Assessing Medical College of Georgia Hospital's Surge Capacity for Pandemic Influenza A

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Abstract

Although influenza pandemics and epidemics have occurred in the past, one cannot predict when they will occur again in the near future. Yet, it is reasonable to believe that a pandemic of influenza A will eventually occur. While concern over the materialization of an influenza A outbreak, hospitals countrywide have been challenged to determine their surge capacity indicating their preparedness and response to this event. The primary purpose of this document was to assess the Medical College of Georgia's (MCG) surge capacity to be used for patient care during the next influenza A pandemic. A study was carried out using an instrument based on hospital surge capacity performance standards and indicators published by the Health Resources and Services Administration (HRSA) National Bioterrorism Hospital Preparedness Program (2005) and Hospital Pandemic Influenza Planning Checklist published in 2009 (U.S. Department of Health and Human Services, 2009). The data received and analyzed suggested that, in spite of the fact MCG possesses a system in place to deal with ill patients infected with influenza A viruses up to 72 hours, providing a normal level of services with assistance from outside resources, the facility cannot provide necessary medical services up to eight weeks without extensive assistance from regional or federal resources. This is especially true in areas of hospital staff, pharmaceutical planning, and medical equipments, such as ventilators and respirators. The recommendations are that MCG focus its efforts to evaluate the status of its influenza pandemic preparedness and response, determine a baseline of influenza outbreak preparedness and response, and identify weaknesses of its influenza pandemic emergency planning.

Keywords: Hospital surge capacity, Influenza A pandemic

Introduction

According to the World Health Organization (WHO, 2009), a pandemic is a worldwide epidemic of a disease, and an influenza pandemic usually occurs when a new influenza virus appears within the human population, where there is no immunity for the virus. Examples of influenza pandemics are avian flu and swine flu, which are variants of influenza A viruses. Influenza A is currently the utmost pandemic disease threat for humanity as the virus has high penetrance into the human population. In other words, because the genes for influenza A show high virulence, a great number of people carrying the underlying alleles will succumb to the disease. Gatherer (2009) argues that the influenza a virus is unique among other major pandemic threats in that it could potentially infect 30% of the world's population within a matter of months. Thus, hospitals around the nation must develop written standards and guidelines for delivery of medical care services in a surge environment.

Kilbourne (2006) discusses that every influenza outbreak or pandemic is unique, and each one must be studied before an appropriate response can be developed. Historically, influenza pandemics have resulted in increased death and enormous social and economic disruptions. In the 20th century, the most severe influenza outbreak occurred in 1918-1919, which caused an estimated 40 to 50 million deaths worldwide. Currently, with the increase in global transportation, urbanization, and overcrowded conditions in some areas, we could expect the virus to spread rapidly if an influenza pandemic were to occur. Epidemiological models from the Center for Disease Control and Prevention (CDC, 2003) have projected that a pandemic could result in two to seven million deaths globally (Luke & Subbarao, 2006). Consequently, effective pandemic preparedness is crucial to mitigate the effects of a virulent disease, especially if it becomes severe.

Recently, evidence indicates that a variant of influenza A, the H1N1 virus, is now a threat to United States (US) citizens as well as other populations around the world. The H1N1 influenza virus was first described in the 1918 pandemic and made resurgence in April 2009 in the form of a triple-reassortant influenza A virus, which is composed of a combination of human, swine, and Eurasian avian strains. The virus has emerged as a combination of three different pieces of nucleic acid from different parents. Such viruses have emerged as a novel swine-origin influenza A virus in humans for which there is no complete immunity, making this virus strain extremely virulent and contagious (Michaelis, Doerr, & Cinatl, 2009). Influenza A is highly virulent and represents a continuous pandemic threat as more cases of H1N1 infection increase, indicating a significant threat in this country. Because a significant number of deaths occurred worldwide, several cases of the H1N1 virus infection were confirmed in 2009 demonstrating that the virus poses a real threat to our community.

The Influenza A virus appears silent at this time, but by observing the behavior of other virus infections in the past, epidemics usually come in multiple waves, and a second and more severe wave of the disease could be disastrous. As the seasonal flu approaches given the seriousness of the H1N1 virus spreading quickly, all hospitals need to undertake preparedness activities. A high level of vigilance must be in place for recognizing cases of respiratory disease, as this provides an important procedure in preparation for a potential influenza outbreak. The need to be equipped for a prolonged surge that could last six to eight weeks is the ultimate goal of any healthcare organization including the Medical College of Georgia Health, Inc (MCG).

Sobierai et al, (2007) showed that for a severe influenza pandemic, hospital beds, ventilators, and other resources would be exceeded within two or three weeks. Since a wave of influenza could last eight weeks, increasing hospital surge capacity is one of the main elements to be addressed in the hospital management planning. Therefore, in response for a possible

influenza outbreak, hospitals have identified one critical challenge, the need to rapidly expand their medical care capacities, as defined as hospital surge capacity.

Hospital surge capacity is the accommodation by hospitals to a transient and unexpected rise in demand for health care following an incident or pandemic (Barbisch, 2003). The ability to expand medical care capabilities in response to prolonged demand is a critical part of community disaster preparedness planning, which focuses on the requirements for additional beds, equipment, personnel, and special capabilities.

The full impact of an influenza pandemic in the Augusta area is not yet clear, and further reassortment with the circulating seasonal influenza strains could potentially lead to a widespread illness. Even though there are a small number of cases so far registered of the seasonal flu as well as swine flu, both virus strains constitute a serious threat to our community. Because H1N1 virus has a successful infection rate into the human population, hospitals must be prepared for the possible epidemic of the viruses.

If the worst case scenario of an influenza outbreak strikes in Augusta/Richmond County area, it possibly will cause mass critical illness and an increase in care capacity to provide adequate critical care will be vital for the wellbeing of the community. Thus, it is expected that hospitals including MCG should be prepared. Therefore, hospital surveillance, evaluation procedures for flu triage, respiratory hygiene, aerosol generating procedures, lab testing, infection prevention, and possible activation of the hospital incident command system are crucial to the hospital's emergency response. Its ability to respond to an overload of patient is translated into hospital surge capacity.

It is impossible to anticipate when the next influenza pandemic might occur or how severe its consequences might be. If an influenza pandemic virus were to appear similar to the one that struck in 1918, even taking into account the advances in medicine, unparalleled tolls of

illness and death could be expected. An outbreak of influenza may yield hundreds or thousands of critically ill patients and an evaluation of a hospital emergency plan and surge capacity is vital to reduce overall impact of a pandemic on a community.

Hospitals require adequate surge capacity to respond to mass casualty events. An analysis of the hospital surge capacity will demonstrate that a large proportion of the hospital resources could be made available in the event of a pandemic. The purpose of this study was to assess MCG's surge capacity and evaluate its pandemic influenza preparedness planning.

Although emergency preparedness is everyone's business, hospitals play a critical and indispensable role in this exercise. The relevance of this study predicts that an analysis of the MCG surge capacity will demonstrate if the facility is well prepared to respond to an outbreak of influenza A in the Augusta area. In addition, this research can be used to identify gaps in MCG's preparedness planning and target investments in emergency response capabilities to better manage hospital patient flow during mass casualties.

Background Information of the MCG

Located in Augusta, GA, the MCG is a health care network, offering comprehensive primary and specialized healthcare in the region. MCG is a non-for-profit corporation and its mission is "to care, to serve, to educate, and to discover". Its goals are to achieve excellence in "compassionate patient care, life-long learning, dedicated public service and leading edge research." (MCGHealth, 2009). The MCG's facilities include 478-licenced beds, MCGHealth Medical Center, the Ambulatory Care Center with more than 80 outpatient practice sites, a trauma center, 22 operating suites, and a 154-licenced bed MCGHealth Children's Medical Center. The health system also includes a variety of centers and units, such as the MCGHealth Sports Medicine Center, and the only Joint Commission accredited stroke program in the area (MCGhealth, 2008).

Also on the MCG campus, the MCG Center of Operational Medicine (MCG-COM) operates as a section of the MCG under the management and direction of the Department of Emergency Medicine. The mission of MCG-COM is to save lives and improve the health of causalities in emergency management services, as well as training, education, and clinical care. The center interacts with and serves the medical, educational, and operational needs of local, state, and federal government agencies. The Office of Disaster Medicine as a part of the MCG-COM has oversight responsibilities for the disaster medical assistance team GA-4 (DMAT GA-4) (Office of Public Health and Hospital Emergency Management [OPHEM], 2009).

In February of 2008, MCG established the Hospital Emergency Management Committee (HEMC) to improve emergency response during disasters. It has the purpose of analyzing plans designed to respond to emergencies and to evaluate their effectiveness for disaster mitigation, preparedness, response, and recovery. The major responsibility of the committee is to oversee the development of emergency preparedness and response plans and analyze all risks, which expose the hospital to natural or man-made disasters (MCG Health, Inc., 2008). Thus, the MCG plays a critical role in both identifying and responding to any potential natural disaster, terrorism attack, or an infectious disease outbreak in the Augusta area.

In 2004, the Georgia Hospital Association (GHA) and the Georgia Department of Public Health Division of Public Health (GDPH DPH) established the Georgia Coordinating Hospitals system. It is a source for managing healthcare emergencies and facilitates emergency planning between hospitals and public health districts. The current system contains three specialty coordinating centers and 14 regional coordinating hospitals also called public health districts. The coordinating hospitals are divided in regions named Region A, B, C, D, E, F, G, H, I, J, K, L, M, and N. MCG is the Georgia regional coordinating hospitals for region (district) G located in the Georgia public health district 6 (East central Augusta). The regional coordinating hospital

region G includes 12 hospitals: Burke Medical Center, Doctors Hospital of Augusta, Eisenhower Army Medical Center, Emanuel Medical Center, Jefferson Hospital, Jenkins County Hospital, Medical College of Georgia, McDuffie Regional Medical Center, Select Specialty Hospital-Augusta, Trinity Hospital of Augusta, university Hospital, Walton Rehabilitation Hospital, and Wills Memorial Hospital. They form the mutual aid task force for the Georgia health district G. The participant hospitals agree, in the event of a disaster, to use their best efforts to make clinical staff, medical and general supplies, including pharmaceuticals, and medical equipments available to each another in accordance with their standard operating procedures (Tuggle, 2008, Georgia Department of Community Health, 2010).

Literature Review

Natural and man-made disasters, as well as the threat of pandemic disease, continue to shape how hospitals operate their emergency management programming. Clear standards to fully evaluate hospital surge capacity are still to be determined. Recommendations from federal government agencies and hospital accreditation and certification programs including the 2009 Joint Commission hospital accreditation standards are available to provide guidance to hospital how to respond to a pandemic outbreak. Over the past decade, the Joint Commission's standards for Healthcare organizations accreditation has been updated several times to better assess how hospitals are meeting the rising complexities of the healthcare emergency management system. From the inclusion of "community-based emergency preparedness" in 2004 to exercises and drills based on a hospital's hazard vulnerability analysis, and the development of the Emergency Operation Plans (EOP) from 2006 through 2008, the Joint Commission is requiring hospitals to meet the new Emergency Management (EM) standards, which are separate and distinct from the environment of patient care standards (The Joint Commission, 2009).

The Joint Commission requires hospitals to have an emergency management program including an emergency management plan. The plan must address any kind of man-made disasters, natural, and biological including communicable diseases and insect swarms. Additionally, hospitals must be able to sustain themselves for a period of nine hours in case of an emergency event occurring. (The Joint Commission, 2009).

Disaster and infectious disease outbreaks over the last several years have demonstrated the importance of emergency preparedness for large-scale events affecting many people. The ability to respond effectively to events producing a massive influx of patients that disrupt daily operations requires a well planned hospital surge capacity strategy. Hospital's surge capacity is a critical component of the hospital emergency operations planning tied to the hospital's ability to respond to mass causality events.

The study of hospital surge capacity is considered a new discipline. It first appeared in 2000 and became more common after the September 11 attacks in 2001. The term "surge capacity" is most commonly studied in the fields of military literature, and most recently in emergency medicine and public health (Schull, 2006). Hospital surge capacity is defined as the ability of a hospital to accommodate an unexpected influx of patients requiring hospitalization and in most cases it is measured as the number of staffed bed (Davis et al, 2005). Thus, the National Disaster Medical System (NDMS) requires hospitals to report information about their surge capacity based on the number of staffed beds that are available based on the midnight bed counts and the number of beds that could be made available in 24 and 72 hours.

However, there are a lot of studies arguing that bed counting is not enough to measure hospital's surge capacity nowadays. After the September 11 attacks, the concept of surge capacity has changed. In addition to increase inpatient bed capacity, hospitals must have a plan in place to expand emergency department staff, decontamination capability, isolation rooms and

personal protective equipments, pharmaceutical supplies and equipments, communications systems, and integration with local or regional systems (Thorne et al, 2006).

Schultz and Koenig (2006) argue that several models for measuring hospital surge capacity are available and are based on the well developed Israel models of surge capacity. It is established that hospitals should increase their surge capacity at a minimum of 20% of staffed beds available at the midnight count as well as supplies and facilities. The Health Resources and Services Administration (2007) has established a benchmark that defines surge capacity requirements for a region as the ability to care for 500 cases per one million population with infectious diseases, 50 cases per one million with chemical toxicity, and 50 cases per one million with radiation injury within a 24-hour period. Schultz and Koenig (2006) recommend four more components for benchmarking hospital surge capacity including: personnel, equipment kits, facilities and supplies, and management structure. The authors argue that hospital surge capacity should not only rely on the hospital's ability to increase staffed beds. Beds alone do not care for the patient. Moreover, decontamination kits, specimen collection kits in lightweight, portable packages should become standard to facilitate emergency response in an influenza outbreak.

Bradt and Drummond (2006) also suggest that in a national pandemic, pre-hospital care play a critical role. Pre-hospital care is defined as occurring before or during transportation to the hospital. It includes: access to antiviral drugs and vaccines as well as medical assessment of ill patients to avoid the possibility of spreading virulent diseases. In addition, during an influenza outbreak threat, the ability of mobilizing resources from other areas also should be considered when hospitals design their hospital pandemic plan.

As the healthcare organization has the commitment to excel and to comply with high quality standards, the central focus is on organizational performance to ensure better healthcare services, continuation of business, and to achieve the needed medical course for incident victims.

The goal of this study is, however, to assess MCG's surge capacity and its influenza emergency planning for a possible flu pandemic in Augusta/Richmond county area.

Methodology and Data Collection

This study was designed to assess the MCG's surge capacity response to a possible influenza pandemic in Augusta/Richmond County area. We used the assessment tools listed in appendices one and two. They are based on the consensus that surge capacity of a hospital could be determined based on four components: personnel, equipment, facilities, and management structure (Schultz, 2006). The critical benchmark assessment tool was designed based on hospital surge capacity performance standards and indicators published by the HRSA National Bioterrorism Hospital Preparedness Program (U.S. Department of Health and Human Services, 2005). The critical benchmarks are described in appendix one. Briefly, a checklist of eight support categories of surge capacity included in this study is:

1. Hospital beds capacities and facilities
2. Isolation capacity
3. Health care personnel and advance registration system
4. Pharmaceutical caches
5. Personal protective equipment
6. Communications and information technology
7. Medical supplies and equipment
8. Management structure.

Some items of specific interest relating to the pandemic respiratory illness plan were assessed using a checklist of fundamental considerations described in appendix two. The plan assessment tool was designed based on the Hospital Pandemic Influenza Planning Checklist published in 2009 (U.S. Department of Health and Human Services, 2009; Higgins et al, 2004).

Data were obtained from the hospital epidemiology, emergency management, pharmacy, material management, and facility operations departments. The contact person from the department of epidemiology was contacted through electronic e-mail and asked to provide the names of the people involved in the emergency planning who could provide the information needed for each critical benchmark and the items of fundamental considerations of the influenza pandemic plan. The chief financial officer (CFO), director of hospital epidemiology, Augusta/Richmond County deputy director, four MCG senior managers, and one MCG clinical instructor were contacted through telephone or electronic mail and asked to review, provide information, and give an assessment of the MCG emergency plan and preparedness following the critical benchmarks and fundamental considerations listed in appendices one and two. MCG's influenza illness plan is made available to the public and also was used in this study to measure variables related to the facility characteristics to respond an influenza outbreak.

The data collected was analyzed and compared with the critical benchmarks described in appendix one. The pandemic respiratory illness plan elements were measured up against the fundamental considerations listed in appendix two. This methodology was not intended to be statistically representative, but rather to help develop an initial understanding of the extent of preparedness of the hospital to respond an influenza A outbreak. Finally, an assessment of needs was identified and recommendations were provided for improvement of the organization's surge capacity to respond to a possible influenza A pandemic in the Augusta area.

Results

Assessing hospital surge capacity for an influenza outbreak

This study was a secondary data analysis of the MCG emergency preparedness to care for an influx of potential infectious patients with influenza A viruses. The people contacted by electronic mail who provide the data were: the chief financial officer (CFO), director of hospital

epidemiology, Augusta/Richmond County deputy director and public health liaison, emergency management specialist, manager of facility operations, manager for materials management, manager of pharmaceuticals, and a respiratory therapist. An e-mail with an attachment of the critical benchmarks and elements of fundamental interest listed in appendices one and two were sent to the person who could provide the specific information requested.

The contacted person was asked to review, provide the data, and give an assessment of the MCG emergency plan and preparedness following the guidelines listed in the assessment tools. Each one of the participants received by e-mail, the critical benchmark and items of fundamental considerations related to his/her specialty. For instance, the manager of pharmaceuticals received the critical benchmark (4) - pharmaceuticals caches, the manager of facility operations received critical benchmark (2) - isolation capacity, and the manager for materials management received critical benchmark (7) - medical supplies and equipments. Most of the respondents gave their assessment by electronic e-mail or by phone.

The data provided were grouped and examined for each benchmark, which was used as a point of reference to measure and assess MCG's surge capacity for influenza A outbreak.

Critical benchmark 1: Hospital bed capacity and facilities: HRSA defines surge capacity requirements for a region as the ability to care for 500 cases per one million populations with infectious diseases within a 24-hour period. Yet, the basis for these recommendations and the implications for individual hospitals remain indescribable. Making this definition applicable to an individual hospital requires some mathematical manipulation. For instance, the region G whose coordinating hospital is MCG has a population of 427,524 people with 12 hospitals encompassing 2,102 beds. Using the HRSA definition for infectious diseases, hospitals in region Georgia regional G must absorb 213 patients in 24 hours, translating to a surge capacity of approximately 10% above maximal patient care levels for each hospital.

MCG is a 478-licenced beds facility with an occupancy rate of 68 (range: 64 – 78). It has an admission rate of 1,647 (range: 1,521 – 1,748) and discharge rate of 1,675 (range: 1,528 – 1,750) monthly with an average length of stay of six days. MCG has the capability to increase as much as 70 beds beyond the current staffed bed capacity in a 24 hours period, which would be translated in a 14.6% surge capacity. Assuming that 10% of the casualties would require inpatient treatment, MCG met the 500 casualty planning standard. The total population for the MCG catchment area is 35,627 people.

Critical benchmark 2: Isolation capacity: The CDC (2003) recommends negative pressure containment for airborne infectious for patients with known or suspect infectious disease, such as swine flu (H1N1 influenza A), avian influenza A (H5N1) virus, and severe acute respiratory syndrome (SARS). Hospitals must have sufficient numbers of negative pressure to accommodate their current isolation needs. In addition, HRSA recommends that 75 percent of regional hospitals have one negative-pressure isolation bed beyond the current staffed isolation bed capacity, for a suspected case of highly infectious disease and 75 percent of awardees regions have one regional health care facility that simultaneously can support at least ten adult and pediatric patients requiring a negative-pressure isolation bed in a 24-hour period. MCG has 37 negative-pressure rooms total including adult and pediatric. In addition, in the worst case scenario, MCG has 20 positive pressure rooms that could be converted to negative pressure in the adult side, and 14 in the children medical center, pediatric side. This would add a total of 61 negative-pressure rooms total available. One should keep in mind that it will take some time to switch all to negative pressure; however, MCG has the capability. Based on this information, MCG met critical benchmark 2: isolation capacity. Yet, it was not clear if MCG had tested inpatient isolation procedures put in place to hand an influenza outbreak.

Critical benchmark 3: Health care personnel and advance registration system: Expanding bed and equipments do not necessarily translate to patient care surge capacity because beds and equipments do not take care of patients. The hospital must be able to expand its medical, nursing, and ancillary staff proportionally. Thus, expanding hospital staff is one of the vital components of hospital surge capacity. MCG is able to increase its staff by maximizing the use of their own personnel. The facility knows what percentage of staff is on call, off, or unavailable on any given day and time. In addition, to further support hospital staffing MCG may request volunteers from Georgia State's Emergency Registry of volunteers (SERVGA). SERVGA is a system put in place by Georgia State's Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP). The system registers and prescreens volunteers that in theory could be utilized in emergencies (SERVGA, 2010). The answer was no to the inquiry of dual commitments to use other neighboring facilities leaving only the SERVA to provide for additional staffing. The facility did not meet the standards since the hospital has not developed a system allowing advance registration and has not established and tested mutual agreements for sharing personnel with other facilities. Theoretically MCG has access to hospital staff from other facilities based on the task force agreements among regional coordinating hospitals. But, it was clear that MCG has not tested the system. Thus, MCG relies on its own workforce and SERVA to increase hospital staff in an emergency situation.

Critical benchmark 4: Pharmaceutical caches: This benchmark provides recommendations for hospitals to have pharmaceutical caches sufficient to cover hospital personnel, first responders, and family members associated with their facilities for 72 hours period. Also, regional coordinating hospitals should have established a community-wide immunization/prophylaxis plan compatible with the state plan. MCG was able to get 8,000

employees and their children vaccinated during the 2009 flu season. It is mandatory to all MCG employees to get both seasonal and H1N1 virus vaccines or they will be terminated.

MCG is the designated distributor for the region G stockpile, and it requests pharmaceutical supplies from itself. How the state stockpile gets split up among the regions is up to the state, and MCG has no say in the matter. MCG just takes whatever the state sends to be used by participant hospitals. MCG does it best to distribute it equitable to the other hospitals in the region.

At the time of this study, MCG has an inventory consisting of Tamiflu, split in the following formulations:1320 courses of 75mg capsules, 48 bottles of 45mg capsules, 84 bottles of 30mg capsules, and 33 bottles of suspension 12mg/ml. The hospital does not have enough inventories of pharmaceutical caches to handle a surge of 500 patients/employees for three days. Medications will be needed including anti-infective, anti-virals, and vaccines for hospital staff, patients, visitors and the general public. MCG did not meet this standard.

Critical benchmark 5: personal protection: It is recommended by HRSA that the hospital must maintain adequate personal protective equipment (PPE) to protect current and additional health care personnel during an incident requiring PPE. This benchmark is tied directly to the number of health care personnel who will support the surge. Based on average daily usage, MCG has PPE and disaster supplies on-hand to protect staff up to four days. Since the number of people who get sick is unpredictable, the days of supplies may decrease. However, MCG has an agreement with vendors to provide additional disaster supplies. The unscheduled amount requested is tied to the same amount MCG buys on a daily/monthly basis. Even though resources are attached to the availability of funding, MCG has met the standards of personal protection to up to 72 - 96 hours.

Critical benchmark 6: communications and information technologies: The HRSA recommends that hospitals must have a secure and redundant (more than one piece of equipment to provide the same service) communications system to connect all agencies and health care entities responding to an emergency event or other public health emergency. MCG has phones, computers, and hammer radio capabilities. In case of a complete distraction of terrestrial cell antennas and networks, MCG also has satellite phone potential, which bypasses networks congestion and covers a much larger area. The whole communications systems at MCG can be set up in a 15 minutes time frame. MCG also has access to internet and methods for rapidly posting public health alerts. It has a public information officer who is designated for media and family updates regularly throughout the incident. A family access center is planned to be set up for keeping family members informed about the health status of their loved ones. Updates on patient medical status will be released on schedule and will depend upon the severity of the situation. MCG is well equipped and met this benchmark.

Critical benchmark 7: medical supplies and equipments: This critical benchmark requires hospital to ensure adequate medical supplies and equipments for patient care during a mass casualty event. The types of medical equipment/supplies assessed in this study were ventilators, approved respirators for airborne, and surgical masks for droplet precautions. MCG has medical equipments/supplies surge capacity for up to three days. There are no numbers attached to these items. The standards are that the hospital possesses an inventory to initially expand patient care, assure access to regional and federal stockpiles, and has a plan to maintain a surge capacity by mutual agreement with other facilities and vendors to deliver supplies after an unscheduled request.

The rule of thumb is that a wave of influenza A is estimated to last up to eight weeks. Thus, based on this assumption, MCG does not have the supplies needed to care for an influx of

patient who require a mechanical ventilator and an approved respirator up to 72 hours period. However, MCG would have enough surgical masks to handle a surge capacity for three to four days. Yet, one should keep in mind that MCG has access to the national pandemic supplies stockpile, which could be requested to supplement its medical supplies and equipments stockpiles. Overall, MCG did not meet this standard.

Critical benchmark 8: management structure: Surge capacity planning must address a sequence of events which is dynamic and requires different types of resources. Joint Commission requires the hospital to have and use an incident management system that integrates actions during the incident. MCG has a well established hospital incident command to be activated during a large-scale disaster. It is planned to meet in the pathology conference room and to be activated in 15 to 30 minutes.

MCG has participated in tabletop exercises in a regional plan for medical care of flu patients in number to 200%. Full-scale exercises have not happened yet. MCG also has a plan to achieve specific surge capacity target using standardized assumptions, but it is not based on FluSurge projections. FluSurge is a spreadsheet-based software available through the CDC website (CDC, 2010). It was designed to help hospital administrators and public health officials to estimate the impact of the 2009 H1N1 pandemic on the hospital surge capacity. It was not revealed which system will be used to estimate demands for hospital services during the next pandemic influenza. The data suggested that MCG's pandemic influenza preparedness planning is representative of hospital emergency pandemic planning at the national level considering the 72 hours period to respond a mass casualty event, and MCG met this standard.

Assessing hospital pandemic respiratory illness plan

Hospitals are required to prepare an effective emergency response plan to comply with local, state and federal regulatory agencies. MCG has developed and Emergency Operations Plan

(EOP) for using in planning, preparing, responding and recovering from emergencies, which may impact the community. The facility also has prepared a pandemic respiratory illness plan, which is included in the EOP. A concise assessment of the emergency plan was performed using the items of fundamental interest listed in appendix two. The list contains 20 items. MCG met 17 of the 20 standards. The data demonstrated that MCG's preparedness for a pandemic influenza is realistic with the national standards. MCG's possesses a comprehensive pandemic emergency plan, which includes procedures and guidelines that will decrease and handle a possible influenza outbreak in the Augusta/Richmond County area.

Discussion

There is growing concern about a possible influenza pandemic against the Augusta/Richmond county civilian population. Although such an incident has not occurred to date, the need for concern is still elevated, and the community must take seriously the necessity to prepare for a possible influenza A pandemic. Statistics show that a large proportion of hospitals around the nation probably are poorly prepared to handle victims of influenza A outbreak, specifically those in the small size hospital range and located in the rural area (Higgins, Wainright, Lu, & Carrico, 2004). Generally, hospitals are not fully prepared to respond to massive casualty disasters of any kind, either in their capacity of care for large numbers of victims or in their ability to provide care in coordination with a regional or federal incident command structure (Auf der Heide, 1996). Hence, hospitals require adequate surge capacity to respond to mass casualty events.

Surge capacity for hospital is defined as the components necessary to care for a sudden, unexpected increase in patient volume that exceeds current capacity (Hick et al, 2004). Hospital surge capacity can vary from day to day, and its measurement may be affected by the types of services that are provided by the organization. Several models for measuring hospital surge

capacity exist even though the lack of a conceptual definition and specificity makes it difficult for hospitals to determine how to define and report their surge ability to meet the standards.

Surge capacity for an influenza pandemic is still more complex since infected people in a community can exceed what is normally expected and most of the time cannot be predicted. Additionally, it is impracticable to predict when it will appear, originate, its severity. Nor is there agreement about the subtype of influenza virus most likely to cause the next pandemic. There are several uncertainties related to the potential of a pandemic influenza A, and there are also a number of serious concerns tied to it; for instance, the identification and isolation of the infectious agent, vaccine production capacity, and the supply of anti-viral drugs. The major challenge is to predict how the next influenza pandemic will appear and get hospitals ready to respond.

This report is an assessment of the MCG surge capacity to an influenza pandemic in the hypothetical event of influenza A outbreak in the Augusta area using the HRSA critical benchmark standards. HRSA had defined surge capacity requirements for a region as the ability to care for 500 cases per one million population with infectious diseases which could be translated in an increased of 10% per facility in a region. The findings of this study, while not surprising, were encouraging: they indicate that, overall, MCG is prepared to treat victims of a pandemic influenza A. Levels of preparedness were relatively moderate in all areas examined, such as bed capacity, medical supplies, personal and physical resources. The data suggests that MCG has the ability to temporarily expand patient bed capacity by 16.4% in a 24-hours period and met the HRSA critical benchmark 2.

Most hospitals have policies in place for temporary expanding patient bed capacity in time of crisis. In Israel, hospital surge capacity is arbitrarily set at 20%. Each facility is required to put systems in place that allow it to increase patient care capacity by 20% over baseline in the

event of a mass casualty event. This system has worked very effectively in the scenario of managing victims from terrorist bombings, and Israeli hospitals rarely exceed 5% of their capacity from any civilian event (Peleg, 2009). Therefore, it was encouraging to find that MCG is well prepared to expand its bed capacity beyond the minimum levels. However, it was not revealed how the hospital will meet this standard.

To expand bed capacity, most hospitals include canceling elective procedures and admissions, early discharges of inpatients, and clearing patients with minor complains from the emergency rooms (Kalen, 2005). Additional approach is to use flat space, such as hallways, lobbies, classrooms, and converting single rooms to double occupancy. Reports had shown that these techniques can increase hospital bed capacity as much as 20% - 30% within a few hours after a disaster (Hick et al, 2004). Yet, objective data showing the upper limit of such capacity for MCG were not provided.

Expanding the number of beds does not necessarily translate to patient care surge capacity. It is necessary that the system must provide the necessary personnel and equipments to actually implement patient care in this expanded space. Proposed guidelines or benchmarks exist, but there are no scientifically derived standards and objective measures defining hospital surge capacity. Schultz and Koenig (2006) argue that the problem should be whether hospital resources are exceeded at a given point of time and, if so, what procedures can be implemented to expand and enhance patient care capacity.

Influenza A is a highly contagious illness and an outbreak of influenza A will require the use of negative pressure rooms used to house potentially contagious patients. It was very encouraging to find that MCG has enough negative-pressure rooms and has the ability to quickly switch positive into negative-pressure rooms. It is very important that hospitals of all sizes address and continue to develop plans for negative pressure surge capacity.

Concern to personnel, MCG relies upon it own hospital staff and volunteers from SERVGA. The question remains if MCG had tested the use of such personnel. Also, since little data exists documenting such a procedure, it did not show if MCG is willing to allow such individuals to work within its facility.

The challenge remains to be answered of a possible shortage of hospital workers. For instance, in a pandemic there will be high absenteeism of all hospital staff due to illness, family responsibilities, or fear of contagion. Moreover, the deployment of state medical assets, such as SERVGA is unlikely to be available, since they also will be affected by the pandemic, and there will be many demands on the few volunteers who are available. Mutual aid agreements for sharing personnel through the mutual task force and Georgia Hospital Association, will be, I believe, also unlikely to happen because there will be no personnel to share. Yet, plans had been established to obtain expanded number of hospital staff, but more efficient mechanisms for credentialing health care professionals and ancillary personnel must be developed and tested prior to an influenza outbreak by MCG.

Most national agencies and organizations recommended stockpiling of anti-infective therapy and vaccines, but guidelines for how much of a stockpile are needed have not been developed. MCG has a clear shortage in pharmaceutical caches; however, it has a plan for obtaining additional pharmaceuticals and distributing these medications to participant hospitals in its public health district. Georgia has a pandemic pool from where hospitals could request additional drugs and medical supplies. MCG also has procedures to expand storage capacities for additional supplies, but it was questionable if the state will have enough stockpiles to provide for the hospital in case of an influenza A outbreak. Availability of vaccines and other pharmaceuticals depend upon how fast the infectious agent is identified and isolated. Vaccine production is a very expensive and labor procedure and isolation of the agent is crucial to initiate

the process. Thus, prophylaxis is and will always be a great challenge for any healthcare provider.

Even though MCG has access to additional pharmaceuticals, supplies, and equipments, receptions and distribution policies appear not to be updated and tested regularly. It is a concern for MCG that medication and vaccines will be needed to prevent and treat patients during an influenza outbreak. Therefore, MCG needs to develop a plan for surge capacity for pharmaceutical or preventative drugs. If not, patient care would be compromised.

Management of public and patient information as well as pandemic updates is of critical importance during an epidemic. Interagency communications and methods for collecting, storing, and sharing information also are vital during a disaster. MCG has a plan plus the equipment necessary to assist during the pandemic operations to avoid communication failures. It has the ability to synchronize and coordinate the work and keep the families and the public informed about the development of the disease. It was not apparent if MCG has plan to use the appropriate language to communicate properly with individuals with visual, learning, or other disabilities and those who are non-English language speakers.

Usually hospitals maintain a sufficient number of ventilators, support equipments, and supplies to meet current healthcare demands. At a time of need, hospitals are required to supplement the demand by renting additional ventilators. A significant finding from this study is the lack of ventilators and respirators surge capacity at MCG for a period of eight weeks, the time an influenza A infection is expected to last. MCG can accommodate an influx of any patient who requires a mechanical ventilator for up 72 hours. However, influenza A causes illnesses that result in severe respiratory distress, requiring prolonged intensive care for patients needing a mechanical ventilator. Without ventilator surge capacity, patient care could be compromised severely and result in increased morbidity and mortality. Although ventilator, respirators, and

other medical supplies will have some availability through the CDC's Strategic National Stockpile (SNS) and Georgia Hospital Association stockpile, there will be a delay before such resources are made available at the local level. Also, the amount available may not meet the demand. As a result, MCG needs a plan for surge capacity for ventilators and respiratory protection equipment or patient care would be put at risk.

The incident command is one of the most important elements of surge capacity. The ability to implement an incident management system in the face of a high-consequence event is necessary to maximize surge capacity in a tragedy. MCG has an incident management system well designed and trained to improve its emergency management planning, response, and recovery capabilities. Nonetheless, managing resources during an emergency operation has been required by the Joint Commission standards.

Overall, the assessment described above provided some information about MCG's preparedness planning for an influenza A pandemic. The results indicate that MCG is likely to handle a surge capacity for influenza A epidemic for up to a three days period; consequently, it met most of the HRSA's national standards. It was encouraging to find that MCG not only had developed plans to temporarily expand beds capacity, isolation rooms, and medical supplies, but it needs to test some of components. MCG also has a well designed and trained hospital incident command. However, it is less likely that MCG is able to provide enough workforce, pharmaceuticals, and ventilator/respirators surge for up to eight weeks, the time required for a wave of influenza to last.

Results from this study also show that MCG performed well within it emergency plan for a flu pandemic. Its plan is well developed, tested, and provides the procedures and guidelines needed to handle an influenza A outbreak. The assessment of the flu pandemic emergency plan shows that the organization is able to deliver hospital services during the next pandemic

influenza. Generally, the MCG flu pandemic emergency plan is well designed even though some areas are still a work in progress. Further analysis of the plan is needed to measure its operation and effectiveness to meet and respond the challenges of a flu pandemic in the Augusta Metro area. Lastly, gaps in MCG's preparedness were identified and appear not to reflect on the overall results and ability to respond a possible pandemic influenza during a three days period. One limitation of this study must be noted. Because the respondents were well informed about the necessary information needed for assessment of their organization, these findings may carry some inherent risks of reporting errors or bias. Additionally, hospital surge capacity and hospital preparedness are concepts that vary, leaving emergency management planning committees on their own to determine what is best for their facility given their resources and limitations of financial support.

Recommendations

In general, MCG is prepared to handle an influx of patients infected with influenza A viruses for a period of 72 hours. Yet, this study had identified some discrepancy in MCG's preparedness planning for a possible influenza A outbreak. The areas that are most in need of being addressed are: health care worker, pharmaceuticals, and medical equipments/supplies surge capacity. MCG must continue to address and assess these openings in its infectious disease emergency planning to improve its ability to respond an influenza outbreak in the Augusta area. As MCG's preparedness efforts continue, this study provides useful information for improvement.

The recommendations developed as a result of this study are that MCG:

- Should explore strategies for additional inpatient units outside the hospital, for instance hotels, schools and private hospitals.

- Should ensure that procedures to convert positive-pressure rooms to negative-pressure rooms are tested.
- Must improve its advance registration of professionals.
- Must estimate the needs for pharmaceuticals and vaccines considering that a wave of influenza will last eight weeks.
- Must have a stockpile of capsules or active pharmaceutical ingredients stored in sealed drums to be reconstituted in water when needed.
- Should estimate the number of staff increased during an influenza outbreak.
- Must have a reliable triage system to identify the patients who cannot be managed without a mechanical ventilator to assure that they receive the necessary ventilator support to sustain them during the incident.
- Should clarify the method(s) used to estimate the impact of an influenza pandemic on the hospital surge capacity.
- Must address the need of geriatric and disabled populations in the emergency plan as well as patients with special needs.

In summary, MCG must focus on evaluating the status of its influenza pandemic preparedness, determining a baseline of influenza outbreak preparedness and response, testing all procedures, and identifying weakness of its influenza pandemic emergency planning.

References

Auf der Heide, E. (1996). Disaster planning, Part II: disaster problems, issues, and challenges identified in the research literature. *Emergency Medicine Clinics of North America*, 14:453-480.

Barbisch, D. (2003). Hospital and Healthcare Systems: Surge Capacity. Retrieved October 25, 2009, from http://www.dtic.mil/ndia/2003terrorism/barb.pdf.

Bradt, D. A. & Drummond, C. M. (2006). Avian influenza pandemic threat and health systems response. *Emergency Medicine Australasian,* 18(5-6): 430-443.

CDC. (2003). Guidelines for environmental infection control in health-care facilities. Retrieved March 15, 2010, from http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm.

CDC. (2010). FluSurge 2.0. Retrieved April 22, 2010, from www.cdc.gov/flu/tools/FluSurge.

Davis, D. P., Poste, J. C., Hicks, T, Polk, D, Rymer, T. E., & Jocoby, I. (2005). Hospital Bed Surge Capacity in the Event of a Mass-Casualty Incident. *Prehospital and Disaster Medicine*, 20(3): 169-176.

Gatherer, D. (2009). The 2009 H1N1 influenza outbreak in its historical context. *Journal of Clinical Virology*, 45:174-178.

Georgia Department of Community Health. (2010). Georgia public health districts. Retrieved April 17, 2010, from http://health.state.ga.us/pdfs/publications/PublicHealthDists2006.pdf.

Health Resources and Services Administration. Medical Surge Capacity (2007). Retrieved October 29, 2009, from http://www.hhs.gov/disasters/discussion/planners/mscc/mscc080626.pdf.

Hick, J. L., Hanfling, D., Burstein, J. L., et al. (2004) Health care facility and community strategies for patient care surge capacity. *Annals of Emergency Medicine*; 44:253-261.

Higgins, W., Wainright, C., Lu, N., & Carrico, R. (2004). Assessing hospital preparedness using an instrument based on the mass casualty plan checklist: Results of a statewide survey. *American Journal of Infection Control*; 32(6):327-332.

Kelen, G. D., Kraus, C. K., & Brill, J. D. (2005). The CEPAR Research Group. Creation of hospital surge capacity by the early discharge of inpatients. *Academic Emergency Medicine*; 12-23-a.

Kilbourne, E. D. (2006). Influenza pandemics of the 20th century. *Emerging Infectious Diseases*, 12(1):9-14.

Luke, C. J. & Subbarao, K. (2006). Vaccines for pandemic influenza. Retrieved February 18, 2010, from http://www.cdc.gov/ncidod/EID/vol12no01/pdfs/05-1147.pdf.

MCG Health, Inc., (2008). Hospital Emergency Management Committee (HEMC), Policy No. 9.81. [p. 1-4].

MCGHealth: About Us. (2009). Mission, Vision, Values. Retrieved February 18, 2010, from http://www.mcghealth.org/about-us/McgContentPage.aspx?nd=455.

Michaelis, M., Doerr, H. W., & Cinatl, J. (2009). Novel swine-origin influenza A virus in humans: another pandemic knocking at the door. *Medical Microbiology and Immunology*, 198:175-183.

Office of Public Health and Hospital Emergency Management (OPHEM). Retrieved April 21, 2009, from http://www.mcg.edu.

Peleg, K. & Kellemann, A. L. (2009). Enhancing hospital surge capacity for mass casualty events. *Journal of the American Medical Association*; 302(5):565-567.

Schneid, T. D. & Collins, L. (2000). *Disaster management and preparedness*. Lewis Publishers, Washington D.C.

Schull, M. (2006). Hospital Surge Capacity: If you can't always get what you want, can you get what you need? *Annals of Emergency Medicine*, 48(4):389-390.

Schultz, C. H. & Koenig, K. L. (2006). State of research in high-consequence hospital surge capacity. *Academic Emergency Medicine*, 13(11):1153-1156.

SERVGA. (2010). Train. Prepare. Respond. Retrieved March 15, 2010, from https://servga.gov/.

Sobierai J. A., Reyes J., Dunemn K. N., Carty I. H., Pennathur A, Gutierrez R. S. & Harris M. D. (2007) Modeling hospital response to mild and severe influenza pandemic scenarios under normal and expanded capacities. *Military Medicine*, 172(5):486-490.

The Joint Commission. (2009). Emergency management. Retrieved April 23, 2009, from http://www.jointcommission.org/AccreditationPrograms/Hospitals/.

Thorne, C. D., Levitin, H., Oliver, M., Losch-Skidmore, Neiley, B. A., Socher, M. M., & Gucer, P. W. (2006). A pilot assessment of hospital preparedness for bioterrorism events. *Prehospital and Disaster Medicine*, 21(6); 414-422.

Tuggle, K. (2008). Regional coordinating hospitals: A resource for managing healthcare emergencies. Retrieved April 17, 2010, from http://www.ehcca.com/presentations/emsummit2/4_06.pdf.

U.S. Department of Health & Human Services (2005). The Hospital Preparedeness Program (HPP). Retrieved February 18, 2010, from http://www.hhs.gov/aspr/opeo/hpp/.

U.S. Department of Health & Human Services. Flu.Gov. (2009). Hospital Pandemic Influenza Planning Checklist. Retrieved October 29, 2009, from http://www.flu.gov/professional/hospital/hospitalchecklist.pdf.

World Health Organization (2009). Pandemic preparedness. Retrieved December 21, 2009, from http://www.who.int/csr/disease/influenza/pandemic/e/.

Appendix 1- Assessment of the Medical College of Georgia Hospitals and Clinics using HRSA's critical benchmarks

Critical Benchmark 1: Hospital Bed Capacity and Facilities		
STANDARD	ANALYSIS OF FINDINGS (Met; In Progress; Not Met)	RECOMENDATIONS
Critical Benchmark 1 1.Hospital has established a system that allows the triage, treatment and initial stabilization of 500 adult and pediatric patients per 1,000,000 awardees jurisdictions (1:2000), above the current daily staffed bed capacity for victims of influenza 2.Hospital has policies in place to temporarily expand patient bed capacity by: canceling elective procedures and admissions; early discharging of inpatients; and clearing patients with minor complains from the emergency department	Met Met	
Minimum Level of Readiness The hospital is capable to increase as much as 20-30% occupancy beyond the current staffed bed capacity in a 24-hour period.	In progress	Explore strategies for additional inpatients units outside the hospital, for instance hotels, schools and private hospitals.

Critical Benchmark 2: Isolation Capacity		
STANDARD	ANALYSIS OF FINDINGS (Met; In Progress; Not Met)	RECOMENDATIONS
Critical Benchmark 2 1. Ensure that the hospital has the capacity to maintain, in negative pressure isolation, at least one suspected case of a highly infectious disease.	Met	Ensure that the procedures to convert positive-pressure rooms to negative-pressure rooms are tested
Minimum Level of Readiness The hospital will have identified and upgraded (if needed) the facility to support the initial evaluation and treatment of at least 10 adult and pediatric patients at a time in negative pressure isolation	Met	

Critical Benchmark 3: Health Care Personnel and Advance Registration System		
STANDARD	ANALYSIS OF FINDINGS (Met; In Progress; Not Met)	RECOMENDATIONS
Critical Benchmark 3 1. The hospital has developed a system that allows for the advance registration and credentialing of clinicians needed to augment the facility to meet patient/victim care increased surge capacity needs in support of surge bed capacity noted in Critical Benchmark 1 2. The number of health care personnel must be linked to already established patient care ratios noted by the hospital's Patient Care Practice Acts based on 24-hour operations. 3. The hospital has established mutual agreements for sharing personnel in case of high absenteeism of hospital staff due to illness, family responsibilities, and fear of contagion.	In progress In progress Not met	Hospital must improve its advance registration of professionals.
Minimum Level of Readiness The hospital has established a plan for their state-base systems that allow qualified competent and licensed health care professionals to work in an emergency situation throughout the hospital's jurisdiction	Met	

Critical Benchmark 4: Pharmaceutical Caches		
STANDARD	ANALYSIS OF FINDINGS (Met; In Progress; Not Met)	RECOMENDATIONS
Critical Benchmark 4 The hospital had established a plan that insures a sufficient supply of pharmaceuticals to provide prophylaxis for 3 days to hospital personnel (medical and ancillary staff), emergency first responders and their families as well as for the general community—in the wake of an influenza outbreak	In progress	MCG must estimate the needs for pharmaceuticals and vaccines considering that a wave of influenza will last eight weeks.
Minimum Level of Readiness 1. The hospital will have pharmaceutical caches sufficient to cover hospital personnel (medical and ancillary), emergency first responders and family members associated with their facilities for a 72 hour time period. 2. The hospital will have established community wide prophylaxis plans that are compatible with other existing state immunization or prophylaxis plans for influenza A.	Not met Met	The hospital must have a stockpile of capsules or active pharmaceutical ingredients stored in sealed drums to be reconstituted in water when needed.

Critical Benchmark 5: Personal Protection		
STANDARD	ANALYSIS OF FINDINGS (Met; In Progress; Not Met)	RECOMENDATIONS
Critical Benchmark 5 1. The hospital must ensure adequate personal protective equipment (PPE) to protect current and additional health care personnel, during an influenza outbreak. This benchmark is tied directly to the number of health care personnel the hospital must provide to support surge capacity for beds required in Critical Benchmark 1.	Met	MCG must estimate the number of staff increased during an influenza outbreak
Minimum Level of Readiness 1. The hospital will possess sufficient numbers of PPE to protect both the current and additional healthcare personnel expected to be deployed in support of an influenza event. 2. The hospital will possess contingency plans to establish sufficient numbers of PPE to protect both the current and additional health care personnel expected to be deployed in support of an influenza event.	Met Met	

Critical Benchmark 6: Communications And Information Technology		
STANDARD	ANALYSIS OF FINDINGS (Met; In Progress; Not Met)	RECOMENDATIONS
Critical Benchmark 6 1. The hospital had established a secure and redundant communication system that ensures current information during a influenza emergency between health care facilities and the state, local health departments, emergency medical services, emergency management agencies, public safety agencies, neighboring jurisdictions, federal public health officials, and the community	Met	

Critical Benchmark 7: Medical Supplies and Equipments		
STANDARD	ANALYSIS OF FINDINGS (Met; In Progress; Not Met)	RECOMENDATIONS
Critical Benchmark 7 1. The hospital has held an inventory of medical supplies and equipments to initially expand patient care capacity during an outbreak of influenza. 2.The hospital had a stockpile or assures access to a stockpile of medical supplies sufficient for 8 weeks 3.The hospital has established a plan to maintain surge capacity by mutual agreements with other healthcare facilities, vendors, and government to deliver supplies after an unscheduled request	Met In progress Met	MCG must have a reliable triage system to identify the patients who cannot be managed without a mechanical ventilator to assure that they receive the necessary ventilator support to sustain them during the incident.

Critical Benchmark 8: Management structure		
STANDARD	ANALYSIS OF FINDINGS (Met; In Progress; Not Met)	RECOMENDATIONS
Critical Benchmark 8 1. The hospital has the ability to implement an incident management system in face of a high-consequence event including an influenza outbreak 2. The hospital has established a plan to achieve specific surge capacity targets, based on FluSurge projections using standardize assumptions 3. The hospital had participated in regional plans for medical care of flu patients in numbers up to 200%	Met In progress Met	The hospital must clarify the method(s) used to estimate the impact of a influenza pandemic on the hospital surge capacity

Appendix 2 – Influenza Pandemic Plan Assessment

Fundamental Considerations	**Assessment** (Met; In Progress; Not Met)	**Recommendations**
1. Does the facility have a pandemic influenza plan?	Met	
2. Does the plan detail actions to be taken for both internal and external disasters?	Met	
3. Does the plan detail how it links with the local EMS agencies and local Emergency management agencies?	Met	
4. Is the plan widely distributed and readily available throughout the hospital?	Met	
5. Does the plan identify the personnel authorized to implement the plan, and the organizational structure that will be used?	Met	
6. Does the plan specify the methods for performing and reporting syndromic surveillance for persons with influenza-like illness?	Met	
7. Does the plan have assigned responsibilities for monitoring public health advisories and for updating the pandemic response coordinators when pandemic influenza has been reported nearing the geographic area	Met	
8. Does a written protocol have been developed for monitoring and	Met	

reporting seasonal influenza-like illness among hospitalized patients, volunteers and staff?		
9. Does a written protocol been developed for the evaluation and diagnosis of patients and/or staff with symptoms of pandemic influenza?	Met	
10. Are key public health points of contact for communication during influenza pandemic identified?	Met	
11. Does the plan assign responsibilities for communicating with the public, patients and staff?	Met	
12. Does the facility have a plan in place to provide education and training for personnel and information for patients and visitors to ensure that the implications of, basic prevention and control measures for pandemic influenza understood?	In progress	
13. Does the facility have a developed plan for triage and admission of patients during a pandemic influenza?	Met	
14. Does the plan address the needs of specific patient populations (pediatric, geriatric and disables) affected during a pandemic influenza?	In progress, only addresses the pediatric population	The facility must address the need of geriatric and disable populations in the emergency plan as well as patients with special needs
15. Does the plan address an infection control	Met	

plan for managing hospital patients with pandemic influenza?		
16. Does the facility have a vaccine and antiviral use plan?	Met	
17. Does the plan have address and discussion issues related to surge capacity during a pandemic influenza?	In progress	
18. Does the plan address the steps to be taken to minimize and control points of access into the building?	Met	
19. Does the facility have mutual aid agreements with other facilities in the geographic area?	Met	
20. Has the plan been tested?	Met	