



Published in final edited form as:

J S C Med Assoc. 2011 June ; 107(3): 74–77.

Surge Capability: CHAPTER and SC Healthcare Worker Preparedness

Lance A. Scott, MD*, Andrew P. Ross, MD, Jennifer G. Schnellmann, PhD, ELS, and Amy E. Wahlquist, MS

Introduction

The next major regional disaster will significantly affect hospitals and healthcare facilities faced with hundreds to thousands of patients simultaneously seeking care. Up to 80% of patients bypass first responders when major disasters strike, proceeding directly to hospitals or other healthcare facilities.¹ Unfortunately, health professionals are commonly unprepared and poorly trained to handle large numbers of patients, posing grave risks to both patients and healthcare workers. After the 1995 Tokyo Subway attacks, 23% of one hospital's staff suffered secondary exposure to sarin due to inadequate personal protective equipment (PPE) and training.¹ And following Hurricane Katrina, the lack of physician training in Disaster Medicine was cited as a significant contributor to adverse patient outcomes.^{2, 3} The train derailment and chlorine spill in Graniteville, SC in 2005 highlights the impact of disasters in rural communities. Of the nearly 600 patients reporting exposure to chlorine that day, 63% of self-transported to local hospital emergency rooms, severely limiting already scarce healthcare resources in this South Carolina community.^{4, 5}

The benefits of emergency preparedness training (EPT) are multifold, including learning rapid interventions to triage and save patient lives, personal protection measures to protect against unnecessary exposures, and basic security precautions to maintain the integrity and business continuity of healthcare facilities. Unfortunately, the American College of Emergency Physicians (ACEP) ranked SC 34th in the nation in Disaster Preparedness as part of their 2009 Report Card.⁶ Of the many factors considered when awarding this ranking, ACEP considered the low percentage (38.2%) of South Carolina nurses who participate in disaster training as significant.^{6, 7} The lack of preparedness of SC health professionals represents a significant yet modifiable risk to the health and safety of all South Carolinians.

The Center for Health Professional Training and Emergency Response (CHAPTER)

The Center for Health Professional Training and Emergency Response (CHAPTER) is a SC training collaborative to save and protect patient lives by providing health care workers advanced, performance-based disaster training. Through inter-professional collaboration with our community partners (see Table 1 for members), we unified various EPT curricula around SC into a 1-day program with an 'all-hazards' approach. The CHAPTER 1-day EPT curriculum is innovative, combining didactics, small group exercises, and a performance-based Mass Casualty Incident (MCI) training experience with state-of-the-art patient simulators in an 11,000 ft² technology center (see Figure 1-4). Once fully developed, we will directly train hundreds of patient care providers each year and—via our Train the Trainer modules—hundreds to thousands more. We believe our training will help enhance

*To Whom Correspondence Should be Sent Lancer A. Scott, MD Assistant Professor Division of Emergency Medicine Division of Pediatric Emergency Medicine Director, Center for Health Professional Training and Emergency Response (CHAPTER) Medical University of South Carolina (MUSC) 169 Ashley Avenue Charleston, SC 29425 (c) 843 801 3980.

surge capability in our region by giving health professionals hands-on lessons that will protect and save patient lives. Such training will also protect our most important surge capacity assets, our healthcare workers and hospitals, from being harmed, contaminated, or overrun during a disaster.

In CHAPTER's review of the medical literature, we found no reports describing the level of emergency preparedness for SC health professionals—with the exception of nurses (see 2009 ACEP Report Card). In addition, no publications were found that described EPT deficiencies, obstacles to training, or other relevant workforce training topics. To our knowledge, an EPT needs assessment of SC emergency health professionals has never been published.

This project describes the result of CHAPTER's 2010 survey of SC Emergency Department (ED) Medical Directors that assess the level of emergency preparedness and EPT needs—including hours, resources, obstacles and barriers—for our state's ED care providers.

Materials and Methods

Survey content was developed by a sub-group of content experts (3 volunteer physicians) from the CHAPTER Advisory Committee through a modified Delphi process. The subgroup defined 'disaster' as an event of local, regional or national significance that results in large numbers of patients simultaneously seeking care, depleting (or potentially depleting) available medical resources, capacity and/or capability. The Subgroup defined 'Emergency Preparedness' as the training, knowledge, and skills necessary to meet performance objectives (job appropriate) during a disaster and 'Emergency Preparedness Training (EPT)' as an organized and dedicated training event—including didactic, small group or hands-on performance objective training—designed to prepare staff to fulfill their expected duties during a disaster.

Survey questions were collected by the Project Director and then redistributed to the subgroup through a repetitive process. By design, the survey was limited to 10 questions to ensure, based on prior experience with survey assessment, that we would have greater than 50% response rate. Survey questions included discrete and Likert-based analog scale questions. One Likert-based question assigned impact values to various barriers to EPT. For this question, "1" translated into "Low Impact/Not a Barrier to Training" and a "10" translated as "High Impact/Greatest Barrier to Training." Once consensus was reached on 10 questions, the survey was beta tested on a second group of volunteer ED physicians affiliated with regional academic institutions. From the comments of this second group, some survey modifications were made including requiring respondents to independently assess ED nurses, physician assistants, physicians, ancillary/administrative staff and techs/nursing assistants.

With the assistance of the SC of Emergency Physicians (SCCEP), we identified email addresses for 41 hospital-based, SC ED Directors and contacted them electronically. Emails to these 41 were distributed to respondents between February and June 2010. The emails described the project and asked respondents to voluntarily click on a weblink embedded in the email. Follow-up letters were sent to email nonresponders. The survey was securely administered via Survey Monkey™. The Medical University of South Carolina IRB approved the research project and the survey.

Not all ED Directors responded to every question, and for some facilities the questions were not applicable. Percentages are calculated out of the total measurable responses and not always out of the total number of ED Directors surveyed.

Results

Of the 41 ED Directors, 21 (51%) completed the survey. Six of SC's seven public health regions (Department of Health and Environmental Control [DHEC] regions) were represented in the survey. EDs were well-represented: rural (41%), urban (29%), and suburban (29%) communities were included. Although both teaching and non-teaching hospitals were included, most facilities (78%) were non-teaching. The survey included three ED's based in Level 1 trauma centers.

Survey sample EDs represented were small to moderate in size; greater than half (62%) treat fewer than 50,000 patients per year, with most (52%) treating 20,000–50,000 patients per year. Most ED's (68%) were part of private hospitals; 32% of ED's were affiliated with a public hospital.

Most ED Directors agreed that at least 1 in 5 ED nurses, physician assistants, physicians, ancillary/administrative staff and techs/nursing assistants would fail to execute their expected roles during a disaster (76%, 75%, 76%, 76% and 85% ED Directors agreed, respective to job type). All respondents agreed that at least 25% of ED nurses, physician assistants and physicians would execute their expected roles during a disaster.

All respondents agreed that increased EPT opportunities would be valuable to their hospital and/or health facility. Most 94% (17/18) agreed that increased EPT opportunities would potentially save health worker lives. All respondents agreed that increased emergency preparedness training opportunities would potentially save patient lives. Table 2 depicts healthcare leaders' beliefs about potential sources for adequately training for nurses, physicians, physician assistants, and other health professionals for a disaster. Table 3 depicts the number of hours of EPT a person currently receives per professional role, and Table 4 depicts the perceived barriers considered most significant to EPT.

Discussion

Reform efforts to build and sustain surge capacity in our nation—for example, increasing hospital beds, providing equipment, medicines and transportation—have failed to adequately prepare healthcare workers serving the “front lines” during a disaster. A 2006 Homeland Security Presidential Directive (HSPD 21) called for the dissemination of disaster medicine education in public health fields.⁸ In 2008, Health and Human Services (HHS) announced funding of \$398M to states through the Hospital Preparedness Program (HPP) to help hospitals improve “surge capacity.”⁹ Unfortunately, the HPP does not emphasize training, and hospitals have been reluctant to develop comprehensive emergency preparedness training (EPT) programs on their own. In addition, few state or local initiatives have focused on EPT for healthcare workers. Active EPT programs have been sporadic, lacking follow-up, and are poorly studied. In fact, recent comprehensive reviews suggest that current health worker EPT programs lack clarity, objectivity, competency driven goals, scientific rigor, prospective validation and consistency across medical specialties.^{10, 11}

SC and other southeastern coastal states have unique demographic characteristics that amplify the importance of a healthcare workforce properly trained in disaster medicine. During Hurricane Hugo (1989), for example, 24 counties in SC were declared disaster areas and three of these counties were among the nation's poorest (per capita income).⁵ In addition, 14% of our civilian population is comprised of veterans, who are notably marginalized due to the fact that their housing is often substandard and easily damaged by flooding or foul weather.^{6, 7} Similar to Hurricane Katrina, we expect marginalized and disadvantaged communities to present to local hospitals and other healthcare facilities by the hundreds or thousands. Unfortunately, while hospitals and healthcare facilities represent a

critical ‘front line’ of emergency preparedness, policies and programs that emphasize EPT for healthcare workers have not followed.

In Graniteville, SC small local hospitals and healthcare facilities were quickly overrun with patients. Many of the patients were “worried but well” and not needing immediate care. Understandably, the risks, for both sick and well patients (and the health workers who care for them) are increased in this scenario. The more patients there are, the harder it is to identify truly sick patients and the more likely it is that scant medical resources will be depleted. In addition, larger numbers of patients create chaotic environments, increasing the likelihood that patients and healthy caregivers are exposed to danger (in this case, chlorine gas). In Tokyo, there were at least seven major hospitals that buffered the surge of patients but Graniteville had only one major hospital. As a result the incremental burden on this healthcare facility, for both patients and workers, was amplified.

Our survey assessed the level of emergency preparedness and EPT needs—including hours, resources, obstacles and barriers for our state's ED care providers. All respondents agreed that increasing the EPT opportunities in our state can save patient lives. ED Directors felt strongly that 1 in 4 nurses, physicians and physician assistants are prepared to handle a clinical disaster. Unfortunately, they also believe that 1 in 5 ED workers will fail to perform during a disaster, potentially harming both patients and health providers. We find unacceptable the fact that approximately one-third of ED workers perform between zero and 2 annual hours of EPT (nurses-25%, physician assistants-50%, physicians 40%, techs or nursing assistants-37%, ancillary staff-35%), especially given the increased emphasis by the Joint Commission and other healthcare leaders to incorporate EPT into hospital training programs. Because it takes only one mistake from one individual to compromise an entire hospital during a disaster, we believe 8 hours of mandatory, yearly clinical disaster training for ED health workers would represent a policy starting point for our states’ health leaders and policy makers. At the very least, let's prepare our ED staff for the next disaster.

The most significant obstacles to EPT time and financial constraints that prevent healthcare workers from attending training suggest that additional resources are needed to support healthcare workers who want to attend training but cannot take a day off to attend class. It is important to note that a significant percent of pre-hospital providers (EMS, Fire, Law Enforcement and HazMat) are paid to attend EPT. This is not a common occurrence in the healthcare industry which may explain why the vast majority of respondents in our survey agreed that additional federal, state and local resources are needed to support statewide EPT initiatives.

In conclusion, SC ED Directors report that the SC ED workforce is insufficiently trained, support the notion that EPT can save both patient and healthcare provider lives and encourage additional resources to support EPT programs in our region. CHAPTER will continue to develop all hazards EPT programs for patient care providers using lessons learned from this survey. Our training coalition recently expanded the EPT needs assessment survey to all health providers. Please encourage all patient care providers (including administrative staff) in your facility or private practice to answers these important questions. A weblink to this short, 10-question survey can be found on our webpage at <http://www.musc.edu/chpter>

References

1. Tokuda Y, Kikuchi M, Takahashi O, Stein GH. Prehospital management of sarin nerve gas terrorism in urban settings: 10 years of progress after the Tokyo subway sarin attack. *Resuscitation*. Feb; 2006 68(2):193–202. [PubMed: 16325985]

2. Barkemeyer BM. Practicing neonatology in a blackout: the University Hospital NICU in the midst of Hurricane Katrina: caring for children without power or water. *Pediatrics*. May; 2006 117(5 Pt 3):S369–374. [PubMed: 16735267]
3. Hamm LL. Personal observations and lessons from Katrina. *Am J Med Sci*. Nov; 2006 332(5):245–250. [PubMed: 17106300]
4. Ball LJ, Dworak J. Disaster in Graniteville. *S C Nurse*. Apr-Jun.2005 12(2):1. [PubMed: 16878650]
5. Hueston WJ. The physician workforce in South Carolina: the time to start planning is now. *J S C Med Assoc*. Apr; 2008 104(4):86–90. [PubMed: 18557321]
6. American College of Emergency Room Physicians Task Force. The National Report Card on the State of Emergency Medicine. 2009.
7. Epstein SK, Burstein JL, Case RB, et al. The National Report Card on the State of Emergency Medicine: evaluating the emergency care environment state by state 2009 edition. *Ann Emerg Med*. Jan; 2009 53(1):4–148. [PubMed: 19111195]
8. Martin SD, Bush AC, Lynch JA. A national survey of terrorism preparedness training among pediatric, family practice, and emergency medicine programs. *Pediatrics*. Sep; 2006 118(3):e620–626. [PubMed: 16950954]
9. Pesik N, Keim M, Sampson TR. Do US emergency medicine residency programs provide adequate training for bioterrorism? *Ann Emerg Med*. Aug; 1999 34(2):173–176. [PubMed: 10424918]
10. Berger E. Charity hospital and disaster preparedness. *Ann Emerg Med*. Jan; 2006 47(1):53–56. [PubMed: 16395776]
11. Blanchard G, Rosa D. A Comparison of the Nursing Home Evacuation Experience Between Hurricanes Katrina (2005) and Gustav (2008). *J Am Med Dir Assoc*. 2009; 10(9):639–643. Epub 2009 Oct 12. [PubMed: 19883887]

TABLE 1

CHAPTER COMMUNITY COALITION

• MUSC, Emergency Medicine	• South Carolina Hospital Association	• MUSC, College of Health Professionals
• South Carolina Medical Association	• Bon Secours St. Francis Hospital	• South Carolina DHEC, Region 7
• Ralph H. Johnson VA Medical Center	• MUSC, National Crime Victims Center	• Naval Health Facility of Charleston
• East Cooper Hospital	• Trident Technical College	• South Carolina State Ports Authority
• South Carolina AHEC	• Office of Mayor Joe Riley, City of Charleston	• Roper Hospital
• Charleston Metro Chamber of Commerce	• EMS, FIRE and Law Enforcement Agencies	• Trident United Way
• US Department of the Navy, SPAWAR	• Charleston Police Department	• MUSC, College of Nursing
• County Local Emergency Planning Committees (LEPCs)	• Community and Regional Resilience Institute (CARRI)	• The Meridian Institute
• Trident Health System		

TABLE 2

VALUE AND UTILITY OF EPT

Increased emergency preparedness training opportunities would:	Percent Agree
Be valuable to their hospital and/or health facility	100
Save health worker lives	94
Save patient lives	100

TABLE 3

ANNUAL EPT HOURS BY ED JOB TYPE

ED Job Type	% with <2 h	% with 3-8 h
Nurses	25 (5/20)	50 (10/20)
Physicians Assistant	50 (6/12)	25 (3/12)
Physicians	40 (8/20)	35 (7/20)
Ancillary/administrative staff	35 (7/20)	35 (7/20)
Techs/nursing assistants	37 (7/19)	37 (7/19)

TABLE 4**BARRIERS TO EPT**

	N	Mean	Std. Dev.
Impact of time constraints	21	6.929	2.1580
Impact of financial barriers	21	5.905	2.6059
Lack of instructors	20	5.300	2.5152
Poor quality of curriculum content	18	5.278	2.1090
Unclear standards for training	18	5.222	2.4146
Lack of course/curriculum	20	5.200	2.2618
Lack of interest from staff	21	5.190	2.3795
Unclear needs for training	20	5.100	2.2919

LIKERT SCALE 1= LOWEST BARRIER, 10 = HIGHEST BARRIER)