

## SYMPOSIUM

# The Next Pandemic: Anticipating an Overwhelmed Health Care System

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**Introduction:** In September 2005, an overview of current health care system planning efforts was presented to the audience at the Yale University Ethics Symposium on Avian and Pandemic Influenza. The speaker, also the author of this article, provided the audience with a summary of what was being undertaken with the use of federal preparedness funds to improve the overall infrastructure of the health care system.

All of Connecticut's 31 acute care hospitals, the Veteran's Administration Hospital in West Haven, Hospital for Special Care, Gaylord Rehabilitation Hospital, Natchaug Psychiatric Hospital, and the state's 13 Community Health Centers are currently recipients of federal preparedness funds. Federal funding for this planning comes from Health Resources and Services Administration, Department of Health and Human Service's National Bioterrorism Hospital Preparedness Program.

**Objectives:** This article outlines the planning activities around pandemic influenza that the state's health care system partners started in 2004-05 and also those they are currently participating in or will be participating in the next 12 to 15 months. The article highlights the key objectives and strategies that health care facilities will be using in this planning. There are four major objectives that each health care facility's Emergency Operations Plan must address. They are: increasing bed availability, developing strategies to deal with the potential staffing shortages, developing strategies for dealing with potential critical equipment and pharmaceutical shortages, and, lastly, the implementation of education, training, and communication strategies for their health care workers and the public they serve. These plans, and all the activities needed to operationalize the plans, such as education, training, drills, and exercises, will include their key partners, i.e., local health departments, local emergency management, police, fire, and Emergency Medical Services. This article will describe this work plan in detail.

**Methods:** Descriptive information was obtained through the author's observations and personal experiences, in addition to governmental guidance, reports, and plans.

**Conclusion:** The "all-hazards" planning currently being undertaken by the key health care system partners in Connecticut as a result of federal funding for preparedness post 9/11 has fostered great working relationships between these entities and their local, regional, and statewide planning counterparts. Many of the specific grant dollars being provided to these facilities can assist in the planning that must be done for pandemic flu.

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†Abbreviations: ACS, alternative care site; CDC, Centers for Disease Control; CHC, Community Health Center; DEMHS, Department of Emergency Management and Homeland Security; DHHS, Department of Health and Human Service; DPH, Department of Public Health; HRSA, Health Resources and Services Administration; NBHPP, National Bioterrorism Hospital Preparedness Program.

## **OVERVIEW OF CURRENT HEALTH CARE PLANNING EFFORTS IN CONNECTICUT**

Since 2002, all states and United States territories have been recipients of National Bioterrorism Hospital Preparedness Program (NBHPP)<sup>†</sup> grants offered by the Department of Health and Human Services (DHHS) Health Resources and Services Administration (HRSA). The mission of the NBHPP is to ready hospitals and supporting health care systems to deliver coordinated and effective care to victims of terrorism and other public health emergencies [1]. Currently, the state's 31 acute care hospitals, the Veteran's Administration Hospital in West Haven, the Hospital for Special Care, Gaylord Hospital, Natchaug Psychiatric Hospital, and the 13 Community Health Centers (CHCs) are recipients of these federal preparedness funds to improve the overall infrastructure of the state's health care system. The funding that these facilities receive was, in 2005-06, based on the six HRSA NBHPP Priority Groups: Priority Area No. 2 Surge Capacity Planning, Priority Area No. 5 Education and Training, and Priority Area No. 6 Drills and Exercises. The area of surge capacity planning is quite broad and includes nine benchmarks that the federal government wants the state to meet. These benchmarks are: Surge Capacity — Beds; Surge Capacity — Isolation Capacity; Surge Capacity — Emergency System for Advance Registration of Volunteer Health Professionals (Personnel); Surge Capacity — Pharmaceutical Caches; Surge Capacity — Personal Protective Equipment; Surge Capacity — Decontamination; Surge Capacity — Behavioral Health; Surge Capacity — Trauma and Burn Care; and Surge Capacity — Communications and Information Technology [2]. In this upcoming grant cycle, FY 2006-07, the health care system will need to build on the capacity it developed in the first four years of the program and now move

toward capability based planning and specifically around four scenarios, one of which is pandemic influenza. In addition to the HRSA NBHPP dollars, the states are also receiving funds from the Centers for Disease Control (CDC), an organization within the Department of Health and Human Services (DHHS), for pandemic influenza planning. These monies are being released to states in phases. The dollars each hospital and CHC currently receives for preparedness planning and will be receiving this coming year from both HRSA and CDC will assist them in their pandemic influenza planning efforts. Many of the items needed for surge capacity in a pandemic also could be used to protect the facilities from a multitude of other natural or man-made disasters.

## **HRSA NBHPP RECOMMENDATIONS FOR PANDEMIC INFLUENZA PLANNING**

The FY 2005-06 NBHPP Guidance gave the states specific directives on what needed to be done in order to prepare for an influenza pandemic [2]. The guidance directed them to establish systems that at a minimum could provide triage, treatment, and initial stabilization above their daily staffed bed capacity. The state of Connecticut, with an approximate population of 3.4 million people, would need to increase its capacity and capability to handle an additional 1,750 patients with influenza [2].

This guidance also addressed the fact that a pandemic would place a substantial burden on both inpatient and outpatient health care services and cause an increased demand for health services, while at the same time, there would be an increase in illness and absenteeism among the health care worker population. In addition to a shortage of hospital beds and personnel needed to care for patients, equipment such as ventilators and infection control supplies, and possibly antibiotics, also would most likely be in short supply.

In order to address these shortages, it is essential that the health care system develop strategies and plans to effectively deal with them. All of the hospitals and CHCs have been informed that detailed information concerning the development of influenza pandemic preparedness plans can be found at [www.pandemicflu.gov/plan](http://www.pandemicflu.gov/plan)

When the Department of Public Health (DPH) receives updated information from the DHHS or CDC, the information is immediately forwarded to the contacts in the health care facilities that oversee the planning efforts taking place in that particular institution. Some of the other planning resources made available to these planners include the Canadian Pandemic Flu Plan, Flu Aid, Flu Surge, CDC Education and Training Aids, and the World Health Organization Pandemic Influenza Plan, just to name a few. The recently released National Strategy for Pandemic Influenza can be found at [www.pandemicflu.gov](http://www.pandemicflu.gov). This is also an effective planning tool. In addition to the above-mentioned information being provided to assist in planning, the state's two Centers of Excellence [3] have developed Pandemic Influenza Preparedness Strategies that they are sharing among all the hospitals and the CHCs. Their strategy documents both complement and integrate with the National Strategy and the HHS Pandemic Influenza Plan.

In addition to utilizing the above-mentioned references, DPH worked with the Yale-New Haven Health System (YNHHS) Center of Excellence (CoE) and drafted a Pandemic Influenza Hospital Preparedness Checklist [4], and our CHC planner adapted the hospital checklist for the CHCs [5]. The checklist was sent out to the facilities in March with a request that they be completed and returned to DPH. The gaps present in their checklists will be the basis of our work in the coming year as we move ahead with pandemic flu planning.

## **MAJOR OBJECTIVES FOR HEALTH CARE FACILITY PREPAREDNESS**

As we enter the annual influenza epidemic season each November, it is a great time for facilities to review their current policies for influenza vaccination of their staff and patients. It is noted in the HRSA Guidance that the annual vaccination of health care workers actually has several beneficial effects in the long-term. The increasing of vaccination during an inter-pandemic period potentially could increase vaccine acceptance at the time of a pandemic, and this increased demand may lead the vaccine manufacturers to increase supply and production capacity, which will enhance our preparedness efforts.

Based on the HRSA NBHPP Guidance, the National Strategy, and the HHS Pandemic Influenza Plan, there are four major objectives each state must undertake to assure health care facility preparedness: (1) Develop strategies to maximize staffed beds; (2) Develop strategies to cope with the potential staffing shortages; (3) Develop strategies to deal with potential critical equipment shortages; and (4) Implement education, training, and communication strategies for health care workers and the public.

## **STRATEGIES FOR INCREASING BED AVAILABILITY**

It is essential for the hospitals to develop strategies to increase bed availability, in addition to maximizing those staffed beds. The hospitals would implement more stringent triage and decrease length of hospital stay. There also would be an attempt to decrease other types of admissions if possible. This can be done in a variety of ways, such as the development of guidelines and contingency plans to limit elective admissions and surgeries. Admission criteria should be reviewed and revised as necessary. There also needs to

be increased coordination with local Home Health Agencies and the Visiting Nurses Association for those patients who will have to get an early release to make room for the very sickest patients. Health care facilities need to expand their focus on managing patient flow.

Eventually, the hospital will reach its capacity limit, and the use of alternative care sites will have to be considered. Ideally, these locations could care for large numbers of less critically ill patients, so in essence the hospitals will be treating only the most ill patients. The HRSA NBHPP Guidance for FY 2006-07 mandates states identify alternate sites of care. All states must have the ability to provide surge capacity outside of the hospital setting as has been demonstrated through recent public health emergencies. These alternate care sites (ACSs) should be within a certain radius of health care facilities. An important concept for states to keep in mind is that while selecting these sites, planning must consider that federal assets exist that can be brought to bear but require an "environment of opportunity" for set-up and operation and may not be available for 72 hours. This year, the following information has to be reported to the federal government concerning these sites: How many sites have been identified at the state and sub-state regional level? What types of facilities are being considered? What can the facilities accommodate in terms of the numbers of patients and level of care (i.e., triage, basic care and stabilization, trauma level-type care, patients transferred from hospitals, medical-needs shelters, etc.)?

What staffing plans have been developed for these facilities? What are the plans for supply and re-supply of the facilities? What are the plans for the security of the site? What are the plans for patient movement to the sites and from the sites to more definitive care sites either within or outside of the state? [6] The establishment of these non-traditional settings to provide

health care will require advanced planning in order to succeed. In Connecticut, both the health care facilities and DPH have come to the conclusion that this is a viable option. Now the work is beginning between the state DPH, local health departments, and the hospitals, with their other regional planning partners, to incorporate this option into their pandemic influenza preparedness and response plans. The ACS selection tool that was developed by AHRQ in 2004 will be utilized to determine these sites. This tool has been provided to all hospitals, local health departments, and the regional Department of Emergency Management and Homeland Security (DEMHS) planners for use at the monthly planning meetings and when visits are made to various sites to determine their viability as an ACS. All plans will need to identify a trigger that would cause the activation of these care sites. There are five DEMHS-designated planning regions. All the health care system partners, along with the local traditional response partners, will be working on the identification of these sites over the next six to 12 months. Another important item to consider in this planning is to realize that non-traditional site staffing is not traditionally provided by the local hospitals, as they will most likely be overwhelmed. How they would be staffed, and by whom, is an essential part of the planning that must take place well in advance of a pandemic. Connecticut is currently considering that some hospital personnel will staff these sites in a supervisory capacity and volunteers from our Statewide Emergency Credentialing Program would provide the primary staff positions.

In late June 2006 at the New England States and New York State Pandemic Influenza Planning Meeting in Boston, the following objectives were determined concerning ACSs. The states sought to define levels of care at ACSs and to define the locations for these sites. An agreement

has been reached by all seven states delineating that the administrative authority for the ACS will derive from the institution that has responsibility for the operation. There is also agreement by the seven states on goals for surge capacity. First, the states seek to provide access to care for large numbers of patients. Secondly, the states will move to protect critical health care sectors by maintaining access to hospital-level care for non-flu patients. Thirdly, they will ensure surge management and basic cohorting of flu and non-flu patients. Fourth, hospitalization of non-flu patients will be minimized to the extent possible using standard triage protocols. Fifth, standards will be established to decrease mortality, transmission of the virus, and ameliorate suffering through treatment at ACSs, outpatient, home, and hospital care sites. Sixth, all elective inpatient and outpatient procedures will be suspended. All states have agreed that the sickest patients, including all ICU type patients and those requiring mechanical ventilation, should be admitted to acute care hospitals. The ACS patients would vary according to the scenario. In the event of a diagnosis of pandemic flu, only supportive flu care will be provided. In the ACS, there may be oxygen but there will not be ventilators. For the non-pandemic flu patients, those demonstrating the lowest severity (i.e., orthopaedic patients, post op, etc.) will be moved into ACS to free up capacity in acute care hospitals. There is a need to delineate separate levels of care for special populations. The states have agreed to identify and share contact information on these designated groups through a designated special population coordinator from each state [7].

### **STRATEGIES FOR STAFFING SHORTAGES**

An influenza pandemic will place a substantial burden on inpatient and outpatient health care services. Illness and

absenteeism among health care workers in the context of the increased demand for services will further strain the ability of the health care system to provide quality care [8]. Health care professionals will be an indispensable resource in caring for pandemic victims. A strong stable health care infrastructure could do much to blunt the medical and economic toll of an influenza pandemic [9]. The pandemic flu scenario could potentially cause a problem with personnel, since 40 percent of the health care and response work force may be affected, so Connecticut is currently in the process of another vigorous campaign to recruit more licensed volunteers, specifically to assist in a pandemic, whether it be staffing at ACSs and/or staffing the mobile field hospital, in addition to providing health care surge capacity to the state's 32 acute-care hospitals.

Much has been written in the various federal strategies and plans about creative ways to deal with the potential critical staffing shortages that will most likely result. In order for a health care facility to survive the pandemic, innovative strategies may have to be undertaken. Many plans and articles on the pandemic written by nationally known figures suggest some of the following strategies: Consider using health care workers with mild respiratory illness to provide care to cohorted influenza patients. Some health care workers may simply stay home because they wish to care for sick family members or have child care issues. Health care facilities may want to consider opening up or expanding hospital-sponsored sick care services for staff member's children or elderly family members as a means of getting the health care provider to work. Some have suggested the use of the immune survivors of an earlier pandemic wave, particularly health care workers, to become the primary response corps. It is felt this potentially could be considered if the pandemic was moving slowly enough [10]. Health care facilities also might want to consider, as



part of their pandemic flu planning, shifting health care worker responsibility, using normally non-clinical staff in clinical roles; expanding the use and activities of students; and even bringing in retired health care workers who are interested and able to assist. Some of the hospitals currently are working on developing just-in-time educational information for family members of flu patients so they can assist hospital staff in some less critical aspects of the patient's care. This will greatly assist the staff, who may be overburdened with more than the usual patient load because of staff absenteeism due to illness or ill family members.

### **STRATEGIES FOR CRITICAL EQUIPMENT AND SUPPLY SHORTAGES**

Many questions arise when the hospitals consider what supplies to consider stockpiling and how much should be stockpiled. The HRSA NBHPP Guidance and the National Strategy both provide suggestions on what facilities should consider stockpiling. Connecticut hospitals and CHCs are currently in the process of, or will begin shortly, establishing stockpiles of standard infection control supplies (hand hygiene supplies, gowns, gloves, and surgical masks). In addition, critical equipment shortages will most likely be those used for respiratory care, particularly ventilators, and the associated respiratory equipment needed for a patient requiring mechanical ventilation. Many different ventilators are on the market, and at the monthly hospital meetings [11], the hospitals share information on some of the types they have already ordered or are thinking of ordering. The DPH Hospital Preparedness Coordinator has been meeting with the respiratory care directors from all of the state's hospitals to determine the best ventilators to purchase. Consistency is essential as staffing resources will be in short supply, and we don't want 32 differ-

ent hospitals ordering 32 different ventilators. In September 2006, the directors will come up with recommendations for ventilators and respiratory care equipment for the hospitals to stockpile. Additionally, the hospital preparedness coordinator makes every effort to get this key information out to all the facilities so it can be shared at internal hospital pandemic influenza planning meetings. The state DPH is currently looking into the possibility of establishing regional stockpiles of standard infection control supplies and ventilators [2]. The development of regional stockpiles is already being done with EMS Mass Casualty Incident supplies and some of the Level C and Level B personal protective equipment for our hospitals. There is also concern on the part of the federal government that there may be a shortage of the antibiotics needed to treat secondary infections, so hospitals can use HRSA NBHPP preparedness dollars for stockpiling some additional antibiotics, in addition to antivirals, specifically Tamiflu for the treatment of patients with influenza who present within the first 48 hours of symptoms. It is not recommended to stockpile for the purpose of prophylaxis. Lastly, since there is the possibility that a pandemic will not affect all areas at once, it may be possible to shift some resources between areas of the state and region (HRSA Region 1 includes all the New England states, but for the purposes of our current regional planning efforts, it also includes New York State).

### **EDUCATION AND TRAINING PRIORITIES**

There are many significant education and training priorities in regard to pandemic influenza planning. First of all, the value of annual vaccination for influenza should be highlighted. Hospital personnel with patient contact should be strongly encouraged to receive the available influenza vaccine, as it will not only pro-

vide protection against influenza, but potentially could provide some degree of protection against a mutation of a human influenza virus. Educating health care workers on diagnosis and management of influenza in an interpandemic period, along with basic infection control practices, should be practiced consistently and then monitored to promote and reinforce good behaviors. All institutions should consider utilizing the training materials already developed by CDC to provide training programs for non-clinical health care workers (i.e., director of nursing who is still a licensed clinician but no longer functions in a clinical capacity) to prepare them for clinical roles mentioned earlier under the Strategies for Staffing Shortages. This training program should be implemented when a pandemic appears imminent. Hospitals and CHCs must remember, however, that a key component to this training is the conducting of tabletop or full-scale exercises that allow people to practice their proposed roles in a pandemic response.

### **EFFECTIVE COMMUNICATION STRATEGIES FOR STAFF AND THE PUBLIC**

It is essential for each hospital and CHC to communicate honestly and openly with its staff regarding pandemic influenza and the plan the facility has in place or is working on to deal with a pandemic, should it ever come. Health care organizations should communicate directly not only with their staff, but with the population they primarily serve. There are four main messages they need to communicate over and over: (1) Approaches to prevent becoming infected; (2) When is it actually necessary to come to the facility for care related to influenza; (3) Appropriate sites for outpatient triage and care; and (4) Options for self-care. Another very important message to get out to the public is that they are still there to provide the cardiac

and cancer patients the care they need. Public perception of our planning activities has been plagued historically by insufficient communication strategies and a relative dearth of timely data. In order to avoid massive panic, it is necessary to promote public acceptance wherever and whenever possible, and well in advance of the crisis.

### **CONCLUSION**

While the infrastructure of the state's health care system has improved significantly as a result of the federal preparedness funding received since 2002, there is still work to be done, particularly in the area of planning for an influenza pandemic. With a practical, no-nonsense approach, and maximization of the current dollars being provided, the health care facilities and DPH will work together to make Connecticut's health care system as ready and as able as it can be when the next pandemic arrives.

### **REFERENCES AND NOTES**

1. National Bioterrorism Hospital Preparedness Program, Cooperative Agreement Guidance. US DHHS HRSA. May 2, 2003, p 2.
2. National Bioterrorism Hospital Preparedness Program, FY2005 Continuation Guidance. HRSA Announcement Number 5-U3R-05-001. pp 18-40.
3. In 2002, both Yale-New Haven Health System (comprised of Bridgeport Hospital, Greenwich Hospital and Yale-New Haven Hospital) and Hartford Hospital were given the title of Centers of Excellence by the DPH Commissioner since they were both large academic centers and would be able to work closely with DPH to assist the hospitals in their respective areas with the various planning initiatives that needed to take place. Hartford Hospital, in the northern part of the state, has 15 hospitals specifically assigned to assist the department in working with, and Yale-New Haven Health System, in the southern part of the state, works closely with the 17 hospitals in that area. Their respective infectious disease specialists work very closely with DPH and provide guidance and strategies to assist the hospitals in their planning efforts, which in

- this case specifically is pandemic influenza preparedness planning.
4. Checklist developed for Connecticut's acute care hospitals, modified by Yale New Haven Health System (YNHHS) from the US Dept of Health and Human Services (DHHS), Pandemic Influenza Plan. Supplement 3, November 2005.
  5. Checklist developed for Connecticut's CHCs, modified from the YNHHS CoE hospital checklist, which was based on the DHHS, Pandemic Influenza Plan, Supplement 3, November 2005.
  6. HRSA NBHPP Program Guidance for Fiscal Year 2006. Released July 2, 2006.
  7. Excerpt from the description of medical surge capacity activities and expectations to include in Connecticut's CDC Phase 1 Pan Flu funding progress report and the CDC Phase 2 pan flu funding application developed by DPH employees Albert Geetter and John Bigos.
  8. US Pandemic Flu Plan, Annex 2: Health Care System Guidance. November 2005, pp 2-4.
  9. Canadian Pandemic Influenza Plan, February 2004, Annex H: Resource Management Guidelines for Health Care Facilities during an Influenza Pandemic.
  10. Osterholm MT. Preparing for the next pandemic. *NEJM* 2005;352:3.
  11. In Connecticut, all the hospitals have been meeting on a monthly basis to discuss and work on the various initiatives required by the grant. Mary Duley, hospital preparedness coordinator, or her designee, is always at these meetings, providing the hospitals with updates regarding the various surge planning initiatives. Since early fall 2005, pandemic influenza planning has been an agenda item, and will continue to be as the months move ahead.
  12. Content of regional stockpiles not decided at the time of this printing.