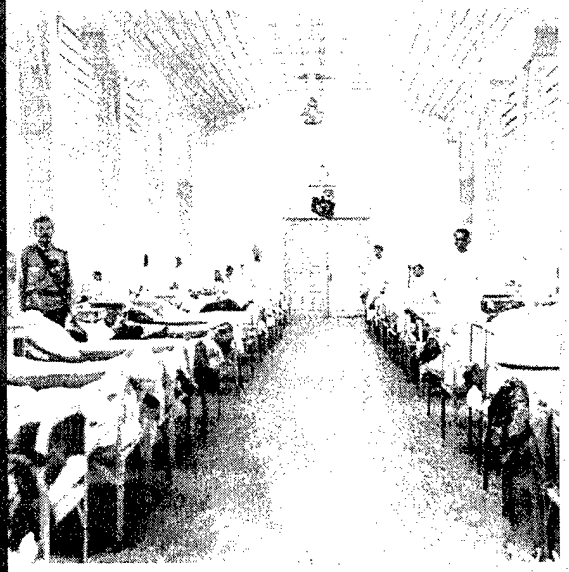
ACUTE CARE CENTER

A Mass Casualty Care Strategy For Biological Terrorism Incidents



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INTRODUCTION AND BACKGROUND

Introduction

The purpose of this pamphlet is to provide basic information on the mass casualty care concept known as the Acute Care Center (ACC). The ACC is one component of a disaster medical system developed by the Domestic Preparedness Biological Weapons Improved Response Program (BW IRP). The system is intended to assist emergency planners and health care providers in planning and coordinating an effective medical response following a large-scale terrorism attack involving the use of a biological weapon in a civilian community. The concept represents one approach that addresses a response to a major noncontagious BW incident. The information contained in this pamphlet is not a final solution but can be tailored for individual community application. A more comprehensive description of the ACC can be found in the *Concept of Operations for the Acute Care Center.*[1]

Background

In recent years, concern over the likelihood of a terrorist attack involving unconventional threats, including the use of biological weapons, has increased. The threat is indeed serious, and the potential for devastating numbers of casualties is high. In 1998, under the auspices of the Department of Defense (DoD) Domestic Preparedness Program (DPP), the BW IRP conducted a series of workshops aimed at identifying improved approaches to managing the consequences of a large-scale biological terrorism attack. One product of this effort is a multi-echelon interagency template for executing a fully integrated disaster response. The cornerstone to this strategy is the efficient use of a community's combined medical resources. The Modular Emergency Medical System (MEMS) represents the BW IRP's initial attempt to systematically address the need for rapidly enhancing a community's medical capacity. One component of this new disaster care system is the ACC. The BW IRP undertook a technical study to better understand the operational feasibility and logistical requirements associated with executing the MEMS strategy. The ACC concept was applied to several hypothetical incidents (including anthrax, tularemia, and Venezuelan equine encephalitis) through the use of operations research modeling. The lessons learned from the modeling efforts, along with feedback from an independent validation panel, were used to modify and enhance the ACC concept. To ensure proper perspective of the concepts and processes of the ACC, one must have a general understanding of the broader MEMS strategy.

Modular Emergency Medical System (MEMS): General Description

MEMS is designed to provide systematic, coordinated, and effective medical response to the casualties of a large-scale BW incident. Specifically, the 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 this system is based on the Incident Command System/Incident Management System (ICS/IMS), which is utilized nationally by the emergency response community. The MEMS strategy also establishes a framework for which outside medical resources can effectively augment local response efforts through the rapid organization of available assets into two types of expandable patient

care modules, Acute Care Centers (ACCs) and Neighborhood Emergency Help Centers (NEHCs). The MEMS has built-in flexibility to accommodate multiple component modules, as required. A network of modules integrated with a Community Outreach effort will mitigate the effects of a BW incident by converting non-hospital facilities into mass care centers, enhancing a community's capacity to care for large numbers of casualties. The ACC and NEHC modules are linked to an area hospital that oversees patient care, medical logistics, and information flow.

Together, these two modules have the capability to provide a wide range of care and services to victims of a biological terrorism incident in addition to the community's normal patient population (see Figure 1, Modular Emergency Medical System). The existing medical infrastructure will continue to function as massive numbers of casualties and asymptomatic, non-exposed individuals (also known as "worried well"), who believe that they have been exposed to a biological agent when in fact they have not present themselves for medical care. The casualties and "worried well" are directed through the MEMS.

Organization and Components of the MEMS

Current medical systems of most communities in the United States include public and private area hospitals, outpatient clinics, ancillary care organizations, and private physicians. These resources can be integrated and expanded upon during emergency operations by activating pre-planned communication and coordination links between components and applying additional resources. Under the MEMS strategy,

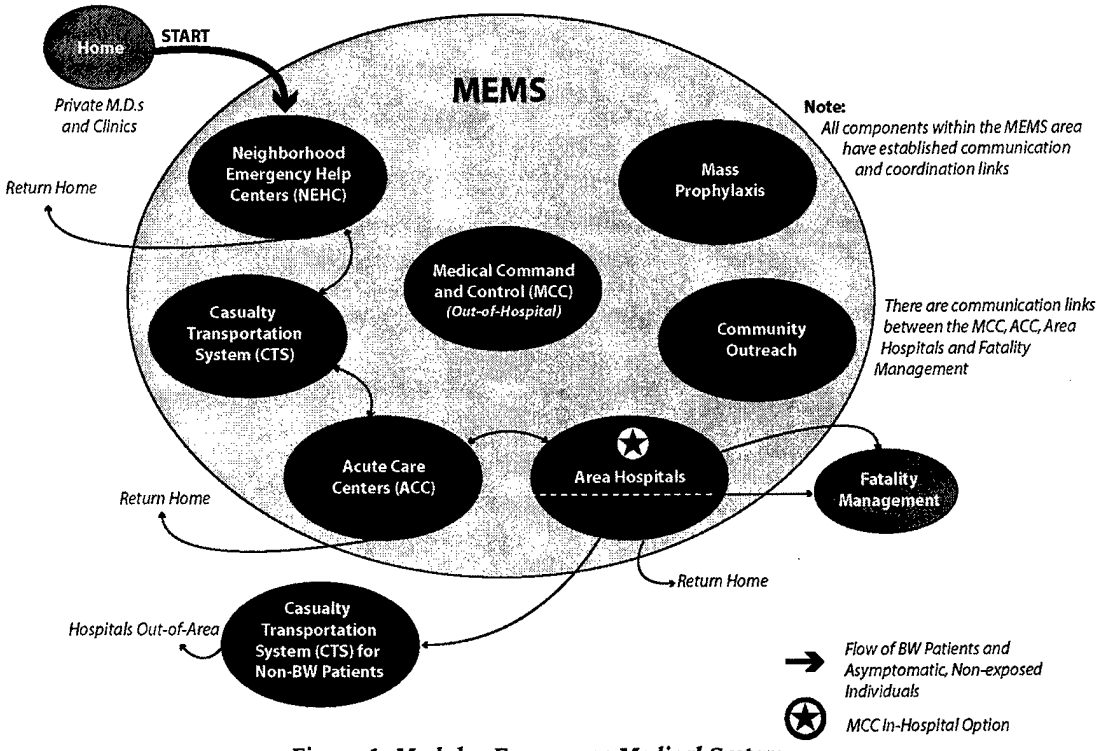


Figure 1. Modular Emergency Medical System

Key Aspects of the MEMS

- Integrates all local medical aspects
- Allows a flexible and timely response through its modular design
- Serves as a framework to support a massive medical response
- Augments the existing medical system
- Consistent with ICS

each area hospital may form its own internal emergency Medical Command Centers (MCCs) to coordinate sector health care operations with their associated modules. As hospitals reach full capacity, they can establish ACCs in nearby buildings to transfer and redirect patients who require non-critical, agent-specific supportive care. Outpatient clinics may also be expanded into NEHCs to help direct non-critical and psychosomatic casualties away from hospital emergency departments.

A Community Outreach effort, organized by local law enforcement, fire, public health, and volunteer organizations can facilitate the medical response and public information efforts. This may be accomplished by conducting door-to-door sector surveys and identifying victims who were otherwise unable to access appropriate medical care. In an incident involving a disease that is thought to be contagious, it would be best to isolate individuals from one another and avoid mass gatherings. In such an incident, authorities might instruct citizens to stay at home and receive assistance via the Community Outreach effort. Casualty transportation units will coordinate all transportation of patients between the NEHCs, hospitals, and ACCs. They can also transfer non-BW hospital patients to remote hospitals to provide additional local hospital space for BW patients.

To carry out the MEMS strategy, hospitals, clinics, and private medical doctors may have to forego their autonomy and jurisdictional medical statutes and function as a unified system. The individual area hospitals and associated centers are linked to the ICS to form a community-wide medical response. An alternative approach to this organization might involve establishing the ACCs and NEHCs as stand-alone facilities that are not associated with area hospitals. Under this organization, the operation of these centers would be a function of the community's emergency management office. The MEMS can be flexibly applied depending on the severity of the situation and the resources available within the affected community. By pre-designating the participating medical organizations by community sector and pre-selecting the locations for the MEMS components, a community will be better prepared to respond quickly and efficiently to a biological terrorism incident, or other large-scale public health emergencies.

ACUTE CARE CENTER (ACC)

Development

The Acute Care Center (ACC) concept is based on extensive consultation and research. The process used to develop and validate the ACC concept involved extensive literature review, a series of working group sessions, and the application of several operational research techniques, including computer modeling and independent panel review.

The Concept of Operations for the Acute Care Center is the product of a multiagency working group, including representatives from the staffs of major academic medical centers, research, government, military, public health, and emergency management institutions and agencies.

Overview

The ACC concept was developed to assist planners, administrators, responders, medical professionals, public health, and emergency management personnel in better preparing for and providing mass casualty care. The content of this document will be of particular interest to anyone involved in civilian preparedness for terrorism. The ACC concept describes the specific command organization, operational execution, and the logistical and staffing requirements associated with the ACC. Additionally, the document addresses the philosophy of care and operational considerations that must be evaluated when implementing the ACC strategy. The aftermath of a large-scale bioterrorist event and its consequences on the fabric of society is almost unimaginable. Designing a healthcare delivery system to care for thousands or even hundreds of thousands of patients or victims when the local healthcare system is overwhelmed poses a daunting task for community or regional planners.

This ACC Concept of Operations guide is a peer-reviewed, local planning document that will provide a framework for developing a unified, comprehensive response that meets the needs of your local community and integrates easily into the federal and state response. The ACC concept was developed by a multidisciplinary team as a realistic plan for providing basic care to patients when an overwhelmed medical system would most likely be unable to do so. The ACC is only one example of an auxiliary medical care facility.

The ACC plan was developed to provide the most good for the greatest number of people while using limited resources. In large-scale disasters, communities or regional leaders will be forced to confront many difficult issues, many of which are addressed in this planning document. We realize that not all issues will apply to your region. In light of that, this document is intended as a starting point for you to develop plans, relationships, and procedures specific to your area. You may find it necessary to devote more resources to some areas while scaling back others. The overarching objective is to use available resources to provide a caring and safe environment for victims of a biological event.

Major issues covered in this document are as follows:

1. Level and scope of care: disaster care vs. non-disaster care, agent-specific care vs. generic care, changing standard of care in mass casualty environments
2. Physical plant: location, size, characteristics, security needs
3. Staffing: personnel needs, volunteers, credentialing

4. Command, control, and communication
5. Integration with federal and state response.

In planning, the ACC must care for patients until the local healthcare system recovers enough to absorb the extra patient load. Depending on the agent involved, this may vary from a few days to several weeks. We have attempted to create a framework that is flexible enough for application in many different scenarios.

Assumptions

In developing the ACC concept, the following assumptions were applied:

a. A large-scale bioterrorist incident will likely produce thousands to hundreds of thousands of casualties and/or fatalities, depending on the agent used.

b. During a bioterrorist event, actual infected casualties and the worried well who seek aid will overwhelm emergency medical services (EMS) and hospitals.

c. Hospital resources will be redirected to care for the most seriously ill. Elective admissions will temporarily cease, but critical medical/surgical and 911 functions will continue.

d. Establishing a system to rapidly expand inpatient acute care facilities will be necessary to provide rapid treatment to a large population of patients who are severely ill from an agent of bioterrorism.

e. A simple system that rapidly integrates medical resources and provides massive casualty management will be needed.

f. Emergency officials will communicate with the medical community in advance (during preplanning activities), and when the event is recognized, to assure healthcare workers that their safety and that of their families has been planned for and that prophylaxis and/or protection will be provided. It will be crucial to have accurate and timely dissemination of information to medical professionals to decrease their risk and concern of becoming secondarily infected and to encourage them to continue caring for patients from an agent of bioterrorism.

g. During a large-scale bioterrorist event, the standard of care in an affected community will change to provide the most effective care to the largest number of victims. In a mass casualty situation, healthcare workers will provide care to as many victims as possible, but individualized treatment plans may be rare or nonexistent. A decentralized team approach to providing basic medical care may be the most effective use of resources. Advanced life-saving technology and treatment options will likely either not be available or unable to be implemented due to lack of specially trained medical personnel.

h. The expanded ACC facilities, as well as medical personnel and supplies, will be most efficient if directed to victims of bioterrorism-related illness only. Victims of such illnesses who also require acute or critical medical treatment of urgent conditions such as heart attack, traumatic injuries, or severe exacerbations of chronic conditions, such as diabetes mellitus, should receive

care at an existing medical facility (i.e., hospital) where more diverse resources are available. The ACC should be an extension of a nearby medical facility (hospital) and transparent to the public. Ideally, the general public would seek initial care from either the NEHC or the emergency department (ED) of their local hospital.

i. The type of agent used and resulting illness will determine the composition of the ACC. The number of casualties expected to survive versus expire will dictate the allocation of medical staff.

j. The ACC will function more efficiently and require fewer dedicated, specialized resources if located adjacent or very close to the supporting hospital(s) in the affected region.

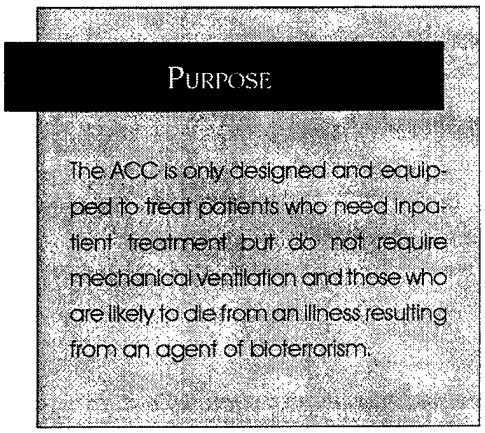
k. Physicians, nurses, and other licensed medical personnel will need to be quickly credentialed following preestablished policies. This function is best carried out by the Office of Emergency Management (OEM) of the respective community, in conjunction with local sponsoring hospitals, before staff arrival at the ACC itself.

l. Preplanning and sensitive surveillance systems are vital in reducing the impact that a bioterrorist event will have on a community. The better the surveillance system and preplanning, the more likely the ACC is to have a positive impact and outcome following the event.

Purpose

The ACC is designed, organized, equipped, and staffed specifically to provide inpatient medical services for those affected by an incident involving a biological weapon of mass destruction (WMD). The ACC is designed to treat patients who need inpatient treatment but do not require mechanical ventilation and those who are likely to die from an illness resulting from an agent of bioterrorism. Patients who require advanced life support (ALS), such as that provided by intensive or critical care units, will receive priority for hospital admission rather than admission to the ACC. If local hospitals are already beyond capacity, the patient(s) will receive as much care as the ACC is capable of providing.

Restricting the type of patients treated at these centers serves two purposes. First, it allows a streamlined approach to patient care; in general, most patients will require similar treatment following preestablished critical pathways or clinical practice guidelines. Secondly, in situations where isolation is desirable but impractical, it cohorts patients with similar infections/exposures from the same disease, thus limiting exposure to noninfected persons (a practice recommended by the Association for Professionals in Infection Control and Epidemiology Inc. [APIC], and the Centers for Disease Control and Prevention [CDC]).



Risk Management Policy

This document does not attempt to resolve legal issues but highlights concerns that were identified while developing the ACC concept. Depending on the scope and magnitude of the event, healthcare practices will likely have to change to effectively apply available assets to care for the greatest number of casualties. Decisions will need to be made to ration the use of the community's limited medical resources until significant mutual aid or federal resources arrive. Procedures for quickly credentialing licensed medical personnel will need to be preestablished by the community's OEM and consistent with federal and state statutes. Liability issues related to negligence and malpractice will likely have to be waived, as clinicians are asked to manage the high volumes of casualties. The standard of practice will likely differ from standards to which clinicians and patients are accustomed.

Personnel with limited medical background or experience, such as medical or nursing students, may need to be assigned to patient care in some capacity. All healthcare providers will have atypically large patient assignments. Patient care will likely have to be prioritized and delivered in a scaled down manner. The design of the ACC considers such factors while attempting to provide the best care available under these conditions. The community's OEM is responsible for ensuring that adequate medical transportation and logistical support is provided to each of the ACCs to initiate and sustain operations.

Level of Care Philosophy

As with all disasters, responding medical personnel must be trained to understand that their natural instinct to deliver as much care as needed for each patient is not optimal and may be deleterious. Predefined criteria for the delivery of care (standing admission orders, discussed next) and guidelines for discharges will provide the framework to assist medical personnel in applying the reduced care delivery model.

The ACC is designed and equipped to provide mass care only to patients of a bioterrorism-related illness who require inpatient treatment. When implemented, ACCs will concentrate on providing agent-specific and ongoing supportive care therapy (i.e., antibiotic therapy, hydration, bronchodilators, and pain management) while hospitals focus on the treatment of critically ill patients. The ACC, therefore, will not have the capability to provide advanced airway management (i.e., intubation and ventilator support), Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), Advanced Trauma Life Support (ATLS), or Neonatal Advanced Life Support (NALS). Patients requiring an advanced level of care (i.e., critical/intensive care-level support) will be transferred to the closest hospital if bed space is available. Otherwise, supportive care will be provided to these individuals at the ACC. The ACC is designed to create an environment in which patients who are going to respond to agent specific treatment can do so. Women who develop active labor

Level of Care

The ACC will provide agent specific therapy and supportive care while hospitals focus on the treatment of critically ill patients.

while in an ACC will be transferred on a priority basis to the nearest hospital ED for obstetrical support and delivery.

The rationale for limiting the level of care at the ACC is based on the following:

1. Hospitals have better access to the resources required to treat critically ill patients. These resources include cardiac monitors, oximeters, ventilators, free-flowing oxygen, intravenous pumps, and invasive monitoring equipment.

2. Hospitals have better access to staff (i.e., respiratory therapists; critical care, emergency, and surgical nurses and physicians) experienced in resuscitation and care of critically ill patients. It is more efficient to concentrate these trained individuals in one location.

3. The ACC is established when demand for healthcare exceeds existing resources. To aid patient survival, the ACC must be set up quickly to maximize its use of limited resources by streamlining its level of care to provide the maximum good to the greatest number of people. This is best accomplished by providing only antibiotics, hydration, bronchodilators, and pain management at the ACC. The primary focus on these four areas simplifies the logistics of setting up these centers and reduces the amount of supplies and equipment a community needs to cache, yet the ACC is enabled to provide the care that will help the greatest number of victims.

4. Providing a selective level of care minimizes the ethical decisions healthcare providers would need to make when only a limited supply of advanced care technology is available.

5. Providing this level of treatment eliminates healthcare providers' dependence on technology to provide mass care.

6. A free-standing ACC faces a number of logistical barriers that directly affect the level of care that can be provided at the facility. An ACC established in a school gymnasium, community field house, or hospital cafeteria will not have necessary access to free-flowing oxygen, medical air to drive ventilators, or specialized electrical outlets required to provide critical care-level medicine. These locations do, however, offer the space necessary to provide agent-specific therapy and basic supportive care to victims of a bioterrorist event.

7. Streamlining the care provided at the ACC will allow healthcare providers of various backgrounds to follow preestablished treatment guidelines. Recommending that an ACC be able to provide the same level of care that can be offered by a hospital puts an unrealistic burden on a community to provide unlimited resources (i.e., money, equipment, and personnel) to an ACC.

Standing Admission Orders

To facilitate rapid admission and treatment of casualties, standing predefined admission orders can be used. These admission orders provide a template for physicians to use for quickly writing orders required to direct inpatient care. These standing predefined admission orders should address the basic components of agent-specific and ongoing supportive care therapy, such as antibiotics or vaccines, hydration, bronchodilators, pain management, and other provisions of basic patient care (See Appendix A, Sample Admission Orders).

Command Organization

The organization of the command and control structure for the ACC will be locally determined and will fit into the existing local emergency command structure. The example in Figure 2 (ACC Command Organization) is modeled after the nationally recognized Incident Command System (ICS) and the companion Hospital Emergency Incident Command System (HEICS).

Patient Flow

Casualties will arrive at the ACC primarily through casualty transportation services or ambulances. Before patients arrive, either the NEHC or the hospital ED should notify the Medical Command Center (MCC) that patients need to be hospitalized. The MCC of the MEMS will determine where the patients will be admitted (hospital or ACC) and communicate that location back to the casualty transportation services staff. The MCC will also communicate to the ACC that there are incoming patients. The information relayed should include the total number of patients and any other pertinent details, such as how many patients require transfer by stretcher versus wheelchair. Presented in Figure 3 (ACC Flow Diagram) is a model illustrating the flow of incoming bioterrorism casualties from NEHC or ED facilities to the ACC.

The ACC will be 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. When the first 50-bed nursing subunit is completely set up and staffed,

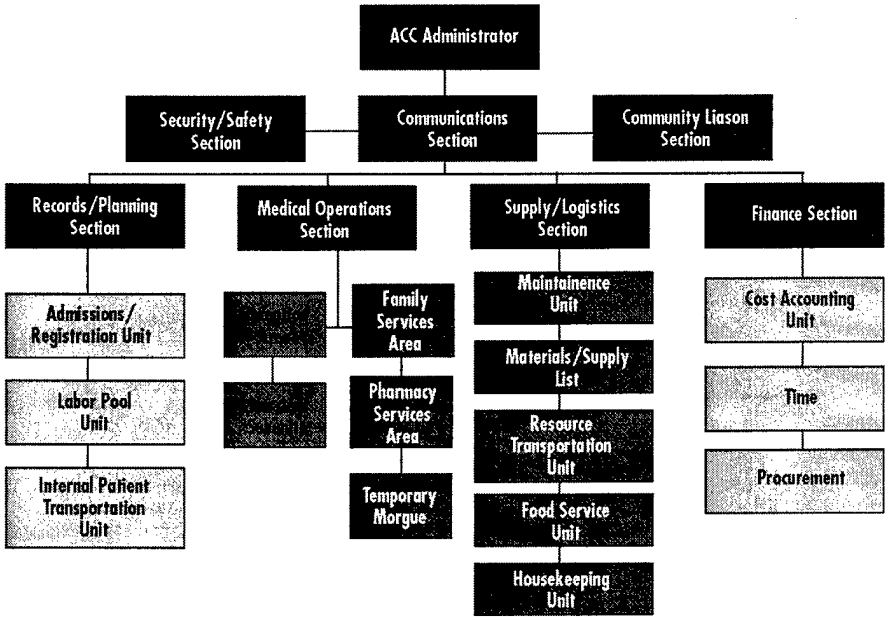


Figure 2. ACC Command Organization

the ACC can begin to accept admissions. As more nursing subunits are completely set up with core staffing and supply resources, admissions can be distributed evenly across the nursing subunits until capacity is reached. A general guideline for admitting patients to the next nursing subunit could be when the current nursing subunit is at 70–80 percent capacity. When the first 250 beds reach 50–60 percent capacity, the next pod should be nearing completion and readying for receipt of patients.

As patients arrive, they should be directed to or dropped off at the ACC's Admissions/Registration area. The patients should be rapidly evaluated for placement and categorized by the Patient Care Coordinator (PCC). As bed assignments are made, the Internal Patient Transportation Unit will move the patient from the Admissions/Registration area to an assigned bed in a nursing subunit.

Patients will be sent from the Admissions/Registration area to their inpatient location with the additional admissions packet of paperwork that includes physician orders (See Appendix A, Sample Admission Orders). These orders should be preprinted and cached during the preplanning activities of the community's OEM. Each patient's admission orders will be completed and tailored to meet the patient's individual needs based on the findings of the physician in the nursing subunit (not in the Admissions/Registration area). Patients who arrive without first having been triaged will be redirected to either an NEHC or hospital ED. The ACC is not designed to

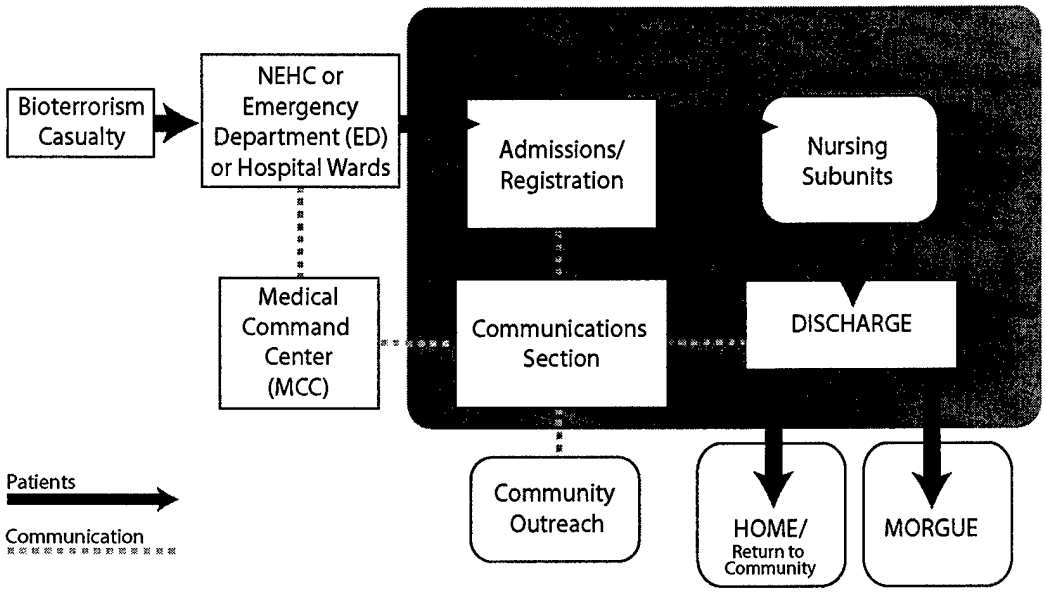


Figure 3. ACC Flow Diagram

Organization of Patient Beds

A fully operational ACC has 1,000 beds. These are organized into four 250-bed pods and each pod has five 50-bed nursing subunits.

provide evaluative type patient assessments in the Admissions/Registration area. This area is intended solely to log patients into the internal tracking system and assign nursing unit and bed location.

When the patient arrives at the assigned location, standard inpatient procedures will prevail, albeit in a more streamlined or scaled-down manner. The medical clerical personnel in each nursing subunit will be responsible for processing the physician's admission orders, while the RN will verify and sign that the orders were implemented.

Standardized plans of care may be developed in advance based on the typical presentation of expected agents that might be used in a bioterrorist attack. Many agents present with flu-like symptoms, which are conducive to a template approach. Preestablished criteria to guide transfer and discharge decisions would be useful to promote patient movement through the system. This approach would assist the ACC in maintaining maximum bed availability for continued admissions of patients affected by bioterrorism-related illness.

Case managers and/or social workers will be responsible for discharge planning to ensure that those who need assistance at home receive such care. Discharge will include the collection of patient records and referral to psychological counseling or other human relief services and any follow-up that may be necessary. Preprinted agent-specific discharge instructions should be developed or obtained during the preplanning stages and cached for use in an actual incident. Patients will be discharged with these instructions and any starter packs of agent-specific medications that they might still require. As with the discharge instructions, when the agent is identified, discharge medications should be prepackaged if feasible. Discharges will be coordinated through the Admissions/Registration area for bed control and patient-tracking purposes.

Facility Requirements

There are several requirements that should be considered when planning for an ACC. The following list is a good starting point but is not necessarily comprehensive.

a. Site selection
b. Parking and access
c. Building considerations
d. Total space and layout
e. Recommended buildings
f. Doorways and corridors
g. Electrical supply
h. Heating and air conditioning
i. Lighting
j. Floor coverings
k. Hand wash facilities
l. Refrigeration capabilities

When evaluating a particular facility, attention to the layout is crucial to the efficient functioning of the ACC. For example, planners should keep in mind the following:

1. General Layout – The nursing subunits should be centrally located to the other areas of the ACC. The Admissions/

Registration area is the focus of the initial patient presentation and admission procedures and should be located at the main entrance of the building.

2. Traffic Pattern (Patient and Supplies) – The ACC layout should allow rapid access to every area with a minimum of cross-traffic. Proximity is desirable between the Admissions/Registration area and the nursing subunits. Protection of visual, auditory, and olfactory privacy is important while recognizing the need for observation of patients by clinical staff.

3. Bed Spacing – Patient care areas should allow at least two feet of clear floor space between beds.

4. Provisions for Medical Gases (Oxygen) – Provision of medical gases (oxygen) is a logistically complex and expensive undertaking. Each community will need to evaluate its resources in determining whether to provide oxygen therapy in the ACC. If emergency planners determine that oxygen will be provided at the ACC, they should consider, for example, developing a multiple branch-line system that pipes medical gases to each nursing subunit and patient bed. This may be accomplished by using portable cylinders; however, it may be more practical to construct a temporary liquid oxygen manifold system because of the sheer number of cylinders that would be needed (one E-cylinder of oxygen lasts an average of 4 to 8 hours for one patient at a flow rate of 2 liters/minute). It is strongly suggested that a biomedical engineer be involved in the setup of the oxygen delivery system, should it be deemed feasible. (See Figure 4, Oxygen Delivery Set-Up.)

Staffing Requirements

The issue of finding adequate numbers of medical professionals to staff an ACC is one that requires creative preplanning. Local communities may need to negotiate mutual aid agreements that specify where additional staff may be obtained while awaiting the arrival of federal resources. It is not expected that an affected community will have the extra staff resources to open an ACC independently. Clearly, the majority of ACC staff will have to come from outside the affected area.

The local Office of Emergency Management (OEM) must establish and provide a centralized registration and credentialing system to rapidly process all persons assigned to an

STAFFING

Suggested minimum staffing per 12-hour shift for a 50-bed nursing subunit follows:

a. One physician
b. One physician's assistant (PA) or nurse practitioner (NP) (physician extenders)
c. Six RNs or a mix of RNs and licensed practical nurses (LPN)
d. Four nursing assistants/nursing support technicians
e. Two medical clerks (unit secretaries)
f. One respiratory therapist (RT)
g. One case manager
h. One social worker
i. Two housekeepers
j. Two patient transporters

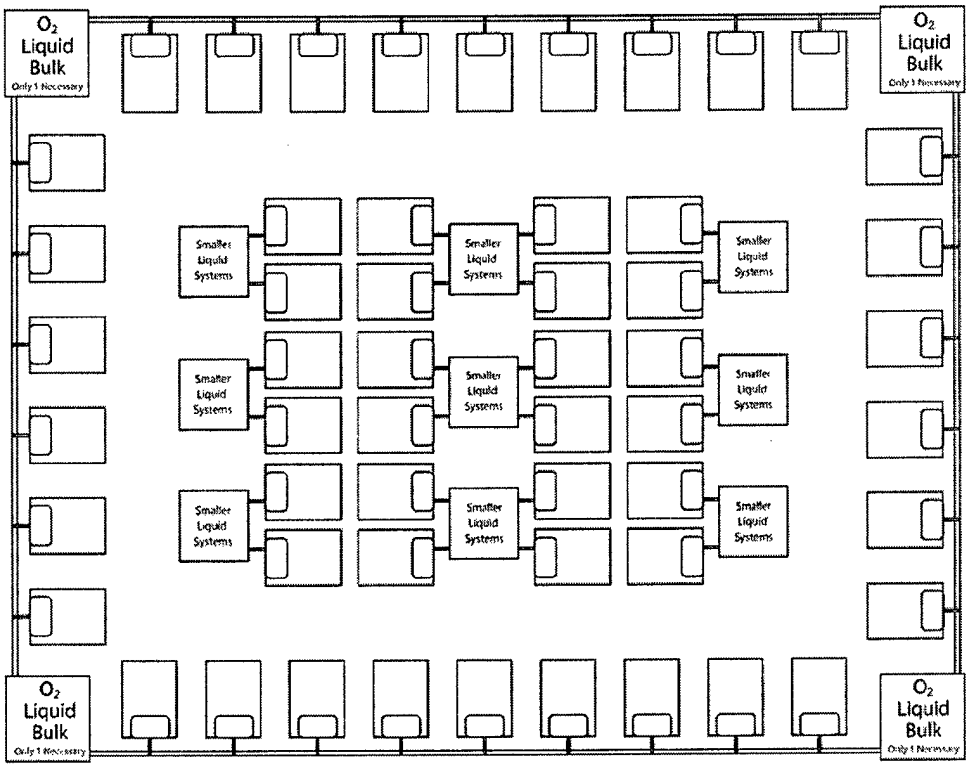


Figure 4. Oxygen Delivery Set-Up

ACC. If your community has a Metropolitan Medical Response System (MMRS) Plan, your staffing should be stated in that plan. This will allow the U.S. Department of Health and Human Services' Office of Emergency Preparedness to preplan the acquisition of the ACC staff. By doing so, when this resource is needed, the request for assistance can be routed to the State Emergency Management Agency, and if the state cannot fulfill the need, subsequent forwarding of the requirement from the State to the Federal Emergency Management Agency can occur.

To ensure that the ACC operates in tandem with the supporting hospital, planners might consider distributing some of the hospital's regular staff among the temporary personnel. This is advantageous because it provides a base of staff who have valuable information, such as departmental phone numbers or procedural knowledge.

Potential types of medical providers who will staff the ACC include physicians and other healthcare providers who may not have inpatient general medical skills or who are still in training. It is highly beneficial to the entire operation of the ACC if some physicians whose current practice includes management of hospitalized patients are dispersed among the ACC's temporary medical staff.

The nature of the medical needs and the shortage of staff in a bioterrorist incident may make traditional role delineation impractical. Therefore, divisions of responsibilities for various aspects of patient care and program administration will be based on knowledge, experience, special talents, and to some extent, interests of individual staff members. In this way, each staff member's particular abilities will be fully used and operations will run more smoothly. Nonmedical personnel, such as clerks and volunteers, will be engaged extensively throughout the ACC to lessen the burden on the clinical staff. Volunteers will be used if available. However, the ACC design is predicated on the assumption that they will not be available. Staffing an ACC is a major challenge, and in practical application, it may be that an ACC cannot be opened until outside staffing resources arrive.

The ACC will likely operate on two rotating 12-hour shifts. The minimum number of staff providing direct patient care on the 50-bed nursing subunit per 12-hour shift is 12, which includes the physician, the physician extenders, nurses, and nursing assistants. The physician will be assigned the entire subunit, while the nursing staff will operate in a team approach. Members of the patient care team will have tasks assigned that are consistent with their scope of practice.

Credentialing of physicians and other licensed medical personnel should be preplanned and is the responsibility of the OEM. As a part of the preplanning activities related to credentialing, the OEM needs to establish a policy for physicians who are licensed in other States (as well as other licensed care providers) and determine what entity is responsible for providing malpractice insurance coverage and protection from future lawsuits for the medical providers.

Operational Considerations

1. **Extemporaneous Training.** Extemporaneous training provides all the orientation and background information necessary for staff members to effectively operate within the ACC organization. The ultimate success of the ACC will depend largely on the effectiveness of this training. At a minimum, staff members should receive some form of training that addresses the mission of the ACC, site orientation, standard operating procedures, and the responsibilities of each member of the ACC. All staff, including volunteers, should receive this training before the opening of the ACC or their initial shift. New clinical staff who report after the ACC has opened must be oriented to their immediate role, environment, and the ACC in general by either the PCC or the pod manager. Other nonclinical staff reporting after the ACC opens will be oriented by their respective unit "manager."

   This training should include, but not be limited to, the following:

   a. Personal protective measures, including infection control measures (handling and disposing of infectious waste, agent-specific transmission prevention measures, etc.)
   b. Standard operating procedures
   c. Information on the agent and treatment modalities
   d. Standard reporting procedures
   e. Response to outside requests for information
   f. Patient confidentiality

2. **Job Action Sheets.** Job Action Sheets

are a simple method for assigning and identifying roles and responsibilities for all personnel. They are straightforward job description checklists outlining critical activities for a specific job position. Job Action Sheets are used in addition to the extemporaneous training to teach staff "what they are going to do, when to do it, and who to report to after they've done it." To ease the burden of memorizing protocols, each staff member is issued a sheet that prioritizes a detailed description of the critical actions necessary for successful performance. Job Action Sheets have already been prepared for all of the jobs in an ACC. These are found in the *Concept of Operations for the Acute Care Center.* (See Appendix B, Sample Job Action Sheet.)

3. **Patient Records**. A functional medical record must be established for every individual who is treated at the ACC. This record accompanies each patient throughout his/her stay and is available to the medical staff as needed for documenting the treatment provided and the patient's response to such. All records must be complete, legible, and thorough. Initially, each patient will arrive at the ACC with some paper documentation that was started in either the NEHC or the transferring hospital's ED. Upon arrival to the ACC, additional components of the patient's medical record will need to be added. A basic admission package of paperwork should be minimally composed of preprinted standing admission orders, medical history and physical checksheet, multidisciplinary progress notes, and nursing flowsheets (for documenting vital signs, intake and output [I&O], activities of daily living [ADL], etc.). Nursing documentation requirements should be scaled down as much as possible, and charting by exception is highly recommended. It is recommended that each ACC adopt the standardized inpatient record system of the supporting hospital in the most simplified form possible, which will facilitate the transfer and management of patient information.

4. **Patient Tracking**. Patient tracking is the responsibility of the Records/Planning Director. Patient demographics will be captured on each patient at the time of admission. The Admissions/Registration area will maintain a patient register (patient logbook) that includes information such as the dates of the patient's admission and discharge and the nursing subunit where the patient was admitted. When the patient is ready for discharge, the nursing subunit will notify the Admissions/Registration area informing it of the location to which the patient is being discharged. This information will also be recorded on the patient register. A copy of the patient register should go to the community's EOC and the MCC at the ACC because they are responsible for handling requests for patient location and bed availability. Accurate patient tracking is a critical function of the ACC as relatives, media, and incident investigators will be trying to locate individuals during this stressful time.

5. **Medical Equipment and Supplies.** Necessary medical equipment and supplies should be predetermined and cached for emergency use wherever possible. If stockpiling is not feasible,

emergency planners must identify mechanisms for rapid acquisition of required supplies. Appropriate stocks of necessary medical supplies and equipment must be available or easily obtainable at all times to sustain continuous operations.

6. **Pharmacologic and Therapeutic Drugs**. Necessary drugs must be made immediately available to the ACC. An initial starting point for emergency planners is to perform a survey of area hospital pharmacies, community pharmacies, and area/regional pharmacy warehouses. Planners should identify all possible sources for obtaining necessary drugs, as well as the volume available from each source. For each source, a phone number that provides 24-hour access to the appropriate authorized individual(s) must be obtained. A mechanism for the emergency acquisition of large quantities of supplies as well as one for the distribution of these medications to hospitals, NEHCs, and ACCs will be required. The minimum medications needed to start and run an ACC are recommended in Appendix C with accompanying rationales.

   Communities should expect to be self-sufficient for up to 72 hours following an attack. Law enforcement agencies may be a possible resource for picking up and delivering the pharmaceutical supplies, especially as they provide a secure mechanism for doing so. In addition, some supplies are available via the CDC's National Pharmaceutical Stockpile (NPS) Program. The most important consideration for emergency planners in regards to the request and receipt of the NPS is that it will arrive in bulk form and require the local community to create a plan for its breakdown and distribution. More information is available via the website, www.cdc.gov.

   It may become necessary to provide security for pharmaceutical suppliers if public panic ensues or is deemed imminent.

7. **Environmental Health and Sanitation (Housekeeping)**. The principles of Standard (Universal) Precautions should be generally applied for the management of patient care equipment and environmental control. At a minimum, the ACC should have policies to address the following environmental health and sanitation issues:

   a. Adequate procedures for the routine care, cleaning, and disinfection of environmental surfaces, beds, bedside equipment, and other frequently touched surfaces and equipment. To ensure that these policies are met, it is recommended that consideration be given to the use of pretreated, disposable germicidal wipes throughout the ACC.
   b. Environmental Protection Agency (EPA)-approved germicidal cleaning agents should be available in patient care areas to use for cleaning spills of contaminated material and disinfecting noncritical equipment.
   c. Used patient care equipment that is soiled or potentially contaminated with blood, body fluids, secretions, or excretions should be handled in a manner that prevents exposures to skin and mucous membranes, avoids contamination of clothing, and minimizes the likelihood of microbial transfer to other patients, personnel, and environments.

d. Sterilization is required for all instruments or equipment that enters normally sterile tissues or through which blood, intravenous (IV) fluids, or medication flow.
e. Rooms and bedside equipment of infected patients should be cleaned using the same procedures that are used for all patients as a component of Standard (Universal) Precautions. Special disinfection of bedside equipment and environmental surfaces may be indicated for certain organisms that can survive in the inanimate environment for extended periods of time.
f. Patient linen (if not disposable) should be handled in accordance with Standard (Universal) Precautions. Although linen may be contaminated, the risk of disease transmission can be minimized if it is handled, transported, and laundered in a manner that avoids transfer of microorganisms to other patients, personnel, and environments.
g. Contaminated medical waste should be sorted and discarded in accordance with federal, state, and local regulations.

8. **Personnel Protection Measures.** All patients in the ACC should be managed using Standard (Universal) Precautions. Standard (Universal) Precautions (which include Universal Precautions for blood and body fluids) are designed to reduce transmission from both recognized and unrecognized sources of infection in healthcare facilities and are recommended for all patients receiving care, regardless of their diagnosis or presumed infection status. For certain diseases or syndromes, additional precautions may be needed to reduce the likelihood for transmission.

Standard (Universal) Precautions prevent direct contact with all body fluids (including blood), secretions, excretions, nonintact skin (including rashes), and mucous membranes.

9. **Provisions for Children and Family Members.** Providing effective care to children poses unique challenges, especially in a disaster situation. Children have special needs, both physically and psychologically.

If possible, incorporate healthcare providers with child care experience into the staff mix of the ACC. When making patient care assignments, make every attempt to assign staff with pediatric experience to the children requiring care.

Ensure that pediatric supplies are included in the medical equipment and supplies stockpiling and acquisition efforts.

10. **Staff Support Services.** At least one room should be provided within the ACC to enable staff to relax during rest periods. There should be allowance for food and drink to be prepared and appropriate table and seating arrangements should be made available. The room or facility should be isolated from the nursing subunits so that the staff can rest and discuss feelings and issues regarding patients out of the sight and hearing of both patients and visitors.

Staff should have access to their own toilet facilities that are not shared with patients and visitors. It would be ideal if the building had shower facilities and lockers so that the staff could clean up before leaving their shift. Having the ability to shower before leaving the ACC

would provide the staff with some peace of mind and a low level of decontamination. It is also strongly recommended that emergency planners consider the following to address healthcare workers' fears:

a. Provision of risk awareness education, including frank discussions of potential risks and measures for protecting health care providers
b. Invitation to staff for active, voluntary involvement in the quality assurance process
c. Provision of daily incident updates
d. Placement of fearful or anxious healthcare providers in other useful roles

11. **Epidemiological and Public Health Investigation.** One of the major challenges that emergency planners face in a bioterrorist incident is to effectively determine the scope and magnitude of the event. To do this, a massive epidemiological investigation will be initiated. Investigators may need frequent access to medical providers, patients, and their medical records. Emergency planners should ensure that the ACC is constructed and operated in a way that supports this critical public health activity.

12. **Patient Disposition.** Most bioterrorism agents are not associated with secondary spread of infection to healthcare providers or families. For certain agents, such as pneumonic plague or smallpox, victims of bioterrorism will ideally not be discharged from the facility until they are deemed noninfectious. However, consideration should be given to developing home care instructions in the event that large numbers of persons exposed may preclude admission of all infected patients.

In addition, home care instructions should provide information on the remaining treatment regime and any follow-up care that may be required. Patients will be discharged from the ACC when they are able to care for themselves (toilet, feed, dress themselves) or when they are recovered enough to go home with someone there to assist in their care and recovery.

Postmortem care will be conducted in the ACC's Temporary Morgue area in accordance with established Federal guidelines. The Temporary Morgue will provide the initial fatality processing and temporary storage of remains until they are transferred to the appropriate mortuary services provider. Death notifications will be handled through official channels only.

13. **Food Services.** One of the greatest challenges facing the ACC Administrator will be to provide for the feeding of both patients and staff. A crisis situation will limit the options available to emergency planners and the ACC Administrator. Careful preplanning is critical to ensure that the plan and system are in place to accomplish this mission. There are two viable options for providing food services: catering all meals to both patients and staff, or catering all meals that can be catered and having special dietary needs handled by the supporting hospital's food service department. If possible, all meals should be catered, as the supporting hospital's food service department is likely to be overextended from supporting their inpatients and staff. Emergency planners need to have contingency catering contracts in place to support the ACC(s).

The catering contract should require that the caterer supply all plates and eating utensils needed for each meal.

14. **Hospice Care.** Hospice care is a compassionate method of caring for terminally ill people. Hospice is a medically directed, interdisciplinary team-managed program of services that focus on the patient/family as the unit of care. Hospice care is palliative rather than curative, with an emphasis on pain and symptom control, so that a person may live out the last days of life fully, with dignity and comfort (National Hospice and Palliative Care Organization). In the event of a bioterrorist incident that is lethal enough to cause high casualty and death counts, hospice care will be a significant part of the medical services provided by the ACC. Therefore, adequate supplies of pain medicine, such as intravenous morphine, must be available, as well as policies surrounding its use.

    The psychosocial aspects of the mixed inpatient population that is likely to exist will be complex. Patients who are expected to die may be located next to patients who are improving. Families of both will be in proximity to each other. Varying beliefs and traditions surrounding death and dying will become evident and may cause already stressful conditions to worsen. Chaplains and other religious personnel should maintain a presence in the ACC around the clock if at all possible. Staff unfamiliar with hospice care and goals should be briefed on both as they will be the first resource the patient and famlies use to assuage fears and receive accurate information on prognosis and treatment.

15. **Provider Credentialing**. The OEM has the overall authority and responsibility for human resources during a disaster situation. One responsibility is to develop emergency hiring procedures using appropriate outside resources as available.

    Inherent in this is the responsibility for verifying that the minimum criteria for clinical practice in the case of licensed medical professionals and in particular, physicians, physician assistants, nurse practitioners, and nurses (registered and licensed practical), has been met. The OEM should work in conjunction with local hospitals or managed care organizations in credentialing licensed healthcare providers in accordance with procedures outlined by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). When physicians and other medical professionals report to the ACC for duty, the credentialing and verification process should already be complete and ideally, a temporary identification badge issued.

Conclusion

The care of presenting casualties and worried well along with medical prophylaxis, vaccination, treatment, and information form the backbone of an effective response to a bioterrorist attack. A mass casualty care system was developed to cope with the high numbers of casualties and those who think they are casualties. One critical component of this system involves opening Acute Care Centers to expand the capabilities of existing hospitals to provide inpatient medical care. ACCs are flexible, modular units that operate in concert with hospitals and Neighborhood Emergency Help Centers. They can be expanded or contracted in a modular fashion to provide a flexible mechanism for an effective medical response to the consequences associated with a bioterrorist attack, regardless of scope. They are also useful in other overwhelming medical emergencies that are not caused by events of bioterrorism.

Points Of Contact For Planning Assistance

Homeland Defense:
http://www2.sbccom.army.mil/hld

- Online source for the 1998 Summary Report on BW Response Template and Response Improvements.
- Information and factsheets on training exercises and equipment.
- Links to related sites including federal partners of the DPP, Chemical Weapons Improved Response Program, and the Rapid Response Information System.
- To get a copy of the Concept of Operations for the Acute Care Center, call (410)436-5686.

Department of Health and Human Services
http://www.dhhs.gov/
(877)-696-6775

National Domestic Preparedness Office
http://www.ndpo.gov/
(202) 324-9026

Centers for Disease Control and Prevention
http://www.cdc.gov/
(800) 311-3435

Federal Emergency Management Agency
http://www.fema.gov/
(202) 646-4600

Department of Defense
http://www.defenselink.mil/
(703) 697-5737

Office of Emergency Preparedness
http://ndms.dhhs.gov
(301) 443-3499

Federal Bureau of Investigation
http://www.fbi.gov/
(202) 324-3000

U.S. Army Medical Research Institute for Infectious Diseases
http://www.usamriid.army.mil/
(888) 872-7443

Environmental Protection Agency
http://www.epa.gov/
(202) 260-2090

Department of Energy
http://www.doe.gov/
(202) 586-5000

Department of Agriculture
http://www.usda.gov/
(202) 720-2791

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Related Reading

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APPENDICES

APPENDIX A: SAMPLE ADMISSION ORDERS

Patient Name/Stamp_____
Date_____

Sample Admission Orders (Template for Admission Orders)

1. Antibiotic: Cipro 500 mg po bid Pediatric Dose:
   ☐ Other:
   ☐ Doxycycline 100 mg po bid Pediatric Dose:
2. Allergies: ☐ Doxy (TCN) ☐ Cipro ☐ PCN (penicillin) ☐ MSO4
   ☐ Phenergan ☐ Sulfa ☐ Iodine/Contrast Dye ☐ Other:
3. IVF: ☐ 0.9%Normal Saline ☐ D_5W .45% NS
   ☐ rate = ____cc/hr ☐ Saline lock
4. IVF Bolus (Pediatric dose: 20cc/kg) : ☐ 250 cc/hr ☐ 500 cc/hr ☐ 1000 cc/hr
   ☐ other_____
5. Oral Rehydration: ☐ 100 cc/hr ☐ 200 cc/hr ☐ 500 cc/hr ☐ other_____ (may be administered per family or volunteer)
6. Oxygen: ☐ _____liters/minute via nasal cannula OR ☐ _____ % via facemask
7. Diet: ☐ Regular ☐ Diabetic ☐ Fluids ☐ Other:
8. Vital signs per routine
9. Routine I&O
10. Foley catheter PRN if no urine output in four (4) hours. Discontinue PRN. Once discontinued, if patient does not void in 8 hrs, replace Foley catheter and notify MD.
11. Routine home medications (if provided by patient or family).

12. Acetaminophen: ADULTS = ☐ 1000 mg PO q4h PRN for temp >101.5 or pain
    PEDIATRICS = ☐ ____ ml q4h PRN (15 mg/kg/dose; 160 mg/5 ml)

(Note: a 70 lb child = 32 kg x 15 mg = 480 mg = 3 tsp or 15 ml)

13. Phenergan: ADULTS = ☐ 12.5–25 mg IM/IV/PR q6h PRN
    PEDIATRICS = ☐ ___mg IM/IV/PR q6h PRN (0.25–0.5 mg/kg/dose)

14. Albuterol: ☐ MDI with spacer: 2–4 puffs q2–4h PRN
    OR ☐ Nebulized unit dose q2h PRN
15. Diphenhydramine (Benadryl): ADULTS = ☐ 25–50 mg IV/IM/PO q6h PRN
    PEDIATRICS = ☐ ____mg IV/IM/PO q6h PRN (1 mg/kg/dose)
16. Lorazepam (Ativan): ADULTS = ☐ 1–2 mg IV/IM q6h PRN
    PEDIATRICS = ☐ ____mg IV/IM q6h PRN (0.05 mg/kg/dose)
17. Morphine Sulfate (titrate to effect): ADULTS = ☐ 2 mg IV/IM/SC q5 min PRN (max. dose: 15 mg in 4h)
    PEDIATRICS = ☐ 0.1 mg/kg/dose IV/IM/SC q5min PRN (max. dose: 10 mg in 6h)
18. Naloxone (Narcan): ADULTS = ☐ 2 mg IV q2min PRN (weight >20 kg)
    PEDIATRICS = ☐ ___mg IV q2min PRN (weight < 20 kg: 0.1 mg/kg/dose)
19. Other:
    - Aspirin: ☐ 325 mg ☐ Other: po qday
    - Nitroglycerin: ☐ 0.4 mg 1 tablet SL q5min PRN (if SBP> or = 90 mm Hg) until chest pain-free or ___ tablets given
    - Insulin: ☐ Regular ___u SQ qAM ☐ NPH___units SQ qAM
      ☐ Regular ___u SQ qPM ☐ NPH___units SQ qPM
      ☐ Insulin 70/30 ____u SQ qAM ☐ Insulin 70/30 ____u SQ qPM
    - Furosemide (Lasix): ☐ 20 mg ☐ 40 mg ☐ 60 mg ☐ 80 mg ☐ Other:
      PO/IV qday or BID
    - Digoxin (Lanoxin): Maintenance = ☐ 0.125 mg ☐ 0.25 mg ☐ Other: qday PO
      Loading = ☐ 0.5 mg PO one dose only now; ☐ Other:
      follow with ☐ 0.125 mg ☐ 0.25 mg PO ☐ Other: one time 8 h later
20. Labs (if available): ☐ CBC ☐ UA ☐ BMP (aka Chem 7) ☐ Dig level ☐ Other:
21. X-rays (if available): ☐ CXR
22. Social services for discharge planning
23. Victim Assistance Referral

MD Signature:_____
RN Signature:_____

ACC Administrator

Mission: Organize and direct the establishment, staffing, and operations of the Acute Care Center. Manage and supervise the day-to-day operations of the ACC in accordance with predetermined policies.

Immediate

____ Read this entire Job Action Sheet.
____ Put on position identification vest.
____ Initiate the ACC Emergency Incident Command System by assuming role of ACC Administrator.
____ Establish the ACC Communications Section (CS).
____ Establish communications with the community's Emergency Operations Center (EOC), the Casualty Relocation Unit (CRU), and supporting hospital's Medical Command Center (MCC).
____ Appoint all Section Directors and distribute the section packets that contain the following:
- Job Action Sheets for each position
- Identification vest for each position
- Forms pertinent to Section & positions

____ Meet with all the Section Directors and critical staff. Direct each section chief to establish their section according to procedures established in this document and under the direction of the ACC Administrator.
____ Appoint a Communications/Operations Officer, Liaison Officer, and a Safety and Security Officer; distribute Job Action Sheets. (May be pre-established.)
____ Announce a schedule of status/action plan meetings of all Section Directors and Unit Leaders.
____ Assign someone as Documentation Recorder/Aide.
____ Receive status reports and discuss an initial action plan with Section Directors and Unit Leaders as the ACC is physically established. Determine appropriate level of service to be provided in the ACC based on planning guidance from the MCC.
____ Obtain patient census and status from MCC Planning Section Chief. Emphasize the necessity of proactive actions from the Command Center and the Functional Units within the Planning Section. Call for a hospital-wide projection report for 4, 8, 24 & 48 hours from time of initial opening of the ACC. Adjust projections as necessary.
____ Coordinate with the Medical Operations Director to authorize a patient prioritization assessment for the purposes of designating appropriate early discharge, if additional beds are needed.
____ Ensure that contact and resource information has been established with outside agencies through the Community Liaison Director.

Intermediate

____ Authorize resources as needed or requested by Section Directors.
____ Designate routine briefings with Section Directors to receive status reports and update the action plan regarding the continuance and termination of the action plan.
____ Communicate status to chairperson of the Hospital Board of Directors and the MCC.
____ Consult with Section Directors on the needs for staff, physician, and volunteer responder food and shelter. Consider needs for dependents. Authorize plan of action.

Extended

____ Approve all internal media releases submitted by _____.
____ Observe all staff, volunteers and patients for signs of stress, fatigue and inappropriate behavior. Provide for staff rest periods and relief.
____ Other concerns:

APPENDIX C: PHARMACEUTICAL LIST

ANTIBIOTICS: Ciprofloxacin 500 mg or Doxycycline 100 mg tablets
Note: Choice of antibiotic will be dependant on agent and public health guidance.

OTHER MEDICATIONS:

a. Promethazine (Phenergan): This drug is safe for both adults and pediatrics and has multiple uses in the clinical setting. It may be used as an anti-emetic, as an adjunct to narcotics to potentiate their effect and thus decrease the amount of narcotic used, and as a sedative to promote rest and calm agitated patients.

b. Digoxin (Lanoxin): Given the expected mass casualty situation, it is likely that many patients would present with comorbidities including cardiovascular disease. Digoxin is versatile enough to treat arrhythmias as well as heart failure.

c. Furosemide (Lasix): Most patients requiring diuresis respond to this diuretic or are on it for maintenance. It is stable, readily available, and inexpensive.

d. Diphenhydramine (Benadryl): A very versatile drug to have on hand to treat allergic (drug) reactions, nausea, and insomnia.

e. Lorazepam (Ativan): This drug provides effective treatment for both anxiety and insomnia. It is relatively safe with few side effects or contraindications and may be given IV or IM. Its rapid onset and short half-life make it a useful addition to the basic drug inventory.

f. Nitroglycerin Sublingual: Provides a safe and effective treatment for congestive heart failure (CHF) and anginal pain. Use of this drug combined with aspirin may stabilize a patient long enough for transfer to a hospital if bed space is available. This combination may also be used for advanced cardiac care, or it may prevent the patient from further suffering.

g. Insulin (Regular and NPH): Insulin was included in the basic drug inventory because approximately 6 percent of the general population are diabetic. In persons 65 years and older, the prevalence increases to more than 18 percent.

Because the elderly are more susceptible to illness in general, it can be surmised that at any given time, the census of the ACC will lean towards more elderly than middle-aged patients and therefore a higher percentage of diabetics. Although regular insulin will be used more than NPH, some portion of the diabetic population will require both.

h. Albuterol Meter Dose Inhaler (MDI): Albuterol is the bronchodilator of choice, when combined with a spacer, because of its ease of administration and rapid onset of action. It is assumed that the need for bronchodilators will be widespread since the respiratory tract will be the primary site of infection.

i. Aspirin: This antiplatelet drug was included in the formulary to help treat cardiac or stroke (including transient ischemic attacks) comorbidity that may present to the ACC.

j. Naloxone (Narcan): This drug prevents or reverses the adverse effects of narcotics, including respiratory depression, hypotension, and sedation. Because many patients will presumably receive morphine for pain and respiratory distress, it is imperative to have Narcan to reverse accidental overdoses.

k. Morphine: Morphine is the preferred pain medicine because of its use in easing respiratory distress and decreasing cardiac oxygen consumption.

l. Oral Rehydration Therapy (ORT): Many patients suffering from the effects of bioterrorist agents will present with dehydration from fever, emesis, or diarrhea. Rehydration may be accomplished by either ORT or intravenous routes. ORT may be used safely for patients with altered mental status (especially pediatric) and may be administered by family members with minimal instruction. It is the mainstay of disaster/epidemic relief worldwide.