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
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(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
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(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 (INCM-CE). 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
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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
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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.