

Regional Approach to Competency-Based Patient Care Provider Disaster Training: The Center for Health Professional Training and Emergency Response

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Objectives: This article details the development of the Center for Health Professional Training and Emergency Response (CHPTER), including its innovative, competency-based emergency preparedness training (EPT) curriculum, and the results of a regional preparedness workforce assessment.

Methods: CHPTER was established in 2009 with the goal of enhancing regional health security and patient surge competency by offering patient care providers, including clinicians and volunteers, hands-on lessons that will protect and save lives during a disaster. A 1-day emergency preparedness training (EPT) course that includes a loud, chaotic clinical disaster scenario was developed. A two-part workforce assessment survey to further refine regional EPT needs was administered.

Results: The 1-day EPT course enhanced patient care providers' knowledge, comfort level, and skills required to save lives during a disaster. Twenty-one emergency department directors and 400 patient care providers responded to the surveys. The majority of emergency department directors surveyed believe that one in five of their provider workforce would fail to properly perform their expected duties in a

disaster. More than half of the patient care providers reported fewer than 2 hours of annual EPT training and 40% of employers required no annual training. The most significant barriers to widespread dissemination of EPT were financial constraints and time availability of providers.

Conclusions: Patient care providers in our region (North and South Carolina) are not prepared for a disaster. The CHPTER 1-day competency-based EPT curricula improved trainee knowledge, comfort level, and disaster care skills. CHPTER may serve as a model for other regions seeking to improve care provider EPT programs.

Key Words: disaster, emergency medicine, emergency preparedness training, patient care providers, simulation, surge capacity

Providing comprehensive emergency preparedness training (EPT) to patient care providers is important to the success of US disaster operations. The lack of disaster training, which is apparent among physicians, nurses, hospital staff, volunteers, public health and safety personnel, and others, poses a

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Key Points

- Patient care providers are poorly trained and this lack of training places patients and patient care providers at risk.
- In an era of declining budgets for emergency preparedness training, collaborative approaches to emergency preparedness training such as those developed by the Center for Health Professional Training and Emergency Response may enhance and improve provider preparedness.
- The Center for Health Professional Training and Emergency Response's innovative 1-day curriculum enhanced patient care provider knowledge, comfort level, and skills required to save lives during a disaster.

Table 1. Comparison of coastal communities

State	Elderly, % ^a	African American, %	White, %	Minimally educated, % ^b	People with disabilities, %	Living below poverty line, %
South Carolina	13.0	28.7	68.6	17	18.1	15.1
Mississippi	12.5	37.2	60.7	20.4	20.6	20.7
Louisiana	12.2	31.9	65.1	19	19.9	18.8
Florida	17.0	15.9	80.0	14.7	17.8	12.1
Georgia	9.9	30	65.6	16.5	15.0	14.3
Texas	10.0	12.0	82.6	20	14.8	16.3
North Carolina	12.2	21.7	74.0	16.4	16.7	14.3
Alabama	13.5	26.5	71.0	18.6	20.2	16.6
US at large	12.6	12.8	80.0	15	16.3	13.0

^aAges 65 years old and older.

^bDid not receive high school diploma.

considerable yet modifiable risk to patients, care providers, and healthcare facilities.¹⁻⁸

States in the southeastern United States have unique demographic characteristics, including higher rates of poverty and substandard housing, which amplify the importance of a well-trained network of patient care providers (Table 1).⁹⁻¹¹ Following Hurricane Hugo, 24 counties in South Carolina were declared disaster areas, three of which were among the nation's poorest with regard to per capita income. During Hurricane Katrina, thousands of displaced patients from marginalized and disadvantaged communities presented to local hospitals and other public facilities seeking care. Resources for these patients were rapidly depleted, resulting in chaotic and dangerous circumstances at local hospitals, stadiums, airports, and other public facilities.¹²⁻¹⁴ Retrospective reviews of Hurricane Katrina suggest that patient care providers were not adequately prepared to cope with the patient surges and that their lack of training unnecessarily increased mortality and other adverse patient outcomes.¹⁴⁻¹⁹

The Association of American Medical Colleges and the Institute of Medicine have made several key recommendations to expand EPT curricula to patient care providers across the United States.^{20,21} Unfortunately, US medical schools have been slow to develop stand-alone EPT curricula, and newly developed EPT programs have focused largely on practicing clinicians, not trainees.^{12,22-24} Despite The Joint Commission's regulations that require all emergency services facilities to perform yearly disaster drills, hospitals have been reluctant to develop comprehensive EPT programs on their own.²⁵ Overall, comprehensive reviews in the last 5 to 6 years suggest that healthcare worker training programs in the United States lack clarity, objectivity, competency-driven goals, scientific rigor, prospective validation, and consistency across medical specialties.²⁶⁻²⁹

This article details the development of the Center for Health Professional Training and Emergency Response (CHPTER), including its innovative, competency-based EPT curriculum.

Furthermore, the results of voluntary, Web-based workforce assessment surveys measuring patient care provider preparedness and EPT needs are reviewed.

Origins of CHPTER

In 2008, the American College of Emergency Physicians ranked South Carolina 34th of 50 states in disaster preparedness as part of its national report card, based partially on the low percentage (38.2%) of South Carolina nurses who reported any disaster training.³⁰ In 2009, key South Carolina

Table 2. CHPTER community coalition

MUSC Emergency Medicine and Trauma Departments	SCHA	MUSC College of Health Professionals
SCMA	Bon Secours St Francis Hospital	South Carolina DHEC
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 the Mayor, 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/Sheriff's Department	MUSC College of Nursing
County LEPCs	Trident Health System	SCHA

AHEC, Area Health Education Consortium; CHPTER, Center for Health Professional Training and Emergency Response; DHEC, Department of Health and Environmental Control; EMS, emergency medical services; LEPCs, County Local Emergency Planning Committees; MUSC, Medical University of South Carolina; SCHA, South Carolina Hospital Association; SCMA, South Carolina Medical Association; SPAWAR, Space and Naval Warfare Systems Command; VA, Veterans Affairs.

hospitals, public health officials, and other emergency preparedness stakeholders met to address EPT gaps and other regional health security issues. CHAPTER was subsequently formed with the help of a community coalition of supporters (www.musc.edu/chppter) (Table 2).

CHAPTER's vision is to enhance regional health security and surge capability by offering patient care providers hands-on training in preparation for the next major disaster. A CHAPTER curriculum task force met to develop a 1-day, all-hazards EPT curriculum based on established competency objectives.³¹ Additional competency and evaluative frameworks considered by the task force included those from the Veterans Health Administration (VHA), the American Medical Association's Center for Public Health Preparedness and Disaster Response, the Agency for Health Care Research and Quality, Columbia University, and others.³²⁻³⁶

The task force began with the hypothesis that an EPT course for patient care providers that recreated a loud, chaotic, multiactor clinical disaster scene would enhance provider awareness, skills, and confidence necessary to save lives during a disaster. The task force decided the following:

- The EPT course should be no longer than 1 day to ensure increased attendance from busy patient care providers.
- The curriculum should be directed toward the general medical trainee, defined broadly as any patient care provider during a disaster, so that it could develop into an interdisciplinary experience.
- The curriculum should be interactive and case based so that trainees were able to recognize the relevance of disaster medicine knowledge and clinical skills in their workplace.
- Simulations should be used to create realistic clinical disaster scenarios.
- Competency-based research metrics should be developed to measure trainee skill acquisition and performance.

During the course of several months, the task force established course learning objectives, consolidated the curriculum into 18 competencies, and developed performance metrics to assess proficiency in competency objectives.

Methods

CHAPTER Unique Curriculum

The task force developed a variety of interactive educational approaches for providing competency-based EPT. Small-group exercises were designed to prepare students for an afternoon disaster scenario. The team-building exercise consisted of 7 performance components and 4 fictional disaster scenarios printed on 32-piece puzzles. The (unsolved) puzzles were presented to teams in large envelopes and teams were evaluated based on their ability to assign tasks and verbalize appropriate responses to threats presented while completing the puzzle. The communications exercise consisted of three scenarios (bus crash, factory explosion, and chemical leak) and teams were rated on their ability to communicate clinical disaster information. Trainees also participated in a triage module

during which 60 small toys imprinted with clinical information were presented and classified according to Simple Triage and Rapid Treatment (commonly known as START) criteria as green (minor injuries), yellow (injuries requiring delayed medical attention), red (injuries requiring immediate attention), or black (dead, expectant death, or beyond medical help).

During the afternoon session, trainees participated in a clinical disaster scenario inside a large, university-based human patient simulation center. One of the center's larger observation rooms was designed to resemble a small emergency department waiting room with several chairs, a security guard's desk, a metal detector, and communication devices. High- and low-fidelity patient simulators and up to 15 trained actors mimicked the chaos and demands of a real event. During the training scenario, students assessed and treated both ambulatory and non-ambulatory patients presenting with various levels of medical acuity. Working in teams of four to six, trainees were asked to mitigate the complex and chaotic scene using skills they had learned during the didactic and small-group lessons. The success of the 1-day, scenario-based training was gauged using performance metrics to assess proficiency in the identified competency objectives, including whether trainees would intervene medically to save human-simulated patients who would decompensate to cardiac arrest in the absence of appropriate care.

CHAPTER Workforce Assessment Surveys

To improve and expand on the curriculum, CHAPTER developed a two-part, online patient care provider workforce assessment survey to evaluate the disaster preparedness capabilities of patient care providers in our region (North and South Carolina). In the first survey, 41 emergency department (ED) directors were contacted using databases provided by the South Carolina College of Emergency Physicians. A second voluntary survey developed in 2011 measured levels of preparedness, recorded training preferences, and assessed patient care provider EPT needs. Based on a review of previous disasters affecting the United States, the task force defined patient care provider as any person who would likely care for patients during a disaster, including clinical providers, emergency medical services, mental health providers, volunteers, and other potential providers. CHAPTER used existing databases from private, public, and nonprofit provider networks to recruit participants for the second survey. Because several of the recruitment databases overlapped with North Carolina, providers who worked in North Carolina also were included.

The surveys presented questions in multiple choice and ranking format. The ranking questions provided a numeric scale for respondents to select a discrete number 1 through 10, with 1 and 10 representing polar viewpoints such as "not a barrier" and "great barrier." Respondents also were given a "not applicable" choice on each question. Not every patient care provider who responded to the survey answered all of the questions.

Results

CHAPTER Unique Curriculum

More than 42 hours of CHAPTER training have been provided since 2008, reaching approximately 400 trainees. The number of attendees has varied at each session depending on the technology used and the equipment needed to test competency. The CHAPTER target audiences have included clinicians and clinician trainees, hospital workers, mental health-care providers, emergency managers, public safety officials, emergency medical services, law enforcement, military personnel, community volunteers, and local business owners and employees.

An analysis of the 1-day EPT course demonstrated that patient care providers enhanced their knowledge, comfort level, and skills required to improve their performance during a disaster.³⁷ To our knowledge, the CHAPTER course is the first published curriculum to use high-fidelity simulation and multi-actor scenarios to measure the lifesaving performance of patient care providers confronted with >10 simultaneous patients at once. (Further information regarding the EPT curriculum, including a short video that details the competency-based disaster scenario, can be accessed at www.musc.edu/chpter.)

CHAPTER Workforce Assessment Surveys

Twenty-one of the 41 South Carolina ED directors contacted completed the first survey. Most ED directors agreed that at least one in five ED workers (nurses, physician assistants, physicians, ancillary/administrative staff, and technicians/nursing assistants) would fail to execute their expected roles during a disaster. Nearly all (94%) agreed that increased EPT opportunities could save healthcare worker lives. All (100%)

agreed that increased EPT opportunities would be valuable to their hospital and/or health facility and could save patient lives.

In the second survey, 398 patient care providers responded, including 201 physicians (51%), 56 nurses (14%), 16 mental health providers (4%), 15 emergency managers (4%), 9 hospital administrators (2.3%), 4 public health officials (1.0%), 3 disaster volunteers (0.8%), and 3 law enforcement officials (0.8%). The survey group included both experienced and novice providers. A total of 103 (26%) reported >21 years of work experience, whereas 81 (20%) were still in training and 232 (61%) respondents reported ≤2 hours of annual training required (Fig. 1). Obstacles to EPT training were rated using a scale of 1 to 10, with 1 being “not a barrier” and 10 being a “great barrier.” Financial and time constraints represented the greatest obstacles and received a mean score of 6.52/10 and 7.24/10, respectively (Fig. 2).

Overall, providers rated their personal, coworker, and facility preparedness level as just above average (6.1/10, 5.9/10, 6.7/10, respectively; Fig. 3). Approximately half of the patient care providers surveyed (52%) estimated that most employees at their business or facility would fail to perform safe, effective disaster care.

Discussion

Patient care providers are commonly unprepared and poorly trained to handle the large influx of patients during a disaster, 60% to 80% of whom bypass first responders and self-transport directly to public facilities. During the first hours after Hurricane Katrina, for example, medical providers at the Louis Armstrong New Orleans International Airport were confronted by as many as 2500 patients seeking care. Nearly 500 patients were cared for inside the airport. Unfortunately, no well-trained disaster medical assistant team arrived to assist airport crews

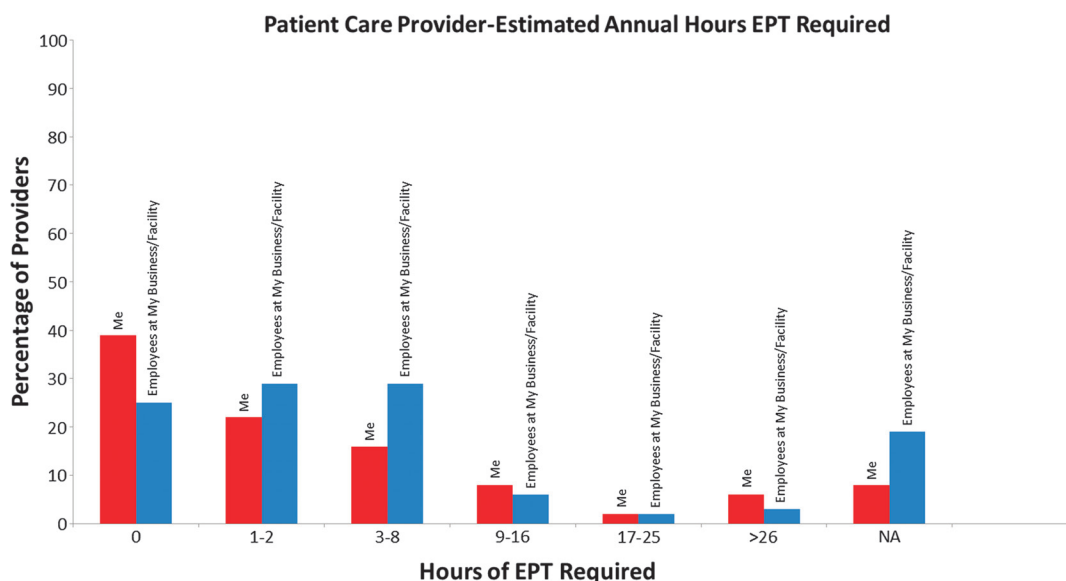


Fig. 1. Patient care provider estimated annual hours emergency preparedness training (EPT) required.

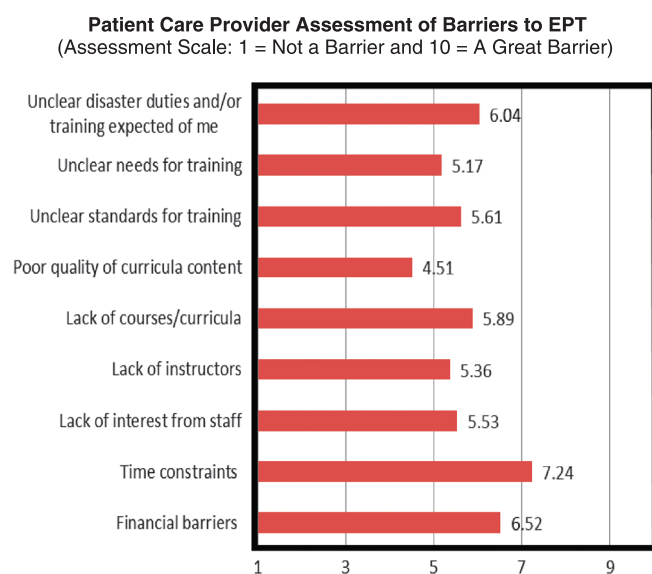


Fig. 2. Patient care provider assessment of barriers to emergency preparedness training (scale: 1 = not a barrier, 10 = great barrier).

until 41 hours after the storm. During this gap, 36 patients died at the airport, representing 8 to 10 deaths per day.¹⁴

Despite the lessons learned from Hurricane Katrina, few states have adopted policies and programs to sustain competency-based EPT programs for patient care providers. In addition, few states have performed workforce assessments of their patient care providers to identify EPT needs (ie, measured levels of preparedness, recorded training preferences, and assessed obstacles to EPT) or identified processes to deliver more targeted and potentially cost-effective training.

Federal programs supporting emergency preparedness for hospitals and health facilities have failed to adequately prepare health workers. In 2008, the US Department of Health and Human Services announced funding of \$398 million to states through the Hospital Preparedness Program (HPP) to help hospitals improve surge capacity.³⁸ Unfortunately, the HPP does not emphasize training and hospitals have been reluctant to develop their own comprehensive EPT programs. All 50 states have experienced a significant decline in HPP funding since 2008 because of federal cutbacks.³⁹

CHAPTER may serve as a model to other regions attempting to enhance health security and surge capability in an era of declining budgets for EPT. CHAPTER used existing training competencies and technologies in an innovative way to develop a loud, chaotic disaster scenario to test the performance of patient care providers. We believe that multipatient, scenario-based training adds a sense of chaos and reality that is not appreciated using Web-based or didactic training alone, which better prepares providers for what they may encounter during an actual disaster. According to the CHAPTER postcourse evaluation, patient care providers who completed the 1-day course enhanced their disaster management skills, comfort level, and knowledge. To our knowledge, CHAPTER is the first published curriculum

to use >10 patients at once to test providers' performance in a simulated clinical environment of an emergency influx of patients.

The CHAPTER workforce assessment surveys reveal that nearly all ED directors and patient care providers in our region desire increased EPT opportunities and believe that increased EPT would save both patient and provider lives. The time and financial constraints that prevent patient care providers from attending EPT sessions suggest that additional resources are needed to support providers who want to attend training but cannot afford to take the day off to attend class. Effective opportunities for increased EPT include developing short (<1 day) courses that combine targeted performance assessments for wide target audiences in a simulated (ie, scenario-based) environment.

We believe it is unacceptable that 52% of patient care providers report <2 hours/year of EPT and that 40% of employers require no annual disaster training. Individual care provider mistakes can compromise an entire healthcare disaster operation, resulting in increased patient morbidity or mortality. Healthcare employers also should recognize that a poorly trained workforce can significantly limit business continuity and place employee lives in danger. Based on the CHAPTER online surveys, time constraint was identified as one of the greatest barriers to EPT in our region. Of those polled, 304 (90%) encouraged simulated environments for EPT and 291 (76%) believed that EPT should be ≤1 day/year. Although a course with four 2-hour meetings, taken throughout 1 year, could have been designed, we chose the 8-hour, 1-day format based on feedback from our regional workforce. Our trainees succeeded in improving the knowledge, comfort level, and skills necessary to mitigate a clinical disaster. Although further research is needed to select competencies and identify the best methods to achieve and measure EPT performance, we believe that 8 hours of mandatory, yearly clinical disaster training for patient care providers represents a policy starting point as we continue to evaluate EPT.

Conclusions

Providing competency-based EPT for patient care providers is essential to the future success of disaster operations in

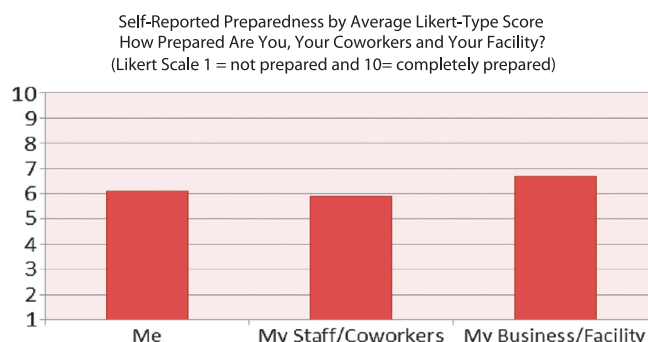


Fig. 3. Patient care provider assessment of preparedness (scale: 1 = not prepared, 10 = completely prepared).

the United States. Leaders in health care have been slow to implement the lessons learned from Hurricane Katrina and other disasters regarding the risks of patient surge and a poorly trained workforce. CHAPTER workforce assessment surveys identified low levels of preparedness for patient care providers in our region. Our 1-day competency-based EPT curricula improved both trainee comfort level and the skills necessary to perform patient care during a disaster. CHAPTER may serve as a model for other regions seeking to enhance health security and adopt policies and programs to sustain competency-based EPT programs for disaster care providers.

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