underserved communities impacted by mass trauma around the world will be discussed.
Keywords: children; disaster; Hurricane Katrina; mental health; public health
Prehosp Disast Med 2007;22(2):s141

Assessing Mental Health Disability and Its Psychosocial Correlates in a Cohort of Displaced and Residents from the Hurricane Katrina-Affected Gulf Coast

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A number of clinical and social psychologists have described acute traumatic stress as a normative response to disasters, much of which may be time-limited. However, other individuals exposed to disasters and major traumas experience varying degrees of significant mental health disability which may require clinical or social interventions. The field of disaster mental health has categorized patients in to one of three broad categories: (1) individuals with pre-existing psychiatric disorders who need ongoing, continuous care and treatment; (2) individuals with significant mental health disability subsequent to a disaster that might be related to post-traumatic stress disorder or other clinical

depression or anxiety disorders; and (3) individuals with a more diffuse symptomatology and mental health distress that may not be defined sufficiently so as to be characterized as a clinical condition. The latter two categories of patients may be more appropriately identified and treated based on the psychosocial factors defined in Silove and Steel's ADAPT model (Adaptation and Development After Persecution and Trauma), which include threats to safety and security, disrupted interpersonal bonds, confused identities and roles, and destabilized institutions. The current study examines these psychosocial correlates in a cohort of 1,245 randomly sampled, displaced and heavily impacted households in Louisiana and Mississippi, post-Katrina, and further considers their relationship to emotional and behavioral difficulties experienced by children who were exposed to the disaster. The prevalence of mental health disability among a disaster-exposed cohort, and the potential clinical and social interventions to address them will be discussed.

Keywords: disability; displaced persons; Hurricane Katrina; mental health; psychosocial
Prehosp Disast Med 2007;22(2):s141–s142

Population Selective Serotonin Reuptake Inhibitor Prescription Rates Following a Terrorist Attack

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In order to determine if mental health service utilization increased following a terrorist attack, changes in population psychoactive drug prescription rates were assessed. The rate of selective serotonin reuptake inhibitor (SSRI) prescription use among enrollees of a public benefit insurance program in New York was measured before and after the terrorist attacks of 11 September 2001. The association between the geographic proximity to the events and the changes in the rate of SSRI prescription use around 11 September 2001 was assessed.

From September to December 2001, there was an 18.2% increase in the SSRI prescription rate compared to the previous eight month period ($p = 0.0011$) among individuals residing within three miles of the attack site. While there was a 9.3% increase in the SSRI prescription rate for non-exposed residents, this change was not statistically significant ($p = 0.74$).

In conclusion, there was a quantifiable increase in the dispensing of psychoactive drugs following the terrorist attacks of 11 September 2001. This effect varied in response with geographic proximity to the events. These findings build on the knowledge of the pervasive effects of disasters and terrorist events on population health, and demonstrate the need to include mental and behavioral health as key components of surge capacity and the public health response to mass traumas.

Keywords: medication; mental health; public health; surge capacity; terrorism
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Emergency Department Utilization for Mental Health Care after a Terrorist Attack

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Introduction: The purpose of this study was to assess the utilization of the emergency department for behavioral and mental health conditions in the aftermath of the terrorist attacks of 11 September 2001.

Methods: A New York State public benefit insurance program database was analyzed.

Four mutually exclusive geographic areas located at varying distances from the New York City attack site were identified. The data were divided into four time periods. All persons in the files were categorized by their postal codes of residence. Primary emergency department diagnoses were coded for post-traumatic stress disorder, substance abuse, psychogenic illness, severe psychiatric illness, depression, sleep disorders, eating disorders, stress-related disorders, and adjustment disorders.

Results: There was a 10.1% temporal increase in the number of emergency department behavioral and mental health diagnoses following the 11 September 2001 terrorist attacks for adult Medicaid enrollees residing within a three mile radius of the attack site. The incidence of these diagnoses declined, relatively in other geographic areas. In population-based comparisons, Medicaid recipients who lived within three miles of the World Trade Center following the terrorist attacks had a 20% increased risk of an emergency department mental health diagnosis (Incidence Density Ratio 1.2; 95% confidence interval 1.1–1.3), compared to those who were non-New York City residents.

Conclusion: This may the first report of a quantifiable increase in emergency department utilization for mental health services among persons living in proximity to a terrorist attack and emphasizes the increasingly complex role that emergency departments play in responding to terrorism and disasters.

Keywords: behavioral health; Medicaid;mental health; post-traumatic stress; terrorism
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Social Support as a Buffering Factor Against Stress Reactions like Post-Traumatic Stress Disorder

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Introduction: The impact of Event Scale-Revised (IES-R) is one of the most regularly used forms of questionnaires in epidemiological research on disaster mental health regarding post-traumatic stress disorder (PTSD). The IES-R is used to determine the incidence and frequency of self-reported post-traumatic symptoms, according to the 4th edition of *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) criteria. It is not clear why some people develop PTSD and others do not after experiencing a traumatic event. Also, among those scoring high on the

IES-R, some may not have experienced a traumatic event. The purpose of this study is to clarify the differences between: (1) IES-R-J (the Japanese-language version) high and low scoring groups; (2) IES-R-J high and low scoring groups who had experienced a traumatic event; and (3) those with high IES-R-J scores with and without experiencing a traumatic event.

Methods: The IES-R-J questionnaire was distributed to all firefighters in a local fire department.

Results: Of the 157 possible subjects, 131 (83.4%) responded to the questionnaire. All were Japanese males with a mean age of 42 years; most worked a 24-hour shift.

In general, those who scored high on IES-R were unhealthy, stressed, and received little social support. Those who had experienced a traumatic event and received social support received low IES-R scores, that is, they experienced few PTSD symptoms. Respondents who had experienced traumatic events and received little social support, scored high on the IES-R.

Conclusions: Social support is a key buffering factor against the development of PTSD.

Keywords: firefighters; impact of event scale-revised (IES-R); Japan; post-traumatic stress disorder (PTSD); social support
Prehosp Disast Med 2007;22(2):s143

An Online Tsunami System

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The goal of this study was to create an online Tsunami survivor directory for the purposes of community-building and research. Over a 14-month period, that began two weeks after the 2004 Tsunami, 129 Dutch Tsunami survivors visited a Website that utilized online, self-report measures assessing peri-traumatic mental status, post-traumatic stress, and depression.

A cross-sectional analysis demonstrated that 80% of the Website visitors suffered from ≥1 dissociative symptom during or shortly after the Tsunami. Fifty-five percent of the Website visitors suffered from symptoms of post-traumatic stress.

Keywords: mental health; online; post-traumatic stress; tsunami; Website
Prehosp Disast Med 2007;22(2):s143

Session 4

Chairs: T. Levanon; M. del Rocio Saenz

Disaster Mental Health Training Programs in New York City following 11 September 2001

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Following large-scale disasters, the need for mental health care resources to provide both acute and long-term services to the community is well-documented. However, data on the effectiveness of communities in meeting the post-disaster mental health needs of those affected are sparse. In order to improve post-disaster mental health care in New York City, the New York City Department of Health and Mental Hygiene, in collaboration with the Columbia University National Center for Disaster Preparedness assessed the quality of mental health care available in the aftermath of the 11 September 2001 World Trade Center disaster in New York City by conducting a review of the disaster mental health training programs provided by community-based, professional, hospital and government agencies. Results indicate that while a considerable number of mental health training programs were provided, the programs varied greatly in a number of respects. In particular, a lack of standardization regarding disaster mental health training curriculum and learning objectives was noted. Record keeping and trainer credentialing inconsistencies were common across agencies. Most of the training programs offered are no longer available. Key recommendations for improving the status of disaster mental health training in New York City, and perhaps elsewhere, include establishing criteria for all essential aspects (e.g., trainers, curriculum, assessment, etc.) to improve the overall quality of these programs and provide an essential, post-disaster service.

Keywords: 11 September 2001; disaster; mental health; psychosocial; training
Prehosp Disast Med 2007;22(2):s143

Post-Traumatic Stress Disorder in the Firemen Corporation of Portalegre, Portugal: Prevention and Treatment

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This presentation concerns the presence of Post-Traumatic Stress Disorder (PTSD) among Firemen between 16 and 60 years of age in the District of Portalegre, Portugal. Post-Traumatic Stress Disorder is particularly relevant because these workers constantly face stressors.

The authors intended to identify the type of personality that is more susceptible to the development of PTSD, the existence of manifestations indicative of PTSD, and possible vulnerability to stress. They also assessed the presence of somatic symptoms.

The following evaluation instruments were used: (1) The Big Five Inventory (BFI) of John, Donahue, and Kentle (1991); (2) PTSD-Anxiety Disorders Association (1994); (3) Escala de Vulnerabilidade ao Stress of (QVS) Adriano Vaz Serra (2000); and (4) General Health Questionnaire (GHQ) of D. Goldberg (1978). These instruments were used to determine the presence of factors that could lead to PTSD.

It was verified that 20% of the participants displayed manifestations indicative of PTSD. It also was verified that 30% of the participants displayed a high amount of stress vulnerability.

Keywords: fire department workers; Portugal; post-traumatic stress disorder (PTSD); stress vulnerability; stressors
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Psychosocial Care in the Aftermath of Disasters in Amsterdam

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In The Netherlands, terrorism and disasters are a political priority. It is not so much the question of "if", but "when" and "where" such events will occur. Amsterdam, the capital of The Netherlands, is at a relatively great risk, due to its 750,000 inhabitants and many tourists, a large number of people may be affected. This warrants a major disaster plan. A main task of the Amsterdam Municipal Health Services (MHS) is providing help to those who develop disaster-related (mental) health problems. In order to fulfill this task properly, it is important to identify the people that need the most help.

In collaboration with the Impact Foundation, the MHS has developed a procedure to efficiently select victims with disaster-related mental health symptoms. Six weeks and six months post-disaster, a short, population based screening tool will be distributed to the affected persons. This questionnaire consists of well-known, standardized instruments. In the case of elevated scores, the MHS will contact the respective persons. In this outreach approach, the MHS offers a semi-structured interview in which the impact of the event is assessed. In the case of psychopathology, the patient will be referred to a mental healthcare center.

This presentation will outline the psychosocial part of Amsterdam's disaster plan. What will the MHS do in the case of a disaster or terrorist attack in the Amsterdam area? The presentation will focus on the use and validation of the short screening tool, which plays a central role in the disaster plan.

Keywords: disaster; disaster plan; mental health; Netherlands psychosocial
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Living in "Temporary" Housing Two Years after the Hurricane: The Mental Health Implications of Long-Term Residence in FEMA Trailer Camps

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Hurricane Katrina was the first disaster in the US to test the federal government's ability to rapidly construct disaster housing sites for hundreds of thousands of people. Immediately following the hurricane, individuals displaced by the storm were housed by the Federal Emergency Management Agency (FEMA) in hotels and vacant apartments. "Eligible" individuals then were transitioned into government trailers, which were located on private property, in privately owned trailer parks, or in newly constructed, FEMA-run trailer camps. The trailer camps were intended to be a temporary housing solution; however, two years after the hurricane, >13,000 families in Louisiana still are living in the FEMA trailer camps.

The design of the FEMA trailer camps reflects the intended temporary nature of the housing: trailers are lined, row after row, on gravel or rock, often in isolated or desolate areas. Many camps do not have grass or playgrounds; the majority do not have community space in which residents can gather. Temporary disaster housing, designed to meet the basic needs of shelter, can be detrimental to mental and social health when residents continue to live in the locations for the longterm. Residents often have limited or no access to transportation, employers, or community services. The authors will describe how long-term residence in temporary housing impacts the mental health of displaced persons and will provide recommendations for improvement in the design of disaster housing.

Keywords: temporary housing; Hurricane Katrina; longterm residence; displaced populations; shelter
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Ongoing Impact of Hurricane Katrina on Children: Role of School-Based Health Centers

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Introduction: The impact of a disaster on children is widespread, often including long-lasting emotional and behavioral problems. Especially vulnerable are children already coping with poverty, violence, and inadequate medical care: e.g., such as the residents of New Orleans, Louisiana whose communities were devastated by Hurricane Katrina and still remain largely uninhabitable. Currently, an estimated 140,000 children and youth remain homeless, having evacuated following the hurricane, and, in many cases, still are separated from their families. Their devastating loses and the disruption of community ties, including school attendance, place them at an elevated risk for emotional, behavioral, and academic problems.

Methods: Six months after Hurricane Katrina, a descriptive study was conducted to determine the immediate impact of the hurricane. The survey was distributed to 43 of the 56 school-based, health centers (SBHCs) in Louisiana. Results: The response rate was 98%. These schools had an average enrollment of 937 students, with an average mean of 12% of the students were hurricane evacuees. One-half of the SBHCs reported increased patient volume without increased resources. Increases in oppositional and disruptive behavior were reported as follows: (1) arguments, 76%; (2) fights, 64%; (3) truancy, 55%; (4) parent conflict, 36%; and (5) sexual promiscuity, 31%. Other problems that increased included anger, grief, domestic violence, somatic symptoms, sleep disturbance, and suicidal ideation. Schools with a higher percentage of evacuee students reported more problem behavior. Families affected by the hurricane had a high level of need for case management services, including

help locating housing, food assistance, and advocacy to receive benefits, including financial resources. This presentation reviews these findings and bring them up-to-date.

Keywords: behavior; child evacuees; emotional problems; Hurricane Katrina; school-based health centers
Prehosp Disast Med 2007;22(2):s144–s145

Poster Presentations—Theme 14: Psychosocial Aspects

(238) S.O.S. Psychological Aid

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A training program titled S.O.S. Psychosocial Support was launched with the aim to promote appropriate response strategies for emergencies and disasters. This program has been active in Argentina for the past four years, and has reached about 800 beneficiaries.

The training framework was composed of four main courses. It focused on community level actors, such as hospital and sanitary personnel, volunteers, professionals, and practitioners. Community leaders and university actors also were included.

The program primarily was designed to address the lack of knowledge of handling human emotions in situations of social conflict. In this sense, the role played by social actors was essential. A second aim was to provide actors with training on building evacuation techniques, with which few had experience.

Communities are not unfamiliar with the negative aspects of disasters. For this reason, community members should be given tools to help cope with disasters and emergencies. Areas of possible training are: (1) treatment of the behavior of adolescents; (2) implementation of strategies aimed at reducing risks; and (3) promotion of a behavioral change towards better results. A joint participation approach can provide a deeper knowledge of these areas of interest.

Keywords: behavior; community response; disaster; disaster response; training
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(239) Sources of Occupational Stress and Coping Strategies among Emergency Department Nurses

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Introduction: Numerous studies have indicated that job stress is significant in nursing. This will seriously impair the provision of quality care and the efficacy of health services delivery. Therefore, there is a need to generate information about sources of job stress, and the adopted coping strategies used by nurses in emergency department

Methods: A descriptive survey was conducted and 90 emergency ward nurses from three large teaching hospitals in Shiraz City, Iran. were involved in the study. The data were collected through a self-administered questionnaire to identify the sources of job stress and nurses profile and lazarous standard questionnaires to determine the types of coping strategies.

Results: The greatest proportion of respondents were women (86.7%), range 23-50 years, we identified the following stressors:problem related to physical environment,dealing with patients or their relatives, not enough staff, work load, lack of support by nursing administrators, being exposed to health and safety hazards.

The most common strategy used by nurses was Self Controlling (mean = 12.92 ±0.43) and Positive Reappraisal (mean = 12.92 ±0.39) and the strategy least used was a Accepting Responsibility (Mean = 5.88 ±0.29). In our study large proportional of nurses used an emotion-focussed strategy such as attempts to suppress upsetting emotions and remove oneself from the stressful situation but problem-focused approaches were generally less used.

Conclusion: Principals used a number of coping mechanisms during the performance of their duties. The coping scales, Positive Reappraisal and Self-Controlling, are extremely important in emergency department nurses.

Keywords: coping strategies; emergency department; nursing; psychosocial; stress
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(240) Legal Issues in Psychiatric Emergencies

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Psychiatric emergencies are disturbances in thought and feeling or mood and behaviors disorders that required urgent. And intensive attention and intervention. Common instances of psychiatric emergencies are aggression, suicide and suicidal thought, sadism, masochism, destructive behaviors directed to self or others. Patient, clients, caregivers safety is and essential component of caring in emergencies departments. Research results showed that nursing staffs confronted patient's aggression, trauma and injuries 2.5 times higher than other health care staffs. In psychiatric emergencies, we must assess and identifying patient induced risks for nurses and other nurse's safety and security got in center of national organization attention in recent years. Psychiatric organization need full exploration of job-induced risks and ways, strategies for solving and dealing with these risks.

Keywords: aggression; psychiatric emergencies; staff safety and security
Prehosp Disast Med 2007;22(2):s145

Oral Presentations—Theme 15: Research and Health Surveillance

Session 1

Chairs: Joost L.M. Bierens

Researching Disaster Preparedness: Can it be Done?

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It has been said that is not possible to research disaster prospectively, as researchers would have to cause a disaster in order to study one.

Eleven high-fidelity, inter-professional, mass-casualty exercises were conducted by a team of subject matter experts from 2003 until 2006, ranging from terrorism to chemical spills, bus rollovers, and pandemics. They examined the following concepts and observed trends they believe will help increase the number of victims saved during events that overwhelm local hospitals:

1. At the site of the incident
    a. Destination algorithms for casualty distribution;
    b. Treat and release directives for paramedics and nurses;
2. At the hospital
    c. Diversion of minor injuries to "shared care" sites e.g., hospital and non-hospital medical staff;
    d. Diversion of significant others to a Family Imformation Centre;
    e. Establishment of a discharge unit;
    f. Sequential Organ Failure Assessment Score for Critical Care Triage;
    g. Mutual Aid Agreements with long-term care facilities;
3. Both
    h. Triage system even simpler than START;
    i. Situational awareness dashboards; and
    j. Distibuted command systems.

Based on this work, and entity called the Interprofessional Disaster and Emergency Action Studies (IDEAS) Network, consisting of a consortium of Canadian universities, colleges, the government, and subject matter advisors was created. It will be their mandate to evaluate the effectiveness of simulation in concept development and preparing interprofessional teams to respond to disasters.

Keywords: disaster; drill; research; planning; preparedness
Prehosp Disast Med 2007;22(2):s146

Role of Meta-Narrative Mapping in Synthesis of Complex Evidence in Prehospital and Disaster Medicine

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Evidence-based methods are highly suited to the review of experimental studies but other methods must be embraced in prehospital and disaster medicine research where complex policy interventions involving long implementation chains may be evaluated, need local adaptation, and (potentially) have impact at multiple levels (individual, group, community, organization). Complex policy and service interventions are rarely evaluated by high-quality randomised controlled trials (RCTs)—and even when they are, the position of the RCT atop the hierarchy of evidence might, legitimately, be questioned. It is important to recognise the limitations of simplistic "hierarchies of evidence" and not reject evidence as "methodologically flawed" because it does not fit into a familiar taxonomy. Acknowledging the value of diversity of approaches in research, meta-narrative mapping has been developed and used by researchers in areas of complex policy, innovations and interventions.

Using a broad-based search strategy covering electronic databases and journals reporting on disaster and pre-hospital medical studies, we attempted to undertake a meta-narrative review and map the literature into research traditions. The findings were grouped under broad themes and a rich picture was developed using contributions from different traditions. Heterogeneity of approaches and contradictions in findings could be analysed systematically, permitting the ability to draw conclusions instead of statements such as, "there is contradictory evidence" or "more research is needed". This paper will report on meta-narrative mapping and attempt to evaluate the use of such a technique for creating a knowledge repository in disaster and prehospital medicine.

Keywords: disaster; evidence; meta-narrative mapping; prehospital; research
Prehosp Disast Med 2007;22(2):s146

National Academy for Medical Assistance in Accidents and Disasters

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In May 2006, the Dutch ministry of the Interior and Kingdom Relations initiated a project to establish a national Academy for the Medical Assistance in Accidents and Disasters (AMAAD). The AMAAD is hosted by the Netherlands Institute for Safety Nibra and is scheduled to become operational by 01 January 2008.

The aims of AMAAD are: (1) to create an inventory of the current questions in the field of AMAAD; (2) to build a network of expertise from which national and international experts can be selected in case of the need for information; (3) to aggregate existing knowledge of AMAAD from science and practice; (4) to identify gaps in knowledge and initiate scientific research in strategic research projects with the support of professional groups, universities, and research institutes; (5) to establish a helpdesk for advice; and (6) to allow access to current knowledge that is easily and quickly available for field workers, researchers, policy makers and crisis managers in case of a disaster or crisis.

This project is supported by a multidisciplinary scientific group and a steering group that reflects relevant stakeholders in the field of disaster medicine.

In February 2007, a working meeting and an expert meeting occurred in which inventories were made of the current questions and networks. The outcome of these meetings will be presented, as well as the lessons learned from establishing a national AMAAD.

Keywords: Academy for the Medical Assistance in Accidents and Disasters (AMAAD); disasters; knowledge; research
Prehosp Disast Med 2007;22(2):s146–s147

Comparative Analysis of Medical Needs and Living Conditions in the Sub-Acute Phase of the Iran Earthquake and Sri Lanka Tsunami Disaster

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Objective: The objective of this study was to clarify typical characteristics of medical needs and living conditions in the sub-acute phase of the Iran Earthquake and the Sri Lanka Tsunami Disaster.
Methods: The study was performed by interviewing displaced persons in the refugee camps using a questionnaire sheet and by examining the status of the medical needs and living conditions (including the water and sanitation situation, and insect bite situation).
Results and Discussion: Medical needs of displaced persons from the Iran Earthquake included: respiratory disease (50%), trauma (33%), and mental problems (8%). Living conditions such as water were maintained fairly well, although in several cases people did not have access to a toilet.

For the Sri Lanka Tsunami disaster, physical trauma was the most common medical need, affecting 24% of those interviewed. This was followed by respiratory disease (14%), skin disease (11%) and mental problems (7%). Water and sanitation conditions were relatively good.
Conclusions: The following conclusions were made:

1. Typical characteristics of medical needs in the sub-acute phase of earthquake- and tsunami-related disaters are respiratory disease, mental problems, and trauma.
2. Information obtained from formal surveys provide valuable data for disaster relief planning.

Keywords: analysis; Iran; needs; research; Sri Lanka
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Digital Screening in Trauma Care Centers: A Case Study with the Save Accident Victims Association of Nigeria (SAVAN)

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Trauma care centers are known for their workload on health care providers, especially during disasters or mass casualty events due to road traffic accidents. The prioritization of patient care leaves little time or opportunity for routine research or for screening for causative factors, although alcohol and substance abuse may be causative factors of many unintentional injuries. Because of the absence of the availability to rapidly screen patients for such factors, Save Accident Victims Association of Nigeria (SAVAN) introduced digital alcohol breathalyzers, to determine blood alcohol concentration, and digital oral screen machines, in order to screen for substance abuse in local trauma care centers. The oral screen machine uses saliva to identify cocaine, heroin, cannabis, and amphetamine in patients abusing such substances.

A tertiary health institution was selected for the pilot study. During a trial period of six months, approximately 43% of road traffic accident victims had an elevated blood alcohol concentration, while 2.5% of victims tested positive for other substance abuse. The influence of alcohol and other substances occurred more frequency in males than females (ratio: 3:1), and in the age group 21–30 years. Among those tested, alcohol followed by cocaine. Of the 2.5% that tested positive for substance abuse other than alcohol, 87.5% were drivers who transported logs from the forest to a sawmill.

Digital screening for alcohol and substance abuse should be encouraged in all trauma care centers to facilitate further research on this subject.

Keywords: alcohol; digital screening devices; Save Accident Victims Association of Nigeria (SAVAN); substance abuse; traffic crashes
Prehosp Disast Med 2007;22(2):s147

Session 2

Chairs: Joost L.M. Bierens

Toward a Generic Method for Evaluation and Assessment of Medical Management in Large-Scale Disaster Drills

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Introduction: This study aims to demonstrate progresses in developing a generic method for evaluating medical management in live exercises by applying a newly designed method and technology.
Methods: In a simulated building explosion (112 victims), time schedules concerning triage, evacuation procedures, medical treatment, and MDs' positions were recorded by trained observers and complemented by other data, such as radio communications, pictures, videos. The CITE® Explorer software was used to integrate, index, and present all data. The quality of medical care quality was evaluated analyzing timing and treatment accuracy for four groups: Airways (A), Breathing (B), Circulation (C), and Other (O). Contingency tables and non-parametric tests were used to compare treatment and timing. Radio communication and position tracking were used to evaluate decision-making, command, and control.
Results: The correct, under- and over-triage rates were 84%, 11%, 5%, respectively. Evacuation times for the crash and the Advanced Medical Post were established. Correct maneuvers were 85.2%, 78.7%, 65.6%, 57.4% in A, B, O, and C groups, respectively, with significant differences in A vs. C (p <0.0001) and B vs. C (p = 0.0009) groups and for

A vs. O (p = 0.0018) and B vs. O (p = 0.039) groups, but not for A vs. B or C vs. O groups. A total of 246 radio calls were qualitatively classified according to contents.
Conclusions: The integration of data enables a combination of qualitative and quantitative data to link treatment and outcomes to patient management. On that basis, it is possible to consider agency-specific evacuation protocols, poor resource utilization, and different education levels among rescue personnel.
Keywords: assessment; disaster drills; explosion; treatment and timing; triage
Prehosp Disast Med 2007;22(2):s147–s148

Pediatric European Network for Treatment of AIDS (PENTA): Development of a Pediatric Trauma Registry in Flanders, Belgium

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Funded by the Flemish Fund for Scientific Research FWO "Levenslijn Kinderfonds".

Objective: To collect epidemiological data on trauma and trauma care among children and adolescents in Flanders, Belgium, as available data are fragmentary and out-of-date.
Methods: The Pediatric European Network for Treatment of AIDS (PENTA) network prospectively collected data in a representative sample (n = 18) of Flemish emergency departments (ED). All children (age 0–18 years) who presented at the ED in 2005 or died prehospital due to trauma were included. The basic "A" registry consisted of 30 variables, the more exhaustive "B" registry (defined for severe trauma as the length of hospitalization exceeding 48 hours, including all non-survivors) consisted of 291 variables.
Results: The incidence of pediatric victims of trauma presenting at a Flemish ED was approximately 110/1000/year. Additional data were collected in a random sample of 7,875 cases (24% of all patients). The mean age of the cohort was 9.6 ±5.5 years; 59% were male. The majority of injuries were minor in severity. Hospital admission was needed for 6.6% of patients, mostly for <48 hours. Of all cases, 0.8% were considered severe and included in the "B" registry (median injury severity score = 9, Interquartile range = 13). Of these patients, 10% were discharged eventually with moderate to severe disability, and 6.1% died.
Conclusions: The epidemiological data collected by PENTA on pediatric trauma in Flanders will be used for specific research, will aid prevention initiatives, and guide decision-making. Eventually, they will be used for auditing trauma care.
Keywords: epidemiological data; Flanders; pediatric; registry; trauma
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Research on Increase of Effectiveness of Prehospital Triage in Mass Casualty Incidents with Application of the WASKOs Command Center Support System

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The Polish rescue system is forced to react to an increasing number of Mass-Casualty Incidents (MCIs). In such extreme situations, correct prehospital triage plays a key role in the organization of emergency care both at scene of the event and at the Emergency Departments (EDs). The Polish rescue system uses popular methods of triage based on START, JumpSTART, and Triage SIEVE (sort) systems. The objective of the research was to evaluate the opportunities for using digital technologies currently available in management support systems and telemedicine to increase the effectiveness of prehospital triage.

The research was conducted at the 2nd Polish Winter Championships in Emergency Care that were held in Szczyrk and participated by 40 ALS teams. An MCI was simulated in which 30 people were injured. After the first triage, re-triage effectiveness, transport priorities, and casualties allocation to local EDs were evaluated using the Command Centre Support System (CCSS). A subjective assessment of digital technology implementation opportunities was made based on survey.

Digital technology implementation resulted in the provision of more effective emergency care both from patients triage accuracy, transport priority, ED allocation, and from the point of view of time required to perform triage and emergency care management compared to methods based on traditional procedure and transmission of patients information and particulars.

Implementation of digital technology increases the effectiveness of emergency care in MCIs. A subjective assessment of digital technology skills implementation explicitly correlates with availability of technology in everyday rescue and medical practice.
Keywords: digital technology; mass-casualty event; simulator; triage
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Earthquake Preparedness for Foreign Residents in Sendai

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Introduction: Earthquakes frequently occur in Sendai, Japan. There exists a 99% probability that a strong earthquake will occur in Sendai within the next 10 years.
Objectives: This survey sought to answer several questions about the knowledge of foreign residents regarding earthquake preparedness and their response to the earthquake that occurred on 16 August 2005 in Miyagi. It also addresses the difficulty in accessing relevant information on earthquake preparedness.

Methods: Data were gathered through a questionnaire survey that was distributed to available foreign residents.
Results: Of the respondents, 26% can not communicate in Japanese, while 90% can communicate in English. Two women could not communicate in either Japanese or English. Most of the respondents did not take safe action during the Miyagi earthquake: 55% of respondents who were in a building at the time of the earthquake did not respond safely, and 75% of those who were driving did not respond safely. Among respondents, 84% did not have a emergency kit prepared, 70% did not have their furniture fixed on the walls, 57% did not know their evacuation area, and 51% did not know how to provide first aid to injured people.
Conclusions: Foreign residents in Sendai are vulnerable to disasters; they require better access to information in English in order to be better prepared and to minimize risk during and following up-coming earthquakes.
Keywords: earthquakes; foreign residents; Japan;preparedness; risk
Prehosp Disast Med 2007;22(2):s148–s149

Community Preparedness: A Disaster Management-Trigger Mechanism as a Model in Disaster Preparedness

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The regular occurrence of disasters in coastal Andhra Pradesh, India, has had a series of repercussions on the country's economy and development policies, and on the daily lives of millions of Indians. Disaster prevention and preparedness is a neglected aspect of disaster management in this area.

Coastal Area Disaster Mitigation (CADME) has initiated a program that induces early warnings and preparedness in 350 most vulnerable villages on the coast.

The effort made by CADME has been successful and is considered a "best practice" to mitigate the effects of events.
Keywords: emergency; integration; mitigation; preparedness; taskforce; vulnerability
Prehosp Disast Med 2007;22(2):s149

Poster Presentations—Theme 15: Research and Health Surveillance

(241) The Management of Healthcare Services at the Time of Natural Disasters: A Qualitative Study

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Iran is one of the world's most predisposed and liable countries to disasters. Studies have shown no coordination in providing health services to Iran at the time of disasters. Thus, studying the management of health services is important. This study makes an attempt to bring the experiences of health service providers who were in disasters and to suggest effective factors in the management of health services.

This study is based on the grounded theory. Participants consisted of a group of 17 individuals (15 males and two females) comprised of six nurses, two psychiatrists, an epidemiologist, a social worker, a psychologist, a PhD in health, a master of health, a nurse aide, two Bam residents, and a physician. The average of the ages of the participants was 37 years. All had at least one disaster-related experience. Data were obtained by semi-structured interviews, which were recorded, transcribed, and analyzed using the Strauss and Corbin method.

The participants emphasized management during disasters, and issues such as planning, organization, coordination, and participation of other countries were brought up as well. The lack of planning and discipline in providing health services, the division of labor, duties and responsibilities, lack of coordination, and the inability of the United Nations in coordinating international participations are considered main obstacles in providing required health services for survivors at the time of disasters. These issues can be dealt with by appropriate management.

Since the participants emphasized management and its important role in coordinating continuous, accessible health services, preparedness, attention to the importance of international, provincial, and local planning, human resources, division of labor, resources, and equipment. Proper management can help to provide adequate health services in disasters.
Keywords: coordination; disaster; disaster management; Iran; health services
Prehosp Disast Med 2007;22(2):s149

(242) Pre-Crash Phase Development of Blood Screening in a Southern Nigeria City: A Case Study with the Save Accident Victims Association of Nigeria (SAVAN)

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The use of auto-bikes as commercial transportation became popular in Nigeria in the mid-1980s. This is due to the failures of mass transportation infrastructures in the country. The sudden rise in auto-bike transportation with no safety or regulatory measures and a lack of trained personnel led to a rise in the number of crashes involving auto-bike drivers, their passengers, and pedestrians.

One factor related to the "golden hour" usually is massive loss of blood. This puts pressure on the blood bank for blood type screening, and the delay in obtaining needed blood for transfusion may lead to increased mortality. The delay in accessing blood for the victims led to establishing pre-crash blood data as an incentive for all auto-bike riders that participated in a Save Accident Victims Association of Nigeria (SAVAN) training program.

A total of 1,250 bike riders were screened for their blood type. Volunteers for the screening included nurses, scientists, and doctors. The results of the screening revealed that 54.3% of the volunteers had a blood type of O positive, 20.3% were A positive, 18.8% were B positive, 3.7% were O negative, 1.3% were AB positive, 1.1% were B negative, and 0.5% were A negative. None of the volunteers had a blood type of AB

negative. All blood type groups were documented with coded identification cards so this information could be retrieved easily when needed.

Such pre-crash data had positive effects on trauma and other systemic emergency care requiring blood transfusions. The time lag in obtaining blood was significantly reduced, thus enhancing survival of victims.

In conclusion, blood type data from all stakeholders should be well documented to facilitate blood transfusion during major crises or disasters.

Keywords: auto-bike; blood types; Nigeria; traffic crashes; transfusion
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(243) Reporting Blindly in Randomized Controlled Trials in Prehospital Emergency Medicine Literature

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Introduction: Double blind is a term that frequently is used by researchers and accepted by readers as a key marker of the validity of a randomized controlled trial (RCT). Double-blind trials tend to report smaller effects than similar trials that are not double blind. In most clinical trials the success of the blinding procedures is assumed, but not tested. Sub-optimal reporting of blinding in full text publications and secondary journals has hindered readers. Trials in prehospital medicine are difficult to conduct due to numerous reasons, both logistic and ethical. However, it would be prudent to strive to achieve methodological standards in designing and reporting RCTs. The objective of this study is to assess how often the success of blinding is tested in RCTs in prehospital medicine, to describe the methods used, and to assess the frequency of trials with successful blinding

Methods: Prehospital randomized controlled trials using the Cochrane prehospital search filter were identified using MEDLINE, EMBASE, CINAHL, and The Cochrane Library. Full paper versions of randomized controlled trials will be retrieved, hand and electronically searched, and assessed for reports of blinding with the test for success of blinding. Two reviewers will abstract data and analyze results. Statistical analysis will be conducted using Microsoft Excel.

Results: The work is in progress and will be presented at WCDEM 2007.

Conclusions: It is difficult to conduct double-blind randomized controlled trials in prehospital emergency medicine due to logistic and ethical reasons. If double blind RCTs are conducted, those conducting the trials should describe the methods of blinding and matching characteristics in detail.

Keywords: double-blinding; literature; prehospital; randomized controlled trial (RCT); success
Prehosp Disast Med 2007;22(2):s150

(244) Mobilizing a Rapid Assessment of Population Health and Social Service Needs Subsequent to a Large-Scale Disaster

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Hurricane Katrina led to the largest population movement in contemporary American history, and engendered substantial population needs among evacuees and displaced populations. Using housing data supplied by the US Federal Emergency Management Agency, a research team developed a multi-stage cluster sampling plan, assembled a collaborative fieldwork operation involving five university science centers. A total of 1,245 face-to-face household surveys were conducted in Louisiana and Mississippi to assess the population's health and social service needs. The cooperation rate among contacted respondents was 83%. The logistics of mounting such an assessment effort in a developed country will be presented, and include: (1) the establishment of administrative, field, and data protocols; (2) the assembly and training of a survey research team; (3) the management of material and transportation logistics; and (4) the maintainanence of high-quality data and research integrity in the face of field challenges.

The Louisiana field work was completed in nine days; the Mississippi field work was completed in 18 days. The research team abided by four principles: (1) using survey measures comparable to a national data set in order to approximate "pre-" and "post-" disaster conditions; (2) using standardized mental health and physical health scales, to allow for cross-study comparisons; (3) adopting and maintaining a rigorous sampling protocol, in order to maximize the level of representation of the sample; and (4) streamlining the implementation and reporting cycles so as to provide policy-makers and providers with timely data. The presentation will elaborate upon the planning considerations involved in mounting such research operations in post-disaster environments.

Keywords: Hurricane Katrina; population; public health; assessment; survey
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(246) Disaster and Risk Assessment of Chemical in the Workplace

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Objectives: The objective of this study is to look into disaster and risk management in occupational settings where workers are exposed to organic chemicals.

Methods: The study was conducted among 500 workers in various manufacturing industries. There was 100% use of chemicals in the industries, either as raw material or as solvent for processing. The industries generated dust and vapours, as well as acids and caustics. The blood lead result of the 285 subjects revealed that 40.7% of subjects had within the 21–30 ug/dL, which the Department of Health considers to be inimical to health of workers. When hazards and illness were correlated with alpha set at 0.05, radiation expo-

sure was associated with bone pain, and dust exposure with eye strain and viral exposure. Based on these results, a proposed chemical exposure rating was performed. For example, an exposure rating estimate of zero means no exposure either through dermal contact or inhalation. Moderate exposure is given an estimate of 2 which means that the subject is exposed for <50% of the total 8-hour workday. Very high exposure is above the TLV, which varies per chemical, and the exposure time >8 hours.
Conclusion: This is a significant study that looked into the actual amount of worker exposure to chemical, which may result in a chemical disaster.
Keywords: chemicals; exposure; hazards; health; occupational setting
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(247) Multidisciplinary Approach in Environmental Assessment of Chemical Spill Due to Mining in the Philippines

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Objective: The purpose of this study was to determine the health epidemiology associated with chemical spills in mining industries.
Methods: This was a preliminary study to establish a framework on how to investigate and manage chemical spills in the metallic mining industry in The Philippines. Consultations with experts from other disciplines such as sociology, epidemiology, occupational and environmental health, engineering, applied chemistry, and social work were obtained.

Chemical spills from mining industries are not uncommon in The Philippines. When such events arise, there is a need for a standard procedure for the proper investigation, gathering of data, and overall management of the situation. The basic elements of this process should include investigations of the workplace, of the immediate environment, and the community health in order to establish parameters of emergency management. Investigation of the workplace involves a detailed account of the industrial accident, the causes of leaks or spillage into the river system, and the breakdown of the work process, machines, and other facilities. Samples of water and soil are taken on a spatial basis in order to establish distance of affectation. Air sampling during chemical exposures provides data on concentrations.
Conclusions: This is a significant study that developed a standard management procedure on how to investigate chemical spills and contaminations from mining industries.
Keywords: chemical spills; consultation; management procedure; mining industries; The Phillipines
Prehosp Disast Med 2007;22(2):s151

Oral Presentations—Theme 16: Types of Disasters

Session 1: Chemical, Biological, Radiological, and Nuclear 1

Chairs: Victor Koscheyev; M. Ruijten

Standardization of Mobile Analytical Equipment for Chemical, Biological, Radiological, and Nuclear Agents in a European Country

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Background: Tactical hazardous materials (HAZMAT) response, medical treatment, and logistics are highly dependent on early identification of the chemical, biological, radiological, and nuclear (CBRN) agents involved.
Discussion: In 1998, the German federal government modernized its fleet of CBRN detection vehicles. By 2001, 371 vehicles were delivered to local fire stations. These "CBRN explorers" have been placed in strategic, geographically important locations in the country in order to assure shorter response times by rapid deployment of high-tech analytic capabilities. These vehicles are equipped with comprehensive CBRN analysis and measurement technology, telecommunication, geopositioning, meteorological, and personal protective equipment. The German government distributed these uniformly equipped CBRN explorers to assure more timely and consistent analytic capabilities in all geographic areas during HAZMAT disasters. In the United States, the fire departments' HAZMAT teams and other agencies own a variety of non-standardized analytical CBRN tools. The national standardization of analytical CBRN equipment for all US HAZMAT teams should be considered seriously.
Conclusions: The rapid and precise chemical and physical identification of HAZMAT is essential in order to adjust and optimize tactical, medical, and public safety responses. The German federal government has delivered standardized, high-tech analytic CBRN equipment throughout the county. This model of equipement standardization and widespread distribution of mobile CBRN units could serve as an international model.
Keywords: chemical, biological, radiological, and nuclear; Germany; hazardous materials; standardization; vehicles
Prehosp Disast Med 2007;22(2):s151

Dirty Bomb or Radiological Dispersion Device: Preparedness and Management Priorities

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Background: The detonation of a radiological dispersion device (RDD) has become a realistic scenario. The presence of radionuclides at an explosion site, along with triage, medical management, and logstics, will be made more difficult and complex by the unfamiliarity of rescue and medical personnel with how to prioritize exposed bomb victims.

Discussion: A RDD is a conventional explosive device mixed with radionuclides. Upon detonation, is disperses radioactive material. A RDD is not a tactical nuclear weapon and does not produce a thermonuclear reaction by fission. The use of a RDD by terrorists has become a likely scenario, and the presence of radioactive material makes rescue operations more complex. The greatest risk of immediate morbidity and mortality stems from the blast component of the RDD and not from the nuclear exposure. Hence, triage and rescue efforts of RDD victims should focus primarily on the traumatic injuries, followed by management of exposure to radionuclides. The protection of rescue and medical staff, detection capabilities, and a specialized support staff are essential in order to minimize irradiation, contamination, and incorporation by radioactive material of victims and staff. Continuous education and a sufficient supply of equipment aid the successful management of victims of a RDD. Staffing problems after a RDD detonation may arise from absenteeism and refusal to care for victims exposed to radionuclides.
Conclusions: The presence of radionuclear material after the detonation of a RDD complicates the rescue operation and treatment of victims. Continuous education, risk communication, and early deployment of equipment will contribute to the successful management of a RDD detonation.
Keywords: dirty bomb; emergency response; explosive; radionuclides; terrorism
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Prehospital Use of a Mobile Decontamination Unit: Influence on Body Temperature and Discomfort Experienced by Healthy Volunteers

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Introduction: Decontamination is intended to reduce or remove chemical, biological, or radiactive elements from the skin and clothes. Several different commercial solutions are available for prehospital use but there are no scientific reports on the decontamination process or its efficiancy.
Methods: An outdoor training session was arranged by the Helsinki Fire Department, the Helsinki Emergency Medical Services (EMS) and the Finnish Defence Force. Thirty-six healthy volunteers were exposed to a talc powder simulating a potential biological agent. The decontamination was performed using a field decontamination unit and a hazardous materials team. The decontamination process included the removal of clothing, showering with water, and drying. The efficiency was estimated by inspection and judged to be insufficient if any residuals of the talc powder were found The volunteers were asked to rate the discomfort they felt during the decontamination on a scale of 1–5. The tympanic body temperature was measured before and after the exercise. Data collection did not interfere with the exercise, and all participants gave their consent for collecting and using the data.
Results: All 36 volunteers were male, 24–47 years of age. Twenty-eight were walking and eight were non-walking. The mean body temperature before the decontamination was 36.6° C before and 35.1° C after the decontamination (p <0.001). The decontamination was estimated to be sufficient in 35 of 36 cases. Only one of all the volunteers judged the decontamination procedure as unpleasant (numbers 4 and 5 on the scale).
Conclusions: There was a significant reduction in body temperature caused by the decontamination. Decontamination was effective and discomfort caused by the procedure was minor.
Keywords: body temperature; contamination; decontamination; Finland; mobile decontamination unit
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Into the Hot Zone: To Go or Not to Go, That is the Question

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Countermeasures to chemical terrorism consist principally of two different sources: (1) the military; and (2) the civilian hazardous material (HAZMAT) teams. In response to urban chemical terrorism, the most effective countermeasure is likely to be a compromise between these two options. Currently, there is no international consensus regarding whether medical teams, including physicians, should be sent into a Hot Zone. Some first responders insist that medical teams should not be sent into a Hot Zone because, unlike first-responder HAZMAT teams, medical teams generally are not as well prepared. Preventing an increase in the number of casualties is the principal aim of civilian first responders. In Japan, some doctors have recommended that medical teams should remain in the Cold Zone, while doctors elsewhere have advocated that more direct medical control by medical doctors in the Warm Zone during decontamination is necessary. Several doctors in western countries have proposed that medical teams in the Hot Zone can save more lives. For example, specialized US marine field doctors operate in the Hot Zone. However, untrained medical teams are vulnerable and may be hindered in performing their tasks by the need to wear level A or level B suits. This choice is relevant particularly given that medical observations can now be conducted remotely using information technology. While the outcome of this debate is likely to depend on the potential risk to which medical teams will be exposed, one thing is certain; untrained persons should not be permitted into the Hot Zone.
Keywords: civilian; chemical terrorism; Hot Zone; medical response; military
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Session 2: Chemical, Biological, Radiological, and Nuclear

Chairs: Victor Koscheyev; J. DeCock

Differentiated Tactical and Therapeutical Approach to Nerve Agents of the Same Chemical Class as a Result of Their Different Physical, Chemical, and Physiological Properties

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Background: Nerve agents are toxic substances which primarily cause an inhibition of the enzyme acetylcholinesterase (AchE). The varying chemical substances of the same class of nerve agents have different physical, chemical, and physiological properties, such as their signature aging half-life. Early specific chemical identification of these agents will impact triage and therapeutic measures.
Discussion: Nerve agents are derivates of organophosphates (OP) with very specific physical, chemical, and pharmacological properties. Nerve agents are usually divided into the G series, such as sarin (GB), and V series, such as VX. Usually, these agents are absorbed by inhalation or by skin or mucosal contact, which will cause a certain toxidrome over time. Their differing solubility and vapor pressure determines their propensity for inhalative versus contact absorption. Knowledge of volatility, vapor pressure, and gas density will influence tactical consideration in triage and rescue efforts. Their different aging half-life has a major impact on whether specific and early antidote intervention with AchE enzyme-reactivating therapy is useful or whether patients will require ventilatory support. Early recognition of an epidemic toxidrome will help detect the presence of a certain toxin class. Early, readily available, mobile and highly specific chemical detection methods like GC/MS are pivotal elements in tactical rescue consideration, medical decision making, and resource allocation.
Conclusion: The rapid and specific chemical identification of individual toxic substances will guide and impact tactical rescue and medical decisions due to their different chemical, physical, and physiological profiles. Additionally, all healthcare and rescue personnel should be able to recognize toxidromes.
Keywords: nerve agents;organophosphates; toxidrome; toxin class; triage;
Prehosp Disast Med 2007;22(2):s153

Lessons Learned from Chemical Gas Leak at Esenboga Airport

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A package suspected of being contaminated with an NBC agent was found at the Ankara Esenboga Airport Cargo section on 10 February 2005. The Civil Defense was called on-site and responded with necessary equipment. Following decontamination, three people who been in contact with the suspicious package and another five people who had been in the room at the time of the contact were dispatched to SSK Diskapi Hospital. The dispatches were organized under the coordination of the Ankara EMS. Quarantine preventions were undertaken at the Emergency Service. Biological and chemical analysis of the material inside the suspicious package was performed. Chemical and biological detector scanning was conducted. The end of quarantine was announced to the public.

Lessons learned from this incident include: For emergency incidents, a system should be established to transmit information to a higher level coordination center and to start the process depending on the responses received from this center. A communication map should be formed that is functional in meeting the needs of the center.

Contaminated people should not be transported from the scene to another place. Response teams should be prepared to enter a contaminated scene. Decontamination units should exist at the entrance to the Emergency Services. All people who have any contacts at any levels of the medical treatments of the incident and cases should be aware and trained and approach the incident seriously.
Keywords: chemical release; contamination; coordination; decontamination; precautions
Prehosp Disast Med 2007;22(2):s153

Comprehensive Disaster Medical System for Newly Emerging Threat of Nuclear Disaster in Korea

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Introduction: The medical response system against nuclear disaster in Korea usually is focused on the regions located near nuclear power reactors, but recently, the newly emerging threat of nuclear disaster should be considered, due to the rise of nuclear, biological, and chemical terrorism and the change of the international political situation. Researchers examined and recommended the new comprehensive disaster medical system for the newly emerging threat of nuclear disaster.
Methods: The national disaster response system and the Emergency Medical Services (EMS) for nuclear disaster were reviewed and data from the preliminary study regarding the nuclear emergency medical system around the nuclear power plant were reorganized based on a risk assessment method. A questionnaire survey was conducted for experts in disaster response and EMS regarding the threat of nuclear disaster.
Results and Discussion: The primary EMS around the nuclear plants was considered to be good, but problems during nights and holidays were identified. Some of these problems could result in many injured victims. The systems for decontamination in receiving facilities were insufficient. Medical teams were not well-equipped with personal protection devices. The new system is based on the assumption that a nuclear disaster could happen anywhere, in any situation. This includes the scenario of urban radiological material leakage, nuclear contamination from a neighboring region, or

a mass panic state after the perception of a nuclear threat.
Conclusions: For the adequate response to the newly emerging threat of various nuclear disasters, new concepts and a new, comprehensive disaster medical system is necessary, as well as effective utilization of pre-existing resources.
Keywords: disaster response; emergency medical services; hospitals; nuclear disaster; personal protective equipment; preparedness
Prehosp Disast Med 2007;22(2):s153–s154

Terrorist Radiological Dispersal Devices and Improvised Devices: A New Global Threat

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The events of 11 September 2001 have increased awareness of the dangers posed by terrorists gaining access to weapons of mass destruction and radioactive and chemical materials, as well as their means of delivery. The current resurgence of terrorism is part of a complex pattern of global changes and imbalances. It is crucial to analyze, prevent, and mitigate possible terrorist attacks, such as man-made disasters.

Nuclear, non-conventional weapons and devices are particularly suited to maximizing the number of casualties, and are more attractive to terrorists than are biological and chemical weapons. Therefore, nuclear or chemical explosion might be the next step in the escalation of terrorist attacks. The medical and healthcare infrastructure, as well as all other forces engaged in emergency responses, must be able to prevent and to treat illnesses and injuries resulting from chemical, biological, radioactive, nuclear, or explosive terrorism (CBRNE). Preparing the medical community to address these threats is a great challenge, but the consequences of being unprepared could be devastating. Preparedness must be implemented at national and international levels, with tight cooperation between countries and governments, and with a public health system program and a government policy of terrorism prevention plans. The aim of this paper is to attempt to analyze and understand a non-conventional nuclear or chemical device as a possible tool for use in a future terrorist attack.
Keywords: chemical device; explosive; nuclear device; preparedness; prevention; response; terrorism
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Session 3: Burns

Chairs: R. Kreis

The United Kingdom Burn Major Incident Plan: A Historical Mapping Exercise

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The United Kingdom National Burn Care Group published its Burn Major Incident Plan in 2006. It describes the planned multi-agency response to an incident involving a large number of burn casualties.

To carry out a form of validation for this plan, a historical mapping exercise was performed using previous European major incidents involving multiple burn casualties to assess how it might have performed. A literature search for public and official inquiries, peer-reviewed medical literature, and online print media was performed to obtain information about the injured and their dispersal from the scene. A total of nine major incidents with >30 burn patients were reviewed in detail. Only reports of three incidents provided sufficient information regarding casualty care to allow for detailed examination and "testing" of the 2006 plan. These three incidents were: (1) the Bradford Football Stadium Fire in 1985; (2) the Manchester Airport Plane Fire in 1985; and (3) the Nightclub fire in Volendam, the Netherlands in 2001. If the 2006 Burn Major Incident Plan was implemented in each of these situations, the impact of each event would be reduced to a manageable level by dispersing duties across units within the country.
Clinical management details from major incidents are not well recorded. This is an issue that must be addressed and rectified. A national dataset-library using an Utstein-type template is essential. If a burn incident similar to the three reported incidents of this order were to happen in the UK, the 2006 Burn Plan would significantly improve the pathways to specialist care while not overwhelming the services.
Keywords: burn patients; major incident plan; mapping exercise; multi-agency response; United Kingdom
Prehosp Disast Med 2007;22(2):s154

The United Kingdom National Burn Plan

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The United Kingdom Emergency Planning Guidance recognizes that the capacity of the National Health Service (NHS) for significantly burned patients would be challenged by a major event involving multiple burn victims.

The National Burn Care Group has devised a response system by which specific burn care triage occurs at the site of the incident and/or the primary receiving Emergency Departments. The system also calls for burn qualified personnel to guide initial resuscitation and temporizing measures, while a suitable, fully equipped burn care bed is identified through the National Burn Bed Bureau.

The plan will be activated following the recognition that an incident with multiple burn victims has occurred. The local Burn Service will stop direct transfer of all referred cases and apply a form of triage, before matching patients to appropriate definitive care facilities.

Burns Assessment Teams (BATs) will be mobilized from the primary receiving Burn Service or, by mutual-aid arrangements, from adjacent services. Personnel from the BATs will perform the initial assessments and make treatment recommendations, while providing information to the control point. Once the national burn bed status has been determined, the local ambulance service, potentially aided by the receiving services, will manage the dispersal of the patients to units across the country.

The plan has been adopted by the UK Department of Health to ensure that burn victims receive high-quality, specialist care at the earliest opportunity, and are admitted

into a fully functioning and capable Burn Unit for their resuscitation and definitive care.

Keywords: burn assessment teams(BAT); burn beds; burn victims; capacity; planning; response; triage
Prehosp Disast Med 2007;22(2):s155

Session 5: Terrorism

Chair: E.R. Muller

Terrorist Bombings on Mumbai Commuter Trains

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On 11 July 2006, >180 people were killed in the coordinated blasts on commuter trains in Mumbai, India's financial center. Trains are the main form of transportation for most people in Mumbai—one of the most congested cities in the world. Renowned for being uncomfortable, nevertheless it is described as the city's lifeline. The Mumbai line has the highest passenger density of any urban railway system in the world—every day about six million people travel on the city's Suburban Railway system, more than the entire population of Israel. In this paper, these attacks and the medical response and triage are debated and compared to other similar attacks in London and Madrid.

On Thursday, 07 July 2005, four suicide bombers struck in central London, killing 52 people and injuring >770. The 11 March 2004 Madrid attacks consisted of a series of 10 explosions that occurred on four commuter trains at the height of rush hour. Thirteen improvised explosive devices were reported to have been used by a militant group that was responsible for the bombing, all but three detonated. Terrorists are targeting civilian population as soft targets to create fear psychosis. If they succeed, they can go part-time, as their purpose is served. As ancient Chinese strategist once said, "Kill one, scare ten thousand" was quoted by an ancient Chinese strategist. Physical trauma, psychological trauma, and the social dimensions of these manmade disasters and possible solutions are discussed.

Keywords: bombing; disaster; India; psychological aspects; terrorist attacks; transportation
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Hospitals Under the Threat of Terrorist Attacks: Lessons Learned from Hospital Evacuation Experience

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Objective: The aim of this study was to present aspects of actions undertaken in hospitals under high risk of terrorist attack.

Methods: An analysis was conducted of published papers and personal experiences in situations when hospitals have been evacuated due to a military situation direct.

Results: The main problems encountered during hospital evacuation operations included: (1) no formal evacuation plans; (2) too many people in charge; (3) poor communication; and (4) no free beds in others hospitals (especially for ICU patients) for patient transfers.

A formal evacuation plan is an essential component of hospital preparedness. Knowledge of the local language, habits, culture, and religion is important particularly in war zone areas. Examples of these principals are given from our experience.

Keywords: communication; coordination; evacuation; hospitals; terrorism; terrorist attacks
Prehosp Disast Med 2007;22(2):s155

Terrorist Bombing in Croatia

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2. Croatia

Introduction: This report describes the experience that the city of Rijeka, Croatia had following a terrorist attack. The intention of this report is to outline how emergency services were functioning during this sudden-onset situation.

Methods: The medical documentation of 27 wounded citizens in the attack was analyzed and the appearance of bodily wounds, severity of wounds, and the mechanisms of injury are described. From the forensic medical report, the wounds and damages sustained by the terrorist also were analyzed. All findings were compared with similar cases from around the world.

Results: In the 27 wounded citizens, three (11%) had head injuries. Injuries of the abdomen were found in only two cases (7%). The most common injuries sustained involved one or more extremities: 16 (59%) persons had wounds of an upper or lower extremity or a combination of multiple wounds. The main cause of death of the terrorist was explosive wounds to the chest and abdomen with destruction of multiple inner organs (primarily the kidneys, liver, abdomen, and lungs). Furthermore, the terrorist had a fracture of the base of the skull and multiple injuries to the brain.

Conclusions: When comparing these findings with data from the literature, the distribution in the percentages of the wounded almost is the same as reported in many other bomb attacks. In this case, the building walls protected many citizens, which is why so few were injured seriously. Forensic examination of the terrorist's body showed all of the characteristics of blast injuries.

Keywords: blast injuries; civilian casualties; Croatia; disasters; terrorist attack
Prehosp Disast Med 2007;22(2):s155

Poster Presentations—Theme 16: Types of Disasters

(247) The Antwerp Bromine Incident

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2. AZ St. Jozef, Malle, Belgium
3. Imelda Hospital, Bonheiden, Belgium
4. ZNA Stuivenberg, Antwerp, Belgium
5. University Hospital, Antwerp, Belgium

A tanker truck rolled over in the port of Antwerp, Belgium, spilling bromine that was highly toxic and corrosive (UN no. 1744). The driver was admitted to the hospital with signs of a concussion, but without toxicological symptoms. A 500-meter safety perimeter was installed around the spill site, and neighboring plants were evacuated.

Soon, some of the evacuees experienced respiratory and eye irritation, and 44 patients were treated in a nearby Red Cross polyclinic ambulance post. Twenty-nine of these evacuees were transferred to nearby hospitals, mostly due to other associated diseases.

Due the spread of the spill through the sewer system, another one km2 area that included two nursing homes had to be evacuated and forcefully closed. A total of 800 people were distributed to three shelters for the night of the event. One of these centers eventually was evacuated to an adjacent one, as the safety perimeter was enlarged to six km^2, causing approximately 3,000 additional residents to evacuate. Many evacuees stayed with family or friends outside the risk area, and 310 persons were bussed to military camps and youth hostels. One hundred forty evacuees stayed overnight in one of the shelters. The area was cleared around noon the next day.

As a result of this incident, a total of 135 patients were seen in Antwerp hospitals. Only two were admitted. The practical organization and problems of this incident will be discussed (mainly communication and logistics).

Keywords: Belgium; Bromine; chemical spills; evacuation; evacuation centers
Prehosp Disast Med 2007;22(2):s156

(248) Comparison of Different Simulation Models of an Earthquake in Vrancea

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2. Ministry of Interior, Bucharest, Romania

Objective: The objective of this study was to continue the previous evaluations of morbidity and specific mortality due to an earthquake measuring 7.2 on the Richter Scale, with a main seismic wave duration of 10–15 seconds.
Methods: A simulation of an earthquake in the Vrancea area, with an magnitude of 8.0 on the Richter Scale lasting 15 seconds, was simulated using the following seismic risks maps: (1) author's own simulation; (2) Munich Re model; (3) Swiss Re model; and (4) Cresta Proposed model.
Results: The computer program Epi Info 6.04D was used and a unique calculation algorithm was developed to obtain the results. The main results of the simulation were: (1) 22,147 total expected casualties; (2) 3,336 total diseased; and (3) 4,034 total trapped casualties. Other categories are presented in the rest of the work.
Conclusions: It was noted that an evaluation of urban vulnerability, an estimation of the expected number of casualties, and an evaluation of the hospital and prehospital systems' capacity and structures are needed. Also, an accurate prehospital intervention system and a medical emergency system for disaster situations must be developed as the infrastructure for the medical intervention system. Proper endowment and preparedness of the entire medical intervention system is needed, and a firm leadership in the medical intervention system and communication system must be provided.

Keywords: disaster; earthquake; simulation; preparedness; intervention system
Prehosp Disast Med 2007;22(2):s156

(249) Lessons Learned from Two Explosions with Multiple Casualties in the Town of Mulhouse

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Mulhouse, France

The town of Mulhouse, France has experienced two explosions, both of which caused multiple casualties. One occurred on 26 December 2004 and the other occurred on 24 March 2006. The first was a gas explosion in a condominium that later collapsed. The second explosion occurred in the chemical laboratory of the University Chemical School. This presentation will describe these two events, and the responding local management.

The coordination between different agencies, such as fire and rescue, police, and medical agencies, will be analyzed to explore the important psychological aspect for the inhabitants of Mulhouse, as well as how the explosions were covered in the media.

Keywords: coordination; explosions; France; local management; multiple casualties
Prehosp Disast Med 2007;22(2):s156

(250) Expedition Medicine: Mt. Everest

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Adventurous emergency physicians and other healthcare professionals have the opportunity to provide medical support for expeditions to some of the worlds most challenging environments. In 2006, Dr. Catlett served as the team physician for one of the largest expeditions on Mt. Everest. This presentation will describe important considerations for an expedition physician, such as client health screening, specialized medical kits, and the harrows of medical care in the "Death Zone." The presenter will explain three complicated case studies requiring evacuation from the mountain and take the participants on an amazing pictorial journey to the summit of the highest mountain in the world.

Keywords: health care; Mount Everest; physicians
Prehosp Disast Med 2007;22(2):s156

(251) Injuries due to the Bam Earthquake in Iran

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Introduction: Iran is a country with an area of 1,648,195 km^2 and a population of >68,000,000 people. The devastating earthquake in the Bam District of Kerman Province struck on 26 December 2003, leaving a total of 29,878 people dead and 22,628 injured. The earthquake measured as 7.4 on the Richter scale. The main aim of this study was to determine the frequency of physical injuries.
Material and Methods: The data from 206 patients were collected from the medical records, physical examinations, and paraclinics of earthquake victims who were admitted to Hazrat Rasol Hospital in Tehran.
Results: The majority of patients were in 20–29 years of age. The female/male ratio was 1.51. The overall mortality rate was 2%. The most frequent injuries were lower extremity, pelvic, and spinal fractures, respectively. Of the patients with extremity fractures, 4.9% were open, and 95.1% were closed. Nineteen patients underwent fasiotomy for relief of the compartment syndrome. Of the pelvic fractures, 7.9% were unstable, and there were spinal cord injuries in 32% of the vertebral fracture cases. Other injuries had less frequency and included pneumothorax, hemothorax, abdominal viscous injuries, rib fractures, and head injuries.
Conclusions: The main problems in these victims were orthopedic. These types of injuries must be prepared for in the future.

Keywords: Bam; disasters; injuries; Iran; orthopedic
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(252) 2005 Pakistan Earthquake Experience

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One month after the 2005 earthquake in Pakistan, a Georgian medical team consisting of a surgeon, a pediatrician, an anesthesiologist, and two nurses, went to Pakistan to provide medical assistance to the local population. The group arrived in Islamabad on 28 October 2005, where they were met by a representative from Johanniter International, the organization with which they were to work. The group then travelled to Batala, which is situated in the northern part of Pakistan, 1,600 meters above sea level.

Accompanied by the military service of Pakistan, the group went to villages in the region that were located at a higher elevation, and worked on population ambulatory examinations, diagnoses, prescriptions, and providing medications. An average of 300 patients were examined daily. Diseases identified that are common to this situation included viral infections, pneumonia, diarrhea, skin infections, and others. Up to 30 seriously ill patients were sent to the hospital. This population would have benefitted from a greater volume of medical assistance. During the period spent in Pakistan up to 2,500 patients were examined by this group.

Even a month after the disaster, medical teams continued to provide the necessary assistance. This work must be installed permanently in the region through alternating medical teams. If this is not instituted, we believe expenses will increase and the effectiveness of work will decrease.

Keywords: disaster; earthquake; Georgia; medical team; Pakistan
Prehosp Disast Med 2007;22(2):s157

(253) Bam Iran Earthquake: The Experiences of a Turkish Medical Team

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On 26 December, 2003, an earthquake occurred in Iran with a magnitude of 6.5 on the Richter Scale. The earthquake happened at 05:26h and lasted for three minutes. The epicenter was located in Bam City and the damages resulted in approximately 25,000 fatalities, 50,000 injured, and rendered 100,000 people homeless. The activities of a 50-person, primary care, health provider team sent from Turkey following the request of the Iranian government are described in this study. Within three days following the earthquake, the chaotic environment was taken under control, water supplies were chlorinated, and ambulatory health care was provided to the local population. These activities helped the team gain significant disaster response experience in the field. In light of the lessons learned here, preparations have been started for future missions.

Keywords: Bam earthquake; experience; primary care; response team; Turkey
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(254) Indonesia Tsunami: Turkish Medical Team Experiences

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On 26 December 2004, just before 06:58 hours (h)(local time), an earthquake occurred that measured 9.3 on the Richter Scale. The epicenter of this earthquake was off the west coast of northern Sumatra, and the resulting tsunami waves were 10–12 meters high, travelling at a speed of 500 km/h. As a result of the tsunami, nearly 230,000 people lost their lives and 1.5 million people remained homeless. Including Turkey, 41 countries and 9 international bodies assisted the affected countries.

First, a Turkish aircraft arrived at Thailand, Bangkok and next, military C-130 airplanes of Turkish Armed Forces arrived in Banda Aceh. The Sahra Hospital was activated and three different teams were assembled. The services provided included medical treatment, surgical interventions, general medical check-ups, environmental health, water supply and sanitation, toilet care, and health education. Over a 10 day period, 6,824 people took advantage of these medical services. There was no communication between the Sahra Hospital camp and the rest of the outside world. Transportation was sufficent. The teams supplied all their needs through their

own resources. In disaster areas such as this, there should be services for those who have suffered, and also extra services for the special risk groups to prevent exploitation.

Keywords: earthquake; Indonesia; rescue; tsunami; Turkey
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(255) Evaluation of the Preparedness for Chemical Incidents Caused by the Derailment of a Freight Train Carrying Chlorine

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Introduction: In February 2005, a freight train derailed near Kungsbacka, Sweden. The train consisted of 12 tank cars, each of which carried 65 tons of chlorine. The derailment occurred because the freight train went onto a blind track to await a meeting train. Attempts to stop the train failed, and the engine and four of the cars derailed into the surrounding field. Fortunately none of the tanks were disrupted. However, the event raised questions regarding the consequences of the accident if a chlorine leak had occurred.
Methods: An evaluation of the preparedness of the emergency services' response to chemical accidents was conducted. Simulations based on mathematical models were conducted to determine the dispersal rate of chlorine given the weather conditions during the event. The potential impact on the population in the area surrounding the site of derailment was calculated using population data provided by the local authorities in Kungsbacka.
Results: The simulations showed that release of chlorine after the incident would have resulted in severe consequences for the people in the dissemination area. None of the emergency services involved possessed adequate preparedness to manage the scenario.
Conclusions: It is important to realize that the extent of the dissemination area is not limited to the geographic area where the accident occurred. Casualties may be scattered throughout a wide area, both inside and outside of buildings. It is recommended that casualties are evacuated before decontamination, particularly during incidents involving industrial chemicals.

Keywords: chemicals; derailment; dissemination; preparedness; simulation
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(256) Lessons Learned from Greek Myths

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Standard categorizing of disasters into "god-made" and "human-made" should be revised. In some myths, such as Damocles's sword, Pandora's box, and Medusa's head, there are includedmethods for dealing with disasters. Concepts of trust and confidence on the one hand, and a certain culture of risk on the other, point to an acceptance of nature as uncertain and unstable. Can we learn the solution to disasters by listening to Greek ancient myths? Because inside the myths, truth is living.

Keywords: categorization; coping; disaster; Greek mythology
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(257) The "Helios" Aircraft Crash in Athens

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The aim of this report is to study the mobilization and problems faced by the agencies that managed the "Helios" aircraft crash in Grammatiko, Greece, on 14 August 2005. The incident involved the "Helios" flight ZU522 from Larnaca, Cyprus via Athens, Greece to Prague, Czech Republic on a Boeing 737-31S with 116 passengers and a five-person crew. The aircraft took off from Larnaca at 06:07 hours (h) UTC and crashed near Grammatiko at 09:03 h UTC.

The "El Venizelos", Athens International Airport (EV-AIA, called a "full emergency status" at 08:50 h UTC. At the same time the Hellenic National System for Emergency Medical Care, EKAB, was alarmed and immediately placed two mobile intensive care units (MICUs)and three B-ambulances at the disposal of the EV-AIA. At 08:55 h, the alarm was escalated to face an "uncontrolled" approach and landing. At 09:03 h, EV-AIA and EKAB were notified about the airliner crash about 12 nm north of EV-AIA. The full-scale alarm status in EKAB included the dispatch of 9 MICUs, 11 other physician-equipped vehicles, 25 B-ambulances, and one medevac helicopter.

The problems faced at the disaster site in order of importance were: (1) horizontal dispatch of information; (2) coordination between agencies; (3) chain of command; (4) inadequate and difficult access to the disaster site; and (5) staging of responding vehicles. The major problem outside of the site was the deficiency of ambulance vehicles in Athens for about four hours. Nevertheless, at no time was the health or safety personnel jeopardized—singly or collectively.

This incident identified response deficiencies to such an event and also generated ways to improve the responses.

Keywords: aircraft crash; deficiencies; Greece; opportunity costs; responses; safety
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(258) Hospital Fires: Gazi University Case

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3. Gazi University, Ankara, Turkey

Gazi University Hospital is a 950-bed, university hospital situated in central Ankara, Turkey. A fire started on 28 June, around 11:00 hours (h). Nurses on the 12th floor of the hospital notified the Emergency Management Department of the presence of smoke in a ventilation hall. Initial response was provided by the security personnel in the hospital and the small fire caused by burning garments and a small amount of garbage thrown out of a window at 7th floor was contained. However, about 15 minutes later, a fire alarm was given due to the presence of heavy smoke coming from the main electrical control room in the basement. Emergency response units (fire department and EMS) were notified and the evacuation of the tower that was affected by the fire was ordered. Around 250 patients

in that particular tower were evacuated within 10 minutes. Non-ambulatory patients were evacuated mainly horizontally to the unaffected tower connected through the hallways. Fire was contained by the fire department. No deaths or injuries were reported related to the incident. A total of 34 patients with potentially critical condition were transported to other hospitals in the area by the EMS.

Fires are one of the most common events encountered by hospitals worldwide. Emergency management planning, staff training, and regular drills are required for better responses to these events. Preplanned evacuation actions should be taught to the personnel. Horizontal evacuation of non-ambulatory patients can be an effective method during the initial response.

Keywords: evacuation; fire; hospital; training
Prehosp Disast Med 2007;22(2):s158–s159

(259) Disaster Potentials and a New Classification

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As known, life has three dimensions—macro-, micro-, and normo-features. Energy released by events occurring within these dimensions has the power to terminate human life. All potentials, both known and unknown, contain the potential power of creating crises for human beings. Meteor rains, collisions of planets, satellite crashes, or satellite accidents that could occur during their landing are the disaster potentials of "Macro Life". "Micro Life" is a dimension that cannot be seen through the eyes, but can be explained with the means of modern medicine. Throughout history, these potentials caused disasters which ended in multiple deaths. Plague, tularemia, AIDS, and SARS are among the most important micro-life potentials, and their agents are known. The third dimension is "Normo Life" in which our normal life is shaped. Potentials here should be classified as "Natural Disaster Potentials (NDP)" and "Man-Made Disaster Potentials (MMDP)". Terrorism, NBC attacks and accidents, fires, transportation accidents, wars, environmental pollution, migration, and technological accidents can be listed among the most common man made DP. Another classification among natural DP which is "Lithosphere", "Atmosphere" and "Hydrosphere" oriented potentials, can help us understand the overall potentials. Earthquakes, landslides, and volcanic eruptions are the potentials of lithosphere. Floods and inundation are the common examples for the disaster potentials of hydrosphere, and meteorological events such as cyclones, storm, hurricanes, and tornados are the disaster potentials of atmosphere. Droughts, poverty, and tsunamis, can be listed among "mixed" disaster potentials which cover all these spherical layers.

Keywords: classification; crises' disaster potentials; dimensions; events
Prehosp Disast Med 2007;22(2):s159

(260) Shipping Disasters in the Channel: A Need for International, Multidisciplinary Rescues

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On 06 March 1987 the ferry Herald of Free Enterprise (HOFE) capsized outside the harbour of Zeebrugge. A large rescue operation was implemented. Boats were directed towards an empty pontoon. At the pontoon, emergency care was provided and further transport was organized to convey victims to surrounding hospitals. 21 medical teams received more than 250 victims within hours of the event. The majority of casualties were due to immersion. One-third of the victims died, one-third was hospitalized, and the remaining victims were transported to emergency shelters.

The Mont Louis, a French Roro Ship, collided with the car ferry, Olau Brittannia, on 25 August 1984 off the Belgian coast. The Mont Louis carried 30 cylinders with 15 ton of UF6 low radioactivity.

On 14 December 2002, the Tricolor, a cargo transporting 3,000 cars, with "shoebox" construction similar to the ferry HOFE, sunk after a collision a few miles out of Zeebrugge. Despite all kinds of warning systems, 10 near collisions and two real collisions occurred within two weeks after this event

The high density of maritime traffic in the Channel (20% of the world maritime traffic) requires for disaster planning with cross-border responses. The IMO has begun efforts to improve the safety of traffic on the sea. Human failure still is possible.

Keywords: accidents; international; maritime; rescue; safety; traffic
Prehosp Disast Med 2007;22(2):s159

(261) Mass Carbon Monoxide Intoxication at Two Ice Hockey Games: Initial Approach and Long-term Follow-Up

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3. University Hospital Gasthuisberg, Louvain, Belgium

Introduction: A group of people became ill during a Premier League ice hockey game due to a carbon monoxide intoxication caused by the exhaust of an ice maintenance machine. Due to this intoxication, a total of 235 patients were seen at area hospitals. Twenty months after this event, another mass intoxication occurred during an ice hockey game. Forty-three patients presented to the index hospital at that time. To the knowledge of the authors, these are the first reported ice hockey-related mass intoxications in Belgium.

Methods: Apart from the file data of the different emergency departments, a follow-up mailing was sent to all patients one year after the mass intoxication events to evaluate delayed complaints and clinical controls.

Results: There was a response rate of 67.7%. The mean value for the carboxyhemoglobin concentrations (COHb) was 10.2% (max = 30.2%). There was a significant relationship with the presence of headaches ($p = 0.006$), dizziness ($p = 0.000$), and fatigue ($p = 0.000$) and the COHb level. Abdominal pain, nausea, and vomiting were not significantly related. Of the respondents, 6.3% had residual complaints (headaches) with a significantly higher incidence ($p = 0.000$) with high COHb levels. Only 1.3% had an abnormal neurological control. Work incapacity was not significantly related to the COHb levels.

Conclusions: Mass intoxications from carbon monoxide remain a risk at indoor sporting events. These short exposures cause delayed medical problems in a small number of those exposed. Symptomatology is not a useful tool for triage. The use of non-mineral energy sources like electricity is the best way to prevent such intoxications.

Keywords: Belgium; carbon monoxide; hospitals; indoor sporting events; mass intoxications; residual
Prehosp Disast Med 2007;22(2):s159–s160

(262) Enabling Technologies for Improved Situational Awareness

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Objective: The National Bioterrorism Civilian Medical Response Center (CIMERC) develops enabling tools that produce an effective, integrated response to complex medical emergencies. The CIMERC continues to work to meet the needs of healthcare organizations, emergency managers, and disaster responders challenged by disparate capabilities and limited resources.
Methods: A collaborative relationship between a local police department, a school within the designated test bed, a commercial partner, and the CIMERC was developed to offer first responders the ability to command, communicate, and adapt tactical plans in an emergency situation. The team will integrate four discrete technologies, which presently are in use in the first responder and public security space. These will be deployed for use in a complex medical emergency in the test-bed school.
Results: The implementation of the technology will create an ad-hoc network to share images and real-time information with the responders. This network provides an increased awareness level, allowing strategic decisions to be made and resulting in a faster and more effective response. The evaluation of this technology will be conducted through a number of tests, including a simulation exercise based on a developed scenario and user feedback.
Conclusion: Police, fire, and emergency medical teams rely on their communications systems and networks to provide information about the situation as it evolves, and this "situation awareness" is essential for fast, sound decision-making. The optimization of communication and visual cues during an emergency will improve a coordinated response, enhance responder safety, and minimize the negative impact of the events on the casualties.

Keywords: emergency; decision making; health care; response; technology
Prehosp Disast Med 2007;22(2):s160

(264) Physical Abnormalities following Paternal Exposure to Sulfur Mustard Gas

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2. Baqiyatollah Medical Sciences University, Tehran, Iran
3. Janbazan Engineering and Medical Scie, Tehran, Iran
4. Shaheed Beheshti University of Medica, Tehran, Iran

This session will describe critical issues surrounding the National Disaster Medical System (NDMS)/Federal Emergency Management Agency (FEMA) activation during Hurricane Katrina. This response was the largest full activation of the patient movement portion of the NDMS. Expert speakers will describe the events surrounding the NDMS public health response to Hurricane Katrina, where >20,000 people were evacuated from New Orleans, Louisiana, and panelists from multiple organizations, at all levels of organization, from the local/regional front lines in New Orleans to the state and federal levels, and will present data from their Katrina experiences. Ground-level activities, giving the audience a first-hand glimpse of issues surrounding the lack of communication and organization. Dr. Sweinton and Dr. Proctor then will comment on local preparedness and the national response, with specific insights into activities and operational considerations occurring at the State Emergency Operations Center and the Federal Department of Homeland Security. Dr. Rinnert will describe her experiences receiving evacuated patients at surge capacity shelters in Dallas, Texas, and include clinical and social considerations. Finally, Dr. Marty will provide a federal perspective, delineating the procedures that were in place, as well as what should have been in place for such a large-scale disaster. The session will be concluded brief question-and-answer session.

Keywords: Federal Emergency Management Agency (FEMA); Hurricane Katrina; National Disaster Medical System (NDMS); preparedness; public health response
Prehosp Disast Med 2007;22(2):s160

Oral Presentations—Theme 17: Spanish Abstracts/Resúmes españoles

Session 1

Chair: Felipe Cruz-Vega

Hospital Seguro Mexico

F. Cruz-Vega
Instituto Mexicano del Seguro Social, Mexico City, Mexico

La Organización Panamericana de la Salud (OPS) define como "hospital seguro" a "un establecimiento de salud cuyos servicios permanecen accesibles y funcionando a su máxima capacidad instalada y en su misma infraestructura inmediatamente después de un fenómeno destructivo de origen natural". El hospital, además de proteger la vida de los pacientes y del personal de salud, debe tener una estruc-

tura física que soporte los efectos de un desastre y estar en condiciones de continuar brindando sus servicios.

El concepto de hospital seguro no quiere decir que la estructura física sea 100% segura en caso de terremotos o huracanes, sino que su estructura permite la continuidad del funcionamiento más allá de los daños que se ocasionan.

Esta iniciativa ha sido avalada en enero del 2005 en la Conferencia Mundial sobre Reducción de Desastres, llevada a cabo en Kobe, Japón, la que fue incorporada al plan de acción 2005-2015. Solicita a los países a 'integrar la planificación para la reducción de desastres en el sector salud y promover la meta de hospitales seguros frente a desastres

En México, es el Sistema Nacional de Protección Civil es el responsable de establecer el diagnostico de la seguridad tanto en hospitales nuevos como existentes bajo los estándares de la OPS. Se ha constituido un 'Grupo Multidisciplinario de evaluadores' quienes establecerán el diagnostico de casi 1085 hospitales, iniciando por los ubicados en zonas de mas alto riesgo y con aquellos que se encuentren en las mejores condiciones se iniciara el proceso de certificación.

Prehosp Disast Med 2007;22(2):s160–s161

Hospital Segura Municipio de Puebla

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F.J. Sanchez Lopez[2]

1. H. Ayuntamiento de Puebla, Puebla, Mexico
2. Proteccin Civil Municipal, Puebla, Mexico

La OPS define como Hospital Seguro a "un establecimiento de salud cuyos servicios permanecen accesibles y funcionando a su mxima capacidad instalada y en su misma infraestructura inmediatamente despus de un fenmeno destructivo de origen natural". Esta iniciativa ha sido avalada por la Conferencia Mundial sobre Reduccin de Desastres, llevada a cabo en Kobe, Japn en enero de 2005.

Se asisti a dos reuniones del Comit Nacional del Programa "Hospital Seguro", en Abril y Noviembre del presente ao, en la Ciudad de Mxico.

Actualmente contamos en el Municipio de Puebla con 26 hospitales de un total de 96 (Hospitales Sanatorios y Clínicas) que conforman el Consejo de Instituciones de Salud y Protección Civil del Municipio de Puebla. Actualmente se ha sesionado en 21 ocasiones, con 14 simulacros en total, incluyendo 2 simulacros parcialmente anunciados y un Magnosimulacro donde participaron 29 instituciones de salud.

Se han capacitado un total de 800 personas en materia de protección civil en hospitales.

Actualmente se han evaluado bajo el Programa de Hospital Seguro nueve hospitales, encontrndonos actualmente en la etapa de preclasificacin y futura certificacin.

Nuestra meta es certificar al mayor nmero de hospitales dentro del Programa Hospital Seguro antes del 2008.

Prehosp Disast Med 2007;22(2):s161

Escuelas Seguras

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La Salle, Veracruz, Mexico

La Organización de Naciones Unidas llevo a efecto en enero del 2005 la Conferencia Mundial sobre Reducción de Desastres, llevada a cabo en Kobe, Japón, en la que fue incorporada al plan de acción 2005–2015, entre otros compromisos el concepto de Hospital Seguro y estableció un llamado a los países a "integrar la planificación para la reducción de desastres en el sector salud y promover la meta de hospitales seguros frente a desastres". Sobre esta base y teniendo como antecedente que durante el Decenio Internacional para la Reducción de los Desastres Naturales se dedico el año de 1996 a la seguridad en instalaciones de salud y escuelas, es que se elabora la iniciativa que en paralelo al compromiso de la década 2005–2015 se integre como programa paralelo al de Hospital Seguro el de "Escuelas Seguras" bajo la responsabilidad de los Sistemas Nacionales de Protección Civil de los países

Es innegable la importancia de proteger la vida del estudiantado, sin embargo en términos de ingeniería no se pretende únicamente proteger vida e inversión, sino que las escuelas sigan funcionando después de un desastre natural, incluyendo los casos en que temporalmente se utilicen como albergues a desplazados. En el ámbito mundial son múltiples los ejemplos de recintos escolares destruidos por estos fenómenos, pero afortunadamente también cada día son mas los ejemplos de la preocupación que incluso países en vías de desarrollo han realizado para invertir en seguridad estructural, no estructural y organización funcional de escuelas frente a desastres naturales.

Prehosp Disast Med 2007;22(2):s161

Centro Regulador de Urgencias Medicas

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1. H. Ayuntamiento de Puebla, Puebla, Mexico
2. Proteccin Civil Municipal, Puebla, Mexico

Operamos un Centro Regulador de Urgencias Médicas en coordinacin con dependencias estatales y municipales. Se han realizado reuniones con personal de Prevención de Trauma y Desastres, dependencia de la Secretara de Salud del Estado de Puebla para colocar el rea física del CRUM dentro de las instalaciones del Hospital General Norte. Asimismo se están realizando convenio con Cruz Roja Mexicana, para lograr la regionalización de la ciudad. Contamos con 6 ambulancias equipadas con sistemas de desfibrilación automtica y manual, un programa de Detección Oportuna de Infarto, una Unidad de rescate para cualquier salvamento urbano, acutico y/o vertical. Se ha dotado con radios tipo MATRA a 8 hospitales para agilizar la recepción de pacientes en dichos hospitales. El personal recaba información acerca de la ocupacin diaria en las reas de urgencias, con la finalidad de optimizar el ingreso de pacientes. Operativamente contamos con Responsables de Turno, que se encargan de vigilar el desempeo de las

ambulancias. Un supervisor médico y un coordinador médico de rea solventan problemas operativos, y regulan la urgencia mdica cotidiana. Durante el periodo comprendido entre el 16 de Enero a la fecha se han atendido 12, 543 atenciones de Urgencias con un tiempo promedio de respuesta de 7:50 minutos. Adems se coordina a los diferentes sistemas de atencin médica prehospitalaria del Municipio y de aledaos, en situaciones de desastre.
Prehosp Disast Med 2007;22(2):s161–s162

Session 2

Chair: Maria Cristina Saenz

Comparación entre dos Modelos para la Atención de las Urgencias Médicas

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Objetivo: Determinar si el Sistema Integral de Urgencias Médicas del Distrito Federal (SIUM), a través de la regulación de pacientes, es mejor alternativa que la forma tradicional para atender las urgencias médicas.
Material y métodos: Estudio de seguimiento a 393 pacientes graves que ingresaron en alguno de los servicios de urgencias de doce hospitales pertenecientes a cuatro instituciones de salud en el Distrito Federal, México, del 8 de mayo al 15 de junio de 2006. En 331 pacientes el ingreso fue de manera tradicional, es decir al hospital más cercano, y en el resto se aplicaron criterios de regulación médica.
Resultados: El 59.5% de los pacientes egresaron por mejoría, 23.9% por defunción, 5.7% por traslado y 8.7% continuaban hospitalizados al término del estudio. Por cada 100 días de hospitalización, 16 pacientes regulados egresaron por mejoría, en comparación con 10 no regulados. Por cada 100 días de hospitalización fallecieron 2 pacientes regulados contra 4 no regulados. Los pacientes regulados mostraron 0.56 veces mayor probabilidad de mejorar que los no regulados; además, los pacientes regulados tuvieron 0.49 veces menor probabilidad de fallecer que los no regulados. En el análisis de sobrevida de Kaplan-Meier, se observó que los pacientes regulados egresaron en menos de 20 días, en comparación con los no regulados quienes egresaron en más de 30.
Conclusiones: La regulación de pacientes disminuye la estancia y mortalidad hospitalarias, e incrementa la probabilidad de mejoría; muy probablemente se deba a la implantación del SIUM para atender a los pacientes graves.
Prehosp Disast Med 2007;22(2):s162

Asistencia Urgente a Inmigrantes Llegados de Forma Irregular por Vía Marítima a Tenerife (Islas Canarias) en un Año

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1. Servico Urgencias Canario, Tenerife, Spain
2. SCS, Tenerife, Spain

Objetivos: Determinar el tipo de asistencia y las patologías atendidas de los inmigrantes que llegan de forma irregular vía marítima a Tenerife. Se describe el dispositivo creado para atender a los afectados.
Diseño: Estudio transversal.
Emplazamiento: Puntos de asistencia de campaña: personal del Servicio de Urgencias Canario, Cruz Roja Española y equipo de Atención Primaria.
Participantes: Todos los inmigrantes que llegan de octubre de 2005 a octubre de 2006.
Mediciones Principales: Patologías diagnosticadas al llegar, derivaciones realizadas y su causa.
Resultados: Llegada de 30.939 inmigrantes. Valorados todos en el primer triage precisando asistencia sanitaria 498 (1,6%). 322 (64,6%) fueron tratados in situ y 176 (35,3%) tuvieron que ser trasladados a diferentes centros sanitarios. In situ se trataron 103 de hipotermia (31.9%), 79 hipoglucemias (24.5%), 37 erosiones (11.4%), 21 traumatismos leves (6.5%) 15 por sarna (4.6%), y 14 por dolor abdominal (4.3%%); no se registró el diagnóstico en 16 casos (4.9%). Los traslados fueron por: deshidratación 28 (15.9%), heridas en extremidades 22 (12.5%), quemaduras 18 (10.2%), dolor abdominal 14 (7.9%), hipotermia 16 (9%), hipoglucemia 8 (4.5%), malestar general 6 (3.4%), vómitos 8 (4.5%), hipotensión 3 (1.7%), traumatismo torácico 3 (1.7%) y 50 (28.4%) por otros 24 diagnósticos.
Conclusiones: La inmensa mayoría de los inmigrantes llegan en aparente buen estado de salud. De los que precisan atención sanitaria, la tercera parte han de ser trasladados a otros centros.
Prehosp Disast Med 2007;22(2):s162

Magnosimulacro Puebla

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2. Proteccin Civil Municipal, Puebla, Mexico

En conmemoración de los sismos ocurridos en México el 19 y 20 de Septiembre de 1985, surgi la necesidad prioritaria, de realizar acciones preventivas que recuerden el da que se da por sentado el Sistema Nacional de Proteccin Civil y el Programa de Proteccin Civil que las mismas contienen, publicado en el Diario Oficial de la Federacin el da 06 de mayo de 1986.

En la Ciudad de Puebla, se realiza un Magnosimulacro el 19 de septiembre del 2006 con hora de inicio 10:00 hás con hiptesis de sismo, participando Instituciones publicas, privadas y voluntarios.

El objetivo fue lograr la coordinacin de los servicios de Emergencias del Municipio bajo el Plan de Emergencia Municipal.

Se instalaron 3 puntos de impacto, uno Facultad de medicina con derrumbe y más de 100 lesionados, otro incendio y fuga de materiales peligrosos en la zona industrial de IDESA, y otro en Zcalo con personas atrapadas que tuvieron necesidad de rescate vertical.

Se cont con la participacin de 69 Dependencias con un total de 1990 edificios, y 461,740 participantes en promedio, de los cuales 433,731 sern evacuados, bajo la dirección de 2471 brigadistas, ms de 200 lesionados.
Prehosp Disast Med 2007;22(2):s162

Session 3

Chair: Maria Cristina Saenz

Tragedia o Desastre?

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Cromagnon, tragedia en una disco rock en la Cap. Fed. de Argentina, 30 Diciembre 2004, un incendio que produjo aprox. 800 heridos, 199 jóvenes muertos y 3000 personas directamente impactadas por el siniestro, allí se trabajo con los familiares de las victimas y se coordinaron talleres de debriefing—indagación psicológica estructurada durante y luego del evento.

Personal especializado en Atención psicológica en Emergencia oriento a los voluntarios/as y profesionales.

Metodología: La tarea fundamental era la orientación a los familiares de los jóvenes muertos y la información respecto de los jóvenes heridos y derivados a hospitales.

El anuncio a los familiares de la muerte y el reconocimiento de las victimas se realizaba en la morgue judicial con el acompañamiento de personal especializado. Cruz Roja, Policía Federal, Bomberos, SAME, Defensa Civil, hospitales de Derivación, Morgue Judicial,etc.

Recomendaciones: Los talleres de debriefing permiten la ventilación de vivencias y emociones experimentadas. La disminución del stress proveniente de la experiencia vivida. La identificación de las posibles distorsiones cognitivas. Generación de apoyo y solidaridad, de orden en la respuesta al siniestro y cohesión en las acciones.

El stress agudo puede ser tratado profesionalmente y evitar la instalación de patologías cronicas.Especialmente evitar el stress post-traumático.

Disminuir los efectos y los riesgos de posibles patologías en los trabajadores del rescate debe ser una meta a tratar desde diferentes ámbitos de la Salud para proteger a ellos en todas las organizaciones que movilizan personal en las catástrofes.

Prehosp Disast Med 2007;22(2):s163

Por que no a mi, esta Catastrofe?

B. Arena; M.C. Sáenz
Buenos Aires, Argentina

Betty, persona con miastenia gravis con hiperplasia timica-fibromialgias severas con fibrosistis cervical y múltiple patología artrosica degenerativa,hipotiroidismo,neuropatía sensorial desmielinizante en los comienzos de los síntomas de su enfermedad, peregrinó casi 7 años, con sufrimientos asociados a la patología de base, dado que no encontraban el diagnostico acertado. Luego cuenta en su libro el recorrido de dolor, de fe, de aciertos y desaciertos de los profesionales que la han atendido y la calidad que lleva hoy día la cual daría mucha esperanza a muchas personas que sufren esta patología u otra.

Para que trasmitir esta experiencia de vida?

Muchas personas sufren efectos luego de hechos disruptivos, sea cual fuere su temática, inundaciones, incendios, terremotos, etc., también hechos disruptivos en la vida personal y familiar como en este caso.

Cuando se viven situacions traumatics y dolorosas que marcan un antes y un despues en la vida se mide la capacidad de resiliencia de las personas.

La capacidad de construir en medio de la adversidad. ¿Construir que?

La continuidad de la vida, con calidad y dignidad y crecer en medio de ello.

Aparece aquí la *resiliencia* y la capacidad de continuar en medio de las dificultades es un aprendizaje y es un modelo de respuesta ante situaciones límites de la vida, vida y la ilusión, como así también la certeza de que es posible una calidad espiritual psíquica y social optima en medio de la catástrofe.

Prehosp Disast Med 2007;22(2):s163

Aluvion de Emociones

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Auxilios psicológicos

En la provincia de Santa Fe el nivel del Río Salado ha crecido llegando a una altura de 7,88 metros. Mayo 2003.
100.000 personas evacuadas en, más de 200 centros. Las viviendas afectadas aproximadamente 24.000, 4.000 totalmente destruidas.

La desolación, la angustia y los efectos de la ansiedad por disrupción eran un fuerte golpe que solo seria soportado en primer lugar, por aquellas personas que tuvieran una fuerte resiliencia para afrontar dichas situaciones y por quienes es recibieran adecuada contención y auxilios psicológicos para transitar esta catástrofe,

Concientes de que el estrés pos-traumático es susceptible de prolongarse en el tiempo promoviendo dolencias psicosomáticas y lograr que el estrés agudo no se instalara como estrés crónico. También detectar patologías psíquicas preexistentes.

600 profesionales capacitados para brindar apoyo psicológico en los Centros de Evacuados.

Se han instalo un equipo de especialistas que brindaron apoyo psicológico telefónico.

Mantener en todos los equipos, desde el ámbito de la salud mental, el objetivo de evitar o reducir el impacto, de las situaciones emocionalmente agobiantes, disminuir la vulnerabilidad, fomentar la resiliencia, Síndrome de burnout, etc.

Se distribuyeron 20,000 folletos titulados Reacciones de los niños y de los adultos ante dos desastres en los que se detallan las reacciones esperables ante esta situación desde lo bio-psico-social y los efectos esperables, especialmente las reacciones normales ante situaciones anormales, Algunas conclusiones:

1. capacitación in situ; y
2. promover tareas de debriefing.

Solo estando preparados se disminuyen riesgos

Prehosp Disast Med 2007;22(2):s163

Gestionamos Crisis o Riesgos?

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Tradicionalmente entendemos al desastre como producto, dejando afuera del análisis la consideración de la sociedad expuesta al riesgo.

El desastre deja de ser un momento de disrupción en la cotidianeidad y pasa a ser el instante preciso en que el riesgo esta en evidencia: Cromagnon, inundaciones en Santa Fe, Argentina

Gestión Crisis: Incluye el establecimiento de las prioridades organizacionales en materia de salud mental, la continuidad de los programas implementados, las actividades de entrenamiento para los trabajadores del campo, y la implementación de medidas de apoyo psicológico para la asistencia de las víctimas e intervinientes y la disminución del riesgo para que el stress no deje daños irreparables.

Gestión Integral Riesgos: Mitiga el impacto, convocando a todos los integrantes de la comunidad para la realización de acuerdos mediante una Planificación Estratégica sobre Gestión Integral de Riesgos que incluye la respuesta.

Método: Se testearon con la participación de varios profesionales, en grupos de respuesta o prevención de desastres y emergencias, gubernamentales y no gubernamentales, así como en la población afectada o vulnerable de los hechos trágicos ocurridos en 25 años en Argentina.

Los métodos de: observación directa del comportamiento humano en operaciones de rescate, actividades de entrenamiento, entrevistas, pruebas tomadas a rescatistas y datos estadísticos.

Resultados: La emergencia o el desastre es el grado de actualización del riesgo en que vive una sociedad, aquí se hace prioritaria la implementación.

Prehosp Disast Med 2007;22(2):s164

Session 4

Chair: Felipe Cruz-Vega

Puentes de Rescate: Desempleo—Emergencia Social

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Fundamentacion: Los efectos de las situaciones disruptivas, ej, prdida de trabajo y de oportunidades de un lugar en el mbito ocupacional y laboral es visualizado como una situacin catastrfica, produce un impacto que conlleva una sintomatologa de crisis a resolver.

Todo depende de la vulnerabilidad de las personas y de los grupos en relacin a su resiliencia ante las situaciones adversas de la vida como a la contencin social familiar e institucional, como respuesta al hecho

Secuencia de la situacin: Perdida del espacio ocupacional, falta de un lugar de desarrollo personal; fracturas familiares; stress agudo, traumtico o post-traumtico posible; efectos de la ansiedad por disrupcin; y aumento de conductas de riesgo social.

Acciones: Trabajar en una primera etapa con quienes han sobrevivido a esta situacin y tienen perfil de salidores del impacto psicosocial que produce el estar expulsado de un sistema. Generar espacios como tutores sociales que brinden motivacin, capacitacion y inclusin laboral

Grupo Objetivo: Mujeres y hombres que han trabajado en un tiempo y quedaron fuera del sistema laboral por crianza de sus hijos o por cierre de las empresas; beneficiarios de planes sociales; e aquellas personas que desean capacitarse.

Metodologa: Participativa orientativa y las actividades grupales logran redescubrir los sentimientos y las emociones mas profundas y construir un nuevo horizonte con cambios de conductas positivas

Objetivo: 1ra etapa-INCLUSION SOCIAL del 75 % del grupo Objetivo de 50.000 personas que estaban fuera del sistema laboral o sin orientacin desde el Estado

Prehosp Disast Med 2007;22(2):s164

Plan de Preparacion y Respuesta en Aragn (Espaa) Frente a la Gripe Aviar

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Introduccion: El Hospital Royo Villanova fue designado como centro de referencia de gripe aviar en Aragn en el ao 2005. Esto ha requerido una serie de cambios estructurales y organizativos en el hospital, asi como el desarrollo de un protocolo de actuacin basado en las directrices de las autoridades sanitarias y la evidencia cientfica, cuya descripcin es el objetivo del presente trabajo.

Material y metodos:

1. Documentacion disponible sobre prevencion y tratamiento de la gripe aviar.
2. Definicin de caso.
3. Deteccin de caso.
4. Actas y trabajos de las diferentes comisiones y rganos directivos del hospital.
5. Reuniones con expertos en sanidad humana y animal.

Desarrollo: Se describen las medidas de modificacin y estructura del centro (aislamiento y trnsito de casos sospechosos) y se presenta el protocolo de actuacin.

Conclusion: La puesta en marcha de un protocolo de actuacin ante gripe aviar requiere de un conjunto de medidas de caracter multidisciplinar y complejas que permitan la adaptacin de un centro hospitalario a centro de referencia.

Prehosp Disast Med 2007;22(2):s164

Atención de Brotes de Botulismo Aviar en Cuerpos de Agua Epicontinentales en Mexico

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En México la Comisión Nacional del Agua (CONAGUA) que es un organismo de competencia federal tiene la responsabilidad de atender las contingencias ambientales o emergencias hidroecológicas causadas por mortandades masivas de aves acuáticas generadas por la bacteria Clostridium botulinum. Por lo que ha desarrollado un procedimiento de atención que tiene como principal objetivo

el de establecer los procedimientos técnicos para la atención de brotes de botulismo aviar en cuerpos de agua epicontinentales.

En ello se plantea la importancia de la atención para determinar los programas de trabajo en los sitios que resulten de un diagnóstico positivo y se establezcan las acciones a realizar siguiendo una línea de acción efectiva además de la difusión a la comunidad y su propia participación.

Además de familiarizarse con los diferentes procedimientos para la atención de brotes de botulismo desarrollados e implementados en el Manual de Atención de Brotes de Botulismo Aviar en Cuerpos de Agua Epicontinentales editado por la CONAGUA es necesario que se determinen acciones a corto y mediano plazo para la prevención y atención de este tipo de eventos en los recursos naturales de los diversos embalses de cada en la temporada migratoria de México, a fin de realizar acciones coordinadas destinadas a la protección de los recursos naturales y su entorno, contra las situaciones de riesgo o desastre.

Prehosp Disast Med 2007;22(2):s164–s165

Ahogamiento Accidental en Menores de Cinco Años en la Argentina

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2. Fundacin Barcel, Buenos Aires, Argentina

Objetivos: El objetivo del trabajo es revisar los aspectos epidemiolgicos de los ltimos 3 aos del ahogamiento accidental en menores de 5 aos en La Argentina.

Material y Mertodos: Revisin bibliogrfica sobre ahogamiento sumndose las publicaciones del Ministerio de Salud de Argentina.

Resultados: El ahogamiento accidental es una de las principales causas de muerte. En los menores de 5 aos es la primer causa de muerte. Esta patologa lejos de disminuir, tiende a aumentar y lleva una relacin inversamente proporcional entre incidencia y edad, luego de los 24 aos.

El trabajo se basa en la etiologa accidental, pudiendo haber factores patolgicos desencadenantes como los traumatismos encfalo craneanos, las crisis convulsivas, deslizamiento, cada dentro del agua, por la falta de dominio del cuerpo en la posicin horizontal.

Conclusion: En Argentina caus entre 150 y 180 muertes anuales en los ltimos aos, siendo los nios y adultos jvenes las vctimas ms frecuentes.

Al ser esta una patologa potencialmente reversible y una de las principales causas de muerte en edades tempranas de la vida, los pilares fundamentales para evitar el avance que muestra en los ltimos aos son: la prevencin, la familiarizacin temprana con el medio acutico y un correcto tratamiento, que en conjunto con su mayor estudio dar no solo menos vctimas, sino que disminuir las secuelas que esta produce.

Prehosp Disast Med 2007;22(2):s165

Poster Presentations—Theme 17: Spanish Abstracts/Resúmes españoles

(265) Periodo de Latencia en la Intoxicacin por Setas

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Introducción: En la intoxicacin por setas hay que determinar el tiempo transcurrido desde la ingesta hasta la aparicin de sntomas (periodo de latencia).

Objetivos: Presentamos dos casos de intoxicadin por setas con diferentes periodos de latencia.

Casos Clinicos:

1. Varn de 25 años que ingiri una seta sin identificar y a la hora comienza con gastroenteritis. Se instaur tratamiento sintomtico tras lavado gstrico y carbn activado. Se identific la seta como Entoloma lividum
2. Mujer de 43 años y varn de 47 que comieron setas identificadas como Tricholoma terreum por error. A las 8 horas comienzan con gastroenteritis.Llegan al hospital a las 22 horas de la ingesta, con deterioro del estado general y deshidratacin. El varn present afectacin heptica. Se administr sueroterapia, carbn activado, aspiracin contina con SNG y Penicilina G sdica. La seta se identific como Lepiota brunneoincarnata.

Resultados: El paciente del caso 1 evolucion favorablemente tolerando ingesta y siendo alta en las primeras 24 horas.

En el caso 2 ambos pacientes ingresaron en planta de Medicina Interna.

La mujer fue dada de alta a los 9 das con el diagnstico síndrome ciclopeptdeo leve por lepiota. El varn permaneci ingresado 17 das normalizndose su funcin heptica y resolvindose el cuadro con tratamiento conservador.

Conclusiones:

1. Determinar en los Servicios de Urgencias el perodo de latencia que condiciona la gravedad.
2. Instaurar precozmente el tratamiento adecuado ante un caso sospechoso sin esperar resultados analticos.

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(266) Equipamiento Logistico en Situaciones de Desastre

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Introducción: El equipamiento logístico en situaciones de desastres es un elemento de gran importancia para dar una contestación eficaz.

Objetivos: Mostrar las diferentes soluciones de logística para encarar una situación del desastre con los medios disponibles. Mostrar las características técnicas de estos equipamientos, funcionamiento y medios.

Material y Métodos: La Empresa Arpa Construcción Modular es un fabricante español de edificaciones modulares. Nuestra Empresa cuenta con 3 divisiones: (1) Vivienda; (2) Sanidad; y (3) Educación.

Dentro de nuestra División sanitaria Arpa Construcción Modular ha diseñado a un puesto de socorro, teniendo en

cuenta la comodidad del usuario, la eficacia de trabajo y siempre cumpliendo con la normativa vigente. **Conclusión:** Trabajando en estrecha colaboración con las autoridades sanitarias, compañías públicas, privadas, autoridades civiles y militares para mejorar la capacidad de respuesta ante cualquier situación.

El equipamiento logístico médico es un eslabón en la cadena para proporcionar la más eficiente y efectiva respuesta médica ante cualquier amenaza

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(267) Ictericia Obstructiva por Diverticulo Duodenal

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Objetivos: Los divertículos duodenales son relativamente frecuentes, la gran mayoría latentes, descubriendose de manera casual. Únicamente dan clínica en el 1–2% y sólo un porcentaje requieren cirugía. Presentamos un caso de ictericia obstructiva ocasionada por voluminoso divertículo duodenal.

Caso Clinico: Paciente de 64 años, sin antecedentes de interés. Desde hace un mes, hiporexia, astenia y malestar; los últimos días acompañado de ictericia con orinas colúricas.

Exploración física: Ictericia de piel y mucosas, resto normal.

Analítica sanguínea: Elevación de transaminasas y bilirrubina, resto normal.

Ecografía abdominal: Hígado de tamaño y morfología normal, mínima ectasia de vía biliar intrahepática, colédoco anfractuoso, zona hiperecogénica (15,5- 20 mm.) en hilio hepático que pudiera corresponder con colangiocarcinoma. Vesícula postpandrial. Páncreas normal. Ingresa para estudio. Analítica de ingreso: bilirrubina total 4,6; directa 2,8: GOT 311; GPT 1105; GGT 544; Fosfatasa alcalina 151; marcadores tumorales normales.

TC abdominal: Hígado, vías biliares normales. Páncreas bien delimitado con desplazamiento de la cabeza en sentido anterior por formación de contenido líquido que parece corresponder a un voluminoso divertículo de la 2ª porción duodenal.

Estudio gastroduodenal: gran divertículo duodenal.

Trás desaparición de la ictericia y mejoría de parámetros hepáticos, es dado de alta; valorado por Servicio de Cirugía, citándole para cirugía programada.

Discusion: La ictericia obstructiva es un síndrome clínico frecuente. La causa más frecuente es la obstrucción por cálculo, otras relativamente frecuentes son las obstrucciones por tumores. En nuestro caso la obstrucción se produjo por un divertículo duodenal gigante (poco frecuente), patología benigna que pudo ser resuelta con cirugía.

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(268) Fractura-Luxación de Húmero Tras Electrocución

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Objetivos: La mayoría de las lesiones producidas por electricidad ocurren accidentalmente en el hogar con corriente alterna de bajo voltaje. Nos podemos encontrar desde simples eritemas hasta parada cardiorrespiratoria y muerte. Presentamos un caso en el que se produjo fractura-luxación del húmero.

Caso Clinico: Paciente de 61 años, sin antecedentes de interés. Acude al servicio de urgencias, por haber sufrido hace 30 minutos descarga eléctrica en el baño de su casa, refiere dolor e impotencia funcional en extremidad superior izquierda. Consciente y hemodinámicamente estable, destaca punto eritematoso no necrótico, en palma de mano derecha, dolor e impotencia funcional en hombro izquierdo y disminución de fuerza, sin apreciar síndrome compartimental, ni punto de salida. Pruebas complementarias: demuestran fractura-luxación de húmero izquierdo y ligera elevación de CK. Se realiza reducción de la fractura-luxación por traumatólogo, queda en observación en el servicio de urgencias, siendo dado de alta en 24 horas sin complicaciones.

Discusion: El grado de lesión tisular depende de varios factores: tipo e intensidad de la corriente, voltaje, resistencia, duración del contacto y trayecto. La corriente alterna suele producir más daños que la continua. La lesión será mayor cuanto más alto sea el voltaje y menor la resistencia de los tejidos (alta en el hueso). En general son peores los trayectos horizontales. En todo paciente que ha sufrido una electrocución debemos valorar en el primer momento la afectación respiratoria, cardiaca y neurológica; y posteriormente la existencia de afectación renal, las secuelas neurológicas y lesiones traumáticas.

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(269) Revision de Reclamaciones en un Servicio de Urgencias Hospitalario

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Hemos revisado un total de 84 reclamaciones recibidas en el servicio de urgencias del hospital Royo Villanova de Zaragoza (Espaa) desde septiembre del 2005 a octubre del 2006, realizadas por mayores de 14 años obtenindose los siguientes datos:

1. El 66,67% son mujeres
2. La reclamacin la realiza por igual el paciente (54,76%) o el acompaante (45,24%).
3. Más de la mitad (69,05%) son menores de 50 años.
4. En un alto porcentaje (90,48) son interpuestas el mismo da de la demanda de asistencia.
5. Practicamente la mitad son recibidas entre lunes y martés.
6. El motivo principal de la reclamación es la demora en la asistencia.
7. El tiempo de contestacin a dichas reclamaciones no supera los 15 das en un 89,28%.

Se revisan los diagnsticos al alta y nicamente en un 8,33% están relativamente justificadas.

Hay que destacar que en un 32,15% el paciente abandona el servicio sin esperar a ser atendido y en un 59,52% el diagnstico al alta no justifica su asistencia en un servicio de urgencias hospitalario.

Por lo tanto si tenemos en cuenta los pacientes que abandonan el servicio y aquellos en los que no está justifi-

cada su asistencia hospitalaria obtenemos un total de 91,67% de pacientes que han reclamado y que deberan haber consultado previamente en atención primaria.
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(270) Intoxicacion por Adelfas

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La Adelfa (Nerium oleander L.), es una planta arbustiva de hoja perenne, cuyas hojas, flores, tallos, ramas y semillas son venenosas. Pose heterosidos cardiotonicos: oleandrina, digitoxigenina, y flavonoides. Se encuentra en zonas de clima templado arido. Muy tipicas de jardines y medianas de carreteras.

Paciente de 47 años, de profesion conserje-jardinero, que acude al Servicio de Urgencias por presentar nauseas, vomitos y diarreas. No presenta sintomatologia neurologica, dolor toracico ni disnea. Como antecedente de interes, refiere haber estado podando adelfas durante aproximadamente 2 horas, esa misma mañana. Se trata de una tarea que realiza semestralmente. No emplea proteccion.

La exploracin fisica resulta dentro de la normalidad, excepto moderada epigastralgia a la palpacion, con peristaltismo aumentado, sin signos de irritacion peritoneal. En la auscultacion cardiopulmonar, tonos ritmicos a 90 p.m. Pulsos femorales y pedios presentes. Exploracion neurologica completa, normal.

En las pruebas complementarias se obtienen niveles de sodio-potasio-magnesio normales con digoxinemia de 0,17. En el electrocardiograma presenta ritmo sinusal a 100 p.m. sin alteraciones de la repolarizacion ni sugestivas de isquemia.

La intoxicacion por adelfa es parecida a la intoxicacion digitalica. Entre 4-12 horas despues de la ingesta se producen alteraciones gastrointestinales acompaadas de nauseas y vomitos, con deposiciones sanguinolentas, vertigo, ataxia, midriasis, excitacion nerviosa seguida de depresion, disnea, convulsiones tetaniformes. Tambien puede aparecer fibrilacion auricular y bloqueo con parada cardiaca.

En nuestro caso, la intoxicacion resulto leve, probablemente debido a una minima ingesta, que fue suficiente para tener clinica, lo que pone de manifiesto la gran toxicidad de esta planta.
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(271) Intoxicacion por Monoxido de Carbobo y Heroina

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Paciente de 40 aos, es traida al Servicio Urgencias por sus familiares por presentar cuadro de disminucion del nivel de conciencia y dificultad respiratoria. A su llegada, esta fria, temblorosa, arreactiva con tiraje respiratorio y con Glasgow 10. Presenta pupilas mioticas, arreactivas, y sin reflejo fotomotor. Cianosis central y periferica. Presenta una convulsion que cede con Diacepam rectal.

La auscultacion cardiaca es de tonos ritmicos a 100 p.m. sin soplos y en la auscultacion pulmonar presenta roncus y sibilantes dispersos con crepitantes bibasales. Saturacion de O2 <70%. En el electrocardiograma no se observan alteraciones sugestivas de isquemia ni alteraciones en la repolarizacion.

Se pide colaboracion a su marido para realizar la historia clinica. Refiere que la paciente estaba en una habitacion donde habia mucho humo procedente de un quemador de gasolina y que ademas habia fumado heroina.

Se administran antidotos (flumazenil y naloxona) con mejoria transitoria del nivel de conciencia pero sin recuperacion total. Se realiza cooximetria, que muestra una carboxihemoglobina del 32% (normal: 0-1,5%). Acidosis metabolica compensada. Se ingresa en U.C.I. donde se continua con oxigenoterapia con FiO2 100%, perfusion de naloxona y de bicarbonato.

La evolucion posterior ha sido favorable, presentando una carboxihemoglobina del 8,6% a la hora y 0,6% a las 6 horas. Tras 24 horas, la paciente pasa a Medicina Interna para continuar evolucion.

Resaltar la importancia de la historia clinica, en este caso el aporte que hicieron sus familiares, que resulto clave para llegar al diagnostico.
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(272) Indicadores de Calidad Asistencial del Paciente Crítico en el Rea de Emergencia Hospitalaria

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Objetivo: Para el enfermo crtico en rea de emergencias: definir los indicadores de calidad y evaluar su legibilidad.
Metodologa: Estudio descriptivo transversal. Seleccin, por consenso de grupo nominal, entre los 120 indicadores de la Sociedad Espaola de Medicina Intensiva Crtica y Unidades Coronarias. Se mide la legibilidad con el mtodo Flesch la frmula adaptada por Fernndez Huerta para el idioma espanol.
Resultados: Se analizan 84 indicadores: 60 de proceso, 22 de resultados y 3 de estructura, analizndose segn diferentes catergoras de cuidados y siendo el valor promedio de legibilidad de 69,88 que resulta una legibilidad estandar según el índice de Flesch.
Conclusiones: conseguir una buena asistencia clnica ante el paciente crtico ingresado en el rea de emergencias pasa por utilizar indicadores de calidad válidos para cambiar o modificar aquellos aspectos de la prctica asistencial susceptibles de mejora. Los indicadores propuestos por este estudio tienen esa finalidad, a su vez, el preocuparse por la legibilidad o la dificultad de lectura es uno de los factores esenciales para que la redaccin de los indicadores sea fcilmente comprensible y asimilada por el equipo de urgencias (mejora continua de la calidad asistencial). El nivel de legibilidad

calculado nos da una aproximación de la escasa dificultad que presentan su lectura y de forma indirecta su aplicabilidad.
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(273) Que Riesgos Ocupacionales se Asocian con la Actividad Profesional dde Enfermera en Urgencias Extrahospitalarias?

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Introduccion: El riesgo ocupacional tiene mucha relevancia en las unidades de urgencias hospitalarias.Son escasos los registros de accidentes y exposicin a riesgos laborales de enfermeros en unidades de urgencias prehospitalarias.
Objetivos: identificar los riesgos fsicos, psquicos y biolgicos de la profesin de enfermera en los dispositivos de emergencias prehospitalarias del rea Sanitaria de Ferrol, que necesiten ser eliminados o minimizados.
Metodologa: Estudio descriptivo transversal sobre la poblacin de profesionales de enfermera Se analizan los biocontenedores de seguridad para el desecho de material punzante/cortante. Mediante chek-list y pooled rank se obtienen los datos del estudio. Se utiliza estadstica descriptiva, de correlacin y de comparacin cualitativa (χ^2) para un valor p <0.05.
Resultados: Se clasificaron los enfermeros por edad, sexo, antiguedad profesional y vinculacin contractual. Principal actividade de riesgo de tipo biolgico result la recogida de material biocontaminante; de tipo físico las posturas forzadas del raquis y la carga de pesos y de tipo písquico la falta de sueo y la ansiedad por la demanda asistencial. De forma indirecta se midi el riesgo biolgico del total de contenedores de bioseguridad modelo B-D Guardian resultando su uso incorrecto en el 16,4%, inadecuado en el 10% y con alto riesgo biolgico en 4 de ellos por sobrepasar la lnea de llenado de seguridad.
Conclusiones: Se identifica los riesgos potenciales de tipo biolgico, fsico y psquico. Se detectan hbitos errneos en la manipulacin de contenedores de bioseguridad. Es necesario profundizar en esta línea de investigacin con nuevos estudios que para refrendar los resultados obtenidos.
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(274) Sincope de Causa Extra: Arnold-Chiari

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Historia clínica: paciente varn de 47 aos, antecedentes de dislipemia, sin hbitos txicos, que encontrándose previamente bien, presenta ésbitamente cuadro de prdida de conciencia con hipotona generalizada y apneas de 40-60 segundos. Como nico antecedente seala un traumatismo sacro-lumbar unas horas antes (cada de 1 metro de altura), sin trauma craneal. Es trasladado en UVI-móvil y a su llegada a Urgencias se objetivan episodios de caractersticas similares con desaturaciones de hasta 74% de O2, sin alteraciones del ritmo cardiaco.
Exploracin fsica: Glasgow 15, buen estado general, neurolgicamente sin focalidad, auscultacin cardiopulmonar sin alteraciones, abdomen anodino.
Pruebas complementarias en Urgencias: BM test: 82 mg/dl, ECG: sinusal a 68 lpm sin alteraciones de repolarizacin. Analtica (incluidos txicos) sin datos de inters. Rx trax: normal y TAC cerebral: sin alteraciones.
Evolucin: Se decidi ingreso en UCI, el cuadro remiti espontneamente y se traslad a planta de Medicina Interna para completar estudio. Ecocardiograma, Eco Doppler de troncos supraarticos, ECG-Holter de 24 horas y EEG sin alteraciones. RNM: Malformacin de Arnold Chiari tipo I (descenso de amigdalas cerebelosas por debajo de los 5 mm) y quiste en comisura anterior. Se interpret el cuadro como crisis comicial autolimitada de etiologa no filiada y se procedi al alta hospitalaria con observacin ambulatoria por el servicio de Neurologa.
Conclusiones: La malformación Arnold Chiari tipo I provoca sintomatologa muy diversa y en adultos la edad de debut se sita en torno a los 40 años. Los traumatismos se consideran factor desencadenante o agravante de la clnica.
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(275) Postura ante la Educacion en Medicos con Actividades Docentes, Alcances de dos Diferentes Estrategias Educativas

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Objetivos: Construir, validar, y aplicar un instrumento para apreciar la postura ante la educacin en mdicos. Comparar el alcance de 2 estrategia educativa diferentes sobre el desarrollo de una postura ante la educacin en mdicos con funciones docentes.
Metodos: Estudio cuasiexperimental aprobado por el comit de investigación. Se construyo y valido por ronda de expertos un instrumento enfocado a situaciones médico asistenciales consistente en 74 enunciados que abordan el desarrollo de una postura ante la educación a travás de aspectos del quehacer docente en forma de duplas excluyentes a travás de 3 indicadores: acuerdo indiscriminado, enfoque más popular y consecuencia. Los grupos naturales se conformaron cada uno por 7 médicos con actividades docentes inscritos en 2 diplomados en docencia con estrategias diferentes (tradicional vs promotora de la participación). Los instrumentos fueron aplicados previo consentimiento. El anlisis estadstico utilizado fue no paramtrico.
Resultados: La U de Mann Whitney inicial no mostra diferencias entre los grupos, aunque tras las intervenciones encontr diferencia significativa a favor del grupo con estrategia participativa, principalmente en el indicador de consecuencia. La prueba de Wilcoxon mostra un incremente (p <0.01) sus evaluaciones en los 3 indicadores de postura, aunque solo 2 médicos la alcanzaron como tal; situación no encontrada en el grupo comparativo, en donde no se encontr incremento significativo en ninguno de los sujetos ni alcanzaron a desarrollar postura.

Conclusiones: Una estrategia promotora de la participacin alcanza mejores logros en el desarrollo de una postura ante la educación en médicos con funciones docentes.
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(276) Aptitudes Clinicas de Residentes de Urgencias en el abordaje de la Enfermedad Vascular Cerebral

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Objetivos: Construir, validar y aplicar un instrumento evaluar las aptitudes clínicas de los médicos residentes de Urgencias en el manejo de pacientes con enfermedad vascular cerebral.
Metodos: Estudio observacional, autorizado por el comit de investigación en que se evaluaron los 31 residentes de los 3 grados de la especialidad de urgencias de una de las sedes del Distrito Federal.

Para la construcción del instrumento se emplearon 3 casos clnicos reales de pacientes con Enfermedad Vascular Cerebra. La validez de contenido se obtuvo por consenso 4 de 4 por expertos en urgencias e investigación educativa. Se realiz una prueba piloto en médicos internos de pregrado. La consistencia se determin con la prueba de Kuder-Richardson. El instrumento validado se aplica en una nica sesión ex profeso, determinándose posteriormente las respuestas esperadas por azar a travás de la prueba de Prez-Padilla. Se utiliz un anlisis estadístico no paramtrico
Resultados: La versión final del instrumento se constitur por 153 temás distribuidos en 10 indicadores. La consistencia result de 0.92. La puntuación máxima fue de 124 y la mínima de 44. Se obtuvieron 25 respuestas esperadas por azar. El anlisis estadístico no encontré diferencias entre los grados acadmicos. La mayora de los residentes se ubicaron dentro del rango intermedio (41.93%) y alto (25.80%). En la mayora de los indicadores los residentes de 3er año obtuvieron mejores calificaciones.
Conclusiones: El instrumento construido tiene una adecuada confiabilidad. El proceso educativo en esta sede parece promover un proceso de reflexin y crítica por parte de los residentes.
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(277) Intoxicacion por Tolueno

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Los disolventes orgánicos son tóxicos. Los vapores que desprenden los disolventes organicos son más pesados que el aire, por lo que su mayor concentración estar cerca del suelo. Estos vapores, cruzan las membranas celulares, y, debido a su gran solubilidad en grasas, alcanzan concentraciones altas en el SNC
Caso clínico: Varn de 50 años trado en UVI movil por presentar, en su domicilio, episodio de prédida de conciencia recuperada y posteriormente habla disrítrica e incoherencia; se sospecha de estado de embriaguez.

En urgencias, paciente consciente, no orientado en tiempo ni espacio, somnoliento con constantes estables(T arterial 120/80, F.C. 72xmin, T 36,5, Saturacin O2 96%), no fetor enlico.

En la exploracin neurolgica destaca un paciente somnoliento, algo disartrico con Glasgow (3+4+6) 13/15, sin otra focalidad.

Pruebas complementarias: leucocitosis con desviacin izquierda; radiografa torax sin alteraciones; ECG ritmo sinusal 64x min sin alteraciones de la repolarizacin.

Evolución: Al observarse la discrepancia entre la exploracin física y la primera orientacin clínica se reinterroga a la esposa del paciente quien confirma la toma de alcohol y nos informa que haba estado barnizando unos muebles con un producto, que va a buscar a domicilio, el barniz lleva TOLUENO 100:6.

Ante la nueva información se diagnostica de Intoxicacin aguda por Tolueno y se inicia tratamiento.
Conclusiones: La historia clínica siempre es fundamental en el Servicio de Urgencias. Pensar siempre en las intoxicaciones por disolventes en situaciones de afectación del SNC sin focalidad clara.
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(278) Sindrome Bajo Gasto Cardiaco

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Introduccion: Hablamos de síndrome de bajo gasto (independientemente de la causa) cuando nos encontramos con una situación clínica caracterizada: Hipotensin arterial: Tensin Arterial Media < 65 mmHg y signos de mala perfusin perifrica o cerebral. Congestin pulmonar: Presin Aurcula Izquierda > 18 mmHg. Oliguria: diuresis menor de 1ml/Kg/h
Caso clnico: Varn de 78 años acude por dolor abdominal inespecfico de varios das de evolución sin otra clínica. Portador de marcapasos y sin alergias medicamentosas conocidas. En la exploracin: Dolor a la palpacin difusa sin defensa abdominal con constantes estables (T arterial 120/80, F.C. 72xmin, T 36,5). Pruebas complementarias: Analtica de sangre con parmetros habituales sin alteraciones; radiografa abdomen normal; ECG ritmo sinusal 64x min sin alteraciones de la repolarización.
Evolución: Se diagnostica de dolor abdominal inespecfico y se inicia tratamiento con Metamizol iv, a los pocos minutos el paciente presenta dificultad para respirar, dolor torcico y síncope; A la exploracin rubefaccin, anisocoria, A.P: sibilantes dispersos, A.C: Rítmico a 80xmin, Tarterial 80/40 y Sat O2 80%. En ECG: ritmo sinusal 80xmin con isquemia subepicrdica cara inferior. Se inicia tratamiento para el shock anafilctico con recuperacin total.
Conclusiones: No debemos confundir la clínica del bajo gasto como la causa de la situación del paciente, e iniciar el tratamiento que debe seguir una lnea de actuacin lógica donde en primer lugar se analicen y corrijan las causas (en este caso anafilaxia). El objetivo es mantener un flujo sangu-

neo a los rganos capaz de satisfacer las demandas metablicas, teniendo en cuenta que el corazón debe mantener prioridad.
Prehosp Disast Med 2007;22(2):s169–s170

(279) Perfil de las Intoxicaciones por Productos Quimicos en el Servicio de Urgencias del Hospital Royo Villanova

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Objetivos: conocer el perfil y las caractersticas generales de los pacientes que sufren cualquier tipo de contacto con sustancias químicas y que acuden a un servicio de urgencias hospitalario.
Material y metodos: estudio descriptivo y prospectivo de pacientes que acudieron a urgencias por haber tenido algn tipo de contacto con sustancias químicas. Los casos se recogen en una ficha con 25 items en donde figuran los datos epidemiolgicos, etiolgicos clnicos, analticos y teraputicos. El periodo de estudio abarca el ao 2006.
Resultados: Número de casos totales: 28. Sin diferencias en cuanto a sexos. Media de edad 38 años. La intencionalidad fue suicida en 7,14%, accidentes domsticos 78,58%. Los agentes causales más frecuentes fueron gases (txicos e irritantes) 49%, custicos 28,57 %, disolventes 7,14%, detergentes 14,28%. Presentaron algn tipo de clnica el 81,58%, ms frecuentemente digestiva y neurolgica. Requirieron alguna medida teraputica el 73,83%, generalmente sintomtica y medidas de descontaminacin digestiva. Recibieron antdotos el 7,14% de los pacientes. La estancia media en urgencias fue de 17 horas. Ninguno de los pacientes precis ingreso hospitalario . La evolucin fue satisfactoria en el 100%,sin registrarse ningn fallecido.
Conclusiones: El perfil general del paciente intoxicado por productos qumicos es una persona de 30 a 40 aos sin diferencia en cuanto al sexo. Llama la atencin el bajo numero de casos de intoxicaciones por productos qumicos y la poca gravedad de los mismos.
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(280) Casiahogamiento e Hipotermia

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Introduccin: El casiahogamiento , se define como ahogamiento incompleto, al sobrevivir 24 horas tras la inmersión, considerando húmedo o seco, según haya o no aspiración. Tendremos presente la hipotermia según zona de inmersión.
Caso clnico: Varn 21 años, sin antecedentes, rescatado por bomberos del ro, al cual se haba tirado.

Trado, desnudo y cubierto con manta térmica, el paciente resenta: fetor enlico, temperatura axilar 31, Glasgow 8, saturacin de oxgeno 85% con ventimask y taquicardia sinusal. No lesiones dérmicas.

Se canaliza una segunda va y se procede al calentamiento con medios externos e internos, sueros calientes, manteniendo saturacin mayor de 90% con reservorio.

Pruebas complementarias: leucocitosis con desviacin izquierda, pH: 7,26, aumento de CK y CK-MB, radiografa con focos de condensacin parcheados en ambos campos compatibles con neumona por aspiración.
Evolución: 90 minutos tras su llegada a Urgencias, presenta Glasgow 15, con pH: 7,32 tratamiento de mantenimiento, retirando calentamiento interno, y con antibioterapia. 180 minútos tas su llegada, el paciente comenz bruscamente con tiritona, desaturacin e hizo una parada respiratoria que obligo a la intubación endotraqueal pasando a Cuidados Intensivos. La temperatura no alcanáz los 38. Menos de 24 horas despus se extubo sin complicaciones, sin modificarse el tratamiento previo y con buena evolucin pulmonar.
Conclusiones: Tratar adecuadamente la hipotermia, en nuestro caso moderada (28-32). Tener presente y tratar la aspiracin, de ello puede depender el pronstico del paciente y las complicaciones. Mantener siempre medidas de soporte vital.
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(281) Tratamiento antiarrtmico de los pacientes con Fibrilacin Auricular en una Unidad de Corta Estancia de Urgencias

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Introducción: La Fibrilacin Auricular (FA) es la arritmia ms prevalente en nuestro medio y su manejo se realiza con frecuencia en una Unidad de Corta Estancia (UCE) de los Servicios de Urgencias Hospitalarios.
Objetivos: Valorar el manejo y la efectividad de los diferentes tratamientos antiarrtmicos (AA) utilizados en la Fibrilacin Auricular de pacientes ingresados en una UCE de Urgencias hospitalaria.
Material y metodos: estudio observacional, descriptivo y prospectivo realizado sobre todos los pacientes con FA ingresados en la UCE. El periodo de estudio abarca los dos ltimos aos. Los datos se recogieron en una ficha codificada de las historias de Urgencias de estos pacientes.
Resultados: Número total de casos 520. Los tratamientos ms utilizados fueron: (1) cardiovertidores: amiodarona 227 casos (43,65%); flecainida 46 casos (8,84%); propafenona 26 casos (5%); cardioversin elctrica (CVE) 11 casos (2,11%); y (2) controladores de la frecuencia cardiaca: digoxina 143 casos (27,5%); calcioantagonistas 76 casos (14,61%); betabloqueantes 64 casos (12,30%). Efectividad de los fármacos utilizados para la restauracin del ritmo: flecainida 95,65%, propafenona 80,76%, amiodarona 71,36%, CVE 90,90%. El paso a ritmo sinusal fue espontáneo en 32 casos (6,15%).
Conclusiones: Los antiarrtmicos más utilizados en nuestro estudio fueron dos clásicos: la amiodarona en el grupo de AA utilizados para la restauración del ritmo y la digoxina como controlador de la frecuencia cardiaca. Los fármacos más efectivos para la restauración del ritmo son los del grupo IC especialmente la flecainida. Destaca la baja utilización de la CVE como tratamiento para la restauración del ritmo.
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(282) ¿Se Justifica o No, la Adminstracion Gratuita de la Piladora Postcoital?

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Introducción: Según el decreto 266/2003 del 21 de octubre, el Gobierno de Aragón aprueba la administración gratuita de la píldora postcoital (Levonorgestrel) en los Centros Sanitarios Públicos. Vigente a 24 de octubre 2005.

Sanidad del Gobierno de Aragón justifica esta medida por el incremento de abortos voluntarios en mujeres menores de 20 años, quiere potenciar el contacto de los jóvenes con la Atención Primaria, así como fomentar el uso del preservativo evitando desigualdades en función del poder adquisitivo.

Objetivos: Valorar las características de las pacientes y discutir si la medida se justifica.

Material o metodos: Estudio descriptivo retrospectivo de mujeres que han solicitado la píldora durante el primer año en nuestro hospital.

Resultados: Han solicitado la anticoncepción de urgencia 121 mujeres. De las cuales, el 48% se encuentra entre 20-29 años, el día más frecuentado (36,4%) fue el domingo. El 96,2% de las usuarias refieren fallo del método anticonceptivo, siendo el preservativo utilizado por el 88,4% y un 5,8% no utilizan método. El 76% era la primera vez que solicitaban la anticoncepción hormonal de urgencia, y un 5,8% en más de dos ocasiones.

Conclusiones: La franja de edad que más utiliza este recurso sanitario esta entre los 20 y 29 años, cuando la administración trataba de evitar los embarazos en menores de 20. Hay un pico de incidencia en fin de semana, no existiendo contacto con Atención Primaria. El método utilizado habitualmente es el preservativo. Los objetivos perseguidos, al implantarse esta ley, no se cumplen en su totalidad.

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(283) Perfil de la Violencia de Género

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Introducción y objetivo: Dada la repercusión del tema en los últimos años, tanto en el aumento de las denuncias y sus consecuencias, así como los datos aportados por instituciones políticas y sociales; se refleja que entre el 10 y el 69% de las mujeres ha sido victima de alguna situación de violencia física, decidimos conocer la situación en nuestro entorno.

Material y método: revisamos los partes de lesiones tramitados en los últimos tres años, recogiendo datos demográficos y características del suceso.

Resultados: 53 denuncias, de las cuales el 90.5% eran mujeres de entre 31-50 años (62,4%), la mayoría casadas (54,7%) y cuyo agresor había sido su cónyuge (51%). El 68% de las victimas eran españolas. Tanto mañanas como tardes eran los momentos de mayor violencia y el 54,7% se ejercicio en el domicilio conyugal.

El 30% reconocían era un maltrato reiterado. El 98% había sufrido maltrato físico y un 23% también psíquico, siendo objetivables las lesiones en el 81% de las denuncias.

La mayor parte de las mujeres tenían un estado emocional alterado en su mayoría con cuadros de ansiedad (62.3%).

El 85% preciso algún tipo de tratamiento y sólo el 39,6% precisó alguna prueba complementaria. El 85% se derivo a atención primaria para seguimiento y control.

Conclusiones: Podemos resumir que el perfil de maltrato de género reconocido en nuestro entorno se trata de mujer autóctona, casada, cuyo maltratador es su marido, de entre 30y 51 años, en su mayoría con maltrato físico objetivo y un pronóstico menos grave.

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(284) Mortalidad por Accidentes de Trafico en Mexico durante el Período 1998–2005

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Objetivo: Describir la mortalidad en México, por accidentes de tráfico de 1998–2005.

Material y métodos: Utilizamos el Sistema de Informacin Dinmica de Estadstica en Salud de la Dirección General de Información en Salud. SSA, y Consejo Nacional de Poblacin; analizamos: delegacin de ocurrencia, grupos de edad y sexo, se obtuvieron promedios, proporciones y tasas estandarizadas.

Resultados: Se registraron 122,023 muertes durante el perodo, 78% fueron varones, los grupos ms afectados fueron: 20 a 24, 25 a 29 y 15 a 29 años, los menos 85 y más, 80 a 84 y 75 a 79 años; el promedio anual nacional de muertes fue 15,253; el Estado de México, Jalisco y Distrito Federal (1,576, 1,378 y 1,306 respectivamente), fueron los más altos, las tendencias en las tasas de mortalidad se incrementaron mayormente en Aguascaliente (136.75% r^2 = 0.87), San Lus Potos(68.96% r^2 = 0.85) y Nuevo Len (5.15% r^2 = 0.52) y disminuyeron en Chiapas (-68.81% r^2 = 0.61), Baja California (-46.92% r^2 = 0.78) y Guerrero (-23.66% r^2 = 0.61). La tasa más alta en 2005 la obtuvo Baja California Sur (33.4 x 10–6) y la menor Chiapas (3.2 x1 0-6), el riesgo de muerte es 10 veces mayor en Baja California Sur comparado con Chiapas. El 36% de todas las muertes ocurrió en peatones, los ocupantes de vehculos de 4 ruedas 22%, ciclistas y motociclistas 3%; los vehículos no especificados 37%, accidentes de vehculos especiales y tranvas 1%, areos y navales 1%.

Conclusiones: Las muertes afectan más a varones en edad productiva, la mayor ocurrencia en los estados con ciudades más pobladas y regiones con mayor desarrollo, los peatones los más afectados.

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Icons from the EMDM

Chair: M. Debacker

Study of Escape Patterns in Crisis Based on Psychological Character

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Introduction: It is difficult to presume the exact response or pattern of victims during disasters. Although every victims reacts to a crisis differently, a disaster response system requires uniform conditions for treating individual victims. Based on the assumption that psychological character can affect the response of victims in times of disasters, researchers studied the escape patterns of victims from dangerous, closed spaces in a disaster simulation.

Methods: A questionnaire was distributed before the escape experiment in order to assign the participants into groups based on patterns of psychological character. The questionnaire was created by an expert group, and was based on psycho-behavioral response classification to stress. Volunteers were assigned into one of three groups (A, B, and C) based on the results of the questionnaire. Volunteers started to escape from a room on the fourth floor simultaneously, and proceeded through corridors and stairs, until finally reaching safety outside of the building. The same experiment was repeated, and all of the procedures were recorded by five video cameras located around the building. A post-experimental questionnaire was distributed, and the results were analyzed.

Results: The number of participants in each group was as follows: (1) Group A: 12; (2) Group B: 11; and (3) Group C: 17. The average escape time was 83 seconds. Group A had a tendency to be competitive and to act excessively for escape. However, no statistically significant factor was shown to decrease escape time. Group C had the highest level of satisfaction after the experiment.

Conclusions: Future disaster plans should consider the individual patterns of psychological character for effective response and education. The next steps of the study, including connecting with emergency medical services and assessing survival benefit are being planned.

Keywords: building collapse; disaster; escape; psychosocial; rescue
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New Disaster Database Model: A Project to Collect Data About Terrorism and Man-Made Disasters

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During the last decade, there has been a new resurgence of terrorist-related emergencies and conflicts, reflecting a complex pattern of global changes and imbalances. Across the globe, healthcare providers increasingly are confronted with the challenges of terrorism and the fallout from the use of weapons of mass destruction. The medical and healthcare infrastructure must be prepared to prevent and to treat the illnesses and injuries that might result from chemical, biological, radioactive, nuclear, or explosive terrorism. A good method of preventing and/or responding to a potential terriorist threat may be to develop a program that includes accurate information and a collection of data that will enable the process of correct and immediate decision-making.

The analysis of hazards and vulnerabilities is the key to management and mitigation of a possible terrorist attack or a man-made disaster. The main objective of this study is to create a new, Italian database model, in order to collect all available information about past country terrorist attacks and man-made disasters, and to establish a model for the future, with an analysis of factors that most likely produce hazards. The aim of this project model is to investigate the impact of such events on physical security and public health. The database will be divided into different sections and should be easily sorted and understood, with the main objective of collecting and organizing all of the data on disaster injury epidemiology in a centralized archive. This should happen in real time with the cooperation of all country resources.

Keywords: analysis; database;hazards; model;response; terrorism
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Hospital Disaster Plan Simulation Using the "disastermed.ca" Patient Database and Existing, Computerized, Patient Tracking System: A Virtual Live Exercise

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The use of live actors often is considered the gold standard for a disaster response simulation. However, live exercises are expensive, require extensive planning, and often require a disruption of regular emergency services. The use of an existing emergency department computerized patient tracking system in a Virtual Live Exercise (VLE) may be a viable alternative.

The **disastermed.ca** database, a database of history, findings from physical examinations, and laboratory results for 136 simulated patients, was created based on actual patient encounters. The VLE was performed using a training version of the hospital's Emergency Department Information System (HASS/iSOFT). After first completing a Web-based tutorial, 15 physicians and eight nurses participated in the exercise. The simulated patients were registered, triaged, and tracked throughout their visit using the EDIS. Following the simulation, data were abstracted from the patient tracking software including: (1) triage codes; (2) time from patient presentation to assessment by a physician; and (3) patient disposition.

Following the exercise, participants rated their experience on a modified 10-point Likert scale. The overall participant satisfaction with the exercise was high (8.73). Most participants felt that the exercise effectively simulated the emergency environment and the emergency response activities (7.5). In addition, most participants felt that the simulation adequately tested the readiness and capacity to implement the disaster plan (7.6).

In summary, the use of the **disastermed.ca** patient database, in conjunction with the hospital's patient tracking system represents a simple and inexpensive alternative to traditional live exercises, and achieved a high degree of participant satisfaction.
Keywords: computerized database; disaster plan; education; hospital; patient tracking system; simulation
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Disaster Medicine: Performance Indicators, Information Support, and Documentation

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The science of disaster medicine is more descriptive than analytical. In many instances, research has not employed quantitative methods, and the knowledge based on analytical statistics is very sparse.

Setting standards that can be used as templates for evaluation and research is an objective that constantly is addressed by leading experts in disaster medicine. Performance indicators were developed and tested on reports available from events, and it was concluded that documentation in this form was not adequate for use in this method of evaluation.

When using performance indicators for the evaluation of the medical command and control it was possible to obtain specific information about what needs to be improved.

An information system using an on-line Internet technique was studied twice. The first study concluded that the system could not yet be recommended for use during major incidents. The second study concluded that in all respects this system did not work as well as a conventional ambulance file system.

The lack of staff procedural skills also could be a contributing factor to the fact that lessons in command and control often are not learned from events.

This study shows that measurable performance indicators can be used in command and control training. If performance indicators are to be used in real events and disasters, functioning information systems must be developed. This will contribute to a process in which lessons are learned and mistakes are not repeated.
Keywords: command and control; evaluation; indicators; lessons learned; standards
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WADEM Nursing Section

Chair: TBA

Australian Nurses Volunteering for the Sumatra-Andaman Earhthquake and Tsunami: A Review of Experience and Analysis of Data from a Volunteer Hotline

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This paper provides an outline of the work undertaken by nurses who participated in the relief effort as part of Australian Medical Teams during the 2004 Tsunami response, which is contrasted with the information provided by potential volunteer nurses from the free-call tsunami hotline established by the Australian government. The paper provides an overview of the skills and background of nurses who provided information to the hotline and describes the range and extent of experience among this cohort of potential volunteers. It is concluded that further work is required to investigate the motivations and disincentives for nurses to volunteer in (overseas) disaster work and to develop an improved understanding of the skills, experience and preparation required of volunteer responders. Further, it is argued that the development of standards for disaster health volunteer data collection would assist future responses and provide a basis for developing our understanding of this group of volunteers.
Keywords: Australia; nurses; Sumatra-Andaman Earthquake and Tsunami; tsunami; volunteers
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Hurricane Katrina

Chair: TBA

National Disaster Medical System Activation in a Public Health Response: A Tale of Hurricane Katrina

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This session will describe critical issues surrounding the National Disaster Medical System (NDMS)/Federal Emergency Management Agency (FEMA) activation during Hurricane Katrina. This response was the largest full activation of the patient movement portion of the NDMS. Expert speakers will describe the events surrounding the NDMS public health response to Hurricane Katrina, where >20,000 people were evacuated from New Orleans, Louisiana, and panelists from multiple organizations, at all levels of organization, from the local/regional front lines in New Orleans to the state and federal levels, and will present data from their Katrina experiences. Ground-level activities, giving the audience a first-hand glimpse of issues surrounding the lack of communication and organization. Dr. Sweinton and Dr. Proctor then will comment on local preparedness and the national response, with specific insights into activities and operational considerations occurring at the State Emergency Operations Center and the Federal Department of Homeland Security. Dr. Rinnert will describe her experiences receiving evacuated patients at surge capacity shelters in Dallas, Texas, and include clinical and social considerations. Finally, Dr. Marty will provide a federal perspective, delineating the procedures that were in place, as well as what should have been in place for such a large-scale disaster. The session will be concluded brief question-and-answer session.
Keywords: Federal Emergency Management Agency (FEMA); Hurricane Katrina; National Disaster Medical System (NDMS); preparedness; public health response
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