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DISASTER TRAINING IN 24 HOURS: EVALUATION OF A NOVEL MEDICAL STUDENT CURRICULUM IN DISASTER MEDICINE

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□ Abstract—Background: Over a decade ago, the Association of American Medical Colleges called for incorporation of disaster medicine training into the education of medical students in the United States. Despite this recommendation, similar suggestions by other professional organizations, and significant interest from medical students and educators, few medical schools explicitly include robust disaster training in their curricula. Objectives: This study describes the results of the implementation of a novel medical student curriculum in disaster response at an allopathic U.S. medical school. Specifically, this study evaluates the effectiveness of a voluntary training program in increasing the knowledge of medical students to respond to disasters. Methods: Over 2 years, 24 hours of training consisting of didactics and hands-on exercises was delivered to medical students by volunteers from the Department of Emergency Medicine. Student knowledge was tested prior to and after each training session through a multiplechoice questionnaire and evaluated using a paired t-test. Results: Consistent with previous studies, this voluntary disaster curriculum improved students' knowledge of emergency preparedness. The mean test score for all students participating in the training increased from 5.30 ± 1.05 (with a maximum score of 10), to 7.98 ± 0.96 post course. Conclusion: This intervention represents a low-cost, high-impact mechanism for improving the capacity of an underutilized segment of the health care team to respond to public health emergencies. © 2017 Elsevier Inc. All rights reserved.

□ Keywords—disaster medicine; emergency preparedness and response; medical education; mass casualty incident

INTRODUCTION

After the 9/11 terror attacks and subsequent anthrax mailings, there was significant support for integrating disaster medicine training into the curricula of medical schools (1,2). In 2003, the Association of American Medical Colleges (AAMC) issued a report that called for incorporating disaster training for weapons of mass destruction and other public health emergencies into the medical student curriculum for all years (1). The AAMC recommended that medical students become more familiar with public health and emergency management systems and the physician's role in disaster response (1). Despite this, a 2009 survey of 523 medical students showed that just 17.2% of respondents felt they were receiving sufficient training for a natural disaster, whereas 96% of students expressed interest in assisting in such an event (3).

Recent natural disasters and mass casualty incidents have reaffirmed the need for physicians and medical students with basic training in disaster preparedness and response (4–6). In 2010 alone, there were nearly 10,000 documented mass casualty incidents (6). To address this training gap and incorporate medical students into the hospital-wide disaster response, a voluntary medical student disaster-training program was developed by staff at a U.S. medical school and its affiliated Department of

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Emergency Medicine. The training program was developed to be easily instituted and reproducible for a more standardized approach to disaster medicine training and to explore an underutilized segment of health care personnel in disaster response.

Objectives

The objective of this study was to evaluate the effectiveness of a novel medical student curriculum in disaster preparedness and incorporate trained medical students in the disaster response of the emergency department (ED) in a reproducible way that can be adopted by other medical schools.

MATERIALS AND METHODS

An extracurricular, voluntary, 2-year medical student course involving four sessions per year, each 3 hours in length, was developed by physicians and emergency management staff at an academic medical center in the United States to cover the essential knowledge required in disaster response. The course was conducted for two cohorts: the first from 2011 to 2013 and the second from 2013 to 2015. Each session included 2 hours of didactics and 1 hour of hands-on skills-building workshops. The course content was generated by a committee of subject matter experts that included emergency physicians and emergency management staff. The development of course content involved a thorough review of existing literature and educational resources on disaster medicine and emergency preparedness. Core content areas for the curriculum include:

- Mass casualty incidents and triage
- Chemical, biological, radiological, nuclear, and high explosives threats
- Incident command system and the National Incident Management System
- Blast and burn injuries
- Decontamination and use of personal protective equipment
- Surge capacity and government response
- Hospital preparedness and hazard vulnerability analyses
- Legal and ethical considerations of disaster response

The syllabus of the disaster curriculum, including didactic sessions and experiential activities, can be seen in Tables 1 and 2. Instructional materials, including PowerPoint (Microsoft Corporation, Redmond, WA) presentations, handouts, and pre- and posttests, were produced by emergency physicians and emergency managers. Hands-on exercises associated with each session's didactic content were also formulated. Emergency

Table 1.	Medical Student Disaster Response Team
	Syllabus: Year One

Total Hours: 12 (Four 3-Hour Sessions)		
Session One	 Core Competencies (Two Hours) Disaster epidemiology: definitions and typology Understanding roles of individuals in disaster response Understanding all-hazards response Understanding the Incident Com- mand System Disaster communication primer Technical Skills Laboratory (One Hour) ABCs Refresher 	
Session Two	 First Aid Basics Core Competencies (One Hour) Understanding hospital disaster plans Understanding public health surveillance Understanding public health surveillance 	
	 Onderstanding quarantine principles Core Knowledge (One Hour) Overview of biological weapons Technical Skills Laboratory (One Hour) Suture clinic and wound care refresher* 	
Session Three	 Core Competencies (One Hour) Understanding ethical components to disaster response Understanding the importance of forensic collection Understanding legal issues within disaster response 	
	 Core Knowledge (One Hour) Overview of radiological device/nuclear weapon use and response Technical Skills Laboratory (One Hour) Triage Primer Crowd management 	
Session Four	 Core Competencies (Two Hours) Understanding PPE and decontamination 	
	 Technical Skills Laboratory (One Hour) Decontamination activity 	

PPE = personal protective equipment.

* Though also taught in other required clerkships in medical school, suturing, wound care, and splinting were included in this training as medical students may be tasked with minor injury care during mass casualty incidents. Trainings focused on building these skills in the context of disasters and mass casualty incidents.

medicine residents and emergency management staff from the academic medical center assisted in course didactics and experiential activities.

Medical students of any year were eligible to participate. Students were recruited to voluntarily participate via a school-wide e-mail notification of the course. Written informed consent was obtained from all student participants on the first day of the course. Student knowledge was tested prior to and after each training session through a 10-question multiple-choice questionnaire developed by the course instructors. The mean of the preand postsession test scores was calculated for the participating students and reported along with standard Download English Version:

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