

***Bioterrorism and Other Public Health Emergencies
Tools and Models for Planning and Preparedness***

Use of Former (“Shuttered”) Hospitals to Expand Surge Capacity

Requirements for Reopening a Shuttered Hospital in an Emergency, and Suggestions for Meeting These Requirements

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Executive Summary

Greater Boston and Massachusetts were used as a prototype setting to evaluate the feasibility of, and requirements for, reopening a shuttered hospital to expand surge capacity during an urban mass casualty event. Massachusetts health planners previously identified the need for an additional 150-250 beds for a ‘surge’ event; this is the scale of operation explored in this project. Other communities may be considering this option as well. Our objective was to develop tools to help planners determine whether this option is feasible in their local communities, and to carry out the advance planning and preparation that would be required.

After considering several candidate facilities, conducting careful walk-throughs and assessments of two candidate facilities, and discussing options with the owners of several others in the greater Boston area, we concluded that the following factors would help emergency planners evaluate candidate shuttered hospitals and determine the most likely candidates for surge capacity expansion:

- A completely abandoned hospital that has been vacant for many years would likely have been stripped of anything saleable and will no longer have working utilities, fire and life safety systems, or even possibly water and sanitation fixtures. Thus a totally shuttered facility cannot safely be converted to inpatient care in a timely manner.
- Location and the relative local value of the real estate involved may indicate the likelihood that a facility will remain empty and available or be converted to other purposes such as condominiums or assisted living.
- Similarly, a shuttered hospital may have an uncertain ownership status and may be owned by the city or by a developer, or be part of a bankruptcy proceeding. Uncertain or changing ownership may mean that no one is legally able to negotiate for the use of the facility in an emergency. A partially-shuttered hospital that maintains some sort of affiliation with a tertiary hospital (e.g. urgent care center, walk-in clinic) may be a more likely candidate for surge capacity since organizational/contractual arrangements already exist that can be used to advantage in an emergency.
- A larger shuttered hospital may have more to offer than a very small one, for surge capacity purposes.
- A surge facility located fairly close to the major tertiary medical centers may be advisable to minimize patient transportation time and issues.
- A facility that maintains a cafeteria/food preparation area, certified life safety systems, a phone switch, and similar basic functionality would be better than one that is entirely vacant and un-used.

Planners could rank potential surge facilities using a list like this, as a first step in identifying the best candidate facilities. The resulting list of candidate facilities should be reassessed periodically, as the status of facilities can change over time.

Timing

All urban hospitals in Boston have plans in place to cope with dramatically increased capacity for up to 72 hours; the surge facility would therefore need to open within 3-7 days after a mass casualty event. The surge facility would need to operate for a range of 2-8 weeks, depending on the nature of the disaster and the needs of mass casualty victims, although there is no theoretical limit to how long the facility could remain open.

This rapid reopening would only be possible with considerable advance planning and preparation, requiring at a minimum a couple of months. It is not possible to reopen a partially-shuttered hospital in the days after a mass casualty event, without this advance preparatory work.

Scenarios

There are two general scenarios we believe are appropriate in considering reopening a partially-shuttered hospital as a surge facility:

Scenario 1

Generic mass casualty event (conventional terrorism or war, weapon of mass destruction, natural disaster) where hundreds of ambulatory med/surge patients need to be transferred out of the tertiary care hospitals to make capacity for mass casualty victims. In this scenario, every possible patient at the major tertiary hospitals would be transferred to other settings of care and all elective and non-urgent admissions and procedures would be delayed; if this still did not reduce demand sufficiently, the surge facility would be opened. The most critically ill patients would remain in the tertiary care facilities, and the most medically stable patients would be relocated to the surge facility. It is also conceivable that there would be a domino pattern in a larger metropolitan area experiencing a mass casualty event, where patients from tertiary care settings would be transferred to community hospitals and then those less acutely ill patients from the community hospital setting would be transferred to the surge facility.¹

Scenario 2

An infectious BT agent or communicable disease epidemic (e.g., smallpox, flu, SARS) that requires the creation of an infectious-disease/isolation or quarantine hospital as the surge facility.

Special considerations for a surge facility under an isolation scenario like this include: willingness of facility owners to allow this use at their facility, prophylaxis of staff working at the surge facility, security and perimeter control, infectious waste removal and treatment,

¹ Rural communities are unlikely to have a large enough shuttered hospital to serve as a surge facility (most closed rural hospitals are very small), and would not have the spare equipment, supply and personnel capacity to open such a facility within a week of a disaster.

negative pressure rooms or wards, laundering of contaminated linens, and (possibly) body disposal.

Patient Care Assumptions

During a mass casualty event, tertiary medical centers would discharge patients, delay admissions, relocate patients to rehabilitation and nursing facilities, and almost immediately clear 25% of their beds for emergency use. These activities would mean that surrounding community hospitals, nursing homes, rehab facilities, home health and all other service providers would rapidly reach capacity, leaving nowhere else to relocate patients. The surge facility is intended as a relocation facility for the most ambulatory patients who can be safely be moved out of tertiary medical centers, to clear space for disaster victims. This facility would not be the initial intake point for patients straight from the disaster scene, since it will not have an emergency room. It would not be a 'diversion' destination for ambulances; emergency responders would continue to send patients to the tertiary medical centers' emergency departments and physicians at those hospitals would decide which existing and new patients could be safely relocated to the surge facility.

Inappropriate Services/Patients

Since the goal of the surge facility is to maintain community standards of care, as nearly as possible, it would be inappropriate to relocate certain types of patients. Based on the facilities we assessed, it would not be possible to reconstitute an Intensive Care Unit (ICU) in a shuttered or partially-shuttered hospital, nor an operating room (OR) or suite within 3-7 days. We assume that no emergency department would be created at a former hospital being reopened to meet surge demands. In addition, because of a lack of ICU and OR services, it would not be possible to create a large inpatient acute burn or trauma unit in such a hospital. Under certain circumstances, however, trauma or burn patients in the later stages of convalescence might be appropriately relocated to the surge facility.

Medical experts advise that it would be inappropriate to relocate acutely ill oncology patients to such a surge facility, as the patients' chemotherapy, radiation therapy and other care needs are too sophisticated for such a place. It would not be appropriate to relocate psychiatric inpatients, since most psychiatric patients in acute care hospitals are immediate suicide risks and the entire relocation procedure would further exacerbate their tenuous stability. Pediatric patients would probably not be relocated either, since their needs (and their parents' needs) could not be met as completely in a surge facility as in a dedicated children's hospital.

We further determined that a partially-shuttered hospital would not be appropriate as a surge facility in the following circumstances:

- A BT agent that is airborne and infectious and has no vaccine (e.g., Ebola) therefore posing a significant immediate risk to healthcare providers. This was ruled out as a viable option because a shuttered or partially-shuttered hospital would be unlikely to have an adequate airflow system to handle these patients although there might not be an adequate airflow system at any functional hospital either.
- A hospice for patients needing pain and supportive care while dying from chemical or radiation terrorism events. This was ruled out because victims of chemical

terrorism would either die almost immediately, need 24 hours of ICU care, or walk away with minimal treatment. There would be little need for a large-scale inpatient hospice.

Recommendations

In addition to a variety of recommendations appearing throughout this report, the following over-arching recommendations are offered:

Any community considering the use of a shuttered hospital for surge expansion or as an isolation facility, needs to do a thorough assessment of the candidate facilities, and engage in substantial advance planning in order to make this option ready, should the need arise. Waiting until after a mass casualty event has occurred before considering such options, will eliminate the options altogether – a shuttered hospital simply cannot be reopened without advance planning, in the days after a disaster. (We would argue that no surge facility, whether at a shuttered hospital, a school or a hotel, can be opened without considerable advance planning.)

The most efficient and comprehensive approach might be for an existing tertiary medical center to take on the responsibility of making the surge facility a ‘satellite’ of the medical center. Existing contracts and vendor agreements could be extended to the ‘satellite’ facility and medical, security, materials management and other staff could lend their expertise. Patient charts could remain unified and pharmacy/lab services extended to the satellite. While some cities may not have a tertiary medical center or enterprise willing and able to fill this role, and this approach is certainly not the only one that would work, it is a logistically reasonable and efficient approach for planners to consider.

Federal and State regulations pose barriers to the rapid conversion/reopening of a shuttered hospital (e.g. EMTALA, Medicare Conditions of Participation, HIPAA).² These issues need to be considered well in advance of a mass casualty event necessitating surge capacity expansion at any facility that is not a functioning hospital. Provision for waivers could be set in place in advance, for example, to permit this surge capacity expansion. Perhaps the Federal government could offer ‘model’ waiver legislation and/or regulations as a starting point for States to consider.

There remain unanswered policy questions that planners need to consider including:

- Who will have responsibility for operating the facility? Options include a local tertiary care hospital or hospital system, or a city or State health department. Will this entity bear legal/liability responsibility as well?
- Who will have responsibility, at Federal and State levels, to review/revise regulations and establish contingencies for waiving specific regulatory requirements in an emergency?

² . These issues are discussed in an appendix to this report.

- How will the surge facility and all of its staff, equipment and supplies be paid for? Can this be determined in advance, or only after a major emergency? Will third party insurers be asked to reimburse for care provided in the surge facility, and will the facility therefore need a sophisticated billing system (not dealt with here)?

1.0 Background and Introduction

1.1 Hospital Surge Capacity

America's health care system, in both urban and rural areas, is at or near capacity with little ability to expand to respond to an unusually large mass casualty or surge event. The economics of hospital finance has largely driven excess capacity out of the system. Not only are hospitals at virtually 100% capacity in many cities, and must frequently close their emergency departments to new patients³, there is little excess capacity in the nursing home, home health or other healthcare sectors⁴. Patients cannot readily be moved out of hospitals to make room for large numbers of trauma victims or infectious patients, because there is nowhere to move them to.

Jeffrey Rubin, in *Recurring Pitfalls in Hospital Preparedness and Response*, notes that despite requirements, standards and best intentions, the combination of staff and equipment shortages, lack of surge capacity, and minimal funding have remained significant obstacles.⁵ Although there have been (and likely will continue to be) substantial improvements, most hospitals are still unprepared to effectively manage the results of a major mass casualty incident requiring rapid expansion of hospital capacity for any sustained period beyond the initial incident.

In a presentation for the National Defense Industrial Association, "*Hospital and Healthcare Systems – Surge Capacity*" Donna Barbisch discussed options for expanding hospital surge capacity, which she termed expanding through a "planned Degradation of Care". She suggested:

- Converting existing buildings to temporary hospitals
- Building temporary facilities
- Developing protocols addressing emergency standard of care procedures⁶
- At a presentation before the Secretary's Council for Public Health Preparedness in 2002, Lyman van Nostrand (HRSA) noted several strategies for increasing capacity, including:
 - Converting short stay (outpatient procedure) beds into inpatient beds
 - Utilizing hallways or creating alternative patient treatment areas
 - Partnering...to create emergency inpatient and outpatient capacity outside the hospital.

³ <http://www.bu.edu/bridge/archive/2002/01-18/in-the-news.html>

⁴ <http://www.managedcaredigest.com/edigests/is2001/is2001c03s01g02.shtml>

⁵ (Rubin J, *Recurring Pitfalls in Hospital Preparedness and Response*, Journal of Homeland Security, Jan 2004)

⁶ <http://www.dtic.mil/ndia/2003terrorism/barb.pdf>

HRSA funds emergency preparedness in all States and requires that a surge plan be in place by August, 2005. This project uses Massachusetts as a case study to explore issues surrounding use of a shuttered hospital for surge capacity expansion. In Massachusetts, a Statewide system is in place to help regions allocate ‘surge capacity’ beds – that is, hospitals throughout the State contribute data to a system that will allow regional coordinators to identify empty beds and distribute patients among existing hospitals.⁷ At best, however, this sort of planning and coordination can redistribute several dozens of patients or perhaps a couple of hundred and, to date, has not been tested or drilled in any real time scenario. In a hospital system as close to capacity as that of greater Boston, this relocation of patients would be inadequate to meet the surge requirements of many hundreds or thousands of simultaneous trauma or infectious disease patients and has no sustainability beyond the few days following an event, nor is sustainability part of the plan. Regional planning councils are considering other surge capacity expansion possibilities.

1.2 Use of Shuttered Facilities to Expand Surge Capacity

Recognizing that reallocating patients among existing hospital beds will not be adequate for a truly large-scale disaster or even moderate patient surge, the Massachusetts Department of Public Health workgroup in late 2003 convened a subcommittee to explore the use of shuttered facilities. Minutes from the first meeting indicate that the purpose of the group:

“Use of shuttered facilities to create Surge Capacity: DPH presented the topic of exploring the use of shuttered hospital sites for use to meet surge capacity needs in a disaster. The workgroup agreed that it would be appropriate to work on identifying shuttered sites, mechanisms to salvage or preserve them, and to present to the workgroup recommended next steps. DPH agreed to convene a “Shuttered Sites” subgroup to convene and report to the workgroup.”⁸

What sort of facilities could be best suited to serve as medical ‘surge’ facilities and provide the needed 125 beds? Many communities around the country have experienced hospital closures and conversions in recent years and have former hospitals that have not yet been converted to other purposes. Former hospitals might be the best alternative for “surge” facilities – better than churches, schools or hotels – because they are plumbed, wired, and in other ways appropriate for inpatient care, since they were originally designed and operated as inpatient hospitals.

Although not every community has such shuttered facilities, many do. For example, during the decade from 1990–1999, bed capacity in the city of Boston declined nearly 28%.⁹ In the Boston area, several community hospitals were converted to outpatient services only, generally leaving large empty floors of former inpatient rooms. Boston is not alone: hospital capacity in other cities has also declined during the past decade. According to the

⁷ <file:///C:/Documents%20and%20Settings/hassola/Local%20Settings/Temporary%20Internet%20Files/Content.IE5/W9O83LXJ/260,1>,

⁸ http://www.state.ma.us/dph/bioterrorism/advisorygrps/surge_minutes_9_03.htm

⁹ <http://www.ftc.gov/ogc/healthcarehearings/docs/altmanstuart2.pdf>

Washington D.C. Hospital Association, for example, there were 4,741 acute care hospital beds in service in 1994; by late 2003, that number had dropped almost 42 percent to 2,767¹⁰. The former D.C. General Hospital was a Level 1 trauma center with nearly 850 acute care beds, and has now has been reduced to an Urgent Care and Outpatient Center in its former emergency department.¹¹

We focused on the greater Boston area as a test setting, for several reasons. First, Boston's Longwood Medical Area (LMA) is an example of geographically concentrated trauma/emergency medical services that would bear the burden of responding to a mass casualty incident. Boston serves as the trauma "capital" for much of eastern New England. Many other cities are similarly organized with a geographic concentration of specialty and trauma care, serving a much larger region. Second, there have been a significant number of community hospital closures around Boston in recent years and unfortunately this also is true of many other major urban areas. Thus we believe that Boston personifies a very common situation for large urban areas (areas that may also be at increased risk of a major terrorist event). Third, this option is consistent with State priorities. The Massachusetts Department of Health has been discussing the concept of surge capacity expansion and has appointed a committee to consider the option of using shuttered hospitals for this purpose.

1.3 How Much Additional Capacity is Needed?

In a report filed in 2003, Massachusetts divided emergency preparedness planning into six regions for purposes of addressing patient surge and other needs. DPH further indicated that it would develop plans for hospitals in each region to collectively handle a surge of up to 500 patients beyond the licensed bed capacity of the hospitals. The planning would be for a total of 3000 surge patients Statewide. In other words, the surge planning task was to locate an additional 3000 hospital beds in the Commonwealth.

In a 2004 update to the 2003 report, DPH increased the number of required hospital surge beds to 3214 and identified two possible sources of the required beds:

- (1) Approximately 1880 beds that are licensed, but not staffed, located in existing hospitals.
- (2) Approximately 1200 licensed hospital beds that could be opened up through early discharge and transfer of patients to other settings, postponement of non-emergent procedures, etc. The plan for early discharge and surgery postponement, however, is not sustainable as patients who are discharged earlier than typical often require a return to an inpatient or emergency setting at a higher rate than others, and postponed non-emergency surgeries become more urgent or emergent as time passes.

This 2004 estimate leaves approximately 124 beds that do not currently exist and must be further identified.

¹⁰ <http://www.dcha.org/Data%20and%20Pub.htm>

¹¹ http://dchealth.dc.gov/news_room/release.asp?id=146&mon=200304

1.4 Facility Selection

The Massachusetts Hospital Association website contains a list of hospitals that have been closed over the past two decades, whether they were converted to other purposes (and which purposes), and the current ownership status – see Table 1 below. From this list we identified 6-7 facilities close to Boston that appear to be good candidates for the proposed project and we contacted several of them. There is probably no ideal or perfect facility for this exploratory work and given that we have several local options, we used the following criteria, in descending order, to select two candidate facilities:

- The hospital has not physically deteriorated to the point where patient safety would be jeopardized;
- The hospital has some ongoing medical or quasi-medical mission (but not inpatient) and maintains its life safety/emergency systems;
- The hospital could be made available and ready for surge capacity within three to seven days of a mass casualty event (Boston hospitals drill/plan to function at extreme excess capacity for up to 72 hours but cannot sustain this level of operations);
- Current owners were willing to participate in this project and were able to commit the cooperation of the facility managers; and
- Facilities are close enough to Boston to permit rapid patient transport (i.e., inside the route 128 beltway).

The following list includes the hospitals closed or converted in the past decade, in the greater Boston area.

Table 1: Boston Area Hospital Closures Since 1994

Year	Type	Owner	Name	City
1994	Acute	Private	Winthrop Hospital (to outpatient)	Winthrop
1996	Psychiatric	Private	AtlantiCare Hospital (formerly Lynn Hospital)	Lynn
1996	Chronic Care	City	Boston Specialty & Rehabilitation Hospital	Boston
1999	Acute	Religious	Boston Regional Medical Center	Stoneham
1999	Chronic/Rehab	Investor	Cranberry Specialty Hospital (to outpatient)	Middleboro
1999	Acute	Private	Malden Hospital (to outpatient)	Malden
1999	Acute	Investor	Symmes Hospital and Medical Center (to outpatient)	Arlington
2003	Psychiatric	State	Medfield State Hospital	Medfield
2003	Acute	Private	Waltham Hospital	Waltham

Using the criteria above, we explored the candidate facilities.¹² Our search and negotiation efforts with several area real estate and healthcare organizations resulted in selection of two hospitals to be used as examples for purposes of this project, which we will call Hospital 1 and Hospital 2.¹³ Both of the hospitals selected meet all of the above criteria.¹⁴

Hospital 1 is located in an inner suburb of Boston. This hospital was formerly licensed for 350 beds although the typical average maximum census was closer to 200 beds, and is sited on 12.8 acres. The building was first constructed in the 1930s with the most recent addition in 1985. The hospital was closed as an inpatient facility in 2001, with portions of the building currently used for administrative offices, a small walk-in clinic, a few doctor's offices, a dialysis unit, a sleep clinic, biomedical tenants, and an elder day care center.

Hospital 2 is also located in an inner suburb of Boston. This hospital was formerly licensed for 161 beds, and is sited on 18.1 acres. The building was first constructed in 1917, with the most recent addition in 1984. The hospital was closed as an inpatient facility in 2000, with portions of the building currently used for outpatient services and physician offices (including pediatric, internal medicine, and oncology).

We conducted inspection tours of these two hospitals, aided by the current building engineers. Our inspection team consisted of experts in disaster medicine, emergency medicine, pre-hospital care and patient transport, anesthesiology and critical care medicine, nursing, emergency management, building engineering, materials management, patient transportation, and other relevant fields (all from the Brigham and Women's Hospital and Massachusetts General Hospital), and project staff from Abt Associates. Working from pre-developed checklists, the team itemized detailed information about the current status of the closed hospitals, from utilities to food preparation to patient care, while planning for the eventual goal of being able to care for inpatients within three to seven days of initial activation.

¹² In addition to this list, two Veterans Administration inpatient acute care hospitals have been converted to other purposes during the past decade. We discussed the appropriateness of these facilities with Bill Burney, a Boston area Veteran's official. He advised that neither former veterans facilities in the Boston area would be appropriate and usable for our purposes. One continues to do outpatient surgery in a small surgi-center but the rest of the space has been converted to offices and would be no more appropriate than any other office building. The other facility is now a long-term care facility; those patients have nowhere else to go so the facility does not meet our criteria. There is a third V.H.A. facility in Boston which continues to operate as an acute care hospital; it is old and rapidly becoming obsolete, but it is in full use. We thus do not have an appropriate former V.H.A. hospital to use for study purposes, although such might exist in other communities.

¹³ The hospitals will not be named in this report due to political considerations affecting the future of these facilities.

¹⁴ A surge facility cannot safely offer operating rooms or intensive care. Patients with advanced or intensive medical procedures and needs would remain at (or be returned to) the tertiary medical centers, while patients with lesser needs would be moved to the Surge facility.

1.5 Assumptions for Reopening a Shuttered Hospital as a Surge Facility

This section outlines the assumptions for this project that were developed by project staff from Abt Associates and experts from Massachusetts General Hospital and Brigham and Women's Hospital.

Timing

Since area hospitals have plans in place to cope with dramatically increased capacity for up to 72 hours, we adopted the assumption that the surge facility would need to open within 3-7 days after a mass casualty event. We anticipate that the surge facility would need to operate for a range of 2-8 weeks, depending on the nature of the disaster and the needs of mass casualty victims, although there was no maximum operational period.

Recommendation: a partially-shuttered hospital should be ready to open as a surge facility 3-7 days after a mass casualty event.
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This rapid reopening will only be possible with considerable advance planning and preparation – which will probably require at least a few months. It would not be possible to reopen a partially-shuttered hospital after a mass casualty event, without this advance preparatory work.

Scenarios

There are two general scenarios we believe are appropriate in considering reopening a partially-shuttered hospital as a surge facility:

Scenario 1

Generic mass casualty event (conventional terrorism or war, weapon of mass destruction, natural disaster) where hundreds of ambulatory med/surge patients need to be transferred out of the tertiary care hospitals to make capacity for mass casualty victims. In this scenario, every possible patient at the major tertiary hospitals would be transferred to other settings of care and all elective and non-urgent admissions and procedures would be delayed; if this still did not reduce demand sufficiently, the surge facility would be opened. The most critically ill patients would remain in the tertiary care facilities, and the most medically stable patients would be relocated to the surge facility. It is conceivable that there would also be a domino effect where patients from a tertiary care setting would be transferred to a community hospital and then those less acutely ill patients from the community setting would be transferred to the surge facility.

Scenario 2

An infectious BT agent or communicable disease epidemic (e.g., smallpox, flu, SARS) that requires the creation of an infectious-disease/isolation or quarantine hospital as the surge facility.

Most of the factors necessary for an isolation surge facility are the same for scenarios one and two above, and include:

- Basic human needs (shelter, heat, food, water)
- Basic medical care (beds, medical staff, medical equipment and supplies, medications, electricity)
- Maintenance of sanitary conditions and management of wastes (plumbing, sanitizable surfaces, linens, means of waste disposal)
- Ancillary patient needs (social services, family waiting areas)
- Communications, safety, and security: (fixed and portable communications devices, life safety systems, site and building access control devices, security staff)

Special considerations for a surge facility operated under scenario two include the following:

- **Willingness of owners to permit isolation/infectious disease containment use.** The current facility owner will need to give permission for its use, which may be harder to obtain if the facility is to be used as an infectious disease/isolation hospital. The fact that partially shuttered hospitals have limited current uses and are likely to be demolished or converted in the future might minimize this problem, especially in comparison with other surge capacity options like schools, hotels or churches serving as isolation facilities where the facility must be returned to its previous function when the epidemic is over.

Recommendation: an isolation facility will have special requirements for the facility, staff, waste handling, ventilation, etc.
- **Staff Prophylaxis.** If there is an effective vaccine or prophylactic medication for a biological agent causing a community epidemic, this will need to be administered to all staff prior to the facility opening.
- **Security.** In addition to the site and facility access control devices for any surge use, an increase in security staff may be needed under the isolation scenario. The immediate neighbors may be against the opening of an infectious disease/isolation facility near their homes and may try to prevent its opening. Lockdown and exterior crowd control security protocols need to be developed in advance as part of the overall surge facility planning effort.
- **Media.** An isolation surge facility will likely draw significant media attention during a highly-publicized epidemic or bioterrorism attack. A media contact person should be designated to handle media information requests and ensure that a single, clear, and consistent set of information is provided to the media.
- **Infectious Wastes.** Infectious wastes will likely be managed off-site as most hospitals no longer operate on-site incinerators, and shuttered hospitals are even less likely to have functioning incinerators. There are existing procedures for wastes from an isolation patient in regular hospitals (i.e. red bag waste procedures), which would be broadly used at an isolation surge facility. Biohazardous waste transporters and medical waste processors will be available in most major cities.
- **Isolation Air Handling.** The air isolation mechanism at shuttered hospitals prevents air in the isolation space from seeping out of the area into other building airspaces, or from recirculating into other building areas via the mechanical ventilation. These mechanisms do not filter or otherwise contain air contaminants from exiting via the exhaust to the outside.

HEPA filtration is an additional containment measure that could be considered for air exhausted from isolation rooms or wards.

- **Infectious Laundry.** Laundry at the surge facility will likely be outsourced, as is the case with many major hospitals. Potentially biohazardous laundry is generated under even a typical hospital's operations, and there are procedures in place to handle this laundry, for example (e.g. red bag procedures and elimination of laundry sorting prior to laundering). Additional measures should not be necessary with the exception of smallpox, where autoclaving of linens is also recommended prior to laundering. Commercial laundries servicing hospitals may or may not have autoclave capability. As a precautionary alternative, disposable linens may be used.
- **Isolation Anterooms.** An anteroom space is required outside of specific patient isolation areas, to prevent cross-contamination of patients. Shuttered hospitals should have anterooms outside of areas previously used for isolation purposes. Also, general design of most former hospitals includes patient units or wards with nursing stations, and this physical lay-out may be amenable to the temporary creation of anterooms serving entire units or sections of a floor.
- **Body Disposal.** As indicated in the Medical Examiners, Coroners, and Biologic Terrorism guidance prepared by the Centers for Disease Control, the majority of biologic terrorism agents are not likely to be transmitted through non-autopsy handling of corpses. Such transmission can occur, however, with smallpox and hemorrhagic fever virus, and with anthrax. With these agents, cremation without embalming should be employed. For all agents, surface decontamination of the corpse-containing body bags is also recommended.

Patient Care Assumptions

During a mass casualty event, tertiary medical centers would discharge patients, delay admissions, relocate patients to rehabilitation and nursing facilities, and almost immediately clear 25% of their beds for emergency use. These activities would mean that surrounding community hospitals, nursing homes, rehab facilities, home health and all other service providers would rapidly reach capacity, leaving nowhere else to relocate patients. The surge facility is intended as a relocation facility for the most ambulatory patients who can most safely be moved out of tertiary medical centers, to clear space for disaster victims. This facility would not be the initial intake point for patients straight from the disaster scene, since it will not have an emergency room. It would not be a 'diversion' destination for ambulances; emergency planners would continue to send patients to the tertiary medical centers' emergency departments and those hospitals would decide which existing and new patients could be safely relocated to the surge facility.

Inappropriate Services/Patients

Since the goal of the surge facility is to maintain community standards of care, as nearly as possible, it would be inappropriate to relocate certain types of patients. Under either scenario, it would not be possible to reconstitute an Intensive Care Unit (ICU) in a shuttered hospital, nor an operating room (OR) or suite. We assume that no emergency department would be created at a shuttered hospital being reopened to meet surge demands. In addition, because of a lack of ICU and OR services, it would probably not be possible to create a large

inpatient acute burn or trauma unit in such a hospital. Under certain circumstances, however, trauma or burn patients in the later stages of convalescence might be appropriately relocated to the surge facility. Medical experts advise that it would be inappropriate to relocate acutely ill oncology patients to such the surge facility, as the patients' chemotherapy, radiation therapy and other care needs are too sophisticated for such a place. It would not be appropriate to relocate psychiatric inpatients, since most psychiatric patients in acute care hospitals are immediate suicide risks and the entire relocation procedure would further exacerbate their very tenuous stability. Pediatric patients would probably not be relocated either, since their needs (and their parents' needs) could not be met as completely in a surge facility as in a dedicated children's hospital.

Recommendation: a surge facility could not safely offer surgery, ICU or emergency services; these services should remain at tertiary hospitals while the surge facility is used for stable medical and post-surgical patients (clearing space in the tertiary hospitals).

We further determined that a shuttered hospital would probably not be appropriate as a surge facility in the following circumstances:

A BT agent that is airborne and infectious and has no vaccine (e.g., Ebola) therefore posing a significant immediate risk to healthcare providers. This was ruled out as a viable option because a shuttered hospital would be unlikely to have an adequate airflow system to handle these patients although there might not be an adequate airflow system at any functional hospital either.

A hospice for patients needing pain and supportive care while dying from chemical or radiation terrorism events. This was ruled out because victims of chemical terrorism would either probably die almost immediately, need 24 hours of ICU care, or walk away with minimal treatment. There would probably be no need for a large-scale inpatient hospice.

Patient Population Assumptions

Patients would continue to be cared for in the surge facility for at least 30 days (and perhaps as many as 60 days or longer), and we further assume that all the patients would not arrive on day one of the event; their arrival would most likely be spread out between days 3 and 11 following a mass casualty event, or spread out even more in the case of an evolving epidemic. For Scenario 1 we assume an average patient stay of two to three days; for Scenario 2 the length of stay is more difficult to predict but could be 2-3 weeks. Patients would be discharged slowly, over the course of several days or weeks, until the surge facility is no longer needed.

Ideally, the required amount of supplies held in inventory at the surge facility should be adequate to last at least three days per patient, regardless of the patient population.

For the purposes of estimating equipment and supply needs, we assume the surge facility will be operating at 100% capacity (a maximum of 300 patients at Hospital 1) beginning 3-7 days after an emergency is declared, and will continue for at least 30 days. For our calculations, at day 30, the surge facility would continue to be operating at capacity. This is an artificial endpoint - under Scenario 1, we could safely assume that a surge facility could end peak operation before day 30, while under Scenario 2, peak operation may continue for up to 60

days. At day 30, any remaining patients might be directed back into one of the tertiary or community hospitals under Scenario 1, and the same would probably be true by day 60 for Scenario 2 (personnel, equipment and supplies would need to be increased if the epidemic during Scenario 2 is protracted).

Technology Assumptions

The two hospitals we inspected had some vestiges of information technology remaining (data ports, phone switches, etc.) but little was in working order; we expect the same to be true for other shuttered hospitals. We assume that no significant investment would be made at a shuttered hospital prior to an emergency and therefore assume that any information technology the surge facility needs must be brought in during the 3-7 days that the facility is being prepared. While the lack of information technology might be an annoyance, hospitals can function with either very low-tech substitutions (paper records) or with very high tech solutions (wireless communications). For the majority of this report, we have assumed very basic voice communications and suggest less automated work-arounds in other circumstances where information technology is normally readily available. More sophisticated approaches can be used if feasible but we did not want to let technology become an obstacle during the critical 3-7 day window.

1.6 Planning Phases

There are several identifiable phases to be considered, including: preplanning, to ramp-up after a disaster, opening day, ongoing operations, and close-out.

1.6.1 Preplanning

A substantial amount of advance preparation must take place before a disaster arises that necessitates the opening of a shuttered hospital as a surge facility. A thorough facility assessment should be conducted early, in order to select the facility to be used and identify what is in working order and what is not. Most importantly, authorities must decide who will be responsible for the facility, and for getting it up and running. Options include operating the reopened facility as a satellite of a local major tertiary hospital; having county or State government take responsibility; or possibly a combination of these two approaches. We used Massachusetts as our case study and note that Massachusetts is unique in not having county health departments. In Massachusetts, more authority may be retained at the State level, while in other States more responsibility may devolve to county authorities.

Recommendation: substantial pre-planning is required to prepare a surge facility; waiting until after a disaster occurs will essentially eliminate this option.

This report does not address issues of financing, but planners may wish to determine the costs of reopening a shuttered facility, and how these costs will be recovered.

In order to decide which items/services will be contracted for or outsourced, and which will not, planners should examine the potential for borrowing from other hospitals in the metropolitan area, and also consider goods and services that may be available under a

disaster declaration from State and Federal authorities, including the Strategic National Stockpile. Once the facility assessment has been completed, the planning team should undertake a detailed analysis of available services in their area.

The complexity and scope of hospital procurement has created an industry of vendor middlemen to simplify the process. National equipment and supply vendors provide a host of services (see equipment and supplies chapter below). Regional vendors may be more specialized and only provide one or two necessary services. Some contracting arrangements can be made in advance on a ‘contingency’ basis, so that contracts can be implemented rapidly when an emergency occurs. In the pre-planning stage, it is possible to develop contracts, purchase orders, vendor relationships, and inventory reallocation plans for the 200-bed facility. Not everything needs to be contracted for in advance, however, as many vendors report being able to meet the new demand at virtually any time. If the entire equipment and supply process is to be arranged under a comprehensive service contract, the facility assessment itself could perhaps include someone from the selected contractor who will be responsible for so much of the time-sensitive ramp-up during the week prior to opening. Using an existing contract at a major medical center as the contractual ‘vehicle’ would promote even faster procurement.

Recommendation: an existing tertiary medical center could be responsible for operating the surge facility as a satellite, extending contracts, expertise, medical records, lab and pharmacy to the surge facility.

During discussions with one of the largest national equipment and supply vendors, representatives stated that they have never before proactively entered into an arrangement to provide surge capacity to a facility with whom they do not have a pre-existing non-emergency contract.¹⁵ The company did note that while they could theoretically provide equipment and materials to a surge facility, it would be impossible to provide the staff necessary to support the operation. Their staff are deployed at existing hospitals and they do not have specialists on-call for emergency deployment. Even the largest hospital service contractors do not maintain on-call environmental services, food service, or materials logistic management staff. Thus although large hospital contractors can probably supply a large share of the required equipment and supplies, staff may need to be obtained in other ways.

Contractor and Vendor Arrangements

In addition to routine operating contracts and vendor arrangements, every hospital has strategies to deal with emergency evacuation and patient relocation. These include contingency plans for equipment and supplies at other locations, contingency plans for restructuring staff shifts, and many other emergency strategies. Hospitals also have existing relationships with suppliers and vendors to make very quick adjustments to inventory in order to avoid inventory depletions caused by spikes in the patient population/demand.

For example, in June of 2001, Tropical Storm Allison dumped nearly 80% of Houston’s annual rainfall in two days. The resulting flood destroyed over 180,000 square feet of hospital space at the Methodist Hospital¹⁶. The hospital had a major national a non-clinical

¹⁵ Telephone Discussion, Feb., 2005, Sales Director Aramark

¹⁶ <http://www.nurseweek.com/news/features/01-06/flood.html>

hospital support service company that provided facilities management, supply management, and dietary food service for the Methodist Hospital, provided additional emergency services to the facility during the flood emergency. After the hospital shut down almost 200,000 square feet of space and many patients were transferred to other local hospitals, the support service company sent many of their Methodist Hospital staff to these other local hospitals, following the transferred patients from Methodist Hospital. The company honored their existing relationship with Methodist and continued serving Methodist patients after they were transferred to other hospitals. At the same time, the company was unable to provide support services, supplies or equipment to affected hospitals with which they did not have existing contracts, and would have been unable to begin a new contractual arrangement with a surge facility in the midst of the flood.

The scenarios for reopening a partially-shuttered hospital as a surge facility are quite different from the emergency and contingency plans set in place for events like the Houston flood. While actual hospital capacity in Houston decreased during and after the floods, our scenarios envision the need to increase metropolitan area hospital bed capacity by at least 200 beds. The surge facility will probably only open when all other hospitals are operating well beyond 100% capacity.

Personnel responsible at large Boston area hospitals indicated that there is only limited excess capacity either in their staff or equipment systems, which could be allocated to a surge facility, even on a short-term basis. Given the tight margins at U.S. hospitals today (e.g. “just in time” inventory systems, nursing shortages), it is unlikely that many could part with enough fixed inventory or staff to stock and operate a 200-bed facility. Unless excess capital inventory and staff exist at local hospitals, a diverse array of vendors will be needed to provide the surge facility with the capital goods, materials and supplies, and staff necessary to operate the facility.

A recent case study of an outsourcing experiment at medical facilities in the United Kingdom had somewhat mixed results, and offers the following lessons:¹⁷

Maintain core service staff. The experience at Leicester Hospital suggests that successful use of facility service contractors requires that the hospital employ a core staff. If a planning team determines that complete outsourcing is a possibility, they should examine their needs for other core services staff based on comfort level, the facility, and existing experience with the service vendor.

Clear communication channels should be established and chains of command outlined. The case study and anecdotal conversations suggest this may be the most important aspect of successful service outsourcing. The planning team may elect to hold proactive collaboration sessions, or mock drills before any surge need to establish relationships and informal communication channels that are essential to any operation.

Include the contractors in learning and planning tasks. Contractors should be considered part of the team, not an external organization – and therefore included in planning sessions

¹⁷ Powell, Andy Contracting out Hospital Services May 16th. Leicester Royal Infirmary

and conferences. The UK case studies detail this recommendation as, “Make the contractor part of the family.”

The operational entity is still legally responsible for service. The organization that leads the surge facility operation, despite the fact they are contracting out services, still maintains overall responsibility for service provisioning of critical services.

Recognize the contractor’s need for a reasonable profit. Under a surge situation, some organizations may donate materials, equipment and supplies, but most will need to be paid for in the commercial market. (This report does not address cost or financing issues).

A-La-Carte Services

While vendors and service providers are capable of providing all, many core and support services under a unified contract, such services are also available (from the same firms or others) a la carte. The processes, pitfalls and considerations are similar to those discussed for the comprehensive outsourced services, and thus similar planning processes should be undertaken to employ the services of various vendors for the surge facility.

Advantages and Disadvantages of Vendor Contracting

In an emergency situation where most specialized staffing resources are needed at other existing hospitals, large service providers are a one-stop-shop for many of the needs associated with operating a medical care facility and can alleviate pressure on surge facility planners during the ramp-up period leading to the opening of the surge facility.

Proponents of outsourcing are particularly enthusiastic about outsourcing non- medical services. They suggest that it saves money while increasing service quality because the practice allows the hospital to focus on its core competency of providing medical care. Food service, physical plant maintenance, materials management, pharmacy services, facility management, patient transport, IT and other similar services are important, but ancillary to this core mission. Food Services, for example, could be contracted out to a firm that specializes in food preparation, dietary planning and food service for hospitals.

Detractors of outsourcing cite cost and quality as reasons to keep services in-house. Other general complaints about outsourcing include reduced collaboration and communication, interrupted chains of command between contractor staff and hospital management, and conflicting hospital/contractor organizational goals. Some of these complaints may relate to the general concern that using contractors reduces overall control of the service provision process. Each planning team will need to complete a thorough analysis before deciding whether to outsource services. And planners should develop an organizational chart with clearly delineated responsibilities for both the week prior to reopening of the facility, but also for ongoing operations (however long this lasts).

1.6.2 Ramp-Up During the 3-7 Days After the Emergency is Declared and Before the Facility Opens

Upon declaration of a major mass casualty event and a decision to reopen a partially-shuttered hospital, the lead person responsible for each activity below will need to devote full

time to getting the facility ready. We suggest the following assignments (at a minimum), which mirror sections in this report that follow:

- Facility Readiness (structure, systems, repairs, removal of debris/furniture, testing, cleaning, etc.)
- Equipment and Supplies (including pharmacy, laundry and food service)
- Staffing
- Security
- Patient Transportation
- Patient Information Systems (medical records)

It will be each team leader's responsibility to ensure that their area of control is adequately prepared for 200 patients within three to seven days of the emergency event. Since these teams must work concurrently rather than consecutively, responsibility must be distributed in terms of both decision-making and spending. Most critically, communication between the teams will need to be clear and frequent during the ramp-up process.

1.6.3 Day One

Three to seven days after the emergency event occurs, the surge facility must be ready to receive patients. Much will need to happen on Day One, particularly in terms of staff at the facility and patient transport. We assume that staff will have been assembled (together or in shifts) in the day or two prior to opening, so that they will have met each other and be somewhat familiar with the physical layout of the facility. Security staff will also have been introduced to the facility in the days prior to opening and their shifts will be established for opening day. Supplies and equipment will be in place, as well as a functional pharmacy, dietary services, housekeeping, and other ancillary services.

A major effort on Day One will be patient discharge from their tertiary hospitals, transport to the surge facility, and intake at the surge facility. This movement will be facilitated by an abbreviated patient transport record (see sections below on Patient Transport and Patient Information) listing each patient's monitoring, medication and other needs that must be met during and after transport.

We expect that extra staff will be in place on Day One, to handle unforeseen difficulties on this unusual day, and staff shift rotations might need considerable overlap so that the 'hand off' from one shift to another is smooth.

1.6.4 Ongoing Operations

Once the facility has opened, team members will be responsible for continued operations at the surge facility, taking on roles similar to their customary responsibilities in routine hospital operations. We assume that most of the leadership team will have the necessary experience in their area of expertise. For example, the senior members of the security team will have backgrounds in hospital security, and those running the pharmacy will have worked at hospital pharmacies in the past. Team members would continue providing services such as

overseeing service contracts, managing staff, ensuring quality of service, maintaining appropriate inventory levels and mitigating problems within their area of influence and responsibility.

Teams may face different problems/issues if the surge facility remains open more than a few weeks. Temporary fixes may not hold for three months, and supplies that are available immediately to open the facility may need to be replenished. Staffing that can be handled in the short-term, with Public Health Service clinicians and other Federal or State assets, may not be available longer term, and their lodging needs cannot be considered ‘temporary’ indefinitely. If the facility must remain open for more than a few weeks, adjustments will be needed by many teams.

1.6.5 Facility Closure

As the emergency subsides, the surge facility will begin to reduce staff, services and supply re-order volume. For example, the materials management team leader must manage this decline toward closure, maintaining levels of service and supply appropriate for the decreasing intensity of operations, while beginning to plan for return of leased equipment, etc. When the facility is fully closed, the materials management leader will be responsible for ending contracts and determining how the remaining supplies and equipment will be allocated within the local health system.

1.6.6 Review and Replan

After the surge facility closes, we recommend that team leaders assemble and review the experience – what went well and what did not. This review can be used to revise plans so that if the surge facility is needed again in the future, operations will have improved based on lessons learned from the first experience.

1.7 Report Organization

This report deals with scenarios (1) and (2) described above. In each section of this report, all general information provided is applicable to both scenarios. Any additional, special requirements for the infectious disease/isolation situation (Scenario 2) are noted.

This report contains our findings from visiting Hospital 1 and Hospital 2, our conclusions regarding what one can expect to find at any partially-shuttered hospital, conclusions about features that probably vary between one shuttered hospital and another, the many resources that are not available at any partially-shuttered hospital and would need to be brought to the facility before it could be reopened to meet surge demands, and how these needs can best be met. The sections of the report are presented in the following areas:

2.0 Facility Structure and Status

3.0 Equipment and Supplies

4.0 Staffing

5.0 Patient Transportation

6.0 Security

7.0 Patient Information

2.0 Facility Structure and Status

During the investigation of the two partially-shuttered hospitals, site, structural components, layout, fixed equipment, and utilities were assessed in light of potential for surge capacity use during a catastrophic event. This section of the report presents findings regarding location of the facility, access, and building infrastructure and critical systems. The toolkit accompanying this report contains a checklist used by the project team during inspection of these two hospitals.

Recommendation: a systematic assessment of candidate facilities should be conducted in advance, to determine strengths/weaknesses of each and whether this is a feasible option for a given municipality.

2.1 Location and Access

Location

Both hospitals are located outside of the core metropolitan area of the city, and thus would likely be outside of the area of impact of a catastrophic event barring an atomic detonation. The hospitals are also relatively close to the city, within thirty minutes driving time, and ten miles, such that transportation of patients, staff and equipment from the metro area would be readily feasible.

Roadway Access and Security

One of the partially-shuttered hospitals has access via two roadways and the other via three. This would provide continued access to the hospital in the event that one roadway became blocked or inaccessible. Both hospitals are located a short distance from the regular thoroughfares, on relatively large land sites. This requires long, connecting roadways that go only to the hospital property. It would be relatively easy to set up traffic stop points to limit access and check personal identification or vehicles if needed during surge use.

Vehicle Access and Parking

Roadways to both hospitals are large enough to accommodate cars, ambulances, buses and trucks. More than ample parking was available at both facilities.

Both hospitals have small ambulance bays, allowing for unloading of one or two ambulances at a time. This would necessitate coordinated or staged scheduling for receiving patients on gurneys unless the loading docks were used for ambulance traffic as well.

Both hospitals have small loading docks. Hospital 1 could accommodate up to four 18-wheelers at a time, while Hospital 2 could likely only accommodate one or two at a time

because there is not adequate space for straight back-in, but instead angled back-in would be needed. This would necessitate coordinated or staged scheduling for receiving equipment shipments from trucks. Hospital 2 also has a second, smaller receiving area for the cafeteria. Both hospitals could receive from four or more vans at a time at the loading docks.

Both hospitals could receive helicopters. Hospital 2 has a helipad in the former nursing school parking lot that is a short distance down the access road. The back parking area at Hospital 1 could readily function as a helipad.

2.2 Building Security and Life Safety Systems

Security

All locks and alarm systems are in place and functional at both hospitals. Exterior windows, doors, and other structural components are in place, with no breach in exterior structural components allowing for building access other than in normal doorway entrances.

Both hospitals have a limited number of building entranceways (approximately a half dozen or fewer) that are readily controllable for security purposes. Both hospitals currently have on-site security staff. Hospital 1 currently has security guards around the clock, while Hospital 2 has security guards from approximately noon to ten p.m. This security staff could likely continue to serve as security during surge use but would need to be augmented.

Life Safety Systems

Both hospitals have maintained operational life safety systems such as fire alarms and sprinklers. One has maintained the Department of Public Safety licensure, while the other has not kept up with quarterly fire inspections.

Abutters

Both hospitals are at least a few acres from surrounding residential areas and have no close abutters. There are no abutters that would prevent surge use of the hospitals. One hospital has a nursing home with approximately 200 beds in a separate building on the property while the other has a closed nursing school. These other buildings could have potential for housing of staff or other support services.

2.3 Structural Components

One entire hospital and most of the second, are in acceptable physical condition for surge use.

Exterior Structural Components

All exterior structural components, including exterior walls, roof, exterior windows and exterior doors, are sound and in place at both of the former hospitals, with the exception of the roof over one wing of Hospital 1 where there is extensive water damage from a leaking roof. This area is not currently used, and formerly housed the operating rooms and pre- and post-operative areas. Much of the ceiling has come down due to the water damage. This

portion of the hospital would not be usable, but the remainder of the building, comprising capacity of over 150 beds, is in acceptable condition for surge use.

Interior Structural Components

At Hospital 2, all interior structural components, including floors, walls, ceilings, interior windows, and interior doors are in place and in good condition. At Hospital 1, these interior structural components are in place and in good or usable condition with the following exceptions: 1) there is significant damage to the ceiling from water leaks in the former Operating Room area, 2) parts of the building such as the former psychiatric ward are in general disrepair, and 3) room doors are missing from a large percentage of former patient rooms currently used as administrative offices. As stated above, the portion of Hospital 1 with water damage would not be usable for surge use. For surge use, missing patient room doors would need to be replaced for negative pressure or simple isolation rooms, and if needed for patient privacy.

Elevators

Elevators at both hospitals are operational with inspection certificates maintained. Two of the four elevators at Hospital 2 are slated for closure to avoid needed costly repairs.

2.4 Utilities

In general, all needed utility set-ups at both hospitals are operational and adequate for surge use. There is sufficient space at both hospitals for a portable on-site generator, chiller, and boiler if there is a need to bring these in, although it does not appear this would be necessary as back-up systems are in place at both hospitals.

Recommendation: working utilities, fixtures and life-safety systems are an absolute prerequisite for a surge facility.
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Electric Power

Both hospitals currently receive power from an outside power source, and each has two outside feeds. Both also have operational on-site power plants that could generate electrical power if the facility is separated from the electrical grid or there is grid failure due to the catastrophic event. Back-up power would feed electricity to life safety systems, equipment branch, and critical branch loads during a loss of normal power. One hospital has two back-up generators, each serving different portions of the building, running on #2 fuel oil. The other has three back-up generators, each capable of serving the entire facility, which can run on either natural gas or #2 fuel oil. The hospitals currently store enough back-up fuel oil to run the back-up generators for 24 to 48 hours. The necessary fuel oil for the back-up generators is typically easy to obtain, and getting fuel oil trucked in during surge use would be highly feasible.

These back-up generators can meet all of the electrical capacity needed during medical surge use. Heat could be maintained to both hospitals with the back-up generators but not air conditioning. Electric closets and wiring are functional and in good condition at both hospitals, in all areas deemed usable for surge capacity.

HVAC Automation Systems

One hospital has a Honeywell automation system controlling portions of the building, while the other facility has no automation system. The existing HVAC control system could easily be overridden if needed. Presence or lack of this type of automation system was deemed to have no effect on whether the hospital was suitable for surge use.

Heating

Both hospitals have operational heating systems using a combination of steam and hot water heat. Boilers at both hospitals have dual-fuel capability (diesel or natural gas), but there is not a natural gas connection to the boilers at one of the hospitals due to piping restrictions, so fuel oil would need to be used. At the other hospital, use of natural gas would be preferred to preserve fuel oil for the back-up generators. Both hospitals have capacity to provide full heat to functional building areas, and enough heat to prevent freeze conditions in non-functional building areas.

Ventilation

Air handlers are operational at both hospitals, with fresh air intakes at roof level. It appears that the requirement to have exhaust greater than 25 feet away from air intakes is met at both hospitals.

Air Conditioning

The chillers are operational at both hospitals, although one of the two chillers at Hospital 1, although operational, is not in good shape and would not likely be functional for an extended period of time without significant reconditioning. The chillers cannot function from the back-up generators. It is extremely unlikely that lack of air conditioning would prevent surge use although this issue would have to be closely examined should the surge situation occur in the summer months in a warmer climate.

2.5 Water and Plumbing

Both facilities have a functional water source and plumbing systems.

Water Source and Back-up

The local Publicly-Owned Treatment Works (POTW) supplies water to both hospitals, with two feeds to each for back up. The domestic water booster pump system is operational at both hospitals. The emergency water supply at each hospital could last two to three days. If catastrophic events cut-off a surge facility from the POTW, water would need to be trucked in.

Hot Water

Each of the hospitals has two operational hot water tanks, but they are not currently operating at full capacity. To prepare for surge use, minor maintenance such as checking of pump seals would need to be conducted, and water in both tanks would need to be fully heated. This would take approximately two to three days.

Plumbing

Plumbing fixtures, such as toilets, sinks, and piping are in place and in good condition at both hospitals. Toilets have been shut down in some areas and flushometers may need to be replaced in some toilets; valves would need to be opened to return water to the system. To conduct these activities and get all toilets operational would take approximately three to five days, and sections of the hospitals could be outfitted and reopened in stages.

Wastewater

No on-site wastewater treatment is conducted at either hospital. Wastewater is returned to the local POTW, and all necessary piping is in place at both hospitals. There are no special wastewater controls or containment at existing ordinary community hospitals in the Boston area, so no such systems would be needed for surge use, even in the case of isolation/quarantine.

2.6 Containment and Wastes

Air Flow/Isolation

Hospital 1 has a few negative pressure/isolation rooms on almost every floor with HEPA filters. These would need to be re-certified prior to surge use. At Hospital 2, only a very few rooms (perhaps four) were formerly negative pressure and we could not determine whether filters in such rooms are still functional. At both hospitals, the air handling systems are such that entire floors could be converted to negative pressure via manual controls, thus converting an entire floor into an isolation area.

Isolation/Quarantine:

Current requirements indicate that an anteroom (a defined space from which air is being removed) must exist outside of isolation patient rooms. If entire floors are converted to negative pressure, a defined space with doors must be identified to serve as the anteroom for the entire floor.

The function of negative pressure in isolation areas is to ensure that contaminated air does not go elsewhere within the facility via seepage to the air handling system. Systems at ordinary community hospitals, however, including these two assessed hospitals, do not filter or otherwise contain air contaminants from exiting via the exhaust to the outside. For this reason, if an entire hospital is used for the purposes of isolation/quarantine, an assessment would be needed to ensure that contagions cannot enter facility fresh air intakes, drift to receiving areas or entranceways, or migrate to sensitive receptors in the area.

Medical Wastes

Neither hospital houses an operational on-site incinerator for destruction of medical wastes, nor were there other waste treatment systems on-site. Both hospitals have adequate, separated space near the loading docks to store red-bag (bio-hazard) waste until pick-up by a licensed hauler.

Solid Wastes

Both hospitals have compactors and dumpsters on-site for management of solid wastes until pick-up.

2.7 Services

Pharmacy

Both hospitals had on-site pharmacies and therefore have a physical set-up for this activity. At Hospital 1, the pharmacy inventory management system is still available in the computer system. For surge use, it would be feasible to create an on-site pharmacy.

Laboratory

Neither hospital has a functioning laboratory. At Hospital 1, only very limited lab work was ever conducted on-site and all lab equipment has been removed. At Hospital 2, there are two functional and operating blood draw rooms, bench space, working hoods, and a reverse osmosis water system, but other laboratory equipment has been removed. For surge use, it would be more practicable to send samples out to local medical laboratories rather than try to create or restore functioning labs at the hospitals. Portable lab kits and bedside testing are another option, discussed below.

Morgue

Both hospitals have morgue cold storage, but at very limited capacity. Hospital 2 has a small refrigerated unit that could hold two bodies and Hospital 1 has a cold room that can hold at most 20 corpses in body bags or only a few on stretchers. Under the first scenario of using the hospital for non-critical medical and surgical patients, this capacity may be adequate. Under the second isolation/quarantine scenario, if there is high mortality from the infectious agent, this capacity will unlikely be adequate. In this case, refrigeration trucks could be brought in. Obtaining these refrigeration trucks is readily feasible in Boston or other urban areas.

Cafeteria

On-site food preparation capability is not absolutely required for surge use of a facility, but would certainly enhance convenience. Both hospitals have full kitchens and cafeterias. At Hospital 1, the kitchen is currently only used to heat food. Returning this kitchen to full food preparation capability would require re-charging the Ansul fire suppression system over the stove, which would take approximately three to five days. Hospital 2 has a more fully functional kitchen and is currently operating a full capability as a public cafeteria-style restaurant for local residents.

Laundry

No laundry service is available on-site at either hospital. Sterilizers exist in both hospitals and appeared functional. In addition, three cart washers are available at Hospital 1. On-site laundry capability is not necessary for surge use of the facilities, and could instead be conducted off-site.

2.8 Patient Care Spaces and Patient Care Needs

Patient Rooms

Hospital 1 was at one time licensed for 350 beds and Hospital 2 for 161 beds. At Hospital 1, there would be appropriate space for at least 150 beds (some of the space is not currently usable due to water damage and general disrepair). Hospital 2 is fully usable to its previous capacity of 161 beds, as the entire building is in good repair.

At Hospital 1, many of the patient rooms are currently being used as administrative offices. A significant effort would be required to move out the desks, filing cabinets, and other items to free up the patient room spaces. It is estimated that it would take at least 24 hours to conduct this move. It would be feasible to move these items to the portions of the hospital not suitable for surge use (i.e., areas in disrepair) or move it all to temporary off-site storage. In addition, significant cleaning would need to occur prior to bringing in patients.

Both hospitals were designed for and contain primarily single and double patient rooms. Patient rooms are each equipped with bathroom facilities, patient panels, and regular and emergency power outlets. Rooms designed as singles are large enough to fit two patient beds. There are two potential regulatory barriers to use of single rooms for two patients. First, current requirements indicate that there should be one panel per patient bed. While both patients could share medical gases from one patient panel by the use of splitters, this is not allowable under current regulations. Second, regulatory requirements dictating size and space required for hospital patient rooms have not yet been explored. Space and head panel requirements might need to be relaxed in a surge event, or portables could be used for a second patient in a 'single' room.

Ward Spaces

As the hospitals were generally designed for single and double patient rooms, most of the space does not work well for a multi-patient ward arrangement. There are a few spaces at each hospital that we identified as potentially suitable for a ward, in the event that low staffing levels dictate this need. Such spaces include the former post-operative/recovery areas, and the former Intensive Care and Transitional Care Units, where visual observation of multiple patients by one staff member is possible.

Nurse Stations

In the standard patient room areas, both hospitals had a pod-type set-up with a nursing station for every 8-12 patient rooms.

Medical Gases

The medical gas system that supplies patient rooms is still in place at both hospitals, but would need to be tested and reconditioned with some replacement of parts at outlets. Medical gas outlets are current enough at both hospitals that parts could be obtained. Oxygen hook-ups are compatible with new oxygen machines at both hospitals. Before the medical gas delivery system could be used, the lines would need to be cleaned. The zone valve and alarm panels would need to be verified to service areas. The system would need to

be re-certified by a medical gas certification company. At both hospitals, the bulk oxygen supply tank has been removed but the truck connection exists for delivery from a liquid oxygen tanker truck.

To complete all of the tasks described above and get the medical gas system operational would take a minimum of a week to the first area in each hospital designated to receive patients, with a few weeks needed to bring a whole hospital back to functional status. Portable equipment would need to be used during the interval time to provide medical gases.

2.9 Non-Patient Care Spaces

Both hospitals have several large spaces available for non-patient care needs, including cafeterias, an auditorium, a large lobby area, and conference rooms. Necessary space for non-patient care functions appears to present no issue or barrier for surge use.

Reception/Registration

Both hospitals had former reception areas that would work well to control access into and out of the building. Both also had former registration spaces that could be readily prepared for patient registration by re-establishing needed information systems. At Hospital 2 this space is not currently in use while at Hospital 1 this space is currently used as an elder day-care center and would require move-out of some furniture.

Family Waiting Area

Both hospitals have several large spaces that would be suitable as waiting areas if chairs were brought in.

Staff Sleeping Area

Both hospitals have reasonable options available for staff sleeping areas. At Hospital 1, the former psych ward was identified for this use; at Hospital 2 a large public meeting room in the basement area and also the former rehabilitation area were identified as good options for staff sleeping quarters.

2.10 IT/Communications

Nurse Call System

Both hospitals have at least partial nurse call systems in place. It would take approximately one week to troubleshoot and reactivate these systems. If surge use is initiated before the nurse call systems are fully operational, manual devices such as bells could be used for this function.

Code Call System

It could not be ascertained whether the code call systems are functional, although the system appeared functional in at least some portions of Hospital 2. It would be difficult to repair or install a code call system during the three to seven days allotted for readying a partially-shuttered hospital for surge use. Alternatives for code call such as sirens or silent paging

need to be identified as an element of surge use readiness, especially for Scenario 2 (isolation/quarantine) where sicker patients would be admitted.

Telemetry

Some patient areas of Hospital 2 contain a telemetry system, while none exists at Hospital 1. A telemetry system was not deemed necessary for surge use. The more critical alarms on vital signs monitoring devices are independent of the telemetry system and, if deemed necessary at the time, a simple remote radio frequency monitoring system could be brought in to individual floors.

Facility-Wide Paging

A facility-wide paging system is in place at one hospital but not the other. An operational facility-wide paging system was not deemed necessary for surge use as portable pagers could be used if necessary.

Telephone

The telephone switch was recently upgraded at Hospital 1, but was not considered operational at Hospital 2, where the town has a system and the current outpatient unit has its own switch. While a single functional hospital-wide telephone system would be convenient, lack of such a system is not a barrier to surge use. Many alternate means of communication could be used such as two-way radios or cellular telephones.

Computer Network and Internet

Hospital 1 is wired for IT/network and Internet. There are IT closets on every floor, and IT cables into all patient rooms (other than psych) and nurses stations. At Hospital 2, data sockets exist for network, but it was unknown if they are operational. If a hospital-wide network cannot be established, alternatives are presented in the IT chapter of this document.

2.11 Summary

Overall, the experts assessing these two partially-shuttered hospitals agree that they would be good candidates for surge capacity use. The condition of structural components, fixed equipment, and systems was generally good enough that they could be brought to full operational status within the three to seven days before surge capacity use would begin. For items requiring more than seven days, it appears that feasible temporary options exist. Since these were functional hospitals just a few years ago, design and layout are well suited to the intended medical use during surge capacity.

The following table summarizes the status of typical/likely conditions one might expect to find at recently or partially-shuttered hospitals relative to surge capacity use, based on the assessments conducted and expertise of the team.

Table 2: Summary of Expected Conditions at a Partially-Shuttered Hospital

Item/Issue	Typical Status at Partially-Shuttered Hospital	Additional Needs for Surge Use
Roadway and Vehicle Access	Usable and Sufficient	Minor modifications and maintenance may be needed for helipads.
Security	Usable and Sufficient	Current security staff or others will need to be recruited to work during surge use.
Life Safety Systems	Usable and Sufficient	Department of Public Safety licensure may need to be reinstated; rapid-fire inspections conducted.
Exterior Structural Components	Components in place and in good condition excepting possible roof leaks in some areas.	No action needed. Areas with roof leaks would not be used during surge.
Interior Structural Components	Necessary components in good place and in good condition except possible water damage and missing room doors.	No action needed. Areas with water damage would not be used during surge. Replacing patient room doors is likely not necessary.
Elevators	In place and functional.	Elevator inspections and certificates may be needed.
Electric Power	Usable and sufficient. Connection to grid and back-up systems in place and functional. Wiring in good condition in usable building areas.	Fuel may need to be obtained for back-up generators.
HVAC	Usable and sufficient. Heating and cooling systems in place and functional, excepting cooling under back-up power. Air handlers in place and functional.	Fuel will be needed for on-going operation of the heating system. Fans or other back-up cooling devices may be needed. Isolation rooms may need to be re-certified. Manual conversion of some floors or areas to negative pressure may be needed for the quarantine/isolation scenario.
Water and Plumbing	Connection to external water source and plumbing systems usable and sufficient. Water heating systems operational.	Water will need to be returned to the system with minor plumbing replacements. Minor repairs and ramp-up of boilers will be needed. If external water source lost, truck-in of water will be needed within a few days. In areas without POTWs, on-site water treatment system may need ramp-up.
Pharmacy	Space available, computer system may be available although unlikely.	Necessary equipment and all medications will need to be brought in.
Laboratory	Space available but virtually all equipment gone.	Outsourcing of laboratory functions or rapid point of care testing is recommended during surge.

Table 2: Summary of Expected Conditions at a Partially-Shuttered Hospital

Item/Issue	Typical Status at Partially-Shuttered Hospital	Additional Needs for Surge Use
Morgue	Limited refrigerated space available.	For surge isolation/quarantine use with a high mortality agent, refrigerated trucks or other alternative would be needed for body storage.
Cafeteria	Functional food preparation set-up exists.	Re-charging of stove hood fire suppression systems may be needed. Food ingredients would need to be brought in after a day or two. Outsourcing of food services is also a viable option during surge.
Laundry	Not available.	Outsourcing of laundry services is recommended during surge.
Patient Rooms	Space available in usable condition. Beds and all portable equipment missing. Electric outlets and patient panels in place.	Beds and all portable equipment will need to be brought in. Move-out of furniture may be needed if patient rooms currently used for offices. Significant cleaning of patient space areas will be needed.
Medical Gases	Systems delivering medical gases to patient rooms are in place, but work is needed to make functional. Bulk oxygen tanks removed, but oxygen truck connections are in place.	Replacement of parts at outlets, cleaning of lines, verification of zone valves and alarm panels, and re-certification of system needed. Portables need to be brought in during surge use for the one to two weeks needed to get centralized system fully operational.
Ward Spaces	While some facilities are designed primarily for single patient rooms, several available spaces for ward set-ups exist.	Beds and all other portable equipment would need to be brought in.
Nurse Stations	Nurse station set-ups exist.	Information and communications systems would need to be re-established.
Reception/Registration	Suitable and available space exists for this function.	Information systems would need to be re-established.
Family Waiting Area	Suitable and available space exists for this function.	Chairs would need to be brought in.
Staff Sleeping Area	Suitable and available space exists for this function.	Beds or cots would need to be brought in.

Table 2: Summary of Expected Conditions at a Partially-Shuttered Hospital

Item/Issue	Typical Status at Partially-Shuttered Hospital	Additional Needs for Surge Use
Air Containment for quarantine	Air handlers and ventilation system functional and in place. Isolation rooms likely exist.	Isolation rooms need to be re-certified. Manual conversion of some floors or areas to negative pressure may be needed for the quarantine/isolation scenario. Anteroom area needs to be identified for isolation areas.
Medical and Solid Wastes	Adequate storage areas exist for containment of medical and solid wastes. Loading docks and dumpsters exist. On-site incinerators or other waste management set-ups likely do not exist.	Medical and solid wastes will need to be picked up during surge use as during normal use of the facility.
Nurse Call System	Likely present, may not be functional.	Portable devices such as bells could be used for this function during the week or so needed to troubleshoot and reactivate these systems.
Code Call System	Likely present, may not be functional.	Reactivating this system would be difficult in a short timeframe. An alternative is needed under the isolation/quarantine scenario causing critical illness.
Facility-wide paging and telemetry	May or may not be present and functional.	Not necessary for surge use.
Telephone system	May or may not be present and functional.	Portable alternatives can be used during surge.
Computer Network and Internet	May or may not be present and functional.	Portable alternatives can be used during surge.

2.12 Preparing to Open a Partially-Shuttered Hospital

As discussed above, the physical plants of the partially-shuttered hospitals we assessed are in relatively good structural and operational condition. Below we list items that probably would not require additional attention, and those for which outsourcing might be optimal.

2.12.1 No Additional Attention Required

Roadway Access and Parking: Ambulance, bus, truck, and car access to the assessed partially-shuttered facilities is feasible and in good condition. Ample on-site parking is available for surge facility use.

Exterior Structural Components: Exterior structural components, including walls, doors, windows, and roof were intact and in place. Water leaks through the roof did exist in limited facility areas, but it was determined that these areas would simply not be used versus conducting repairs to these areas.

Recommendation: a former hospital has advantages for surge capacity over a school, hotel or gymnasium, including: patient care and nursing-station lay-out, familiarity for clinical staff, food-prep, morgue, lockable pharmacy space, isolation rooms, and more.
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Interior Structural Components: Excepting limited areas with water damage at one assessed facility, interior structural components including floors, walls, and ceilings were in good condition. Many interior patient room doors are missing at one of the assessed facilities, but it was determined that replacement of these doors was not necessary and would not be conducted.

Lay-out: Due to previous use as an inpatient hospital, the partially-shuttered hospital facilities have functional spaces to serve as a reception/registration area, patient rooms and wards, nursing stations, a family waiting area, staff sleeping spaces, equipment and supplies storage, and for any other operational needs. Non-fixed items are needed such as chairs, beds, and medical equipment and supplies. Procurement of these items is discussed in more detail in Chapter 3, Equipment and Supplies.

Electric Power: It is expected that functional power supply set-ups, including back-up generators, will be in place at partially-shuttered hospitals, as is the case with the facilities assessed in the Boston area. No additional actions are necessary to ensure power to the surge facility, excepting routine fuel delivery as needed for back-up generators, which will likely not be needed.

Pharmacy Space: It is expected that usable, lockable areas will exist at partially-shuttered hospitals for set-up of pharmacy services, as is the case with the facilities assessed in the Boston area. Equipment and pharmaceuticals are needed, but space suitable for use as a pharmacy is in place. Procurement of needed pharmacy equipment and pharmaceuticals is discussed in more detail in Chapter 3, Equipment and Supplies.

Other services at the partially-shuttered hospitals are either completely absent, or could not easily be brought back into full operation in time for opening of the surge facility. Some of these “missing” services can readily be outsourced. Information on making contractual arrangements for these services is given below in the section on Equipment and Supplies.

2.12.2 Recommended for Outsourcing

Laboratory: While spaces formerly used as laboratories will likely exist at partially shuttered hospitals, all equipment will generally be gone, as is the case with the facilities assessed in the Boston area. It is not feasible to procure laboratory equipment and supplies and qualified technicians within the necessary timeframe, nor will it be possible to set up quality procedures and accreditation within one week. For these reasons, laboratory services will need to be outsourced at the surge facility.

Laundry: Laundry machines and set-up will likely not be available at partially shuttered hospitals. Procurement and installation of machines, and set-up of operations to meet stringent sanitation requirements such as sterilization will require a significant effort. For these reasons, and because of more urgent needed efforts to bring the medical services into readiness, it is recommended that these services be outsourced for the surge facility.

Recommendation: some services normally provided by hospital staff/equipment should be outsourced for a temporary surge facility, rather than trying to bring them back to in-house status in a matter of days.

Food Preparation: Kitchen facilities may or may not be functional. If functional, there is likely a significant effort needed to bring stove hood fire suppression systems up to code, as discussed further in Section 3.9. Also, the kitchen must be brought up to local and State sanitation code requirements. Further, procurement of food and qualified kitchen staff will be required. For these reasons, and because of more urgent needed efforts to bring the medical services into readiness, it is recommended that food preparation services be outsourced.

Pharmacy, sanitation engineering, and major components of equipment and supplies may also be appropriate for outsourcing.

In addition to facilities and services that are in place, and those that can be readily outsourced, certain corrective actions will be needed to bring a partially shuttered hospital into suitable condition for use as a functioning surge hospital. Information on securing needed facility and maintenance staff, equipment, or services for each of these areas is provided below. Subsequent chapters of this report address medical staffing, medical equipment and supplies, and other requirements.

2.12.3 Staffing and Supplies for Needed Facility Upgrades

In order to get a shuttered hospital up and ready, both staff and supplies will be needed and repairs will need to be completed before patients arrive. The facility will need to be emptied of any unnecessary furniture and it will need to be cleaned. This section of the report describes all of the preparatory activities that must be undertaken before the surge facility opens, and the staffing and supplies that will be needed to accomplish these activities.

Facilities Staff

A team of qualified facilities staff will be needed to bring utility systems fully up to operational capacity, and to conduct needed repairs, testing and general facility readiness activities. At each of the two partially shuttered hospitals assessed in Massachusetts, only

one or two facilities personnel currently remain on staff and would not be able to accomplish all of these tasks in the 3-7 days before patients need to be transported. A team of approximately 15 facilities personnel would be needed to prepare the surge facility for opening within a one-week period. The majority of these personnel should have an HVAC license. Also, at least two of these staff should be licensed plumbers and at least one or two should be licensed electricians.

Facility operations management from the major Boston tertiary hospitals indicated that they could readily assemble this team from within their own staff, and that they would still have adequate staff to conduct needed activities at their own facility, even during a mass casualty event. While this might be true in Boston, it may not be true elsewhere. In the event that a major hospital cannot provide their own staff for these essential functions, other arrangements must be made. Every major city will have a mechanical temporary agency that could provide the needed facilities staff, probably within a day. It would not be necessary to have advance contractual arrangements with this type of agency. In addition, every city will have a large number of property and facility management companies who also employ facilities staff. Facilities experts indicated that these companies would be willing to serve during an emergency.

Facility Repairs and Supplies

Replacement parts, fixtures and supplies for minor electrical or plumbing repairs, may be needed to prepare the surge facility for opening. Partially shuttered hospitals will have a limited quantity of these supplies in stock. If additional supplies are needed, every major city will have specialty supply houses for the different trades, such as plumbing supply houses used by licensed plumbers. These will typically contain whatever might be needed for the facility preparation. In addition to the supply houses used by tradesman, every major city will have large supply outlets used by contractors and homeowners such as Home Depot that also contain most of whatever might be needed for the facility preparation.

Removal of Extraneous Furniture and Items

The assessed facilities in Boston are using patient care spaces for administrative and other non-medical functions and this may be equally true at shuttered hospitals in other cities. Prior to opening the surge facility for use as an inpatient hospital, desks, filing cabinets, office equipment, and any other furniture or items will need to be removed as quickly as possible, so that the space can be cleaned and made ready for beds and other medical equipment.

Local moving and storage companies could provide enough staff and trucks to conduct this move-out within a day. In particular, moving companies specializing in office moves routinely conduct moves of this scale within a very short timeframe (often overnight). Moving company officials we contacted indicated that an advance contract would not be required and that they would make every effort to provide assistance during a catastrophic emergency event. If a moving company cannot be obtained, every major city will have temporary agencies that can provide general laborers, and could provide a large crew within a day without the requirement of an advance contract.

The movers or laborers may be able to move the unwanted items into other unusable portions of the facility to expedite matters. If items must be fully removed from the hospital, use of moving trucks or truck rental, and temporary storage would need to be arranged in conjunction with use of the movers or temporary laborers. Transportation experts indicate that there will be more than enough trucks available for rental in a major city, and that an advance contract would not be required.

Cleaning

Any major city will have a variety of cleaning service contractors available that could respond within a day or less, to prepare a shuttered facility for patient care. Industrial and commercial cleaning contractors will have staffing, equipment, and cleaning products on-hand to conduct the necessary facility cleaning, and could respond immediately if not elsewhere fully committed. Commercial cleaning company managers we contacted indicated that in addition to their regular staff, they maintain a roster of extra workers to be called in when there are large or unanticipated jobs. These managers agreed that the needed team of cleaners for the surge facility could be readily assembled with a combination of the regular and occasional staff.

There are also specialty cleaning contractors that are prepared to respond quickly following emergencies. These specialty cleaning firms include disaster cleaning specialists (who clean facilities following fires, floods, and other disasters) and death and crime scene cleaning specialists. This level of expertise is unlikely to be needed, but does exist in any major city. Local hospitals will likely have contracts with such specialty cleaning services and the cleaning of the surge facility could perhaps be arranged under one of these existing contracts. If not, advance contracting with a specialty cleaning firm is not necessary as these firms are organized respond quickly to unplanned events.

Partitioning

It may be necessary to close off the unusable/unsafe portions of the partially shuttered facility, for example in areas where roof water leaks have caused ceiling damage. For security purposes (see Chapter 6, Security for a more detailed discussion) it may be advisable to restrict access to certain parts of the surge facility. And some spaces of the facility may be currently in use for other purposes and will need to be physically separated from the inpatient facility. One straightforward method to accomplish this is to erect walls or barriers at key access points. Staff from the facilities team or general laborers hired to conduct the move-out could readily accomplish this partitioning using plywood or other building materials. Note that in areas where physical partitioning is not feasible, security staff or security monitoring equipment can be used, as discussed further below.

Elevators

Both of the Massachusetts facilities we assessed have operational elevators with current inspection certificates. For partially shuttered hospitals with any activities occurring on upper floors, this would be expected. In the event that a shuttered facility has not maintained inspection certificates for their elevators, local elevator companies can arrange for an inspector; in an emergency, these inspections should be possible within a day or two.

Life Safety Systems

Partially shuttered hospitals are likely to have functional sprinkler and fire alarm systems in place, as is the case with the assessed facilities in Massachusetts. If the facility has not maintained licensure with the local Department of Public Safety, a fire inspection will need to occur prior to opening the surge facility. Local fire department officials indicated that they could conduct this inspection within the three to seven day timeframe prior to opening of the surge facility, and this would also be expected in other localities.

In the event that a facility does not have functional sprinkler systems in place, it can still be opened as a surge facility. Portable fire extinguishers would be required and the facility must be kept under an around-the-clock fire watch by the fire department. Fire safety suppliers indicated that there is a more than ample supply of portable extinguishers always on-hand to fully outfit a surge facility (hundreds of portable extinguishers are typically in stock). Additionally, fire safety suppliers indicated that they could readily provide the OSHA-required fire extinguisher training (approximately one hour in length) to surge facility staff within the three to seven day timeframe. The fire watch would be staffed by the local fire department on all shifts. Based on standard Mutual Aid agreements that exist between local fire departments, fire companies from other municipalities could conduct the fire watch if the local fire department is not available for this function.

HVAC System

Partially shuttered hospitals will typically have functional HVAC systems. Facilities staff with HVAC licenses will need to test the HVAC system prior to opening of the surge facility. This will include an area-by-area inspection and any needed system adjustments, as well as returning full levels of heat or air conditioning to all building areas that will be used. In addition, under Scenario Two, some floors may need to be converted to negative pressure through manual override of HVAC controls, and isolation rooms may need to be re-certified. All of this HVAC work could occur within a one-week timeframe.

Plumbing and Hot Water

As with the facilities assessed in the Boston area, it is expected that partially shuttered hospitals will have functional plumbing and hot water systems. Facilities staff, including some licensed plumbers will need to conduct work prior to opening of the surge facility. This will include opening valves to return water to all building areas that will be used, and replacing minor parts on sinks and toilets as needed. Also, for hot water, minor maintenance such as checking of pump seals must be undertaken, as well as initiating full heating of hot water tanks. With the staffing level described in Section 3.1 above, all of this plumbing work could occur within a one-week timeframe.

Medical Gases

Partially shuttered facilities will typically have centralized medical gas delivery systems with patient room wall outlets, and the bulk oxygen tanks for these systems will likely have been removed, as was the case with the facilities assessed in Massachusetts. It may or may not be feasible to return these systems to operational status, depending on how the system was closed down. If the lines were not valved off and capped when the bulk oxygen tank was

removed, and back bodies were not installed at wall outlets, the system pipelines may have become oxidized or otherwise contaminated.

A credentialed medical gas system verifier is needed to check the status of the medical gas delivery system. The system verifier will inspect the entire system and test the lines by introducing nitrogen into each pipeline and testing for purity by looking for hydrocarbons or particulates. If pipelines are usable or can be made usable through cleaning, the medical gas delivery system could be brought back on-line. In addition to the piping, zone valve and alarm panels must be verified, and wall outlets must be tested. Credentialed technicians are typically readily available for immediate response, and these medical gas system verifiers can be located at www.mgpho.org by State.

Parts for wall outlets can typically be shipped overnight anywhere in the country, and in the worst case obtaining these parts would only take a matter of days. Repair parts for the central system can be obtained within a week. Items requiring full replacement, such as manifolds, will take three to four weeks to obtain. Medical vacuum systems (to provide suction) could take months to obtain. Advance contracts would not be necessary as these suppliers will do emergency credit card orders, but obtaining parts may cause substantial delays.

Medical gas supply companies indicated that bulk oxygen trucks are always available and could be at the surge facility within two hours to supply oxygen to a centralized medical gas system. These companies indicated that a contract would need to be set up in advance for this service. The truck connection for the oxygen was still in place at both of the assessed facilities.

If the in-house system cannot be brought back online in a timely fashion, portable medical gases could be used instead. We contacted several medical gas supply companies and each indicated that they maintain a large stock of portable oxygen cylinders, and could realistically provide a more than adequate supply for continued operation of a 200 – 300 bed surge facility for weeks or months. Another supplier would be needed for the masks and regulators used in conjunction with the oxygen cylinders, and suppliers of these items indicated that masks and regulators could be shipped within a day or two; in addition, these suppliers indicated that they each typically have double or triple the needed quantity in stock. Portable suction devices are also readily available.

In addition to the medical gas suppliers that service hospitals, there are also durable medical equipment companies that service medical supply needs to home patients. Portable oxygen is a major component of the service of these companies, thus they maintain large stocks of portable oxygen. These companies are set up to respond quickly to these supply delivery needs, and they maintain large fleets of drivers and delivery vehicles.

Morgue

Limited refrigerated morgue space is available at the partially shuttered facilities we assessed. The available morgue space might be sufficient for Scenario One, when mortality would be low as patients would be non-critical/ambulatory medical and surgical patients. Under Scenario Two, however, if the infectious agent has a high mortality rate, additional refrigerated morgue space may be needed. Physicians expert in mass casualty situations

recommended use of refrigerated trucks for supplemental morgue space at the surge facility. The National Association of Medical Examiners Mass Fatality Plan also recommends the use of refrigerated trucks. Refrigerated trucks with metal floors and ramps that allow for decontamination are recommended and 20 bodies can be stored per 40-foot trailer maintained at 35 – 38 degrees Fahrenheit.

Based on these Medical Examiner recommendations, likely one and at most a few trucks would be needed to supplement morgue space. In addition, medical examiners in major cities will likely have refrigerated trucks. If the medical examiner cannot provide a refrigerated truck, very large fleets of refrigerated trucks exist in a major city. In assessing the Boston area, for example, 2002 economic census data showed 1,600 refrigerated tractor trucks, and 3,600 refrigerated vans in Massachusetts. Options for obtaining refrigerated trucks including rental, leasing or borrowing. Large truck leasing companies such as Ryder and Penske have refrigerated trucks available for rental. There are additional refrigerated storage options beyond the use of trucks. In assessing the Boston area, a few specialty firms were located that focus solely on rental of refrigerated storage units, including delivery of large walk-in refrigerated storage units, and refrigerated trailers (that can be moved via a pick-up with a trailer hitch). In extreme situations, truck purchase could also be considered.

Kitchen Fire Suppression

Partially shuttered hospitals may or may not have functional food preparation kitchens in place. Even potentially functional kitchens may not be usable for food preparation for the surge facility if the fire suppression equipment is not up to code. Kitchen stoves must have stove hood fire suppression systems in place. These systems were previously charged with dry chemical, but in 1998 the requirements changed to a wet chemical system. Many facilities were grandfathered, so partially shuttered hospitals are likely to have the older system, which are probably no longer functional. Re-charging of stoves with the older system is not possible as powder and parts are no longer available. To install a new system is a complex matter, requiring an electrician as the wet chemical system is electrically conductive, a plumber to ensure that the gas valve is compatible with the fire system, and a fire alarm company technician as the fire suppression system will be tied in with the facility fire alarm. This could be accomplished within the seven-day timeframe before surge facility opening, but may not be worth the effort as food preparation services can be readily outsourced.

Communications Systems

There will likely be wide variability in the types and status of communications systems at partially shuttered hospitals. At the two facilities we assessed, one had a telephone switch and one did not; one had a facility-wide paging system and one did not; one was wired for a LAN network and the Internet and the other was not. Where fixed communications systems do not exist or cannot be made functional within a short timeframe, portable alternatives can be used to meet the communication needs.

Some method for a nurse call and code call system will be needed for a surge facility. Infrastructure for these systems will likely be in place at partially shuttered hospitals, but they may not be operational. Facilities experts indicated that these systems could likely be repaired and reactivated within the one-week timeframe. If they cannot be repaired, or do

not exist, patient rooms could be equipped with portable hand bells to serve as a nurse call system. Fixed bells mounted outside of patient rooms and struck to alert other staff to a code situation could serve as the code call system. Although rudimentary, such a system may suffice for the few weeks during which a facility operates under Scenario 1; such a system may be less adequate, however, for several months of operation under Scenario 2.

Medical experts advise that facility-wide paging systems and telemetry are not necessary for a functional surge hospital, so these systems do not need to be repaired or replaced with portables.

There will be multiple needs surrounding internal and external communications including security, patient information, logistics, and staff coordination on patient care. These activities would be conducted via telephone or computer under normal circumstances of operation. During the facility inspection, the team should note the presence/absence of information technology and consider several options:

Recommendation: internal and external communications will require an off-the-shelf solution, as the former hospital's systems and equipment will not be intact.

- Any existing network infrastructure
- Analog phone/fax service with no data access
- Analog phone/fax service with limited dial-up

If traditional telephone lines are available – dial-up Internet access may be an option. There are many acceptable options to choose from in major metropolitan areas including both national and local providers. In some hospitals that have recently been closed, the telephone lines may actually be digital – which would not allow analog communication, making dial-up impossible. Likewise older, degraded analog lines may not provide acceptable speeds – despite an ISPs ability to deliver 56k. Even at 56k, with the large files sizes, and complex web based applications widely used today in hospital operations dial-up connections would provide only a very basic and limited connection with external data systems.

For basic Internet and voice communication, planners may wish to disregard available data ports and telephone line, which may be obsolete or damaged, and institute a completely wireless system.¹⁸ Assuming a clear view of the southern sky vendors can install a satellite Internet connection, and wireless area network protocol. This will provide wireless Internet access in *select* portions of the hospital. It would not provide Internet connections across the facility. If other portions of the surge facility currently operate as office space, and internet connections are live, the IT and facility planners may elect to install wireless routers that could provide internet connectivity wirelessly to other portions of the hospital, making the satellite unnecessary.

There is lingering concern, however, over the safety of wireless networks/devices on patients with pacemakers, and their effect on advanced medical devises such as MRIs. Several studies suggest that there is little if any impact. A study conducted by competing wireless

¹⁸ We noted, however, that both former hospitals in Massachusetts had large “dead zones” where handheld wireless devices could not be used.

vendors Linksys and Cisco suggests that wireless frequencies operating even in close proximity produce no effect on most medical devices.¹⁹ Despite these studies and increased use of new wireless technologies in medical environments (i.e., RFID) many continue to question their appropriateness in medical settings, and do ban the use in some areas – including operating rooms.

¹⁹ Cisco Website “Radio Frequency Safety Issues” http://www.cisco.com/en/US/products/hw/wireless/ps430/products_white_paper09186a0080088791.shtml

3.0 Equipment and Supplies

Most shuttered hospitals are going to have little if any usable medical equipment or supplies on hand. The lack of appropriate equipment or supplies should not be a stumbling block, however, as the vast majority of equipment and supplies are both portable and obtainable.

This section of the report provides a basic understanding of equipment and supplies one might expect to find at a hospital closed within the past five years, based on inspections of the two hospitals in the Boston area, and the resources that would need to be procured. The equipment and supplies discussed here are applicable to the two mass casualty scenarios discussed above.

Patient Population Assumptions, for Purposes of Estimating Supply Needs

The specific equipment and supply needs for the two scenarios vary, but there is a significant amount of basic equipment for any patient population that must be procured to make a shuttered hospital operational. The required amount of minimum supplies held in inventory at the hospital should ideally be sufficient to last at least three days per admitted patient, regardless of the patient population. It is probably not advantageous to hold larger inventory, as this would require significant storage space – space that would be better used housing patients. Many hospitals operate in a “just in time” inventory and receive supply shipments on a daily basis, allowing procurement staff to order only what is necessary and minimize expenditures and storage requirements. Although the two scenarios require the same general amount of basic supplies, patients with active infections, as in Scenario 2, would likely need higher acuity care (ICU care is not anticipated at the surge facility) so for Scenario 2 the basic list of supplies is somewhat augmented²⁰. Patients treated under Scenario 2 (infectious disease/isolation) would require more extensive supportive care than the general medical-surgical patients served under Scenario 1. For example, if we assume that Scenario 2 requires supplies similar to those stocked by an intensive care unit at a large urban hospital, supplemental supplies such as the following would be needed: respiratory support (tracheal tubes, respiratory solutions, and fluid resistant masks) and tubes (gastronomy, nasenteral, culture). In addition, kits such as those used for aspiration procedures, blood gas sampling, and administering intravenous central lines, and a more extensive array of thoracic, suction, hemodialysis, and cardiovascular catheters (cardiovascular guide wires, injection tubing, and introducers) might need to be stocked for Scenario 2. Perhaps even renal dialysis supplies, spinal needles, and anti-embolic garments, and pressure monitoring systems should be available to serve patients in Scenario 2, although patients with such extreme needs might be better served by being returned to a tertiary care hospital if it is an options.

We obtained inventory lists from three operational general community hospitals in the Boston area minus those specific supplies to provide more specialized care like surgery or obstetrics, to serve as a ‘standard’ for supplies needed for a surge facility. Appendix A lists the types and amounts of supplies to run a surge facility for thirty days. We have broken out each type of equipment or supply into the amounts that are necessary for a floor/ward of 30-

²⁰ The augmented supplies and equipment list for Scenario 2 will be similar to that used in a traditional intensive care unit (ICU).

40 patients (shuttered hospitals of the size we examined could hold perhaps 4-8 such wards), and then considered how that inventory would be depleted over the course of a thirty-day operation. In doing so, we made assumptions about the type of patients entering the facility, usage of equipment and supplies during their course of treatment.

We assume that patients would continue to be cared for in the surge facility for at least 30 days (and perhaps as many as 60 days), and we further assume that all the patients would not arrive on one day; their arrival would be spread out between day 8 and 11 following a mass casualty event, or spread out even more in the case of an evolving epidemic. For Scenario 1 we assume an average patient stay of two to three days; for Scenario 2 the length of stay could be 1-2 weeks. Patients would be discharged slowly, over the course of several days or weeks, until the facility is no longer needed.

For the purposes of estimating equipment and supply needs, we assume the hospital will be operating at 100% utilization (as many as 300 patients at Hospital 1) beginning 3-7 days after an emergency is declared and operating for at least 30 days. For our calculations, after 30 days, the surge hospital would continue to operate at capacity. This is an artificial endpoint - under Scenario 1 (medically stable general patients), we could safely assume that a surge facility could end peak operation earlier, while under Scenario 2 (infectious disease/isolation) peak operation could continue for months. Therefore, in addition to calculations for one-month supply, we've provided a 1-3 day supply calculation for a fully occupied ward of 30-40 patients that can be utilized for additional procurement if the hospital remains open. At day 30, we assume any remaining patients will be directed back into one of the tertiary or community hospitals for Scenario 1, and the same would probably be true by day 60 for Scenario 2 (the total supply quantities would need to be increased if the epidemic during Scenario 2 is protracted).

Supply replenishment would be dictated by the number and severity of patients admitted into the facility. If illness severity is slightly higher, thereby increasing the average patient stay by one day, many items including patient comfort items such as toothbrushes will not need to be replenished as frequently, while other medical supplies may be depleted at faster rates for more severely ill patients.

Reabsorbing supplies and equipment that are left over after the surge facility closes also warrants attention. Since hospitals are not able to hold more than one week's worth of inventory at the most, and vendors would probably not agree to reclaim unused supplies, it may be necessary to parcel out the remaining supplies to several local hospitals (including the sponsor/oversight hospital if there is one, the local public hospital, and others.)

3.1 Shuttered Hospitals' Existing Equipment

Based on extensive tours of two Boston area hospitals closed within the past five years, it is clear that most usable equipment will have been removed from the premises for resale or use elsewhere. There are, however, important pieces of infrastructure that will likely remain. This section describes what will probably exist in a shuttered hospital, in patient rooms, nursing stations, kitchens, and other areas of the hospital.

3.1.1 Patient Rooms

Beds. Hospital beds are both costly and difficult to procure quickly, in the numbers likely to be required. During the two facility tours we noticed a total of four beds²¹, and were told that neither facility stored any additional beds. While modern, electronic adjustable beds may be the ideal for patient safety and comfort, they are not absolutely necessary. Regular beds, cots, or other arrangements might suffice for the weeks of surge capacity required of a shuttered facility. Each patient would need a bedside table as well although, again, this is not essential.

Bed Linens. The standard amount of linen per patient is one sheet, one blanket, one disposable pillow, one gown (“Johnnie”), one pair of disposable slippers, one face cloth, and one towel. Linens would be changed up to three times for every patient, every 24 hours. This too could be rationed and linens could be changed less frequently for certain patients.

Patient Call Buttons. Ideally, electronic patient call buttons should be available by each patient’s bedside, and the call system would be operational at the nursing station in each patient ward. If the electronic system is not working/available, an alternative manual or visual system could be adopted, such as a bell or buzzer, or even a nurse’ aide circulating to visually monitor all patients.

Bathrooms. Most patient rooms have a private bathroom, although in some cases a shared bathroom connects two patient rooms. Most bathrooms have fixtures such as toilets, showerheads and sinks. It may be necessary to replace some showerheads or other minor plumbing fixtures.

Optional Items. Items that are not essential to medical care but could improve patient and staff comfort include: one chair (folding) per patient room, one table or nightstand per patient, and one trashcan or plastic bag for refuse per patient room. In addition, having one television or radio per patient floor could improve patient morale, although these would certainly not be necessary. Cable TV would not be operational so only limited reception would be available, should televisions be brought in.

Storage. Some patient rooms contain built-in shelving or closet space, but where movable storage units were used and no longer exist, storage will be needed for personal effects as well as medical supplies and equipment. For personal supplies, each patient would need one small plastic bin filled with sundries such as a toothbrush, toothpaste, and comb. These supplies would be distributed throughout the patient treatment areas in bins for easy dissemination by hospital staff.

Privacy. Most patient hospital rooms lack window shades, curtains between beds, and some lack room doors. For patient comfort and privacy, curtains could be hung on doorframes. In the event of long-term operation of the shuttered facility, doors could be reattached.

²¹ One facility had a single well-equipped patient room among dozens of completely empty rooms. We learned that equipped room was used for filming for both advertisements and training videos for a local HMO.

3.1.2 Nursing Stations and Common Spaces

The common spaces on general patient wards will likely be stripped of any useful material from beds to trash cans. However, most common spaces are still functional by utilizing portable equipment and supplies.

Nursing Station. Some nursing stations have wiring for computer and telephone hook-ups. While we cannot assume that these lines are live, they all have modern wiring technology, giving us confidence to suggest that Internet and voice service could quickly be turned on. While not part of our initial recommendations, some planners may want to consider portable laptops as part of their equipment procurement plan. A nursing station at a shuttered hospital would need telephones, computers (or a paper registration/records system), office supplies, and enough chairs for the staff on duty. We do not intend to include telephones in the patient rooms, as that is a luxury that is not essential during an emergency period.

Utility Closets. At a minimum, at least three closets per patient floor are needed: one each for clean and dirty linen and one for equipment and supplies. While these closets may exist at a shuttered hospital, they may have been stripped of any shelving, carts, or hooks for organizing equipment and supplies. Therefore, it may be necessary to supply carts and portable shelving units for each closet.

Clean and Soiled Linen. The hospital would need one large rolling Rubbermaid type cart to deliver clean linens to each floor, and 4-5 five-shelf carts (dimensions: 6 feet high by 6 feet wide x 2 feet deep) with chrome shelves (rust-proof), to store the clean linens. An identical Rubbermaid cart and 5 linen hampers would be needed for soiled linen. If closets are not available to store linens, the carts can be placed in central hallways for easy access.

Both hospitals we inspected currently have an ongoing outpatient medical mission; current occupants include walk-in clinics, a visiting nurse association office, a dialysis clinic, and hospital administrative offices such as accounts receivable. Therefore, it is possible that a limited amount of disposable and consumable medical supplies will be in place. Most of what is available (bandages, tongue depressors, blood pressure monitors, scales, cotton swabs, sterilizing alcohol and other basic equipment) could be useful in a surge situation but would be in short supply and would be used up in the first hours of operation.

3.1.3 Ancillary Medical Service Areas

Laboratories. In all probability, former laboratory space will be lacking modern equipment, will be used as storage for supplies or paperwork, and will not be operational without significant time and effort. It will be easier to employ bedside point of care testing for common tests and a courier service and contract with private laboratory testing companies or other hospitals for more advanced tests than to resurrect a moribund laboratory. We assume that specimens will be obtained in the facility and sent out for virtually all laboratory tests. While many currently operating hospitals do send out their lab work, under certain emergency situations, particularly under Scenario 2, shipment and transportation may be challenging. Bedside point of care lab testing is an option that provides a higher level of patient/caretaker interaction and quicker results. Portable and bedside lab capabilities are usually limited to uncomplicated tests, such as blood glucose tests, blood gas monitoring systems, and whole blood analyzers for cardiac markers, blood clotting tests basic metabolic

panels and blood counts. It is expected that bedside lab kits will become increasingly sophisticated as technology advances over the coming years. If the hospital elects to utilize point of care lab testing, we recommend procurement of one complete lab kit per patient ward. Depending on specific patient populations and tests performed, consumable lab material may need to be reordered.

Pharmacy. We examined the customary stock held by functioning community hospitals, which is ordinarily over 4000 different drugs and biologicals. Since the surge facility will not be a full-service hospital (no operating room, no ICU, no emergency department, no active oncology), it will not need the entire diverse formulary one finds in a community hospital. With advice from clinical experts, we have developed a preliminary ‘basic’ pharmacy list, which would need to be stocked at the surge facility once it opens, and which would be supplemented as needed. See Appendix B. One option might be to have a nearby tertiary hospital serve as the main pharmacy, with the surge facility as a ‘satellite’ pharmacy. The formulary does not assume delivery of Strategic National Stockpile (SNS) inventory.

3.1.4 Support Service Areas

Central Supply Area. Since a large amount of equipment and supplies will need to be received, inventoried, stored, and dispensed, a central supply area would be helpful. A large open area, such as an atrium or auditorium could serve as central supply.

Laundry. Both hospitals have laundry hook-ups in utility closets in general patient ward areas, but no laundry equipment exists. It would be more feasible to use vendors for laundry purposes.

Biohazard and Waste Disposal. Even when not treating contagious patients, it is important to properly dispose of biohazard waste such as needles. To handle hazardous waste, 6-7 large trash cans, a trash can or bag in every patient room, 4-5 biohazard containers per floor, a hazardous materials container remover (1-2 large red carts similar to large Rubbermaid laundry carts), and a hazardous materials outside trailer provided by the State health authorities would be needed.

Receiving. The loading dock itself would require one pallet jack, 3 flatbed delivery carts for unloading supplies, and bins to hold bulk items such as patient sundries once received.

Water Supply. Most shuttered facilities will have municipal water, with holding tanks, but one cannot also assume that the tanks are filled to adequate capacity to supply the five gallons per patient per day²² that would be required. In an emergency, the facility could make arrangements with the local government and health department for additional water, or could temporarily use bottled water from a commercial supplier.

Cafeteria. Both hospitals have operating cafeterias (see Chapter 2 above). Both facilities appeared to have most operating equipment necessary to supply food to a full hospital, although some of the equipment was turned off and may need a thorough cleaning and re-certification. Since patient-specific dietary needs will dictate specific food orders, the

²² Andrew Madden, personal communication, 10/01/04.

hospital should be prepared with fairly generic staples based on the scenario for the first three days, and order as necessary thereafter. Appendix A shows the significant volume of supplies that a kitchen will utilize over the course of a month.

3.1.5 Miscellaneous Areas

Visitors/Waiting/Lobby Area. If visitors will be accommodated, some minimal furniture will be needed. Furniture would also be needed for staff doing intake/admitting.

Areas of former hospitals that served an administrative purpose, such as patient intake, may still have furniture and supplies. Many shuttered facilities are used as administrative space (medical records, billing, etc.) for the entities that own them, and may still contain some office furniture, computers, and even photocopy and fax machines.

Other. Both Boston area hospitals continue to operate with medical missions and both have basic outpatient radiology rooms still in use, although neither had a workable CT scanner, MRI, ultrasound, or other more sophisticated radiology equipment.

3.1.6 Special Equipment for Infectious Disease Scenarios

As there are multiple possible infectious disease scenarios, there is a significant amount of personal protective equipment that may be required to safeguard the health of hospital personnel. Very little, if any, of this material is currently available in recently closed hospitals appropriate for re-opening in the case of surge needs.

Level D personal protective equipment as defined by the Department of Labor as coveralls or other work clothes, boots, and gloves (Level D) is included in the list necessary supplies for any surge scenario. There may be need for positive or negative respirators in certain infectious disease scenarios (Level C PPE as defined by the Department of Labor), and in such a scenario these materials would need to be procured.

Level B protection is used in situations where vapor harm to the skin is lessened, but respiratory protection is still required. As per the Department of Labor, Level A equipment provides maximal protection against liquid and vapor. Under very specific and rare circumstances, there may be a need for Level A personal protection equipment. The equipment includes self-contained breathing apparatus, and chemical resistant clothing, boots and glove. These materials are more like to be available from local, State, and Federal emergency planners – and planners should consider accordingly when preparing a surge facility equipment plan.

Table 3: Summary of Expected Supplies and Equipment at Partially Shuttered Hospitals

Item/Issue	Typical Status at Partially Shuttered Hospital	Additional Needs for Surge Use
<i>Patient Care Areas</i>		
Beds	Very few beds available	Beds would need to be procured and brought in, including hospital beds or standard beds, cots or other reasonable approximations.
Bed Linens	No stock of bed linens in facilities.	Linens would need to be brought in, three sets per patient per 24 hours.
Patient Call buttons	Patient call buttons may or may not be available/operational	Bells or buzzers could be given to each patient.
Bathrooms	Many patient rooms have bathrooms.	Minor fixtures like showerheads may be needed in some bathrooms.
Storage	Some patient rooms have built-in shelving or closet space.	Each patient would need a small patient bin filled with personal supplies.
Privacy	Most hospital rooms lack window shades and doors.	Curtains could be hung on doorframes or doors reattached.
<i>Nurses Stations</i>		
Nursing Station	Some stations have wiring for computers and telephone hook-ups.	Each nursing station would need telephones, computers, office supplies and chairs.
Galley Kitchens	May have operating kitchen on several floors.	Ice machine would need to be cleaned and serviced, or ice delivered to the floors from a central ice supply.
Utility Closet	Most closets were stripped of shelving.	Each floor would need supply carts and portable shelving units.
Clean and Soiled Linen	No operating system for clean and soiled linen.	Large rolling Rubbermaid carts can deliver/remove clean/soiled linens.
<i>Ancillary Medical Service Areas</i>		
Laboratories	Laboratories not operational.	Employ a courier service and contract with private laboratory testing companies.
Pharmacy	No current stock of pharmaceuticals	Pharmaceuticals would need to be brought in

Table 3: Summary of Expected Supplies and Equipment at Partially Shuttered Hospitals

Item/Issue	Typical Status at Partially Shuttered Hospital	Additional Needs for Surge Use
<i>Support Service Areas</i>		
Laundry Facilities	Linens and disposable supplies are not available.	Use laundry vendors.
Biohazard and waste disposal	No current mechanism to dispose waste	6-7 large trash cans, a trash can in every patient room, 4-5 biohazard containers per floor, a hazardous materials container remover, and hazardous materials trailer
Receiving	Loading docks available for receiving supplies	Loading dock would need one palate jack, 3 flatbed delivery carts, and bins to hold items.
Water Supply	Facility has water-holding tanks	Need enough capacity to supply 5 gallons pr patient per day. May need additional water or bottled water.
Informational Technology and Community	Some communications equipment may be available	Equipment would be needed at nurses' stations, at a minimum.
Morgue	Morgues may be available but have limited capacity	Refrigeration units would need to be available/improved, perhaps through the use of rented trucks.
Cafeteria	Cafeteria operating	Some equipment may need thorough cleaning, re-certification. Disposable dining supplies for 200-300 patients and staff, food supplies would need to be brought in.
<i>Miscellaneous Areas</i>		
Visitors/Waiting/Lobby Area	Limited furniture remains	If needed, furniture would need to be procured.
Intake/Admin Areas	Sufficient space for intake	Chairs, technology, and supplies would need to be brought in or moved from other sections of facility.

3.2 Procuring Equipment, Supplies and Associated Support

Based on inspections of two former hospitals, it appears that most such facilities will have little if any usable medical equipment or supplies on hand – equipment will have been transferred elsewhere, sold or discarded as obsolete. These deficits should not be a stumbling block, however, as the vast majority of equipment and supplies are both portable and obtainable.

The sections below address the ability to procure equipment and supplies for a shuttered hospital for use during a surge event. There will also be a need for staff to deliver, maintain and operate the equipment. Most hospitals divide procurement (and associated services) across several different departments. This section is organized around the following common specialty areas of materials management:

- Fixed and Disposable Supplies and Equipment

- Biomedical Equipment

- Pharmaceuticals

- Food and Food Service

- Environmental Engineering

The scope, magnitude and detail necessarily to supply a hospital properly cannot be underestimated. Fortunately, nearly all the equipment and supply procurement and associated services in the following sections can be outsourced to any one (or a combination) of a number of national hospital service and vendor supply firms and such organizations could be valuable partners. In each of the following sections, we outline the service capabilities of such organizations, specific considerations and specific associated challenges.

General Planning Responsibilities

With the advice of hospital materials management experts and service vendors, we have concluded that it would be essentially impossible to open a closed facility in three to seven days, in a city experiencing massive casualties, without contracts, service agreements, and purchase orders that have been previously created. Processes and responsibilities to maintain adequate supplies and service levels must be in place before there is a need to open the surge facility, and these plans should be reviewed on a yearly basis to keep them up-to-date. The team responsible for equipment and supplies might consider including equipment and supply company representatives in the inspection and planning stages for the surge facility.

If the team decides to negotiate an executable contract – which would be signed only when a mass casualty even occurs – such a plan and its associated executable contracts should be reviewed on a regular basis – perhaps once a year – and modified based on changes in disaster risk, facility or vendor status.

Suppliers and Contracts

Hospitals buy their supplies and equipment either from wholesalers, distributors, or directly from manufacturers. In general, the medical-surgical equipment and supplies market is more

fragmented than the pharmaceutical market, with a larger number of vendors, more products, less customer expertise, and less standardization.²³ In the healthcare sector, one-stop shopping for pharmaceuticals is more common than for other supplies because of greater consolidation within the pharmaceutical industry.²⁴

Given the myriad equipment and supplies needed by a hospital, more than one person within the hospital is usually involved in purchasing, and this can contribute to the fragmented nature of supplies and equipment procurement. The use of multiple vendors could make procuring equipment and supplies for a surge facility difficult and confusing, particularly for biomedical and disposable supplies.

Large suppliers have existing emergency plans that have proven valuable in emergency situations. The “Disaster Contingency Plan” from one distributor provides a snapshot of advance preparations hospitals and their distributors establish, which keep operations flowing smoothly during an emergency:

- Prepare an emergency critical items list;
- Develop an updated order form (paper as well as electronic copies);
- Maximize standardization and utilization efforts between the vendors and hospital;
- Consolidate distributors and manufacturers;
- Make sure accounts payable is up to date;
- Keep account clean and resolve any discrepancies or disputes, and
- Establish pre-payment if necessary.²⁵

In an emergency, equipment and supply vendors will most likely assist those hospitals with which they have pre-existing procurement arrangements and might be unable to suddenly support the needs of a surge facility with which they have no prior agreements or arrangements. Thus it will be essential to establish such agreements and arrangements in advance.

Large suppliers or distributors may be reluctant to enter into a new contract with a hospital or local health unit solely to operate a surge facility. If the surge facility is being overseen/operated by a hospital that has a current vendor contract with a vendor, supplies and equipment could be procured through that existing contract. The materials management director at Brigham and Women’s Hospital advises that even if the BWH was the sponsoring/oversight hospital and used its own established contract in this way to meet the needs of the surge facility, it would be necessary to have signed contracts and a complete understanding from each vendor as to the expectations and need. The vendor would need to

²³ Burns, LR, and Wharton School Colleagues. The Health Care Value Chain: Producers, Purchasers, and Providers. Jossey-Bass: 2002.

²⁴ IDEM, Burns, LR.

²⁵ Owens and Minor. “O+M Disaster Contingency Plan for Partners Healthcare.” December 5, 2001.

add staff, add truck routes, add to food orders, and so on. Without a sponsoring hospital that already had contracts and ordering procedures in place, it might not be possible for a vendor to simply implement full support for a surge facility. When we discussed possibilities with vendors, however, we were advised that an advance contract of some sort could probably be worked out, so that the vendors would be prepared to support most (if not all) of the needs of a surge facility with a 3-7 day notice.

Stockpiling

Every hospital in the mass casualty zone would need emergency supplies and one might anticipate stockpiling or “hoarding” to begin as the magnitude of the event becomes clear. Fortunately, supply shortages due to hoarding are unlikely because the large equipment and supply vendors each maintain many warehouse locations – often many in a single metropolitan area – and because hospitals lack the inventory space to stockpile more than a few days worth of supplies. It might be useful, however, for area hospitals in any community to discuss the supply and equipment procurement process for a potential surge event, in advance, in order to avoid stockpiling and misunderstandings.

3.2.1 Fixed and Disposable Supplies and Equipment Procurement

Disposable equipment and supplies are generally delivered to hospitals on a daily basis. Although the disposable equipment and supplies market is fairly fragmented, with many companies supplying each hospital, in most major healthcare providers. Approximately 10% of the vendors supply 90% of the equipment and supplies.²⁶ Since most major vendors have warehouses and nationwide distribution networks, hospitals that have existing relationships with large distributors should not have difficulty obtaining additional supplies for a surge facility within one week. For example, Owens and Minor delivers five trucks of supplies to Brigham and Women’s Hospital every day. When the hospital requests something new or additional, it is generally delivered within five hours.

For larger equipment where supplies may be more limited, there are also very large national suppliers with a presence in virtually every city. For example, it is unlikely that any firm warehouses over 200 hospital beds in the Boston area. There is, however, a nationwide supplier with a 52% nationwide market share²⁷ that could import beds from warehouses around the country if there was a shortage in the Boston area, and those beds would arrive during the 3-7 preparation for opening the surge facility. Other specific supplies and equipment, such as IV pumps and defibrillators, might not be delivered in sufficient volume during this short timeframe, however. In this case, if the facility is being operated/overseen by a major hospital, that hospital could share its own inventory on a short-term basis.²⁸ After the surge facility is set up and initially supplied, vendors could probably replenish it at

²⁶ Andrew Madden. Materials Management Department, Brigham and Women’s Hospital, Boston, Massachusetts Personal communication. December 2004.

²⁷ Andrew Madden. Materials Management Department, Brigham and Women’s Hospital, Boston, Massachusetts Personal communication. December 2004.

²⁸ Brigham and Women’s personnel indicated that they would be able to provide up to 25% of their existing inventory of critical equipment and supplies to the surge facility while the facility is awaiting a shipment, even during a mass casualty event where BWH is operating beyond 100% capacity.

a more customary pace. If there is no sponsoring/oversight hospital involved, it would be harder to meet all the short-term equipment and supply needs and open the surge facility within 3-7 days of an emergency. Again, however, vendors advised that with advance planning, faster and more complete support would be possible.

In a surge situation, if a sponsoring hospital did not have access to the customary information management tools that are used for supply ordering, such as handheld communication devices (PDAs) or Internet access, the hospital inventory management system could adapt to a process involving the manual taking of inventory for each hospital department followed by off-site data entry and electronic order submission to the major suppliers and equipment vendors. More specifically, in case there is no electronic communication, generic lists of supplies for specific hospital departments such as the medical-surgical units could be utilized in paper form by the hospital staff at the surge facility. Even large and sophisticated hospitals occasionally use such forms, particularly during the holiday season, and suppliers are accustomed to filling orders they receive in paper format (although there may be some delays).

Additional staff will be required at the surge facility to ensure that procurement, delivery, and distribution run smoothly. Experts we consulted suggest that perhaps 4-5 FTEs are needed to staff the materials management department, including two skilled workers to run an electronic inventory management system, if planners decide to implement one at the surge facility. The remaining three employees are non-skilled, but must have good organizational abilities, since supplies and equipment will probably be arriving at uneven intervals, sometimes without documentation, and accurate record keeping is essential.

Given the magnitude of effort required to maintain adequate inventory, and the efficiencies that can be realized by tapping into vendor electronic ordering systems, many hospitals opt for an electronic data entry, inventory tracking, ordering and reporting tool. This is called an Enterprise Reporting Portal System. These systems are fairly expensive, and complicated to deploy. If surge facility planners choose to contract with an established logistics provider (or sponsoring/oversight hospital), they may be able to tap into an existing system remotely. If not, it is recommended that all processes be paper-based as the effort to implement a system would not be warranted for the period of time the facility would utilize the system.

3.2.2 BioMedical Equipment Procurement

Biomedical equipment and supplies differ from general capital goods like furniture, or disposable supplies like bandages, and can require major financial outlays. In scenario 1, the biomedical materials necessary for continued care will be very similar to those found in any community hospital's step down unit. Within each unit one is likely to need the following biomedical equipment:

- SP0² spot testing capability
- ECG equipment
- Non-Invasive blood pressure monitors
- Automatic external defibrillators (airport grade)

The automatic external defibrillator is designed for use by an average individual. Medical specialists recommend more advanced code cart and defibrillators be available in the hospital within a three-minute distance from all patients. Patients who appear likely to need such care will not be discharged from the primary care facility. However, even in step-down units, unforeseen problems do arise, and resuscitation may be necessary prior to be transported back to the primary care facility for further more intensive care. Depending on the types of patients being discharged to the surge facility, the facility may require more advanced equipment like cardiac monitoring and EEC tools. Under scenario 2, which would include some type of infectious disease, a larger number of ventilators may be necessary for optimal patient care.

The biomedical equipment member of the core team should begin planning for biomedical needs far in advance of any potential surge needs. It is possible that loaned or leased equipment could be available from other local hospitals. The first step is to take an accurate inventory of current excess biomedical capacity at any volunteering or participating hospitals within several hours drive time to the surge facility. The ability of hospitals to “share” such equipment may depend on the situation at the time of the mass casualty event. If a significant outbreak of the flu should cause a declaration of surge need, for example, much of the excess ventilation capacity at existing local hospitals will be in use, and not available for redeployment at the surge facility. If equipment is offered from other hospitals, it must all have appropriate documentation, a current inspection/certification if appropriate, meet current safety standards, and be tested to the manufacture’ specifications.

Given the complexity and cost of biomedical equipment, simply identifying excess inventory is not enough. Planners must assess appropriateness of available equipment, ease of use, similarity with other tools that staff are already familiar with (to reduce training costs), and maintenance costs/expertise requirements. The planning team must weigh the ongoing maintenance costs of existing equipment with potentially cheaper costs, and reduced labor burden, associated with newer equipment.

Procurement Strategies

The planning team will almost certainly need to supplement the excess equipment available from other currently operating facilities. The biomedical equipment listed above is expensive, but does not include some of the imaging, monitoring, or nuclear medicine products that have price points in the millions. If the planning team is considering providing these medical services at a surge facility (which we do not recommend), budget allocations and additional planning could be substantial. To investigate further the possibilities for procuring this more sophisticated and costly equipment, planners should:

- Investigate the feasibility of outsourcing to a biomedical equipment service provider.
- Determine technical specifications: biomedical equipment can be complex and require significant training to operate. To reduce training costs, planners may wish to standardize equipment across one or two vendors, regardless of cost considerations.

- Quote tendering: Upon determination of a need, quotes could be sought (in advance) from a select group of vendors and providers.
- Determine operating and training costs (including the cost of ancillary supplies).
- Determine appropriate procurement strategies: Planners could elect to buy, rent, lease, or finance new or used equipment.
- Create contracting vehicles/purchase orders that can be executed in an emergency.

Vendors offer a host of financing plans, including alternatives to outright purchase, to help hospitals acquire the latest equipment. These alternatives should be considered carefully, particularly given the limited time frame that the surge facility will be open (thirty days to three months). The following are among the procurement strategies to be considered.

Used Equipment. Planners might also wish to investigate acquisition of used biomedical equipment. Given the high value of biomedical equipment, and the extreme competitive pressure hospitals feel to maintain the most advanced biomedical equipment, many pieces are taken out of service well before their useful life has ended. This equipment can be purchased outright, or potentially procured through a variety of alternative financing methods. For example, Siemens, one of the worlds largest medical equipment manufactures, claims that it can save hospitals up to 30% in biomedical equipment costs through its equipment refurbishing programs.²⁹

Equipment Rental. Vendors understand that there are situations where hospitals must temporarily increase their capacity to provide services. Unfortunately, only limited biomedical equipment – primarily imaging equipment – is available under this financing method. Vendors may make equipment available on a basis as short as one week. Given that vendors have equipment in stock across the country, it is reasonable to assume that they can be delivered to the healthcare facility within a very short time period.

Lease. Leasing has become a popular financing alternative for high value capital goods in many industries including healthcare. Many vendors provide flexible lease terms for new or used equipment. However, unlike equipment rentals, lease time frames are usually in years not weeks or months. For example, GE Healthcare’s capital lease program provides lease terms beginning at thirty-six months to an eighty-four month period. Leasing is therefore a less viable option than renting.

Lease with Service. Biomedical equipment may have parts and components that need maintenance, repair and replacement on a periodic basis. Therefore, most vendors provide a lease option that includes a service option. This option is particularly attractive given the limited skills of staff at the surge facility and the emergency status of all other local hospitals (requiring their own staff’s full time attention) during the mass casualty event.

Purchase and Purchase Financing. In exploring options from vendors, including GE Healthcare financial, a variety of purchasing options are available, including off-balance

²⁹ Siemens BioMedical Supply, <http://www.medical.siemens.com>

sheet financing (a modified lease), tax-exempt purchase financing and purchasing, it appears few of these options are appropriate in a situation where their useful life will be shorter than three months. Most goods are depreciated over 3 to 4 years. If an operational entity were to purchase such goods, a considerable effort would need to be undertaken during ramp down to off-load the equipment on the used biomedical equipment market. This process, called asset recovery, is a service provided by Universal Health Services, and other outsourced service providers.

Timing

Depending on the type of equipment, whether it is new or used, and the financial arrangement (renting versus buying), the equipment could arrive at the surge facility within several hours, days or even weeks. Ordering some specialized biomedical equipment directly from suppliers may take several weeks, making it difficult to open a surge facility within 3-7 days.

Fortunately, the materials specified in this plan are not specialty items, nor extraordinarily complex and all were available for rental at a major service provider we contacted. Therefore, much of the equipment can be delivered within a day or two to the surge facility, once a contract has been executed. Some equipment will then need to be set up by trained biomedical equipment support staff. If outsourcing with a service vendor is used, the trained staff will be part of the service. Getting all biomedical equipment set up and ready is expected to take up to 1 week. This in turn implies that contracts must be pre-drawn and executable within days, so that equipment is ready when patients begin to arrive at the surge facility.

Equipment may need to be serviced during operation. All the vendors support their own equipment with service agreements. They all stock parts and supplies that can be quickly delivered for any machinery that requires them. Biomedical maintenance can be a major expense. If opting for completely outsourced biomedical equipment services, they provide support and maintenance on their rented products.

3.2.3 Pharmaceutical Procurement

The procurement of pharmaceuticals for the surge facility poses more challenges than does the procurement of disposable equipment and supplies, food service, or environmental engineering supplies and equipment because of the legal licensing requirements for the prescription, storage, and preparation of pharmaceuticals. Conversations with pharmacy directors indicate that the surge facility would need to have up-to-date licenses to legally store pharmaceuticals, especially for controlled substances. The necessary licenses would include: (1) Board of Pharmacy; (2) Drug Enforcement Administration number; (3) Department of Public Health license. In addition, jurisdiction over the writing of medical orders at the surge facility would have to be addressed, because traditionally orders need to be written by a physician at the facility itself.

Like all other areas of procurement discussed in this section, if the facility does not have pre-existing contracts with the pharmaceutical suppliers or pre-arranged purchase orders, ordering pharmaceuticals could be difficult. One solution is that the surge facility could receive pharmaceutical supplies from a sponsoring hospital facility's pharmaceutical vendor,

using an arrangement similar to that for purchasing disposable equipment and supplies from major vendors. Alternatively, an advance contract with major pharmaceutical distributors could be established – much like the model discussed for other services, and implemented only in an emergency. With an agreement executable on day one of surge need, a “pre-order” of disaster supplies needed for the surge facility would speed the acquisition of pharmaceuticals.

Because of the legal issues surrounding prescribing pharmaceuticals, a physician authorizing the prescriptions would have to be determined in advance. In addition, all of the medication stored at the surge facility would have to be monitored by a pharmacist, ensuring that the available space at the surge facility could adequately secure and store the medications in accordance with the legal requirements for doing so.³⁰

Within the pharmacy space at the surge facility, there must be adequate refrigeration, freezers, sterile prep areas, and a locked area for narcotics. Dispensing would need to be carried out manually, without the use of electronic medication dispensing machines.

3.2.4 Food and Food Service Procurement

Providing surge facility patients and staff with adequate food services will be a critical part of the surge facility’s operational success. Issues to consider include adherence to Department of Public Health regulations and outsourcing food service preparation and delivery vs. an in-house kitchen.

Since clearance to serve food could occur within a day³¹, the biggest decision for planners will be whether to contract with a food service company for food preparation and service. A diversified services company or a foodservice firm that specializes in hospitals are reasonable options. A national or local firm might be able to provide both the foodservice staff, dietary consulting, and food, to meet all the related needs for the surge facility. Regardless of the source of the staff, food preparation workers must possess a serve-safe certification from the Food and Drug Administration known as Hazard Analysis and Critical Control Point (HACCP). Vendors’ staff will all be correctly certified.

Planners can estimate staffing and food service needs by engaging competing vendors in an information gathering process, well in advance of any emergency, without actually proceeding immediately to a contract. There are benchmarks to calculate the quantity of food needed to serve patients and staff members at a 200-bed surge facility for the entire period of its operation. In the food service industry, the standard measurement is meals per productive hour. In order to calculate the number of meals needed for the surge facility, planners could ask a national company to compare the surge facility to other hospitals of similar size based on the meals per productive hour standard. The company performing the comparison would use a market basket analysis approach to standardize the reporting across

³⁰ Note: some or all of the legal requirements could potentially be waived by state health officials. These issues are explored in our accompanying paper on legal and regulatory issues for opening a shuttered hospital for us as a surge facility.

³¹ Karen Purdy-Reilly. Food Services Department, Brigham and Women’s Hospital, Boston, Massachusetts. Personal communication. January 21, 2005.

the country. Since the surge facility will have no pre-existing data about food consumption, useful information to benchmark the calculation would include: type and breadth of services offered, size of the staff, number and type of patients, and type of patient meal delivery (cold or hot food, delivered to patient rooms or served in a centralized location such as the cafeteria).

Most nationwide vendors with whom we spoke were eager to give estimates about equipment, supply and staffing estimates, and it is conceivable that opening a dialogue with vendors prior to the surge event could be useful in gauging supplies and equipment needs for any segment of the surge facility. These companies do not, however, have “on call” staff available for emergency response, and it may be difficult for them to respond with only a 3-7 day notice. In fact, many food service vendors do not even have emergency expansion plans with the hospitals they currently serve. Existing hospitals instead rely on the predictability of food service needs: the frequency of food delivery at a hospital (up to three times per week for food vendors, daily from smaller food vendors and paper products vendors), and the existence of standing purchase orders with vendors, eliminates the need for an emergency plan, since vendors deliver food to the facility on short notice and multiple times per week.³² In some cases, cold food may be prepared off-site and when delivered to the surge facility, it would be assembled, perhaps warmed, and served.

In terms of equipment and supplies for food service, room service delivery will require more staff and additional equipment and supplies, such as delivery carts and dishes rather than disposable plates and cups. Planners must decide whether hot or cold food will be served and whether the food will be prepared on-site, or prepared off-site (catered) and delivered to the surge facility to be reheated. Each of these decisions affects the staffing level, as well as the type and quantity of food service supplies needed for the surge facility.

3.2.5 Environmental Engineering – Staff, Equipment and Supplies

The term ‘environmental engineering,’ is not simply a euphemism for hospital janitorial services. With hazardous and infectious materials and exceptionally strict occupational and facility cleanliness standards for patient safety, hospital environmental engineering is a science in itself. The several hundred page *Guidelines for Environmental Infection Control in Health Care Facilities* is a Center for Disease control document specifically aimed at environmental controls that decrease patient illness from common hospital infections at all phases of care right up to discharge. The environmental engineering tasks outlined in this section require some procurement of supplies and equipment. Staff and/or contractors will be needed for the following functions:

- Cleaning the surge facility to bring it to sanitary standards before admitting patients
- Maintaining sanitary water, air, and other environment throughout the course of surge facility operation.

³² The frequency of deliveries is due to the lack of storage space at the hospital facility, an issue that would most likely be found at the surge facility as well.

- Laundering uniforms, bedding, and other cloth goods
- Disposing of hazardous materials under strict EPA guidelines
- Disposing of medical and other waste (both solid and liquid)

In addition to staffing, the environmental services department will need to purchase or procure the following equipment:

- EPA Certified detergents, disinfectants and chemical sterilants (including tuberculoids and germicides)
- Disposable mops, cleaning cloths, sponges, and other cleaning apparatus
- Floor buffer/polisher, carpet shampooer
- Sweeping apparatus (note: recommendations from EPA suggest minimizing the use of such tools as they may disturb and distribute dust into the air – use wet mops whenever possible)
- Industrial strength vacuum with HEPA filter (and replacement)
- Containers and labels for hazardous waste
- General waste containers
- Cleaning carts and cleaning material storage shelving

During the planning phase, environmental engineers should accompany a team on a thorough assessment of the selected surge facility. They should take note of the facility's current condition from a sanitary perspective. If pests or rodents are noted, planners may wish to fumigate the facility using appropriate hospital procedures prior to any declaration of surge need. Patient areas must be free of chemical residue and therefore special precautions, specific techniques and time must be observed. Proactive pest control will allow the hospital to open without delay. Planners will also need to consider infrastructure options for waste disposal and removal. Many hospitals have pre-existing executable contracts with hazard remediation cleaners who would be appropriate to clean a facility that has had limited upkeep over several years and prepare it for patient care once again. During the 3-7 days prior to opening the surge facility, environmental staff will transition from a hazard remediation cleaning standard to an upkeep phase. It may be appropriate at this point to transition from cleaning contractors to other service vendors or staff familiar with general hospital sanitary operations.

For a facility of 250-300 patients, the environmental engineering staff will likely include up to 30 FTEs and five managers to cover all the shifts. These staff and managers should be familiar with U.S. Code pertaining to hospital cleanliness standards, OSHA regulations, FDA guidelines and regulations, EPA guidelines, and general best practices.

Planners may choose to pre-establish executable contracts for disaster remediation and pest control, as well as general waste management, hazardous waste disposal and laundry services.

There are many organizations that provide these services and unlike most other contractors discussed in this document – they tend to be local. Waste disposal is almost always outsourced, and in the absence of on-site laundry machines, it would be wise to outsource laundry services as well.

An environmental crew should be the first staff in the facility as soon as a department of public health has authorized its preparation for use. This disaster remediation team, noting the specific instructions based on the facility assessment, will be responsible for cleaning a facility that has not had a medical grade cleaning in several years – and bringing it to sanitary standards appropriate for patients. Cleaners will maintain the facility, prepare and clean older equipment and keep general orderliness and solitariness while many people enter and exit the facility during the preparation period.

Once patients are admitted and the surge facility is operation, environmental services staff will take on a roll identical to that at any traditional hospital. Under Scenario 2, their role will require additional germicidal and disinfectant tools. In either scenario, the operating organization should provide both in-house staff and contractors with an expected practices list that includes text on the following items:

- General cleaning of surfaces and walls within patient areas, including wet/dry methods, timing to repetition, appropriate materials, and detergents/disinfectants
- Mitigation of the use of mists, aerosols and fumigants in patient areas. Use of cleaning methods that disturb and distributed dust into patient areas
- Cleaning areas with immuno compromised patients.
- Cleaning spills of bodily fluids
- Special care of carpeting and other cloth furnishings
- Special pathogen considerations.

As patients are gradually discharged and the surge facility is prepared for closure, cleaning staff can also be reduced. A core staff will remain to shut down the facility and return it to a safe shuttered state, taking special precautions to maintain standards to ease possible reopening sometime in the future.

4.0 Staffing Considerations

For purposes of this report, we assume that current community standards of care will be maintained at a surge facility, even though this may not be possible due to current nursing and ancillary healthcare provider work force shortages. To determine the staffing needed to maintain this standard of care, we first considered the skill sets that would be needed at a surge facility. We then examined State and Federal regulations for guidance on the staffing types and ratios that would match these skill sets. While these regulations offer guidance, they lack specificity. We therefore considered the staffing ratios currently used at Boston area community hospitals and skilled nursing facilities, as we expect the patients served at a surge facility will fall in this range of patient acuity and care needs. The sections below explore the skills that would be needed at a surge facility, by staffing type, regulatory requirements for hospital staff, Staff-patient ratios and numbers of staff needed (based on community hospital staffing and SNF staffing), and available sources of staff for a surge facility.

4.1 Skills Needed, by Staff Type

It will be important to identify particular skills of each staff type that would be considered essential, based on the type of patients hospitalized. For example, under Scenario 2 good infection control skills would be essential for all staff – not only for the nursing staff, but also for housekeeping, dietary, social services, laundry, etc. It would be necessary for those responsible for recruiting staff to identify the needs of the anticipated patients and the corresponding skills that would be required. Nursing departments frequently use a skills checklist during the hiring process to identify the potential employee’s level of expertise in various patient care areas. New or potential hires are asked to rate their experience with particular patient types or procedures as proficient (2+ years experience), moderate (1-2 years experience), limited (or intermittent experience) or no practice, theory only. Such a checklist would be useful in a surge situation to identify skill levels and as an aide to assigning staff to particular units/areas to ensure a good mix of skill levels. For example, many nurses do not know (or are not experienced in) how to insert an intravenous line. When selecting/recruiting nursing staff, it would be helpful to have at least some, not necessarily all, of the nurses capable of performing this task.

Many of the tasks that nurses perform can be done by other types of staff – both inside and outside the nursing department. Some tasks would require some amount of training, while others would require little or no training. In a surge situation, it would make sense to re-assign as many RN tasks as possible and safe to others capable of handling them. The goal would be to maximize utilization of the RNs’ specialized assessment and judgment skills, while using ancillary staff to provide hands-on care, treatment and gathering patient information/data. The table in Appendix C is set up as a shell to illustrate the process that could be employed to identify RN skills that could be delegated to other staff types. Only those skills potentially applicable for other staff types are included. Knowledge of the training curriculum used with these other staff types would be essential. Tasks could be coded as “able” for those skills/tasks that the various staff types would be expected to know, “potential” for tasks that they, depending on training and experience, could do and “with training” for tasks that they could be trained to do. For example, nurse aides are taught how

to take vital signs (temperature, pulse, respirations and blood pressure) and could likely be trained to do certain dressings and treatments.

This information, used in combination with the suggested staffing types/numbers may provide options for alternative approaches when the identified staffing types/numbers are not available.

Recommendation: SNF staff levels/ratios may be acceptable for stable surge facility patients. Nurse-extenders could also have expanded roles.

4.2 Federal and State Regulations on Staffing

We conducted a preliminary review of Federal and State regulations to understand: 1) current staffing requirements, and 2) to identify regulations for which some type of waiver in a declared emergency would be required. After discussion with the Massachusetts Department of Public Health, we understand that at least some of these regulations could be waived or ‘relaxed’ in a major mass casualty incident, and thus do not consider these regulations to constitute absolute requirements. The same may not be equally true in other States, where emergency waiver authority may not be as extensive as it is in Massachusetts.

We examined regulations governing hospital staffing and nursing facility staffing, as the medically stable patients relocated to a surge facility in an emergency are likely to have an acuity level (and needs) somewhere between that of an SNF and a community hospital.

4.2.1 Federal Regulations on Staffing

Hospital Staffing

The Code of Federal Regulations conditions of participation for hospitals participating in the Medicare program, contains regulations covering various services offered. Based on our assumed patient population and their needs, we reviewed the regulations on staffing. Most regulations are not specific, requiring only that staff be qualified and sufficient to meet the needs of the patients. Requirements for the following services were reviewed:³³

Medical Staff. The medical staff must be composed of doctors of medicine or osteopathy.

Nursing Services. “The director of nursing services must be a licensed registered nurse. He or she is responsible for ...determining the types and numbers of nursing personnel and staff necessary to provide nursing care for all areas of the hospital. There must be adequate numbers of registered nurses, licensed nurses and other personnel to provide nursing care to all patients as needed. There must be supervisory and staff personnel for each department or nursing unit to ensure, when needed, the immediate availability of a registered nurse for bedside care of any patient.”

Medical Records. “Must be appropriate to the scope and complexity of services performed. The hospital must employ adequate personnel to ensure prompt completion, filing and retrieval of records.”

³³ 42 CFR §482.22 – 482.28

Pharmaceutical Services. “A full-time, part-time or consulting pharmacist must be responsible forall the activities of the pharmacy services. The pharmaceutical service must have an adequate number of personnel to ensure quality pharmaceutical services, including emergency services.”

Radiology Services. A qualified full-time, part-time or consulting radiologist must supervise the ionizing radiology services. A radiologist is a doctor of medicine or osteopathy who is qualified by education and experience in radiology.

Laboratory Services. The hospital must maintain or have available (either directly or through a contractual agreement), adequate laboratory services to need the needs of its patients.

Food and Dietetic Services. The hospital must have a full-time employee who services as director of the food and dietetic service and there must be a qualified dietician full-time, part-time or on a consultant basis and administrative and technical personnel competent in their respective duties.

Long-term Care Staffing

Federal requirements for staffing in long-term care facilities are similar to those for hospitals with additional provisions for ensuring that services not available on site are available contractually, e.g., laboratory, radiology and pharmacy.

Nursing. Long-term care regulations are specific that there must be a registered nurse in the facility eight consecutive hours seven days a week and that there must be “sufficient nursing staff to provide nursing and related services to attain or maintain the highest practicable physical, mental and psychosocial well-being of each resident...”³⁴

Dietary. The facility must employ a qualified dietitian either full-time, part-time or on a consultant basis. If a qualified dietician is not employed full-time, the facility must designate a person to serve as the director of food service who receives frequently scheduled consultation from a qualified dietician.³⁵ A qualified dietician is one who is qualified based upon either registration by the Commission on Dietetic Registration of the American Dietetic Association, or on the basis of education, training or experience in identification of dietary needs, planning and implementation of dietary programs.³⁶ Federal regulations now allow the use of paid feeding assistants provided the individual has completed a State approved training course and works under the supervision of a registered nurse or licensed practical nurse.³⁷

Social Services. A facility with more than 120 beds must employ a qualified social worker on a full-time basis – a bachelor’s degree in social work or a bachelor’s degree in a human services field including but not limited to sociology, special education, rehabilitation

³⁴ 42 CRF 483.30

³⁵ 42 CFR §483.35

³⁶ Ibid.

³⁷ Ibid.

counseling and psychology, and one year of supervised social work experience in a health care setting working directly with individuals.³⁸

4.2.2 Massachusetts Regulations on Hospital and Long-Term Care Facility Nurse Staffing

Hospital Nurse Staffing

Like the Federal regulations, Massachusetts regulations on nursing coverage are not specific to the number of hours required per patient per day or to any specific ratio of nurse to patients, only that there be a sufficient number of registered nurses on duty at all times to plan, supervise and evaluate and perform nursing care. The regulations do state that each hospital shall establish a nursing service under the direction of a registered nurse, currently registered by the Board of Registration who holds a baccalaureate degree in nursing and who has had at least four years experience in nursing practice, at least two of which were in an administrative or supervisory capacity.³⁹ There must be adequate supervisory coverage for all nursing units during each shift and units must be staffed with at least one registered nurse at all times. The only exception to the required unit coverage allows a licensed practical nurse to cover a unit provided it adjoins a unit covered by a registered nurse such that the registered nurse can be readily available to go from one nursing unit to another when skilled nursing services are needed.⁴⁰

The only provision in the regulations concerning numbers of nursing staff assigned by unit states that, “The number of registered nurses, licensed practical nurses and unlicensed nursing personnel assigned to each nursing unit shall be consistent with the types of nursing care needed by the patients and the capabilities of the staff”.⁴¹

Long-term Regulations on Nurse Staffing

Massachusetts regulations for long-term care facilities, like the hospital regulations require “appropriate, adequate and sufficient nursing services to meet the needs of patients or residents and to assure that preventive measures, treatments, medications, diets, restorative services, activities and related services are carried out recorded and reviewed.”⁴² Regulations are less stringent in that although the director of nursing and supervisor must be registered nurses, charge nurses may be registered nurses or licensed practical nurses. Regulations, however, are more specific regarding staffing ratios. Facilities are identified by level (I - IV) with staffing ratios specific to the level. Level I facilities (Intensive Nursing and Rehab Care Facility) must provide 2.6 hours of nursing care per day; at least 0.6 hours shall be provided by licensed nursing personnel and 2.0 hours by ancillary nursing personnel. Level II facilities (Skilled Nursing Care Facilities) must provide 2.0 hours of nursing care per patient per day; at least 0.6 hours shall be provided by licensed nursing personnel and 1.4 hours by ancillary nursing personnel. Level III (Supportive Nursing Care Facilities) and Level IV

³⁸ 42 CFR §483.15(g)

³⁹ Title 105 in Code of Massachusetts Regulations (CMR) chapter 130.310

⁴⁰ 105 CMR 130.311

⁴¹ 105 CMR 130.312

⁴² 105 CMR 150.007

(Resident Care Facilities) are not applicable for the population identified for this study, as skilled nursing is required only periodically.

4.3 Staff Types Needed in a Surge Situation

Clinical experts offered guidance about the staff types needed for a surge facility, which are grouped in four major categories:

- Physicians and physician extenders – includes nurse practitioners and physician assistants, medics/paramedics;
- Nursing – licensed nurses (RNs and LPNs) and nurse aides or patient care assistants/technicians, medics/paramedics,
- Allied health – laboratory, x-ray, pharmacy, therapy and medical records; and
- All others – laundry, housekeeping, food service, central supply, security, etc.

Staff types are also ranked according to how critically they would be needed for the two scenarios. Three ranks were identified:

- 1) Staff needed onsite on a 24 hour basis/seven days per week (O);
- 2) Staff needed onsite for some portion of the day and available on an on-call basis when not on site (D); and
- 3) Staff needed to be available only occasionally either on-site or for telephone consultation (A).

For example, staff responsible for direct patient care are ranked as being needed on a 24-hour basis, while those providing specialized services might only be available as needed or on call. In a surge situation, we would expect that one staff person might assume multiple roles, at least on a time-limited basis. If the newly opened hospital were to remain in service for greater than some predetermined length of time, this assumption of multiple roles would have to be replaced by recruitment of the appropriately qualified individuals. In addition, patients' condition could deteriorate while at the surge facility, requiring their return to the tertiary care hospital (since the surge facility would not house an ICU, OR or ED.) Also, during off-hours, those in the building may be required to cover for departments other than their own. For example, on the night shift, the person in charge of security may be responsible for delivering drugs/supplies to the nursing units.

Selection of staff types and availability ranks are based on discussions with experts in the fields of emergency medicine and a review of available emergency and disaster management plans. The following table illustrates the staff types proposed and their availability.

Table 4: Staffing Types Needed For Medical/Surgical and Infectious Disease Scenarios

Category	Staff Type	Medical/Surgical Scenario	Infectious Disease Scenario
Physician and Physician Extenders	Medical Care Director	D	D
	Internist	D	D
	Radiologist	A	D
	Infectious Disease Specialist/Practitioner	A	D
	Nurse Practitioner/Physician Assistant	D	D
	Psychiatrist	A	A
Nursing	Nursing Director	D	D
	Supervisor	O	O
	RN	O	O
	LPN	O	O
	Nurse Aide	O	O
Allied Health	Dietician	D	D
	Discharge Planner	D	D
	EKG Technician	D	D
	Laboratory Technician	D	D
	Medical Records	D	D
	Mental Health Worker/Social Worker	D	D
	Pharmacist	D	D
	Pharmacy Technician	D	D
	Phlebotomist	D	D
	Physical Therapist	A	A
	Physical Therapy Assistant or Aide	A	A
	Respiratory Therapist	A	D
	Speech/Language Therapist	A	A
X-Ray Technician	A	A	
Other	Administrative Support	D	D
	Biomedical engineering	D	D
	Central Supply/Materials management	D	D
	Communications Specialist (telephones, intercom, etc.)	A	A
	Dependent care (managing children of staff)	A	A
	Food Service Supervisor	D	D
	Cook	D	D

Table 4: Staffing Types Needed For Medical/Surgical and Infectious Disease Scenarios

Category	Staff Type	Medical/Surgical Scenario	Infectious Disease Scenario
	Food Service Workers	D	D
	Housekeeping	O	O
	Human Resources	A	A
	Interpreter	A	A
	Laundry	D	D
	Maintenance	D	D
	Morgue Worker	D	D
	Public information specialist	D	D
	Safety Manager	D	D
	Security	O	O
	Transport	D	D
	Volunteers	D	D

O = Needed on-site 24 hours/7 days per week;

D = Needed on-site for some number of hours daily and available on-site or for telephone consultation during off-hours;

A = Available for telephone or on-site consultation.

4.4 Typical Staffing Ratios and Community Hospitals and SNFs

In an effort to determine the numbers of staff that would be needed to care for the patient population identified, while maintaining community standards of care, we examined staffing levels in Boston area community hospitals of 200–300 beds, and at local long-term care facilities, to better understand the staffing currently viewed as acceptable. The two functioning community hospitals that we used as community ‘models’ are licensed for 150 and 236 beds. The long-term care facility we used as a ‘model’ has a sub-acute or transitional care unit (29 beds) along with several long-term units (92 beds). The sub-acute or transitional care units were included because they care for patients who may be much like those served by a surge facility under Scenario 1, i.e., needing short-term skilled nursing and rehabilitation services until ready to return home. This section of the report describes the staffing of such facilities, which constitute an acceptable range for staffing a surge facility

4.4.1 Physician Staffing

Physician Staffing in community hospitals is typically variable, with each patient having one attending physician assigned to their care and each patient usually being seen at least one time per day. Most community hospitals have at least one physician in house 24 hours per day, seven days a week as well as an internist functioning as a hospitalist or house doctor who is available for admissions and in-house emergencies or urgencies. Community hospitals typically utilize non-physician practitioners (NP, PA) to perform some of the routine rounding on stable patients. The surge facility will require at least one physician in

house 24 hours per day and a variable number during working hours depending on census, acuity and the availability of non-physician practitioners.

Patients in long-term care facilities are seen by their physician on admission and as needed but usually at least one time per week and even more commonly every second or third day. There are no physicians in the building on a 24-hour basis. Nurses contact physicians with questions regarding their patients and physicians either come to the facility to examine and treat the patient, have the patient transferred to a hospital emergency room, or give the nurse orders over the phone. Nurse practitioners, under the supervision of a physician, may also see patients. Regulations regarding the scope of nurse practitioner practice are specific to each State. We assume that most patient needs at a surge facility would similarly be met by nurses (RNs and advance practice nurses) and that on-site physician presence would be minimal, although probably greater than at a nursing facility.

4.4.2 Nurse Staffing

We examined staffing at current sub-acute/transitional units and long-term care units to better understand the range of staffing possible and because some staff types apply to the entire facility, not just the sub-acute/transitional care unit (e.g., housekeeping, laundry, dietary).

Staffing may be estimated using ratios of nurses or nurse aides to patients or using hours per patient per day. These ratios may apply to all nursing staff, for nurses by licensure type (RN, LPN, nurse aide or patient care assistant) or by licensed vs. non-licensed staff. Hospitals consider staffing in terms of “nurses” per patient, not distinguishing between registered nurses and licensed practical nurses. The two community hospitals we used as ‘models’ apply the following nurse to patient ratios for medical/surgical units:

Model Hospital A (150 beds) reported ratios of 1:5 on all shifts for general surgical, telemetry, and medical/surgical units (all days including weekends and holidays with an occasional one additional patient on the night shift);

Model Hospital B (236 beds) reported 1:4-5 on days and evenings, 1:7 on nights with 1-2 Personal Care Attendants (nurse aides) (PCA) per shift per unit. Units range in size from 20 – 36 beds. Staffing is the same on weekdays, weekends and holidays.

In contrast, a local long-term care (LTC) facility reported the following ratios for nurses and nurse aides:

Sub acute/transitional care unit. 1 nurse: 14-15 patients on all shifts, all days of the week. Nurse aide ratios are 1 aide for 5 – 6 patients on day shift, 1: 7-8 on evening shift and 1:14-15 on night shift;

Long-term care units - 1 nurse for 18-19 patients on the day shift and 1 nurse for 36-37 patients on the evening and night shifts. Nurse aide ratios on long-term care units ranged from 1:7-9 on day and evening shifts and 1:18-19 on night shifts.

Table 5 summarizes staffing for these facilities we examined; these staffing estimates could be used to create ranges on which staffing for a surge facility might be based.

Table 5: Staffing Ratios as Observed in Community Hospitals and Long-term Care Facilities

	Ratios		Hours per Patient Day (ppd)	
	Nurses	Aides	Nurses	Aides
Hospital # 1	1:5	unavailable	4.8	unavailable
Hospital # 2	1:4-5 (days and evenings), 1:7 (nights)	1-2 PCAs per unit	4.3-5.1	0.2-0.5
Long-term Care Facility Sub acute unit	1:14-15 (all shifts)	1:5-6 (days) 1:7-8 (evenings) 1:14-15 (nights)	1.7	3.0
Long-term Care Facility long-term unit	1:18-19 (days) 1:36-37 (evening and nights)	1:7-9 (days and evenings) 1:18-19 (nights)	0.9 – 1.3	2.4 – 2.9

4.4.3 Allied Health Staffing

Hospital Allied Health Staffing

Allied Health staffing at the two model community hospitals provides limited guidance as both of these facilities are teaching hospitals with intensive care units, emergency departments, surgical services, maternity, nursery and pediatric units – none of which the surge hospital is envisioned as providing. Descriptions of allied health staffing in the LTC facility may provide a more realistic picture of staffing needs in the surge situation.

LTC Allied Health Staffing

A review of staffing for allied health positions at long-term care facilities revealed that many services are contracted out (pharmacy, laboratory, x-ray, respiratory therapy) while others used infrequently may be shared with several other facilities, e.g., speech therapy. Modifications to usual staffing responsibilities were made because of the higher demand for services that nursing facility vendors were not able to meet. For example, nurse aides at the facility we contacted have been taught how to take EKGs and draw blood because the laboratories that service the facility will not come to draw bloods as frequently as is needed on the sub-acute/transitional care unit. The use of contracted services, common in the LTC environment, and noted earlier in Section 2.7 as a reasonable approach in a surge situation, makes a review of LTC staffing/services a fairly reliable model for what will likely be needed/required in the surge situation. Table 6 summarizes allied health staff use in the LTC facility. Table 6 summarizes allied health staff use at the ‘model’ community hospitals and LTC facility.

4.4.4 All Other Types of Staff

Other Hospital Staff

As noted in the previous section, because the model community hospitals used in this study provided many more services (with associated staff types and numbers) than anticipated for

the surge hospital, we have opted to rely more heavily on staffing information from the nursing facility setting as it is likely more applicable to the surge situation under study. We anticipate no ICU, OR or ED, for example, leaving surge facility patients who resemble skilled nursing facility patients rather than community hospital patients. Table 6 provides information on other staff types utilized by the nursing facility we reviewed, terms of hours per day.

Table 6: Hours per Day for Allied Health Staffing in Nursing Facilities*

Dietician	4 hours (M-F)
Discharge Planner	Responsibility of Social Services
EKG Technician	Nurse aides are trained to do as needed
Laboratory Technician	Contracted service
Medical Records	8 hours per day (M-F)
Mental Health/Social Services	8 hours per day (M-F) for sub acute/transitional care unit + 8 hours per day (4 days per week) for long-term care patients
Pharmacist	Contracted service
Pharmacy Technician	Contracted service
Phlebotomist	Contracted + nurse aides are trained
Physical Therapist	8 hours per day, 5-7 days per week as needed
Physical Therapy Assistant/Aide	16 hours per day, 5-7 days per week as needed
Respiratory Therapist	Contracted service through oxygen supplier
Speech Therapist	Shared with two other facilities – approximately 13 hours per week
X-Ray technician	Contracted service

*Hours per day not available for contracted services

Other Nursing Facility Staff

Certain staff types are not utilized in the particular nursing facility setting we contacted, or alternatively are contracted out (e.g., Biomedical engineering, morgue workers). Table 7 illustrates the staffing levels observed for all other types of staff in nursing facilities we contacted. The long-term care facility includes a 29-bed sub acute/transitional care unit and 92 long-term care beds. Allied health staff are utilized without assignment to any particular unit, thus no differentiation is made between sub acute/transitional care and long-term care.

Table 7: Hours per Day for Other Non-Clinical Staff in Nursing Facilities

Staff Type	Long-term Nursing Facility (121 beds)
Administration/Administrative Support	8 hours per day (M-F) per unit for unit clerk 8 hours per day (M-F) Billing 8 hours 4 days/week Payroll
Biomedical Engineering	N/A
Central Supply/Materials mgt	N/A Each department orders their own supplies
Communications Specialist	Maintenance Dept
Food Service Supervisor	8 hours per day (M-F)
Cook	24 hours per day
Food Service Workers	40 hours per day
Housekeeping	46 hours per day
Human Resources	NA
Interpreter	NA – Bilingual employees interpret when needed
Laundry	Linen service contracted
Maintenance	8 – 24 hours per day
Morgue Worker	N/A
Public information specialist	N/A
Safety Manager	Maintenance Dept
Security	Maintenance Dept
Transport	Nursing Dept
Volunteers	N/A

*Hours per day not available for contracted services

4.4.5 Numbers of Staff Needed in a Surge Hospital Situation

To estimate the numbers of staff needed under the two Scenarios, we relied on information provided by two community hospital and nursing facility staff, and the opinions of experts in the field of hospital administration, medicine, healthcare human resources, and emergency management. In an emergency situation, staffing levels would be based on the judgment of those in charge and the numbers of available qualified people. Staffing would probably not be as high as is currently reported by the ‘model’ community hospitals. The nurse staffing levels reported at nursing facilities may be more useful, to illustrate the numbers of patients that can be cared for with adequate supplemental ancillary help (i.e., nurse aides). The next table shows a range of staffing levels by staff type, using community hospital levels as an ideal and nursing facility staffing as a suggested minimum.

For purposes of this report, we’re assuming that the patients under the two mass casualty scenarios are equally acute and that staffing levels will vary depending on: 1) the expertise that will be required to care for the two groups, 2) a presumption that the institution of precaution procedures in the infectious population (Scenario 2) would necessitate higher direct care staffing levels because of the additional time required to care for patients on

precautions, and 3) the availability of ancillary staff (e.g., EKG tech, phlebotomist) will impact the number of nursing staff required. A decrease in ancillary staff would necessitate a higher level of nursing staff to accomplish tasks normally the responsibility of ancillary staff. We did not assume that FEMA would deploy one or more DMAT's to assist in staffing the surge facility, although that may be a likely scenario based on historical precedent, if the MCI is localized to one geographic area or region.

Table 8 contains a suggested range of staff needed for Scenario. Estimates of staffing needs are included for those types identified as needed on a daily basis for one or the other Scenario.

Table 8: Estimated Staffing Levels for Surge Facility Scenarios

Staff Type		Scenario 1: Medical/ Surgical	Scenario 2: Infectious Disease	Discussion
Physician and Physician Extenders	Chief Medical Officer	1	1	One person responsible for medical care 24 hours per day/ 7 days per week. Physically onsite 8 hours/ day, M-F, available off-shift and weekends.
	Internist	3-7 FTEs/ 7A - 7P 1 FTE/ 7P – 7A	3-7 FTEs/ 7A - 7P 1 FTE/ 7P – 7A	Each MD, assuming 10 - 15 minutes per patient, could see 48 - 72 patients over 12 hours (7A – 7 P) plus at least one person for night coverage (7P-7A).
	Radiologist	As needed	As needed	Adjust according to patient acuity. May be an increased need with an infectious disease population.
	Infectious Disease Specialist	As needed	As needed	Likely only needed for infectious disease population.
	Nurse Practitioner/ Physician Asst	As needed to supplement internists or nurses	As needed to supplement internists or nurses	Must work under the supervision of an MD, could supplement internist coverage if adequate number of physicians not available or supplement nursing coverage (supervisor or RN).
Nursing	Nursing Director	1 RN	1 RN	One person responsible for nursing care 24 hours per day/ 7 days per week. Physically onsite 8 hours/ day, M-F, available off-shift and weekends.
	Supervisor	1 RN per shift	1 RN per shift	Prefer RN supervisor, but if none available, an experienced LPN would suffice.
	RN	1:5 – 1:15 RN to patient ratios	1:5 – 1:15 RN to patient ratios	Could go as high a 1:40 with adequate LPN, nurse aide and ancillary staff coverage, but highly dependent on patient acuity. Precaution procedures in an infectious disease scenario would require increased staffing levels to accommodate the additional time needed for gowning, disposal of infectious waste, etc.

Table 8: Estimated Staffing Levels for Surge Facility Scenarios

Staff Type		Scenario 1: Medical/ Surgical	Scenario 2: Infectious Disease	Discussion
	LPN	1:5 – 1:15 LPN to patient ratios	1:5 – 1:15 LPN to patient ratios	Could go as high as 1:40 on off-shifts with adequate nurse aide and ancillary staff coverage but highly dependent on patient acuity. Precaution procedures in an infectious disease scenario would require increased staffing levels to accommodate the additional time needed for gowning, disposal of infectious waste, etc.
	Nurse Aide	1:6 (day shift) 1:8 (eve shift) 1:15 (night shift) NA to patient ratios	1:6 (day shift) 1:8 (eve shift) 1:15 (night shift) NA to patient ratios	Adjust nurse aides up or down according to licensed nurse coverage and ancillary staff support. Precaution procedures in an infectious disease scenario would require increased staffing levels to accommodate the additional time needed for gowning, disposal of infectious waste, etc.
Allied Health	Dietician	1 FTE RD	1 FTE RD	Dependent on the level of supervision needed in Dietary Department, number of admissions and discharges, level of patient acuity.
	Discharge Planner	2 - 4 FTEs (M-F normal business hours) Discharge planners or social workers	2 - 4 FTEs (M-F normal business hours) Discharge planners or social workers	Adjust up as needed according to number of admissions and discharges. Assumed one SW per two units (80 beds)
	EKG Technician	1 FTE to cover 7-3 M-F	1 FTE to cover 7-3 M-F	If no EKG tech available, EKGs may be done by nurses, NP/PAs, physicians, EMTs. Interpretation done by physician or interpretive software program if available.
	Laboratory Technician	2.1 FTEs (7A – 7 P, 7 days/week) One person to run basic hematology, chemistry, urinalysis, bacteriology tests. Assume no blood bank, no type and x-match needed.	2.1 FTEs (7A – 7 P, 7 days/week) One person to run basic hematology, chemistry, urinalysis, bacteriology tests. Assume no blood bank, no type and x-match needed.	Adjust up according to the number of specimens to be processed. May not be needed if specimens are sent out. Nursing able to perform certain screens (e.g., dipstick urine, hemocult) on the unit.

Table 8: Estimated Staffing Levels for Surge Facility Scenarios

Staff Type		Scenario 1: Medical/ Surgical	Scenario 2: Infectious Disease	Discussion
	Medical Records	1 FTE	1 FTE	Adjust up according to the number of admissions and discharges.
	Mental Health Worker/Social Worker	2 –4 FTEs (M – F, 8A – 4P)	2 - 4 FTEs (M – F, 8A – 4P)	Adjust up according to patient, family and staff needs. Assumed one SW per two units (80 beds)
	Pharmacist	2.1 FTEs RPh (7A – 7P, 7 days/week)	2.1 FTEs RPh (7A – 7P, 7 days/week)	Adjust up according to patient needs. If drugs were supplied from another location, would not be needed.
	Pharmacy Technician	1-2 FTEs CPhTs	1-2 FTEs CPhTs	Adjust up according to patient needs. Must be supervised by pharmacist.
	Phlebotomist	1 FTE able to perform venipuncture 7 – 3 M-F	1 FTE able to perform venipuncture 7-3 M-F	If not available, some nurses, NP/PAs, physicians, and EMTs would be able to draw blood.
	Respiratory Therapist	1 FTE RT needed primarily to set up, monitor and troubleshoot problems with ventilators	1 FTE RT needed primarily to set up, monitor and trouble shoot problems with ventilators	Adjust according to patient needs. Nurses/physicians/NP/PAs and EMTs are able to assess lung sounds, provide chest physical therapy.
	X-Ray Technician	1 FTE	1 FTE	May not be needed on a daily basis, but requires specialized skills. It's likely that coverage would not be available from other staff types.
All Other Types of Staff	Administrative Support	3-6 FTEs (8A – 4P, M-F)	3-6 FTEs (8A – 4P, M-F)	Includes payroll (1 person), billing (1 person) and 1-4 people to assist with unit clerk-level work.
	Biomedical Engineering	1 FTE 7-3 M-F and on-call	1 FTE 7-3 M-F and on-call	As needed to deal wit problems associated with medical monitoring equipment.
	Central Supply/Materials Mgt	2-4 FTEs 1-2 people covering 7A – 7 P, 7 days/week	2-4 FTEs 1-2 people covering 7A – 7 P, 7 days/week	To oversee ordering, distribution of supplies. Adjust up as needed based on acuity of patients.
	Food Service Supervisor	1 FTE (M-F, 8A – 4P)	1 FTE (M-F, 8A – 4P)	To oversee the dietary department, order food and supplies, schedule dietary staff.

Table 8: Estimated Staffing Levels for Surge Facility Scenarios

Staff Type	Scenario 1: Medical/ Surgical	Scenario 2: Infectious Disease	Discussion
Cook	2-4 per meal	2-4 per meal	Food Service Supervisor may also act as cook.
Food Service Workers	4-6 per meal	4-6 per meal	Increased staff needed at peak meal times.
House keeping	5-9 people 7A – 7 P 1-2 people 7P – 7A	5-9 people 7A – 7 P 1-2 people 7P - 7A	Assuming one person per unit (40 beds) plus one person for common areas, trash from 7A – 7 P. One – two people 7 P - 7A.
Human Resources	1 FTE (M-F, 8A – 4P)	1 FTE (M-F, 8A – 4P)	Assist with staff support/dependent care. May need to recruit dependent care staff/volunteers to cover all shifts as needed.
Laundry			Adjust depending on equipment available. And acuity of patients. Assuming three complete bed changes per day.
Maintenance	3-4 FTEs (1-3 people, 8A – 4P, 7 days per week)	3-4 FTEs (1-3 people, 8A – 4P, 7 days per week)	May assist with housekeeping, safety and security as needed.
Morgue Worker	1 FTE	1 FTE	As needed.
Public Information Specialist	1 FTE	1 –2 FTEs	An infectious disease scenario would likely require more communication with media, families, etc.
Safety Manager	1 FTE	1 FTE	May have maintenance responsibilities also.
Security	8-12 FTEs (1-3 people per shift, 7 days per week, 24 hours per day)	8 – 12 FTEs (1-3 people per shift, 7 days per week, 24 hours per day)	Adjust according to scenario, number of entrances, facility location.
Transport	1.5 - 3 FTEs (1-2 people covering M-F, 7A-7P)	1.5-3 FTEs (1-2 people covering M-F, 7A-7P)	Adjust according to staff availability. All staff capable of transport.
Volunteers	As available	As available	Assist with transport, delivery of supplies and meals, administrative/clerical functions, dependent care, etc.

4.5 Staff Organization

In a mass casualty situation where a shuttered hospital is reopened, staff will be functioning in an unfamiliar environment and likely working with others previously unknown to them. Staff confusion and stress surrounding their work and personal situations will undoubtedly be high. Utilizing a standardized organizational system that clarifies individual and team responsibilities, chain of command, and communication pathways will facilitate maximum staff efficiency in a difficult situation.

It is not clear who will ‘own’ the surge facility or will have ultimate authority and responsibility for it. Several alternatives are possible and should be considered by State planners. At least two possibilities are: a) transferring temporary control/responsibility of the surge facility to one of the major health systems or hospitals in the area; or b) conferring temporary control/responsibility on a State, county or city health department. If alternative (b) is considered, it would be highly advisable to enlist the assistance of local hospital leaders and administrators with experience in running a hospital. In either case, a command and control structure will need to be implemented, in advance, so that all parties are prepared to act if a mass casualty occurs.

Hospital Emergency Incident Command System (HEICS)

The Hospital Emergency Incident Command System (HEICS) is “an emergency management system which employs a logical management structure, defined responsibilities, clear reporting channels, and a common nomenclature to help unify hospitals with other emergency responders.”⁴³ It was released as a generic disaster response plan modeled after the FIRESCOPE management system, which was developed in the early 1970’s out of a partnership between Federal, State, and local fire agencies. The Hospital Emergency Incident Command System (HEICS) has been made available with copies sent throughout the United States, Canada and across the globe. HEICS is “becoming a standard for health care disaster response and offers the following features:

- Predictable chain of command;
- Flexible organizational chart allows flexible response to specific emergencies;
- Prioritized response checklists;
- Accountability of position function;
- Improved documentation for improved accountability and cost recovery;
- Common language to promote communication and facilitate outside assistance;

⁴³ San Mateo County Health Services Agency Emergency Medical Services. *The Hospital Emergency Incident Command System*. Third Edition, June 1998.

- Generic approach to command and control that is designed to function with positions instead of relying on key individuals and
- Cost effective emergency planning within health care organizations.”⁴⁴

HEICS features a flexible management organizational chart, which allows for a customized hospital response to the crisis at hand. The system may be activated on a limited basis and expanded as more personnel become available or are required. In early phases, staff may assume more than one role and as more staff becomes available, these multiple roles are handed off to other qualified staff. The organizational chart consists of four major area section chiefs reporting to the Incident Commander. Each of the section chiefs (Logistics, Planning, Finance and Operations) has a number of supporting staff. Each position has an accompanying *Job Action Sheet* describing whom the person reports to, the mission and immediate, intermediate and extended tasks. This organizational structure provides a platform for common terminology to enhance communication and improve documentation. HEICS materials are offered without charge to interested hospitals.

In a surge hospital situation, the HEICS system provides a standardized organizational plan, which may be familiar to staff recruited to work in the building. Based on a disaster response, many of the tasks listed on job actions sheets are not appropriate, however, because of the structure provided it appears to be an appropriate tool to help organize staff to function in an unfamiliar and confusing environment. The job action sheets are useful by outlining job responsibilities, identifying who reports to whom, and prioritizing tasks.

Key Positions and Responsibilities

HEICS specifies a variety of roles and responsibilities for incident command, many of which are applicable for the situation of reopening a shuttered hospital for surge capacity expansion.

Incident Commander. The Incident Commander assumes overall leadership. He/she is assisted by several advisors/coordinators who deal with the new media, other agencies, security and safety, and physician assignment. The four major section chiefs are assigned by the incident commander. Each chief designates directors and unit leaders to sub-functions. Figure 1 illustrates a typical organizational chart adapted for this particular surge hospital situation, (i.e., no emergency department, no critical care, no surgical service, no maternity/nursery, no pediatrics).

Logistics Section Chief. The Logistics Section Chief focuses on operations associated with the physical environment and ensuring adequate levels of food, shelter and supplies. He/she is responsible for power, utilities, sanitation, water, trash, communication systems (telephone, intercom, paging system), transportation of supplies, patients and staff, and meals for patients and staff.

Planning Section Chief. The Planning Section is responsible for compiling information about the current situation and developing long range planning. He/she is to keep staff up to date regarding the current disaster situation inside the hospital and in the surrounding area, maintain an inventory of available staff and volunteers, organize and coordinate medical and nursing staff, track patient census by location and status and anticipate needs.

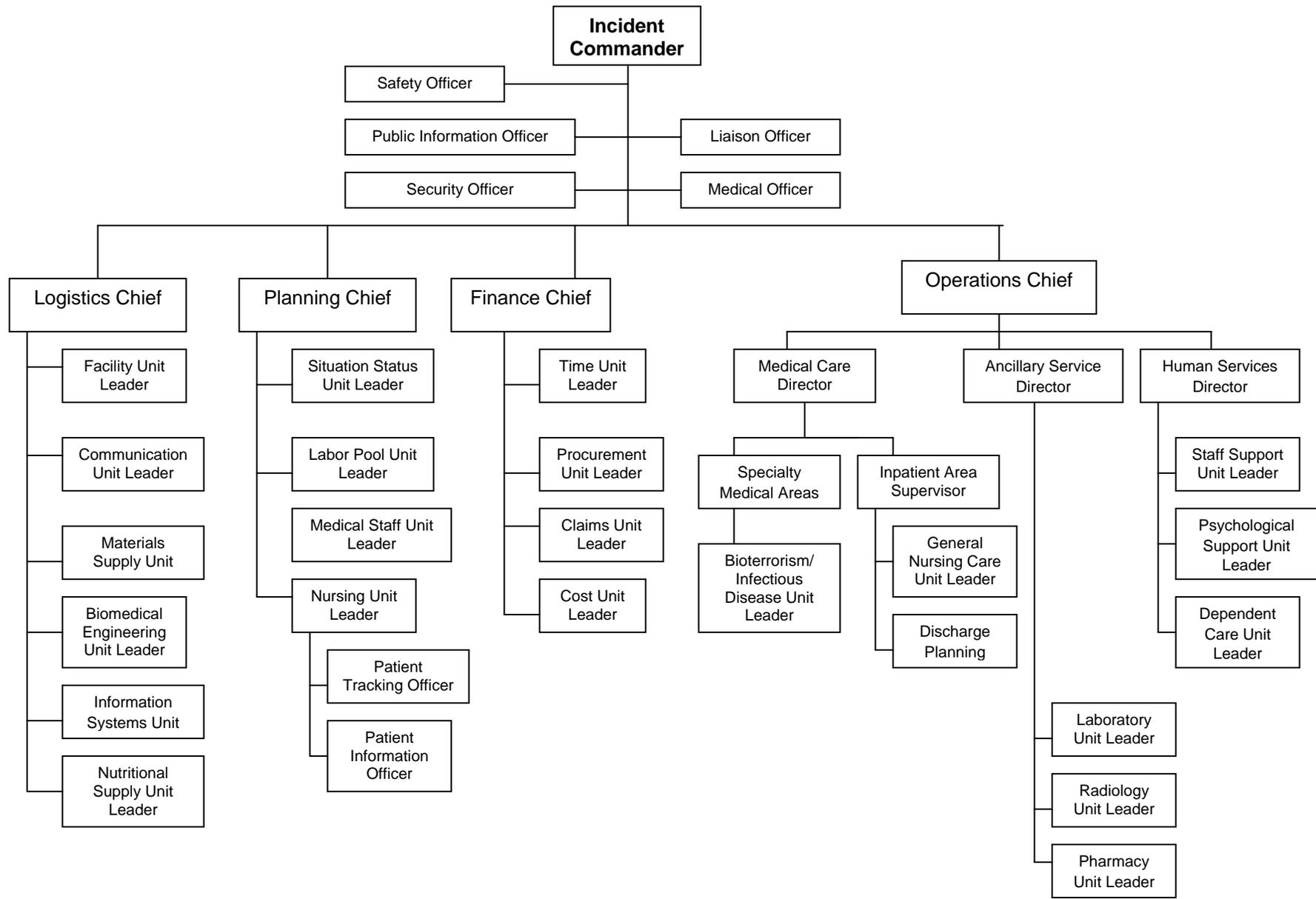
⁴⁴ <http://www.emsa.ca.gov/Dms2/HISTORY.HTM>

Finance Section Chief. The Finance Section is to monitor the utilization of financial assets. He/she is responsible for the accounting and documentation of all resource expenditures, providing cost analysis data, maintaining personnel time records, negotiating and/or issuing contracts to purchase or obtain resources and receiving and investigating all accident/incident claims resulting from an employee action on hospital property.

Operations Section Chief. This is a large section covering the overall delivery of medical care, ancillary services and staff support. This group is responsible for triage, patient admissions and discharges, planning for short and long staffing and medical resource needs, morgue services, overseeing laboratory, radiology, and pharmacy services, and the social and psychological needs of the staff, patients and families. This group would also be responsible for sheltering and feeding of staff and volunteer dependents.

Recommendation: planners should establish an incident command structure, familiar to all who will be called upon to serve.
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Exhibit 1: Incident Command Structure



4.6 Staffing Based on the Modular Emergency Medical System Acute Care Center

The discussion above describes the numbers and types of staff needed in a surge hospital situation based on information provided by community hospital and nursing facility staff, and the opinions of experts in the field of hospital administration, medicine, healthcare human resources and emergency management. A range of needed staffing numbers was determined by using the community hospital ratios as an ideal and the nursing facility staffing as a suggested minimum. Another model for determining staffing numbers for a surge facility is that provided under the Modular Emergency Medical System (MEMS), which is based on the Incident Command System described in the previous section.

The Modular Emergency Medical System (MEMS) was designed as a template to assist communities to rapidly increase their medical capacity to deal with casualties from a large-scale biological weapons incident.⁴⁵ The concept came out of a series of workshops conducted in 1998 by the Domestic Preparedness Biological Weapons Improved Response Program (BW IPP) under the auspices of the Department of Defense Domestic Preparedness Program. MEMS focuses on managing an incident where the number of casualties significantly overwhelms a community's existing medical capabilities and involves an outbreak of a disease. Management of the system is based on the Incident Command System, which is commonly utilized by the emergency response community. The system establishes a framework for expanding patient care through the use of two modules – Neighborhood Emergency Help Centers (NEHCs) and Acute Care Centers (ACCs). Centers, which may be linked to an area hospital or to a community emergency management office. The NEMCs are temporary outpatient care centers that deal with non-critical and psychosomatic complaints, keeping these patients away from hospital emergency departments. NEMCs provide basic medical evaluation and limited treatment, but primarily are seen as distributors of prophylactic medications and self-help information. The ACC is designed to provide inpatient treatment for patients with a bioterrorism-related illness. The ACC provides basic agent-specific and ongoing support care therapy (i.e., antibiotic therapy, hydration, bronchodilators and pain management) while hospitals focus on the treatment of critically ill patients.⁴⁶ This remainder of this section focuses on the ACC and its applicability to this project.

The maximum capacity of an ACC is 1,000 beds, organized in increments of 250 bed pods and 50-bed nursing subunits. It is modeled after the Incident Command System with the following main components along with their respective responsibilities.

- ACC Administrator – responsible for command and control functions of the entire center;

⁴⁵ U.S. Department of Defense, 2001. A Mass Casualty Care Strategy for Biological Terrorism Incidents – Neighborhood Emergency Help Center, Prepared in response to the Nunn-Lugar-Domenici Domestic Preparedness Program, May 1, 2001.

⁴⁶ U.S. Department of Defense, 2001. A Mass Casualty Care Strategy for Biological Terrorism Incidents – Acute Care Center, Prepared in response to the Nunn-Lugar-Domenici Domestic Preparedness Program, December 1, 2001.

- Communications Section – coordinate with the area’s Emergency Operations Center, maintains an activity log that documents all activities including bed status reports, operational problems and similar items;
- Security/Safety Section – responsible for assigning security staff, identification procedures, and environmental health and sanitation;
- Community Liaison Section – responsible for responding to community concerns, preparing information for the media and outside agencies;
- Functional Units
- Records/Planning Section – responsible for all the paperwork generated within the ACC, maintaining staff logs, patient registration, treatment and disposition records. A Patient Care Coordinator, within this section, maintains a control register identifying patients admitted to the ACC. The PCC’s role is similar to a nursing supervisor as he/she is aware of nursing staff and bed availability. He/she directs admitted patients to the appropriate unit. If staffing permits, a Labor Pool Leader may be added to hospitals focus on the treatment of critically ill patients.⁴⁷ This remainder of this section focuses on the ACC and it’s applicability to this project.

The maximum capacity of an ACC is 1,000 beds, organized in increments of 250 bed pods and 50-bed nursing subunits. It is modeled after the Incident Command System with the following main components along with their respective responsibilities.

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Security/Safety Section – responsible for assigning security staff, identification procedures, and environmental health and sanitation;

Community Liaison Section – responsible for responding to community concerns, preparing information for the media and outside agencies;

Functional Units

- Records/Planning Section – responsible for all the paperwork generated within the ACC, maintaining staff logs, patient registration, treatment and disposition records. A Patient Care Coordinator, within this section, maintains a control register identifying patients admitted to the ACC. The PCC’s role is similar to a nursing supervisor as he/she is aware of nursing staff and bed

⁴⁷ U.S. Department of Defense, 2001. A Mass Casualty Care Strategy for Biological Terrorism Incidents – Acute Care Center, Prepared in response to the Nunn-Lugar-Domenici Domestic Preparedness Program, December 1, 2001.

availability. He/she directs admitted patients to the appropriate unit. If staffing permits, a Labor Pool Leader may be added to assist with staff assignments.

- Medical Operations Section – consists of the nursing subunits, pharmacy services, family services (optional) and temporary morgue.
- Supply Logistics Section – responsible for obtaining and maintaining the facility, equipment and supplies as well has contracts for services, supplies and equipment. Section includes the Materials/Supply, Food Service, Resource Transportation, Housekeeping and Maintenance functional units.
- Finance Section – if needed and if staffing permits, a finance director is assigned responsibility for providing monies for procuring special equipment or supplies, contracting with vendors, timekeeping, cost analysis, collection of insurance information from patients and any other financial aspects of the incident.

The ACC is physically set up so that one 250-bed pod, composed of five 50-bed nursing subunits is completed before beginning the physical setup of the next 250-bed pod. Patients are admitted when the first 50-bed nursing subunit is completely set up and staffed. When the nursing subunit is at 70-80 percent capacity, another subunit is opened. When the first 250 beds reach 50-60 percent capacity the next pod should be ready for receipt of patients.

Suggested staffing per 12-hour shift for a 50-bed subunit is as follows:

1 physician	1 physician’s assistant or nurse practitioner
6 RNs or a mix of RNs and LPNs	4 nursing assistants/nursing support technicians
2 medical clerks/unit secretaries	1 respiratory therapist
1 case manager	1 social worker
2 housekeepers	2 patient transporters

The minimum number of staff providing direct patient care per 12-hour shift is 12, which includes the physician, the physician extenders, nurses and nursing assistants. If staffing permits, each nursing subunit should have a unit leader (either physician or RN). Staffing in non-direct care areas for the maximum capacity ACC is estimated at approximately 50 with some variability depending on the number of, for example, security guards needed, and available volunteers.⁴⁸ ACC developers caution that precise numbers of each type of staff will be dependent on the type of disaster and resulting illnesses. The ACC report recommends staffing for other departments as shown in the following table:

⁴⁸ Estimate based on five nursing subunits or 250 beds to allow comparison with model surge facility.

Table 9: ACC Recommended Staffing

ACC Administrator	One person – may be an administrator, nurse or physician executive
Communications Section	Director and a communications specialist
Security/Safety Section	Director and enough security guards for every entry point and potentially high risk areas, e.g., pharmacy
Community Liaison Section	Director and Liaison Assistant
Records/Planning Section	Director Admission/Registration (one clerical supervisor and 2-4 clerks), Labor Pool Leader Volunteers (admissions, nursing area, morgue supply and transportation) Internal Patient Transportation (Clerk and 6 transporters)
Medical Operations	Director Patient Care Coordinator Staffing for nursing subunits (see above) Pharmacy unit leader, pharmacist and pharmacy technician Family Services – a licensed social worker or chaplain with volunteers to assist Temporary morgue – Unit leader, one clerk and one volunteer
Supply/Logistics Section	Director Maintenance unit leader, clerk and five volunteers Transportation unit leader, transporters Food service supervisor, one ordering clerk and four food handlers per 12 hour shift for each 250-bed pod. (Food is prepared offsite for patients and staff.) Housekeeping supervisor and 1-2 per nursing subunit, 1 for administrative areas and volunteers
Finance Section	Director If needs /resources available may add cost accounting, time and procurement.

Sources: Skidmore, S, Wall, WT, Church, JK. 2003. Modular Emergency Medical System: Concept of Operations for the Acute Care Center (ACC)

The ACC suggested staffing numbers for the types of staff identified are fairly close to what we had proposed based on expert opinion, taking into consideration the different bed configurations – the 50-bed ACC subunit as compared to the FTE’s for the 200 –300 bed surge hospital. Our staffing estimates include additional staff types designated as needed depending on patients needs, e.g., an infectious disease specialist, and a radiologist as well as some staff types to cover operations that the ACC does not include in its scope of work, for example food preparation.

4.7 Preparing to Staff a Surge Facility

We identified possible staffing sources based on Federal, State and local resources. Declaration of a local, State and Federal disaster activates various level emergency operations making available an array of resources.

In the event of a disaster, local governments utilize their own response and community-to-community mutual aid agreements first. If the disaster depletes or threatens to deplete local response capabilities, the local government requests assistance from the State. If warranted, the State may request assistance from the Federal government and nearby States. In Massachusetts, emergencies or disasters are divided into four levels based upon the severity of the situation and potential to intensity in severity and anticipated local, State and Federal assistance required. Level 1 designates normal day-to-day operations while Level IV refers to an emergency event involving all State and Federal resources.⁴⁹

4.7.1 Federal Resources

National Disaster Management Teams

The primary medical disaster response personnel resource on the Federal level is the National Disaster Medical System (NDMS). Established in the early 1980's, the NDMS exists as a partnership between Department of Health and Human Services (DHHS), the Department of Veterans Affairs (VA), Department of Defense (DoD) and the Federal Emergency Management Agency (FEMA) now under the Department of Homeland Security (DHS). There are approximately 7,000 volunteer health professionals organized in general and specialty teams. The general disaster medical assistance teams (DMATs) are 35-member teams, which include two physicians, 10 nurses, 10 EMTs/Paramedics and support personnel (communications, logistics, maintenance and security) and are categorized according to their ability to respond. Each team generally has many more than 35 members so as to provide "redundancy for each job role." Teams are locally sponsored and community-based and maintain a Memorandum of Understanding with the U.S. Public Health Service, which enables them to be "federalized" upon activation of a team. Federalization allows team members to legally function in any State and covers liability and workers compensation issues. Specialty teams include pediatric, burn, mortuary service, nursing, veterinarian, mental health and pharmacy teams. The table below shows team types, composition, deployment schedules and availability of teams applicable to this project.

⁴⁹ Massachusetts Comprehensive Emergency Management Plan, September 2004.

Table 10: Components of National Disaster Medical Assistance System

Team	Type	Composition	Deployment	Availability
DMAT	Type I DMAT	105 or more deployable members with 12 physicians, and at least 3 physician assistants (PAs) or Nurse Practitioners (NPs), 3 RNs, 3 pharmacists and 3 paramedics.	Ready within 6 hours of activation.	9 teams
	Type II DMAT	90 or more deployable members with at least 9 physicians and at least 3 PAs or NPs, 3 RNs, 3 pharmacists and 3 paramedics.	Ready within 12 hours of activation.	12 teams
	Type III DMAT	50 or more deployable members with at least 6 physicians, and at least 2 PAs or NPs, 2 RNs, 2 pharmacists, and 2 paramedics.	Deployable locally for intrastate emergency situations ready within 24 hours	18 teams
	Type IV DMAT	Teams under development.	May supplement other teams as necessary to allow members to obtain experience.	16 teams
National Pharmacy Response Teams		Pharmacists, pharmacy technicians and students of pharmacy organized in each of the ten Department of Homeland Security Regions used to assist in chemoprophylaxis or vaccinations or in another scenario requiring many pharmacists.	Deployed in the event of a declared national disaster	10 teams
National Nurse Response Teams		Teams of registered nurses who could be called upon to assist in chemoprophylaxis or vaccinations. In the future will be two large regional teams (eastern and western regions of the country)	Team size varies from 5 – 30 members. Deployed in the event of a declared national disaster	10 teams

^a Availability based on communications with FEMA/NDMS staff member 11/04 and National Disaster Medical System, 2/1/05.

Public Health Service Commissioned Corps

The Public Health Service (PHS) Commissioned Corp, led by the U.S. Surgeon General, consists of approximately 6,000 officers available to “furnish health expertise in time of war or other national or international emergencies” as well as carry out other health promotional activities. Dentists, engineers, health services professionals (social workers, physician assistants, optometrists, statisticians, computer scientists, dental hygienists, medical records administrators and others), nurses, pharmacists, physicians, scientists, therapists (physical,

occupational, speech and audiology), and veterinarians are represented in the corps. Health professionals are assigned to Federal, State or local agencies or international organizations to accomplish their mission. There are slightly over 2,000 regular corps on active duty and about 3,900 reserve corps on active duty. There are also inactive reserve corps that may be activated with or without their consent depending on the level of emergency. In a national emergency or war, the PHS commissioned corps may be declared a military service and branch of the land and naval forces. Reserve Corps officers may be called to active duty without their consent.⁵⁰ The table below shows approximate numbers of each type of PHS type.

Table 11: National Public Health Service

Category	Description	Number of Regular and Reserve Corps as of 1/18/05
Medical	MD or DO with one year postgraduate medical education (internship or first year residency)	1133
Dental	DDS or DMD	471
Nurse	Bachelor or master's degree from an accredited nursing program.	1291
Engineer	Bachelor's or master's degree in engineering from an approved engineering program	410
Scientist	PhD, DPH, DSc, or EdD	258
Environmental Health Officer	Bachelor, Master's or Doctoral degree in Environmental health, Industrial hygiene, or Occupational health, or Certification as an Industrial Hygienist or Health Physicist.	379
Veterinary	DVM	88
Pharmacy	BS or PharmD	902
Dietetics	Bachelor's, Master's or Doctoral degree in Food and Nutrition, Dietetics, Institutional Management, Public Health Nutrition, Food Science, Sports Nutrition or Animal Nutrition	88
Therapy	Physical therapist, occupational therapist, speech and language pathology and audiology	120
Health Services Officer	Computer science/informational technology, dental hygiene, medical record administration, medical technology, physician assistant, biostatistics, chemistry, epidemiology, health education, health physics, health service administration, public health, social work, clinical psychology, optometry, podiatry.	850

Sources: Statistical Report, Public Health Service, Management Information System (http://dcp.psc.gov/rpt_select.asp)

The Department of Veterans Affairs

Although there are many clinicians employed by Veterans Affairs (physicians, RN/LPNs, respiratory therapists, dentists, dieticians, medical records administrators and technicians,

⁵⁰ Department of Health and Human Services, PHS Personnel Instruction, PHS-CC 644, Chapter CC23.5, Section E, p.4-5. 10/7/99.

physical and occupational therapists, psychologist and social workers), these staff members are permanently assigned to a facility and would not be relocated in the event of an emergency. According to a VA contact, these staff members could volunteer to assist in an emergency but unlike the military branches of service (e.g., public health service) would not be reassigned. Their licenses, however, are recognized in any State and any who did volunteer would not have to be re-licensed in the disaster State.

Recommendation: federal staff resources (e.g. NDMS, Public Health Service, VHA) could be made available in certain local mass casualty emergencies not designated as national disasters.

Medical Reserve Corps

The Medical Reserve Corps (MRC) are community-based organizations within the Citizen's Corp and the USA Freedom Corp. Leadership responsibility of the MRC falls under Office of the Surgeon General within the Department of Health and Human Services. MRCs are locally developed and managed with local volunteers for local needs. They consist of both health professionals and interested citizens with the goal to provide an organized response during times of emergency and general public health needs. Initiated in 2002, with two million dollars of grant money, and extended and expanded in 2003 to \$ 8 million, a total of 207 programs in 44 States were funded. As of September 2004, there are 212 MRC units with more than 27,500 volunteers. Grantees received up to \$50,000 to begin or continue development of MRC units. MRC unit members cannot be federalized like other Federal response teams, thus are intended for use only in the local community in which they were developed. Because of their local-base, MRCs will be described in greater detail under Local Resources.

National Urban Search and Rescue Response System

The National Urban Search and Rescue (US&R) Response System, established under the authority of the Federal Emergency Management Agency (FEMA) in 1989 is a framework for structuring local emergency services personnel into integrated disaster response task forces.⁵¹ There are 28 Task Forces (or teams) in the U.S. able to respond within six hours in the event of a disaster.⁵² Teams have all the necessary tools, equipment and personnel needed to assist in search and rescue operations. Each task force consists of two 35-person teams, four canines and a comprehensive equipment cache. Team members are specialized in search, rescue, technical, medical, hazmat or planning areas. Each team is composed of the following personnel:

⁵¹ <http://www.fema.gov/usr/about.shtm>

⁵² There is one team from Arizona; eight from California; one from Colorado; two from Florida; two from Virginia, and one each from Indiana, Maryland, Massachusetts, Missouri, Nebraska, Nevada, New Mexico, New York, Ohio, Pennsylvania, Tennessee, Texas, Utah and Washington State.

Table 12: Federal Emergency Management Agency: Urban Search and Rescue Task Force Composition

Specialization Area	Members	Number	Responsibility
Commander	Leader	2	Overall management and coordination of all Task Force operations
	Safety Officer	2	
Search Team	Manager	2	Locate live victims trapped in collapsed structure utilizing a combination of canine and technical/electronic search techniques.
	Canine Search Specialist	4	
	Technical Search Specialist	2	
Rescue Team	Manager	2	Evaluation of compromised areas, structural stabilization, breaching, site exploration and live victim extrication.
	Squad officer and 5 rescue specialists/squad (4 squads)	24	
Medical Team	Physicians	2	Provide pre-hospital emergency care for victims.
	Paramedics	4	
Planning Team	Manager	2	Support to the overall search and rescue mission.
	Structural Specialists	2	
	Heavy Rigging Specialists	2	
	Tech Info Specialists	2	
	Communication Specialists	2	
Logistics Team	Manager	2	Responsible for mobilization/demobilization, provision and maintenance of equipment and transportation support.
	Logistics Specialists	4	
Hazmat Team	Manager	2	Monitor the atmosphere for a variety of natural and man-made hazards
	Hazmat specialists	8	

Sources: Public Relations Materials from Massachusetts Task Force 1 (MA-TF1 US&R)

When a Federal disaster is declared, FEMA deploys the three closest teams. Each team member is registered as a volunteer with FEMA, and upon activation becomes a Federal employee with tort liability, workers compensation and long-term liability protection. Team members may be deployed for up to 14 days. To maintain a constant state of readiness, team members attend regular drills and meetings, and provide the necessary information to keep personnel files current (current physical exam, immunizations, credentials, and a criminal background check).

The Massachusetts Task Force Manager was contacted in connection with this study. The MA-1 Task Force draws its volunteers from all the New England States with each position triple filled. There are 165 people who train on a monthly basis. MA-1 can supply 80 people on a four-hour notice. According to his volunteer roster, the group consists of:

- Physicians (4 + 2 veterinarians who are cross trained as logistics people because the system does not call for veterinarians);

- Medical Specialists (RNs and Paramedics) (9);
- Rescue specialists, officers and managers (54);
- Canine Search specialists (13);
- Communication specialists (e.g., radio technicians) (4)
- Hazmat technicians (20);
- Logistics managers and specialists (27)
- Planning managers (2)
- Rigging specialists (6)
- Safety (3)
- Search Manager and specialists (6)
- Computer operators (6);
- Structural engineers (5).

Many of the volunteers, however, are cross-trained to one or more positions. The Task Force manager believed that his teams would be able to assist in staffing a surge facility. Although not all positions would be needed, because they train regularly as a team, he felt that they would be much more efficient than a group of volunteers brought together for the first time in an unfamiliar stressful situation.

4.7.2 State Personnel Resources

State and County Departments of Public Health

In the event of a mass casualty event, State and county health department employees will likely be engaged in emergency management operations and not available to assist in staffing a surge facility. Under the Massachusetts Comprehensive Emergency Management Plan, the Massachusetts Department of Public Health (DPH) is the primary support agency for Emergency Support Function (ESF) 8 (Health and Welfare). If the emergency plan is activated, DPH is responsible for coordinating public health, mental health, medical and health care resources. They would be assisting local and regional entities in identifying and meeting the health, medical and mental health needs of victims, emergency responders and the general public. Since there are a limited number of physicians and nurses within the MDPH who and they have other responsibilities, they would probably not be a good source for staffing. (Note that Massachusetts does not have county health departments, relying instead on local Boards of Health. In other States, staff from county departments may be able to contribute to this effort.)

4.7.3 Local Government Personnel Resources

Local city and town departments of public health, even smaller in size than State departments, will likely be involved in emergency operations and not a reasonable source for staffing a surge facility. The local health department, however, may have access to names and contact information of residents with medical credentials, who may be available to assist

in some capacity. In the course of this project, one researcher was contacted by her town's public health nurse, for confirmation of her nursing license and requesting a response as to whether this individual would be available in the event of an emergency.

4.7.4 Non-Government Personnel Resources

American Red Cross

The role of the American Red Cross in disaster situations has been, in addition to sheltering and blood related activities, providing Family Assistance Centers. These centers, staffed by mental health professionals provide information, counseling and support to family members affected by the disaster. The ARC contact explained that their nurses do not typically provide direct care and would not be available to staff a surge hospital. The trained mental health workers, however, could be available provided there was a pre-established partnership with the hospital. The mental health workers are generally licensed social workers trained by the ARC. There are approximately 130 trained mental health volunteers in Massachusetts. Some are employed by the State's Department of Mental Health, which because of the State's disaster leave law would be available for up to three weeks to respond to a disaster. Some would be available to travel, while others could respond only locally.

Out of Area Hospitals

In the event that the mass casualty event is not widespread, it is possible that staff from out of area hospitals could be available. Communities would have to execute mutual aid agreements with surrounding area hospitals to specify where additional staff might be obtained.

Temporary Medical Staffing Agencies

Temporary staffing agencies provide nurses (RN, LPN), nurse aides, home health aides, homemakers, and allied health staff (physical therapists, occupational therapists, speech therapists) to hospitals, nursing homes, clinics and private homes. Agencies may be locally owned or operated or part of a national multi-agency corporation. Individuals that work for a temporary agency may or may not be employed in another medical setting, limiting their availability. The number of staff available to staff a surge facility would require an assessment of locally available services and the availability of out-of-area staff through a multi-agency chain. Such an assessment would be best performed by the State or local emergency management system, as agencies consider the numbers and types of clients and employees as sensitive information. Assessments would require periodic updating as agencies and individuals working through the agencies change frequently.

Volunteer Programs

Each State (except for South Dakota) has a State agency to coordinate and oversee community service and volunteerism. In Massachusetts, the Massachusetts Service Alliance is a private nonprofit organization tasked with "creating and supporting high quality service and volunteer opportunities for all age groups." The Alliance invests public and private funds in community-based organizations. The agency's website (<http://www.mass-service.org/>) provides a complete listing and description of funded volunteer programs. These volunteer programs may provide an additional source for surge facility non-clinical staff types, which are described below.

Corporation of National Community Service and USA Freedom Corp

The Corporation for National and Community Service, created in 1994, is now part of USA Freedom Corp, the White House Initiative to coordinate citizen volunteer efforts. Senior Corps and AmeriCorp National Civilian Community Corp (NCCC), State and National programs, which are Corporation programs, are potential sources for volunteer staffing for a surge facility. Each State has a Corporation office, which could provide information specific to the programs and volunteers available locally.

Citizen Corps

Citizen Corps is a component of USA Freedom Corp, coordinated and managed at the local level by Citizen Corps Councils, and includes Neighborhood Watch programs, Community Emergency Response Teams (CERT), Volunteers in Police Service and Medical Reserve Corps (MRC). CERT programs that provide training in emergency preparedness and basic response techniques and MRC programs that coordinate volunteers trained in healthcare and others interested in public health issues are two programs that potentially could supply volunteers to a surge facility. In Massachusetts, there are approximately 107 cities or towns that are at various stages of organizing CERT teams. CERT training includes 20 hours of sessions on disaster preparedness, fire suppression, basic disaster medical services, light search and rescue, team organization and protection against terrorist threats. In Massachusetts, there are 11 MRC teams.

Medical Reserve Corps

Locally-based Medical Reserve Corps (MRCs) are partnered with local government or non-government organizations to coordinate the skills of physicians, nurses, health professionals and others who are willing to volunteer during an emergency and other times of community need. Partnering entities include health departments, cities, counties and towns, churches, educational institutions, hospitals, fire departments, emergency medical service providers, nursing associations, Red Cross chapters, and DMATs.

As one MRC coordinator explained, each MRC is different, depending on its stage of development, leadership and the resources in the local community. For example, MA-1 US&R is an MRC, in addition to a FEMA search and rescue team. When formed, this MRC had a ready supply of over 160 trained volunteers who drill together monthly, and a paid office support staff to keep personnel records kept up-to-date. In contrast, another MRC, sponsored by a faith-based organization, has over 50 volunteers, one third of whom are medical personnel and two-thirds that have no clinical skills. This group consists of the following volunteers:

- | | |
|------------------------------------|------------------------------|
| 10 physicians | 19 nurses (18 RNs and 1 LPN) |
| 1 physician's assistant | 1 veterinarian |
| 1 public health worker | 2 pharmacists |
| 5 behavioral health/social workers | 1 physical therapist |
| 1 nurse aide | 3 business managers |
| 38 administrative assistants | 1 driver |
| 2 funeral directors | 2 chaplains |

3 financial experts

1 public relations expert

1 medical supply person

1 public health advisor

The coordinator cautioned that many of the clinical volunteers are employed at hospitals, which would likely call them into work in the event of a disaster, which would severely limit their availability. MRCs based at hospitals would be affected to an even greater degree.

SeniorCorps

SeniorCorps recruits Americans 55 years and older to participate in a variety of programs, one of which is the Special Volunteer Program in Homeland Security, which engages people in projects related to public safety, homeland security and disaster preparedness and relief. Grants totaling \$8.7 million were announced in September 2004 to support more than 32,000 volunteers working on projects sponsored by 29 national and local organizations. Grant programs are underway in 23 States, with the possibility that volunteers in the surge area could be available to assist in non-clinical roles. In Massachusetts, there are 15 Retired Senior Volunteer Programs (RSVP) of which four indicate disaster preparedness activities.

AmeriCorps

AmeriCorps includes State, National and NCCC programs. AmeriCorps State are programs operating within a single State, while National programs operate in multiple States. In Massachusetts, there are 20 State programs and eight national programs operating. Programs that involve volunteers on a full-time basis were considered to be a better potential source for volunteers as these people could be moved from their current project to one related to the disaster. One of the residential programs mentioned as an example was an environmental/first responder program. Twenty-four people were currently manning a shelter opened because of a winter blizzard. Another potential source for clinical staff was from a project involving 10 half-time LPNs and nurse practitioners operating a community clinic. The AmeriCorps representative remarked that a city/town could apply for funding for a disaster preparedness program. Funding could be requested for some number of volunteers for a determined number of hours. Full-time programs consist of 1700 hours, half-time 900 hours, and quarter time 450 hour, over the course of a year. If there was no disaster, the group could be involved in planning and preparedness activities in the community.

AmeriCorps NCCC is a 10-month full-time, team based, residential program for individuals ages 18-24 focused on disaster relief and homeland security. There are currently 1800 volunteers organized in regional teams of 10 – 15 members/team with a designated leader. Participants receive a \$4,000 annual living allowance and an educational award of \$4,725 upon successful completion of their service. Priority is given to projects that focus on public safety, public health and disaster relief. NCCC appears particularly well suited to assist in a surge situation as members are organized in teams, trained in CPR, first aid and mass care and can be deployed immediately to support disaster relief efforts in cooperation with the American Red Cross and FEMA. NCCC members receive one month of training and then spend nine months engaged in regional projects.

In FY 2004, NCCC engaged 1,187 members on 591 projects in 50 States. Members served with 16,000 volunteers, or about 15 volunteers per member.⁵³ Six percent of projects focused on homeland security and five percent on disaster relief. Regionally, 16 percent of projects were conducted in the Northeast. According to the annual report, the team-based program model allows high volume rapid response that is extremely cost effective. In FY 2004, 545 NCCC members were deployed at the request of FEMA and the American Red Cross to assist citizens in areas hit by hurricanes.

A contact in the Northeast regional office suggested that it would be very feasible for NCCC volunteers to assist in a surge facility. Depending on the extent of the disaster, one or more of their 14 teams could be in route to the surge facility within one hour to assist with non-clinical tasks. Deployment of teams, however, would likely occur at the national level, with the director of operations determining which teams would be sent, as regional teams have staggered start dates. On September 11, 2001, all 16 teams at the time were deployed to New York City to assist with feeding volunteers and stacking goods and equipment in a warehouse.

4.7.5 Alternate Sources

In the event that the previous listed sources of personnel resources do not provide enough skilled nursing staff to support the surge hospital, we investigated the feasibility of delegating specific tasks to medical students, nursing students, respiratory therapy students and graduates, patient care assistant students, pharmacy technician students, phlebotomy technician students, surgical technology assistant students, medical assistant students, medical radiography students, faculty members, veterinarians and dentists. Boston has a large number of medical training programs with three medical schools and several nursing schools.⁵⁴ In cities where there are no training programs, a surge facility would not have these students and instructors available to supplement staffing.

Medical Students

According to a dean at a local university school of medicine, medical students have the requisite knowledge to work as nurses at the time they enter their third year of training, but would not have had the necessary experience at that point. By the beginning of their fourth year of studies, medical students have the experience to fully function as nurses, however medical students would be unfamiliar with nursing protocols and the organizational structure of nursing care, so they would require some orientation and supervision for a period of time. At this point, the dean believes the medical students would be capable of functioning in a fully independent mode, including all of the nursing skills listed in Appendix C.

There are three medical schools located in the city of Boston. If fourth year students could be useful to perform nursing skills, there would be over 400 students in each school year located in the city of Boston.

⁵³ Corporation for National and Community Service, FY 2004 Performance and Accountability Report, Washington, D.C. 2004.

⁵⁴ Nursing programs are available at Boston College, Northeastern University, Bunker Hill Community College, Emmanuel College, Massachusetts College of Pharmacy and Health Sciences, Simmons College

Table 13: Examples of Number of Students per Year at Medical Schools in Boston

Medical School	Number of Medical Students per Year
Harvard Medical School	165
Tufts University School of Medicine	137
Boston University School of Medicine	109

Sources: Obtained from the respective Schools of Medicine websites.

Nursing Students

According to a dean of nurse education and health professions at a local community college and a professor of a four-year baccalaureate program, nursing students would be appropriate to work at a surge facility. Nursing students gain experience performing many nursing skills during their two-year or four-year program; these skills and the semester at which the nursing student has the requisite experience are indicated in Appendix C. The professor of a four-year baccalaureate program stated that the identified skills would be able to be performed by senior students who have completed a seven-week Critical Care Rotation and junior students who have completed fifteen weeks of medical surgical nursing. In addition, a student's skill level will vary depending on the curriculum content and practicum experience the student receives. Hospital policies and practice standards would prohibit nursing students from administering medications in the absence of a nursing instructor. Additionally, IV drugs or ET drugs affecting the cardiovascular system may not be administered or titrated by students, but students may monitor the effects of these drugs. Nursing students have student IDs and schools maintain a database of the student information. Although this information is confidential, in an emergency it may be possible to confirm the identity of these students. Nursing students have medical malpractice and liability insurance.

In addition to using nursing students, the nursing instructors would be appropriate to work in the surge facility. In Boston, there is a large supply of nursing students and instructors.

Table 14: Examples of Number of Nursing Students and Instructors at Boston Area Nursing Programs

School	Total Number of Students	Number of Instructors
Simmons College	130 Graduate nursing 300 Undergraduate nursing	25 Full time Professors
Bunker Hill Community College	150 Associate of Science	13 Full time Professors

Sources: Obtained from professors at the respective nursing programs.

Patient Care Assistant, Pharmacy Technician, Phlebotomy Technician, Surgical Technology Assistant, Medical Assistant, and Medical Radiography Students and Graduates

According to a dean of nurse education and health professions at a local community college, students of patient care assistant, pharmacy technician, phlebotomy technician, surgical technology, and medical assistant programs would only be appropriate for performing supportive tasks such as transferring patients and changing bed sheets. Although many of these students will have experience working in hospitals from previous jobs, they do not gain any hospital experience through their respective programs. These students may be more useful than a non-health professional volunteer to perform these tasks, but they do not gain the hands-on experience during their studies to perform any of the nursing skills. In addition to these supportive tasks, medical radiography students may be able to take a patient's vital signs.

Pharmacy technicians assist pharmacists, which typically consists of preparing prescribed medications for patients. Although only one-third of pharmacy technicians do not work in retail pharmacies, those that work in hospitals, nursing homes, and assisted-living facilities may have experience useful in a surge hospital. According to the Department of Labor Occupational Outlook Handbook, pharmacy technicians “read patient charts and prepare and deliver the medicine to patients.” They may also “assemble a 24-hour supply of medicine for each patient.”⁵⁵

Phlebotomists may be used to collect blood samples.⁵⁶ According to a dean of health professions, surgical technologists would probably not be appropriate to work in a surge facility because they do not have experience outside of surgery. Medical assistants typically perform administrative and clinical tasks in health practitioner offices. They could be appropriate to perform some basic tasks in a surge facility because their clinical duties, depending on their experience and State laws may “include taking medical histories and recording vital signs, explaining treatment procedures to patients, preparing patients for examination, assisting the physician during the examination. Medical assistants collect and prepare laboratory specimens or perform basic laboratory tests on the premises, dispose of contaminated supplies, and sterilize medical instruments. They instruct patients about medications and special diets, prepare and administer medications as directed by a physician, authorize drug refills as directed, telephone prescriptions to a pharmacy, draw blood, prepare patients for x rays, take electrocardiograms, remove sutures, and change dressings. Medical assistants also may arrange examining-room instruments and equipment, purchase and maintain supplies and equipment, and keep waiting and examining rooms neat and clean.”⁵⁷

Respiratory Therapy Students and Graduates

Respiratory Therapists evaluate, treat and care for patients with breathing or other cardiopulmonary disorders. Respiratory Therapists practice under physician direction and

⁵⁵ U.S. Department of Labor, Bureau of Labor Statistics. *Occupational Outlook Handbook*. 2004-2005. <http://www.bls.gov/oco/home.htm>

⁵⁶ IBID

⁵⁷ IBID

assume primary responsibility for all respiratory care therapeutic treatments and diagnostic procedures.⁵⁸ A contact at an area hospital's Respiratory Therapy department stated a surge facility would have a difficult time finding respiratory therapists due to the current shortage. Respiratory therapy students would be beneficial to use in the event of an emergency and would be able to perform several of the nursing skills listed in the skills list. These skills are indicated in Appendix C. Students are able to perform many of the skills after their first semester and first year. Typical programs are two years. There are three local schools offering respiratory therapy programs.

Dentists

In the process of diagnosing, preventing, and treating problems with teeth or mouth tissue, dentists administer anesthetics and write prescriptions for antibiotics and other medications. Dental school studies usually include anatomy, microbiology, biochemistry, physiology, and clinical sciences. Dentists might be able to supplement staff at a surge facility. The nursing skills that could perhaps be delegated to a dentist are indicated in Appendix C. Specialized dentists, such as oral surgeons, would have a more medically oriented skill level.

4.8 Licensing, Credentials and Privileging Issues⁵⁹

4.8.1 Background

In the event of a disaster, health professionals may be called to work outside their normal place of employment, possibly even outside their State of licensure in less than ideal working conditions. Physicians and nurses may have to triage patients, use unapproved drugs or treatments and/or care for patients in unusual circumstances or surroundings. In extreme circumstances, certain health professionals may be required to function outside their normal scope of practice, e.g., dentists or veterinarians assisting with triage.

Issues around the need to quickly verify professional licenses and credentials need to be explored, as well as the need to provide protection from liability to those delivering the care. State laws vary regarding scope of practice and professional liability in emergency situations, as are seen in, what are commonly referred to as Good Samaritan laws. States also differ in terms of the extent to which State laws and regulations may be waived in emergency situations. Under normal circumstances, the hospital or facility in which an individual practices is liable for the actions of health care professionals on their premises.⁶⁰ Health systems and their medical staffs may be held liable for damages if they permit an unqualified practitioner to practice in the organization or if they allow even a qualified practitioner to provide special clinical services that he or she has not been deemed competent to perform within that health system.⁶¹

⁵⁸ U.S. Department of Labor, Bureau of Labor Statistics. *Occupational Outlook Handbook*. 2004-2005. <http://www.bls.gov/oco/home.htm>

⁵⁹ See accompanying report on Legal and Regulatory Issues, Abt Associates Inc., 2005.

⁶⁰ Galt, KA. 2004. Credentialing and Privileging for Pharmacists. *American Journal Health-Systems Pharmacists*. 61(7): 661-670.

⁶¹ Ibid.

State laws require that potential surge hospital staff members - physicians, nurses, nurse aides and nurse practitioners, dieticians, physician assistants, pharmacists, respiratory therapists, emergency medical technicians (EMTs), paramedics and social workers be licensed or certified by the State in which they practice. Responding to an emergency in another State would require licensure or certification in that State, unless the health professional is a member of a Federal disaster team in which case the person may be federalized or the disaster State has agreement(s) in place to recognize the licenses/certifications of other designated States. Training requirements for licensing/certification may vary from State to State, complicating the option for States to grant reciprocity to other States.

Credentialing is the process used to validate professional licensure, clinical experience and preparation for specialty practice. Credentials include proof that the practitioner has completed an accredited training program, specific patient care activity or a defined number of specific patient care activities under the supervision of an expert.⁶² In 1989, the Joint Commission on Accreditation of Healthcare Organizations established standards that required health care organizations to perform credentialing functions.⁶³ Credentialing ensures competence in a broad area, but lacks specificity for specific patient care functions. Credentials to ensure competence in one health care organization or region may not be adequate to ensure competence in different area.⁶⁴ Under normal non-disaster circumstances this information is checked directly with the medical school and specialty board. Clinical competence is verified through communication with individuals familiar with the physician or nurse practitioner/physician assistant.

Privileging is the process to grant to a specific practitioner the authorization to provide specific patient care services. Privileging ensures that the individual requesting privileges is capable of providing patient care services in accordance with the standard of care of the facility granting the privilege. In a November, 2004 memo, the Director of the Centers for Medicare and Medicaid Services wrote that, "The hospitals governing body must ensure that all practitioners who provide a medical level of care an/or conduct surgical procedures in the hospital are individually evaluated by its medical staff and that those practitioners possess current qualifications and demonstrated competencies for the privileges granted... Board certification, certification or licensure in an of itself is not recognized as an appropriate basis to bestow or award any or all of the privileges included in a particular practitioner's category."⁶⁵

Verification of Licensing

Even if the State licensing requirement were to be waived, licenses and certification would still need to be verified by the surge hospital. Under normal circumstances, the verification of a license may take several weeks time. States may have access to electronic databases of

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Ibid.

⁶⁵ Hamilton, TE. 2004. Memo to State Survey Agency Directors, Centers for Medicare & Medicaid Services. Ref: S&C-05-04, November 12, 2004.

current licensees for some professions, but not for all professional groups or for other States. Physician licenses may be verified using information from either the American Medical Association Physician Master file, the Educational Commission for Foreign Medical Graduates or the American Osteopathic Association.⁶⁶ In Massachusetts, the license (or certification) for a physician, nurse, social worker, respiratory therapist, occupational therapist and assistant, physical therapist and assistant, dentist and dental hygienist, pharmacist, pharmacy technician, physician assistant, emergency medical technician, paramedic and veterinarian may be verified on-line. Guidelines for the verification of emergency medical technicians, for example, caution that searches must use exact spellings, and/or city/town listings, and/or zip code listings. Even though the system is updated monthly, the instructions state that due to the frequency of name changes, address changes, and legibility of application information they recommend that anyone seeking information contact the Office of Emergency Management in writing for official verification of the status of any individual EMT.

The Massachusetts Board of Registration in nursing uses an online nurse license verification system, Nursys® (Nurse System), provided by the National Council of State Boards of Nursing. Nursys® receives regular updates of nurses' personal (name, address, etc.) and license information from participating boards of nursing.⁶⁷ All boards of nursing, including non-participating boards have access to information within Nursys® and are able to enter and edit discipline information.

The Massachusetts Board of Registration in Medicine provides on-line physician credential verification. The following information is provided as part of a physician profile:

- Education
- Training
- Medical specialties
- Professional demographics, including business address, insurance plan and hospital affiliations, and available translation services.
- Professional or community awards received
- Research or publications by the physician

⁶⁶ The AMA Physician Masterfile includes current and historical data on all physicians, including AMA members and nonmembers, and graduates of foreign medical schools who reside in the United States and who have met the educational and credentialing requirements necessary for recognition as physicians. The data base includes students in 125 Liaison Committee on Medical Education (LCME)-accredited medical schools, 7,900 Accreditation Council on Graduate Medical Education (ACGME)-accredited graduate medical educational programs; 1,600 teaching institutions, 820,000 physicians, and 19,000 medical group practices.

⁶⁷ Alaska, Arizona, Arkansas, Colorado, Delaware, Florida, Idaho, Indiana, Iowa, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, New Mexico, North Carolina, North Dakota, Ohio, Oregon, South Dakota, Tennessee, Texas, Utah Vermont, Virginia, and Wisconsin.

- Malpractice claims paid in the past ten years
- Hospital discipline in the past ten years
- Criminal convictions in the past ten years
- Disciplinary actions of the Massachusetts Board of Registration in Medicine in the past ten years
- License information (license number, renewal date and date renewal received) is available to “healthcare entities”. Anyone seeking physician license information must submit a request on institution letterhead and upon approval will receive a username and password.
- Verification of the certification of Massachusetts nurse aides is not available online, but through the Nurse Aide Registry Automated Voice Response System, which may be accessed 24 hours a day, seven days a week to those facilities and agencies with Registry access codes.

Except for members of DMAT, and US&R teams who can be federalized in a declared disaster, and thus able to practice anywhere in the U.S., potential surge hospital workers from outside the State would have to have credentials, licenses and/or certification verified in the limited time prior to surge hospital opening.⁶⁸ Except for verification of licensure, which may be available through a database, the credentialing and privileging processes appear to be much more labor intensive and subject to the review of more than one individual. Advance research on State regulations regarding verification of licensure, credentials and privileging, any reciprocal agreements between the State and other States as well as the waiving on such verification requirements in the event of a disaster for each professional type would be extremely advantageous.

Mutual Recognition

Mutual recognition is a system that allows licensed professionals to practice across State lines, similar to the current driver’s license model. Under a mutual recognition system, any licensed professional may practice in other States on the basis of their home State license. Participating States enter into an interstate compact that allows licensed professionals to practice in any of the participating States without obtaining licenses for each individual State, a costing and time consuming process. As of December 2004, 18 States have entered into the Nurse Licensure Compact (Arizona, Arkansas, Delaware, Idaho, Iowa, Maine, Maryland, Mississippi, Nebraska, New Mexico, North Carolina, North Dakota, South Dakota, Tennessee, Texas, Utah, Virginia and Wisconsin).⁶⁹ A nurse licensed in one compact State is allowed to practice in another compact State provided he/she adheres to the practice laws and rules of the State in which the patient receives care. The existence of similar interstate pacts for other health professionals has not yet been determined.

⁶⁸ V.A. clinicians and those from the Public Health Service might not need state-specific licensure during emergency response.

⁶⁹ http://www.ncsbn.org/nlc/rnlpvncompact_mutual_recognition_state.asp

4.8.2 Verification Requirements by Staff Types

Physicians, Nurse Practitioners and Physician Assistants

According to a policy statement in the Annals of Emergency Medicine, physicians responding as volunteers in a disaster situation will need one or more of the following:

- Current hospital identification card;
- Current license to practice and valid picture ID issued by State, Federal or regulatory agency;
- Identification showing individual is a DMAT team member;
- Identification indicating that the individual has been granted authority to render patient care in disaster circumstances, such authority having been granted by a Federal, State or municipal entity;
- Presentation by current hospital or medical staff member with personal knowledge regarding the practitioner's identity.⁷⁰

When practical the following should also be verified:

- Current and unencumbered medical license verification; and
- Drug Enforcement Administration and State narcotics registration verification.

Nurse practitioners and physician assistants will need current professional license and picture identification. Credentials and privileges should be verified at his/her home hospital.

Nurses, Nurse Aides and Allied Health Workers

Presentation of current professional license or certificate, picture identification and current CPR card if available, should be sufficient verification to practice in most States.

4.8.3 Volunteer Protection Laws

The Federal Volunteer Protection Act of 1997 provides immunity for volunteers serving nonprofit organizations or governmental entities for harm caused by their acts or omissions if:

- Volunteer was acting within the scope of his/her responsibilities;
- Volunteer was properly licensed, certified or authorized to act;

⁷⁰ Policy Statements - Hospital Disaster Privileging. 2003. Annals of Emergency Medicine. 42:4. October 2003.

- Harm was not caused by willful, criminal or reckless misconduct or gross negligence; and
- Harm was not caused by volunteer operating a motor vehicle, vessel or aircraft.

A volunteer in the context of the law is defined as an individual who performs a service for a nonprofit organization or government entity and does not receive compensation (or anything of value in lieu of compensation) in excess of \$500 per year. The law includes as volunteers the directors, officers and trustees as well as direct service providers. The Federal law preempts State law to the extent that the State law is inconsistent with the Federal law. The State may provide greater protection to volunteers than that allowed in the Federal law, but not less protection.

Most States have enacted some form of Good Samaritan or volunteer protection law. These laws vary in terms of who or what entities constitute a volunteer organization, and the situations in which the granted immunity may not apply. For most States, only uncompensated volunteers are protected. A definition of compensation, however, may differ from State to State. The term volunteer may include directors, officers and trustees of nonprofit organizations as well as direct service providers. In about one-third of States, protection is limited to directors, officers and trustees of an entity, and volunteers in general are afforded no special protection. The type of entity covered also varies in terms of tax status, organization under State law, and specified types of service or interest of the nonprofit organization. In some States hospitals and governmental entities are included in the scope of protection in addition to nonprofit organization. Lastly, States vary in specifying situations in which the immunity does not apply. Generally, immunity is not granted for conduct that is “willful and wanton.” Some States also add conduct that is “grossly negligent, reckless, malicious, in bad faith, fraudulent or intentionally tortuous or that is a knowing violation of the law.”⁷¹

As an example, Massachusetts State laws provide immunity for EMTs, fire and police who render first aid in the course of their jobs.⁷² The law also states that no physician, physician assistant or nurse who renders emergency care or treatment as a volunteer without fee other than in the ordinary course of his or her practice, shall be liable in a suit for damages as a result of his acts or omissions.⁷³ Lastly, Massachusetts’ law also protects physicians and nurses administering immunizations or other protective programs under public health programs. The law states that they shall not be held liable in a civil suit for damages as a result of any act or omission.⁷⁴

⁷¹ Carter-Yamauchi, CA. 1996. *Volunteerism – A Risky Business?* Report # 1, Legislative Reference Bureau, State Capitol, Honolulu, Hawaii. Available at <http://www.hawaii.gov/lrb/rpts96/vol/voldoc.html>.

⁷² Mass General Laws Ann. Chapter 111C, Section 14 Liability of emergency medical technicians, police officers or firefighters.

⁷³ Mass General Laws, Chapter 112: Section 12B Emergency care of injured persons; exemption from civil liability.

⁷⁴ Mass General Laws, Chapter 112: Section 12C Immunity of physician or nurse.

Organizations are advised to 1) review their State statutes to determine if (or which) sections provide greater or lesser protection than the Federal law; 2) compensation arrangements with volunteers, especially members of governing boards to verify that compensation is within the \$500 maximum allowed amount and 3) ensure that volunteer duties are clearly defined so that each volunteer is acting within their scope of duties and hence protected under the law.⁷⁵

4.9 Orientation and Training

Given that the individuals staffing the surge facility will likely come from a variety of sources with varying levels of clinical expertise and current experience, it would be advantageous that at least some proportion of physicians and nurses would come from an acute care hospital local to the surge facility. These individuals, if dispersed among the clinical staff would provide leadership and support to those with less current training and experience.

All staff should receive training on the mission of the surge facility, orientation to the building, standard operating procedures and responsibilities for each staff type. This may occur prior to or during their first shift on duty. Staff should be oriented, at a minimum, to the following:

- Personal protective measures, including standard precautions, location of personal protective equipment, disposal of infectious waster, etc.;
- Standard operating procedures;
- Standard reporting procedures;
- Response to outside requests for information; and
- Patient confidentiality.

In the Incident Command System, the Records/Planning Director along with the Medical Operations Directors is responsible for making sure that training occurs. Clinical staff will need additional orientation to their unit including:

- Leadership and chain of command;
- Location of medications, patient care supplies and equipment;
- Procedures for ordering medications, supplies and equipment;
- Admission and discharge procedures;
- Ordering patient tests and procedures;

⁷⁵ Beavers, JP. 2000. The Federal Volunteer Protection Act of 1997. Bricker & Eckler LLP Attorneys at Law. Available at www.bricker.com/publications/articles/148.asp.

- Patient records and charting requirements;
- Procedures for contacting physicians, nurse practitioners, physician assistants; and
- Care delivery system (e.g., primary care, team nursing, utilization of non-clinical staff, students and volunteers).

4.9.1 Job Action Sheets

The Incident Command System utilizes *Job Action Sheets* to identify roles and responsibilities for all personnel. *Job Action Sheets* are organized by position and include simple checklists, which include whom the person reports to, the responsibility of the position, immediate, intermediate and extended job responsibilities. These sheets provide guidance to new, likely stressed workers in unfamiliar surroundings. Sample job action sheets for clinical (Medical Operations Director and Nursing Subunit Supervisor) and non-clinical (Housekeeping Unit Leader and Maintenance Unit Leader) positions are included in the Appendix.

4.10 Summary

Although we can expect many shuttered hospitals to have limited staff on site, we can't count on these people to be available for use during a surge event. Aside from possibly the security staff, almost all staff would have to be brought in from outside. The two scenarios may have somewhat different staffing needs, but in either case the four main types of staff that will be needed are; physicians and physician extenders, nursing staff, allied health staff, and other types of staff such as security, laundry and kitchen staff. Some skills could be delegated from nurses to allied health staff. It will be important to use a highly standardized organizational system that outlines individual and team responsibilities such as the HEICS. It will also be important to assign responsibilities in advance so that all parties know their roles and responsibilities. Both Federal and Massachusetts State regulations on nursing coverage and nurse to patient ratio are general, and in a surge event could probably be waived or relaxed.

Ideal surge facility staff would be those individuals with current/recent acute care experience but no current employment obligation (or flexibility to be absent from current obligations), living locally (to minimize housing and licensing requirements), with no (or delegated) child/elderly parent/pet responsibilities, and available to work within several days for at least several weeks. Additionally, we feel it important that these individuals would have worked together previously as a team. The nursing and physician leaders would, in an ideal situation, come from an acute care hospital local to the surge facility.

Individuals currently volunteering on Federal disaster or urban search and rescue teams would be preferred staffing candidates as they would be federally credentialed in a disaster situation, with up-to-date clinical skills and available within the timeframe needed. Those serving with the U.S. Public Health Service would also be available within hours, but not experienced working together and may not have current clinical skills. Private groups like the American Red Cross appear to be a good source for mental health workers. Students (medical, nursing and allied health) are available, at least in this area, but because of

licensing issues would be restricted to nursing assistant or non-clinical tasks. Their instructors, however, may be a very good source of clinicians with up-to-date skills and few other employment responsibilities. Volunteer organizations are plentiful and may be sources for non-clinical staff, but level of expertise, readiness and availability would certainly vary across the various groups. Some “residential” teams like AmeriCorps NCCC seem like a promising source for non-clinical staff based on their numbers, reported availability and experience working together as teams on disaster-related projects.

5.0 Patient Transport

As described previously, the use of the shuttered hospital would begin three to seven days out from the catastrophic event, when patient transport would begin. Transport would need to be completed within a period of hours or a few days under Scenario 1 (medically stable med/surg patients), and might continue over the course of weeks during an evolving epidemic under Scenario 2 (infectious disease/isolation). This section discusses transportation needs including vehicles, drivers and medical attendants, and regulatory issues related to patient transportation.

5.1 Surge Facility Location and Route

Both of the assessed shuttered hospitals are located outside of the core metropolitan Boston area and thus would likely be outside of the area of impact of a chemical release, focal biologic release, or a non-nuclear explosive device. Both hospitals, however, are within ten miles of Boston's tertiary hospitals, making transportation of patients sufficiently expedient.

The tertiary care hospitals in the Boston metro area are accessible by a number of different roadways, as are the shuttered hospitals. There are numerous surface road route alternatives between the tertiary hospitals and the shuttered facilities so that, even if some roadways were closed, there should be sufficient alternative routes available to allow for patient transport.

As outlined in Chapter 2 of this report, both of the shuttered hospitals are readily accessible by public transportation (for staff and families), ambulance and van. Minor modifications to designated helipad areas could be performed rapidly to permit helicopter landing at each facility, although this would probably not be necessary under either scenario, since medically unstable patients would not be relocated to the surge facility.

5.2 Preparing Patients for Transport

Appropriately preparing patients, their records and medications for transport may present a greater challenge than the actual transport itself. The critical tasks will involve preplanning the processes for patient discharge from the tertiary facility, patient admission to the surge facility, transfer of medical records and orders, and communication among care providers.

Patient Medications and Supplies. Prior to transfer, there must be an assessment of which medications and/or supplies each patient will need in the short term at the surge facility and when or whether these materials will be available there. These medications probably cannot be transported with the patient and must be sent to the surge facility in advance of each patient's transport.

Patient Records. Transfer of each patient's full medical record will probably not be feasible during the emergency, especially as many of Boston's tertiary hospitals use electronic health records that are not inter-operable and there will be no comparable electronic record system at the surge facility. Patients cannot be transported safely to a surge facility without certain pieces of critical medical information, however, and our team of emergency medical experts has devised an abbreviated portable discharge summary that can be created easily and rapidly

at the sending hospital prior to discharge. This record would ideally be physically transferred on the patient’s person, such as in a necklace binder. The transfer record would include information such as diagnosis, recent care, further care needed, current and prior medications, physician and family contact information, etc. The Patient Information chapter of this document explains this transfer record in detail.

Patient Discharge/Transfer. Patients being relocated to the surge facility must be formally discharged from the primary hospital. In addition to the critical actions of preplanning this process for large numbers of patients, there may be additional regulatory requirements for discharge (e.g., patient consent to transfer). This will be more fully explored as the regulatory assessment phase of the project continues.

5.3 Appropriate Transport Vehicles

In reviewing the patient populations slated for transport, we determined that transportation could be successfully conducted using a combination of buses, ambulances, and wheelchair vans. Our assumptions of how many patients would be transported via each vehicle type are outlined below in Table 15. These assumptions vary for the two scenarios, with more patients under Scenario 1 probably requiring BLS ambulance transport.

Table 15: Estimated Patient Transport Vehicle Needs

Vehicle Type	Percentage of Patients Transported per Vehicle Type	
	Scenario 1	Scenario 2
Bus	25%	50%
Basic Life Support (BLS) Ambulance	50%	25%
Wheelchair Van	25%	25%

Bus

The most appropriate patients to be transported by bus would be both medically stable and fully ambulatory. While it may be possible to transport non-ambulatory patients by bus, using backboards or litters, this is not desirable and would probably not be pursued. Buses used for patient transport would need to be staffed by medical personnel as well as drivers. Patients transported by bus who require frequent reassessment of vital signs, for example, would increase staffing requirements. It is not generally feasible to provide significant ongoing medical care or monitoring during transport by bus. Patients requiring this level of care would need to be transported by BLS ambulance.

Under the infectious disease outbreak scenario, careful consideration must be given to which patients are appropriate for bus transfer. Personal protective gear appropriate for the hazard, such as HEPA-filtered respirators, may be necessary for all transport staff.

Ambulance

Non-ambulatory or more seriously ill patients would be transported by ambulance. It is presumed that most of the patients designated for transfer to a surge facility could be transferred by Basic Life Support (BLS) level of staffing during transport comprised of two Emergency Medical Technicians (EMTs). Patients requiring advanced life support during transport would probably not be appropriate for relocation to the surge facility.

Wheelchair Van

Non-ambulatory patients (those using wheelchairs) who are able to sit in a chair and who do not require continuous monitoring, oxygen or IV lines, could be transported by wheelchair van.

Staffing for Transport of Infectious Patients

Under the infectious disease outbreak scenario, it was postulated that bus and van drivers may not wish to serve in transporting infected patients. While EMTs and paramedics may have a legal obligation to respond while on duty, private drivers cannot be forced to serve. EMS personnel serving with Disaster Management Assistance Teams (DMATs) from other States (from areas not affected by the incident) were identified as one potential source of replacement staffing for transport of patients to the surge facility, although local drivers would be preferable because they know the local roadways.

Vehicle Decontamination

Medical experts on the project team indicated that cleaning/decontamination of vehicles following transport of infectious patients could be readily conducted and should not pose any significant obstacle or challenge.

5.4 Regulatory Issues

Several important regulatory issues were identified during the patient transport assessment that need to be more fully explored. These issues included clinician communications, privacy of information, patient consent to transfer, exemptions from pre-hospital staffing requirements, and liability.

Recommendation: patient/family consent to transfer is an EMTALA-related issue that needs to be addressed to permit use of a surge facility.
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A thorough review of the relevant regulatory environment in each State should be completed prior to reaching the conclusion that rapid transport of large numbers of hospitalized patients can be successfully achieved.

5.5 Preparing for Patient Transportation

As neither of the assessed facilities has vehicles or drivers at their disposal, and other shuttered facilities will probably not have these resources, arrangements must be made to procure medical transport vehicles and qualified drivers. It is also important to establish appropriate patient discharge and transfer procedures prior to transport. Details on

feasibility, needed actions, and timing for conducting these activities are outlined below. For some of the issues surrounding patient transport, the two facilities we assessed present no barriers and no further action is needed for potential surge capacity use; included site location, roadways to the area, access roadways, vehicle access potential, and patient unloading and facility entry all appear to be satisfactory and no further discussion of these issues is offered below.

5.5.1 Patient Transport Vehicles

It will be necessary to arrange for the use of vehicles, qualified drivers and EMTs to transport patients from primary hospitals to a surge facility. In reviewing the patient populations slated for transport, emergency physicians determined that patient transportation to the surge facility could be successfully conducted using a combination of buses, ambulances, and wheelchair vans in the ratios presented in the table below. Assuming that 300 patients will be transported, the number of needed vehicles trips was projected and an average round trip time of two hours was assumed. This includes the 30 minutes of driving time to and from the facility, and 30 minutes each of loading and unloading time. This allows for completion of four trips per vehicle per eight-hour day.

Transit authority officials indicated that a typical transit bus can carry up to 45 passengers. Assuming that medical patients may require more room (i.e. most of a seating row each), this was divided in half to assume 22 bus passengers per trip. Ambulances were assumed to carry one patient per trip; ambulances could possibly transport two patients per trip, one on a stretcher and one on a backboard on the seat, but that was not presumed as necessary for patient transport to a surge facility. Wheelchair van service officials indicated that the average wheelchair van holds three wheelchairs and patients. Given these vehicle capacities, and assuming eight completed trips conducted over two eight-hour days, the table below lists the number of each of the vehicle types needed to transport 300 patients.

Table 16: Numbers of Vehicles Needed, by Type

Vehicle Type	% Patients Transported via this Vehicle Type	Total Patients	Total Trips	Vehicles Needed to Complete Transport in Two 8-hr. Days
Bus	50%	150	5	1
Ambulance	25%	75	75	10
Wheelchair Van	25%	75	75	4

The existing private and public vehicle fleets in the greater metropolitan Boston area vastly exceed the number of needed vehicles. Even though demand for patient transport in the area may still be somewhat elevated three to seven days following a mass casualty event of the size anticipated here, the vehicles needed for patient transport to the surge facility comprise such a small portion of the overall vehicle that there should be no shortage of vehicles for this purpose.

For example, approximate fleet information for the greater metropolitan Boston area is as follows:

Buses. The public transit authority serving metropolitan Boston owns approximately 1,000 standard transit buses. This authority also contracts with some of the private bus companies and 250 additional private buses providing service for the transit authority. Private bus fleets, shuttle vans, and school buses not included in these counts.

Ambulances. There are approximately 1,200 ambulances in service in Massachusetts, about 80% of these private and 20% public. The majority of these serve the more populous eastern portion of the State where Boston is located.

Wheelchair Vans. The City of Boston maintains a fleet of wheelchair vans through the Mayor's Office on Elder Services, and there are also three private non-profit organizations providing wheelchair van service in the communities immediately surrounding Boston. This creates a wheelchair van fleet of approximately 200 vehicles, not including private wheelchair van services or transit authority vehicles with wheelchair capacity. The private non-profits are primarily funded through State transportation and community development grants; and knowledgeable informants report that wheelchair van fleets may be somewhat lower (per capita) elsewhere in the United States.

As is the case in the metropolitan Boston area, public transit authorities typically have a working relationship with the Fire Department/Local Emergency Planning Committee (LEPC) to provide buses as part of the community's evacuation plans for chemical disaster planning as required under the Federal Emergency Planning and Community Right to Know Act (EPCRA). These coordinated efforts are well-established and pre-date September 11, 2001. In the Boston area, as would be expected in other urban parts of the United States, the local transportation authority indicated that they would be willing to provide their vehicles for patient transport to a surge facility. Similarly, the local wheelchair van services indicated that they have a pre-arranged agreement with the local Fire Departments and would also be willing to transport patients to a surge facility.

Major hospitals often have existing contractual relationships with some private ambulance services (preferred provider agreements), and patient transport to the surge facility could generally fall within the scope of these contracts. Other private ambulance services also indicated that they would be willing to serve in transporting patients to the surge facility, but they would prefer to establish emergency contractual arrangements in advance. Private ambulance services frequently have contracts with the city and if emergency contractual arrangements are to be established, it will be important to avoid competing contractual obligations.

The city public ambulance services will likely not be able to participate in transporting patients outside of the city limits to a surge facility. However, public ambulance services in municipalities or counties that do not have a major hospital, and routinely transport patients outside of their locale to a major hospital, may be able to serve as this is within their ordinary scope of service.

In the event that fleet owners are unwilling to provide vehicles for emergency transport of patients to a surge facility, vehicles could be commandeered under certain circumstances. For example, the Massachusetts public health authority has jurisdiction over ambulances and could commandeer these vehicles. City emergency officials also indicated that they have the authority to commandeer needed vehicles during a catastrophic emergency. Their authority in this regard is stronger if a formal “State of Emergency” has been declared by the Mayor, Governor or President.

5.5.2 Required Staffing Levels for Safe Patient Transport

Medical attendant staffing levels during transport are as follows:

Bus. General medical oversight will be needed, but Basic Life Support (BLS) of two EMTs or Advanced Life Support (ALS) of two paramedics will not be required.

Wheelchair Van. At a maximum, the (BLS) level of two EMTs would be needed for patients transported in wheelchair vans.

Ambulance. Most patients transported by ambulance to a surge facility could be transported under BLS, because we specifically would not be transporting patients requiring intensive care; a very small proportion of those transported might require ALS.

Under emergency conditions in Massachusetts, the State department of public health can issue a waiver that drops the requirement for ALS from two paramedics to one paramedic and one EMT, and in many States there is no requirement for two paramedics for ALS.

5.5.3 Drivers and EMTs

While vehicles can be commandeered in the circumstances outlined above, private drivers cannot be compelled to serve. Public drivers can be instructed to serve as part of their job duties, but they can certainly refuse to perform duties or walk off the job. Essentially, there is no way to force drivers to serve if they are unwilling.

Driver Willingness to Serve. All of these transportation entities discussed in the previous section reported that they were fully staffed with qualified personnel. All of these fleet operators who could provide vehicles were also willing and able to provide their drivers and EMTs for these vehicles under Scenario One (non-infectious traumatic casualty event). However, under Scenario Two (infectious patients), the majority of public and private transport services indicated that they would not ask their drivers to serve, or believed their drivers would not serve. Exceptions to this included a wheelchair van service that reported that all of their drivers were willing to transport AIDS patients during the era when fear of AIDS was at its peak, and the mechanism for infection with AIDS was not yet well understood. This wheelchair van service manager believed Scenario Two would constitute a similar situation and that his drivers would continue to work.

Protection for Ambulance Drivers and EMTs. Private ambulance services in particular indicated that EMTs may not serve in Scenario Two under current conditions, but that they would serve if their drivers and EMTs were provided with respiratory protection from biological agents. City emergency planning officials and some private ambulance services

indicated that they are confident that devices for respiratory protection from biological agents will be provided to all EMTs and paramedics through Department of Homeland Security grants as early as Spring of 2005. Currently, public and private EMTs and paramedics are all outfitted with N95 respirators commonly referred to as TB (tuberculosis) masks. These particulate filter respirators are typically of the mask variety, though they can also be cartridge-type. They are protective against TB and also smallpox if they are properly fitted. Facial hair, for example, greatly interferes with the fit and therefore protective function of the mask. OSHA set a separate standard for TB respiratory protection that does not require medical screening (including pulmonary function tests) and annual fit testing procedures beyond the initial fit test. There is existing controversy over the separate TB standard, so this waiver on medical screening and fit testing may be overturned.

Respiratory protection devices to be issued under the Homeland Security grants are N100 respirators, commonly referred to as HEPA respirators. These are also particulate filters that protect against a wider array of biological agents as they provide a greater removal efficiency for particulates such as viruses and bacteria. These are cartridge-type air-purifying respirators (APRs) or powered air-purifying respirators (PAPRs). PAPRs provide an even higher level of protection than APRs as they create a positive pressure atmosphere that prevents entry of particulates into the breathing zone if there are any breaches in the respirator seal. Under the OSHA general respiratory protection standard 134, medical screening and formal fit testing are required for use of these respirators.

A key element of planning for the proposed surge facility is to check with local public and private ambulance services on their status in terms of respiratory protection for their EMTs. Under Scenario Two, ambulances may be the only transportation that can be procured, and even these drivers may be unwilling or unable to serve if they are not adequately protected. Fortunately, the necessary protective equipment is becoming available in urban areas throughout the country. It thus appears that drivers and EMTs who require respirators as a prerequisite for Scenario Two will have this equipment, and will likely be willing to transport patients. Alternatively, such respirators could be added to the list of needed equipment and supplies, for use during the two days of patient transport to the surge facility. If drivers do have respiratory protection available, the head of the Statewide private ambulance association indicated that he could readily muster two to three hundred staffed ambulances for the mass transport to the surge facility within the needed timeframe.

Protection for Bus Drivers. Public and private bus companies generally indicated that their drivers would not transport infectious patients. A local transit authority official suggested that Hazmat-trained firefighters outfitted with respiratory protection could drive the buses since they have training and protective gear, and also are qualified to drive a large vehicle such as a bus since they are qualified to drive a fire truck.

Transportation experts and emergency physicians both indicated that there was no feasible method to create a physical airspace barrier within a vehicle that would separate the driver from the infectious patients and prevent potential disease transmission to the driver, confirming that respiratory protection for the driver is the most feasible option.

5.5.4 Preparing Patients for Transport

It will be important to rapidly discharge patients from tertiary hospitals while preparing adequate medical records and short-term orders for use at the surge facility. For this reason, an abbreviated Patient Information Form was developed. This form captures the critical medical information needed for transfer and continued care of the patient, as well as important medical and family contact information, in a standardized format. A detailed description of the form appears in the section below on Patient Information, and a sample of the Patient Information Form appears in the Toolkit accompanying this report.

Emergency transportation experts advise that it would be unwise to transport medications with the patient due to issues with controlled substances, cold storage, etc. Therefore, if a patient requires medications that will not be available at the surge facility pharmacy, these must be transported to the surge facility separately, and in advance of the patient's need for this medication.

6.0 Security

Under Scenario One, security needs and goals at the surge facility would be comparable to those at any suburban hospital under normal conditions of operation. These include general safety of patients, staff, and visitors, and protection of pharmaceuticals and other attractive assets. However, typical measures to achieve security would be more complex at a newly-opened surge facility for the following reasons:

Since this is a new and temporary facility; the facility itself and security procedures will be unfamiliar and not yet routine to the security staff. Therefore, protocols will be more difficult to maintain and unusual events will be more difficult to identify.

Hospital personnel will not be known to security staff or to one another, therefore unauthorized persons will be more difficult to identify.

Mechanical and electronic security controls will be quickly retrofitted onto this structure, and may not be of optimal design and function for this facility.

All personnel, patients, and visitors will be under heightened stress due to the catastrophic event that necessitated opening of a surge facility.

If the surge facility is affiliated or identified with a major hospital, protestors and demonstrators who typically target the major hospital (for example, animal rights activists) may target the surge facility.

6.1 Security Needs

To achieve the security goals for both scenarios, the following measures must be undertaken:

- Controlling Access into the Building
- Controlling Access within the Building
- Identification and Tracking of Patients, Staff, and Visitors
- Securing of Pharmaceuticals and Other Assets
- Communicating with the Base Facility (the Major Hospital) and Local/State/Federal Emergency Officials

Under Scenario 2, there are significant additional security concerns and risks beyond those mentioned above. If the surge facility is to serve as an isolation/quarantine hospital for infectious patients, there could be a strong “Not In My Backyard” reaction from the community surrounding the surge facility, generated by fear of the infectious agent. This could cause community members to object and try to prevent the facility from opening and receiving patients, and might lead to disruption of facility operations. If there is widespread perceived risk from

Recommendation: discussions with local police will be necessary prior to opening an isolation/infectious surge facility, to address potential community hostility.

the infectious agent, and if vaccinations, medical prevention and treatment are in short supply, there could be aggressive attempts to obtain or steal medications from the surge facility. These are serious and real security risks, and they will be difficult to manage under the conditions of a quickly opened temporary surge facility.

To achieve the security goals for Scenario 2, the following additional measures should be considered:

- Provision of security for incoming and outgoing Vehicles (for roadways between site perimeter and major corridors through the community), in particular those transporting infected patients
- Controlling Access to the Grounds
- Heightened Access Control into and around the Building
- More Stringent Identification and tracking of patients, staff, and visitors.

Note that for both scenarios it is assumed that the entire region will be operating under heightened security alert status if the catastrophic event was caused by a terrorist attack, but it is not assumed that the surge facility will have particular status as a potential target for a second attack. In fact, the selected surge facility should be well outside of the primary target zone.

6.1.1 Access Control

Control of access to the site and the building would be achieved through security personnel, physical barriers such as fencing and Jersey knees, and mechanical/electronic devices such as locks, card reader systems on doors, and security cameras. There is a strong interplay between these security methods. As an example, if doorways that cannot be locked or secured with electronic card readers, additional security staff will be needed at each doorway.

General Location and Roadway Access to the Site

Both facilities we assessed are located outside of the core metropolitan area of the city, and thus would be likely outside of the area of impact of a catastrophic terrorist event. We thus anticipate that roadways between major thoroughfares and the facility would be open and usable. The facilities are also relatively close to the city (thirty minutes driving time, ten miles) and there are multiple routes to each location from the metropolitan area. In other cities, surge facilities should be selected with these location attributes in mind.

It would not be feasible to close all roadways leading to the facilities as there are multiple routes to the site and accesses onto the site. Therefore, if there is negative community reaction to an isolation/quarantine facility such that transport of patients is impeded, security vehicle escorts might be needed.

Controlling Site Access

Currently, there are no security staff, physical barriers, or mechanical/electronic devices in place to control access to entrance roadways or other portions of the site perimeter, at either

of the former hospitals we assessed. Both facilities have more than one roadway access, two in one case, three in the other. Both facilities are located at a slight distance from the regular thoroughfares, being sited on elevated portions of relatively large land sites. This requires long, connecting roadways that go only to the hospital property; a common design of hospitals constructed in suburban areas. In these circumstances, it would be readily feasible easy to establish traffic stop points at the roadway entrances to limit access and check personal identification or vehicles if necessary. In particularly difficult security situations, all roadways except one could be blocked with Jersey knees or other barriers, and traffic access limited to one checkpoint using physical traffic barriers plus security staff. Facility access roadways are also wide enough to create zig-zag pathways to prevent a hostile vehicle from approaching the facility at high enough speeds to cause damage.

Aside from the roadways discussed above, both facilities we assessed have soft perimeters. There are large, open land areas surrounding each facility, with no fencing or other barriers at the border between the hospital site and adjacent properties. Significant installation of physical barriers as well as security staff would be needed to control access onto the site. It is not likely that this type of site control would be needed under Scenario One, but it could be needed under Scenario Two.

Controlling Building Access

At the facilities assessed, exterior windows, doors, and other structural components are in place, with no breach in the building envelope allowing for building access other than in normal doorway entrances. Locks on doors and windows are in place and functional. Both facilities have a limited number of building entranceways (approximately a half dozen or fewer). Some exterior doorways have exit alarms in place. Both facilities have maintained operational life safety systems such as fire alarms, but do not appear to have comprehensive building alarm systems in place. Neither facility has doorway card readers in place or functional security camera systems. Both facilities have security staff to control building access, but it is very limited compared with what would be needed for surge use. These security staff are unformed and unarmed. If exterior doorways could be controlled with locks and electronic card readers, security experts estimate that three to four security personnel would be needed per shift to control building access and monitor the building. If doorways could not be secured via use of such technology, additional security personnel would be needed to control these doorways.

Controlling Internal Facility Access/Movement

At both facilities we assessed there are no controls in place to limit movement within the facility or to control access to specific building areas. All interior spaces are fully connected via walkways and cannot readily be segregated via existing lockable doors. There are no physical or mechanical barriers or devices in place restricting or monitoring movement within the facility, nor are security personnel present at any location within the facility except the building entranceways.

Under Scenario One, on-going monitoring of movement within the facility is recommended as a general security measure, but specific area restrictions are likely not needed. Under Scenario Two, it will be necessary to prevent access to isolation rooms, wards or floors, and to ensure that required isolation protocols are maintained and more stringent monitoring for

unauthorized and hostile persons is recommended. Limiting movement and access to smaller zones within the facility would improve security and reduce the need to track movement and identify unauthorized persons.

Securing Pharmaceuticals

Both facilities assessed have a lockable pharmacy area, although there currently are no pharmacies operating in either facility. Aside from the lockable doors, there is no additional security in place at the pharmacy location such as alarms, cameras or security personnel. Installation of some of these additional security controls may be needed to protect the pharmacy area under the isolation/quarantine scenario if there is a general shortage of vaccines or preventative or curative medications as described in the introduction.

6.1.2 Other Security Issues

Other miscellaneous issues are discussed below.

Identification and Tracking of Patients, Staff and Visitors

Comprehensive identification and tracking efforts will be needed and security experts recommend issuance of staff identification badges, use of security personnel and/or electronic card readers, computerized patient tracking if feasible, and identification and tracking or limitation of visitors. This identification and tracking would be conducted in concert with other access control measures as described above.

Monitoring and Prevention

Neither of the facilities we assessed is conducting on-going security monitoring. There are no active security cameras or other remote monitoring in place, nor are there patrols/sweeps conducted by security personnel. Under Scenario One, regular patrols by security personnel would be needed to continually identify and de-escalate potential security problems. Under Scenario Two, significant monitoring efforts would be needed as the security risks are much greater. Ideally, remote security monitoring devices such as door alarms and security cameras would be used in combination with patrolling security personnel. If remote monitoring is not feasible, a significantly higher number of security personnel will be needed.

Security Communications

Effective execution of security protocols will require that on-site security personnel to communicate with one another, and be able to call in outside emergency personnel if needed. In addition, if a tertiary hospital is acting in an oversight or coordinating role, there may be need to communicate with personnel there. At the facilities we assessed, there is typically only one security person on-site; both facilities simply use the “911” system to call in outside emergency personnel, such as police, if needed. Under surge use, security teams will need to communicate with each other, possibly with the tertiary hospital overseeing operations, and possibly with the local police department.

6.1.3 Security Management and Protocols

There are currently no comprehensive security management plans or protocols in place at the assessed facilities, as this is not needed with the very limited and low risk uses of these facilities. A comprehensive security management plan and action protocols need to be developed by security experts for any planned surge facility use.

6.2 Preparing to Open a Shuttered Facility

The major gap noted in the security assessment was the need for additional security personnel to control access to the site and the building and to control movement within the facility. Systems for identification and tracking of staff, patients and visitors, protection of people and assets, and on-going security monitoring and communication are also needed.

6.2.1 Security Staffing

Under Scenario One, approximately four to six security staff per shift would be needed, and perhaps more at a larger facility. This includes three to four staff for building access control and security, and one to two staff for site access control and security. This level of staffing assumes that a reasonable level of physical barriers and mechanical/electronic security controls can be installed so that doors can all be locked and physical traffic barriers are in place. If this is not the case, additional staffing will be needed. For example, an additional security staff person would be needed at each entrance door that could not be locked or otherwise secured.

Under Scenario Two, a higher level of staffing will be needed as security risks are greater. Approximately eight to twelve security staff would be needed, four to six each for both building access control and security and site access control and security. Again, this level of staffing assumes that physical and mechanical controls can be installed for site and building access control. If these controls cannot be put in place, a higher level of staffing would be needed, including two to four additional security staff per shift to patrol and secure the site perimeter.

Sources of Security Staff

It is possible that one of the major metropolitan hospitals will take responsibility for setting up security at the surge facility. If this occurs, the major hospital may be able to supply security staff for the surge facility from within their own ranks of security personnel. This is ideal as these personnel will be trained and equipped. If sufficient security staff cannot be spared, other hospital personnel could potentially serve, such as staff from support services or administration. These personnel would have the advantage of familiarity with general hospital operations and procedures. They could be selected, trained, and managed by the existing major hospital security management. We should note, however, that all major tertiary hospitals will be in 24/7 full-response mode and may have no personnel of any sort to spare.

The next option would be to contract with a private security firm, which exist in every city. Some of these firms specialize in the types of emergencies that would necessitate opening a

surge facility. A contract would have to be set up in advance with a firm, to specify the following:

- Number of security personnel needed and within what timeframe. (It should be readily feasible to get up to 10 security personnel from a private firm within 24 hours.)
- Security protocols to be followed once deployed, and exact parameters of responsibility.
- Level of training needed.
- Gear and equipment specifications.
- Number of personnel who need to be armed.
- Chain of command and communications issues.

The firm under contract should specify how (and how quickly) needed personnel will be made available given the needs of their permanent client list, and to assess if they can truly deliver the needed staff.

If other staffing attempts are not successful, it may be possible to hire officers from the local community police department in the town where the surge facility is located, to serve as paid police details. This cannot be set up in advance nor guaranteed. Depending on what else is happening within the community, all officers may be fully utilized conducting their regular duties and will only be available to respond to active security/civil unrest situations.

Under Scenario Two it may be more difficult to obtain security personnel, as many will not wish to serve at an isolation/quarantine facility. Armed security staff may be needed under this scenario if civil unrest threatens to disrupt facility operations. Staff might also need protective gear against the infectious agent, such as respirators for which medical screening, training, and fit testing are required. Private security firms and/or their staff will likely be unwilling to serve at the isolation/quarantine surge facility. Local police officers might have the necessary skills and training, and are likely to be fitted with respirators under Homeland Security preparedness efforts (powered air-purifying respirator or air-purifying respirator fitted with HEPA cartridges at a minimum are recommended) but may be unwilling to serve at the isolation/quarantine surge facility.

As a last resort, security personnel may have to be called in from public police or military entities such as: local police, State police, National Guard, military police, or security members of Federal DMATs or DMRTs (only under a Federal emergency). Personnel from these organizations cannot be arranged for in advance, but can only be called in to respond to an existing emergency situation.

Security Staff Training, Equipment, and Preparation

Under both scenarios, security personnel should be uniformed and have a reflective vest if they are conducting traffic control. Security staff coming from the hospital, private security firm, or public policing authority would be uniformed.

Ideally, security staff serving at the proposed surge facility would receive advance training in the security protocols developed for the surge facility. Under Scenario Two, training in crowd control and negotiation would be important as there could be strong community response to the surge facility presence.

6.2.2 Security Equipment and Technology

Traffic Control Barriers

Significant traffic control measures could be needed under Scenario Two. These include traffic stop/checkpoints and zigzagged traffic pathways to prevent high-speed vehicle access to the facility. Physical traffic control barriers such as cones, stanchions, and jersey barriers can be readily obtained within a few days, thus prior to the proposed opening schedule for the surge facility. Public local, county, and State highway departments typically have supplies of these barriers on-site, as well as the vehicles and staff to transport and set-up the barriers at the surge facility. During an emergency event scenario, however, there may be competition for this equipment or staff. Private vendors of these barriers can typically deliver the quantity of these items as would be needed at the surge facility within the seven day opening timeframe. The major trade organizations for the Jersey barriers can be found at pci.org and precast.org. The closest supplier can be located through these websites.

Site Perimeter Control Barriers

Physical site perimeter barriers may be needed under Scenario Two. Fencing is the most practical and readily available site control barrier. For a site of up to 20 acres, fencing contractors and fencing trade association officials indicated that chain link fence could be installed around the full perimeter within the three to seven day timeframe, even within a day if needed. This can be accomplished through the use of temporary chain link fence, which is typically in stock in more than sufficient quantities in any major city. This temporary chain link fence is typically six feet in height, and is of the same strength as permanent fencing, but the posts are not set as permanently in the ground. To locate a fencing contractor a geographic search of the trade association website, www.americanfenceassociation.com, can be conducted, or a commercial/industrial contractor can be located through the yellow pages.

Building Access Control Devices

We expect that partially-shuttered hospitals will have functional locks on exterior doors and windows. Under Scenario One, it could be sufficient to limit access to one or two manned entranceways, with all other exterior entranceways locked. Under Scenario two, an increased level of building access control will likely be needed. There are additional devices that could be used to increase the flexibility and control of exterior doorway access while maintaining security. These include door card reader systems and remote door controls. We contacted vendors of this equipment who indicated that door card reader systems and door controls vary depending on the existing door hardware. Depending on which system is compatible

with the door hardware, these systems may be in stock or may take up to a few weeks to be delivered. Once the vendor has the system, it will take anywhere from one to eight days to install. The card reader systems are stand-alone wireless and battery-operated systems that can be programmed on-site with a laptop. The access cards can be programmed within a few minutes. If it is not feasible to install these types of door control systems, security personnel could man each doorway where identification checking is needed or that cannot otherwise be secured.

Interior Building Access/Movement Control Measures

Under Scenario One, there is likely no need to control access and movement once proper identification checks and access control have occurred at building entranceways (i.e., only authorized personnel, patients and allowed visitors have gained entrance). The only exception is to areas of the building that are physically unsafe, and the pharmacy and morgue. Unsafe areas can be partitioned or walled off prior to the opening of the surge facility as long as there are still two viable means of egress. Pharmacy and morgue spaces can be locked or assigned a guard.

Under Scenario Two, there is greater need to control access within the facility. First, isolation rooms, wards and floors must be secured. Locked doors with remote opening capability, as described above, can be monitored and controlled by security personnel. Lacking these physical or mechanical controls, additional security personnel would be needed at key locations inside the facility.

Monitoring Devices

Under Scenario One, it may not be necessary to employ significant monitoring efforts beyond security personnel manning key entranceways and conducting facility patrols. Under Scenario Two, monitoring of all access points as well as general site and facility monitoring will be needed under the higher security threat. In lieu of having security personnel stationed at every entranceway and at other key areas of access or activity, there are remote monitoring devices that can be used, in particular security cameras. Vendors for security cameras indicated that both wireless and wired security camera systems are available, and sufficient equipment to set up the surge facility would typically be in stock. This includes cameras, viewing monitors, recording devices, mounts, wires, and batteries. A wireless camera system may not be able to penetrate all areas of the facility, and this would need to be tested in advance. If it is not feasible to have the vendor do this advance testing, a wired camera system could be used. Vendors estimate that it would take four to five of their staff one or two days to install a full security camera system at the surge facility. Cameras would require power, but as outlined in the physical plant assessment, it is expected that electrical service would be available at the surge facility. If power is not available, batteries can be used, but these would only last for eight to twenty-four hours before replacement is needed.

Personal Identification and Tracking

Since the facility will be newly-opened, there will be entirely new staff brought in who will be unfamiliar to security staff. Under both scenarios, a means must be created to clearly identify authorized staff. Identification badges can be issued to all authorized personnel and if a door card reader system is being utilized, the vendor for this equipment can readily

program badges on site. If this is not feasible, unique identification badges can be created and issued on-site. Cameras, printers, and laminating equipment are readily available at a wide variety of retail outlets, and could be obtained immediately.

Security Communications Equipment

A key component of maintaining security under both scenarios at the surge facility will be the ability to communicate within the on-site security team, back to the base facility (whether it be a major hospital or a public emergency authority), and to outside emergency responders.

Hand-held radios will be an important communications tool for on-site security personnel to communicate with each other as they are stationed at or patrol different areas of the building and site. Vendors for this equipment indicate that dozens of hand held radios are typically in stock, and that these could be programmed and delivered within a few days. With the hand-held radios, however, there will likely be radio “dead zones” within the surge facility unless the signal is strengthened through the use of a repeater (amplifier). A repeater may not be necessary in all locations for successful radio communications, but our assessment of two former hospitals indicates that it will probably be needed. Vendors indicate that a repeater will not typically be in stock because it must be ordered based on the frequency to be used for the radios and then programmed and installed. This could take from a few days to up to a month (in the event that the vendor must run cable to ensure blanket radio coverage for the facility). Vendors indicate that they would need to conduct an advance walkthrough of the facility and test radio coverage within the facility to identify and execute an appropriate radio system at the surge facility.

In order to obtain use of a frequency for the radios, a license must be requested from the FCC. The FCC then assigns a frequency. This typically takes 30 days, so this would need to occur in advance for the planned surge facility. Ideally, the potential surge facility would be selected, then a frequency assigned for this specific location given range protection, i.e., there are no other close frequencies assigned in this area. If it is not possible to select one potential surge facility location, a license for a nationwide frequency can be requested. However, a repeater cannot be licensed for this frequency, only radio to radio use for this frequency is allowed.

In the event that all of the above systems fail, the most foolproof option is the use of satellite phones with fully satellite-based technology. We were only able to locate one such service provider (available for orders at sales@iridium.com), as it appears that many of the major telecommunications manufacturers have dropped or are in the process of dropping their satellite lines, and competitors use partially earth-based technology, as described below. This one satellite phone service indicated that they have received inquiries for purchase of these phones from State emergency officials in more than half of all States, as well as numerous local emergency officials. Therefore, it is possible that local or State officials may have satellite phones available for use at the surge facility.

If these satellite phones are not already available through local or State officials, they phones would need to be obtained in advance to ensure their availability for use at the surge facility. The phones are not always in stock, and often are sold out in anticipation of or during emergencies such as severe hurricanes. When phones are in stock, they must be ordered, shipped, and activated. Once phones are obtained, it typically takes about 24 hours to

activate them. These satellite phones will work outdoors, with auxiliary antennas that can be placed outdoors, or if there is a clear line of sight to the sky, such as in a window. For full indoor use, an external antenna must be installed on the structure. Installation of an external antenna on the facility does not seem feasible or necessary for the proposed surge facility, as the phones can still be used outdoors and at windows.

Many satellite phone services use “bent-pipe” technology whereby the signal is transmitted from the satellite to a point on earth then back to the satellite then back down to another point on earth. This system is at risk of failure if the towers being used come down as a result of the catastrophic event. Ham radio uses a tower to tower-to-tower relay approach. While ham radio may still be workable if a relay series of existing towers can be located, there is still some risk of blackout areas where all towers are down. For this reason, the fully satellite or completely earth-free system is recommended.

Security Management Planning and Protocols

Security management officials from whoever is managing the facility will need to devise a security plan in advance. These officials will conduct a walkthrough of the facility and review possible scenarios under which the surge hospital will be used. From this, they will determine needed security staffing levels, staff training and equipment requirements, recommended physical barriers and mechanical/electronic security controls, and security protocols. They will also identify the best source for security staffing of the surge facility, and will execute needed contracts and other advance planning and preparedness efforts with the staffing source.

7.0 Patient Information

Information management issues will arise as patients are: a) discharged from tertiary care hospitals, b) admitted to the surge facility, and c) discharged from the surge facility. Records will also need to be maintained while patients are being cared for in the surge facility.

There is very little in the way of information technology remaining in vacant portions of these former hospitals. While Internet and wireless access may be available, reconnecting and testing these systems will unlikely be a priority during the 3-7 days leading up to opening of the surge facility. Each of the discharging hospitals has different electronic health record systems, which are not inter-operable. Our experts therefore anticipate that a paper discharge record is preferable, as is a manual record system at the surge facility itself. A paper system removes the interoperability issues of dissimilar EHRs, is easily transported, and would not be subject to IT interruptions (and would therefore require no IT support staff).

To facilitate the transfer of information from discharging hospital, to transport staff, to surge facility staff, we suggest the use of a tri-fold 8 ½ x 11 brochure style form that can be inserted into a clear plastic pocket and placed around a patient's neck during transport. This form is included in the Toolkit accompanying this report. The front page of this tri-fold lists basic information, and information regarding transportation methods. Page two

Recommendation: regulatory requirements regarding medical records systems and maintenance among the requirements that will need to be at least partially waived for a surge facility.

of the tri-fold contains more detail about patient condition and immediate needs. Page three provides space for discharging doctors and nurses to provide information about the patient, pertinent to discharge and continuing care needs. Page 4 shows a 12-hour schedule for ongoing needs, to assure that key medication doses are not missed during the discharge process. Page 5 lists additional information material and medications that arrived with the patient (if any), and page 6 provides a list of contact and insurance information. This form should provide the receiving surge facility staff with the minimal information required to provide continuity of care for the medically stable patients under their care.

While care is being provided at the surge facility, a records system must be maintained. Experts recommend a paper-based medical records system for the surge facility, rather than trying to establish an electronic medical record system, for several reasons. First, any electronic medical record system would probably not be interoperable with the systems at the tertiary hospitals the patients originate at (and possibly return to). As a result, patient movement would not be facilitated by an electronic system. A paper record can travel back and forth from one facility to another and, if necessary, can be entered into an electronic format at a sending/receiving tertiary hospital (just as normally occurs when patients move between hospitals that do not use electronic records systems). Second, electronic systems require hardware, software, technicians and clinical personnel who are trained in that particular system. The equipment will most likely not be available on short notice, and staff who are coming from many other settings will not be familiar with the selected system. Finally, the effort does not appear warranted because the surge facility will be in operation for only a few weeks. For all of these reasons, we recommend reliance on a paper-based

medical record, which will require the establishment of a small medical records department at the surge facility, staffed by trained professionals.

Ownership of the medical records long after the facility has closed will be a concern. Current regulations require that a hospital maintain a copy of medical records for several years (up to 20) after discharge, which will clearly not be possible at the surge facility after it is shut down. There are several options for records control. The records could be merged back into the records of the tertiary hospital from which the patient is discharged (which could be problematic if the tertiary hospital uses electronic records and the surge facility uses paper medical records). The records could be stored by the State health department or the records could be stored by the present owner of the facility, which may be a health care entity.

8.0 Conclusions

Table 17 summarizes our findings about the status of former ‘shuttered’ hospitals, and the additional needs for surge use.

Table 17: Summary of Current Status of former ‘Shuttered’ Hospitals’ for Use as Surge Facilities in a Mass Casualty Even

Topic	Typical Status at Partially Shuttered Hospital	Additional Needs for Surge Use
Facility Structure and Status	The condition of structural components, fixed equipment, and systems is generally good enough such that they could be brought to full operation status within the 3 – 7 days. Design and layout are well suited for intended medical use.	<ul style="list-style-type: none"> • Fuel • Refrigerated space for morgue • Replacement of outlet parts may need to be brought in. Information and communications systems would need to be re-established. • Licensure of life safety systems, elevators, isolation rooms, may need to be re-certified.
Equipment and Supplies	There is limited available equipment and supplies.	Most equipment and supplies would need to be brought in: <ul style="list-style-type: none"> • patient beds • linens • bathroom amenities • pharmaceuticals • portable storage units • portable oxygen • water • IT/communication equipment
Staffing	Existing staff employed by companies/individuals that leased space in building. Only Security staff is possibly available.	Most staff would need to be brought in: <ul style="list-style-type: none"> • physicians • physician extenders • nursing staff • allied health staff • ancillary staff such as security, laundry and kitchen staff

Table 17: Summary of Current Status of former ‘Shuttered’ Hospitals’ for Use as Surge Facilities in a Mass Casualty Even

Topic	Typical Status at Partially Shuttered Hospital	Additional Needs for Surge Use
Patient Transportation	Facility sufficiently close to a city, so transportation would be sufficiently expedient. Facility is available by bus, ambulance, van, and helicopter.	<ul style="list-style-type: none">• Combination of buses, vans or ambulances will be used to transport patients.• A standardized medical record for transfer and emergency provision of uncommon medications to be transported with patients would expedite patient transport and ensure quality care.
Patient Information	Little information technology remaining in facility.	<ul style="list-style-type: none">• A paper records system would be used.• It would need to be determined who owns these medical records.

With few exceptions, all of the necessary facility infrastructure, staffing, equipment, supplies, transportation, security and information systems can be obtained, created or installed at a partially-shuttered hospital, to bring it to readiness as a surge facility. Scenario Two (infectious disease) raises issues that are of less concern under Scenario One (mass casualty trauma event) but even these more extensive needs can be addressed.

When community emergency planners consider the partially-shuttered hospitals that might be suitable for surge capacity expansion, a grading system might be helpful for prioritizing the most likely candidate facilities. This prioritization will need to be evaluated periodically in each community, since the status and merits of one shuttered hospital over another can change over time. We suggest the following factors which together might help in this prioritization:

- Shuttered hospitals are often in a state of transition or near-transition to some other purpose. Location and the relative local value of the real estate involved may indicate the likelihood that a facility will remain empty and available or be converted to other purposes such as condominiums or assisted living.
- Similarly, a shuttered hospital may have an uncertain ownership status and may be owned by the city or by a developer, or be part of a bankruptcy proceeding. Uncertain or changing ownership may mean that no one is legally able to negotiate for the use of the facility in an emergency. A partially-shuttered hospital that maintains some sort of affiliation with a tertiary hospital (e.g. urgent care center, walk-in clinic) may be a more likely candidate for surge capacity since organizational/contractual arrangements already exist that can be used to advantage in an emergency.
- A hospital that has been vacant for many years is more likely to have been stripped of necessary fixtures, have undependable utilities, or have structure problems such as roof damage, and therefore may be a lesser candidate for surge capacity expansion.
- A larger shuttered hospital may have more to offer than a very small one, for surge capacity purposes.
- A surge facility located fairly close to the major tertiary medical centers may be advisable to minimize patient transportation time and issues.
- A facility that maintains a cafeteria/food preparation area, certified life safety systems, a phone switch, and similar basic functionality would be better than one that is entirely vacant and un-used.

Planners could rank potential surge facilities using a list like this, as a first step in identifying the best candidate facilities.

The most efficient and comprehensive approach for opening and operating a surge facility might be for an existing tertiary medical center to take on the responsibility of making the surge facility a ‘satellite’ of the medical center. This would be more feasible if a former hospital is the satellite, rather than a school, hotel or some other facility. Existing contracts and vendor agreements could be extended to the satellite surge facility and medical, security, materials management and other staff could lend their expertise, especially in the planning

phase. Patient charts could remain unified and pharmacy/lab services extended to the satellite. While some cities may not have a tertiary medical center or enterprise willing and able to fill this role, and this approach is certainly not the only one that would work, it is a logistically reasonable and efficient approach for planners to consider.

Federal and State regulations pose barriers to the rapid conversion/reopening of a shuttered hospital (e.g. EMTALA, Medicare Conditions of Participation, HIPAA).⁷⁶ These issues need to be considered well in advance of a mass casualty event necessitating surge capacity expansion at any facility that is not a functioning hospital. Provision for waivers could be set in place in advance, for example, to permit this surge capacity expansion. Perhaps the Federal government could offer ‘model’ waiver legislation as a starting point for States to consider.

There remain unanswered policy questions that planners need to consider including:

Who will have responsibility for operating the facility? Options include a local tertiary care hospital or hospital system, or a city or State health department. Will this entity bear legal/liability responsibility as well?

Who will have responsibility, at Federal and State levels, to review/revise regulations and establish contingencies for waiving specific regulatory requirements in an emergency?

How much will it cost to prepare and operate a surge facility and how will the surge facility and all of its staff, equipment and supplies be paid for? Will third party insurers be asked to reimburse for care provided in the surge facility, and will the facility therefore need a sophisticated billing system (not dealt with here)?

⁷⁶ . These issues are discussed in an appendix to this report.

Appendix A

List of Supplies and Equipment Needed for Operation of a Shuttered Facility

Adhesives Bandages, Dressings, and Sponges

<i>Description</i>	<i>Unit</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>	<i>Count for one month, entire facility</i>
APPLICATOR COTTON MEDC 6INCH STE	BOX	1	200
BANDAGE COVERLET 1INCH PLASTIC C	BOX	1	200
BANDAGE ELASTIC 2INCH NSTRL	EACH	1	400
BANDAGE GAUOZE BULKY STERILE CASE	EACH	12	3000
CLOSURE SKINCH 1/2INCHX4INCH STERI S	BOX	1	200
GAUOZE 2INCHX2INCH STRL CASE/30BOX/50E	BOX	2	600
GAUOZE PACKINCHG 1/2INCH PLAINCH CASE/1	BOTTLE	1	200
GAUOZE SPONGE 4INCHX4INCH 6PLY STRL	BOX	2	400
GAUOZE SPONGE 4INCHX8INCH 12PLY BOX/	BOX	2	400
PAD ABD 5INCHX9INCH STERILE CASE/400	BOX	1	200
TAPE DURAPORE 1INCH CASE/10BOX/12EACH	BOX	1	200
TAPE PAPER MICROPORE 1INCH	BOX	1	200
COLD COMPRESS THERAPY	EACH	11	2900
DRESS TRANS 6CMX7CM IV FRAME T	BOX	1	200
DRESSING DUODERM 3INX3IN XTHIN	BOX	1	200
DRESSING DUODERM 4INX4IN CGF W	BOX	1	200
DRESSING DUODERM 6INX6IN CGF W	BOX	1	200
DRESSING TEGADERM 15X20 6INX8I	EACH	20	4000
GAUZE PETROLATUM 1INX8IN CS/14	BOX	40	800
HYDROGEL CARRASYN 3OZ CS/12EA	EACH	2	400
VASELINE PACKET 5GM	EACH	10	2000

Anti-Microbials, Disinfectants, and Scrubs

<i>Description</i>	<i>Unit</i>	Per Ward (30-40 patients) <i>1-3 day supply</i>	<i>Count for one month, entire facility</i>
PAD ALCOHOL PREP MD CASE/15BOX/20	BOX	2	400
SOAP ANTIMICROBIAL HIBICLENS P	EACH	5	1000
SWABSTICK BENOZOINCH SGL CASE/10BOX/	BOX	1	200
SWABSTICK BETADINCHE	PK	25	5000
WIPE ASEPTI II GERMICIDAL CASE/1	CN	2	600

Nutritional and Feeding Supplies

<i>Description</i>	<i>Unit</i>	Per Ward (30-40 patients) <i>1-3 day supply</i>	<i>Count for one month, entire facility</i>
SET ENTERAL FEEDING CONTAINER	EACH	2	400
SET ENTERAL FEEDING TUBE W/PIE	EACH	2	400

Gloves and Masks

<i>Description</i>	<i>Unit</i>	Per Ward (30-40 patients) <i>1-3 day supply</i>	<i>Count for one month, entire facility</i>
GLOVE EXAM LARGE	BOX	3	1400
GLOVE EXAM MEDIUM	BOX	3	3300
GLOVE EXAM SMALL	BOX	3	3300
FACESHIELD ANITFOG 8 3/4INCH W/C	EACH	2	1000
MASK PAPER MOLDED ASEPTEX	BOX	2	1000
STERILE GLOVES	BOX	10	100
PAPER MASK, MOLDED	BOX	20	200

Waste and Water

<i>Description</i>	<i>Unit</i>	Per Ward (30-40 patients) <i>1-3 day</i>	<i>Count for one month, entire</i>
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		<i>supply</i>	<i>facility</i>
HAZORDOUS WASTE CONTAINER FOR SHARP ITEMS	EACH	2	600
INCONTINCE PAD	PACKAGE	3	900
BASIN BLUE STRL 160OZ DISP CASE/7	EACH	25	800
BASIN EMESIS 9INCH MAUVE CASE/250E	EACH	25	800
BASIN WASH RECT 7QT CASE/50EACH	EACH	8	800
BATH SITOZ W/BAG ROSE CASE/10EACH	EACH	8	400
BEDPAN PORTOON ROSE CASE/20EACH	EACH	15	2000
URINAL W/TRANSLUCENT COVER CASE/	EACH	15	2000
ENEMA BAG 1500CC W/TUBE & SOAP	EACH	400	2
ENEMA OIL 4 1/2OZ DISP FLEET C	EACH	400	2
ENEMA PHOSPHATE 4.5OZ. #20	EACH	600	3
TISSUE HAND SANI CS/200BX	BOX	6000	30

Standard and Custom Kits, Packs and Trays

<i>Description</i>	<i>Unit</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>	<i>Count for one month, entire facility</i>
KIT BLOOD GAS PERCUTANEOUS	EACH	22	2800
KIT IV START #1987	EACH	18	2000
SET MIDSTREACHM COLLECTION	EACH	4	1200
SET SUTURE REMOVAL CASE/50EACH	EACH	5	1600
STAPLE REMOVER BUSSE	EACH	2	800
KIT PORTA CATH CASE/20EACH	EACH	2	600
TRAY DRESSINCHG CHANGE CASE/40	EACH	4	1000

Chemical and Non-Drug Pharmaceutical

<i>Description</i>	<i>Unit</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>	<i>Count for one month, entire facility</i>
HYDROGEN PEROXIDE 160OZ	BOTTLE	2	400

Dining and Non IV-Drug Delivery

<i>Description</i>	<i>Unit</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>	<i>Count for one month, entire facility</i>
CARAFE W/HANDLE DELUXE W/LID M	EACH	15	450
CONTAINER MEASURE TRIANGULAR G	EACH	15	450
CUP MEDICIN MEDC CASE/50PK/100E	PK	20	800

Microbiology Needs and Syringes

	<i>Unit</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>	<i>Count for one month, entire facility</i>
DEVELOPER HEMOCULT SENSA 15ML	EACH	1	300
SET BLOOD CULTURE AEROBIC CASE/4	EACH	11	2200
SET BLOOD CULTURE ANAEROBIC CASE	EACH	11	2200
SWAB CULTURETTE SGL PK/50EACH	EACH	15	3000
HOLDER CARPUJECT REUSABLE	EACH	6	1200
NEEDLE BUTTERFLY 21G SAFETY LO	EACH	15	5000
NEEDLE SAFETY 18GX1 1/2 PINK B	BOX	1	200
NEEDLE SAFETY 20GX1.5 YELLOW C	BOX	1	200
NEEDLE SAFETY 22GX1.5 BLACK CASE	BOX	1	200
NEEDLE SAFETY 23GX1 TURQUOISE	BOX	1	200
NEEDLE SAFETY 25X5/8 ORANGE CASE	BOX	1	200
NEEDLE SAFETY FILTER STRAW BOX/	BOX	1	120
SET BLOOD COLLECTION 23GA SAFE	EACH	25	5000
SYRINCHGE 1CC L/L TIP BD	BOX	1	200

SYRINCHGE 3CC LUER LOK W/O NEEDL	BOX	1	200
SYRINCHGE 5CC LUER LOCK BOX/100EACH	BOX	1	200
SYRINCHGE DISP 10CC LUER LOK	BOX	1	200
SYRINCHGE DISP 20CC LUER LOK	BOX	1	200
SYRINCHGE DISP 60CC LUER LOK CASE/	BOX	1	200
SYRINCHGE INCHSULINCH .5CC 29X1/2 CASE	BOX	1	200
SYRINCHGE ONLY DISP 60CC CATH TI	BOX	1	200
SYRINCHGE SAFETY INCHSULINCH ICC 29X	BOX	1	200
SYRINCHGE SAFETY TB 1CC 27X0.5 C	BOX	1	200
VACUTAINCHER HOLDER SGL USE W/O	EACH	10	2000

Patient Sundries

	<i>Unit</i>	Per Ward (30- 40 patients) <i>1-3 day supply</i>	<i>Count for one month, entire facility</i>
TOOTHPASTE COLGATE .85OZ TUBE	EACH	2000	34
BAG PATIENT BELONGING 20INX18.	EACH	2000	33
PAD SANITARY MATERNITY CS/24PK	PK	400	2
TAMPON TAMPAX REGULAR 40'S CS/	BOX	200	1
TOOTHBRUSH	EACH	2000	32
BAND PATIENT ID BLUE BX/500EA	EACH	3000	25
SOAP BAR 3/4OZ CS/1000EA	EACH	3000	37
LOTION BODY AND HAND 3.5OZ	EACH	2400	12
PILLOW DISPOSABLE	EACH	3300	40

Other Non-Durables

	<i>Unit</i>	Per Ward (30- 40 patients)	<i>Count for one</i>
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		<i>1-3 day supply</i>	<i>month, entire facility</i>
CUP SPECIMEN 4.5OZ CS/200EA	EACH	2400	12
SPECIMEN TRAY	EACH	4000	20
SURGI LUBE 3.0GR CS/12BX/144EA	BOX	200	1
TONGUE DEPRESSOR 6IN STRL CS/1	BOX	100	1

Patient Care and Support

	<i>Unit</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>	<i>Count for one month, entire facility</i>
BOARD ARM 3X18 DISP	EACH	200	3
BOARD ARM TOMAC 3X9 DISP	EACH	200	3
PROTECTOR HEEL AND ELBOW PR	PR	100	2
RESTRAINT ANKLE	EACH	100	2
RESTRAINT VEST LG	EACH	100	2
RESTRAINT VEST MED	EACH	100	2
RESTRAINT VEST SM	EACH	100	1
RESTRAINT WRIST	PR	200	2
SLING ECONOMY ARM LG	EACH	200	2
SLING ECONOMY ARM MED	EACH	200	2

Many patients will come fitted with these items from the originating hospital. Depletion of these items may be quite slow. If possible, we recommend ordering on a more frequent basis and monitoring supplies closely.

Point of Care Testing and Specimen Collection

	<i>Unit</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>	<i>Count for one month, entire facility</i>
Description	Unit		Count
STETHOSCOPE BLUE MEDICAL SURGICAL HEACHD	EACH	12	150
CATHETER DOUBLE LUMEN	EACH		200
AQUASONIC 100 TRANSMISSION GEL	EACH	2	400
ELECTRODE EKG ADHESIVE CASE/40PK	PK		1400
ELECTRODE MONITORING RED DOT	BAG	5	1000
PAD DEFIB BOX/12	EACH	2	400
APPLICATOR STRAW GASTROCULT CS	BG	1	200
GASTROCULT DEVELOPER	EACH	2	600
GUAIAAC SLIDE TEST HEMOCULT	BOX	1	200
SLIDE GASTROCULT CS/10BX/40EA	BOX	1	200
STRIP BLOOD GLUCOSE MEDI SENSE	BOX	4	800
COVER PROBE THERMOMETER	CT	2	400
CONTAINER URINE 24HR	EACH	400	2
LANCET ACCUCHECK SAFE T PRO CS	PK	200	1
STRAINER RENAL CALCULI	EACH	400	2
TUBE PST PLUS 4.5ML	BOX	200	1
TUBE VACUTAINER 10ML RED 16X10	BOX	200	1
VACUTAINER 10ML GREEN	BOX	200	1
VACUTAINER 2ML 13X75MM PLASTIC	BOX	200	1
VACUTAINER 4.5ML CITRATE 3.2%	BOX	200	1
VACUTAINER 4ML K2 EDTA 13X75MM	BOX	200	1

Under Scenario 2, we will need to increase stethoscope supplies, as medical personnel may not use one on more than one individual patient.

Respiratory

	<i>Unit</i>	<i>Count for one month, entire facility</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>
AIRWAY NASOPHARANGEAL 7.0 CS/1	EACH	400	2
AIRWAY ORAL PVC 10CM BX/30	EACH	400	2
AIRWAY ORAL PVC 9CM BX/30EA	EACH	400	2
CANNULA OVER THE EAR NON FLARE	EACH	1400	7
CATHETER SUCTION 12FR	EACH	400	2
CATHETER SUCTION 14FR	EACH	400	2
CATHETER SUCTION 18FR	EACH	400	2
CONNECTOR TUBING 5IN 1 3/16 7/	EACH	800	4
CONNECTOR TUBING 5IN 1 FOR 5/1	EACH	400	2
CONNECTOR TUBING Y LG	EACH	600	3
CONTAINER SUCT FLEX 1L 1000CC	EACH	1200	6
CONTAINER SUCT HARD 3L 3000CC	EACH	600	3
CONTAINER TRAP SPUTUM COLLECTI	EACH	600	3
HUMIDIFIER	EACH	1000	5
NEBULIZER MICROMIST W/ TEE	EACH	1000	5
SODIUM CHLORIDE .9% INHAL 3ML	BOX	200	1
TAPE BINDING BLEACHED 1/2IN	ROLL	200	1
TIP YANKAUER SUCTION ONLY	EACH	2000	10
TUBING PLASTIC UNIV BUBBLE	BOX	200	1

Under Scenario 2, we may find that supplies of these items are depleted on a more frequent basis.

Urological

Item		3-4 Day Supply 30-40 patients	Thirty Day Supply Hospital
CATHETER PLUG	EACH	4	400
TRAY IRRIGATION STRL	EACH	2	200
BAG LEG URINE MED 19OZ.	EACH	6	600
BAG URINARY DRAINAGE	EACH	2	200
SET CYSTO IRG	EACH	2	200
CATHETER MALE MED 28MM EXTERNA	EACH	2	200
CATHETER MALE EXT 31MM INT LAT	EACH	2	200
CATHETER MALE LG EXTERNAL 35MM	EACH	2	200
CATHETER SECURE	EACH	12	1200
SET CATH TRAY CLEAR PVC CATH 1	EACH	4	400
TRAY CATHETER IC FLY 16FR BARD	EACH	2	200
SET CATH TRAY FOLEY 18FR CLOS	EACH	2	200
TRAY URINEMETER W/SAMPLING POR	EACH	2	200
CATHETER FOLEY 5CC BAG 14FR	EACH	2	200
CATHETER FOLEY 5CC BAG 16FR	EACH	2	200
CATHETER FOLEY 5CC BAG 18FR	EACH	2	200
CATHETER FOLEY 30 CC BAG 16FR	EACH	2	200
CATHETER FOLEY 3WAY 5CC 16FR	EACH	2	200
CATHETER FOLEY 30CC 18FR	EACH	2	200

Medical Skin Care

	<i>Unit</i>	<i>Count for one month, entire facility</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>
CREAM ANTIFUNGAL 5OZ CS/12EA	EACH	400	2
CREAM BARRIER MOISTURE 3.5 OZ	EACH	400	2
CREAM EUCRIN JAR 4OZ	EACH	600	3
FOAM CLEANSING CARRA PERINAL	EACH	400	2
LANOLIN COMPOUND TUBE 1OZ	EACH	400	2
LOTION ACCENT PLUS 1 540ML CS/	EACH	400	2
NEOMYCIN POLYMYXIN BACITRACIN	BOX	200	1

Under certain situations in Scenario 2, these items may be depleted relatively quickly as compared with general medical surge.

Solutions

	<i>Unit</i>	<i>Count for one month, entire facility</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>
SALINE NORMAL 10ML FLIP TOP VI	PK	200	1
SOL BO NAACL .9% IRR 1000ML	EACH	1000	5
SOL BO NAACL .9% IRR 500ML	EACH	1200	6
SOL BO STRL WATER IRR 1000ML	EACH	1000	5
SOL DEX 10% IN WATER INJ 1000M	EACH	400	2
SOL DEX 5% INJ 1000ML	EACH	400	2
SOL DEX 5% INJ 100ML	EACH	1800	9
SOL DEX 5% INJ 150ML	EACH	800	4
SOL DEX 5% INJ 250ML	EACH	800	4
SOL DEX 5% INJ 500ML	EACH	400	2
SOL DEX 5% INJ 50ML CS/48EA	EACH	5400	27
SOL DEX 5% LACT RINGER 1000ML	EACH	400	2
SOL DEX 5% NAACL .45%	EACH	2400	12

1000ML			
SOL DEX 5% NACL .45% 20MEQ 100	EACH	2400	12
SOL DEX 5% NACL .45% 40MEQ 100	EACH	600	3
SOL DEX 5% NACL .45% 500ML	EACH	600	3
SOL DEX 5% NACL .9% 1000ML	EACH	2000	10
SOL DEX 5% NACL .9% 500ML	EACH	400	2
SOL KCL 20MEQ D5%+.9% NS 1000M	EACH	1000	5
SOL KCL 40MEQ D5%+.9% NS 1000M	EACH	1000	5
SOL LACT RINGER'S INJ 1000ML	EACH	600	3
SOL NACL .45% INJ 1000ML	EACH	1200	6
SOL NACL .9% INJ 1000 ML	EACH	2400	12
SOL NACL .9% INJ 100ML	EACH	2400	12
SOL NACL .9% INJ 150ML	EACH	1600	8
SOL NACL .9% INJ 250ML	EACH	1600	8
SOL NACL .9% INJ 500ML	EACH	800	4
SOL NACL .9% IRR 3000ML	EACH	400	2
SOLUTION NACL 0.9 20MEQ 1000ML	EACH	800	4
WATER STRL 10ML FLIP TOP PK/25	PK	200	1

Woven Goods and Clothing

	<i>Unit</i>	<i>Count for one month, entire facility</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>
DRAPE HALF 6INX44IN STRL CS/54	EACH	400	2
GOWN IMPERVIOUS COMFORT BLUE U	PK	200	1
GOWN REINFORCED LG ULTRA FABRI	EACH	400	2
KIT SHROUD DISP	EACH	400	2
SLIPPER TERRY NON SKID LG CS/4	PR	1800	9
SLIPPER TERRY NON SKID MED CS/	PR	1800	9
SLIPPER TERRY NON SKID XLG CS/	PR	2000	10

STOCKINETTE 2INX25YD	EACH	200	1
STOCKING TED KNEE LG	PR	600	3
STOCKING TED KNEE MED	PR	600	3
STOCKING TED THIGH LG	PR	600	3
STOCKING TED THIGH LG SHORT	PR	600	3
TOWEL POLY DISP STRL NON FEN C	BOX	200	1

Cafeteria and Water

	<i>Unit</i>	<i>Count for one month, entire facility</i>	<i>Per Ward (30-40 patients) 1-3 day supply</i>
POTABLE WATER	GLLN	60,000	200
DINNER PLANTES DISPOSABLE	EACH	48,000	600
TRAYS DISPOSABLE	EACH	48,000	600
CUPS DISPOSABLE	EACH	72,000	720
UTENSILS DISPOSABLE	EACH	72,000	720
NAPKINS DISPOSABLE	EACH	72,000	720
MEALS (3xDAY)	BOX	36,000	360

Appendix B

Preliminary “Basic” Pharmacy List

This is a list of the medications that would be used for typical medically stable med/surg patients. Wholesalers maintain disaster stockpiles of most of these medications and many are also in the SNS.

Acyclovir sodium 200mg cap
 Albumin 25% 12.5 mg INJ
 Albuterol 2.5 mg/3ml 3ml soln
 Albuterol 90MCG aerosol
 Albuterol sulfate/IP 3ml solution
 Alprazolam .25mg tab
 Alprazolam 0.5 mg tab
 Amiodarone 200mg tab
 Amitriptyline 25mg tab
 Amitriptyline 50mg tab
 Amlodipine 5mg table
 Aspirin (E.C.) 325mg tab
 Aspirin (E.C.) baby 81 tab
 Atenonol 25mg tab
 Atenonol 50mg tab
 B1/5%+dilo.02mg/ml 200 ml bag
 B1/8%+dilo.02mg/ml 200 ml bag
 Baclofen 10 mg tab
 Calcitriol 025MCG tab
 Calcium /VIT D 600mg/200 UEA tab
 Calcium carbonate 500mg tab
 Calcium citrate 950mg tab
 Calcium gluconate 1mg INJ
 Captopril 12.5mg tab
 Captopril 25mg tab
 Carbamazepine 200mg tab
 Cafazolin 1G/50ml IN DE
 Caphalezin 250mg cap
 Caphalezin 500mg cap
 Cetrizine 10mg tab
 Citalopran Hydrobromide 20mg tab
 Clinamycin 600mg bag
 Clinamycin HCL 150mg cap
 Clonazepan 0.5 tablet
 Clotrimazole 1EA TROCH
 Codeine 30mg tablet
 Codeine 3mg/1ml 5ml CUP
 Darvon-n 100 100mg tablet
 Dexamethasone 2mg tab
 Dexamethasone 4mg INJ
 Deztrose 50% 25mg SYR
 Diazepam 5mg tablet
 Digoxin 0.125 tab
 Digoxin 0.25 tab
 Diltiazem 30mg tab
 Diphenhydramin 50mg/1ml 1ml VIAL
 Diphenoxylate w/ atrophine tab
 Dopamine 400mg bag
 Doxycycline 100mg cap
 Enalapril maleate 5mg table
 Enoxaparin 100mg INJ
 Enoxaparin 40mg INJ
 Enoxaparin 60mg INJ
 Enoxaparin 80mg INJ
 Enoxaparin SO 30mg/0.3ml DISP SY
 Ephedrine 50mg INJ
 Ephephrine HCL 1mg INJ
 Esomeprazole 20mg cap
 Estrogens, conjugate 0.625mg tab
 Famotidine 20mg bag
 Famotidine 20mg tab
 Fentanyl 50MCG/1ml 2ml ampule
 Ferrous sulfate 325mg tab
 Floricet 1EA tablet
 Florinal 1EA capsule
 Fluconazole 200mg tab
 Flumazenil 0.5ml vial
 Fluoxetine 20mg cap
 Folic acid 1mg tab
 Furosedime 10mg/1ml 10ml INJ
 Furosedime 10mg/1ml 2ml INJ
 Furosedime 20mg tab
 Furosedime 40mg tab
 Furosedime 80mg tab
 Gabapentin 100mg cap
 Gabapentine 300mg capsu
 Gentamicin 100mg bag
 Gentamicin 80mg bag
 Glipizide 5mg tab
 Glybride 2.5mg tab
 Glybride 5mg
 Guifenesin 100mg/5ml syrup
 Guifenesin/D-methorph 5ml syrup
 Haloperidol 1mg tab
 Haloperidol 5mg vial
 Heparin 5000units/1ml 1ml syringe
 Heparin (PR 25000 units 250ml bag)
 Hydralazine HCL 250mg/1ml vial
 Hydrochlorothiazide 25 tablet
 Hydrocortisone SOD 100mg vial
 Hydromorphon 2mg/1ml 1ml syringe
 Hydromorphon 4mg/1ml 1ml syringe
 Hydromorphone 1mg/1ml
 Hydromorphone 2mg tablet

Hydromorphone 4mg tablet	Morphine 5mg/1ml 30ml PCA
Hydroxychloroquine 200mg tab	Morphine I.R. 15mg tablet
Hydroxyzine 25mg tab	Morphine I.R. 30mg tablet
Ibuprofen 800mg tab	Morphine sul 20mg/1ml 120ml SOLN
Indomethacin 25mg cap	Morphine sulfat 1mg/1ml 30ml PCA
Ipratropium 0.02% 0.5	MS contin (SA) 15mg tablet
Isosorbide dinitrate 10mg tab	MS contin (SA) 30mg tablet
Isosorbide monnitrate 30mg tab	MS contin (SA) 60mg tablet
Ketorolac 30mg 1ml INJ	Nalbuphine HCL 10mg INJ
Lactulose 30ml syrp	Naloxone HCL 0.4mg 1ml INJ
Levetiracetam 500mg tab	Naproxen 250 tab
Levofloxacin 250mg bag	Nephro-vite RX 1EA tablet
Levofloxacin 250mg tab	Neutraphos 250mg powder
Levothyroxine 100MCG tab	Nifedipine (SR) 30mg CR TA
Lido 2% w/ EPI 1::200,0 20ml vial	Nifedipine (SR) 60mg tab
Lidocaine 2% (viscous) 20ml cup	Niferex-150 150mg cap
Lidocaine 2% (uro-jet 10ml jelly)	Nitroglycerin 1/150 0.4mg tab
Lidocaine 2% 10ml amp	Ondansetron HCL 1mg syrin
Lisinopril 10mg tab	Oxazepam 10mg capsule
Lisinopril 20mg tab	Oxycodone 1mg/1ml 5ml cup
Loperamide 2mg cap	Oxycodone 5mg tablet
Loratadine 10mg tab	Oxycontin SR 10mg tablet
Lorazepam 0.5mg tab	Oxycontin SR 20mg tablet
Lorazepam 1mg tab	Paroxetine 20mg tab
Lorazepam 2mg/1ml syringe	Perphanazine 2mg 1EA tab
Magnesium gluconate 500mg tab	Phenobarbital (60mg/1ml 1ml INJ)
Magnesium oxide (heavy 400mg tab)	Phenobarbital 64.8mg tablet
Magnesium sulfate 1 gm 2ml injection	Phenobarbital 97.2 mg tablet
Megestrol acetate 40mg tab	Phenulephrine 10mg INJ
Mesalamine CR 250MG CA	Phenytoin 100mg capsule
Metformin 500mg tab	Phenytoin 250mg INJ
Methylphenidate 5mg tab	Phytonadione 10mg INJ
Methylprednisolone 125mg INJ	Postassium Chloride 10MEQ 100ml bag
Methylprednisolone succ 40mg INJ	Postassium Chloride 10MEQ CAP
Metoclopramide 10mg tab	Postassium Chloride 20MEQ PWD
Metropolol 12.5ml cap	Predenisonone 10mg tab
Metropolol 50 mg tab	Prednisone 20mg tab
Metropolol 5mg INJ	Prednisone 50mg tab
Metropolol succinate 50mg tab	Prenatal vitamins 1EA tab
Metronidazole 250mg tab	Prochlorperazine 10mg 2ml INJ
Metronidazole 500mg tab	Prochlorperazine 10mg tab
Midazolam 1mg/1ml 2ml vial	Prochlorperazine 25mg supp
Morphine 10mg/1ml 10ml vial	Prochlorperazine 5mg tab
Morphine 10mg/1ml 1ml syringe	Promethazine HC 25mg/1ml 1ml INJ
Morphine 2mg/1ml 5ml syringe	Promethazine HCL 25mg tab
Morphine 2mg/1ml 5ml cup	Propranolol 1mg AMP
Morphine 4mg/1ml 1ml syringe	Pseudoephedrine 30mg tab

Psyllium mucilliod (3.4GM packet)
Risperidone 0.25mg tab
Rosiglitazone 4mg tab
Sertraline 50mg tab
Sertraline HCL 100mg tablet
Simthicone 80mg tab
Simvastatin 10mg tab
Simvastatin 5mg tab
Sirolimus 1mg table
Sodium bicarbonate 650mg 1EA table
Sodium bicarbonate 50MEQ SYR
Spironolactone 25mg tab
Trazadone HCL 50mg table
Thimthoprim/sulfa DS 160mg tab
Valacyclovir HCL 500mg cap
Valsartan 160mg table
Vancomycin (200m 1000mg 200ml bag)
Verapamil 5mg INJ
Verapamil SR 240mg tab
Vicodin 1EA tab
Vitamin E 400IU capule
Warafrin 1mg tab
Warafrin 2.5mg tab
Warafrin 2mg tab
Warafrin 5mg tab
Zolpiden 5mg tablet

Appendix C

RN Nursing Skills for Possible Delegation

The table below is set up as a shell to illustrate the process that could be employed to identify RN skills that could be delegated to other staff types. Only those skills potentially applicable for other staff types are included. Knowledge of the training curriculum used with these other staff types would be essential. Tasks could be coded as “able” for those skills/tasks that the various staff types would be expected to know, “potential” for tasks that they, depending on training and experience, could do and “with training” for tasks that they could be trained to do. For example, nurse aides are taught how to take vital signs (temperature, pulse, respirations and blood pressure) and could likely be taught to do certain dressings and treatments.

RN Nursing Skills for Possible Delegation

	Nursing Student – 4 Year BSN program	Nursing Student – 2 year Program	Respiratory Therapy Student	Respiratory Therapist
Cardiac				
Use of cardiac monitors	✓ Year 4	✓ If at all, Semester 4		
Record/describe heart sounds	✓ Year 3	Only after work		
CPR	✓ Year 3	✓ Semester 2	✓	✓
Care of a patient with:		✓ Semester 4		
- CHF	✓ Year 3	✓ Semester 4		
- Acute MI	✓ Year 4	✓ Semester 4		
- Aneurysm	✓ Year 4	✓ Semester 4		
- Angina	✓ Year 3	✓ Semester 4		
- Cardiac arrest	✓ Year 4, with direct supervision	✓ Semester 4		
Medications				
- Digoxin	✓ Year 3, oral only			
- Diltiazem	✓ Year 3, oral only			
- Furosemide	✓ Year 3			
- Nitroglycerin	✓ Year 3, no IV			
- Thrombolytic therapy	No			
Pulmonary				
Record description of lung sounds	✓ Year 3		✓ Semester 1	✓
Pulse oximetry	✓ Year 3	✓ Semester 2	✓ Semester 1	✓
Airway management	✓ Year 3	✓ Semester 4, but depends on clinical experience	✓ Semester 2	✓
- Endotracheal suctioning	✓ Year 4	✓ Semester 4, but depends on clinical experience	✓ Semester 2	✓
- Nasal airway suctioning	✓ Year 3	✓ Semester 4, but depends on clinical experience	✓ Semester 2	✓
- Oropharyngeal suctioning	✓ Year 3	✓ Semester 4, but depends on clinical experience	✓ Semester 2	✓

RN Nursing Skills for Possible Delegation

	Nursing Student – 4 Year BSN program	Nursing Student – 2 year Program	Respiratory Therapy Student	Respiratory Therapist
- Sputum specimen collection	✓ Year 3	✓ Semester 4, but depends on clinical experience	✓ Semester 2	✓
- Tracheostomy suctioning	✓ Year 4	✓ Semester 4, but depends on clinical experience	✓ Semester 2	✓
Oxygen therapy and medication delivery systems	✓ Year 3	✓ Semester 2	✓ Semester 1	✓
- Inhalers	✓ Year 3	✓ Semester 2	✓ Semester 1	✓
- Nebulizer	✓ Year 3	✓ Semester 2	✓ Semester 1	✓
- Face mask	✓ Year 3	✓ Semester 2	✓ Semester 1	✓
- Nasal cannula	✓ Year 3	✓ Semester 2	✓ Semester 1	✓
- Portable O2 tank	✓ Year 3	✓ Semester 2	✓ Semester 1	✓
- Trach collar	✓ Year 3	✓ Semester 2	✓ Semester 1	✓
Care of a patient with				
- Ventilator	✓ Year 4	✓ Semester 4, if at all	✓ Semester 2	✓
- Chest tube	✓ Year 3	✓ Semester 4	✓ Semester 2	✓
- COPD	✓ Year 3	✓ Semester 4	✓ Semester 1	✓
- Pneumonia	✓ Year 3	✓ Semester 4	✓ Semester 1	✓
- Tuberculosis	✓ Year 3	✓ Semester 4	✓ Semester 1	✓
Medications				
- Theophylline	✓ Year 3			
- Adrenalin	✓ Year 3, SC/IM/INH – no IV	Not at all		
- Steroids	✓ Year 4			
- Isuprel	✓ Year 3, SL/INH – no IV	Not at all		
Neurological				
Record/describe				
- Glasgow coma scale	✓ Year 3	✓ Semester 4		
- Reflex/motor deficits	✓ Year 3	✓ Semester 4		
- Visual/communication deficits	✓ Year 3	✓ Semester 4		

RN Nursing Skills for Possible Delegation

	Nursing Student – 4 Year BSN program	Nursing Student – 2 year Program	Respiratory Therapy Student	Respiratory Therapist
- Level of consciousness	✓ Year 3	✓ Semester 4		
Care of a patient with:				
- Alzheimer's disease	✓ Year 3	✓ Semester 2		
- Closed head injury	✓ Year 4	✓ Semester 4		
- CVA	✓ Year 3	✓ Semester 4		
- Seizures	✓ Year 3	✓ Semester 4		
- Spinal cord injury	✓ Year 3	✓ Semester 4		
Medications				
- Decadron	✓ Year 4	✓ Semester 2		
- Dilantin	✓ Year 3, oral only			
- Mannitol	No			
- Phenobarbital	✓ Year 3, oral only			
- Solu-Medrol	✓ Year 4			
Orthopedics				
Record/describe				
- Circulation checks	✓ Year 3	✓ Semester 2		
- Gait	✓ Year 3	✓ Semester 2		
- Range of motion	✓ Year 3	✓ Semester 2		
- Skin	✓ Year 3	✓ Semester 2		
Care of a patient with:				
- Cast	✓ Year 3	✓ Semester 2		
- Prosthesis/Amputation	✓ Year 3	✓ Semester 2		
- Pinned fractures	✓ Year 3	✓ Semester 2		
- Splints	✓ Year 3	✓ Semester 2		
- Pressure relief devices	✓ Year 3	✓ Semester 2		
- Total hip replacement	✓ Year 3	✓ Semester 2		
- Total knee replacement	✓ Year 3	✓ Semester 2		
Hoyer lift	✓ Year 3	✓ Semester 2		
Gastrointestinal				
Record/describe:				
- Bowel sounds	✓ Year 3	✓ Semester 2		
- Fluid balance	✓ Year 3	✓ Semester 2		
- Nutritional status	✓ Year 3	✓ Semester 2		
Care of a patient with:				
- Bowel obstruction	✓ Year 3	✓ Semester 2		
- GI bleed	✓ Year 3	✓ Semester 4		
- Hepatitis	✓ Year 3	✓ Semester 2		
- NG tube care and feedings	✓ Year 3	✓ Semester 2		
- Colostomy	✓ Year 3	✓ Semester 2		

RN Nursing Skills for Possible Delegation

	Nursing Student – 4 Year BSN program	Nursing Student – 2 year Program	Respiratory Therapy Student	Respiratory Therapist
- Gastronomy tube and feedings	✓ Year 3	✓ Semester 4		
Medications:				
- Antiemetics	✓ Year 3			
- Antispasmodic	✓ Year 3			
Genitourinary				
Insertion of Foley catheter:		✓ Semester 2		
- Male	✓ Year 3			
- Female	✓ Year 3			
Care of a patient with:				
- Acute renal failure	✓ Year 3	✓ Semester 2		
- Peritoneal lavage	No	✓ Semester 2, if have experience		
- Urinary tract infection	✓ Year 3	✓ Semester 2		
- Ileostomy	✓ Year 3	✓ Semester 2		
- Nephrostomy tube	✓ Year 3	✓ Semester 2		
- GU irrigation	✓ Year 3	✓ Semester 2		
- Suprapubic tube	✓ Year 3	✓ Semester 4		
Endocrine				
Record/describe				
- S/S hyperglycemia	✓ Year 3	✓ Semester 2		
- S/S hypoglycemia	✓ Year 3	✓ Semester 2		
Blood glucose monitoring				
- Electronic monitoring device	✓ Year 3	✓ Semester 2		
- Finger stick	✓ Year 3	✓ Semester 2		
Care of a patient with:				
- Diabetic ketoacidosis	✓ Year 4	✓ Semester 4		
Medications				
- Insulin	✓ Year 3 –SC only	✓ Semester 2, with instructor supervision		
- Oral hypoglycemics	✓ Year 3	✓ Semester 2, with instructor supervision		
Infectious Disease				
Care of a patient with:				
- Fever	✓ Year 3	✓ Semester 2		
- Isolation	✓ Year 3	✓ Semester 2		

RN Nursing Skills for Possible Delegation

	Nursing Student – 4 Year BSN program	Nursing Student – 2 year Program	Respiratory Therapy Student	Respiratory Therapist
- AIDS	✓ Year 3	✓ Semester 4, but depends on clinical experience		
Medications/IV Therapy				
Medication calculation	✓ Year 3	✓ Semester 2, simple ones		
Reconstitution	✓ Year 3, with direct supervision	✓ Semester 2		
Oral administration	✓ Year 3	✓ Semester 2		
Eye administration	✓ Year 3	✓ Semester 2		
IM administration	✓ Year 3	✓ Semester 2		
SQ administration	✓ Year 3	✓ Semester 2		
Rectal administration	✓ Year 3	✓ Semester 2		
Starting IVs	No			
IV medication administration	With restrictions	After school		
Drawing venous blood	✓ Year 4 from central line	After school		
Care of a patient with:				
- Broviac/Hichman line	✓ Year 3	✓ Semester 4		
- Groshong	✓ Year 3	✓ Semester 4		
- PICC	✓ Year 3	✓ Semester 4		
- Portacath	✓ Year 3	✓ Semester 4		
Pumps	✓ Year 3	✓ Semester 2		
Total Parenteral Nutrition	✓ Year 3	✓ Semester 4		

*The nurse practice act in each State would have to be reviewed for any legal limitations imposed on LPNs.

Sources: Check list items identified/selected from several sample medical surgical and long-term care skills checklists found at
http://www.professionalnurse.com/download/skills_medsurg.pdf;
<http://www.dblhealthcare.com/forms/medical-surgical-nursing-skills-checklist.htm>;
http://www.musc.edu/nursing/student_life/SkillsCheckList1.pdf;

Appendix D

Legal & Regulatory Issues

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1.0 Background and Introduction

America's health care system is at or near capacity with little ability to expand in response to an unusually large mass casualty event. There is little surge capacity in the system, particularly in major urban areas. Due to the economics of healthcare delivery and low financial margins, hospitals are at virtually 100 percent capacity in many cities. Moreover, there is little excess capacity in the nursing home, home health or other healthcare sectors. Patients cannot readily be moved out of hospitals to make room for large numbers of trauma victims or infectious patients, because there is nowhere for them to be placed. These factors severely constrain the ability of the hospital sector to absorb a large influx of trauma or infectious disease victims. Although most hospitals plan and drill to operate at 125 percent capacity or more, for up to 72 hours, most cannot maintain this level of service beyond three days.

Recognizing that reallocating patients among existing facilities will not be adequate for a large-scale disaster, States and the Federal government have begun to investigate the feasibility of rapidly converting non-hospital buildings for use as temporary hospitals. The Department of Health and Human Services is particularly interested in the feasibility of reopening former (shuttered or partially shuttered) hospitals to temporarily increase capacity. The conversion of former hospitals to medical 'surge' facilities could be an option for many communities, given the large number of hospital closures and conversions in recent years. Originally designed and operated as inpatient facilities, shuttered hospitals might be better alternatives than hotels, schools, offices or churches for providing inpatient care.

To assess the feasibility of converting former hospitals to inpatient surge facilities, Abt Associates and experts from Partners Healthcare System evaluated two hospitals in suburban Boston using a set of basic criteria for a surge facility operating in a mass casualty event. The assessment of the two hospitals encompassed physical structure of the facility, supplies and staffing needs, security, patient transport, and information requirements (see accompanying report). In addition, the team recognized that legal issues could pose challenges to converting a shuttered facility into a surge hospital.

This report examines the primary legal and regulatory issues related to converting a former hospital (now closed or partially in use for non-hospital services) into an inpatient surge hospital. Relevant Federal laws and regulations pertaining to hospitals and personnel are identified and analyzed, as well as State regulations, and other legal issues. For the State analysis, we examined regulations from Kansas, Illinois, Texas, and Massachusetts to illustrate how this surge facility concept might play out in different regulatory environments.

The remainder of the report is organized as follows:

- 2.0 Federal Laws and Regulations
- 3.0 Four States' Laws and Regulations
- 4.0 Other Legal Issues

1.1 Scenarios for Surge Capacity Expansion Using a Shuttered Hospital

There are two general scenarios where reopening a shuttered hospital as a surge facility might be appropriate:

Scenario 1

Generic mass casualty events (conventional terrorism or war, weapon of mass destruction, natural disaster) where hundreds of ambulatory med/surge patients need to be transferred out of the tertiary care hospitals to make capacity for mass casualty victims. In this scenario, every possible patient at the major tertiary hospitals would be transferred to other settings of care and all elective and non-urgent admissions and procedures would be delayed; if this still did not reduce demand sufficiently, the surge facility would be opened. The most critically ill patients would remain in the tertiary care facilities, and the most medically stable patients would be relocated to the surge facility. It is conceivable that there would also be a domino effect where patients from a tertiary care setting would be transferred to a community hospital and then those less acutely ill patients from the community hospital would be transferred to the surge facility.

Scenario 2

An infectious BT agent or communicable disease epidemic (e.g., smallpox, flu, SARS) that requires the creation of an infectious-disease/isolation or quarantine hospital at the surge facility.

1.2 Assumptions for Opening a Shuttered Hospital as a Surge Facility

This section describes the assumptions made by Abt Associates and experts from Massachusetts General Hospital and Brigham and Women's Hospital for the purpose of evaluating requirements for reopening a shuttered hospital as a surge facility.

Timing

Since area hospitals plan to deal with dramatically increased capacity for up to 72 hours, we adopted the assumption that the surge facility would need to open within 3-7 days after a mass casualty event. We anticipate that the surge facility would need to operate for a range of 2-8 weeks, depending on the nature of the disaster and the needs of mass casualty victims, although there is no maximum operational period and the facility could remain open for a longer period if needed.

Inappropriate Services/Patients

Since the goal of the surge facility is to maintain community standards of care, as nearly as possible, it would be inappropriate to relocate certain types of patients. Under either scenario, it would not be possible to reconstitute an Intensive Care Unit (ICU) in a shuttered hospital, nor an operating room (OR) or suite. We assume that no emergency department would be created at a shuttered hospital being reopened to meet surge demands. In addition,

because of a lack of ICU and OR services, it would probably not be possible to create a large inpatient acute burn or trauma unit in such a hospital. Under certain circumstances, however, trauma or burn patients in the later stages of convalescence might be appropriately relocated to the surge facility. Medical experts advise that it would be inappropriate to relocate acutely ill oncology patients to such the surge facility, as the patients' chemotherapy, radiation therapy and other care needs are too sophisticated for such a place. It would not be appropriate to relocate psychiatric inpatients, since most psychiatric patients in acute care hospitals are immediate suicide risks and the entire relocation procedure would further exacerbate their very tenuous stability. Pediatric patients would probably not be relocated either, since their needs (and their parents' needs) could not be met as completely in a surge facility as in a dedicated children's hospital.

We further determined that a shuttered hospital would probably not be appropriate as a surge facility in the following circumstances:

A BT agent that is airborne and infectious and has no vaccine (e.g., Ebola) therefore posing a significant immediate risk to healthcare providers. This was ruled out as a viable option because a shuttered hospital would be unlikely to have an adequate airflow system to handle these patients although there might not be an adequate airflow system at any functional hospital either.

A hospice for patients needing pain and supportive care while dying from chemical or radiation terrorism events. This was ruled out because victims of chemical terrorism will either probably die almost immediately, need 24 hours of ICU care, or walk away with minimal treatment. There would probably be no need for a large-scale inpatient hospice.

Surge Facility Patient Population Assumptions

We assume that patients would continue to be cared for in the surge facility for at least 30 days (and perhaps as long as 60 days or more), and that all patients would not arrive on day one of the event. Instead, their arrival would most likely be spread out between days 3 and 11 following a mass casualty event, or spread out even more in the case of an evolving epidemic. For Scenario 1 we assume an average patient stay of two to three days; for Scenario 2 the length of stay is more difficult to predict but could be 1-3 weeks. Patients would be discharged gradually, over the course of several days or weeks, until the surge facility is no longer needed.

Ideally, the required amount of supplies held in inventory at the surge facility should be adequate to last at least three days per patient, regardless of the patient population. For the purposes of estimating ease of implementing regulatory requirements, we assume the surge facility will be operating at 100 percent capacity beginning 3-7 days after an emergency is declared, and will continue for at least 30 days. Under Scenario 1, a surge facility could end peak operation before day 30, while under Scenario 2, peak operation may continue for more than 60 days. Following the mass casualty event, we assume any remaining patients will be directed back into one of the tertiary or community hospitals.

2.0 Federal Laws and Regulations

The Federal regulatory and statutory requirements for hospitals are extensive. The Code of Federal Regulations (CFR) contains requirements for hospital administration, services, staffing, patient rights, patient transport, and record keeping. Many of these regulations are contained in the part of the CFR devoted to the Medicare conditions of participation (COPs) for hospitals. These standards must be met for a hospital to participate in the Medicare program (i.e., receive payment for services furnished to Medicare beneficiaries). While a surge hospital would likely count Medicare beneficiaries among its patients, some of the standards required of Medicare participating hospitals are not appropriate for the circumstances under which a surge facility would be operating. In order for a surge facility to operate within the boundaries of the law and serve its intended purpose, these requirements would need to be waived by the Federal government in advance of an emergency.

This chapter describes the Federal standards for the operation of acute-care hospitals and identifies requirements that could not be met by a former/shuttered hospital operating in a surge capacity.

2.1 Administration

Federal rules concerning the administration of hospitals are found in the CFR under the Medicare program's conditions of participation.⁷⁷ The CFR addresses the following Federal requirements regarding the administration of hospitals:

- Compliance with Federal, State, and Local Laws;
- Governing Body;
- Quality Assessment and Improvement Program; and
- Survey and Certification.

As noted above, the Federal government provides general guidance on the operation of hospitals while State and local laws include more specific requirements.

Compliance with Federal, State and Local Laws. “The hospital must be in compliance with applicable Federal laws related to the health and safety of patients.” The hospital must be licensed or approved for meeting State and local standards and ensure that its personnel are licensed or meet the requirements of applicable State or local laws.

State and local laws may address hospital licensure, accreditation of personnel, environmental hazards, and emergency response systems. State and local laws and their applicability to surge facilities are addressed in Section 3.0 of this report.

⁷⁷ 42 CFR §482.11-.13.

Governing body. “The hospital must have an effective governing body legally responsible for the conduct of the hospital as an institution or the persons legally responsible for the conduct of the hospital must carry out the functions of the governing body related to medical staff, chief executive officer, care of patients, institutional plan and budget, and contracted services.”

One of the primary questions regarding the conversion of a former hospital into a surge facility is ‘who would be responsible for its operation?’ A currently functioning acute-care hospital or healthcare system would be a likely entity to assume responsibility for a surge facility, given that it has systems and experience in overseeing all aspects of hospital operations. The Board or other governing body of the overseeing hospital or healthcare system would be responsible for ensuring that Federal, State and local requirements are met at the surge facility. Because the activities of a surge facility would be more limited and perhaps different from those of an ordinary hospital, the procedures and policies of the surge facility would likely be separate from those of the overseeing hospital. The governing Board of the overseeing hospital would need to develop the policies and procedures for the surge facility prior to a disaster.

Another option would be for the State or county health department to assume responsibility for the surge facility, which would be necessary if there were no existing hospital or healthcare system willing/able to step in. In this case, none of these boards, procedures or policies would exist and all would need to be created in advance of a mass casualty event, in order to implement a surge facility plan.

Quality Assessment and Performance Improvement Program. “The hospital must develop and implement an effective, ongoing, hospital-wide, data-driven quality assessment and performance improvement program.” Quality assessment and performance improvement plans include protocols for patient care that are continuously evaluated and amended to improve outcomes and other measures of quality.

The particular circumstances of a surge facility make quality assessment and performance improvement programs impractical to implement. Data collection and analysis, as well as process improvements would be difficult to perform on the temporary basis in which a surge facility operates. At the same time, a quality assessment and performance program would allow the entity overseeing the surge facility to learn from its disaster experience so that it could provide better care in future surge situations. An assessment and improvement program could be developed to address basic issues prior to the operation of a surge facility. Such a plan would require the collection of basic data from the surge facility. From a practical standpoint, the data could be analyzed at the conclusion of the emergency rather than on an ongoing basis. The surge facilities’ quality protocols could be modified once the emergency situation has abated.

Recommendation: some requirements, like quality assessment programs, cannot be met at a temporary/emergency surge facility, and would need to be waived.
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2.2 Services

The Medicare hospital conditions of participation also provide standards for services furnished in acute-care facilities. The COPs define and provide standards for “basic

services,” those that must be provided by a Medicare participating hospital. In addition, these regulations provide standards for optional services.

As defined in section 1.2 of this report, a surge facility would not provide all of the basic’ services required by Federal regulations. Standards would need to be revised or requirements waived in order for surge facilities to comply. This might also be true of existing hospitals that are not be able to comply with current standards in a large-scale mass casualty situation.

Recommendation: Medicare COPs would need to be reduced/waived for a temporary/limited service surge facility.

2.2.1 Basic Services

This section identifies services hospitals must provide in order to be in compliance with the Medicare conditions of participation. Most of these services would be provided by a surge hospital during scenarios described in Chapter 1 of this report.

Pharmaceutical services. “The hospital must have pharmaceutical services that meet the needs of the patients. The institution must have a pharmacy directed by a registered pharmacist or a drug storage area under competent supervision. The medical staff is responsible for developing policies and procedures that minimize drug errors. This function may be delegated to the hospital’s organized pharmaceutical service.”

The CFR provides further definitions of the Federal standards for pharmacy management and administration, and delivery of pharmacy services including but not limited to storage of pharmaceuticals and biologics, reporting of errors and adverse reactions, and formulary development.

We expect that the surge facility will provide pharmacy services. The regulations for pharmacy services are broad and would not necessarily need to be changed for a surge facility. If the surge facility were to have a stock of “basic” pharmaceuticals needed for opening, these drugs and biologics could be supplemented as needed. One option might be to have a nearby tertiary hospital serve as the main pharmacy, supplying the surge facility and managing inventory/ordering. This would require a revision to the regulations as the surge pharmacy would not, by itself, meet the needs of its patients. If no nearby hospital can/will fill this role, the surge facility will be on its own and waivers may need to be even more extensive.

Radiologic services. “The hospital must maintain, or have available, diagnostic radiologic services. If therapeutic services are also provided, they, as well as the diagnostic services, must meet professionally approved standards for safety and personnel qualifications.”

If the surge facility does not have operational radiology services already in place, portable diagnostic radiology equipment, supplies and staff will need to be brought into the facility. Patients needing therapeutic radiology services such as chemotherapy would be treated in a tertiary care hospital, not in the surge facility.

Laboratory services. “The hospital must maintain, or have available, adequate laboratory services to meet the needs of its patients. The hospital must ensure that all laboratory services provided to its patients are performed in a facility that is certified...”

We expect a formerly shuttered hospital might be lacking modern equipment and would not be operational without significant investment of time and effort. Rather than create an on-site clinical laboratory, it would be more practical to use bedside point of care testing for routine tests and contract with a private laboratory testing company accessed by courier for more advanced tests. It does not appear that these regulations would pose a problem or need to be adapted, to permit this approach.

Food and Dietetic Services. “The hospital must have organized dietary services that are directed and staffed by adequately qualified personnel.” The CFR allows the hospital to contract these services with an outside food management company if the company has a dietitian and consults with the medical staff.

Former hospitals with intact kitchens would be able to provide food services to patients, with the oversight of a hospital dietician to design special diets for patients with restrictions. It is unlikely that a hospital without a functional kitchen, however, would be able to meet this standard. Obtaining food and dietetic services from an outside vendor is a possibility and vendors we contacted indicated that they could absorb the increased demand of a temporary facility housing upwards of 200 patients.

Utilization Review. The CFR requires that hospitals have a plan in place to review services provided by the institution and medical staff, either internally or by a Quality Improvement Organization. It would be impractical for a surge facility to conduct utilization review either directly or by another entity. The data set examined would be small due to the short time-frame the facility would be open, and it would be difficult to determine appropriateness of services given the unusual circumstances under which the surge facility would be operating. This requirement would need to be waived for a surge facility in a mass casualty event.

Physical environment. “The hospital must be constructed, arranged, and maintained to ensure the safety of the patient, and to provide facilities for diagnosis and treatment for special hospital services appropriate to the needs of the community.” From a practical standpoint, any former hospital that would be considered a surge facility would need to comply with this requirement. Legally, a facility could be at great risk if its physical environment was not safe for patients or suitable for providing the care needed for the scenarios described earlier.⁷⁸

Infection Control. “The hospital must provide a sanitary environment to avoid sources and transmission of infections and communicable diseases. There must be an active program for the prevention, control, and investigation of infectious and communicable diseases.” The regulations provide more detail on the responsibilities of personnel with regard to infection control and reporting. To be effective, an infection control program would need to be established prior to the opening of the surge facility. If the hospital is operated by a nearby

⁷⁸ Please see the main body of this report which contains chapters on Facilities Structure, for additional detail about life safety and other facility requirements.

acute-care hospital, the plan could be modeled on that of the oversight hospital. If not, the State would have to design such a program, in advance, appropriate for either scenario 1 (general ambulatory med/surg patients) or scenario 2 (infectious patients). We do not believe this requirement can or should be waived.

Discharge Planning. “The hospital must have in effect a discharge planning process that applies to all patients. The hospital’s policies and procedures must be specified in writing.” The CFR also specifies the process of identifying patients in particular need of discharge planning, conducting a discharge planning evaluation, and requirements of the plan.

In the case of a mass casualty event, acute care hospitals would need to simplify or modify their discharge planning process so that patients could be quickly discharged to skilled nursing facilities, rehab facilities, a surge facility, or home, as appropriate. All hospitals might need to have the authority to use an alternative discharge plan in the case of a disaster. The plans would need to be developed prior to an actual disaster. Similarly, a surge facility could comply with the requirement to have a discharge plan as long as the process was designed in advance of a mass casualty event. Such a plan could be modeled on that of an existing facility, modified as needed to fit the particular circumstances of the disaster situation. That is, if a major trauma center has a plan for revising discharge processes, planners for the surge facility could adopt and modify that plan for their own purposes. For either existing hospitals or a surge facility, discharge planning requirements may need to be waived in a mass casualty situation, so that patients can be quickly moved to the most appropriate setting of care while serving the needs of large numbers of acutely ill or injured patients.

Organ, Tissue, and eye procurement. The CFR requires hospitals to have agreements with organ procurement organizations (OPOs) for the identification and harvesting of organs for transplant. Given that a surge facility would not be providing sophisticated levels of care and would not have an operating room, it is unlikely that it would be able to provide the level of care required for the safe harvesting of organs. A surge facility would not be able to meet the requirements of an organ procurement agreement. While continuously operating hospitals would have agreements with OPOs, they too may have difficulty meeting such obligations in a disaster situation. Federal regulations and provisions of contracts between hospitals and OPOs should probably be suspended for all hospitals during a mass-casualty event, and would need to be waived entirely for a surge facility.

2.2.2 Emergency Services

The Emergency Medical Treatment and Labor Act (EMTALA) was passed in 1986 in response to reports that hospital emergency rooms were refusing to accept or treat individuals with emergency conditions if the individual did not have insurance.⁷⁹ The law defines the obligation of Medicare-participating hospitals with respect to persons who come to a hospital emergency department and request examination or treatment for medical conditions. In addition, EMTALA sets forth requirements for performing a medical screening, providing

⁷⁹ Centers for Medicare & Medicaid Services, Department of Health and Human Services. Medicare Program: Clarifying Policies Related to the Responsibilities of Medicare-Participating hospitals in Treating Individuals with Emergency Medical Conditions, Federal Register. September 9, 2003, Vol. 68, No. 174.

stabilizing services, and appropriate transfer of the patient. In addition, the Act sets forth civil monetary penalties on hospitals and physicians for 1) failing to properly screen an individual seeking medical care; 2) negligently failing to provide stabilizing treatment to an individual with an emergency medical condition; or 3) negligently transferring or releasing from care an individual with an emergency medical condition.⁸⁰ These penalties for inappropriate transfer during a national emergency do not apply to a hospital operating in an emergency area.⁸¹

The regulations define hospitals' responsibilities with respect to EMTALA as follows:

When an individual presents to a hospital's emergency department and a request is made on the individual's behalf for examination or treatment of a medical condition, the hospital must provide for an appropriate medical screening examination to determine whether or not an emergency medical condition exists.

If the hospital determines that an emergency medical condition exists, the hospital must provide for further medical examination and treatment in order to stabilize the individual.

If the hospital does not have the capabilities to stabilize the individual a transfer to another facility is permitted.

A transfer is appropriate when the benefits of the transfer outweigh the medical risks of the transfer.

In addition, a hospital may transfer an unstable patient who makes an informed written request.

As yet there has been no guidance that permits waiver of EMTALA, even in a mass casualty event or Federally-declared disaster. We reviewed the EMTALA regulations for their applicability to surge facilities and other hospitals operating in a mass casualty situation.⁸² The regulations broadly define a hospital emergency department as "a specially equipped and staffed area of the hospital that is used a significant portion of time for the initial evaluation and treatment of outpatients for emergency medical conditions." The definition encompasses not only what is generally thought of as a hospital's emergency department but also includes other departments of hospitals, such as labor and obstetrical delivery departments and psychiatric units of hospitals, if these departments provide emergency services. In addition, the definition includes other departments of the

Recommendation: elements of EMTALA would also need to be reduced/waived for a temporary/limited service surge facility. Ex: the benefits of transfer to a surge facility would be to make room for other patients needing tertiary hospital services, not necessarily for the benefit of the transferred patient. Ex: patients would not necessarily be asked to consent to transfer to the surge facility.

⁸⁰ Ibid.

⁸¹ 42 CFR §489.24

⁸² 42 CFR §489.24

hospital that are presented to the public as an appropriate place to come for medical services on an urgent, non-appointment basis.

In a disaster scenario, it is likely that many people will present at trauma centers and community hospitals seeking medical evaluation and or treatment. An extremely large volume of people seeking evaluation would pose challenges for any hospital. Trauma centers and tertiary care hospitals – entities that provide emergency medical services and present so to the public – are bound by the EMTALA regulations and would have to assess the condition of each patient to determine whether or not s/he was in an emergency situation and provide stabilizing treatment to those who need it. As the regulations provide for the transfer of patients who are unstable, with their written consent, the hospital could transfer an unstable patient to another facility before conducting an evaluation, but only if the patient consented. Otherwise the hospital would need to provide an examination to determine whether or not the person was in an emergent situation and provide stabilizing care as needed.

The surge facility we envision would not meet EMTALA’s broad definition of a hospital with an emergency department, as they would not have provided these services in several years and would not present themselves to the public as a provider of emergency medical services. As envisioned here, a surge facility would provide services to patients that had been transferred to it, from a trauma center or tertiary care hospital. The surge facility’s unique situation would make it unlikely that individuals would go to the facility seeking treatment because people in community would not think of it as a usual source of care or a source of emergency. Anyone who did present to the surge facility could be redirected to one of the fully-functional hospitals in the area. Should someone present seeking a medical evaluation, it is not clear whether or not EMTALA’s rules for screening and providing stabilization care would apply to a surge facility. Guidance should be obtained from the Federal government regarding the applicability of EMTALA to a surge facility.

Hospitals are concerned about the implications of EMTALA in disaster situations. The Joint Commission on Accreditation of Healthcare Organizations, the accrediting body for 80 percent of the nation’s hospitals, believes the Department of Health and Human Services should provide clarification on the application of EMTALA during disaster situations. Such clarification would assist communities in their disaster preparedness activities.⁸³ If such clarification is forthcoming, we recommend that it also address:

Recommendation: Federal officials should specifically address EMTALA-related issues, rather than waiting for a mass casualty “test case”.

What constitutes a disaster that obviates EMTALA requirements (if any), and who can declare such a disaster – only the President?

Which EMTALA requirements can be ‘lifted’ (partially or entirely) for various potential types of disasters? For how long?

⁸³ Joint Commission on Accreditation of Healthcare Organizations. Health Care at the Crossroads: Strategies for Creating and Sustaining Community-wide Emergency Preparedness Systems. Washington (DC), JCAHO, 2003.

Is there a scaled-down set of EMTALA requirements that might apply to a surge facility during a mass casualty event?

At what point would the EMTALA requirements be reapplied – when would they go back into effect following a mass casualty event?

Could the monetary penalties be enforced – or could they be suspended – during /following a mass-casualty event?

2.2.3 Optional Services

The CFR also lays out standards for a number of optional services that may be offered by regular hospitals:

- Surgical Services
- Anesthesia Services
- Nuclear Medicine
- Outpatient Services
- Rehabilitation Services
- Respiratory Care Services

These services would likely be provided by any acute care hospital to which trauma casualties would be sent. Fulfilling the Federal requirements during an emergency should not pose a problem for those hospitals already providing the “optional” services, but they might want to reduce attention to these optional services during the mass casualty event. For the scenarios and patient populations considered here, none of these services would be provided by a surge facility.

2.3 Staffing

2.3.1 Hospital Staffing

The Code of Federal Regulations COPS contains regulations covering various services. Based on our assumed patient population and their needs, we reviewed the regulations related to staffing. Most regulations are not specific, requiring only that staff be qualified and in numbers sufficient to meet the needs of the patients. Requirements for the following services were reviewed:⁸⁴

Medical Staff. The medical staff must be composed of doctors of medicine or osteopathy.

Nursing Services. “The director of nursing services must be a licensed registered nurse. He or she is responsible for ...determining the types and numbers of nursing personnel and staff necessary to provide nursing care for all areas of the hospital. There must be adequate numbers of registered nurses, licensed nurses and other personnel to provide nursing care to all patients as needed. There must be supervisory and staff personnel for each department or

⁸⁴ 42 CFR §482.22 – 482.28

nursing unit to ensure, when needed, the immediate availability of a registered nurse for bedside care of any patient.”

Medical Records. “Must be appropriate to the scope and complexity of services performed. The hospital must employ adequate personnel to ensure prompt completion, filing and retrieval of records.”

Pharmaceutical Services. “A full-time, part-time or consulting pharmacist must be responsible for ...all the activities of the pharmacy services. The pharmaceutical service must have an adequate number of personnel to ensure quality pharmaceutical services, including emergency services.”

Radiologic Services. A qualified full-time, part-time or consulting radiologist must supervise the ionizing radiology services. A radiologist is a doctor of medicine or osteopathy who is qualified by education and experience in radiology.

Laboratory Services. The hospital must maintain or have available (either directly or through a contractual agreement), adequate laboratory services to need the needs of its patients.

Food and Dietetic Services. The hospital must have a full-time employee who services as director of the food and dietetic service and there must be a qualified dietician full-time, part-time or on a consultant basis and administrative and technical personnel competent in their respective duties.

2.3.2 Long-term Care Staffing

Federal requirements for staffing in long-term care facilities are similar to those for hospitals, with additional provisions for ensuring that services not available on site are available contractually, e.g., laboratory, radiology and pharmacy. The surge facility may contain patients that more resemble nursing-facility and rehab patients, rather than tertiary care patients. Long-term care staffing ratios may therefore be more appropriate for a surge facility (at least under scenario 1).

Nursing. Long-term care regulations are specific that there must be a registered nurse in the facility eight consecutive hours seven days a week and that there must be “sufficient nursing staff to provide nursing and related services to attain or maintain the highest practicable physical, mental and psychosocial well-being of each resident...”⁸⁵ The surge facility would most assuredly have nursing capacity beyond this minimum.

Dietary. The facility must employ a qualified dietitian either full-time, part-time or on a consultant basis. If a qualified dietician is not employed full-time, the facility must designate a person to serve as the director of food service who receives frequently scheduled consultation from a qualified dietician.⁸⁶ A qualified dietician is one who is qualified based upon either registration by the Commission on Dietetic Registration of the American Dietetic

⁸⁵ 42 CFR §483.30

⁸⁶ 42 CFR §483.35

Association, or on the basis of education, training or experience in identification of dietary needs, planning and implementation of dietary programs.⁸⁷ This would be needed at the surge facility as well and might be available through a food service vendor.

Social Services. A facility with more than 120 beds must employ a qualified social worker on a full-time basis – a bachelor’s degree in social work or a bachelor’s degree in a human services field including but not limited to sociology, special ed, rehab counseling and psychology, and one year of supervised social work experience in a health care setting working directly with individuals.⁸⁸ This might be possible in a surge facility during a mass casualty event, but we suspect that a surge facility would not be able to provide a full range of social services, so this requirement might need to be waived.

2.4 Patient Rights

The Medicare conditions of participation for hospitals include standards to “protect and promote the rights of each patient.” We identified and reviewed the following issues related to patient rights⁸⁹:

Notice of Rights. A hospital is required to inform each patient or his/her representative of the patient’s rights, in advance of furnishing or discontinuing patient care whenever possible. A hospital must notify patients whom to contact to file a grievance and establish a process for the prompt resolution of all grievances. In addition, the following standards for patient rights are also addressed by the conditions of participation. We see no reason that this standard would need to be reduced or waived for a surge facility (or any other hospital) operating during a mass casualty event.

Exercise of Rights. The patient has the right to participate in the development of his/her plan of care, may request or refuse care, develop advance directives, and have a representative be notified of his/her admission to the hospital. This too appears to be acceptable for a surge facility.

Confidentiality of Patient Records. The patient has the right to confidentiality of his or her clinical records and the right to access information contained in his/her medical record within a reasonable timeframe. There is no need to waive or reduce this requirement.

Restraint for acute medical and surgical care. “The patient has the right to be free from restraints of any form that are not medically necessary or are used as a means of coercion, discipline, convenience, or retaliation by staff.” There is no need to waive or reduce this requirement.

Seclusion and restraint for behavior management. “The patient has the right to be free from seclusion and restraints, of any form, imposed as a means of coercion, discipline, convenience, or retaliation by staff.” There is no need to waive or reduce this requirement.

⁸⁷ Ibid.

⁸⁸ 42 CFR §483.15(g)

⁸⁹ 42 CFR §482.13

As part of the Medicare prospective payment system for hospitals, patients have the right to appeal a planned discharge from the hospital.⁹⁰ Under these regulations a patient cannot be discharged while awaiting the appeal decision. This process can take a few days. In the case of a mass casualty event, moving patients quickly from a tertiary hospital to another facility, a surge facility, or home would be critical to meeting increased demand for hospital services. The discharge appeal right outlined in the hospital prospective payment system regulations would probably need to be waived.

The Federal regulations do not provide additional guidance with respect to patient's right to choose the hospital at which he or she is treated, or to which s/he is transferred, however, some States' regulations provide patients with these rights.

2.5 Transport

The CFR outlines general requirements for ambulance providers and suppliers in transporting Medicare beneficiaries. Section §410.41 of 42 CFR describes the requirements of a vehicle operating as an ambulance and the requirements of ambulance staff and their training/certification. Medicare payment rules, which were not examined as part of this study, provide additional clarification on the types of vehicles and level of services provided by ambulances, for which Medicare will reimburse. More detailed rules exist at the State level and are described in Chapter 3 below.

2.6 Patient Information and Privacy Standards

Patient information and privacy of health information are addressed in the regulations pertaining to the Medicare conditions of participation for hospitals and the Health Insurance Portability and Accessibility Act of 1996 (HIPAA). This section describes the standards provided in these two sets of regulations.⁹¹

The COPS requires that hospitals have a medical record service that maintains patient records for every patient in the hospital and that allows for easy and timely retrieval of patient records.⁹² The regulations relate to the organization and staffing of the medical record service, the form and retention of the medical record, as well as the content of the record.

Organization and staffing. “The organization of the medical record service must be appropriate to the scope and complexity of the services performed. The hospital must employ adequate personnel to ensure prompt completion, filing, and retrieval of records.” Maintaining and staffing a medical record service should not pose a problem for a surge facility, assuming adequate advance planning. Our accompanying report includes an organizational chart for a surge facility during a mass casualty event; in this schematic, the patient information officer would be responsible for the patient record systems. If the surge facility were to be operated by an existing hospital, policies and procedures from its hospital

⁹⁰ 42 CFR §489.27

⁹¹ 42 CFR §482.24; 45 CFR Parts 160 and 164

⁹² 42 CFR § 482.24

record service could be modified so that a record service for the surge facility could be put in place very quickly. If the surge facility is to be operated by the State, more extensive advance planning may be needed.

Form and retention of record. “The hospital must maintain a medical record for each inpatient and outpatient. Medical records must be accurately written, promptly completed, properly filed and retained, and accessible. The hospital must use a system of author identification and record maintenance that ensures the integrity of the authentication and protects the security of all record entries.” The regulations also contain specific requirements concerning the content of the medical record for hospital inpatient stays. The hospital must have an indexing system for timely retrieval of records by diagnosis. The regulations further stipulate that medical records must be retained in their original or legally produced form for a period of at least five years. In addition, the hospital must have a procedure to ensure the confidentiality of records.

These requirements may be possible to meet, at least in part, at a surge facility, during a mass casualty event. It would not be practical, however, to produce a medical record as detailed as that required in a regular hospital environment, given the urgency of transferring and treating patients in a disaster situation.

A sophisticated indexing system – such as one that would allow the retrieval of documents by diagnosis – would be unnecessary in a surge facility. The main purpose of an indexing system is to facilitate utilization review and quality improvement studies. Because these functions would not be required of surge facilities, the system is not needed. In addition, the number of patient records generated by a surge facility would be relatively small, assuming the facility would be open for no more than 60 days. These files could be accessed and used for patient care purposes without a sophisticated indexing system.

The requirement that hospitals retain records for five years could be problematic for a surge facility. Because a surge hospital is designed for temporary use and will revert back to its previous (unoccupied) state at the end of the emergency, it may be impractical to store the records at the facility where conditions are sub-optimal and privacy would be hard to ensure. One alternative would be to merge the records back into the records of the tertiary hospital from which each patient was transferred. Or the records could be stored by the State health department, or by an oversight hospital that agrees to operate the surge facility (if applicable). As noted in our previous report, the records could be owned by the State or Federal government; the question of safely storing them and assuring access to them is the primary concern.

Health Information Privacy. The HIPAA privacy regulations provide protection of individually identifiable health data. The regulations protect every data element of individually identifiable health information of a patient when in custody of a covered facility, including those that must 15 identifiers that must be scrubbed from a record to meet minimum safety harbor standards under de-identified data under the privacy rule, including:

- Names;
- Geographic subdivisions smaller than a State;

- Dates related to an individual except month;
- Age except when grouped into categories;
- Telephone and fax numbers,
- Electronic mail addresses and URLs;
- Social Security numbers;
- Medical record numbers;
- Account numbers;
- Health insurance beneficiary numbers;
- Certificate and license numbers;
- Vehicle serial numbers and license plate numbers;
- Biometric identifiers;
- Full-face photographs; and
- Other unique identifying codes and characteristics.

The HIPAA Privacy Rule applies to ‘covered entities’ that are generally defined as healthcare providers, health plans including private entities and government programs such as Medicare and Medicaid, and healthcare clearing houses such as billing services.⁹³ We assume that the rule would also apply to a surge facility, whether as a covered entity in its own right or as a subcontractor to a covered entity, depending on who has operational control of the facility when it opens in a mass casualty situation.

While the Privacy Rule encompasses a large number of data elements and applies to numerous entities that transfer health information, the Privacy Rule attempts to balance the protection of individual health information with the need to protect the public’s health.⁹⁴ The Rule contains special provisions for circumstances when private health information may be disclosed. First, the rule permits the use and disclosure of certain protected health information to public health authorities for public health purposes including but not limited to public health surveillance, investigations, and interventions.⁹⁵ Second, HIPAA permits disclosure of protected health information when required by other Federal, State, Tribal, or local laws.⁹⁶ Third, certain types of private health information may be disclosed for the purpose of research.

It is not clear whether or not these exceptions would apply to hospitals and surge facilities during a mass-casualty event. Each exception is very fact specific and legal analysis may be

⁹³ 45 CFR §160.102

⁹⁴ Centers for Disease Control and Prevention. HIPAA Privacy Rule and public health: guidance from CDC and the U.S. Department of Health and Human Services. MMWR 2003;52(Early Release): page 1.

⁹⁵ 45 CFR §164.512(b)

⁹⁶ 45 CFR §164.512(a)

needed. Clarification from the Federal government would be helpful, for communities actively involved in disaster preparedness planning.

3.0 State Laws and Regulations Governing Hospitals

This section describes State laws and regulations related to hospitals and other health care providers.

Every State has enacted statutes and promulgated regulations to license and regulate hospitals. Although most of these regulatory schemes predate Medicare in their origins, the Medicare Conditions of Participation (discussed above) now serve as a baseline for setting the standards by which acute-care hospitals across the country operate and deliver medical services. In addition, the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) is a private organization that inspects and accredits nearly all of the acute-care hospitals in the country. Thus, even though there are variations in the manner in which the each State regulates its hospitals, there are also many similarities because nearly every acute-care hospital in the country seeks certification for Medicare payment, and accreditation from JCAHO. Each State, however, has its own rules and policies regarding the waiver of its regulatory requirements in the event of a mass casualty event or an epidemic that triggers an emergency. Each may have different waiver abilities that would apply in a situation where a surge hospital might need to be opened and operated for a period of time to increase the capacity of that State's hospital system and address patient overflow created by the mass casualty event or the epidemic.

This section examines the regulatory standards for licensing of acute care hospitals in four different States – Massachusetts, Illinois, Kansas, and Texas – and identifies State regulatory requirements that could affect a surge facility and, therefore, may require waivers. These States were chosen because they have different hospital regulatory environments in general. Thus one might expect that these four States reflect most of the important regulatory issues relevant to surge capacity expansion. Since our project used Boston, MA as a ‘test’ location for the reopening of a shuttered hospital for surge capacity expansion, we begin each of the following sections with Massachusetts regulations. Each section discusses the degree to which the other three States seem to be consistent with Massachusetts regulations and where there appear to be differences. This is not to suggest that Massachusetts regulations are a model that other States should follow; we simply start with Massachusetts as an example to explore each issue and as a comparison for the other selected States.

3.1 Background

Massachusetts has a comprehensive statutory and regulatory scheme for licensure of acute care hospitals.⁹⁷ The State agency with oversight authority for hospital licensure is the Massachusetts Department of Public Health (MDPH). In addition to specific Massachusetts standards, the regulations incorporate, by reference, the Medicare Conditions of Participation.⁹⁸ Finally, Massachusetts offers Deemed Licensure status to any acute-care

⁹⁷ See Massachusetts General Laws (MGL), Chapter 111, Sections 51-53 and Code of Massachusetts Regulations (CMR), 105 CMR 130.000: Hospital Licensure. Separate licensing procedures apply for mental health facilities.

⁹⁸ 105 CMR 130.200. The Medicare Conditions of Participation are discussed in Section 2 of this Report.

hospital that is surveyed and accredited by JCAHO.⁹⁹ Deemed License status means the MDPH accepts the survey results of JCAHO as equivalent to meeting the MDPH regulatory standards.

Illinois, like Massachusetts, has comprehensive hospital licensing legislation and regulations.¹⁰⁰ The Department of Public Health of the State of Illinois (IDPH) has oversight authority for hospital licensure. Illinois regulations require hospitals to comply with the Medicare Conditions of Participation, if participating in Medicare/Medicaid Programs.¹⁰¹ Illinois does not offer Deemed Licensure status to hospitals that are surveyed and accredited by JCAHO but the information obtained from surveys by JCAHO, along with data from division of the Department of Public Health or State Agencies, are considered as the State determines whether an inspection is needed.¹⁰² Illinois regulations require a specialized license (e.g., Psychiatric, Pediatric, Rehabilitation, Tuberculosis) be issued to hospitals that primarily offer a specific category of service.¹⁰³ Hospitals that offer a range of acute care categories of service are issued a general license.

Recommendation: since Medicare COPs are the starting point for state hospital regulations, waivers recognized by the COPs would apply to all states.

Kansas also has a comprehensive statutory and regulatory scheme for licensure of hospitals.¹⁰⁴ The State agency with oversight authority is the Kansas Department of Health and Environment (KDHE). Kansas hospital regulations do not specifically reference the Medicare conditions of participation. A facility surveyed by JCAHO or the American Osteopathic association (AOA) during its current license term submits the survey report to the KDHE. After reviewing the survey report, the licensing agency may notify the facility that a licensing survey will be conducted.¹⁰⁵

Texas has comprehensive legislation and regulations for licensure of hospitals.¹⁰⁶ The Texas Department of State Health Services (DSHS) is the State agency with oversight authority for hospital licensure. Texas hospital licensing regulations, Title 25 Texas Administrative Code, Chapter 133, reference the Medicare Conditions of Participation for Hospitals.¹⁰⁷ Unlike Massachusetts, the regulations do not offer Deemed Licensure status to hospitals accredited by JCAHO. The Department of State Health Services conducts an inspection of each

⁹⁹ Massachusetts also offers deemed status to hospitals surveyed and accredited by the American Osteopathic Association. However, there are no licensed osteopathic hospitals in Massachusetts.

¹⁰⁰ See Illinois Compiled Statutes (ILCS), Chapter 210, Section 85: Hospital Licensing Act and Illinois Administrative Code (IAC), Chapter I, Subchapter b, Part 250: Hospital Licensing Requirements.

¹⁰¹ 77 IAC 250.130

¹⁰² 77 IAC 250.130

¹⁰³ 77 IAC 250.120

¹⁰⁴ Kansas Statutes (KSA) Chapter 65, Article 4: Hospitals and other Facilities and Kansas Administrative Regulations (KAR) 28-34: Kansas Hospital Regulations and 28-52: Risk Management Regulations

¹⁰⁵ KAR 28-34-2

¹⁰⁶ Texas Health and Safety Code, Chapter 241: The Texas Hospital Licensing Law and 25 Texas Administrative Code (TAC), Chapter 133: Hospital Licensing Rules

¹⁰⁷ 25 TAC 133.22(h)(1)

hospital during its initial licensing period.¹⁰⁸ Texas regulations contain specific requirements for licensure of “special hospitals.” A special hospital is defined as an establishment that

“offers services, facilities, and beds for use for more than 24 hours for two or more unrelated individuals who are regularly admitted, treated, and discharged and who require services more intensive than room, board, personal services, and general nursing care; has clinical laboratory facilities, diagnostic X-ray facilities, treatment facilities, or other definitive medical treatment; has a medical staff in regular attendance; and maintains records of the clinical work performed for each patient.”¹⁰⁹

Application for a special hospital license requires a transfer and admission agreement between the special hospital and a general hospital, for services unavailable at the special hospital.¹¹⁰

3.2 Preparing to Open a Shuttered Hospital

3.2.1 Status as a New Hospital

The surge hospital will be a shuttered facility that is reopening after having been closed for a significant period of time.

Massachusetts: Massachusetts will treat the surge hospital as a new hospital entity opening its doors for the first time. As a new hospital, the surge facility will be required to comply with certain statutes and regulations, either through actual compliance or by securing waivers, before the facility can reopen.

Illinois: Setting up for operation in Illinois is comparable to Massachusetts, as the surge hospital will be treated as a new hospital and will need to fulfill or secure waivers for certain requirements set by Illinois statutes and regulations before the facility may open.

Kansas: Setting up for operation in Kansas is comparable to Massachusetts, as the surge hospital will be treated as a new hospital and will need to fulfill or secure waivers for certain requirements set by Kansas statutes and regulations before the facility may open.

Texas: Unlike Massachusetts, the Texas Hospital Licensing rules specifically reference requirements for reopening a building formerly licensed as a hospital. “When an applicant intends to reopen and relicense a building formerly licensed as a hospital, an onsite inspection shall be conducted by the department in accordance with §133.167(e)(4) of this title to determine compliance with applicable construction and fire safety requirements.”¹¹¹ These requirements are further discussed in the *Construction Plan Approval for Renovations* and *Public Safety Certificate and Fire Safety Certificate* sections of this report.

¹⁰⁸ 25 TAC 133.2(h)

¹⁰⁹ Texas Health and Safety Code 241.003 (15)

¹¹⁰ 25 TAC 133.22(a)(4)

¹¹¹ 25 TAC 133.22

3.2.2 Determination of Need

In **Massachusetts**, “No original license shall be issued to establish or maintain a hospital...unless there has been a determination by the department that there is need for such a facility at the designated location...”¹¹² Hospitals that open after a lapse in service are required to obtain an original license. A prerequisite for an original license is a determination of need (also known as certificate of need in other States). The MDPH has discretion to grant an exemption to the determination-of-need process under the applicable regulations¹¹³ and likely would do so after receiving a written request from the surge hospital. If an exemption is not granted, the process for obtaining a determination of need is lengthy (the process can last two or three months even when an application is being handled on an expedited basis) that the surge facility would not be able to open in a timely manner.

Recommendation: states will need to waive CON requirements to allow for a temporary surge facility.

Illinois: Like Massachusetts, Illinois requires an application for hospital licensure to include a “Certificate of Need Permit (CON) or Certificate of Exemption from Certificate of Need (COE) issued by the Health Facility Planning Board.”¹¹⁴ The Health Facility Planning Board would likely grant a COE after a written request from the surge facility. As in Massachusetts, if the exemption is not granted, the lengthy process for obtaining a CON would prevent the surge facility from opening 3 – 7 days after an emergency event occurs.

Kansas: Unlike Massachusetts regulations, Kansas regulations for hospital licensure do not require a Certificate of Need, therefore no exemption would be needed for this part of the process.

Texas: Unlike Massachusetts regulations, regulations for hospital licensure from the Texas Department of State Health Services do not include a Certificate of Need and exemption would not be needed for a surge facility.

3.2.3 Construction Plan Approval for Renovations

Massachusetts regulations state that “In the case of new construction of a hospital, an institution for unwed mothers or a clinic, *or in the case of alterations or additions to an existing hospital* (emphasis added), an institution for unwed mothers or a clinic, preliminary architectural plans and final architectural plans and specifications shall be submitted to the division of hospital facilities of the department. Written approval of the final architectural plans and specifications shall be obtained from said division prior to said new construction or alterations or additions.”¹¹⁵ The MDPH can waive a limited number of physical standards for a healthcare facility so long as patient safety is not jeopardized or the facility’s ability to provide adequate care limited.¹¹⁶ For example, the MDPH may well allow the surge hospital

¹¹² MGL chapter 111, section 51.

¹¹³ See 105 CMR 100.308.

¹¹⁴ IAC 250.110(a)

¹¹⁵ MGL chapter 111, section 51.

¹¹⁶ See 105 CMR 130.050.

to substitute curtains for room doors for a period of time if doors are not readily available. The type of waivers requested by the surge facility, and the willingness of the MDPH to grant waivers, will depend on the number of patients and the acuity of illness of the patient population that the surge facility intends to admit. The surge facility should not anticipate significant leeway in applying for waivers as the construction standards are important for patient safety.

Illinois: As in Massachusetts, preliminary and final architectural plans must be reviewed and approved in Illinois. “When construction is contemplated, either for new buildings or additions or material alterations to existing buildings coming within the scope of this Part, design development drawings and outline specifications shall be submitted to the Department for review. Approval of design development drawings and specifications shall be obtained from the Department prior to starting final working drawings and specifications.”¹¹⁷ The Department of Public Health must also review the final working drawings and specifications before construction begins. The IDPH may waive some standards for the surge facility. However, as previously noted, the licensing agency will likely consider the number and acuity of patients before granting waivers and the surge facility should not seek waivers for standards that are important for patient safety.

Kansas: In Kansas preliminary and final architectural plans must be reviewed and approved. “New construction, alterations or renovations that provide space for patient services or patient rooms shall not be used until authorization has been received from the licensing agency. The licensing agency may give such authorization orally or by telephone and shall provide the facility with written confirmation within 30 days.”¹¹⁸ Any construction must be in accordance with American institute of architects academy of architecture for health, publication No. ISBN 1-55835-151-5, entitled “1996-97 guidelines for design and construction of hospitals and health care facilities,” standards. An architect licensed in Kansas shall prepare the plans and must “certify, in writing, to the agency that the contract documents are in compliance of this regulation” before construction may begin.¹¹⁹ The surge facility would request waivers for specific construction standards. KDHE would only grant waivers if there is no risk to patient care.

Texas: Preliminary and final architectural plans and specifications for construction must be reviewed and approved by the Texas health department. For new construction or a formerly licensed hospital being reopened and relicensed, “necessary preliminary inspections and final construction inspections shall be conducted by the department in accordance with §133.167(e)(4).” Texas Administrative Code 133.167(e)(4) requires the department to determine the number of required inspections necessary to complete all proposed construction projects, at a minimum of two. This determination is stated in a final construction approval letter to the architect of record and the owner. The architect of record or licensee submit an Application for Construction Inspection form to request intermediate and final inspections. The intermediate construction inspection and final construction inspection should be requested at approximately 80% completion and 100% completion,

¹¹⁷ IAC 250.2420

¹¹⁸ KAR 28-34-2

¹¹⁹ KAR 28-34-2

respectively. Although Texas regulations specifically describe the process for construction approval for the relicensure and reopening of a hospital, the surge facility would still seek waivers due to the time constraint for opening the hospital in 3 – 7 days.

3.2.4 Public Safety Certificate and Fire Safety Certificate

Massachusetts: “No original license shall be issued [to a hospital]...unless there shall first be submitted to the department...(1) a certificate of inspection of the egresses, the means of preventing the spread of fire and the apparatus for extinguishing fire, issued by an inspector of the division of inspection of the department of public safety, and (2) a certificate of inspection issued by the head of the local fire department certifying compliance with the local ordinances.”¹²⁰ Prior to opening, the surge facility will be inspected by the Massachusetts Department of Public Safety for compliance with State building codes. The surge facility will also be inspected by the local fire department for compliance with local fire safety ordinances. Since the failure to comply with the State building code or local fire ordinances may jeopardize the safety of the patients and staff of the surge facility, the facility should not seek waivers for any of the Public Safety or Fire Safety requirements.

Illinois: Illinois hospital licensing regulations do not specify that a new hospital must be inspected by the local fire authority before the issuance of a license, but IDPH may “either before or after the issuance of a license, request the cooperation of the State Fire Marshal, county and multiple county health departments, or municipal boards of health, to make investigations to determine if the applicant or licensee is complying with the minimum standards prescribed by the Department.”¹²¹ Hospital regulations do require “buildings and equipment shall be so maintained as to prevent fire and other hazards to personal safety”¹²² and “fire detection and protection systems shall be inspected no less than twice a year by a recognized competent authority.”¹²³ As previously noted, the facility should not seek waivers for any of the Public Safety or Fire Safety requirements.

Kansas: “Approval of the fire protection of a hospital by the local fire department shall be a prerequisite for licensure.”¹²⁴ In addition, regulations require hospitals to establish a plan with the nearest fire department for fire fighting service. “The hospital shall provide the fire department with a current floor plan of the building. The floor plan shall show the location of fire fighting equipment, exits, patient rooms, places where flammable and explosive gases are stored, and any other information that the fire department requires.”¹²⁵ The surge facility should not seek waivers for any of the Public Safety or Fire Safety requirements because they are instituted to maintain patient safety.

¹²⁰ MGL chapter 111, section 51.

121 210 ILCS 85/6

¹²² IAC 250.1980(a)

¹²³ IAC 250.1980

¹²⁴ KAR 28-34-3

¹²⁵ KAR 28-34-3f

The **Texas** DSHS requires a certificate of occupancy approved by the local fire authority and issued by the city building inspector to be submitted to the department before reopening.¹²⁶ The department may also require a license application be approved by the local health authority or other local officials for compliance with municipal or State ordinances on building construction, fire prevention, and sanitation.¹²⁷ “For new construction, addition, and renovation projects, written approval by the local building department and local fire authority shall be submitted during the final construction inspection by the department.”¹²⁸

Texas also has regulations specific to a facility being reopened, which require an engineer must inspect sprinkler system installations “to determine that the fire sprinkler system is installed in accordance with NFPA 13 requirements prior to the final construction inspection conducted by the department.”¹²⁹ The department is unlikely to grant waivers for Public Safety or Fire Safety requirements.

3.2.5 Obtaining a License

In **Massachusetts** a license application must be filed with the MDPH, and the facility inspected by the MDPH, before the surge facility can be authorized to open and operate.

The Applicant. A legal entity or person must be responsible and accountable for operation of the surge facility. This entity or person, known as the applicant, signs the hospital license application. The shuttered hospital that is transformed into the surge hospital will, most likely, be acquired and setup for service by the Commonwealth of Massachusetts under emergency powers held by the governor. Therefore, the applicant will probably be either the Commonwealth, a private management company hired by the Commonwealth, or another healthcare facility or healthcare system within the Commonwealth that either leases or is hired to manage the surge facility. As part of the licensure process, the applicant must meet certain regulatory requirements, including being deemed “responsible and suitable” to be granted a hospital license.¹³⁰ Factors considered in a determination of suitability include financial capacity to operate the healthcare facility, history of prior compliance with Massachusetts laws and the laws of other States governing healthcare facilities, and the history of criminal conduct of the applicant and its officers, if applicable.¹³¹ Review of the license application of the surge hospital will, of necessity, be shortened. In order to expedite the license application, the applicant, if it is not the Commonwealth, should be well known to the MDPH and have a strong record of operating other healthcare facilities so that the MDPH can abbreviate the licensing process without undue concern that it is risking patient safety in doing so.

Illinois: Illinois requires an applicant to have a permit to establish a hospital before he/she may obtain a license to operate a hospital. The permit to establish a hospital is required for

¹²⁶ 25 TAC 133.22(C)(5)

¹²⁷ Texas Health and Safety Code 241.022(e)

¹²⁸ 25 TAC 133.22 (a)(6)

¹²⁹ 25 TAC 133.167(e)(4)

¹³⁰ See 105 CMR 130.104.

¹³¹ 105 CMR 130.104.

“construction of a new hospital; change of location of a hospital; change of license of a hospital; change of license category of a hospital; whenever a facility that was not formerly required to be licensed becomes subject to licensure.”¹³² IDPH will inspect the facility before issuing a license. This additional application process may increase the amount of time it would take a surge facility to obtain a license to operate or be an additional requirement that the facility would need to obtain a waiver for.

The IDPH considers the following factors regarding the applicant in determining whether to issue a permit to establish a hospital: “(1) that the applicant is fit, willing and able to provide a proper standard of hospital service for the community with particular regard to the qualification, background and character of the applicant, (2) that the financial resources available to the applicant demonstrate an ability to construct, maintain, and operate a hospital in accordance with the standards, rules, and regulations adopted pursuant to this Act, and (3) that safeguards are provided which assure hospital operation and maintenance consistent with the public interest having particular regard to safe, adequate, and efficient hospital facilities and services.”¹³³ As previously noted, the applicant of the surge facility license should be well known and have a strong record of healthcare facility operation to help abbreviate the licensing process.

Kansas: In Kansas, a license application must be filed with KDHE at least 90 days before patients are admitted.¹³⁴ This will not be possible for a surge facility unless the application is prepared and submitted before an emergency situation occurs. Unlike Massachusetts, the Kansas licensing regulations do not specify requirements for review of the applicant. However, if the applicant is well known to KDHE, it would likely expedite the licensing process in an emergency situation.

Texas: To obtain a license in Texas, an application (including the complete application form, a copy of the hospital’s patient transfer policy, a copy of the hospital’s memorandum of transfer form, copies of any patient transfer agreements, written approval by the local building department and local fire authority, verification of franchise tax status, additional documentation for new hospitals or conversions) must be filed with the Department of State Health Services. The applicant must attend a presurvey conference with DSHS and DSHS must conduct an inspection of the facility.¹³⁵ Licensing regulations require the application to be submitted no earlier than 60 days before the estimated opening of the facility.¹³⁶

The applicant, the person legally responsible for the operation of the hospital, seeks a hospital license from the Texas health department.¹³⁷ Texas licensing regulations do not require an applicant to meet certain requirements, but if the applicant includes an individual

¹³² 77 IAC 250.110(a)

¹³³ 210 ILCS 85/6a.

¹³⁴ KAR 28-34-2(a)

¹³⁵ 25 TAC 133.22

¹³⁶ 25 TAC 133.22a

¹³⁷ 25 TAC 133.2 (5)

who owns 25% or more of the business entity, the individual's name and social security numbers must be supplied with the application for license of the facility.¹³⁸

States considering the use of shuttered hospitals to expand surge capacity may wish to establish procedures for granting temporary licenses during emergencies.

3.2.6 Waivers

Massachusetts: Any shuttered hospital facility reopened on an emergency basis to meet the need for additional hospital capacity will not be able to meet the usual regulatory standards for acquiring a hospital licensure. Nor will the MDPH have time to conduct its usual review of a license application. However, the MDPH has reserved to itself authority to waive “one or more” of its hospital licensure requirements if certain standards are met, including causing a general hardship to the hospital in question.¹³⁹ Waiver of a significant number of hospital licensing requirements would be necessary for the surge facility to open quickly following a mass casualty event. Assuming the surge facility is identified in advance of the mass casualty event that triggers need for opening the surge facility, a waiver request could be prepared as part of the planning process based upon the general state of the physical plant. The waiver request could then be reviewed in advance with MDPH officials and modified as necessary. The waiver request must be in writing and supported by written documentation. When a mass casualty event actually occurred, the waiver request could be updated depending upon the nature of the casualty event and the patient population to be served. Since the MDPH would have already reviewed and approved most of the request, MDPH would be able to process the request in a shortened time frame. MDPH also has authority to issue a provisional license for a period of no more than one year to a hospital that is not in full compliance with applicable requirements, but which the MDPH finds is in substantial compliance and demonstrates potential for achieving full compliance within the one-year period.¹⁴⁰ MDPH is likely to be cooperative in granting waivers as long as patient and staff safety are not compromised. The surge facility should work with DPH to secure operational authority as quickly as possible.

Illinois: Like Massachusetts, Illinois has a process in place to allow a facility to apply for waiver of regulations. The Department of Public Health “may grant or renew a waiver or alternative compliance methodology with a rule or standard, including without limitation rules and standards for (i) design and construction, (ii) engineering and maintenance of the physical plant, site, equipment, and systems (heating, cooling, electrical, ventilation, plumbing, water, sewer, and solid waste disposal), (iii) fire and safety, and (iv) other rules or standards that may present a barrier to the development, adoption or implementation of an innovation designed to improve patient care for a period not to exceed the duration of the current license.”¹⁴¹ In making this determination the department will consider “the duration and basis for any current waiver with respect to the same rule or standard and the validity and effect upon patient health safety of extending it on the same basis, the effect upon the health

¹³⁸ 25 TAC 133.22a8

¹³⁹ 105 CMR 130.050.

¹⁴⁰ 105 CMR 130.124(B).

¹⁴¹ 210 ILCS 85/8.5)

and safety of patients, the quality of patient care, the hospital's history of compliance with the rules and standards of this Act, and the hospital's attempts to comply with the particular rule or standard in question."¹⁴² IDPH is likely to grant waivers as long as safety of patients and staff is not compromised.

Kansas: Kansas rules allow the secretary of KDHE to grant an emergency waiver "if the need for the hospital project is a result of fire, tornado, flood, storm damage or other similar disaster, if adequate health care facilities are not available for the people who previously used the applicant hospital's facility and if the request for an emergency waiver is limited in nature and scope only to those repairs necessitated by the natural disaster."¹⁴³ Although, these rules specify that a waiver may be granted in the event a facility is damaged, there would need to be an additional waiver process to allow for the opening of a new hospital during an emergency.

Texas: Texas has a mechanism for a surge facility to submit requests for waiver to the director of the Department of State Health Services. However, waivers are not granted for fire safety requirements. The surge facility must submit a written request specifying the sections of the Texas Hospital Licensing Act or Hospital Licensing Rules for which a waiver is requested.¹⁴⁴ The director must submit his written recommendation for granting or denying the waiver to the commissioner of health. The director's recommendation shall address each of the criteria in subsection (b) of this section.¹⁴⁵ "The director shall consider whether the waiver or modification: (1) will adversely affect the health and safety of the hospital patients, employees, or the general public; (2) will adversely impact the hospital's participation in the Federal Medicare program or accreditation by the Joint Commission on Accreditation of Healthcare Organizations or the American Osteopathic Association; (3) if not granted, would impose an unreasonable hardship on the hospital in providing adequate care for patients; (4) will facilitate the creation or operation of the hospital; and (5) is appropriate when balanced against the best interests of the individuals served or to be served by the hospital."¹⁴⁶ DSHS is likely to grant waivers, taking into consideration the criteria described in the regulations.

3.2.7 Physician Credentialing

Massachusetts: MGL Chapter 111, Section 203(d) requires every Massachusetts hospital to participate in a risk management program established by the Board of Registration in Medicine called the Qualified Patient Care Assessment Program.¹⁴⁷ In order to be approved for membership on a hospital's medical staff, a physician is required to submit an application documenting possession of a valid Massachusetts license to practice medicine, criminal offender history, history of malpractice claims and lawsuits, a list of health care facilities with which the physician has been affiliated, and disciplinary history. The process is

¹⁴² 210 ILCS 85/8.5)

¹⁴³ KSA 65-453

¹⁴⁴ 25 TAC 133.81(a)

¹⁴⁵ 25 TAC 133.81(d)

¹⁴⁶ 25 TAC 133.81(b)

¹⁴⁷ See 243 CMR 3.00, The Establishment and Participation in Qualified Patient Care Assessment Programs.

repeated every two years. There is mandated reporting of certain incidents involving physicians as well as certain types of physician behavior (e.g., substance abuse) to the Board of Registration in Medicine. An exception to the credentialing process exists for temporary appointments to the medical staff for up to 120 days in any one-year period for a physician seeking an initial appointment to a particular medical staff, provided that certain information (evidence of a Massachusetts license, of malpractice insurance, of DEA certificate of registration, etc.) is obtained by the hospital.¹⁴⁸ The surge hospital may be able to use this 120-day exemption for the initial start-up of operations so long as it is pursuing the credentialing of every physician granted privileges at the hospital. The exemption may perhaps also be used if the surge hospital expects to cease operation within 120 days of opening. If the surge hospital is operated by an existing hospital, the existing hospital may be able to use its own credentialing process to qualify the surge hospital physicians.

Illinois: Illinois regulations require written procedures, approved by the facility governing board, “relating to the acceptance and processing of initial applications for medical staff membership, granting and denying of medical staff reappointment, and medical staff membership or clinical privileges disciplinary matters.”¹⁴⁹

There are separate rules for county hospitals and non-county hospitals. County Hospitals must have procedures for “determination of qualifications and privileges, criteria for evaluation of qualifications, and procedures requiring information about current health status, current license status in Illinois, and biennial review of renewed license.”¹⁵⁰ Non-county hospitals must have written procedures for “*acceptance and* processing of initial applicants for medical staff membership; ...determining an applicant's qualifications for being granted medical staff membership and privileges; ... evaluating an applicant's qualifications;...[and] evaluation of an applicant's current health status and current license status in Illinois.”¹⁵¹

Kansas: Kansas requires established procedures for “formal application for membership and for the granting of clinical privileges” of the medical staff.¹⁵² This set of procedures should include standards for review of staff credentials.¹⁵³ Since the hospital licensing regulations do not state specific requirements for physician credentialing, it is likely the surge facility would be able to review staff credentials by deferring to the facility where the physician is currently credentialed. A decision regarding this issue would need to be made in advance of an emergency situation.

Texas: Licensing regulations in Texas require medical staff to “examine credentials of candidates for medical staff membership and make recommendations to the governing body on the appointment of the candidate.”¹⁵⁴ Medical staff bylaws should include a description of

¹⁴⁸ 243 CMR 3.08.

¹⁴⁹ IAC 250.310(a)

¹⁵⁰ IAC 250.310

¹⁵¹ IAC 250.310

¹⁵² KAR 28-34-6a (d)

¹⁵³ KAR 28-34-6a

¹⁵⁴ 25 TAC 133.41(k)

qualifications of candidates to be recommended for appointment and “criteria for determining the privileges to be granted and a procedure for applying the criteria to individuals requesting privileges.”¹⁵⁵ Since the hospital licensing regulations do not state specific requirements for physician credentialing, it is likely the surge facility would be able to review staff credentials by deferring to the facility where the physician is currently credentialed. This issue would need to be resolved in advance of an actual mass-casualty event.

3.2.8 Nurse Staffing

Massachusetts: Nurse staffing requirements are set forth at 105 CMR 130.300 *et seq.* Every Massachusetts hospital is required to establish a nursing service under the direction of a registered nurse who must have certain academic credentials. Nursing coverage is not stated in specified nurse-patient ratios of minimum coverage. Instead, the hospital must develop a written staffing plan for each shift that assures adequate nursing coverage is available during the shift. A registered nurse is required to be working in each nursing unit during each shift. Otherwise, the regulations require only that the number of registered nurses, licensed practical nurses and unlicensed nursing personnel be sufficient and adequate to meet the needs of the patients. Thus, the level of nurse staffing at the surge hospital will depend on the acuity of patient illness or trauma and the number of patients in the facility, among other factors.

Illinois: Like Massachusetts, hospitals in Illinois must establish and organized nursing service “under the direction of a registered professional nurse who has qualifications in nursing administration.”¹⁵⁶ Illinois requires “a sufficient number of registered professional nurses shall be on duty at all times to assess, plan, assign, supervise, and evaluate nursing care and provide patients such nursing care for which the judgment and specialized skills of a registered nurse is required.”¹⁵⁷ Specific staffing requirements are required and specified for particular units of the hospital. Staffing schedules for units must identify the nurse in charge, assign personnel with consideration to patient care plans to minimize risk of cross-infections, and project future time schedules of personnel.¹⁵⁸ Since there are specific staffing requirements for particular units, a surge facility would need to meet these requirements or obtain a waiver. However, the surge facility should still consider the acuity of patients and number of patients in the facility in determining staffing levels.

Kansas: Kansas requires a hospital to have an organized nursing department, with a plan of responsibilities for each category of nursing personnel. There are no staffing requirements specified by the hospital licensing regulations. There must always be at least one registered nurse on duty. “All licensed practical nurses and other ancillary personnel performing patient care services shall be under the supervision of a registered nurse.”¹⁵⁹ Although there

¹⁵⁵ 25 TAC 133.41(k)

¹⁵⁶ IAC 250.910(c)

¹⁵⁷ IAC 250.910

¹⁵⁸ IAC 250.910

¹⁵⁹ KAR 28-34-7

are no staffing requirements, the surge facility should take into account the acuity of patients in order to maintain standards of care.

Texas: Texas requires that organized nursing services, with a plan of administrative authority and responsibilities for patient care, should provide 24-hour coverage as needed. A Chief nursing officer has administrative authority and is responsible for “determining the types and numbers of nursing personnel and staff necessary to provide nursing care for all areas of the hospital.”¹⁶⁰

Requirements state that there should be an “adequate numbers of RNs, licensed vocational nurses (LVNs), and other personnel to provide nursing care to all patients... and supervisory and staff personnel for each department or nursing unit to provide the immediate availability of an RN for bedside care of any patient.”¹⁶¹ Staffing levels should take into account patient characteristics, number of patients being cared for, intensity of care, scope of services, context within which care is provided, and nursing staff characteristics.¹⁶² Hospitals should have written procedures for setting these staffing levels.

3.2.9 Complaints and Incident Reports

Massachusetts:

Complaints. Every hospital must develop a written procedure for investigating serious complaints against hospital employees or members of the medical staff.¹⁶³ A senior member of the hospital staff must serve as a complaint officer and oversee the investigations. There must be a clear, written procedure for reporting and investigation of complaints. The surge hospital should comply with this requirement so that it can be made aware of serious problems that may exist within the facility.

Incident Reports. In Massachusetts, the surge hospital will be required to report immediately by telephone to MDPH any of the following serious incidents and accidents that take place on the hospital premises:¹⁶⁴

- Fire
- Suicide
- Serious criminal acts
- Pending or actual strike action by its employees, and contingency plans for operation of the hospital
- Serious physical injury to a patient resulting from an accident or unknown cause

¹⁶⁰ 25 TAC 133.41

¹⁶¹ 25 TAC 133.41

¹⁶² 25 TAC 133.41

¹⁶³ 105 CMR 130.330.

¹⁶⁴ 105 CMR 130.331.

In addition, a written report must be filed with the MDPH of any serious incidents occurring on the licensed premises of the hospital that seriously affect the health and safety of its patients. The surge hospital should expect to comply with this reporting requirement.

Illinois: Illinois requires that each hospital report to the Department of Public Health any incidents or occurrence that puts patients at immediate jeopardy that requires the transfer of patients to other parts of the facility or to other facilities. Each report must be filed within two days working days of the incident. Occurrences requiring reporting include but are not limited to fire, flood, and power failure.¹⁶⁵ In addition, Illinois requires reporting of the death of a pregnant woman or the death of a woman within one year of the termination of a pregnancy¹⁶⁶, special circumstances related to mothers and infants and discharges of children released to someone other than their natural parent,¹⁶⁷ as communicable diseases.¹⁶⁸ These requirements would be required of a surge facility.

Kansas: Kansas also requires hospital risk management committees review all clinical concerns raised by hospital employees, evaluate the level of risk, and report those meeting certain requirements to the licensing agency.¹⁶⁹ For a surge facility, and acute care hospitals in the area would need to meet these standards unless the requirements are modified. Surge facilities, especially, may have difficulty meeting these standards, necessitating a waiver.

Texas: Texas regulations require reporting of fire and other safety-related incidents. In addition, Texas hospitals must develop emergency plans to be put into effect if an incident affecting patient safety were to occur.¹⁷⁰ This plan must be tested annually, a requirement that would not be possible for a surge facility.

3.2.10 Patient Rights

Massachusetts: MGL Chapter 111, section 70E, confers certain legal rights upon patients at hospitals and other health care facilities, including the surge facility. The most pertinent of these rights for the surge hospital is the right of every patient to choose the facility at which the patient will be treated. Although this right is suspended in the event a patient requires emergency medical treatment, the patient ordinarily may refuse to be transferred from one health care facility (e.g., a surge hospital) to another healthcare facility (e.g., a skilled nursing facility or a hospital). Exercise of this right may interrupt the flow of patients from one facility to the other and lead to the surge hospital having a small patient population that it is not well suited to serve. Since the right to choose a health care facility is embedded in a statute, there is no waiver available that would allow the surge facility to exercise an override of the patient's decision.

¹⁶⁵ 77 Ill., Admin. Code, Chapter 1, Subchapter b, Section 250.1520.

¹⁶⁶ 77 Ill. Adm. Code 657, 77 Ill., 77 Ill. Adm. Code. Subchapter b, Section 250.1830 (i)(2).

¹⁶⁷ 77 Ill. Admin. Code, Subchapter b, Section 250.1830 and Section 250.1840.

¹⁶⁸ 77 Ill. Adm. Code 690.

¹⁶⁹ KAR 28-52-1

¹⁷⁰ 25 TAC 133

Illinois: Section 250.260 of Title 77 of the Illinois Administrative Code “recommends” that hospitals adopt a written policy on patients’ rights and that should be available to all patients. That section requires hospitals have a written plan for the provision of spiritual, emotional, and attitudinal health of the patient, patients’ families, and hospital personnel. Surge facilities would likely be able to meet these requirements by adopting that of a hospital currently in operation.

Kansas: Kansas’ Hospital Regulations 28-34-3b confers legal rights to inpatients and outpatients at Kansas hospitals. The regulations do not include provisions for choosing the facility at which the patient is treated.

Texas: Texas Hospital Licensing Rules provide detailed requirements for hospitals regarding patient rights, however, these requirements do not include provisions for selecting the facility at which the patient is treated.¹⁷¹

3.2.11 Medical Records

There are Federal requirements governing privacy and security of personal medical information in the Healthcare Insurance Portability and Accountability Act (HIPAA),¹⁷² with which the surge hospital must comply. These regulations apply to every State.

Massachusetts: Every licensed hospital, including the surge facility, must maintain medical records for each of its patients in accordance with MGL Chapter 111, section 70 for a period of at least 30 years. A copy of the medical record must be made available to the patient or the patient’s authorized representative for a reasonable fee. The surge hospital can expect that the requirement to maintain proper medical records is unlikely to be waived since the quality of patient care often depends upon information available to caregivers through the patient’s record. Responsibility for maintaining and storing patient medical records over the thirty-year period once the surge hospital has closed will rest legally on the licensee. If the licensee is not the Commonwealth of Massachusetts, the Commonwealth may still assume responsibility for storage and retrieval.

Recommendation: provision will need to be made to retain medical records (perhaps at state health departments) after the emergency eases and the surge facility closes.

Illinois: Illinois requires that every licensed hospital must maintain an “adequate, accurate, timely, and complete” medical record for each patient.¹⁷³ The regulations specify that these records must be housed safely to prevent unauthorized use and to protect the records from damage by water or fire. The State requires that a registered medical record administrator or accredited medical record technician be responsible for overseeing the hospital’s record department. Medical records or photographs of such records must be preserved in accordance with the American Hospital Association’s recommendation and legal opinion on record retention and preservation. In addition, each licensed hospital would need to have a

¹⁷¹ 25 TAC 133.42

¹⁷² See Section 2 of this Report.

¹⁷³ 77 Ill. Admin. Code 250.1510.

policy for preservation of records should the hospital close. As in Massachusetts, a surge facility would need to comply with these requirements.

Kansas: Kansas regulations require that patient records be kept on file for ten years after the date of last discharge of the patient and a summary shall be kept on file for 25 years. The regulations further stipulate that the records are the property of the hospital and should not be removed from the premises except as authorized by the governing body of the hospital or for purposes of litigation.¹⁷⁴ These requirements may pose a challenge for a surge facility, particularly with respect to the on-site storage of the medical records. The hospital's governing body would need to permit the removal of the records at the conclusion of the disaster.

Texas: Texas requires that patient records be kept on file for at least ten years. Films and other image records must be retained for five years. The regulations specify that if the hospital should close, the hospital must notify the Department of Health about the location where the records are stored and contact information for the custodian of the records. As described above, a surge facility would need to comply with these requirements.

3.2.12 Discharge Planning; Advocacy Office

Massachusetts:

Discharge Planning. Massachusetts requires every licensed hospital to develop a comprehensive discharge planning service for its patients.¹⁷⁵ Since the surge facility will be a temporary placement for most patients, the discharge planning service will be key to continuity of care for the surge facility patients. Medicare rules for discharge planning are incorporated directly into the Massachusetts regulations. The regulations are unusually specific about certain requirements for the discharge planning service (e.g., for Medicare patients, the regulations set forth the minimum size of the type to be used on the front page of every individual patient discharge plan). The discharge planning service must be multi-disciplinary and responsible for coordinating the transfer of patients to either an independent living situation or another institution. As with any hospital, patients may be discharged from a surge hospital facility for a variety of reasons, including a need for a more acute level of care than is available from the surge hospital, to return home if medical care is no longer needed, or to transfer to another type of health care facility, such as a skilled nursing facility. The surge hospital should review the discharge planning requirements and seek waivers of the requirements that do not have a direct impact on the quality of the discharge service.

Recommendation: a surge facility probably would not be able to provide multi-disciplinary discharge planning; that responsibility could remain with the tertiary medical center that transferred the patient to the surge facility.

Advocacy Office. Acute care hospitals that serve Medicare patients are required to take certain steps to protect the rights of Medicare beneficiaries.¹⁷⁶ Hospitals are prohibited from taking any discriminatory action against any patient based upon the patient's status as a

¹⁷⁴ Kansas Hospital Regulations, 28-34-9.

¹⁷⁵ 105 CMR 342-349A.

¹⁷⁶ 105 CMR 130.345.

Medicare beneficiary. A notice of rights must be distributed to every Medicare beneficiary. In the event a Medicare beneficiary believes a hospital engages in discriminatory behavior or provides inadequate discharge planning, the beneficiary has a right to file a complaint with the Advocacy Office within the MDPH. The Advocacy Office has the authority to investigate complaints from Medicare beneficiaries, encourage negotiated resolution of complaints and issue Notices of Final Disposition in the event negotiated resolutions cannot be achieved. Although this report does not discuss payment issues, Medicare beneficiaries are almost certainly going to be in the patient population served by the surge facility. The surge facility should be prepared to comply with the non-discrimination and notice requirements of this regulation.

Illinois: Illinois provides the general requirement that hospitals have written policies for admission, discharge, and referral of all patients who present themselves for care. In addition, Illinois regulations include the Medicare requirement that hospitals provide 24-hour notice to Medicare beneficiaries prior to discharge along with information concerning their right to appeal.¹⁷⁷

Otherwise, Illinois regulations regarding patient rights do not include provisions for filing a complaint or complaint resolution.¹⁷⁸ A surge facility would not need to comply with requirements beyond the Federal regulations.

Kansas: Kansas regulations include requirements for maternity and infant discharges but are silent with respect to other discharges. These would likely not apply to a surge facility as we envision it.

Kansas regulations require the hospital to develop a procedure for responding to patient grievances.¹⁷⁹

Texas: Hospitals in Texas must comply with a detailed list of requirements concerning patient transfers from one hospital to another. The regulations provide definitions of patients who may be transferred, conditions under which a patient may be transferred, notification requirements regarding the transfer, and parties responsible for the patient during and after the transfer. The regulations describe transfer from one hospital to another but are silent with regard to discharges home or to another institution.¹⁸⁰

Texas regulations also include requirements that all hospitals develop and implement policies to ensure patients' rights, including informing the patient of the hospital's policy for resolving patient complaints.¹⁸¹ A surge facility would need to comply with these requirements unless a waiver was sought.

¹⁷⁷ 77 Ill Adm. Code 250.240

¹⁷⁸ 77 Ill Adm. Code 250.260

¹⁷⁹ KAR 28-34-3b

¹⁸⁰ 25 TAC 133.44

¹⁸¹ 25 TAC 133.41

3.2.13 Clinical Laboratory

Massachusetts: The surge hospital will not have an onsite clinical laboratory. Laboratory tests will be sent to outside laboratories, although there is a possibility that bedside laboratory testing with kits may take place within the surge hospital. Hospital laboratory testing is regulated under 105 CMR 130.350 and 105 CMR 180.000. These regulations do not address directly the issue of whether bedside testing with kits is a regulated activity. Prior to commencing bedside testing, the surge facility should consult with MDPH officials and seek waivers if appropriate.

Illinois: Illinois requires hospitals to have a clinical laboratory that is certified under the Federal Clinical Laboratory Improvement Amendments of 1988.¹⁸² Section 250.510 of Title 77, Illinois specifies that laboratory services must be adequate for the individual hospital as determined by the complexity of services, nature of the hospital, and commensurate with the size of the facility. The regulations further specify the types of basic laboratory tests the facility must provide. All other tests may be conducted by an outside laboratory under contract to the hospital. If a surge facility planned to conduct bedside testing, the Illinois Department of Health would need to be consulted about whether or not that approach would fulfill the requirements of the State. A waiver may be necessary for surge facilities operating in Illinois.

Kansas: Kansas regulations require that laboratory services be performed by a CLIA-certified laboratory either on the hospital premises or by an outside laboratory. As in Massachusetts and Illinois, a waiver would likely be needed for a surge facility in Kansas related to bedside testing.

Texas: Texas regulations also require laboratory services to be furnished by a CLIA-certified laboratory. The regulations require that each hospital have adequate laboratory services to meet the needs of its patients, including the availability of 24-hour a day emergency laboratory services, a written description of the services provided and policies for determining which tissues require macroscopic analysis and which require both macroscopic and microscopic.¹⁸³ Like the other States, the department of health should be consulted about whether or not a waiver would be necessary to perform bedside testing in a surge facility.

3.2.14 Sharps; Medical Waste Disposal

Massachusetts:

Sharps. Massachusetts hospitals are required to take reasonable precautions to protect health care workers from exposure to sharps. Hospitals must develop written exposure control plans that include an effective procedure for identifying and selecting existing sharps injury prevention technology where at all feasible. In addition, every hospital is required to maintain a sharps injury log and report annually to the MDPH information from its sharps injury log in such form as the MDPH shall require.

¹⁸² 77 Ill. Adm. Code 250.510.

¹⁸³ 25 TAC 133.41

Medical Waste Disposal. Storage and disposal of infectious physically dangerous medical or biological waste is addressed in the Massachusetts State Sanitary Code at 105 CMR 480.000 and incorporated by reference into the Massachusetts hospital licensure regulations. Because of the danger to health care workers in the facility and to the public health in general, the MDPH is unlikely to waive or limit the application of the sharps or medical waste disposal requirements.

Illinois: Handling and disposal of medical or biological waste is addressed in the Illinois Administrative code at 77 Ill. Adm. Code 250.1720, the hospital licensure requirements for the State and in regulations related to environmental protection, 35 Ill. Adm. Code 1420.101—120. While the hospital licensure requirements are general, the environmental protection regulations provide detailed requirements on segregation, containment, transfer, and labeling of potentially infectious medical waste and sharps. As in Massachusetts, these regulations are not likely to be waived by the Illinois Department of Public Health.

Kansas: Kansas regulations provide instructions for the disposal of medical waste but do not address sharps.¹⁸⁴ Compared to those in Massachusetts and Illinois, the requirements are quite general, however, it is unlikely the State would waive these requirements during a mass casualty event.

Texas: State regulations in Texas also provide moderately detailed instructions for the disposal, treatment, and transport of medical waste from health care facilities that include provisions for sharps.¹⁸⁵ These are unlikely to be waived during a mass casualty event.

3.2.15 Reportable Diseases, Isolation and Quarantine

Massachusetts:

Reportable Diseases. Massachusetts health care providers are required to report certain diseases and medical conditions to their local boards of health.¹⁸⁶ The term “health care providers” is broadly defined to include hospitals, physicians, registered nurses and others. The list of diseases reportable to local health authorities is published at 105 CMR 300.100. A much shorter list of diseases that are directly reportable to the MDPH by any health care provider is set forth at 105 CMR 300.180(A)-(C). Finally, the MDPH requires that any unusual illness or any illness that is part of an outbreak or cluster be reported to the appropriate local board of health. See 105 CMR 300.133-134. Since surge hospital patients will be transferred to the surge facility from other health care facilities, surge facility patients infected with reportable diseases usually will have been reported prior to their arrival at the surge facility. Nonetheless, each patient’s medical record should be scrutinized upon admittance to the surge hospital to determine whether the patient has a reportable disease and, if the answer is yes, whether the patient has been reported. If the patient has not been reported, the surge facility must be prepared to do so.

¹⁸⁴ Kansas Administrative Regulations, Department of Health and Environment, 28-29-27.

¹⁸⁵ 25 TAC 1.131-1.132 and 30 TAC 330.1004

¹⁸⁶ See, generally, 105 CMR 300.000.

Isolation and Quarantine. 105 CMR 300.200 authorizes isolation and quarantine for diseases identified as dangerous to the public health. Local boards of health are usually the entities charged with enforcing these provisions. The isolation and quarantine requirements, in general, focus on issues of infection control in the overall population and are not limited to, or even intended for, the hospital setting. For example, the most common restrictions are on food handlers who have contagious infections. Standard medical reasons for isolating a patient, such as the patient having an open wound or a compromised immune system, are not addressed in the isolation and quarantine regulations. However, in the event an infectious agent causes a mass casualty event, the Governor and the Commissioner of Public Health, using the governor's emergency powers, have authority to impose isolation and quarantine restrictions beyond those expressed in the regulations.

Local Authority. A series of statutes that authorize local authorities to take police action in the event of an outbreak of infectious disease remain in effect even though they are outdated and have not been enforced for many years¹⁸⁷. These laws allow, in part, for local authorities to break into houses to seize infected persons, to seize hotels, rooming houses and other non-public buildings to house infected persons, and to quarantine individuals in isolation as may be required to protect the public health. In the event of a mass casualty, some of these laws may be resurrected and enforced. Renewed enforcement is not likely, however, to affect operation of the surge facility.

Waivers. 105 CMR 300.000 does not have a waiver provision. Given that an infectious agent may cause the mass casualty event, the surge facility should not seek waiver of the requirements of this regulation.

Illinois: Illinois has defined very detailed rules for reporting suspected or confirmed cases of infectious, contagious, and dangerous diseases.¹⁸⁸ The regulations also place responsibility on an array of health care providers and school personnel for reporting the suspected or diagnosed cases.

Isolation and Quarantine. Unlike Massachusetts, Illinois regulations refer hospital personnel to the CDC's guidelines for isolation precautions in hospitals. The regulations follow the CDC's recommendations with respect to the duration of isolation, except for a few specific diseases where Illinois has developed different requirements.

Local Authority. The regulations also give authority to the local health authority having jurisdiction over the area in which the suspected or carrier of a communicable disease reside. Only the local health authority may establish isolation and quarantine of contacts to a case, carrier, or suspected case of a communicable disease and terminate the isolation and quarantine period. Like Massachusetts, Illinois law gives the health authorities the right to close-off to the public private property in the event of an emergency involving communicable diseases.¹⁸⁹

¹⁸⁷ See, generally, MGL chapter 111, sections 92-109.

¹⁸⁸ 77 Ill. Adm. Code. Section 690.100

¹⁸⁹ 20 UKCS 2105-400

Kansas: Kansas regulations require notification of the State department of health and environment by laboratories that yield positive tests for certain diseases. The regulations define a positive test result and prescribe the information to be reported. It is unlikely that a State department of health would waive this reporting in the case of a mass casualty event, particularly one related to a biologic outbreak.

Isolation and Quarantine. Kansas regulations contain detailed provisions for isolation and quarantine of specific infections and contagious diseases, as well as general provisions for conditions of isolation and quarantine that are not specified in the regulations.¹⁹⁰ Like Massachusetts, the regulations in Kansas do not make specific reference to isolation and quarantine in hospital settings.

Local Authority. The general provisions will be ordered and enforced by a local health officer or the secretary of health and environment.

Texas: Texas regulations also include detailed provisions for reporting of certain conditions and suspected conditions. The regulations provide detailed instructions about who must report a condition, timeliness of reporting, information to be reported, and communication between local, regional, and State health authorities.¹⁹¹ These requirements are unlikely to be waived in the case of a mass-casualty event.

Isolation and Quarantine. The regulations concerning isolation and quarantine are very general. A health authority may declare a house, building, apartment to be a place of quarantine. The regulations do not provide specific requirements for particular diseases nor do they make reference to any specific rules for hospitals. The local health authority will determine the length of quarantine.

Local Authority. The local health authority has jurisdiction over any events relating to isolation and quarantine.

¹⁹⁰ Kansas Disease Control Regulations, 28-1-5 through 28-1-12.

¹⁹¹ 25 TAC 97.1—97.13

3.2.16 Ambulance Transportation

Massachusetts: In Massachusetts, emergency medical services (EMS) are organized into five regions to allow for coordination of emergency services within each region.¹⁹² Ambulance services are licensed at two levels, basic life support and advanced life support. The level of ambulance service required for a patient depends upon the acuity of the patient's illness or trauma. Emergency medical technicians (EMTs) who staff the ambulances are also licensed by the MDPH and certified at three levels—basic, intermediate and paramedic. EMTs are required to be certified at a level consistent with the level of service offered by the ambulance service employing them. Minimum staffing requirements for each licensed level of ambulance service are specified in the regulations.¹⁹³ In addition, 105 CMR 170.360 states that “[N]o ambulance service...shall transport a patient between health care facilities who is receiving medical treatment that is beyond the training and certification capabilities of the EMTs staffing the ambulance unless an additional health care professional with that capability accompanies the patient.”

Transport of Patients with Communicable Disease. EMTs and other health care providers who are suspected of having an unprotected exposure to either a blood borne infection or a disease dangerous to the public health (i.e., a reportable disease) while accompanying a patient in an ambulance must file an Unprotected Exposure Form with the hospital that receives the patient. Once the receiving hospital has confirmed a diagnosis of either a blood borne infection or a disease dangerous to the public health in the patient, the hospital must notify the ambulance service, which in turn must notify the EMT who suffered the exposure. See 105 CMR 172.000.

Agreements to Transfer. Massachusetts law and regulations do not address the form of, or require the existence of, a written agreement to transfer and transport patients between a hospital and an ambulance service. Immediately upon starting the process of reopening the surge facility, the director of the surge hospital should contact the local EMS Regional Council. The director should discuss with the EMS Regional Council the needs of the surge facility and receive a list of appropriate local ambulance services. The director should work with the ambulance services to ensure that surge facility transport needs are met.

Waivers. The Commissioner of Public Health has authority under MGL chapter 111C, Section 22 to waive any regulatory provision or guidelines promulgated under chapter 111C, including 105 CMR 170.000 and 105 CMR 172.000. However, if a mass casualty event occurs and ambulance services in a particular service region of the State are overwhelmed, ambulance services from other regions can be called in to fill the need. Given the availability of backup emergency personnel, it should not be necessary to waive any of the licensure standards either of ambulance services or of EMTs to meet the increased demand for service.

Illinois: In Illinois, requirements for ambulance service providers as well as the broader emergency medical system are addressed in 77 Ill. Adm. Code Section 515. In Illinois, emergency medical services (EMS) are organized into eleven regions. As in Massachusetts,

¹⁹² See, generally, 105 CMR 170.000.

¹⁹³ 105 CMR 170.305.

ambulances are licensed to provide either basic—or advanced—life support services. Emergency medical technicians are also certified at three different levels.

Transport of Patients with Communicable Diseases. The regulations in Illinois do not address reporting requirements of EMT personnel that transport patients with communicable diseases.

Agreement to Transfer and Waivers. As in Massachusetts, the Illinois regulations do not mention agreements to transfer. The Governor has the authority to waive waivers of licensure standards in cases where one system is overburdened. The director of the surge facility should discuss with the Regional Ambulance Service Board the needs of the surge facility and receive a list of appropriate local ambulance services. The director should work with the ambulance services to ensure that surge facility transport needs are met.

Kansas: Kansas regulations address ambulance service providers at KAR 109. In Kansas, emergency medical services are organized into six regions, however, ambulance services may be provided by municipalities. Activities are coordinated by the Emergency Medical Services Board.

Transport of Patients with Communicable Diseases. As described in a previous section, Kansas has fairly extensive requirements concerning reporting of communicable diseases, as well as authority concerning isolation and quarantine. However, Kansas regulations do not specify the role of ambulances in transporting persons with communicable diseases with respect to reporting or notifying the hospital.

Agreement to Transfer. Kansas regulations do not contain any requirements for written agreement between hospitals and ambulance companies. As in the other States above, the surge facility would need to seek approval and guidance from the Emergency Medical Services Board and local municipality.

Waivers. The most significant features of the Kansas regulations related to a mass-casualty event are that they allow for ambulances licensed in States other than Kansas to respond to a call in Kansas and for the temporary licensure of EMT personnel licensed in other jurisdictions.¹⁹⁴

Texas: Texas regulations for EMTs allow the waiver of certain requirements if the individual applying for the license is accredited by a nationally recognized organization. The regulations do not stipulate, however, whether or not licensure can be deemed in the event of an emergency situation.¹⁹⁵ This policy would need to be investigated with the Texas Department of Health.

Transport of Patients with Communicable Diseases. The Texas Communicable Disease Prevention and Control Act requires a licensed hospital to notify a health authority in

¹⁹⁴ KAR 109-2-15 and 109-6-01

¹⁹⁵ 25 TAC 157

instances when an emergency medical services, police officer, or firefighter may have been exposed to a reportable disease from a person delivered to the hospital.¹⁹⁶

Agreement to Transfer. Ambulance service providers in Texas are required to have written permission from the local government authority responsible for each jurisdiction, however, transfer agreements among hospitals are voluntary. All agreements must be in compliance with standards established by the Texas Department of Health and approved by the Department. Hospitals should consult with the Department of Health to determine whether or not an agreement is advisable in the case of a mass-casualty event.¹⁹⁷

3.2.17 Hospital Pharmacy Services

Massachusetts: Establishing a hospital pharmacy requires compliance with a complex set of requirements on the State and Federal level. First of all, the surge facility should have an area within the hospital that previously served as a pharmacy in order to assure security of the drug supply. Once this area has been renovated (if necessary) to meet current construction standards and inspected by the MDPH, the surge facility can file for registration with the Drug Control Program and the Board of Pharmacy within the MDPH. Subsequent to filing for registration with the MDPH, the surge facility should file for a Federal registration number with the Drug Enforcement Agency (DEA). The DEA prefers that State registration be pending or completed prior to filing of the Federal application. In the ordinary course, the DEA takes 30 to 60 days to issue a Federal registration number. If a hospital pharmacy is registered with State authorities, but the DEA application is still pending, the hospital pharmacy is legally authorized to fulfill prescriptions for Schedule VI medications (which includes most prescription drugs). Nevertheless, wholesale suppliers of prescription drugs usually require a DEA registration number before they will sell to a hospital. The surge facility should work closely with the MDPH to expedite State registration. However, the surge hospital may have difficulty acquiring the drugs necessary to fill prescriptions until the DEA approves the hospital's application for Federal registration.

Illinois: Illinois requires all licensed hospitals to operate a pharmacy or drug and medicine service, under the direction of a pharmacist employed by the hospital. Given this requirement, a surge facility would not be able to operate in Illinois if it intended to contract with a pharmacy at another hospital, an option described previously in this report. This requirement may need to be waived for a surge facility depending on the particular circumstances of that facility.

Kansas: The Kansas Hospital Regulations, 28-34-10 contain general provisions for pharmacy services within hospitals, including organization and staffing, facilities, policies, medications dispensed, and use of commercial pharmaceutical services. The regulations require a hospital to establish and maintain a pharmacy and therapeutics committee to formulate and review policies about procurement, storage, distribution and use of drugs in the hospital. This group must meet at least quarterly, according to the regulations. A surge facility would be unable to meet this requirement and would need to seek a waiver related to

¹⁹⁶ 25 TAC 99.11

¹⁹⁷ 25 TAC 133.44

the activities of the committee. If the surge facility were operated by another hospital, it is possible that hospital's committee could incorporate the surge facility into its purview.

Texas: Like Kansas, Texas regulations contain general provisions for pharmacy services within hospitals, including organization and staffing, facilities, policies, and medication dispensing procedures. In many cases, Texas requires that hospital pharmacies adhere to generally accepted practices within the pharmacy profession. One particular requirement that would be difficult for a surge facility to meet is that pharmacy staff must develop programs for hospital staff concerning new drugs added to the formulary, how to resolve drug therapy problems, and other issues. This requirement might be met if the surge facility were operated by another hospital, otherwise it would need to be waived.

4.0 Other Issues¹⁹⁸

This section of the report explores additional issues that planners may need to consider as they prepare to reopen a shuttered hospital for surge capacity purposes. The entity that will be responsible for the facility, the role of Federal and State health officials, liability, cross-State licensure, and other issues could pose barriers and need to be addressed in advance of an emergency.

4.1 Responsibility for a Surge Hospital

Private Healthcare Manage, Hospital or Healthcare System. A private healthcare manager, hospital or system, acting in concert with a State government to implement part of the State's emergency plan, could be authorized to open a surge hospital. The private operator or overseeing hospital would arrange in advance to lease a shuttered facility, arrange for any necessary renovations, arrange to lease or purchase equipment, and arrange for staffing. The securing of necessary waivers of State regulatory standards would be negotiated in advance. The State government would inform the private entity that surge capacity was needed and the private entity would move to open the surge facility. Although it is possible for a private entity to undertake these measures successfully, the amount of work involved is considerable and securing the necessary cooperation with State officials may be difficult.

Federal Government. Any branch or agency of the Federal Government that controls a shuttered hospital, such as the Veteran's Administration, may be able to open a surge facility. Approval within the specific Federal agency (as well as any other Federal agency approvals that are required) would be secured in advance. Although the Federal agency would cooperate with the local State government, the Federal agency would be able to set up and run the surge facility with a minimum of interference from the State. State regulations governing licensure, plan approval for renovations, staffing requirements, and so forth would not apply to a Federal facility. The State would identify the need for additional hospital beds, and the Federal agency would open the surge facility to meet that need. It should be noted a Federal agency would lack flexibility in determining the location of a surge hospital as the location would depend entirely on the availability of a shuttered Federal hospital suitable for conversion and reopening. For example, no shuttered Veteran's Administration Hospital was available in eastern Massachusetts, in such a state that it could be reasonable reopened as a surge facility. Also, the Federal bureaucracy may not be nimble enough to respond as quickly as necessary to issues that arise during the 3-7 days of preparation for opening of a surge facility.

State Government. State government offers several advantages over a private entity or Federal agency in having authority to open a surge hospital. The primary advantage is that the governor in most States has general authority to declare a state of emergency. In Massachusetts, for example, the governor has authority to declare a public health emergency, authorizing the Commissioner of Public Health to "take such action and incur such liabilities as he may deem necessary to assure the maintenance of public health and prevention of

¹⁹⁸ In order to contain the scope of this report, we have not addressed issues of costs, third party reimbursement, or financing of the surge facility.

disease.”¹⁹⁹ Under this authority, a shuttered hospital could be taken by eminent domain (on a temporary or permanent basis) and opened by the Massachusetts Department of Public Health as a surge facility. Alternatively, this authority could be used to take and open a shuttered hospital, which would then be overseen by a private healthcare entity, as discussed above.

4.2 Operation and Control of A Surge Facility

Private Healthcare Manager, Hospital or Healthcare System. A private healthcare manager, hospital or system could operate a surge hospital through two different mechanisms. The first would be that the private entity is authorized, in cooperation with the State, to open the surge hospital. The private entity would then also be responsible for operating the facility and would be vested with legal control. The second would be that the private entity contracts with a government authority to operate the surge hospital. A Federal agency or, more likely, a State agency, would take steps to open the facility and then enter into a management contract with the private entity delegating operational and managerial authority to the private entity. Legal control, however, would continue to rest with the Federal or State agency, as the case may be, that contracted with the private entity. Unresolved issues of liability may, however, limit the interest of a private entity in contracting to operate a surge hospital.

Federal Government. If a Federal agency opens a surge facility, it has the option of hiring a private entity to manage the facility or to set up the surge hospital and manage hospital operations on its own. Issues that may affect the agency’s choice include whether the agency has authority to hire the employees necessary to operate a new hospital, including union issues that may affect hiring of new employees, and whether the agency is lawfully able to delegate authority and enter into facility management agreements. The Federal agency may also decide to operate the surge hospital if it already has access to appropriate staff and equipment because of other hospital operations it maintains in the area.

State Government. As with the Federal government, a State government would have the option of managing the surge facility on its own or contracting for management. A State government is unlikely to have a pool of qualified employees to draw upon to staff the surge facility. The process of hiring health care workers as State employees or obtaining authorization to acquire necessary equipment may well exceed the 3 to 7 day time frame for the surge hospital to be up and operating. Entering into a management contract would pass responsibility for these areas on to a private entity capable of acting with greater speed and flexibility to address operational issues. However, even with a contracted manager, the State would retain ultimate legal authority for control of the surge facility.

4.3 Liability

Background. In the event a surge hospital is brought on line during a public health emergency, medical care in the surge facility will be provided under difficult and often sub-standard conditions. The hospital will have been converted to use after having been shuttered for a period of time, equipment will be moved in that may prove inadequate for

¹⁹⁹ MGL chapter 17, section 2A.

certain care, and medical personnel will be functioning without many of the support systems that are taken for granted in a modern hospital today. The early stages of operation may prove to be chaotic as systems are set up even while patients are admitted. In addition, many licensing requirements for the hospital will be waived in the emergent circumstances of its creation. The result will be that health care providers will be functioning in less than optimal circumstances and the facility itself will likely be substandard in some respects. Mistakes will be made and, in some instances, patients will suffer the consequences of those errors. Once the public health crisis has passed and the surge facility has been closed, lawsuits may be anticipated as former patients or their surviving relatives seek compensation for injuries incurred.

Health Care Providers. Current Massachusetts State laws would provide little or no protection from liability for health care providers who responded to an emergency and performed services in a surge facility²⁰⁰. New statutory provisions should be proposed that offer immunity to all persons who render assistance or advice during a declared emergency with the exception of willful, wanton or reckless misconduct. Texas has strengthened its laws protecting physicians from medical liability during a catastrophic incident. For example, Texas has moved its Good Samaritan Law provisions to the emergency care section of its civil code to include provisions protecting hospital emergency room physicians and admitting physicians at hospitals and to include events where a physician is not covered by medical liability insurance.²⁰¹

4.4 Medical Personnel—Crossing State Lines

Emergency Management Assistance Compact. Every State except California and Hawaii participates in the Emergency Management Assistance Pact (EMAC). EMAC is a mutual aid compact between the forty-eight participating States requiring member States to provide assistance to other member States in the event of an emergency. EMAC grew out of an aid compact between several southern States after Hurricane Andrew, which devastated parts of Florida. Membership growth accelerated following September 11, 2001. EMAC member States generally treat any license, certificate or other permit held by a person in a participating State to be the deemed equivalent of licensure in any other participating State that requests assistance under the compact during a declared emergency or disaster. In practice, however, States have sent only government employees when requested to provide aid, so the issue of cross-State licensure has not yet been confronted in a real-life situation.²⁰²

²⁰⁰ Many states have so-called “Good Samaritan” laws that provide limited immunity from liability for individuals who assist victims of a crime or of an accident. These laws are generally too narrow in scope to be helpful in a prolonged state of emergency. See, for example, MGL chapter 258C, section 13.

²⁰¹ Texas Civil Practice and Remedies Code 74.151-74.154. In addition, the Office of the General Counsel, Texas Department of Health issued a legal memorandum on September 17, 2003 to clarify physician liability in a public health emergency.

²⁰² State employees who are sent to another state to provide assistance are treated for liability purposes under EMAC as employees of the requesting state and thus usually protected from liability under the tort claims act of the requesting state, except for willful misconduct, gross negligence or recklessness.

Nonetheless, the EMAC enabling statute²⁰³ (which each participating State must adopt) does provide a possible legal framework for a broader deemed licensing program.

Emergency System for Advanced Registration of Volunteer Health Care Professionals. The Health Resources and Services Administration has initiated a pilot project that has a goal of establishing a national computer database of volunteer health care providers. As envisioned, the computer database will consist of a list of volunteer health care professionals²⁰⁴ whose credentials have been reviewed and verified. Ten States, including Connecticut and Massachusetts in New England, are participating in the pilot. Once the system is fully established, a State that declares an emergency or experiences a disaster will be able to identify and request specific types of health care professionals from the list of registrants. When fully implemented, any person approved for registration on the list will be able to go anywhere in the country to render assistance. However, as the list is being developed, questions are arising about personal liability of the registrants, and workers compensation in the event a registrant is injured while providing assistance. Although these and other issues remain to be resolved, this registration system holds great promise for the future.

4.5 Physician Back-up by Other Health Care Providers

Massachusetts, as part of its emergency planning, is investigating the possibility of expanding the traditional roles of certain health care providers should an emergency occur that overwhelms the health care system, resulting in a shortage of physicians. Massachusetts is considering expanded roles for dentists, pharmacists and other health care providers during a health emergency. Issues to consider are defining carefully the expanded role, circumstances under which the expanded role would be triggered, and the opposition that any similar proposal may arouse, particularly amongst physicians.

²⁰³ See, for example, Massachusetts Chapter 339 of the Acts of 2000.

²⁰⁴ Doctors, nurses and behavioral health professionals, with others chosen for inclusion on a state-by-state basis.

5.0 Summary

The sections above detail current Federal and State regulatory requirements and issues that may need attention, if States decide to pursue the use of shuttered hospitals (or other settings such as churches, hotels, schools) for surge capacity expansion during a mass casualty event. In some cases clarification from Federal authorities is needed, in other mechanisms are needed to waive State regulations in emergency circumstances.

Recommendation: federal officials could create ‘model’ legislation and regulations for states to use as a starting point, to address surge facility issues.

The following table summarizes the most important Federal and State regulations, identifies those that may require waivers and those that probably do not.

Issue	Guidance/Waiver Likely Needed	Responsible Entity	
		Federal Government	State/Local Government
Hospital Administration		X	X
Compliance with Federal, State and Local Laws		X	X
Governing Body	X	X	X
Quality Assessment and Performance Improvement Program	X	X	
Services		X	X
Pharmaceutical Services		X	X
Radiologic Services		X	X
Laboratory Services	X	X	X
Food and Dietetic Services		X	X
Utilization Review	X	X	X
Physical Environment		X	X
Infection Control		X	X
Discharge Planning	X	X	X
Organ, Tissue, and Eye Procurement	X	X	
Surgical Services	N/A		
Anesthesia Services	N/A		
Nuclear Medicine	N/A		
Outpatient Services	N/A		
Rehabilitation Services	N/A		
Respiratory Care Services	N/A		

Issue	Responsible Entity		
	Guidance/Waiver Likely Needed	Federal Government	State/Local Government
Staffing		X	X
Medical staff		X	X
Nursing services		X	X
Medical records	X	X	X
Pharmaceutical services	X	X	X
Radiologic services		X	X
Laboratory services	X	X	X
Food and Dietetic services		X	X
Long-term Care Staffing		X	
Nursing		X	
Dietary		X	
Social services		X	
Patient Rights		X	X
Notice of rights		X	X
Exercise of rights		X	X
Confidentiality of patient records		X	X
Restraint for acute medical and surgical care		X	
Seclusion and restraint for behavior mgt		X	
Patient Information and Privacy Standards		X	X
Organization and staffing		X	X
Form and retention of records	X	X	X
Health information privacy	X	X	
Other Issues		X	X
Status of a new hospital	X		X
Determination of need	X		X
Construction plan approval for renovations	X		X
Public safety and fire certificates	X		X
Obtaining a license	X		X
Medical personnel credentialing	X		X
Complaints and incident reports			X
Sharps and disposal of medical waste			X
Reportable diseases, isolation, and quarantine			X

Issue	Guidance/Waiver Likely Needed	Responsible Entity	
		Federal Government	State/Local Government
Authority to open a surge facility	X		X
Operation and control of a surge facility	X		X
Liability	X	X	X
Medical personnel--crossing State lines	X		X
Physician back-up by other healthcare providers		X	X