Special FOCUS

Bethesda Hospitals' Emergency Preparedness Partnership: A Model for Transinstitutional Collaboration of Emergency Responses

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ABSTRACT

The events of September 11, 2001 identified a need for health care institutions to develop flexible, creative, and adaptive response mechanisms in the event of a local, regional, or national disaster. The 3 major health care institutions in Bethesda, MD—the National Naval Medical Center (NNMC), the Suburban Hospital Healthcare System (SHHS), and the National Institutes of Health Clinical Center (NIHCC)—have created a preparedness partnership that outstrips what any of the institutions could provide independently by pooling complementary resources. The creation of the partnership initially was driven by geographic proximity and by remarkably complementary resources. This article describes the creation of the partnership, the drivers and obstacles to creation, and the functioning and initial accomplishments of the partnership. The article argues that similar proximity and resource relationships exist among institutions at academic centers throughout the United States and suggests that this partnership may serve as a template for other similarly situated institutions. (*Disaster Med Public Health Preparedness.* 2009;3:168–173)

The terrorism events of September 11, 2001 inextricably changed many aspects of American life. Whereas the events in New York City, Washington, DC, and Shanksville, PA, were visible to and painful for the nation, their long-term sequelae had an even more profound impact and were most acutely felt in the emergency preparedness and health care communities. Before 9/11 most health care institutions had developed on-paper disaster plans that were primarily intellectual exercises and were rarely tested or implemented. The events of 9/11 and their long-term implications mandated major changes in the manner in which health care institutions needed to be prepared to respond. Subsequently, natural disasters, such as the 2005 Gulf Coast hurricanes and Indian Ocean tsunami underscored the need for higher levels of emergency preparedness for health care institutions. A few of the most important lessons learned from 9/11 were the need for preformed, highly flexible disaster plans that cross normal lines of standard operating procedures, well-organized command stations able to integrate institutional and community resources at a moment's notice, and software systems to integrate a multifactorial emergency response to ensure that the greatest number of survivable patients can be transported to facilities that can provide optimal medical support.

After 9/11 most hospitals revised preparedness plans, initially adopting the Hospital Emergency Incident Command System[1] model and, subsequently, the modified Hospital Incident Command System model.[2] Whereas cooperation with regional emergency response authorities has been emphasized in the past,[3–8] we believe that the benefits of this type of partnership have received insufficient attention.

Virtually all institutions create emergency plans independently,[9] often completely internally within the hospital or within individual health care systems. We believe that this siloed approach needs modification. The admiral in charge of the National Naval Medical Center (NNMC) suggested that the 3 major health care institutions in Bethesda—NNMC, the Suburban Hospital Healthcare System (SHHS), and the National Institutes of Health Clinical Center (NIHCC)—pool their complementary resources in an emergency preparedness partnership (Fig. 1). The institutions are located close enough (approximately 9 mi) to Washington, DC, that the partnership could respond effectively to an attack on the capital, but not so close that their facilities would likely be damaged. The partner institutions exist in close proximity (Fig. 2) and have significant individual strengths in physical resources, flexible human resources, acute care, trauma management, subspecialty care, and basic and translational sciences. In addition, each institution recognizes its obligation to protect and preserve the health and well-being of its community.

This article describes the objectives, implementation strategies, strategic plans, performance measures, and successes of this novel partnership. The article also discusses the drivers for and barriers to success that the institutions encountered in the partnership's first 4 years.

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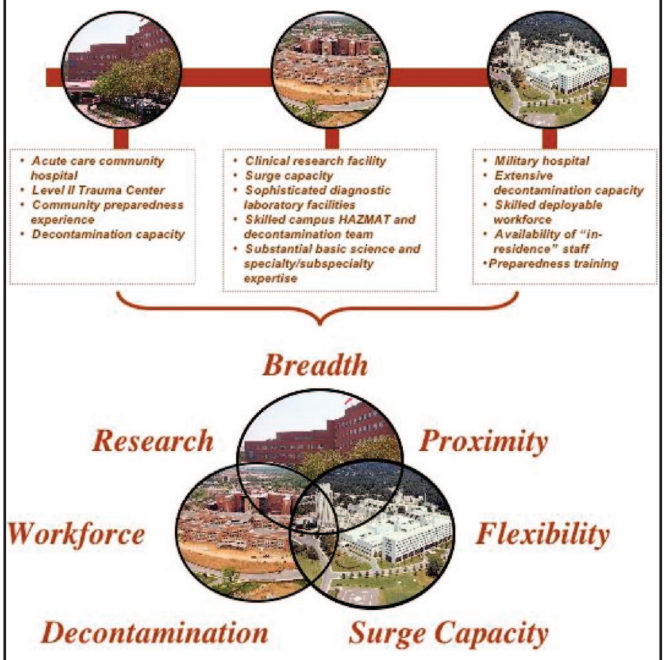
FIGURE 1

Bethesda Hospitals' Emergency Preparedness Partnership core competencies.

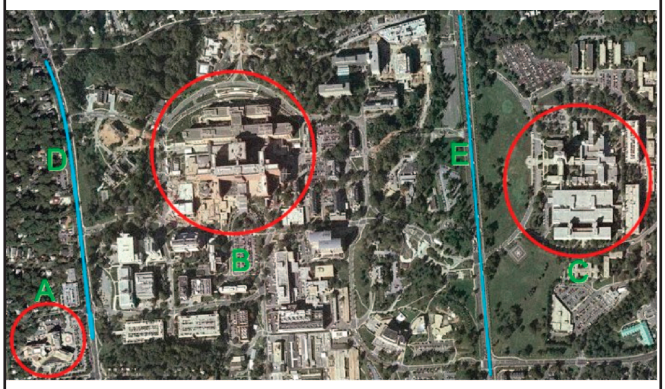


GOALS/OBJECTIVES

The principal goal of the Bethesda Hospital's Emergency Preparedness Partnership (BHEPP) is to respond rapidly, collaboratively, and successfully to any emergency situation, including natural events, acts of terrorism, and war. The partnership's goals are providing a concerted, comprehensive local disaster response; coordinating the response with regional emergency authorities; contributing to a national response; educating partnership and other staff about roles, responsibilities, processes, procedures, and strategies; conducting research that optimizes the collaborative response; and using the partnership as an exportable model.

FIGURE 2

Satellite view of the Bethesda Hospitals' Emergency Preparedness Partnership. A, Suburban Hospital Healthcare System; B, Clinical Center, National Institute of Health; C, National Naval Medical Center; D, Old Georgetown Road; E, Rockville Pike.



COMPLEMENTARY CORE COMPETENCIES

The complementary core competencies of each institution are summarized in Figure 1. NNMC, a Department of Defense hospital, has staff who undergo extensive emergency preparedness training and conduct exhaustive preparedness drills. NNMC has a deployable workforce (many of whom live on base). NNMC has extensive decontamination capacity and has open communication with National Capital Area responders, and specifically with teams from the Department of Defense. SHHS is an acute care community hospital that has close ties to the Bethesda community, more than 900 physicians and 440 nurses on staff, an active level II trauma center emergency department, substantial community preparedness experience, decontamination facilities, and extensive contacts with county and state emergency responders. The NIHCC is a clinical research facility that, because of its mission, has substantial surge capacity. The NIHCC has 88-day hospital stations that can be used as inpatient beds and a number of spacious single-patient rooms that could be used to house additional patients. The Department of Health and Human Services significantly augmented surge capacity by embedding a 250-bed contingency station hospital (Federal Medical Station) in the NIHCC. Because of its research mission, the NIHCC has sophisticated diagnostic laboratory facilities and substantial basic science and specialty/subspecialty expertise. The NIHCC has 1240 credentialed physicians on staff and significant scientific expertise in most major biomedical disciplines. The NIH Fire Department has an extremely skilled hazardous materials and decontamination team. As an example of collaborative efficacy, the combined throughput for gross decontamination is estimated to be approximately 245/hour (100 at NIH, 100 at NNMC, and 45 at SHHS).

DRIVERS AND BARRIERS TO SUCCESS

Partnership representatives almost immediately identified several drivers and barriers to success (Table 1). The NNMC mission is national defense; the mission of SHHS is focused on the Bethesda community and the provision of high-quality clinical care to Montgomery County, MD, residents. The mission of the NIHCC is to conduct path-breaking translational research, moving basic science discoveries into clinical medicine. Because of these widely divergent cultures, our early meetings redefined the concept of herding cats. In addition, each institution has a different electronic medical information system; building interfaces among the 3 is impractical and prohibitive in cost, so alternative solutions must be sought. Finally, the issue of sustainment is a barrier. After initial funding support was obtained, the partnership had to develop strategies to maintain momentum.

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TABLE 1

Drivers and Barriers to Success

	Relevant Detail
Drivers	
Inadequate institutional preparedness	Post-9/11, the single greatest driver for the partnership was leadership's realization that none of the institutions could address the needs of the surrounding community in the face of a major event. Pooling resources offers a much greater opportunity to provide relevant, substantive support.
Fear/urgency	Before 9/11 many institutions took a rather relaxed and theoretical approach to emergency preparedness; 9/11 forced all of us to think in real terms about how our institutions could and would respond if something catastrophic occurred in our communities.
Vision/project champion	The vision and enthusiasm of the base commander at the National Naval Medical Center effectively fathered the partnership; he became the project champion. He believed that the creation of the partnership was essential and his enthusiasm for the project was contagious.
Complementary resources	The leadership of each of the organizations recognized almost from the initial partnership meetings that the institutions had remarkably complementary resources and strengths. In the assessment of partnership leadership and organizers, the whole of the partnership was (and is) far greater than the sum of its parts.
Barriers	
Differences in organizational culture	The striking differences in institutional culture among the 3 organizations presented the most challenging barrier to success. Intrinsic to the cultural differences is the wide divergence in these organizations' missions.
Information technology	Differences in approaches to information technology present complexity for the partnership.
Resources in tight financial times	Creating an effective emergency preparedness partnership is inevitably resource intense. A major initial barrier to success was that even when resources were pooled, the partnership had inadequate human and financial resources to carry out the project.

IMPLEMENTATION STRATEGIES

Partnership representatives conducted an initial self-assessment to characterize the assets that each partner could contribute. Whereas the partnership identified substantial assets, the leadership also identified the fact that a mass casualty disaster would require more robust infrastructure.

Once the leadership made formal commitment to the partnership, the leaders developed and signed a detailed memorandum of agreement outlining each partner's contribution (see Appendix 1, Supplemental Digital Content 1, *http://links.lww.com/DMP/A1*). Subsequently, representatives met to map strategy. The first step in the self-assessment was to identify the infrastructure required to mount a crisp, coordinated response. After considerable deliberation, the group distilled the list to the issues listed in Table 2 and Table 3. Each category listed in Table 2 was analyzed in detail. Although initially daunting, the leadership ultimately generated plans to address missing infrastructure. The group agreed that progress should be easily measurable and that accomplishment of these goals would place the partnership on much firmer ground (Table 2).

None of the partners had personnel who could be dedicated solely to the partnership. The key to success in this endeavor lay in choosing engaged, dedicated individuals who have proven track records of success, empowering them to accomplish the work, and finally holding them accountable for the various work products. A second critical success factor was to ensure alignment of the institutional leadership and to ensure that the 3 organizations' leaders were willing to engage in partnership work.

Following the self-assessment and the creation of the "missing infrastructure" list, the next task was to identify resource support. The group authored a white paper, describing the partnership, the rationale for its creation, the support needed to address the additional infrastructural requirements, and the work accomplished. The white paper was created to assist in making the partnership more visible to its constituents.

The third major task for the partnership was to conduct a conjoint disaster drill under the leadership of the NNMC. The goal for this drill was to create, on a relatively small but highly visible scale, a defined partnership product that underscored the intrinsic value and potential of the partnership. Whereas the drill was a decided success, several areas where additional coordination was needed were identified. The drill received substantial coverage from the local press, and several officials from the federal and regional preparedness organizations were in attendance.

The success of the initial combined drill and the visibility of the partnership resulted in Congress earmarking funds in the Department of Defense appropriations to support the partnership and to allow the partnership to address infrastructural deficiencies (Table 2). With the partnership now firmly established, the executive leadership identified a clear need to create a strategic plan to prioritize the work.

OPERATING PRINCIPLES

The partnership developed operating principles that emphasize each partner's complementary strengths. Because of its commitment to the Bethesda community, its respected emergency department expertise, and its standing as a level II trauma center, SHHS represents the major site for casualty referral, with NNMC as backup. Following the events of 9/11, both the NIH and NNMC campuses were fenced (ie, easily locked down). If decontamination facilities are needed, then both NNMC and

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TABLE 2

Infrastructural Requirements

Infrastructural Requirement	Issue/Background	Partnership Approach
Surge capacity	Surge capacity is extremely limited in most communities.[4, 10–17]	To address this need, the partners developed a strategy to identify and staff up to 500 surge beds for the Bethesda community or the National Capitol Region.
Triage	Triage is a core competency for the emergency preparedness personnel at NNMC and SHHS.	The Department of Defense provided funding for portable shelters, including air-handling and heating and/or cooling systems that can be used for triage, staging, and short-term surge capacity.
Supply stockpile	Supplies—medical soft goods, drugs, and other disposables—present a major obstacle to ongoing operations in times of crisis.	With funds from the Department of Defense FY2007 budget, the partnership purchased supplies that can be rotated through the NNMC supply chain.
Decontamination	For certain types of events, decontamination facilities and skills are essential to success.	NNMC has the largest capacity as well as the most expertise. Both SHHS and NIH have a small cadre of well-trained staff and the facilities necessary to provide backup.
Transportation	Transportation of patients, staff, equipment, and supplies was immediately identified as a potential barrier.[18,19]	Initially, the partnership developed traffic control plans; for the longer term, the partnership has conducted a feasibility study of creating pedestrian bridges across or tunnels under both major roads.
Communication	Communication remains the Achilles' heel of emergency responses.[20–24]	The partnership purchased radios with bidirectional amplifiers and roof-mounted antennae to provide reliable communication and also linked with the Hospital Mutual Aid Radio System for communication with DC and northern Virginia.
Workforce management	A competent, agile, and ready workforce is essential to an effective emergency response.	Each institution assessed internal capacity, flexibility, and ability; identified staff who can be cross-trained; and developed strategies for credentialing and privileging patient care staff.
IT	IT planned to develop a robust, mutually accessible IT system.	Creative IT solutions should be available to support these kinds of interactions.[25,26] The partnership is developing a secure Web portal for a "dashboard" for information exchange and activity tracking.

IT = information technology; NIH = National Institutes of Health; NNMC = National Naval Medical Center; SHHS = Suburban Hospital Healthcare System.

SHHS have portable facilities that can be set up quickly for maximum throughput. The NIH hazardous materials team also maintains a decontamination unit and substantial organizational expertise in setup and processing of patients needing decontamination. These groups train together.

By having stable patients who still require hospitalization transferred from either SHHS or NNMC to the NIHCC, the partnership develops substantial (ie, 300- to 500-bed) surge capacity (Table 2). Whereas the NIHCC has no emergency department, the clinical staff are highly skilled and are familiar with the management of complex cases. In the event of a bioterrorism event, NIHCC practitioners include physicians who have substantial infectious diseases expertise and a highly educated nursing staff who are knowledgeable about and familiar with the implementation and management of high-level isolation protocols.

Students from the Uniformed Services University of the Health Sciences (located on the NNMC campus) are trained as emergency medical technicians by their second year and offer valuable resources. In addition to 1240 credentialed physicians, the NIH campus is filled with basic and translational scientists who have remarkable skills in chemistry, biochemistry, physics, and immunology, among many other disciplines. These individuals provide both personnel and intellectual horsepower and can function as clinical and scientific consultants. Cross-credentialing mechanisms have been established for 2 of the institutions and the third is in process.

ROLE OF STRATEGIC PLANNING

Planners from each of the partners held a retreat to create a strategic and operating plan that included a streamlined governance structure, consensus mission and vision statements, core processes, and defined and measurable short- and long-term targets for the next year. In addition, approaches to the barriers to success were discussed in detail.

The streamlined governance model included oversight by the 3 chief executives of the institutions and a leadership board, made up of the NNMC deputy commander, command emergency manager, and comptroller, the NIHCC deputy director for clinical care and his or her special assistant, and the SHHS chief operating office, corporate director of emergency and safety services, and hospital emergency management specialist (Fig. 3). A second committee (the partnership action committee) was charged with implementing partnership strategies. The group agreed to performance metrics and scheduled, systematic progress reports.

ACCOMPLISHMENTS TO DATE

The partners have conducted 4 complex drills to test communication, coordination, planning, and educational efforts. These exercises have demonstrated the benefits of the geo-

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TABLE 3

Mission Statements: Individual Partners and the BHEPP

NNMC
- As the flagship of Navy medicine
  - We maximize our operational readiness and keep the uniformed services mission-ready.
  - We are the National Capital Region's resource for homeland defense.
  - We provide high-quality primary care and specialty services in a caring, patient-centered environment.
  - We provide outstanding, customer-focused services for our DoD family.
  - We provide distinguished graduate medical and dental education, and ensure professional development for all staff members.
  - We develop and export innovations in health care, informatics, and research.
  - We actively collaborate in an integrated NCA Health System.
  - We provide outstanding base operating support to tenant commands colocated on the NNMC compound.
  - We care for the nation's leaders.
  - We are the President's hospital.

SHHS
- We are a not-for-profit health care provider guided by the needs of our patients and community. We distinguish ourselves through service and clinical excellence, affiliations with NIH and Johns Hopkins Medicine, and state-of-the-art technology and facilities. We are committed to continuous improvement and appropriate use of resources. We create an environment that encourages the success and fulfillment of our physicians, staff, and volunteers.

NIHCC
- As the nation's clinical research center, the NIHCC is dedicated to improving human health by providing an outstanding environment that facilitates
  - Development of diagnostic and therapeutic interventions
  - Training of clinical researchers
  - Development of processes to ensure the safe, efficient, and ethical conduct of clinical research
- NIHCC achieves this mission through a culture that fosters collaboration, innovation, diversity, and the highest ethical standards.

BHEPP
- Collaboratively, the NNMC, the NIHCC, and the SHHS will create and sustain BHEPP. The partnership will leverage its complementary resources to respond to local, regional, and national emergencies in the National Capital Region as well as conduct research about emergency preparedness. This regional emergency readiness collaboration will serve as an exportable model nationally.

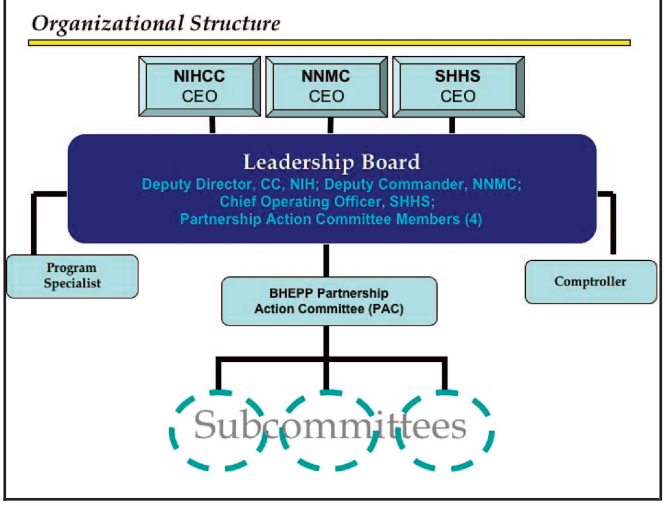
BHEPP = Bethesda Hospital Emergency Preparedness Partnership; DoD = Department of Defense; NCA = National Capital Area; NIHCC = National Institutes of Health Clinical Center; NNMC = National Naval Medical Center; SHHS = Suburban Hospital Healthcare System.

graphic proximity, complementary resources, formal agreement to share resources, and long-standing collaborative relationships. Through these drills and other efforts, the partnership has also formed successful ties to municipal, regional, and federal emergency responders.

In September 2005, the partnership staged its first collaborative drill. The day-long activity included training with more than 35 hands-on skills stations/information booths and multiple relevant lectures. More than 1800 personnel attended, including NNMC staff and numerous local, state, and federal officials. The Collaborative Multi-Agency Exercise (CMAX-05) followed, and involved 8 area hospitals, 1 local school, and more than 30 local, state, and federal emergency response units. The major objectives were to test communications, surge capabilities and patient transportation, workforce management, and public information and media communication. The second exercise (CMAX-06) was an 800-casualty scenario, involving 4500 participants and more than 50 local, state, and federal agencies. During this day-long exercise, more than 5000 staff received training. The partnership tested its mobile decontamination process, evaluated the procedures for transporting stable SHHS inpatients to the NIHCC, assessed offsite triage and acute treatment facilities and processes, tested interfacility transport strategies and procedures, and evaluated communication efficacy among 8 area hospitals. A third large-scale collaborative drill (CMAX-07) was completed in December 2007 and a fourth in November 2008.

FIGURE 3

Governance and organizational structure of the Bethesda Hospitals' Emergency Preparedness Partnership (BHEPP).



In addition to the CMAX drills, the partnership has conducted detailed tabletop exercises. These drills have involved representatives from more than 100 local, state, and federal agencies. One exercise involved assessing how the partnership may interact with the Strategic National Stockpile. These exercises have enabled the partnership to evaluate specific collaborative capabilities, apply lessons learned from previous exercises, and provide a venue to test new strategies and interventions. Costs for these drills are shared across the partners, as appropriate.

CONCLUSIONS

The partners recognized that their complementary strengths provided a unique opportunity to provide emergency preparedness resources for our community that outstrip what any institution could provide independently. By forming this

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partnership and by integrating its responses with municipal, regional, and federal emergency responders, we have created an exportable model. Academic, community, and federal hospitals exist in close proximity in many communities. We propose that a collaborative approach to emergency management among these varied types of institutions will provide options for superior emergency responsiveness.

The early partnership success provides proof of principle that a military/federal/private partnership can succeed, despite substantial cultural barriers. Creation of this partnership resulted in improved preparedness and tight alignment of executive leadership at the 3 institutions. The partnership can serve as a template for military/federal/private preparedness partnerships.

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