

disaster management and can fit in the organizational structure and culture.

**Conclusions:** The educational, organizational, and technological characteristics from which a ubiquitous learning environment can be built were identified. It should support self-directed learning anywhere and anytime. The current state of affairs in developing and piloting a ubiquitous learning environment for first responders will be presented.

**Keywords:** development; education; first responder; training;

ubiquitous learning environment

*Prehosp Disast Med* 2009;24(2):s119–120

### Core Competencies for Emergency Preparedness Education for Health Professional Schools

David S. Markenson; Michael Reilly

New York Medical College, Valhalla, New York USA

The possibility of natural disasters and public health emergencies coupled with the possibility of terrorism, supports the need to incorporate emergency preparedness and response material into the curricula for every health professional school. To date, the focus has been on the education of the existing healthcare workforce. Students' needs differ from those of practitioners in that there is a fundamental difference between educational and occupational competencies. It also is important to recognize that in order to assure proper preparedness, there must be a clear connection between public health departments and all other healthcare entities. To this end, public health students were included in the creation of competencies and it was shown that non-clinical practitioners can, and indeed must, be included in this process.

A list of emergency preparedness core competencies for healthcare professions and their applicability to medical, dental, nursing, and public health students was created. Although this set of competencies was designed using these disciplines, they may be adapted easily to other healthcare disciplines. The only variations would be in the assignment of proficiency levels and the decision of whether or not clinical competencies are appropriate. The core competencies have been divided into the following four categories that represent broad subject areas and the separation of the competencies related to direct patient care:

1. Emergency Management Principles;
2. Terrorism and Public Health Emergency Preparedness;
3. Public Health Surveillance and Response; and
4. Patient Care for Disasters, Terrorism and Public Health Emergencies

**Keywords:** competency; education; preparedness; school; training

*Prehosp Disast Med* 2009;24(2):s120

### Does Simulation Improve Skill and Coordination among the Trauma Team of an Emergency Department?

Sanjeev Bhoi

JPN Apex Trauma Centre, All India Institute of Medical Sciences, New Delhi, India

**Background:** The "To Err is Human" report by Institute of Medicine is the basis for reducing medical error. Simulation as a teaching tool was studied to determine

whether it improves skill and coordination among the trauma team of an emergency department.

**Methods:** This was an observational study. The group consisted of one surgical senior resident, one medical senior resident, one orthopedics senior resident, two junior nurses, and two hospital attendants. Emergency department protocol for triage and initial resuscitation were given one day prior to the day of simulation. A basic manikin was prepared specifically for the trauma scenario. A nurse narrated the trauma scenario. The entire episode was video-recorded using a digital camera. The scenario observers evaluated, on-site and during a video debriefing, based on skill assessment, decision making, and coordination of the trauma team using a Likert scale of 1 to 5. The Likert scale was defined as 1: poor, 2: satisfactory, 3: good, 4: very good, and 5: excellent. Ethical clearance was obtained.

**Results:** Three simulations were conducted during seven months. There were 21 total participants; 39 were observers-cum-evaluators. The skill assessment rating as a group was 3, decision making was 2, and coordination was 1 in the first simulation. The overall average rating was 3 at the end of third simulation.

**Conclusions:** Simulation does improve the skill and coordination among a trauma team.

**Keywords:** competency; education; emergency department; simulation; training; trauma team

*Prehosp Disast Med* 2009;24(2):s120

### Evaluating Interprofessional Education in Disaster Management

Trish Dryden

Centennial College, Toronto, Ontario Canada

**Introduction:** A recent national assessment of emergency planning in Canada suggests that healthcare professionals are not properly prepared for disasters. In response to this gap, an interprofessional course in disaster management was developed, implemented, and evaluated in Toronto from 2007 to 2008. Undergraduate students in nursing, medicine, paramedicine, police, media, and health administration programs from Centennial College, the Michener Institute for Applied Health Sciences, George Brown College, Ryerson University, and the University of Toronto, took the eight-week online course. Curriculum developers set interprofessional competency as a major course outcome right from the start, and this concept guided content and activity development. The course was highly interactive and included video, a discussion forum, an online board game, and the opportunity to participate in a mock disaster simulation with professional staff.

**Methods:** A research study, funded by Health Canada, was conducted using quantitative and qualitative methods to examine the impact of the course on students' disaster management competencies and interprofessional attitudes.

**Results:** Results indicate that the online course and simulation exercise provided an excellent opportunity for undergraduate students to learn and practice inter-professional collaboration, develop disaster management skills, and develop empathy for victims.

**Conclusions:** Results underscore the necessity of extensive inter-institutional collaboration regarding simulation plan-

ning, curriculum development, and faculty training. The session should be of interest to emergency and disaster educators, healthcare professionals, policy-makers, and researchers.

**Keywords:** Canada; course; disaster management; education;

healthcare; professionals

*Prehosp Disast Med* 2009;24(2):s120–s121

### Effectiveness of Simulation-Based Training on the disastermed.ca Emergency Department Simulator in Addition to Problem-Based Learning for Medical Student Training in Disaster Medicine

Jeffrey M. Franc-Law,<sup>1</sup> Pier Luigi Ingrassia,<sup>2</sup> Ragazzoni Luca,<sup>2</sup> Francesco Della Corte<sup>2</sup>

1. University of Alberta, Edmonton, Alberta Canada

2. Università degli Studi del Piemonte Orientale, Novara, Italy

**Introduction:** Disaster medicine is an increasingly important part of medicine. Training in the practical aspects of disaster medicine often is impossible, and simulation may offer an educational opportunity superior to traditional didactic methods.

**Methods:** Twenty-two medical students at the Università degli studi del Piemonte Orientale were block-randomized into two groups of 11 students stratified by year of education. All participants received an eight-hour course of lectures and problem-based learning in disaster medicine. The intervention group received additional disaster medicine training on the disastermed.ca patient simulator, while the control group spent equal time on the simulator in a non-disaster setting. The ability of the two groups to manage a simulated disaster was compared.

**Results:** Students in the intervention group were able to triage their patients more quickly than the control group (mean difference = 43 seconds, 95% CI 0.34–1.09 minutes,  $p < 0.0003$ ). Patients in the intervention group also were assessed more quickly (mean difference = 6.3 minutes, 95% CI = 0.4–12.1 minutes,  $p < 0.04$ ). Scores of performance indicators on a standardized scale was significantly higher in the intervention group (18/18) compared to the control group (8/18;  $p < 0.0004$ ). All students stated that they preferred the simulation-based curriculum to a lecture-based curriculum. When asked to rate the exercise overall, the median score was 8 on a 10-point modified Likert scale with no difference between the control and intervention groups.

**Conclusions:** Simulation of a mass-casualty incident increased the speed at which medical students were able to triage and assess simulated patients. Exposure to the disaster simulation also increased the scores on a structured command-and-control performance indicator instrument. Overall student satisfaction with the simulation-based curriculum was high, and all students felt that the simulation was a valuable learning experience.

**Keywords:** competency; disaster medicine; education; emergency department; medical student; simulation; training

*Prehosp Disast Med* 2009;24(2):s121

### Enhancement of Self-Critical Learning and Coping with Stress through the Use of Serious Games

Caroline Six; Nicolet Theunissen

TNO Defense and Security, Soesterberg, Netherlands

**Introduction:** Disaster and emergency personnel must master a variety of medical skills and must be able to perform under various stressful circumstances. In general, medical personnel are highly educated and are expected to be self-critical individuals even under extreme circumstances. However, self-critical abilities seldom are trained or evaluated within these circumstances. The combination of training for critical tasks and coping with stress can be trained in a personalized way by using serious gaming techniques. Immersion in the real-life stressful context, by means of a game, is a strong trigger for the intrinsic motivation to learn. Serious gaming could be useful, but it is unclear in what way games should include self-critical learning and coping with stress.

**Methods:** Several studies on the possibilities of serious gaming for medical personnel were performed: (1) an investigation on self-directed learning in ambulance workers; (2) an adventure based learning experiment with military physician; and (3) a literature review on games and stress.

**Results:** The more subjects are capable of self-critical learning, the more they benefit from a game. Subjects can actively take control on what, how, and when they want to learn, which has an effect on self-efficacy and coping. Moreover, self-critical learning can be enhanced in a game, using feedback directed at the effects of stress on the critical performance of (medical) tasks.

**Conclusions:** The ways serious games can enhance self-critical learning and coping with stress will be elaborated upon.

**Keywords:** competency; education; game; learning; stress; training

*Prehosp Disast Med* 2009;24(2):s121

### Development and Evaluation of a Graduate Certificate in Emergency Preparedness and Disaster Health as a Core Program for Health Professionals

Frank Archer

Monash University, Department of Community Emergency Health and Paramedic Practice, Frankston, Victoria Australia

**Introduction:** The World Association for Disaster and Emergency Medicine (WADEM) Education Committee recommends that all health professionals be exposed to a core program in disaster health. This paper describes the framework, implementation, and evaluation of a Graduate Certificate in Emergency Preparedness and Disaster Health designed for health professionals.

**Methods:** Based on the WADEM Education Committee's framework for disaster health and the structure of the World Health Organization (WHO) Health Action in Crises Unit, a four-unit Graduate Certificate in Emergency Preparedness and Disaster Health was developed, implemented and evaluated.

**Results:** This Graduate Certificate evolved over three years and includes four units: (1) an introduction to emergency preparedness and disaster health; (2) emergency preparedness; (3)