

Running Head: BIOTERRORISM RESPONSE ASSESSMENT

Bioterrorism: An Assessment of Medical Response

Capabilities at Ben Taub General Hospital

Houston, Texas

A Graduate Management Project Submitted to the Program Director in

Candidacy for the Degree of Master's in Health Administration

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By

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Abstract

Prior to September 11th, 2001, it was believed that an attack against the United States was not likely. Terrorism experts have always agreed the probability of such an attack was low but added it was not a matter of if or when, but where the attack will take place. There have been several incidents throughout the world that clearly demonstrate the different forms of biological terrorism that exist and how they are used at the will of a terrorist.

Terrorism experts estimate only 25 percent of hospitals are at some level of preparedness and therefore able to respond to a bioterrorism incident. A prepared facility will be better prepared to deal with unknown outcomes with greater confidence in the preparedness of the community. Health care organizations cannot delay in the development and implementation of disaster management plans in preparing for a bioterrorism event.

This project evaluates the bioterrorism response capabilities at one of Houston's only two level-one trauma centers using a bioterrorism preparedness survey. The results indicate areas that must be improved or will have a profound impact on the readiness posture of the hospital. The project concludes with recommendations that should be addressed first. The facilities senior leadership should discuss all of the survey results to ensure the highest level of preparedness.

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Bioterrorism: An Assessment of Medical Response

Capabilities at Ben Taub General Hospital

Houston is the nation's fourth largest city with over two million city residents and a metropolitan population of four and a half million. The largest petrochemical center in the United States, Houston has more than 100 petrochemical manufacturing and processing facilities. These refineries represent significant ties to the nation's economy as the Gulf Coast's crude operable capacity represents 22% of the national daily total production. Houston is also a major terminus for underground liquid and gas pipelines for the North American continent. Four of ten major liquid pipeline companies have headquarters in the Houston area, as do half of the major gas pipeline companies. These pipelines transport a variety of products and raw materials to consumers throughout America (City of Houston, 2001).

Many foreign countries and corporations have established a presence in Houston in order to access North American markets via the city's distribution facilities. The city has three major airports, including an international airport, in which over 38 million people travel through each year. All three airports handle domestic, military and general aviation including air charter services. Ellington Field serves as the center for aerospace development due to its close proximity to the Johnson Space Center. The Port of Houston ranks as the nation's largest port in international tonnage and second in total tonnage (Houston Facts, 2001). These facts are important to remember when viewing them from a terrorist point of view.

Houston is home to the Texas Medical Center, the largest medical center campus in the world, with a local economic impact of \$10 billion. More than 61,000 people work

within a complex of 12 hospitals, which encompass over 21 million square feet.

Approximately five million patients visit these facilities each year, many from foreign countries (Houston Facts, 2001).

Even in Houston, a city with a healthy list of great hospitals and the world-renowned Texas Medical Center, Ben Taub General Hospital has garnered the respect of the world as an elite Level 1 trauma center, one of only two in the Harris County area. This 598 licensed-bed acute care facility is one of the nation's busiest trauma centers, caring for more than 100,000 emergency patients each year.

Located in the heart of the Texas Medical Center, Ben Taub General Hospital was home to the military's Joint Trauma Training Center (JTTC) since July 1999. The mission of the JTTC was to train doctors, nurses and medics to care for trauma patients and soldiers in forward military medical operations. The JTTC ceased operations at the end of July 2001. Each uniformed service is currently establishing JTTC sites due in large part to the JTTC's success while at Ben Taub General Hospital.

The Ben Taub Emergency Center is the source of eighty percent of all admissions to the hospital, which provides patients with access to more than 40 medical specialties. During 2000, Ben Taub General Hospital had more than 23,500 adult and pediatric admissions and more than 143,000 specialty clinic visits.

The types of patient most likely seen are those without medical coverage or insurance. Approximately 69% of those patients seen in fiscal year 2001 were ineligible for any form of health insurance. Medicare and Medicaid patients made up 12% and 13% respectively. Only about 6% of the patient population has some form of

commercial insurance. The patient demographics show that 46% of the visits and admissions are from Hispanics, 35% from African-Americans and 15% Caucasian.

The above information is cited to affirm Houston is a thriving and diverse community with regional, national and worldwide socioeconomic ties. An act of terrorism involving any potential target in the city could disrupt the community, cause damage and create casualties; and in many cases, create cascading consequences extending far beyond the boundaries of Houston. Health care facilities are an integral and yet often overlooked component of the overall community response.

Conditions which prompted the study

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) made revisions to the Environment of Care standards effective January 1st, 2001. Specifically addressed was the Environment of Care 1.4 standard requiring hospitals, ambulatory care, long-term care and behavioral healthcare organizations develop plans that address emergency management.

The JCAHO outlines the intent of the emergency management plan. It describes how the organization will establish and maintain a program to ensure effective response to disasters or emergencies affecting the Environment of Care. Added to the standard was that the plan should address four phases of emergency management activities: mitigation, preparedness, response, and recovery.

Mitigation activities are those a health care organization undertakes in attempting to lessen the severity and impact a potential disaster or emergency may have on its operations. Preparedness activities are those an organization undertakes to build capacity and identify resources that may be used should a disaster or emergency occur

(JCAHO, 2001). The organization must be able to respond quickly to the disaster in order to minimize the potential loss of life as well as resources. In doing so, an organization will enhance the required recovery time and be able to prepare for the next disaster.

The plan must provide a process for identifying specific procedures in response to a variety of disasters based on a hazard vulnerability analysis performed by the organization. This analysis is defined as the identification of hazards and the direct and indirect effect these hazards may have on the health care organization. Also, there should be a process for initiating the plan as well as managing the patient, staff, and family-support activities. There should be the logistical management of critical supplies, security and interaction with the news media (JCAHO, 2001).

There are many groups who are determined to cause some form of terrorism on a city's population. Several incidents have occurred already in other countries as well as accidental exposures in the United States. Strangely, not all of the incidents were directly contributed to a bioterrorism attack. These incidents should be a forewarning to the nation's metropolitan areas, especially to the community health facilities. Analysis of these incidents can help the medical community anticipate, plan, and practice for needed contingencies. Preparation for a non-terrorism event could be the same as a nuclear, biological, or chemical (NBC) incident. Hospitals should be prepared as if the incident were a result of a terrorist event. This is important because biological agents can be deployed without any warning.

In the past, most planning for emergency response to terrorism has been concerned with overt attacks such as bombings. Chemical terrorism or exposure incidents are

likely to be overt because the effects of chemical agents absorbed through inhalation or by absorption through the skin or mucous membranes are usually immediate and obvious (Hewitt, 2000).

In contrast, attacks with biological agents are more likely to be covert. These types of an attack present different challenges and require an additional dimension of emergency planning that involves the community health infrastructure. Covert dissemination of a biological agent in a public place will not have an immediate impact because of the delay between the exposure and onset of illness. Consequently, patients appearing in the emergency room in small numbers may not be identified as the first casualties of such an attack but may receive a diagnosis of a disease most often seen in emergency rooms. Examples of overt and covert incidents follow.

Imagine sitting down at a local salad bar enjoying a healthy meal and later becoming ill and not sure why. An event such as this occurred in Dalles, Oregon in 1984. The Rajneeshee religious cult intentionally contaminated restaurant salad bars with *Salmonella Typhimurium*, sparking a community-wide outbreak of salmonellosis that afflicted 751 people with gastroenteritis (Rabkin, 1999). The county health department records indicated five cases on average per year. When a vial of the bacteria was found in a laboratory on the cult's compound, cult members admitted responsibility to the incident. The cult had hoped to influence local elections by sickening potential voters (McDade and Franz, 1998).

In March of 1995, Tokyo was struck by the terrorist group AUM Shinrikyo (Supreme Truth). Early that morning, toxic fumes were reported in a subway station during rush hour. In just a few short hours on the morning of the 20th, five people died and over 560

were immediately hospitalized. In total, twelve people died and over 5,000 were treated (Staten, 1995). The significant factor was that 80% of the casualties presenting to the hospitals were self-referred. It was later revealed that Sarin gas (a nerve agent) was the cause.

In October 1998, a worker at a Planned Parenthood clinic outside of Indianapolis opened an envelope to find inside a brown powder and a note that claimed the substance was anthrax. Emergency workers quickly evacuated the clinic and the 31 staff members who had been in the clinic were hosed down and scrubbed off in the parking lot. They were next rushed to the hospital to receive proper decontamination and were subsequently given ciprofloxacin, an antibiotic that is known to be effective against anthrax. Some of the hospital personnel also took ciprofloxacin themselves, probably in order to prevent contracting the disease. The substance was tested and determined not to be anthrax but a hoax (Hendricks, 1999).

More than 100 people needed medical attention after inhaling gases released during a fire at a chemical plant in Frankfurt, Germany in May of this year. This doesn't include the initial 50-60 workers requiring medical assistance during the onset of the fire (Cable News Network, 2001). All were taken to local medical facilities to be treated. Although not contributed to a terrorist attack, the outcome was the same, a large amount of casualties in a short period.

In July of this year, a 60-car freight train was carrying what was believed to have a number of hazardous materials derailed then caught on fire in a rail tunnel in Baltimore, Maryland. The incident occurred just a few hours prior to the start of a professional

baseball game. Casualties could have reached into the thousands if the game had already started.

On September 11, 2001, Americans were struck at home. Two hijacked planes struck the World Trade Center in New York and a third struck the Pentagon in a deliberate act of terrorism. A fourth plane crashed into a field in western Pennsylvania after what was believed as a heroic act by the passengers after they may have found out the intentions of the hijackers and the potential target. So many individuals had died in such a cowardly act. Not since the attack on Pearl Harbor in 1942 have there been so many lives lost at the hands of another group of individuals. The only difference is that those attackers were known.

This attack on Americans now leads to an additional threat. The nation has been put on a biological terrorism alert (Pederson, 2001). Federal health officials have informed local public health agencies to be on the alert for unusual disease patterns. This is a chilling prospect that the nation may soon be under biological attack. The crop duster industry had been advised by the federal government to be on the look out for suspicious behavior around their hangers. This after having learned of inquiries made by what was described as suspicious individuals regarding the aircraft's storage capacity.

Preparing a facility to address these dangers is a major challenge. Early detection requires increased biological and chemical terrorism awareness among the front-line providers because they are in the best position to identify and report suspicious illnesses and injuries. While health care facilities are an essential component of the emergency response system, at present they are poorly prepared for such incidents.

As noted previously, the greatest challenge may be the sudden presentation of large numbers of contaminated individuals (Macintyre, Christopher, Eitzen, Gum et al., 2000).

This project will focus on the biological preparedness of Ben Taub General Hospital. Agents, which might be used by terrorists, are smallpox, anthrax, plague, *botulinum*, ebola, *tularemia*, and *brucellosis*. Some of these are easier to obtain than others. However, analysts fear anthrax and smallpox as likeliest threats. The bacterium that causes anthrax is easy to grow, store and disseminate. Whereas most lethal bacteria die when exposed to normal weather conditions, spores of anthrax bacteria are resistant. Smallpox may pose even more of a threat. This deadly, highly contagious disease once contracted has no drug treatment. This disease believed to be eradicated in the early 1980's is now on the minds of all. Smallpox was confirmed as the cause of death for over 500 million people in the early 20th century. It is highly lethal and there is a limited supply of vaccines (Berger, 2001). Officials believe the terrorists are highly educated. Reports suggest that some terrorists are microbiologists and health care providers, both of who know how spores and viruses can be changed to make them more difficult to defend against.

Statement of the problem or question

A terrorist incident or accidental exposure to Nuclear, Biological and/or Chemical (NBC) agents is a potential in Houston from a multitude of possible venues. A medical facility is most effective to the community when it properly assesses its response capabilities. Corrective action, when required, must be taken to ensure the best possible results when responding to a potential NBC incident. Ben Taub General Hospital's capabilities will be assessed to determine their overall preparedness level

and as well as compliance with JCAHO requirements. Further, existing emergency preparedness plans were assessed and the actions taken in a large part to the incidents of September 11th.

Literature Review

In the past, an attack with a biological agent was considered very unlikely; however, now it seems entirely possible. Many experts believe that it is no longer a matter of “if” but “when” such an attack will occur (Combating Terrorism, 2001). Some experts have gone on to state that it's neither when nor if but where a bioterrorist will strike. Nations and dissident groups exist that have both the motivation and access to skills to selectively cultivate some of the most dangerous pathogens and to deploy them as agents in acts of terrorism or war (Henderson, 1998). Detection of those intending to use a biological weapon is extremely rare.

Biological attacks present unique challenges not posed by other forms of terrorism. A cloud of microbes released from a small plane won't trigger any alarms. Yet it's crucial that officials respond quickly while a disease is still treatable and before the first wave of infections spreads widely throughout the population (Houston Chronicle, 2001). One theoretical model predicted that a terrorist attack releasing *Bacillus anthracis* spores in prevailing winds toward the suburb of a major city could cause up to 50,000 cases of anthrax, with more than 32,000 deaths, in an exposed population of 100,000 people (Wetter, Daniell and Treser, 2001).

Hospital emergency rooms will likely be the first to receive these casualties. However, health care organizations in the United States have little experience with the deliberate release of biological agents that cause major disease outbreaks. Early

detection of and response to biological or chemical terrorism is crucial. Without special preparation to include the proper supplies and equipment being on-hand, a large-scale attack could easily overwhelm the hospital's infrastructure. Further, there has been a mistaken impression among non-medical policy-makers that antibiotics had beaten infectious diseases.

The U.S. government is taking seriously the need to prepare for a terrorist attack involving a biological agent. The Presidential Decision Directive 39 in 1995 set actions in motion among many national agencies. The Congress enacted the Defense Against Weapons of Mass Destruction Act of 1996, requiring development of a Domestic Preparedness Program, including efforts to improve the capabilities of local emergency response agencies. Minimize the loss of life from an incident involving a biological weapon is critically dependent on the availability of resources at the local level (Wetter et al, 2001).

It is thought that a large number of patients, including both infected persons and the "walking worried," would seek medical attention, with a corresponding need for medical supplies, diagnostic tests and hospital beds. Emergency responders, health care workers and others will be at special risk, and everyday life would be disrupted as a result of widespread fear of contagion (Hewitt, 2000). Several hundred people overwhelmed local hospitals in New York and Washington because the individuals feared they had been exposed to some form of biological agent soon after the events of September 11th. Hospitals in New York reported to have seen 150 to 250 people in a single day with suspected biological agents. Doctors' offices were also flooded with requests for information about anthrax (Tieman, 2001).

The most serious undertaking of assessing capabilities was conducted concurrently in three settings during the spring of 2000. The Defense Against Weapons of Mass Destruction Act of 1996 and the more commonly known Nunn-Lugar-Domenici amendment of 1997 (Waeckerle, Schafermeyer, Eitzen, Burstein et al., 2001) led to a cosponsored exercise code-named TOPOFF, a contraction for the top officials involved in the events, including cabinet-level officials; the Justice Department and the Federal Emergency Management Agency. A decision was made by the United States Congress, in an effort to assess the nation's crisis and consequence management capacity under extraordinary stressful conditions, to direct the Department of Justice to conduct an exercise engaging key personnel in the management of mock chemical, biological, or radiological terrorist attacks (Drociuk, 2001). The simulated events took place during 10 days in May of 2000 and brought more than 100 senior staff members from 35 government agencies to the master control center at the Alliance Center for Collaboration, Education, Science and Software (ACCESS), located in Chantilly, Virginia. The TOPOFF exercise included three simulated terrorism scenarios: (a) a chemical weapons incident at Portsmouth, New Hampshire; (b) a concurrent event involving nuclear devices in the Washington D.C. area; and (c) a bioterrorism/medical crime in Denver, Colorado (Green, 2000).

The third scenario of the TOPOFF exercise was conducted in early May of 2000. Health officials in Denver, Colorado, conducted a simulated exercise to assess the outcome of a bioterrorism incident. Patrons attending a performance at the Denver Performing Arts center were unaware a pneumonic plague was unleashed through the air conditioning vents. The first flu-like symptoms appeared and within days those

symptoms became worse. Eventually, thousands of simulated victims became ill and appeared on the doorsteps of local area hospitals. This eventually led to the secondary infections of healthcare workers. Within a number of days, an estimated 1,500 deaths resulting from pneumonic plague and an additional 3,000 were hospitalized (Healy, 2001).

The scenario in Denver makes a point very clear. Unlike explosions or chemical releases, a bioterrorist attack could be easily conducted in a covert operation and thus would be difficult and time-consuming to detect. As noted above, symptoms might not occur among victims for days. And, once detected, the situation could overwhelm local health systems that are faced not only with the tasks of caring for mass casualties but also with the demands of even larger numbers of people requiring preventive care. To combat this, President George W. Bush named the Federal Emergency Management Administration to coordinate the response efforts (U.S. Department of Health and Human Services, 2001). In a bioterrorism event, the U.S. Department of Health and Human Services would have special responsibilities, including the detection of the disease, investigating the outbreak and providing stockpiled drugs (U.S. Department of Health and Human Services, 2001).

A question that must be answered is whether or not health care organizations are prepared for a biological incident. As pointed out in the incident noted by Hendricks, decontaminating people is the proper procedure to follow if a victim has been exposed to a chemical. But in Indianapolis, the alleged agent was a compilation of dried spores of a bacterium. The substance was controlled at the site. Hendricks pointed out the risk in this incident would come from inhaling the organism, probably not from skin

contact. It was unlikely the worker who opened the envelope would have disturbed the contents enough to disseminate them throughout the clinic or even a few feet. Hospital personnel were not at risk of contracting anthrax but took medications even though it was not necessary because anthrax is not spread from person to person. Henderson (1998) also pointed out the problem. Medical, public health and emergency personnel throughout the nation are simply not prepared to respond to a biological incident (Hendricks, 1999).

Another question is how to educate the public without causing mass hysteria. In any situation where anthrax is either confirmed or suspected, the public must be given clear guidance or they will hinder the work of hospital personnel. This was the case in an event near Houston in October of 2001. A woman had entered an emergency room holding a package that contained a white substance that subsequently spilled out onto the countertop. The hospital quickly turned off all of the air ventilation systems and initiated quarantine procedures. Even though the substance tested negative for anthrax, the emergency room was unavailable to receive patients for five hours (Tieman, 2001).

Purpose

This project is designed to assess the current capabilities of Ben Taub General Hospital and then make recommendations based on existing processes. Given the severity of the information presented above, the only Harris County operated level-one trauma center must be evaluated to ensure an adequate response capability exists to meet the needs of its community.

One of the primary purposes of hospitals in a NBC situation is to protect themselves, the staff and existing patients. The sudden appearance of self-presenting patients exposed to NBC agents would serve to endanger the function of the hospital both from the sheer number of patients as well as put a stress on the hospital's resources and response capabilities.

The 1995 incident in Tokyo caused exposure to 135 healthcare workers that required medical care. Such an action would cause devastating effects on Ben Taub General Hospital. Specifically, the facility would become the site of secondary contamination and be forced to close its doors. Thus the hospital would not be able to receive any further patients for an undetermined period of time. The hospital would then have to be treated by the Houston Medical Response System as a second site of contamination. Hospital operations would have to be immediately suspended. And finally, vital parts of the Texas Medical Center campus would suffer the staggering effects, as other local area facilities would be required to take up the burden for the loss of one of only two level-one trauma centers in the area.

Chapter 2

METHODS AND PROCEDURES

A Bioterrorism Preparedness Survey (see Appendix A) was developed by a committee to consider the issues and how a facility might prepare itself for a NBC event. The committee consisted of Dr. A. David Mangelsdorff, Professor, U.S. Army-Baylor Graduate Program in Health Care Administration, Center for Healthcare Education & Studies; Dr. LaDona Farinacci, University of Texas Health Science Center at San Antonio; and Major Dean Doering and Lieutenant Gina Savini, Administrative Residents, U.S. Army-Baylor Graduate Program in Health Care Administration. The survey was utilized by selected hospitals in San Antonio during Spring 2001.

An interview was conducted for each of the major areas addressed within the survey. The selection of the potential respondents was ascertained with the assistance of the Risk Manager and the Trauma Coordinator for Ben Taub General Hospital, who both have experience in disaster planning. Potential interview candidates were selected based on their knowledge and experience pertaining to the areas that the survey addressed. Once the respondent was identified, the survey was sent in advance for the respondents to familiarize themselves with it. Then, a meeting was scheduled in order to perform a face-to-face interview. Areas were noted that are either well prepared or require improvement in their preparedness planning. Recommendations were made on those areas requiring a more detailed assessment. Each of the interviewee responses is noted by survey section in the results chapter of this project.

Upon completion of this project, a copy will be forward to Mr. Johnnie Stein, Associate Administrator for Ben Taub General Hospital. Mr. Stein is leading a

committee to implement an Incident Command Center within the facility. The role of the center is to be the central point of information for the facility during a response to a disaster. The goal of the center is to provide better control of resources and patients because of the center's on-site location. A system is in place to operate a center at the Harris County Hospital District headquarters.

Chapter 3

RESULTS

The results reported will be in the same outline as the major areas of the survey.

The goal is for the reader to be able to go to the area of the survey they wish to review.

General Information

Interview with Quality and Risk Managers.

The facility had a Joint Commission survey in December of 2000, one month prior to the changes in the Environment of Care standard. Although there were a few discrepancies within this standard, none involved those areas concerning disaster planning. To maintain confidentiality, those discrepancies will not be mentioned here. It should be noted the facility has corrected the noted discrepancies. The next survey is scheduled for sometime in December of 2003.

Ben Taub General Hospital is designated to receive patients in the National Disaster Management System in the event of weapons of mass destruction (WMD) event. The facility is one of eight primary receiving hospitals for the city of Houston (see Appendix B). A primary receiving hospital is designated as such based on three main factors. The first is the emergency department's capability. Secondly, the facility has the resources capable of responding to a WMD event. The third factor is its geographic location. The first and second factors are considered when deciding which hospitals will become a receiving facility.

The facility is aware of the new JCAHO annual exercise requirements and has begun to prepare. An exercise was performed in the spring of 2001 and a WMD exercise is planned before year's end. The staff implemented their disaster plan in a

real-world situation in June 2001. Tropical Storm Allison hit the city hard resulting in the closure of the city's only other level 1-trauma center. Exercises are devised through the efforts of numerous individuals. The Risk Manager and Trauma Coordinator are the primary individuals who receive recommendations from an ad hoc group. Recently, a WMD tabletop scenario involving a smallpox exposure was developed and given to two groups. The first group consisted of individuals from various city and central Texas facilities participating in a trauma workshop at Ben Taub General Hospital. Small groups were formed and asked to brainstorm ideas of what should be done. The second tabletop exercise consisted of members of the medical staff. After action reports were completed and sent to members of the executive administration offices at the facility as well as the Harris County Hospital District.

The facility has a point of contact for bioterrorism and WMD events. The hospital administrator is the direct point of contact and has delegation authority to appoint an associate administrator to that role. The facility operates with an administrator always on-call. The duties of the on-call individual include the set up of the incident command center.

An emergency disaster plan is available and includes a section on bioterrorism awareness and response. However, the current plan has several references made to a biological policy that could not be found in the plan. Further, there are several handouts copied from various sources of other agencies. No plan of action specifically for Ben Taub General Hospital was found for a WMD event. A Hazard Vulnerability Assessment (HVA) had not been conducted and no one knew of anyone drafting the

HVA at the time of this project's completion. The HVA is an essential component in determining which event had the highest probability of occurring.

Communications and Public Affairs

There is not a formalized plan that sets forth how staff members are to initiate communication upon identification of exposure or symptoms related to a bioterrorism/biological agent. The current communication section of the NBC plan addresses the flow of whom the switchboard telephone operators must notify but does not address who notifies them.

Interview with HCHD Public Affairs Representative.

There are neither approved plans nor protocols for media and public affairs to be employed during a bioterrorist incident. There is a draft response plan currently in coordination at the Harris County Hospital District office.

Access to Care

This hospital received over 100,000 visits through the Emergency Center alone in 2000. Over 80% of all visits result in an admission. The staff encounters almost every kind of injury or disease. If a patient presented with a nonspecific flu-like illness with fever, myalgias, cough, headache, and mild chest discomfort the provider would probably treat as flu symptoms and may not believe the encounter to be an anthrax case. This is because in its early presentation, inhalation anthrax may be confused with a plethora of viral or bacterial respiratory illnesses. A patient who presents with a rash may not be diagnosed as having smallpox due to the acute clinical symptoms resembling influenza.

In an era characterized by increased penetration of managed care and emphasis on the provision of care in rural areas, persons with acute infectious diseases are less likely to have direct access to infectious disease specialists. As a result, many patients exposed to a bioterrorist-associated infection are more likely to be seen first by primary care physicians or emergency medicine specialists. However, how many of these patients will it take to determine an epidemic is in process?

The question that must be answered is what is the trigger event. There are no mechanisms in place to determine how many patients presenting with the same symptoms over a short period of time signals to the staff to implement epidemic procedures.

Interview with Directors for Emergency Center, Inpatient Services and Outpatient Services.

Ben Taub General Hospital is generally known as a community hospital. Patients that routinely come here are indigent or have no form of medical insurance coverage. Potential casualties will most likely seek care here if they are already receiving care here. These patients are familiar with the facility. Special provisions for Pediatric care are provided through the Pediatric Emergency Center. The elderly and homeless patients are also seen through the Emergency Center as well as through the various outpatient clinics within Ben Taub.

The Harris County Hospital District was among the first health systems to provide integrated health care to the community. The HCHD operates 11 community health centers (see Appendix C) in and around the city of Houston. These clinics were strategically placed throughout the county and offer a variety of outpatient services to

the community's population surrounding its location. There are six school-based clinics located at various elementary, middle and high schools in which staff from the community health centers work at several days a week. In addition, the HCHD has a freestanding dental center in the downtown area to provide dental care and a freestanding HIV/AIDS treatment center that provides care for over 60% HIV/AIDS patients in Houston.

In an effort to increase the access to preventative health screenings and primary care, the HCHD also operates two mobile clinics in the Houston area. One unit was developed by the HCHD and the HCHD Foundation to bring health care to the medically underserved residents of Southwest Houston. The second unit was developed by the HCHD, the McDonald's corporation and the HCHD Foundation to bring health care to the medically underserved residents of the Aldine area, located in the north central part of Houston.

The Holding Area located in the Emergency Center is a problem area. This area is typically congested with patients waiting for various reasons (i.e., lab results, follow up consultation and/or discharge). There are only two rooms designated as isolation rooms. A small influx of potentially contagious people would easily overwhelm the Emergency Center's ability to isolate those patients. The inpatient units have no formal plan in place. There are very few isolation rooms with the appropriate negative pressure. The waiting area for the outpatient clinics is similar to that of a busy bus station terminal. On any given day the area is packed with those waiting to be seen as well as accompanying family members. This area does not have a plan in place to address a potentially contagious patient.

The patient demographics show that 46% of the visits and admissions are from Hispanics, 35% from African-Americans, almost 15% Caucasian and the Asian comprising just fewer than 4%. With such demographics, there is a strong need for language interpreters and bilingual staff. Several of the directors interviewed mentioned the limited availability of interpreters and are seeking more staff members who are bilingual.

The facility has a department for logistical support services. The director has access to different types of vehicles capable of transporting patients. If a biological event occurred with the probability of fatalities, vehicles made of metal would need to be made available. Vehicles with wood sides and flooring could not be used in order to maintain the spread of the disease through the flooring. The exact numbers of available vehicles is not given due to the sensitivity of the data.

The facility will go on diversion status as soon as it is determined that the hospital cannot provide quality care to one more patient. Diversion status provides a mechanism for receiving hospitals to divert the Houston Fire Department Emergency ambulances away from emergency departments that are temporarily under staffed, under equipped or not prepared to care for additional patients. The ambulance diversion request categories available to Ben Taub General Hospital are (a) emergency department saturation, (b) intensive care unit saturation, (c) psychiatric patient saturation, (d) internal disaster, and (e) trauma saturation. Internal disaster would most likely be the reason for diversion should a patient infected with a highly contagious disease such as smallpox walk into the Emergency Center. However, not all private ambulance companies adhere to the diversion policy as history indicates they continue

to bring patients to the Emergency Center even if it is on diversion status. There is no requirement for the private companies to check the diversion status posted to the Houston Fire Department's Internet site that lists which hospitals are currently on diversion status.

The facility has identified alternative care sites through its emergency preparedness plan. Lyndon Baines Johnson and Quentin-Mease hospitals are listed as an alternative care site. However, the current plan does not address how patients will be transported to the alternate facilities nor does the plan address the quarantining of potentially infected units.

The tracking of transferred patients is accomplished manually as there is not an integrated information system between the facilities. The limited capabilities are able to track patients in some areas of each hospital but not throughout the facility. Further, some of the available information technology infrastructure is not hierarchical language seven compliant, a software connection giving separate systems the capability of communicating with each other.

Business (Healthcare) Continuity Plan

Interview with Representative from Engineering Services.

The facility does not have a formalized plan in place that would enable the entire operations or unaffected segments to continue during a biological disaster. However, there are schematic diagrams available to be consulted and the staff is familiar with the procedures to shut down airflow to affected areas of the hospital. The isolation rooms are vented to the roof. Air handlers can be responsible for operations on multiple floors.

In order for the affected area to be quarantined, personnel from Engineering Services can shut down the fire dampers on the unit usually within 20 minutes.

The high efficiency, particulate air (HEPA) filters provide a three stage filtering system with an over 95% air purity rating at the third stage. The location for these filters is limited to those areas where a high probability of a contagion might be found, such as the operating rooms and shock trauma rooms in the Emergency Center.

Capacity

Interview with Directors for Inpatient Services, Outpatient Services and Intensive Care Units.

Ben Taub General Hospital licensed 588 beds are almost always filled. Capacity consistently exceeds 80% with the intensive care units frequently at 100%. Therefore there are few areas in which the facility has the ability to increase capacity solely by adding more beds. Staffing constraints prohibit extreme census increases, as this can affect not only quality of care but safety as well.

The directors feel the only reasonable method to make room without increasing bed availability would be to decompress the facility. This method consists of assessing patients' acuities and identifying those with lower acuities who could be transferred to nursing homes or other lower level of care facilities that have capacity. However, there is not a formalized plan to initiate this action. Furthermore structural and logistical challenges exist for the establishment of areas for patients requiring isolation rooms or even more extreme, quarantining a unit.

Pharmaceuticals and Equipment

Interview with Director of Pharmacy.

The pharmaceutical inventory was assessed and determined it could support the treatment for mass numbers of patients. PAR (Periodic Automatic Resupply) levels are the quantity normally consumed, and subsequently required, in any given inventory period. PAR levels are usually measured in terms of "days of supply" and based upon average daily consumption, which are established for each medication. When the medication stock drops below that level, the pharmacy will restock to that level. At the present time, the pharmacy levels are preset for all urgent contingencies. These may have to be increased depending on the circumstances of the event. However, at the time of the interview, no exercise scenarios have been completed in order to test the current plan.

The facility has established protocols for medication distribution scenarios in case of limited supplies. The order of priority is to provide for symptomatic patients. The thought is these patients are most likely to have developed the sensitivity of the disease and thus hope to reduce the potential of a Type I error. The idea is to treat those patients that will probably have the disease. Second priority would be to treat patients with known exposure but not yet showing the symptoms. This would allow time to test the specificity of the patients who may not actually have the disease. This reflects the probability that the patients will not have the disease. The third highest priority would go to the patient's family members. The goal is to stop any potential spread of the disease. The fourth priority would provide the medication to the provider and staff members. The lowest priority as established by the facility would be to provide the prophylaxis to staff and provider family members.

Ben Taub General Hospital sees a large number of pediatric patients. The pharmacy has access to dosage requirements for antidotes and therapies for pediatric patients who are exposed to biological agents. The necessary drug administering equipment is available for the on-hand quantities of antidotes and therapies.

The facility has identified the need for an emergency pharmaceutical supply system for the treatment of biological agents. The vendors are available but are not listed here due to the sensitive nature. Further, in response to survey item 6.5, quantities on hand are also not listed at the request of the director. However, it suffices to state there are adequate quantities available to begin dispensing. It is believed that after the initial onset of a biological event the National Pharmaceutical Stockpile will be made available.

Medical Treatment Procedures

Interview with Directors from Inpatient and Outpatient Services and Assistant Director, Emergency Center.

The response to the question of whether the facility has procedures to receive patients who are exposed to biological agents was mixed. Some thought there were while others were unaware of established protocols. There was also confusion as to whether procedures existed to triage patients and address patient and situation confidentiality.

The facility is short of the appropriate respiratory personal protective equipment (PPE) for a biological event. At the time of the interview, there was only one self-contained breathing apparatus and no full-mask, air-line respirators nor any chemical cartridge air purifying respirators available. The facility was not short on HEPA masks.

However, due to recent national events, the facility has accelerated its requisition for the appropriate order size and submission of purchasing documents for the necessary PPE.

The equipment set aside for decontamination equipment consists of some gowns with latex gloves and the above-mentioned HEPA masks. The training procedures are in place but are not implemented due to the lack of appropriate equipment. As mentioned earlier, the facility has made purchase requests for the appropriate PPE. The company chosen will also provide the initial as well as refresher training when the equipment is received. A decontamination area exists outside of the emergency center and can be set up for either litter or ambulatory patients.

Training and Personnel

Interview with the Executive Director, Learning and Resource Center.

The facility has participated in a citywide mock drill earlier this year. This allowed the facility to assess the workforce through determining the level of emergency preparedness and response capabilities. Another drill for a biological response is planned in the near future.

Staff members receive initial training for a bioterrorism event during new employee orientation. A one-page handout is given to the staff that covers generic terms and frequently asked questions such as the challenges HCHD faces and types of groups that would use NBC weapons. Refresher training is given annually but provides only 30 minutes each for emergency/disaster preparedness and bioterrorism awareness/response.

Certain personnel are expected to receive eight hours or more of specialized emergency preparedness and response training each year. This includes personnel

assigned to the decontamination team. This data is currently tracked manually and would require numerous hours to calculate for each cost center/specialty in the facility. The data was not known at the time of the interview. Several key internal people were identified and have attended a formal “train the trainer” course sponsored by the city of Houston. No external agencies were identified that can provide training in emergency preparedness and bioterrorism awareness. The lack of equipment precludes the training requirement for specialized teams to be ready. This problem has already been addressed and there are plans to resolve this issue. This will be conducted through the District’s Disaster Management Committee.

Interview with Director of Laboratory Services.

The laboratory department conducts their own training to fulfill their requirements. The facility has implemented activities to educate health care providers and laboratory workers on several topics regarding the specific procedures relating to biological agents. The acquisition of laboratory specimens is done through laboratory services personnel. A laboratory information system vendor provides the computer systems. All employees in this department are required to go through additional training any time the system receives an upgrade. New personnel receive training on the handling of specimens and must demonstrate the proper procedures prior to handling specimens. Protocols are established for each level of hazard a potential specimen might be categorized. A consultation hotline is available to all laboratory employees 24 hours a day, seven days a week for emergency reporting of a biological incident.

The laboratory staff receives continuous training on the identification of hazard biological agents. The protocols require the education due to the different strains of

biological toxins that are being discovered. Should one of these toxins be discovered, the staff will implement their protocol for notification to the provider as well as the local public health authority.

Interview with the Executive Director, Learning and Resource Center.

Decontamination procedures were not found in written form and documentation could not be produced. However, after interviewing several individuals, it was apparent that all staff members are familiar with the processes to decontaminate and contain hazards that accompany biological incidents.

Ben Taub General Hospital as well as the Harris County Hospital District uses some distance-based learning technology. The facility is willing to conduct training in emergency preparedness and bioterrorism awareness via distance or web-based technology. However, the video conferencing capability is limited. In addition there is no projection system that connects to the Internet for computer training. If training is received then continuing education units or their equivalents are available to the staff.

Interview with the Trauma Coordinator.

The current emergency preparedness plan does not address how personnel cross-trained with external organizations. But, several individuals do participate with the Houston Medical Response System. The Receiving Hospital Working Group is a subcommittee whose purpose is to work out the details of coordination and communication between the Houston Medical Strike Team Hospital Operations Sector and the receiving hospitals. The Incident Command System is being developed and will be included in the next version of the Disaster Management Plan.

Training is evaluated through the use of after action reports. The senior leadership reviews the reports. The last bioterrorism exercise was in January of 2000. The next one will be in the near future and the reports from the previous exercise will be incorporated into the next exercise.

Interview with all Directors for Ben Taub General Hospital.

A bioterrorism incident creates a high level of fear. Such an incident occurring within the facility will cause varying degrees of concern and panic. Word will spread to individuals coming on duty. A realistic concern exists that incoming staff will not actually be available to work. Adequate staffing is vital to the success of maintaining a safe environment.

Some directors felt there were methods in place to ensure adequate staffing for 24-hour operations. Others did not. A review of the emergency preparedness plan did not address this issue. Also, in the case of a unit becoming quarantined, there was no mention of how the current staff would be augmented or some other relief provided. Single parents are a concern as well. There is not a plan in place to take care of staff family members while the single parent staff member is on shift.

Facility Management/Security

Although a formal interview was not accomplished with the director, there were several meetings to discuss the revision of the disaster management plan in which he and I were present. Therefore, no formal meeting was needed.

The emergency preparedness plan does not address the following issues specifically for a bioterrorist event: (a) limiting access, (b) total facility lockdown, (c) crowd control, (d) controlling the media, and (e) augmentation of security force. The current security

management plan addresses these issue on a basic level but does not address actions for a specific event.

Psychiatric Services and Crisis Counseling

Formal plans could not be located that addressed the training programs for the emotional and mental impacts of a terrorist event. Further, protocols are not formalized to prevent public hysteria. Special teams do exist for crisis intervention. The plan does not acknowledge the existence of a Critical Incident Stress Debriefing (CISD) or a CISD capability.

Diagnostic Capabilities

Interview with Director of Laboratory Services.

The laboratory currently analyzes over 99% of all specimens in-house. Less than one percent is analyzed by one of the three contract laboratories. Other laboratories within facilities operated by the Harris County Hospital District have the same systems as Ben Taub General Hospital and can perform the same procedures. A reference laboratory is also available to be used should the need arise. There are procedures/protocols in place for the acquisition, handling and transportation of suspicious laboratory specimens. Telephone numbers for the Centers for Disease Control and Texas Department of Health are readily available. However, local health department policy dictates that all must contact the city's health department first to receive guidance. It is the responsibility of the local health department to contact the state or federal agencies.

Chapter 4

DISCUSSION

The role of the hospital in any disaster must be to respond to the situation with the required resources to initiate a positive medical response for the community it serves. In order to accomplish this task, the facility must be able to provide the requested medical care to the maximum extent of its capabilities. To determine those capabilities, a survey instrument was used to assess a broad range of areas throughout the facility. Listed below are some areas requiring immediate implementation.

Hazard Vulnerability Assessment

The JCAHO requirements in accordance with the environment of care standard 1.4 states the plan should provide processes for identifying specific procedures in response to a variety of disasters based on a HVA performed by the organization.

Communication

Communication protocols will reduce the amount of initial confusion that could hinder initiating the correct reporting algorithms. Procedures already exist for notification of the appropriate key participants. The dilemma remains on how the department that starts the notifications gets notified by the person who first discovers the incident.

Information Technology

Information technology can be very useful for the identification of a possible biological event. Some of the epidemiological features would include (a) an increased incidence in normal population, (b) a sharp rise and fall in epidemic curve, (c) an unusual increase in upper respiratory infections or gastrointestinal illnesses and (d) illnesses occurring in clusters by location. Computer systems can have pre-established

thresholds by diagnosis. However, these pre-established thresholds will take several months of normal operations to determine.

Community Health Centers

Ben Taub General Hospital is consistently at or near bed occupancy capacity. The current nursing shortage is hindering efforts to increase bed availability. Therefore the Disaster Management Plan should address how to decompress the facility. Possible decompression can come from those units that have lower acuity patients that local nursing homes may be able to care for a short time. This author believes the health centers can be a very important asset to the Harris County Hospital District as well as the city of Houston. Patients who believe they have symptoms could report to a designated center to prevent cross-contamination. Others who feel they may have been exposed several days ago but are not demonstrating symptoms can use another health center to be screened.

Training

Putting procedures into a plan is only as effective as the paper it's written on. The effective training of all staff members must be accomplished to reduce confusion and ensure the highest level of performance in a safe manner. Specifically, hands-on training should be routinely performed especially those who use specialized equipment. The decontamination team is a key group of individuals that are the first line of defense before patients begin to enter the facility. The team members should be those who will always be on that team and not be removed if at all possible. They should always train together to reduce the potential for error. The survey results show the need for

documentation of processes to reduce confusion. Standard procedures must include explicit decision-making protocols for hospitals.

Health Response Network

A collaborative effort should be made among all the hospitals within the Texas Medical Center campus. All member hospitals should become part of a medical community that during a disaster can aid other facilities by sharing resources and therefore share the burden should one facility be forced to close. The formation of mutual aid agreements must be accomplished to identify the roles and responsibilities of each hospital. The TMC Headquarters should take on this responsibility or the member hospitals should form a hospital council. In either case, the identified organization must have the authority to implement procedures and protocols at any given moment. An essential component of disaster planning activities must include the identification and the inventorying of all the facilities with the campus. The consequences of not taking on this role and performing these tasks include a longer impact assessment process of disaster effects, (b) increased difficulty in prioritizing scarce disaster relief resources, (c) difficulty in providing sufficient specificity when requesting outside resources, and (d) longer recovery periods for community infrastructure and disaster victims.

The general impression from the interviews is that the staff knows what to do regardless of the event even though processes and plans are not written. The most basic of skills can be applied across almost any disaster encountered. There will be a few additional requirements depending on the event, such as different infection control procedures for smallpox exposures.

A review of the current Emergency Preparedness plan shows a few portions were obtained from other organizations. The Disaster Management Committee had begun the development a District Disaster Management Plan at the time of finalization of this project. The primary components of an effective bioterrorism plan include (a) patient management, (b) post-exposure management, (c) diagnostic capability, and (d) public information and communication. However, based on experiences, an effective disaster plan normally takes several months to coordinate and implement. In the wake of September 11th, this timeline may have been severely shortened.

The survey results indicate that some areas have the capabilities to respond to a bioterrorism event while other areas do not. The laboratory services demonstrated their ability to respond successfully. This area is expected to be well prepared as their day-to-day function is to handle various forms of specimens in a safe manner and implement procedures when unusual results are obtained.

Several individuals and organizations reviewed the survey used to assess the response capabilities of Ben Taub General Hospital. During the course of this project, the American Hospital Association had accepted the survey and posted to their website for other hospitals to review. Also, at this author's request, a copy of the survey was reviewed by a JCAHO administrative surveyor and subsequently reviewed by the Assistant Professor for the Division of Emergency Medicine, University of Texas Southwestern who is also the Medical Director for the Dallas Metropolitan Medical Response System during a JCAHO survey at Parkland Medical Center in Dallas, Texas. The survey and this project's proposal were also sent to the Vice-President for Standards of the Joint Commission on Accreditation for Healthcare Organizations.

Chapter 5

CONCLUSION

A biological attack against the United States was not considered likely prior to September 11th, 2001. Several cases of Anthrax have been reported and hospitals are doing their best to implement procedures to handle this new threat. Hospitals and clinics are having the first opportunity to recognize and initiate a response to a bioterrorism-related incident. Therefore it is imperative that the facility has the capabilities to respond effectively.

Ben Taub General Hospital is a primary provider of trauma care in the Houston metropolitan area. The survey results conclude that this facility has a few departments ready to adequately take care of biological casualties. However, there are some areas of concerns that must be addressed in order to establish guidelines and maintain control of casualties.

Chapter 6

RECOMMENDATIONS

The organization should review the results chapter and use it as a guide for developing corrective strategies for addressing those areas that require more attention.

Several comments were received praising the survey. This organization, as well as other organizations within the Harris County Hospital District, should use the survey to evaluate the response capabilities once the revised Disaster Management Plan is approved and implemented. The results should then be compared to those located in that chapter of this project.

Senior leadership should then determine the response capabilities and take the necessary corrective action. The areas the leadership should focus their immediate attention are: (a) completion of the Hazard Vulnerability Assessment, (b) creating communication protocols, (c) upgrading information technology, and (d) pre-assigning of team members.

Appendices

- A. Ben Taub General Hospital 2001 Bioterrorism Survey
- B. Primary Receiving Hospitals
- C. HCHD Community Health Centers

Appendix A

**BEN TAUB GENERAL HOSPITAL
2001 Bioterrorism Preparedness Survey**

Facility: _____
 POC(s): _____
 POC Phone: _____
 Fax: _____

Facility ID: _____
 Date(s) of Survey: _____
 E-Mail: _____
 Web Page: _____

Confidentiality Statement:

The Ben Taub General Hospital will use the information obtained in this survey for two purposes. First, it will provide a comprehensive profile of the healthcare community's level of preparedness in responding to a bioterrorist incident. This type of incident is a major public health and public safety concern. The profile will facilitate requests for state and federal funding for equipment and supply procurement and will identify the healthcare community's training requirements that could potentially be provided by a central source. Secondly, the information will enable your facility to ascertain its own level of preparedness, and can be used in completing sections of the new JCAHO required Hazard Vulnerability Analysis. Please note that the information will not be shared between facilities or systems. A unique identifier will be assigned to each facility to ensure strict confidentiality of sensitive information.

Directions/Notes:

If a question asks who is the point of contact or is the responsible party, you may cite a person, office, department, committee, or appropriate functional area that best responds to the question.

1.0 GENERAL INFORMATION:

- 1.1 What is the date of the last JCAHO inspection or when is the next inspection scheduled? Last inspection date: _____
 Next inspection date: _____

(DK = Don't Know)

- 1.1.1 Were any deficiencies noted for the Environment of Care? Yes No DK
 1.1.2 If yes, what were they and have they been corrected?

- 1.2 Is your system/facility designated to receive patients in the National Disaster Management System (NDMS)? Yes No DK

- 1.3 Do you know what the new JCAHO annual exercise requirements are for the Environment of Care? Yes No DK

1.3.1 How many exercises does your facility conduct annually? # of exercises: _____

1.3.2 In which months are exercises conducted? _____

1.3.3 Who devises/coordinates exercises? _____

1.3.4 How is the exercise documented for after action review? _____

1.3.5 Is the exercise after action report or results made available to the staff, and if so, how?

- 1.4 Who is your facility/system point of contact (POC) for bioterrorism and weapons of mass destruction (WMD)? POC: _____
- 1.4.1 If there is no designated POC for this type of incident, who may potentially manage it? Name: _____
- 1.4.2 Does the facility/system emergency/disaster plan include a section on bioterrorism awareness/response? Yes No DK
- 1.5 Has your facility/system conducted a Hazard Vulnerability Analysis (HVA)? Yes No DK
- 1.5.1 If yes, does it include a section on bioterrorism/WMD? Yes No DK
- 1.5.2 If no, who is drafting the HVA? Name: _____

2.0 COMMUNICATIONS and PUBLIC AFFAIRS:

- 2.1 Do staff members know who to contact internally upon identification of exposure/symptoms related to bioterrorism/biological agents? Yes No DK
- 2.1.1 Who is this point of contact (POC)? Name: _____
- 2.1.2 Is there an alternative POC? Name: _____
- 2.1.3 How is this person/department contacted? _____
- 2.2 Does your facility/system have specific media and public affairs protocols to be employed during a bioterrorist incident? Yes No DK
- 2.3 Does the facility/system have a skeleton draft of a public service response for this type of incident? Yes No DK

3.0 ACCESS TO CARE:

- 3.1 Have resources been designated to reduce barriers and meet the requirements for special populations' health needs in the event of a threat/emergency due to a biological agent? **Circle** groups for which resources are designated and explain for each population how this will be accomplished.
- 3.1.1 Children Yes No DK
-
- 3.1.2 Elderly persons Yes No DK
-
- 3.1.3 Homeless population Yes No DK
-
- 3.1.4 Remote populations Yes No DK
-
- 3.1.5 Chronically ill who require access to critical services, e.g. kidney dialysis and pharmacy services Yes No DK
-

3.1.6	Those who encounter barriers (culture/language)	Yes	No	DK
3.1.7	Physically and mentally disabled, including homebound	Yes	No	DK
3.1.8	Others	Specify:		
3.3	Does the facility/system have access to logistical assets to transport mass casualties to collection points and/or to other facilities if your facility/system fills to capacity?			
		Yes	No	DK
3.3.1	How many vehicles (capable of patient transport) are in your facility/system inventory? # of vehicles:			
3.3.2	What types of vehicles comprise the inventory? Types of vehicles:			
3.3.3	What is the total capacity of these vehicles?			
	3.3.3a Ambulatory	# ambulatory patients:		
	3.3.3b Litter	# litter patients:		
3.4	Has your facility/system identified a patient dispersion plan and/or an alternative care site in the event that it cannot support adequate patient care?			
		Yes	No	DK
3.4.1	If yes, identify the alternate location(s).			
3.4.2	Has your facility/system established procedures to:			
	3.4.2a Manage patients and patient tracking to and from the alternative site(s), and if yes, explain how (manual or automated):	Yes	No	DK
	3.4.2b Transport patients, staff, and equipment to and from the site(s)	Yes	No	DK
	3.4.2c Establish inter-facility communication between the base and alternative site(s)	Yes	No	DK
3.5	Has your facility/system developed a patient tracking/identification system?			
		Yes	No	DK
3.5.1	If yes, explain the design and strategy of using the system:			

4.0 BUSINESS (HEALTHCARE) CONTINUITY PLAN:

- 4.1 Has your facility/system developed a plan that would enable the entire operations or unaffected segments to continue during a biological/chemical disaster, or reestablish operations following a biological/chemical disaster?

Yes No DK

Ex. If the emergency room is contaminated/dirty and the facility's air handling/ventilation system could be shut down for that particular area, could operations continue in other parts of the facility, i.e. dialysis, cardiac care, supply deliveries, etc.

4.1.1 Explain: _____

5.0 CAPACITY:

- 5.1 Has your facility/system assessed its ability to increase capacity in the event of a mass influx in patient presentations or admissions?

Yes No DK

5.1.1 If yes, how will you increase capacity ? _____

- 5.1.2 Can your facility/system increase capacity for the following services, and if so, by how many beds/units:

(NA= not applicable) # beds

5.1.2a	Adult medicine beds	NA	_____	Yes	No	DK
5.1.2b	Burn unit beds	NA	_____	Yes	No	DK
5.1.2c	Intensive Care Unit (ICU) beds	NA	_____	Yes	No	DK
5.1.2d	Mortuary space	NA	_____	Yes	No	DK
5.1.2e	Multiple trauma beds	NA	_____	Yes	No	DK
5.1.2f	Pediatric beds	NA	_____	Yes	No	DK
5.1.2g	Respiratory isolation units	NA	_____	Yes	No	DK
5.1.2h	Respiratory ventilators	NA	_____	Yes	No	DK
5.1.2i	Quarantine areas	NA	_____	Yes	No	DK

6.0 PHARMACEUTICALS AND EQUIPMENT:

- 6.1 Has your facility/system assessed its pharmaceutical inventory to determine whether it could support the treatment and provide prophylaxis for mass numbers of patients exposed to biological agents?

Yes No DK

6.1.1 When and how often is this inventory monitored? _____

6.2 Has your facility/system identified an emergency pharmaceutical supply system via local pharmacies for pharmaceuticals related to treatment/prophylaxis for biological agents?

Yes No DK

6.3 Has your facility/system identified an emergency pharmaceutical supply system via pharmaceutical vendors related to the prophylaxis and treatment for exposure to biological agents?

Yes No DK

6.3.1 List vendors:

6.4 Does your facility/system have protocols for the following medication distribution scenarios for a bioterrorist incident in the event of limited supplies. **Rank order in terms of precedent for care**

1 highest – 5 lowest

6.4.1 Prophylaxis of patient family members

6.4.2 Patients with known exposure/no symptoms

6.4.3 Prophylaxis of providers/staff members

6.4.4 Symptomatic patients

6.4.5 Prophylaxis of staff/provider family members

6.5 Does your facility/system pharmaceutical and equipment inventory contain the following items. **(If yes, indicate the approximate average amount on hand):**

6.5.1 **Bacterial agents:**

on hand

Ciprofloxacin	NA	_____	Yes	No	DK
Doxycycline	NA	_____	Yes	No	DK
Penicillin	NA	_____	Yes	No	DK
Chloramphenicol	NA	_____	Yes	No	DK
Azithromycin	NA	_____	Yes	No	DK
Rifampin	NA	_____	Yes	No	DK
Streptomycin	NA	_____	Yes	No	DK
Gentamicin	NA	_____	Yes	No	DK

6.5.2 **Botulism toxin:**

Mechanical respiratory ventilators	NA	_____	Yes	No	DK
Other associated supplies	NA	_____	Yes	No	DK

6.5.3 **Cyanides:**

Cyanide antidote kits containing amyl nitrite, sodium nitrite, and sodium thiosulfate	NA	_____	Yes	No	DK
---	----	-------	-----	----	----

6.5.4 **Lewisite:**

British Anti-Lewisite	NA	_____	Yes	No	DK
-----------------------	----	-------	-----	----	----

6.5.5 **Nerve agents:**

Atropine	NA	_____	Yes	No	DK
Pralidoxime chloride	NA	_____	Yes	No	DK
Diazepam (or lorazepam)	NA	_____	Yes	No	DK

6.5.6 **Pulmonary agents:**

Oxygen ventilators	NA	_____	Yes	No	DK
--------------------	----	-------	-----	----	----

- | | | | | | | |
|--|---------------------------|----|-------|-----|----|----|
| | Respiratory care supplies | NA | _____ | Yes | No | DK |
|--|---------------------------|----|-------|-----|----|----|
- 6.5.7 **All agents:**
- | | | | | | | |
|--|--------------------------------------|----|-------|-----|----|----|
| | Resuscitation equipment and supplies | NA | _____ | Yes | No | DK |
| | Vasopressors | NA | _____ | Yes | No | DK |
- 6.6 Does your facility/system have access to dosage requirements for antidotes and therapies for pediatric patients who are exposed to biological agents?
- Yes No DK
- 6.7 Is the necessary drug administering equipment available for the on-hand quantities of antidotes and therapies?
- Yes No DK
- 6.8 Does your facility/system have a staff member designated to accept deliveries from the National Pharmaceutical Stockpile via the Metropolitan Health District in the event of a bioterrorism event?
- Yes No DK
- 6.8.1 Who is this person? Name: _____

7.0 MEDICAL TREATMENT PROCEDURES:

- 7.1 Does your facility/system have procedures to receive patients who are exposed to biological agents and require medical care?
- Yes No DK
- 7.1.1 Does your facility/system have a procedure to triage patients to appropriate treatment facilities?
- Yes No DK
- 7.1.2 Do procedures address patient and situation confidentiality?
- Yes No DK
- 7.2 Does your facility/system have the following respiratory protective equipment available?
- | | # on hand | | Yes | No | DK |
|--|-----------|-----|-----|----|----|
| 7.2.1 Self-contained breathing apparatus (with tank and full mask) | _____ | Yes | No | DK | |
| 7.2.2 Supplied air respirators (full mask and air-line from hospital air system) | _____ | Yes | No | DK | |
| 7.2.3 Chemical cartridge air purifying respirators | _____ | Yes | No | DK | |
| 7.2.4 HEPA masks (OSHA/NIOSH-approved high efficiency particulate) | _____ | Yes | No | DK | |
- 7.3 Does your facility/system have decontamination equipment and a dedicated decontamination area?
- _____ Yes No DK
- 7.3.1 If yes, are there specific training procedures and updates for personnel assigned to this function?
- _____ Yes No DK

8.0 TRAINING AND PERSONNEL:

- 8.1 Has your facility/system assessed its workforce to determine their level of emergency preparedness and response capabilities within the past year?
- Yes No DK

8.1.1 If yes, how was this assessment made? _____

8.2 When do staff members receive training in emergency/disaster and bioterrorism awareness/preparedness? (i.e. initial orientation, periodically, annually)

8.2.1 Is there annual refresher training? Yes No DK

8.2.2 What is the annual number of training hours provided in:

8.2.2a Emergency/disaster preparedness # hours: _____

8.2.2b Bioterrorism awareness/response # hours: _____

8.2.3 Attach a copy of your training curriculum.

8.3 Has the facility estimated the numbers of staff members who have received 8 hours or more of training in emergency preparedness and response within the past year? If yes, please provide numbers for the following:

Yes No DK

	#available	# trained	
8.3.1 Housekeeping Staff	_____	_____	DK
8.3.2 Security	_____	_____	DK
8.3.3 Food Service	_____	_____	DK
8.3.4 Clerical	_____	_____	DK
8.3.5 Pastoral Care	_____	_____	DK
8.3.6 Other Administrative Staff	_____	_____	DK
8.3.7 Medical Logistics	_____	_____	DK
8.3.8 Facilities Staff	_____	_____	DK
8.3.9 Technicians / Ancillary Support	_____	_____	DK
8.3.10 Physicians	_____	_____	DK
8.3.11 Nurses	_____	_____	DK
8.3.12 Nurse Practitioners	_____	_____	DK
8.3.13 Physician assistants	_____	_____	DK
8.3.14 Environmental health workers	_____	_____	DK
8.3.15 Mental health/Social workers	_____	_____	DK
8.3.16 Epidemiologists	_____	_____	DK
8.3.17 Laboratory personnel qualified to biological or chemical agents	_____	_____	DK
8.3.18 Respiratory therapists	_____	_____	DK
8.3.19 Pharmacists	_____	_____	DK
8.3.20 Emergency medical technicians / (EMTs) paramedics	_____	_____	DK
8.3.21 Health administrators/managers	_____	_____	DK
8.3.22 Other (specify) _____	_____	_____	DK

8.3 Does your facility/system have a method for assessing emergency preparedness/bioterrorism training and continuing education needs based on the roles/responsibilities of staff members?

Yes No DK

8.4.1 If yes, explain how: _____

8.5 Has your facility/system identified internal resources who are capable of providing training in emergency preparedness/bioterrorism awareness? Yes No DK

8.5.1 If yes, who can provide this service? Name/position: _____

8.6 Has your facility/system identified external organizations that can provide training in emergency preparedness/bioterrorism awareness? Yes No DK

8.6.1 If yes, what are the names of the organizations? _____

8.7 Have all staff members received training on selection and use of appropriate Personal Protective Equipment (PPE)? Yes No DK

8.7.1 What percent of the total staff has received this type of training? Percent of staff trained: _____

8.7.2 Identify the departments in which this type of training is provided to staff members. _____

8.7.3 Have providers trained to provide patient care while wearing full PPE? Yes No DK

8.8 Has the system/facility-implemented activities to educate health care providers and laboratory workers on topics regarding specific procedures regarding biological and chemical incidents? Yes No DK

8.8.1 If yes, do the training topics include:

8.8.1a Acquisition of laboratory specimens Yes No DK

8.8.1b Handling of laboratory specimens Yes No DK

8.8.1c Transportation of laboratory specimens Yes No DK

8.8.1d Contact telephone numbers for reporting/consultation Yes No DK

8.8.1e Guidelines for immediate reporting/consultation with public health officials Yes No DK

8.8.1f Medical management of patients Yes No DK

8.8.1g Patient decontamination procedures (including those to be used when outside temperatures are extreme) Yes No DK

8.8.1h Identification of hazardous biological agents Yes No DK

8.8.1i Identification of hazardous chemical agents Yes No DK

8.8.1j Role of the healthcare providers in recognizing/suspecting the beginning of an outbreak Yes No DK

8.8.2 Attach a copy of your training curriculum.

8.9 Does your facility/system ensure that training is provided to prepare responsible staff members for decontamination procedures and contagion hazards that may accompany a biological or chemical incident?

Yes No DK

8.9.1 If yes, is training required for the following personnel?

8.9.1a	Emergency department personnel	Yes	No	DK
8.9.1b	Health care providers	Yes	No	DK
8.9.1c	Laboratory workers	Yes	No	DK
8.9.1d	Morgue personnel	Yes	No	DK
8.9.1e	Mortuary professionals	Yes	No	DK
8.9.1f	Pathologists	Yes	No	DK
8.9.1g	Security personnel	Yes	No	DK

8.10 Are facility/system personnel cross-trained with external organizations who are involved in the city's/region's emergency response system?

Yes No DK

8.10.1 If yes, with whom do they cross-train and explain how?

8.11 Do training programs include a description of the civilian incident command system, i.e. familiarization with the procedures of external organizations involved in response actions?

Yes No DK

8.12 Does your facility/system evaluate training and continuing education activities in the areas of bioterrorism and emergency preparedness?

Yes No DK

8.12.1 If yes, explain how:

8.12.2 Is this feedback used to identify future training requirements? Yes No DK

8.13 Does your facility/system use distance based learning technology for training and continuing education in any areas?

Yes No DK

8.13.1 Would your facility/system be willing to conduct training in emergency preparedness/ bioterrorism awareness via distance or web-based technology? Yes No DK

8.13.2 Do you have video conferencing capability? Yes No DK

8.13.3 Do you have a projection system that connects to the internet and or computer for training? Yes No DK

8.14 Are Continuing Education Units (or equivalent) available for emergency preparedness or bioterrorism training in your facility/system for the following educational areas?

8.14.1 CME (physicians) Yes No DK

8.14.2	CEU (nurses/ancillary)	Yes	No	DK
8.14.3	CE (administrative)	Yes	No	DK
8.15	Does your facility/system have procedures in place to:			
8.15.1.	Ensure adequate staffing is available for 24 hour operations	Yes	No	DK
8.15.2	Ensure that an adequate augmentation plan is in place	Yes	No	DK
8.15.3	Ensure that staff have family preparedness plans (i.e. where staff family members are safe and accounted for)	Yes	No	DK
8.15.4	Set aside a location in which family members may stay while the staff member is on shift	Yes	No	DK

9.0 FACILITY MANAGEMENT/SECURITY:

9.1	Specifically for bioterrorist and chemical incidents, does your facility/system security plan address:			
9.1.1	Limiting access to the facility	Yes	No	DK
9.1.2	Total facility lockdown	Yes	No	DK
9.1.3	Crowd control	Yes	No	DK
9.1.4	Controlling the media	Yes	No	DK
9.1.5	Augmentation of the security force	Yes	No	DK

10.0 PSYCHIATRIC SERVICES AND CRISIS COUNSELING:

10.1	Do your facility's/system's training programs include preparation for the emotional and mental health impacts of a terrorist event for the following categories of individuals:			
10.1.1	Staff	Yes	No	DK
10.1.2	Patients	Yes	No	DK
10.1.3	Family members	Yes	No	DK
10.2	Does your facility have 'rumor control' protocols to prevent public hysteria?	Yes	No	DK
10.3	Does your facility have a Critical Incident Stress Debriefing (CISD) Team or CISD capability?	Yes	No	DK

11.0 DIAGNOSTIC CAPABILITIES:

11.1	What percent of laboratory specimens are analyzed in-house?	_____ %
11.2	What percent of laboratory specimens are analyzed by contracted laboratories?	_____ %
11.2.1	With which companies do you have contracts:	_____

11.3	Has your facility identified alternative laboratories in the event your current laboratories are contaminated/inundated?	Yes No DK
11.4	Does your facility/system have procedures/protocols in place for:	

- | | | | | |
|--------|--|-----|----|----|
| 11.4.1 | Acquisition of suspicious laboratory specimens | Yes | No | DK |
| 11.4.2 | Handling of suspicious laboratory specimens | Yes | No | DK |
| 11.4.3 | Transportation of suspicious laboratory specimens | Yes | No | DK |
| 11.5 | Are the telephone numbers for the CDC and Texas Dept. of Health posted in your laboratories? | Yes | No | DK |
| 11.5.1 | What are the numbers that are posted? | | | |

CDC: _____

TDH: _____

Questions regarding this survey should be referred to the following individual:

Paul Begnoche
Administrative Resident
Ben Taub General Hospital

1504 Taub Loop
Houston, Texas 77030

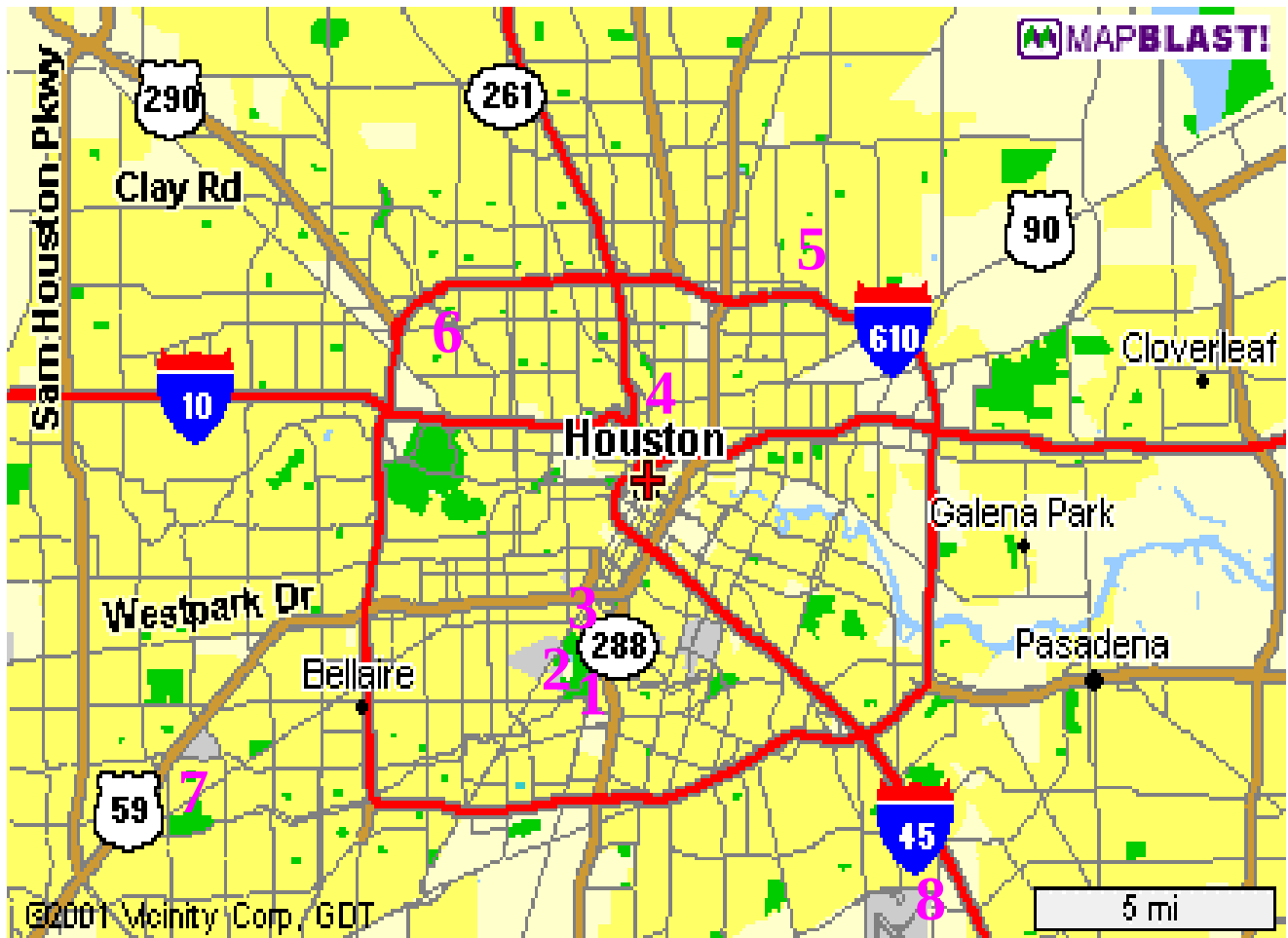
Phone: (713) 873-8867

FAX: (713) 873-2978

E-Mail: Paul_Begnoche@hchd.tmc.edu

Appendix B

Figure B1. Location of the Primary Receiving Hospitals for Houston Texas

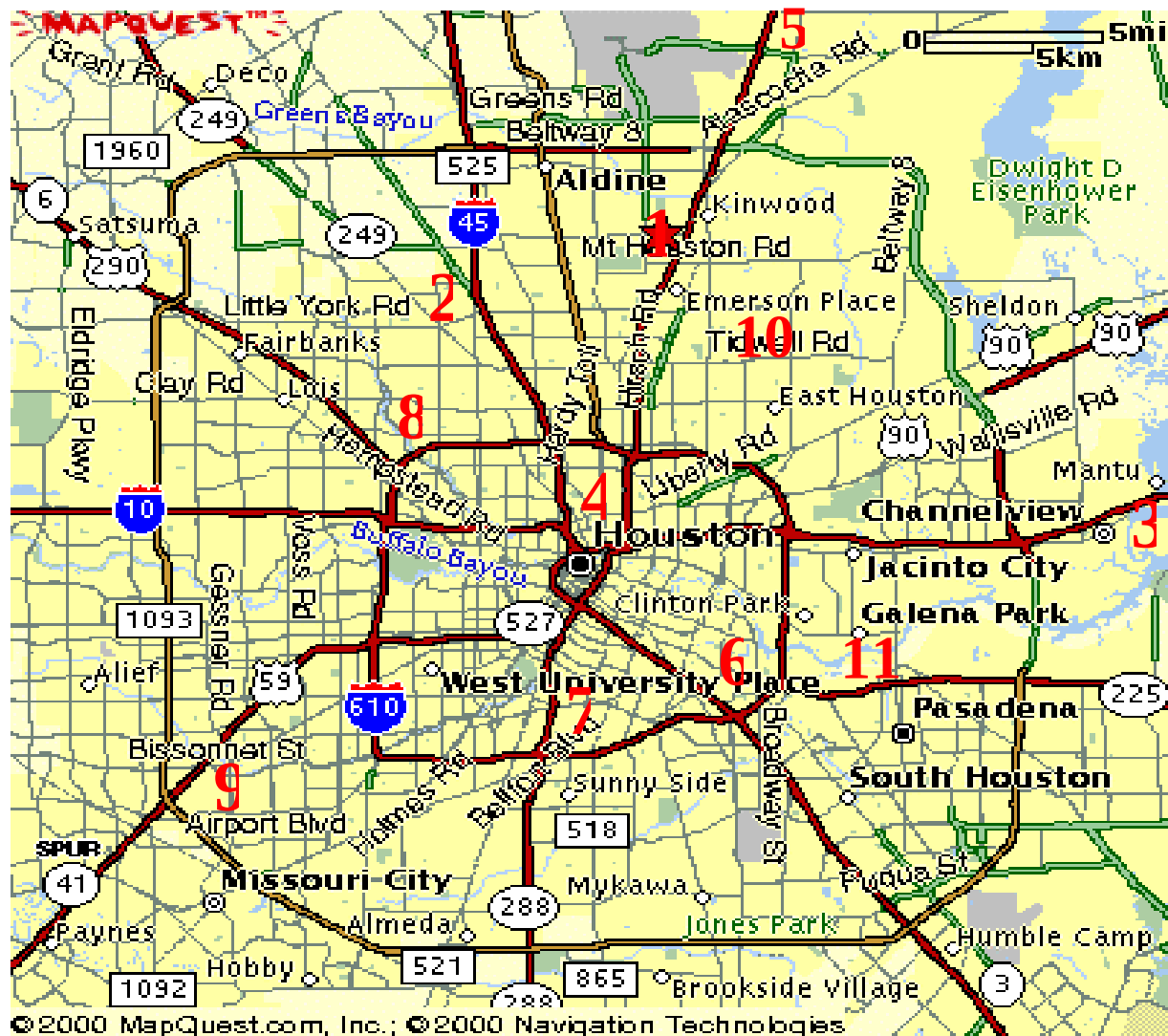


Key:

1. Ben Taub General Hospital
2. Memorial Hermann Hospital
3. Methodist Hospital
4. CHRISTUS St. Joseph Hospital
5. LBJ General Hospital
6. Memorial Hermann Hospital NW
7. Memorial Hermann Hospital SW
8. Memorial Hermann Hospital SE

Appendix C

Figure C1. Location of HCHD Community Health Centers



Key:

- | | |
|---------------------------------------|-------------------------------------|
| 1. Aldine Health Center | 7. Martin Luther King Health Center |
| 2. Acres Home Health Center | 8. Northwest Health Center |
| 3. Baytown Health Center | 9. People's Health Center |
| 4. Casa de Amigos Health Center | 10. Settegast Health Center |
| 5. E.A. "Squatty" Lyons Health Center | 11. Strawberry Health Center |
| 6. Gulfgate Health Center | |

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